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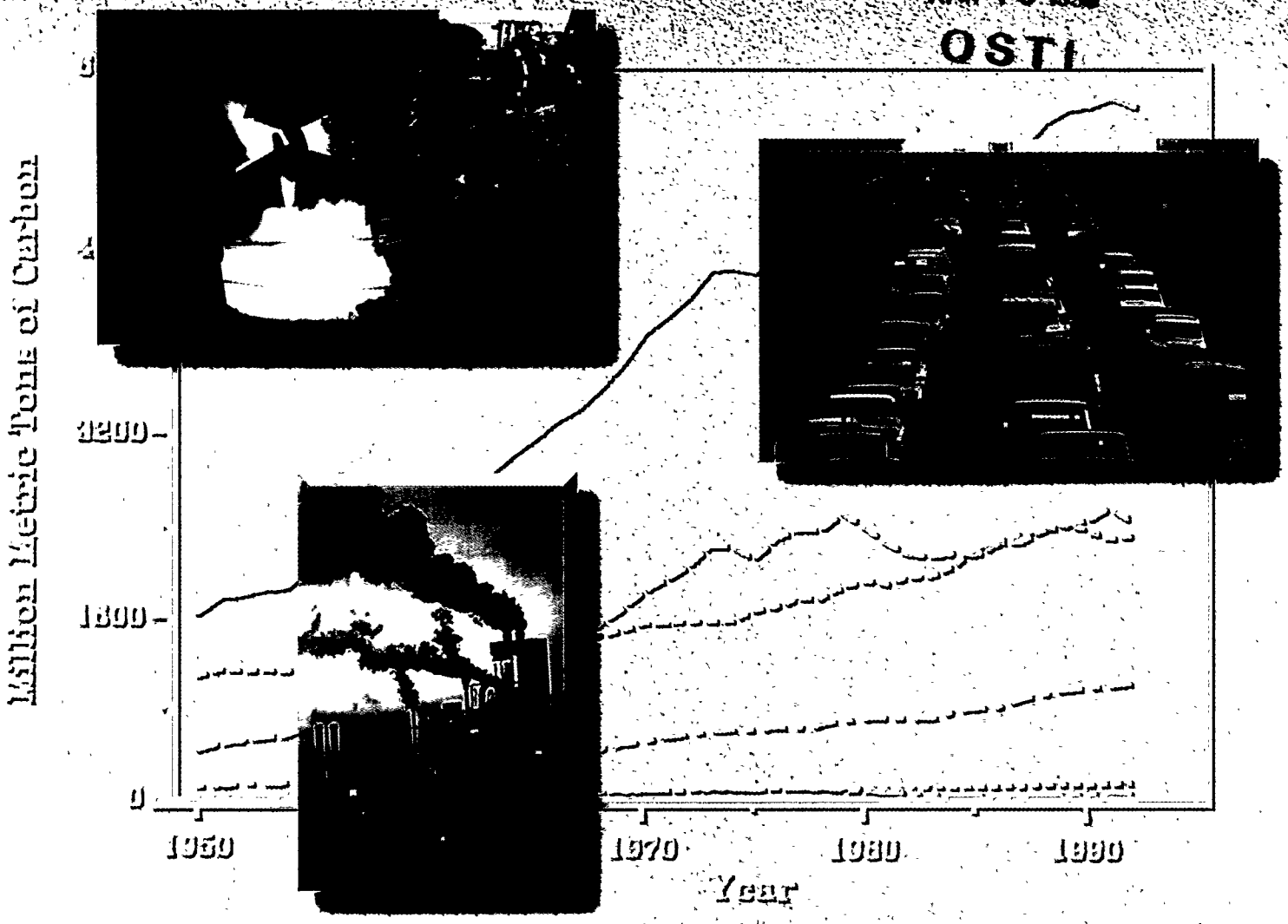
Estimates of Global, Regional, and National Annual CO_2 Emissions from Fossil-Fuel Burning, Hydraulic Cement Production, and Gas Flaring: 1950-1992



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ESTIMATES OF GLOBAL, REGIONAL, AND NATIONAL ANNUAL CO_2 EMISSIONS FROM FOSSIL-FUEL BURNING, HYDRAULIC CEMENT PRODUCTION, AND GAS FLARING: 1950-1992

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ABSTRACT

BODEN, T. A., G. MARLAND, and R. J. ANDRES. 1995. Estimates of Global, Regional, and National Annual CO_2 Emissions from Fossil-Fuel Burning, Hydraulic Cement Production, and Gas Flaring: 1950–1992. ORNL/CDIAC-90, NDP-030/R6. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee, U.S.A. 600 pp.

This document describes the compilation, content, and format of the most comprehensive CO_2-emissions database currently available. The database includes global, regional, and national annual estimates of CO_2 emissions resulting from fossil-fuel burning, cement manufacturing, and gas flaring in oil fields for 1950–92 as well as the energy production, consumption, and trade data used for these estimates. The methods of Marland and Rotty (1983) are used to calculate these emission estimates. For the first time, the methods and data used to calculate CO_2 emissions from gas flaring are presented. This CO_2-emissions database is useful for carbon-cycle research, provides estimates of the rate at which fossil-fuel combustion has released CO_2 to the atmosphere, and offers baseline estimates for those countries compiling 1990 CO_2-emissions inventories.

According to these estimates, the annual total of CO_2 emissions from fossil-fuel consumption, cement production, and gas flaring has grown almost fourfold since 1950. The 1992 estimate of 6097 million metric tons of carbon ended a string of 8 consecutive years of growth in global CO_2 emissions and represents a 1.2% decline from 1991. The 1991 estimate of 6172 million metric tons of carbon is the highest CO_2-emission estimate since the data record began in 1950; however, it includes ~130 million metric tons of carbon emitted to the atmosphere from the Kuwaiti oil field fires.

Regionally, 1992 shows a continuing decline in CO_2 emissions for Eastern Europe, and Western Europe experienced its first decline in emissions since 1987–88. Regions where populations continue to grow—such as Africa, Centrally Planned Asia, Central and South America, the Far East, and Oceania—show corresponding increases in CO_2 emissions. In 1950, North America, Eastern Europe, and Western Europe (including Germany) accounted for 89.1% of global CO_2 emissions from fossil-fuel burning, cement production, and gas flaring, whereas the other regions—Africa, Centrally Planned Asia, Central and South America, the Far East, the Middle East, and Oceania—accounted for only 10.9%. These six regions now contribute 41.1% of the CO_2 emitted globally.

Nationally, the United States continues to be the largest single source of fossil fuel–related CO_2 emissions; 1332 million metric tons of carbon were emitted in 1992. In fact, U.S. emissions are ~45% higher than those of the world's second largest emitter, China. The top three emitting countries—the United States, China, and Russia—were responsible for 43.2% of the world's emissions from fossil-fuel burning in 1992. The top 20 emitting countries accounted for ~80% of all the world's emissions.

These data are available without charge as a numeric data package (NDP) from the Carbon Dioxide Information Analysis Center. The NDP consists of this document and 28 files that comprise the CO_2-emissions database. The database requires ~8.5 megabytes of disk storage and is available on a variety of media (i.e., floppy diskettes, 8-mm tape, and 9-track magnetic tape) or via the Internet.

Keywords: Carbon dioxide emissions; fossil fuels; cement; gas flaring; energy production and consumption; carbon cycle; atmospheric CO_2 concentrations; climate change

PART 1:

OVERVIEW OF THE DATABASE

1. BACKGROUND INFORMATION

Evidence that the atmospheric CO_2 concentration has risen during the past several decades (Keeling et al. 1989; Keeling and Whorf 1994; Conway et al. 1994) is irrefutable. Most of the observed increase in atmospheric CO_2 is believed to result from CO_2 releases from fossil-fuel burning. The United Nations (UN) Framework Convention on Climate Change (FCCC), signed in Rio de Janeiro in June 1992 (United Nations 1992), reflects global concern over the increasing CO_2 concentration and its potential impact on climate. One of the convention's stated objectives is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." Specifically, the FCCC asks all 154 signing countries to conduct an inventory of their current greenhouse gas emissions, and it sets nonbinding targets for some countries to control emissions by stabilizing them at 1990 levels by the year 2000. Given the importance of CO_2 as a greenhouse gas, the relationship between CO_2 emissions and increases in atmospheric CO_2 levels, and the potential impacts of a greenhouse gas–induced climate change it is important that comprehensive, accurate CO_2-emission records be compiled, maintained, and fully documented.

We have used internationally available data to estimate CO_2 emissions from all countries on a uniform and consistent basis. Inventories compiled by individual countries in response to the FCCC agreements may be based on more extensive national data sets and more nation-specific derivation and application of the parameters needed in the calculations, and should ultimately lead to more accurate estimates for individual countries for individual years. Broad national participation and careful adherence to internationally agreed upon methodologies may eventually lead to improved estimates of regional and global-total emissions as well.

Keeling (1973) was the first to establish a systematic method for estimating the amount of CO_2 emitted from fossil fuels. Keeling used energy data from the UN Department of International Economic and Social Affairs. Since 1973, both energy data collection and the procedures for estimating CO_2 emissions have been refined and improved (Marland and Rotty 1984; United Nations 1994). The global distributions, trends, and patterns of these fossil fuel CO_2 emissions have been studied and described by Marland and Rotty (1984), Marland and Boden (1993), and Marland et al. (1994a, b).

Another industrial source of CO_2 is cement manufacturing. Hydraulic cement, particularly Portland cement, is the most abundant and widely used type of cement. Portland cement is a combination of two types of raw materials: one rich in calcium, such as limestone, chalk, marl, or clam or oyster shells; the other rich in silica, such as clay or shale (Griffin 1987). In a cement kiln, calcium carbonate ($CaCO_3$) is broken down (calcined) into CO_2 and calcium oxide (CaO) (Helmuth et al. 1979). The CaO is used in manufacturing cement, and the CO_2 is released to the atmosphere. Several studies (Keeling 1973; Griffin 1987; Rotty 1987) determined the amount of CO_2 emitted during cement manufacturing using data published by the UN or the United States Bureau of Mines. Although the amounts of CO_2 produced from cement manufacturing are far less (~3% of 1992 global CO_2 emissions) than those from fossil-fuel consumption, the quantities are large enough to constitute an important source of CO_2 emissions.

Biomass derived fuels are specifically not included in the inventories here. The basic philosophy is that a complete accounting of CO_2 emissions requires that emissions from loss of forest and other C storage in the biosphere be added to the numbers here for CO_2 emissions from fossil fuels. To the extent that use of biomass fuels represent long-term loss of C from the biosphere, this should be reflected in numbers for emissions from forest clearing and attempts to include biomass fuels here would run great risk of double counting. The Intergovernmental Panel on Climate Change (IPCC) methodology for national greenhouse gas emissions inventories suggests that CO_2 emissions from

biofuels be estimated for the sake of complete accounting of the energy system, but that the numbers not be included when sums are produced.

Another source of CO_2 is the flaring of natural gas, a practice used in oil fields to eliminate waste gases and vapors. This practice is used for convenience in oil field operations that lack the ability to adequately handle and recover natural gas while producing oil and is used as a mechanism to quickly eliminate excess gases during unexpected equipment failures or plant emergencies. Like those from cement production, emissions from gas flaring are far less (~1% of 1992 global CO_2 emissions) than those from fossil-fuel consumption. For some nations (e.g., Kuwait, Oman), however, CO_2 emissions from gas flaring constitute a sizeable portion of their total CO_2 emissions; these emissions were particularly high during the 1960s and 1970s, before the Middle Eastern countries had the infrastructure and impetus to recover natural gas at their oil fields.

The purpose of this document is to fully document the most comprehensive CO_2-emissions database currently available. The database contains global, regional, and national annual estimates of CO_2 emissions resulting from fossil-fuel burning, cement manufacturing, and gas flaring in oil fields for 1950–92. This document focuses largely on the format and content of the database and the data used to calculate these emission estimates. The methods used to calculate the global totals are discussed briefly and are described in detail in Marland and Rotty (1984). A copy of the Marland and Rotty (1984) paper is provided in Appendix B of this documentation. More detail of methods and philosophies behind the national estimates is contained in Marland and Boden (1993). The methods and data used to calculate emissions from gas flaring are described here for the first time.

This database provides estimates of the rate at which fossil-fuel combustion and cement manufacturing have released CO_2 to the atmosphere. These CO_2-emission estimates are useful for carbon-cycle research, provide one of the fundamental data sets needed to assess the magnitude and potential effects of increased concentrations of atmospheric CO_2, and offer baseline estimates for those countries compiling 1990 CO_2-emission inventories to meet FCCC requirements.

2. DATA SOURCES AND SCOPE

The data described in this document include global, regional, and national annual CO_2-emission estimates and the data used in calculating these estimates. This includes a large portion of the 1992 UN Energy Statistics (UNSTAT) Database (UN 1994), hydraulic cement production estimates compiled by the U.S. Department of Interior's Bureau of Mines (Solomon 1993), and supplemental data on gas flaring obtained from the U.S. Department of Energy's Energy Information Administration (DOE/EIA). Annual CO_2-emission estimates are provided for the period 1950–92 for the globe, 10 regions, and 240 countries. Global estimates, derived from UN fuel production data, and national estimates, derived from UN data for international trade, were calculated by using the methods of Marland and Rotty (1984). In addition, annual per capita rates of carbon emission are provided. These emission rates were calculated by using population estimates published by the UN Statistical Division (UN 1994).

The primary database used to estimate the amount of CO_2 emitted to the atmosphere from fossil-fuel burning and gas flaring is the UNSTAT Database, a comprehensive collection of international energy data compiled by the United Nations Statistical Office.[1] This database provides data for primary and secondary forms of energy, for almost every nation in the world (Tables 1 and 2), and by individual fuel types. The complete UNSTAT Database also contains data on production,

[1] The complete UNSTAT Database is available from the United Nations Statistical Division, 2 United Nations Plaza, New York, NY 10017

Table 1. Alphabetical listing of the countries and areas (and their corresponding country and area codes) represented in the United Nations Energy Statistics Database

Country	Code	Country	Code
Afghanistan	004	Chad (from 1959)	148
Africa	002	Chile	152
Albania	008	China, Peoples Republic of[4]	156
Algeria	012	Christmas Island	162
American Samoa	016	Colombia	170
Angola	024	Comoros	174
Antarctic Fisheries[1]	081	Congo (from 1959)	178
Antigua and Barbuda (from 1957)	028	Cook Islands	184
Argentina	032	Costa Rica	188
Armenia	051	Côte d'Ivoire (from 1958)	384
Aruba (from 1986)	533	Croatia	191
Asia	006	Cuba	192
Australia[2]	036	Cyprus	196
Austria	040	Czechoslovakia[5]	200
Azerbaijan	031	Czech Republic	203
Bahamas	044	Denmark	208
Bahrain	048	Djibouti	262
Bangladesh (from 1972)	050	Dominica	212
Barbados	052	Dominican Republic	214
Belarus	112	East Timor (1950–1975)	626
Belgium	056	Ecuador	218
Belize	084	Egypt	818
Benin (from 1958)	204	El Salvador	222
Bermuda	060	Equatorial Guinea	226
Bhutan	064	Eritrea	232
Bolivia	068	Estonia	233
Bosnia-Herzegovinia	070	Ethiopia	230
Botswana	072	Europe	007
Brazil	076	Faeroe Islands	234
British Virgin Islands (from 1957)	092	Falkland Islands (Malvinas)	238
Brunei Darussalam	096	Fiji	242
Bulgaria	100	Finland	246
Burkina Faso	854	France[6]	250
Burundi (from 1962)	108	France (includes Monaco)	251
Cambodia (from 1955)[3]	116	French Equatorial Africa[7]	263
Cameroon, Republic of	120	French Guiana	254
Canada	124	French Indo-China[8]	265
Cape Verde	132	French Polynesia	258
Cayman Islands	136	French West Africa[9]	267
Central African Republic (from 1959)	140	Gabon (from 1959)	266

Table 1. (Continued)

Country	Code	Country	Code
Gambia	270	Kyrgyzstan	417
Georgia	268	Lao, People's Dem. Rep. (from 1955)	418
German Dem. Rep. (former)	278	Latvia	428
Germany[10]	276	Lebanon	422
Germany, Fed. Rep. of	280	Leeward Islands[17]	423
Ghana	288	Lesotho	426
Gibraltar	292	Liberia	430
Greece	300	Libyan Arab Jamahiriyah	434
Greenland	304	Liechtenstein[18]	438
Grenada	308	Lithuania	440
Guadeloupe	312	Luxembourg	442
Guam	316	Macau	446
Guatemala	320	Macedonia, TFYR	807
Guinea (from 1958)	324	Madagascar	450
Guinea-Bissau	624	Malawi (from 1964)	454
Guyana	328	Malaya-Singapore, Federation of[19]	455
Haiti	332	Malaysia (from 1970)[20]	458
Honduras	340	Malaysia, Peninsular (1957–1969)	459
Hong Kong	344	Maldives	462
Hungary	348	Mali (from 1958)	466
Iceland	352	Malta	470
India	356	Martinique	474
Indonesia[11]	360	Mauritania (from 1958)	478
Iran, Islamic Republic of	364	Mauritius	480
Iraq	368	Mexico	484
Ireland	372	Moldova	498
Israel	376	Monaco[6]	492
Italy[12]	380	Mongolia	496
Italy (includes San Marino)	382	Montserrat (from 1957)	500
Jamaica	388	Morocco	504
Japan (from 1973)[13]	392	Mozambique	508
Japan (1950–1972)[14]	393	Myanmar[21]	104
Jordan	400	Namibia	516
Kazakhstan	398	Nauru	520
Kenya	404	Nepal	524
Kiribati	296	Netherlands	528
Korea, Dem. People's Rep. of	408	Netherlands Antilles (from 1986)[22]	530
Korea, Republic of	410	Netherlands Antilles and Aruba (1950–1985)	532
Kuwait[15]	415	New Caledonia	540
Kuwaiti Oil Fires[16]	416	New Zealand	554

Table 1. (Continued)

Country	Code	Country	Code
Nicaragua	558	Sao Tome and Principe	678
Niger (from 1958)	562	Sarawak (1950–1969)	457
Nigeria	566	Saudi Arabia[32]	684
Niue (from 1970)	570	Senegal (from 1958)	686
North America	003	Seychelles	690
Norway[23]	578	Sierra Leone	694
Norway (incl. Svalbard & Jan Mayen Islands)	579	Singapore (from 1957)	702
Oceania	009	Slovakia	703
Oman	512	Slovenia	705
Other Far East[24]	158	Solomon Islands	090
Pacific Islands (Palau)[25]	582	Somalia	706
Pakistan (from 1972)	586	South Africa	710
Pakistan, East and West (1950–1971)[26]	588	South Africa, Customs Union of[33]	711
Panama (excl. Canal Zone) (1950–1979)[27]	590	South America	005
Panama (incl. Canal Zone) (from 1980)[28]	591	Spain	724
Panama Canal Zone (former) (1950–1979)	592	Sri Lanka	144
Papua New Guinea	598	Sudan	736
Paraguay	600	Suriname	740
Peru	604	Svalbard and Jan Mayen Islands[23]	744
Philippines	608	Swaziland	748
Poland	616	Sweden	752
Portugal	620	Switzerland[18]	756
Puerto Rico	630	Switzerland (includes Liechtenstein)	757
Qatar	634	Syrian Arab Republic	760
Réunion	638	Taiwan	158
Rhodesia-Nyasaland (1950–1963)[29]	717	Tajikistan	762
Romania	642	Tanganyika (1950–1969)	835
Russian Federation	643	Tanzania, United Rep. of (1970)[34]	834
Rwanda (from 1962)	646	Thailand	764
Rwanda-Urundi (1950–1975)[30]	645	Togo	768
Ryukyu Islands (1950–1972)[31]	647	Tonga	776
Sabah (1950–1969)	461	Trinidad and Tobago	780
Saint Helena	654	Tunisia	788
Saint Kitts-Nevis (from 1981)	659	Turkey	792
Saint Kitts-Nevis-Anguilla (1957–1980)	658	Turkmenistan	795
Saint Lucia	662	Turks and Caicos Islands	796
Saint Pierre and Miquelon	666	Uganda	800
Saint Vincent and the Grenadines	670	Ukraine	804
Samoa	882	Union of Soviet Socialist Rep. (former)	810
San Marino[12]	674	United Arab Emirates[35]	784

Table 1. (Continued)

Country	Code	Country	Code
United Kingdom	826		
United States of America	840		
Uruguay	858		
U.S. Virgin Islands	850		
Uzbekistan	860		
Vanuatu	548		
Venezuela	862		
Vietnam[36]	704		
Vietnam, Dem. Rep. of (1955–1969)	866		
Vietnam, Rep. of South(1955–1969)	868		
Wake Island	872		
Western Sahara (from 1959)	732		
World[37]	001		
Yemen[38]	887		
Yemen (former)	886		
Yemen, Democratic (former)	720		
Yugoslavia, Federal Republic of	891		
Yugoslavia, Socialist Federal Rep.[39]	890		
Zaire	180		
Zambia (from 1964)	894		
Zanzibar (1950-1969)	836		
Zimbabwe (from 1964)	716		

1 Identifies bunkers delivered by tankers to vessels on the Antarctic fishing grounds; fuels delivered to Antarctic research stations are not included.
2 Includes Christmas Island.
3 Refers to the former Democratic Kampuchea.
4 Excludes Taiwan province.
5 Prior to 1 January 1993, refers to the former Czechoslovakia composed of the Czech Republic and Slovakia.
6 Code used for population data only. Energy statistics for France and Monaco are combined (251).
7 From 1950 to 1958, data includes Central African Republic, Chad, Congo, and Gabon.
8 From 1950 to 1954, data includes Cambodia, Laos, and Vietnam.
9 From 1950 to 1957, data includes Benin, Burkina Faso, Côte d'Ivoire, Guinea, Mali, Mauritania, Niger, and Senegal.
10 Through accession of the German Democratic Republic to the Federated Republic of Germany with effect from 3 October 1990, the two German States have united to form one sovereign state. As from the date of unification, the Federal Republic of Germany acts in the United Nations under the designation of Germany. All data shown which pertain to Germany prior to 3 October 1990, are indicated separately for the Federal Republic of Germany and the former German Democratic Republic based on their respective territories at the time indicated. Where data for united Germany (subsequent to 3 October 1990) are not available, they are shown separately and pertain to the territorial boundaries prior to 3 October 1990.
11 From 1976 onwards, data includes East Timor.
12 Code used for population data only. Energy statistics for Italy and San Marino are combined (382).
13 Includes Okinawa.
14 Excludes Okinawa.
15 Includes part of the Neutral Zone.
16 In 1991, conflict in the Middle East resulted in large quantities of oil and gas being ignited at oil fields in Kuwait. Using data principally from the U.S. National Oceanic and Atmospheric Administration (NOAA 1991), we have estimated the amount of CO_2 released by these fires at ~130 million metric tons of C (Andres et al., in press). Because these emissions need to be included in our emissions estimates but because they have little to do with the time series of releases from energy consumption and production activities in Kuwait, the authors created an artificial country code (416) and identified these emissions as oil consumption and gas flaring in the country labeled "Kuwaiti oil fires." Thus the emissions do not appear with the Kuwait national emissions but are included in the Middle East and global totals.
17 From 1950 to 1956, data includes Antigua and Barbuda, the British Virgin Islands, Montserrat, and Saint Kitts-Nevis.
18 Code used for population data only. Energy statistics for Liechtenstein and Switzerland are combined (757).
19 From 1950 to 1956, data includes Peninsular Malaysia and Singapore.
20 Comprises Peninsular Malaysia, Sabah, and Sarawak.
21 Refers to former Burma.
22 Comprises Bonaire, Curacao, Saba, Saint Eustatius, and the Dutch part of Saint Martin.
23 Code used for population data only. Energy statistics for Norway, Svalbard, and Jan Mayen Islands are combined (579).
24 Includes Taiwan Province.
25 Comprises the Caroline, Mariana, and Marshall Islands but excludes Guam, which is shown separately.
26 From 1950 to 1971, data includes Bangladesh and Pakistan.
27 Excludes the former Panama Canal Zone.
28 Includes the former Panama Canal Zone.
29 From 1950 to 1963, data includes Malawi, Zambia, and Zimbabwe.
30 From 1950 to 1961, data includes Burundi and Rwanda.
31 Includes Okinawa.
32 Includes part of the Neutral Zone.

[33] For imports and exports only, data includes Botswana, Lesotho, Namibia, South Africa, and Swaziland.

[34] From 1970 onwards, data include Tanganyika and Zanzibar.

[35] Comprises the seven emirates of the former Trucial Oman, namely: Abu Dhabi, Ajman, Dubai, Fujaira, Ras al Khaima, Sharja, and Umm al Qaiwan.

[36] From 1970 onwards, data include the former Democratic Republic of Vietnam and the Republic of South Vietnam.

[37] Comprises the sum of Africa, North America, South America, Asia, Europe, Oceania, the former U.S.S.R., and the Antarctic Fisheries.

[38] On 22 May 1990, Democratic Yemen and Yemen merged to form a single state. Since that date, they have been represented as one member with the name Yemen. Where data for united Yemen (subsequent to 22 May 1990) are not available, they are shown separately and pertain to the territorial boundaries prior to 22 May 1990.

[39] Prior to 1 January 1992, data refer to the Socialist Federal Republic of Yugoslavia, which was composed of the Fed. Republic of Yugoslavia, Slovenia, Bosnia-Herzegovinia, and Croatia

Table 2. Listing of the countries and areas represented in the United Nations Energy Statistics Database by country and area code

Country	Code	Country	Code
World[1]	001	Canada	124
Africa	002	Cape Verde	132
North America	003	Cayman Islands	136
Afghanistan	004	Central African Republic (from 1959)	140
South America	005	Sri Lanka	144
Asia	006	Chad (from 1959)	148
Europe	007	Chile	152
Albania	008	China, Peoples Republic of[6]	156
Oceania	009	Other Far East[7]	158
Algeria	012	Christmas Island	162
American Samoa	016	Colombia	170
Angola	024	Comoros	174
Antigua and Barbuda (from 1957)	028	Congo (from 1959)	178
Azerbaijan	031	Zaire	180
Argentina	032	Cook Islands	184
Australia[2]	036	Costa Rica	188
Austria	040	Croatia	191
Bahamas	044	Cuba	192
Bahrain	048	Cyprus	196
Bangladesh (from 1972)	050	Czechoslovakia[8]	200
Armenia	051	Czech Republic	203
Barbados	052	Benin (from 1958)	204
Belgium	056	Denmark	208
Bermuda	060	Dominica	212
Bhutan	064	Dominican Republic	214
Bolivia	068	Ecuador	218
Bosnia-Herzegovinia	070	El Salvador	222
Botswana	072	Equatorial Guinea	226
Brazil	076	Ethiopia	230
Antarctic Fisheries[3]	081	Eritrea	232
Belize	084	Estonia	233
Solomon Islands	090	Faeroe Islands	234
British Virgin Islands (from 1957)	092	Falkland Islands (Malvinas)	238
Brunei Darussalam	096	Fiji	242
Bulgaria	100	Finland	246
Myanmar[4]	104	France[9]	250
Burundi (from 1962)	108	France (includes Monaco)	251
Belarus	112	French Guiana	254
Cambodia (from 1955)[5]	116	French Polynesia	258
Cameroon, Republic of	120	Djibouti	262

Table 2. (Continued)

Country	Code	Country	Code
French Equatorial Africa[10]	263	Korea, Dem. People's Rep. of	408
French Indo China[11]	265	Korea, Republic of	410
Gabon (from 1959)	266	Kuwait[18]	415
French West Africa[12]	267	Kuwaiti Oil Fires (1991)[19]	
Georgia	268	Kyrgyzstan	417
Gambia	270	Lao, People's Dem. Rep. (from 1955)	418
Germany[13]	276	Lebanon	422
German Dem. Rep. (former)	278	Leeward Islands[20]	423
Germany, Fed. Rep. of	280	Lesotho	426
Ghana	288	Latvia	428
Gibraltar	292	Liberia	430
Kiribati	296	Libyan Arab Jamahiriyah	434
Greece	300	Liechtenstein[21]	438
Greenland	304	Lithuania	440
Grenada	308	Luxembourg	442
Guadeloupe	312	Macau	446
Guam	316	Madagascar	450
Guatemala	320	Malawi (from 1964)	454
Guinea (from 1958)	324	Malaya-Singapore, Federation of[22]	455
Guyana	328	Sarawak (1950–1969)	457
Haiti	332	Malaysia (from 1970)[23]	458
Honduras	340	Malaysia, Peninsular (1957–1969)	459
Hong Kong	344	Sabah (1950–1969)	461
Hungary	348	Maldives	462
Iceland	352	Mali (from 1958)	466
India	356	Malta	470
Indonesia[14]	360	Martinique	474
Iran, Islamic Republic of	364	Mauritania (from 1958)	478
Iraq	368	Mauritius	480
Ireland	372	Mexico	484
Israel	376	Monaco[9]	492
Italy[15]	380	Mongolia	496
Italy (includes San Marino)	382	Moldova	498
Côte d'Ivoire (from 1958)	384	Montserrat (from 1957)	500
Jamaica	388	Morocco	504
Japan (from 1973)[16]	392	Mozambique	508
Japan (1950–1972)[17]	393	Oman	512
Kazakhstan	398	Namibia	516
Jordan	400	Nauru	520
Kenya	404	Nepal	524

Table 2. (Continued)

Country	Code	Country	Code
Netherlands	528	San Marino[15]	674
Netherlands Antilles (from 1986)[24]	530	Sao Tome and Principe	678
Netherlands Antilles and Aruba (1950–1985)	532	Saudi Arabia[32]	684
Aruba (from 1986)	533	Senegal (from 1958)	686
New Caledonia	540	Seychelles	690
Vanuatu	548	Sierra Leone	694
New Zealand	554	Singapore (from 1957)	702
Nicaragua	558	Slovakia	703
Niger (from 1958)	562	Vietnam[33]	704
Nigeria	566	Slovenia	705
Niue (from 1970)	570	Somalia	706
Norway[25]	578	South Africa	710
Norway (incl. Svalbard & Jan Mayen Islands)	579	South Africa, Customs Union of[34]	711
Pacific Islands (Palau)[26]	582	Zimbabwe (from 1964)	716
Pakistan (from 1972)	586	Rhodesia-Nyasaland (1950–1963)[35]	717
Pakistan, East and West (1950–1971)[27]	588	Yemen, Democratic (former)	720
Panama (excl. Canal Zone) (1950–1979)[28]	590	Spain	724
Panama (incl. Canal Zone) (from 1980)[29]	591	Western Sahara (from 1959)	732
Panama Canal Zone (former) (1950–1979)	592	Sudan	736
Papua New Guinea	598	Suriname	740
Paraguay	600	Svalbard and Jan Mayen Islands[25]	744
Peru	604	Swaziland	748
Philippines	608	Sweden	752
Poland	616	Switzerland[21]	756
Portugal	620	Switzerland (includes Liechtenstein)	757
Guinea-Bissau	624	Syrian Arab Republic	760
East Timor (1950–1975)	626	Tajikistan	762
Qatar	634	Thailand	764
Réunion	638	Togo	768
Romania	642	Tonga	776
Russian Federation	643	Trinidad and Tobago	780
Rwanda–Urundi (1950–1975)[30]	645	United Arab Emirates[36]	784
Rwanda (from 1962)	646	Tunisia	788
Ryukyu Islands (1950–1972)[31]	647	Turkey	792
Saint Helena	654	Turkmenistan	795
Saint Kitts-Nevis-Anguilla (1957–1980)	658	Turks and Caicos Islands	796
Saint Kitts-Nevis (from 1981)	659	Uganda	800
Saint Lucia	662	Ukraine	804
Saint Pierre and Miquelon	666	Macedonia, TFYR	807
Saint Vincent and the Grenadines	670	Union of Soviet Socialist Rep. (former)	810

Table 2. (Continued)

Country	Code	Country	Code
Egypt	818		
United Kingdom	826		
Tanzania, United Rep. of (1970)[37]	834		
Tanganyika (1950–1969)	835		
Zanzibar (1950–1969)	836		
United States of America	840		
U.S. Virgin Islands	850		
Burkina Faso	854		
Uruguay	858		
Uzbekistan	860		
Venezuela	862		
Vietnam, Dem. Rep. of (1955–1969)	866		
Vietnam, Rep. of South (1955–1969)	868		
Wake Island	872		
Samoa	882		
Yemen (former)	886		
Yemen[38]	887		
Yugoslavia, Socialist Federal Rep.[39]	890		
Yugoslavia, Federal Republic of	891		
Zambia (from 1964)	894		

1 Comprises the sum of Africa, North America, South America, Asia, Europe, Oceania, the former U.S.S.R., and the Antarctic Fisheries.

2 Includes Christmas Island.

3 Identifies bunkers delivered by tankers to vessels on the Antarctic fishing grounds; fuels delivered to Antarctic research stations are not included.

4 Refers to former Burma.

5 Refers to the former Democratic Kampuchea.

6 Excludes Taiwan province.

7 Includes Taiwan Province.

8 Prior to 1 January 1993, refers to the former Czechoslovakia composed of the Czech Republic and Slovakia.

9 Code used for population data only. Energy statistics for France and Monaco are combined (251).

10 From 1950 to 1958, data includes the Central African Republic, Chad, Congo, and Gabon.

11 From 1950 to 1954, data includes Cambodia, Laos, and Vietnam.

12 From 1950 to 1957, data includes Benin, Burkina Faso, Côte d'Ivoire, Guinea, Mali, Mauritania, Niger, and Senegal.

13 Through accession of the German Democratic Republic to the Federated Republic of Germany with effect from 3 October 1990, the two German States have united to form one sovereign state. As from the date of unification, the Federal Republic of Germany acts in the United Nations under the designation of Germany. All data shown which pertain to Germany prior to 3 October 1990, are indicated separately for the Federal Republic of Germany and the former German Democratic Republic based on their respective territories at the time indicated. Where data for united Germany (subsequent to 3 October 1990) are not available, they are shown separately and pertain to the territorial boundaries prior to 3 October 1990.

14 From 1976 onwards, data includes East Timor.

15 Code used for population data only. Energy statistics for Italy and San Marino are combined (382).

16 Includes Okinawa.

17 Excludes Okinawa.

18 Includes part of the Neutral Zone.

19 In 1991, conflict in the Middle East resulted in large quantities of oil and gas being ignited at oil fields in Kuwait. Using data principally from the U.S. National Oceanic and Atmospheric Administration (NOAA 1991), we have estimated the amount of CO_2 released by these fires at ~130 million metric tons of C (Andres et al., in press). Because these emissions need to be included in our emissions estimates but because they have little to do with the time series of releases from energy consumption and production activities in Kuwait, the authors created an artificial country code (416) and identified these emissions as oil consumption and gas flaring in the country labeled "Kuwaiti oil fires." Thus the emissions do not appear with the Kuwait national emissions but are included in the Middle East and global totals.

20 From 1950 to 1956, data includes Antigua and Barbuda, the British Virgin Islands, Montserrat, and Saint Kitts-Nevis.

21 Code used for population data only. Energy statistics for Liechtenstein and Switzerland are combined (757).

22 From 1950 to 1956, data includes Peninsular Malaysia and Singapore.

23 Comprises Peninsular Malaysia, Sabah, and Sarawak.

24 Comprises Bonaire, Curacao, Saba, Saint Eustatius, and the Dutch part of Saint Martin.

25 Code used for population data only. Energy statistics for Norway, Svalbard, and Jan Mayen Islands are combined (579).

26 Comprises the Caroline, Mariana, and Marshall Islands but excludes Guam, which is shown separately.

27 From 1950 to 1971, data includes Bangladesh and Pakistan.

28 Excludes the former Panama Canal Zone.

29 Includes the former Panama Canal Zone.

30 From 1950 to 1961, data includes Burundi and Rwanda.

31 Includes Okinawa.

[32] Includes part of the Neutral Zone.

[33] From 1970 onwards, data include the former Democratic Republic of Vietnam and the Republic of South Vietnam.

[34] For imports and exports only, data includes Botswana, Lesotho, Namibia, South Africa, and Swaziland.

[35] From 1950 to 1963, data includes Malawi, Zambia, and Zimbabwe.

[36] Comprises the seven emirates of the former Trucial Oman, namely: Abu Dhabi, Ajman, Dubai, Fujaira, Ras al Khaima, Sharja, and Umm al Qaiwan.

[37] From 1970 onwards, data include Tanganyika and Zanzibar.

[38] On 22 May 1990, Democratic Yemen and Yemen merged to form a single state. Since that date, they have been represented as one member with the name Yemen. Where data for united Yemen (subsequent to 22 May 1990) are not available, they are shown separately and pertain to the territorial boundaries prior to 22 May 1990.

[39] Prior to 1 January 1992, data refer to the Socialist Federal Republic of Yugoslavia, which was composed of the Fed. Rèpublic of Yugoslavia, Slovenia, Bosnia-Herzegovinia, and Croatia

consumption, capacity, reserves, losses, and trade of heat and power, renewable, and nuclear energy commodities; none of which are used for the calculation of CO_2 emissions. The complete 1992 version of the UNSTAT Database contains 440,623 records with 3,084,361 data values and requires ~13 megabytes of disk space. The energy statistics in the UNSTAT Database were compiled primarily from annual questionnaires distributed by the UN Statistical Division and were supplemented by data in official national statistical publications. Where official data were not available or were inconsistent, estimates were made by the UN Statistical Division on the basis of governmental, professional, or commercial materials. These international statistics are published annually by the UN in the *Energy Statistics Yearbook* (originally published as *World Energy Supplies in Selected Years, 1929–1950*). A 2-year lag typically occurs between the publication of the yearbook and the last year of data (i.e., the 1994 yearbook provides energy statistics through 1992).

The cement manufacturing data, used to estimate emissions from hydraulic cement production, were compiled by the U.S. Department of Interior's Bureau of Mines. The cement production database is a comprehensive collection of international data from 166 countries. These data, like those in the UNSTAT Database, are reported on an individual country basis. In cement production, CO_2 is released to the atmosphere through calcination:

$$CaCO_3 \xrightarrow{\Delta} CaO + CO_2$$

Because cement manufacturing uses essentially 100% of the calcium oxide obtained from burning the calcium carbonate, the amount of calcium oxide in the finished cement provides a good measure of the amount of CO_2 released during production (Griffin 1987).

Gas-flaring CO_2-emission estimates are derived primarily from flaring estimates provided in the UNSTAT Database. The UNSTAT Database has incomplete time series for many countries including China, France, Norway, Oman, and Russia and little data before 1970. Gas-flaring estimates provided by DOE/EIA were used to complete or supplement the flaring time series for these countries, and the resulting database contains estimates of gas flaring in 57 countries.

3. CO_2 EMISSION CALCULATIONS

The methods of Marland and Rotty (1984) were used to estimate the amount of CO_2 emitted to the atmosphere from fossil-fuel burning, gas flaring, and cement production. This section briefly summarizes these methods and states some of the assumptions used in these methods [for a complete discussion see the copy of the Marland and Rotty (1984) paper provided in Appendix B].

As indicated earlier, the primary data used to calculate the CO_2-emission estimates came from the UNSTAT Database. Fuel production data were used in generating global CO_2-emission estimates because these data are more complete than energy consumption data. For regional or national emission estimates, however, one needs to know the amount of fossil fuels consumed in each region or nation, and not the amount produced, to calculate the CO_2 emitted.

The calculation of CO_2 emissions from fossil fuels is conceptually very simple (Marland and Rotty 1984). For each type of fuel, the annual CO_2 emissions are the product of three terms: the amount of fuel consumed, the fraction of the fuel that becomes oxidized, and a factor for the carbon content of the fuel (Marland and Rotty 1984). That is,

$$CO_{2i} = (P_i)\,(FO_i)\,(C_i)\,, \qquad (1)$$

where subscript i represents a particular fuel commodity, P represents the amount of fuel i that is consumed each year, FO is the fraction of P that is oxidized, C is the average carbon content for fuel i, and CO_2 is the resulting CO_2 emissions for fuel i expressed in mass of carbon. For CO_2 emissions, fossil fuels can be divided into the usual groups of solid, liquid, and gas fuels. An identical procedure has been adopted by the IPCC in prescribing a methodology for countries to use in estimating and reporting greenhouse gas emissions (IPCC 1995).

Global total CO_2-emission estimates are generated by using the above equation, where P represents production data from the UNSTAT Database for all primary solid, liquid, and gas fuels. Because secondary fuels are derived from primary fuels, they need not be included.

Trade data are required to calculate regional and national CO_2-emission estimates. For these calculations, both primary and secondary fuel data are used. Table 3 lists the UNSTAT primary and secondary fuels used in these CO_2-emission calculations. Consumption [i.e., P_i in Eq. (1)] is the sum of production and imports less exports, "bunkers," and stock changes. This is what the UN calls "apparent consumption" because it relies on production and trade data rather than end-use consumption data. That is,

$$consumption_i = production_i + imports_i - exports_i - bunkers_i - changes\ in\ stocks_i\ , \qquad (2)$$

where i is a solid, liquid, or gas fuel. Bunkers refer to fuels consumed by ships and aircraft engaged in international trade. Stock changes refer to changes in stocks at producers, importers, and/or industrial consumers from the beginning to the end of each year.

The emissions coefficients (C_i) are defined in such a way as to express as accurately as possible the fuel carbon content in terms of easily accessible measures of the quantity of fuel consumed. As described in Marland and Rotty (1984), we feel that the mean carbon content of liquid fuels is most accurately estimated in terms of the mass fraction while the carbon content of solid and gas fuels is most accurately estimated in units of mass C per unit of energy content. Using energy content in the denominator compensates for the wide variability in the chemical and physical properties of coals (Marland et al. 1994a) and captures the variability of gaseous fuels as well. In order to conform to units used in the U.N. data series, the emissions coefficient for solid fuels is expressed in terms of the lower (net) heating value of the fuel. Units of measure for the heating value of gas fuels in the UNSTAT Database are ambiguous and probably lack consistency and our emissions coefficient is based on the higher (gross) heating value of the fuel.

Emissions of CO_2 from the combustion of bunker fuels are shown with the country in which the final fuel loading occurred but the emissions are not included with the national total. On geochemical grounds, these emissions will occur along international shipping lanes rather than from the country where the final loading took place. On geopolitical grounds, it is not obvious how emissions from bunker fuels should be accounted for.

Adjustment is made for the fraction of crude oil converted into nonenergy products (e.g., lubricants, asphalt, naphthas). National totals for emissions from petroleum products are based on energy uses only and do not include emissions from the oxidation of nonfuel products, whereas the global totals do include an estimate of emissions from oxidation of the nonenergy products.

This section thus outlines 4 reasons why the sum of emissions estimated for all countries is not equal to the estimate of global total emissions: 1.) the global total includes emissions from bunker fuels whereas these are not included in any national totals, 2.) the global total includes estimates for the oxidation of non-fuel hydrocarbon products whereas national totals do not, 3.) national totals include annual changes in fuel stocks whereas the global total does not, and 4.) due to statistical differences in the international statistics, the sum of exports from all exporters is not identical to the sum of imports by all importers.

Table 3. Listing of the primary and secondary fuels from the United Nations Energy Statistics Database used in calculating CO_2-emission estimates. The two-letter commodity code used by the United Nations for each fuel type is shown in parentheses.

Gas Fuels	
Primary gas fuels	*Secondary gas fuels*
Natural gas (NG)	Gasworks gas (GG)
	Coke-oven gas (OG)
	Refinery gas (RG)
Liquid Fuels	
Primary liquid fuels	*Secondary liquid fuels*
Crude petroleum (CR)	Aviation gasoline (AV)
Natural gas liquids (GL)	Plant condensate (CD)
	Gas-diesel oils (DL)
	Feedstocks (FS)
	Jet fuel (JF)
	Kerosene (KR)
	Liquefied petroleum gas (LP)
	Motor gasoline (MO)
	Natural gasoline (NT)
	Residual fuel oils (RF)
	Secondary nonenergy liquid fuels
	Bitumen/asphalt (BT)
	Lubricants (LU)
	Naphthas (NP)
	Petroleum coke (PK)
	Other petroleum products (PP)
	Petroleum waxes (PW)
	White spirit/industrial spirit (WS)
Solid Fuels	
Primary solid fuels	*Secondary solid fuels*
Coal (CL)	Lignite (brown coal) briquettes (BB)
Lignite/brown coal (LB)	Hard coal (patent fuel) briquettes (BC)
Oil shale (OS)	Brown coal coke (BK)
Peat (PT)	Peat briquettes (BP)
	Gas coke (GK)

Once consumption and production values have been calculated, these estimates are multiplied by a factor that reflects the fraction of each broad fuel category that is oxidized [i.e., *FO* in Eq. (1)] and the average carbon content (*C*) of each fuel category. Table 4 lists the values and units of *P*, *FO*, and *C* for each fuel category.

3.1 CO_2 Emissions from Cement Manufacturing

Because cement manufacturing uses essentially 100% of the calcium oxide obtained from burning the calcium carbonate during calcination, the amount of calcium oxide content in the finished cement is a good measure of the amount of CO_2 released during production (Griffin 1987). To determine the amount of CO_2 released from cement manufacturing, one needs to know how much cement was manufactured, the average calcium oxide content per unit of cement, and a factor to convert the calcium oxide content into carbon dioxide equivalents. Cement production data published by the U.S. Bureau of Mines are currently reported in thousand short tons, but before 1970 the data were reported in barrels. To ensure consistent units throughout the 1950–92 record, two equations were used to convert cement production estimates to units of metric tons. Cement production before 1970 was calculated by using

$$\textit{cement production (in metric tons)} = 0.17055 \times \textit{quantity of cement produced (in barrels)}\ , \qquad (3)$$

where 0.17055 is the metric-ton equivalent for a barrel.

After 1969, net cement production was calculated by using

$$\textit{cement production (in metric tons)} = 0.90718474 \times \textit{quantity of cement produced (in short tons)}\ , \qquad (4)$$

where 0.90718474 is the metric-ton equivalent for a short ton. The amount of CO_2 produced from cement production was calculated by using

$$\textit{CO}_2\textit{ production (in metric tons of C)} = 0.136 \text{ metric tons of C per metric ton cement} \times \textit{quantity of cement produced (metric tons)} \qquad (5)$$

This conversion factor was obtained by dividing the molar mass of carbon by the molar mass of calcium oxide and multiplying this quotient by the average fraction of calcium oxide contained in cement:

$$(12.01 \text{ g C/mole } CaCO_3 \div 56.08 \text{ g CaO/mole } CaCO_3) \times 0.635 \text{ g CaO/g cement} = 0.136 \text{ g C/g cement} \qquad (6)$$

The consensus that 63.5% of the typical cement in the world is composed of calcium oxide is based on the opinions of experts consulted in the field, as well as inspection of composition data by type and country (Griffin 1987).

3.2 Per Capita CO_2-Emission Rates

Using the UN population data, the authors estimate per capita CO_2 emission rates for individual countries, using the equation:

$$\textit{national per capita CO}_2\textit{ emission} \cdot \textit{year}^{-1} = \textit{total national CO}_2\textit{ emission estimate} \cdot \textit{year}^{-1} \div \textit{national population} \qquad (7)$$

The resulting per capita estimates are expressed in metric tons of carbon $\cdot$ person^{-1} $\cdot$ year^{-1}.

Table 4. Factors and units for calculating CO_2 emissions from fuel production and trade data

$$CO_{2i} = (P_i)\ (FO_i)\ (C_i)$$

From primary and secondary gas fuel production and trade[1]

CO_{2g} = CO_2 emissions in 10^6 metric tons of carbon
P_g = annual production or consumption in thousands of 10^{12} joules
$FO_g = 0.98 \pm 1\%$
C_g = carbon content in 10^6 tons per thousand 10^{12} joules = $0.0137 \pm 2\%$

From crude oil and natural gas liquids production in the global-total accounts[2]

CO_{2l} = CO_2 emissions in 10^6 metric tons of carbon
P_l = annual production or consumption in 10^6 tons
$FO_l = 0.918 \pm 3\%$
C_l = carbon content in tons C per ton fuel = $0.85 \pm 1\%$

From primary and secondary liquid fuel production and trade in the national accounts when non-energy liquid products are specifically subtracted[3]

CO_{2l} = CO_2 emissions in 10^6 metric tons of carbon
P_l = annual production or consumption in 10^6 tons
$FO_l = 0.985 \pm 3\%$
C_l = carbon content in tons C per ton fuel = $0.85 \pm 1\%$

From liquid bunker fuel consumption[4]

CO_{2l} = CO_2 emissions in 10^6 metric tons of carbon
P_l = annual production or consumption in 10^6 tons
$FO_l = 1.00 \pm 3\%$
C_l = carbon content in tons C per ton fuel = $0.855 \pm 1\%$

From primary and secondary solid fuel production and trade[5]

CO_{2s} = CO_2 emissions in 10^6 metric tons of carbon
P_s = annual production or consumption in 10^6 tons coal equivalent[6]
$FO_s = 0.982 \pm 2\%$
C_s = carbon content in tons C per ton coal equivalent = $0.746 \pm 2\%$

From natural gas flaring[7]

CO_{2f} = CO_2 emissions in 10^6 metric tons of carbon
P_f = annual production or consumption in 10^{12} joules
$FO_f = 1.00 \pm 1\%$
C_f = carbon content in 10^6 tons C per 10^{12} joules = $13.454 \pm 2\%$

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[1] With respect to the above gas-related calculations, the following procedures and assumptions should be noted:

(1) If a solid was produced and then converted to a gas that was subsequently consumed, the assumption was made that the solid was produced and consumed. In this situation, none of the gas records were influenced.

(2) If a solid was produced and then converted to a gas that was exported, it was assumed that in the producing country a solid was produced and the gas was exported. As a result, gas consumption for this country could show a negative value (consumption = production + imports − exports: C = (0 + 0) − exports). In the consuming country, gas was imported and consumed.

(3) Natural gas contains 13.7 metric tons of carbon per terajoule.

(4) Some of the units seem contrived but are chosen to accommodate data reported in the primary data sources.

[2] With respect to the above global liquid-related calculations, the following procedures and assumptions should be noted:

(1) Crude petroleum, natural gas liquids, and all secondary energy liquids were summed on an equal basis in mass units. That is, a ton of any liquid contains the same fraction of carbon.

(2) When calculating global total CO_2 emissions from liquids, we have estimated that a quantity of liquids equivalent to 6.7% of liquids produced are not oxidized each year and another 1.5% passes through burners unoxidized or is otherwise spilled. Hence, 91.8% of annual liquid production is oxidized each year.

(3) Liquid fuels contain 85.0% carbon by weight.

[3] With respect to the above national liquid-related calculations, the following procedures and assumptions should be noted:

(1) Crude petroleum, natural gas liquids, and all secondary energy liquids were summed on an equal basis in mass units. That is, a ton of any liquid contains the same fraction of carbon.

(2) When calculating CO_2 emissions by country, non-energy secondary liquids were subtracted at the time of production and additional transactions (i.e., imports, exports, changes in stock) were not accounted further. Therefore, CO_2 production is only for energy products and CO_2 production from the oxidation of non-energy products is not included.

(3) When calculating national total CO_2 emissions from liquids, we have estimated that a quantity of liquids equivalent to 1.5% passes through burners unoxidized or is otherwise spilled.

(4) Liquid fuels contain 85.0% carbon by weight.

[4] With respect to the above bunker liquid-related calculations, the following procedures and assumptions should be noted:

(1) Crude petroleum, natural gas liquids, and all secondary energy liquids were summed on an equal basis in mass units. That is, a ton of any liquid contains the same fraction of carbon.

(2) Liquid bunker fuels contain 85.5% carbon by weight.

(3) Emissions from bunker fuels are calculated at the point where final fuel loading occurs but are not included in any national totals.

[5] The UNSTAT Database provides specific values of the energy content (in kcal/kg) for solid fuels for many country-commodity-year combinations. Where no conversion factor exists in the UN data set for a country/commodity, the following standard factors (kcal/kg) are used:

Coal	7000
Lignite brown coal	2695
Peat	2275
Coke-oven coke	6300
Gas coke	6300
Brown coal coke	4690
Hard coal briquettes	7000
Brown coal briquettes	4690

[6] The data for annual fuel production must recognize that all coal is not of the same composition, and thus may have varying energy content and CO_2 potential. There is a strong correlation between energy content and C content so the C content is quite constant when production is in units of tons coal equivalent where 1 ton coal equivalent is defined as 29.31×10^9 joules.

[7] With respect to the above gas flaring–related calculations, the following derivation and assumption should be noted:

(1) The carbon conversion factor of 13.454 metric tons of C TJ^{-1} is the result of dividing the average carbon content of a cubic meter of flared natural gas (525 g C/m^3) by the average heating value of a cubic meter of flared natural gas (39.021 $TJ/10^6\ m^3$).

(2) These calculations assume that flared gas is released to the atmosphere immediately as CO_2, even though it is known that a small fraction is initially discharged as methane or carbon monoxide.

4. TRENDS IN CO_2 EMISSIONS

According to these estimates, the global total of CO_2 emissions from fossil-fuel consumption, cement production, and gas flaring has grown almost fourfold since 1950 (Table 5 and Fig. 1). The 1992 estimate of 6097 million metric tons of carbon ends a string of 8 consecutive years of growth in global CO_2 emissions and represents a 1.2% decline from 1991. The 1991 estimate of 6172 million metric tons of carbon is the highest CO_2-emission estimate since the data record began in 1950; however, it includes 130 million metric tons of C emitted to the atmosphere from the Kuwaiti oil–field fires[2].

Globally, liquid and solid fuels accounted for 79% of the emissions from fossil-fuel burning in 1992. Combustion of gas fuels (i.e., natural gas) accounted for ~17% (1045 million metric tons C) of total emissions from fossil fuels in 1992 and reflects a gradually increasing global utilization of natural gas. Emissions from cement production increased slightly and now account for ~3% of total emissions. Emissions from gas flaring declined ~11% from 1991 to 1992 to 68 million metric tons C (just 1% of the global total), due largely to the end of the Iraq-Kuwait conflict, and remain well below the levels of the 1970s. This trend for gas flaring is not fully clear because of uncertainty about the gas-flaring data for Russia.

Regionally, Eastern Europe continued to have a marked decline in CO_2 emissions, North American emissions increased 1.3% during 1992 after 2 successive years of declining emissions, and Western Europe experienced its first decline since 1987–88 (Fig. 2). However, regions where populations continue to grow—such as Africa, Centrally Planned Asia, Central and South America, the Far East, and Oceania—showed increases in CO_2 emissions (Fig. 3). In 1950, North America, Eastern Europe, and Western Europe (including Germany) accounted for 89.1% of global CO_2 emissions from fossil-fuel burning, cement production, and gas flaring, whereas the remaining six regions accounted for only 10.9%. Now these six regions—Africa, Central and South America, Centrally Planned Asia, the Far East, the Middle East, and Oceania—contribute 41.1% of the CO_2 emitted globally. Table 6 lists the countries assigned to each region. The table includes the regional assignments of countries which no longer exist because of subdivision or re-aggregation. Because of uncertainty in how to deal with the data time series, Germany is defined here as a separate region.

The top 20 emitting countries accounted for ~80% of all the 1992 world CO_2 emissions from fossil-fuel consumption (Fig. 4). The top three countries—the United States, China, and Russia—were responsible for 43.2% of the world's emissions from fossil fuel burning in 1992. Spain, the 20th-highest CO_2-emitting nation, contributed slightly less than 1% to this total. The United States continued as the largest single source of fossil fuel–related CO_2 emissions, with 1332 million metric tons of carbon emitted in 1992. In fact, U.S. emissions are ~45% higher than those of the world's second largest emitter, China. U.S. emissions in 1992 were nearly twice those in 1950, although the U.S. share of global emissions declined from 44% to 23% over the same interval because of higher growth rates in other countries.

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[2] In 1991, conflict in the Middle East resulted in large quantities of oil and gas being ignited at oil fields in Kuwait. Using data principally from the U.S. National Oceanic and Atmospheric Administration (NOAA 1991), we have estimated the amount of CO_2 released by these fires at ~130 million metric tons of C (Andres et al., in press). Because these emissions need to be included in our emissions estimates but because they have little to do with the time series of releases from energy consumption and production activities in Kuwait, we created an artificial country code (416) and identified these emissions as oil consumption and gas flaring in the country labeled "Kuwaiti oil fires." Thus the emissions do not appear with the Kuwait national emissions but are included in the Middle East and global totals.

Table 5. Global annual CO_2 emissions from fossil-fuel burning, gas flaring, and cement production for 1950–92

Year	Carbon dioxide emissions (million metric tons of carbon)						Per capita CO_2 emissions (metric tons of carbon)
	Total	Solid	Liquid	Gas	Cement	Gas flaring	
1950	1638	1077	423	97	18	23	0.65
1951	1775	1137	479	115	20	24	0.69
1952	1803	1127	504	124	22	26	0.69
1953	1848	1132	533	131	24	27	0.70
1954	1871	1123	557	138	27	27	0.69
1955	2050	1215	625	150	30	31	0.74
1956	2185	1281	679	161	32	32	0.78
1957	2278	1317	714	178	34	35	0.80
1958	2338	1344	732	192	36	35	0.80
1959	2471	1390	790	214	40	36	0.83
1960	2586	1419	850	235	43	39	0.86
1961	2602	1356	905	254	45	42	0.85
1962	2708	1358	981	277	49	44	0.86
1963	2855	1404	1053	300	51	47	0.89
1964	3016	1442	1138	328	57	51	0.92
1965	3154	1468	1221	351	59	55	0.95
1966	3314	1485	1325	380	63	60	0.97
1967	3420	1455	1424	410	65	66	0.98
1968	3596	1456	1552	445	70	73	1.01
1969	3809	1494	1674	487	74	80	1.05
1970	4084	1564	1838	516	78	87	1.10
1971	4235	1564	1946	554	84	88	1.12
1972	4403	1580	2055	583	89	94	1.14
1973	4641	1588	2240	608	95	110	1.18
1974	4649	1585	2244	618	96	107	1.16
1975	4622	1679	2131	623	95	93	1.13
1976	4889	1717	2313	647	103	109	1.18
1977	5028	1780	2389	646	108	104	1.19
1978	5076	1796	2383	674	116	107	1.18
1979	5358	1892	2534	714	119	100	1.23
1980	5290	1949	2407	726	120	89	1.19
1981	5119	1920	2271	736	121	72	1.13
1982	5080	1983	2176	731	121	69	1.10
1983	5070	1989	2161	733	125	63	1.08
1984	5242	2081	2185	791	128	58	1.10
1985	5417	2238	2170	822	131	57	1.12
1986	5609	2299	2279	840	137	54	1.14
1987	5736	2350	2289	903	143	51	1.14
1988	5961	2412	2393	946	152	58	1.17
1989	6070	2447	2429	982	156	56	1.17
1990	6099	2389	2481	1008	156	65	1.15
1991	6172	2320	2587	1028	162	76	1.15
1992	6097	2344	2470	1045	171	68	1.12

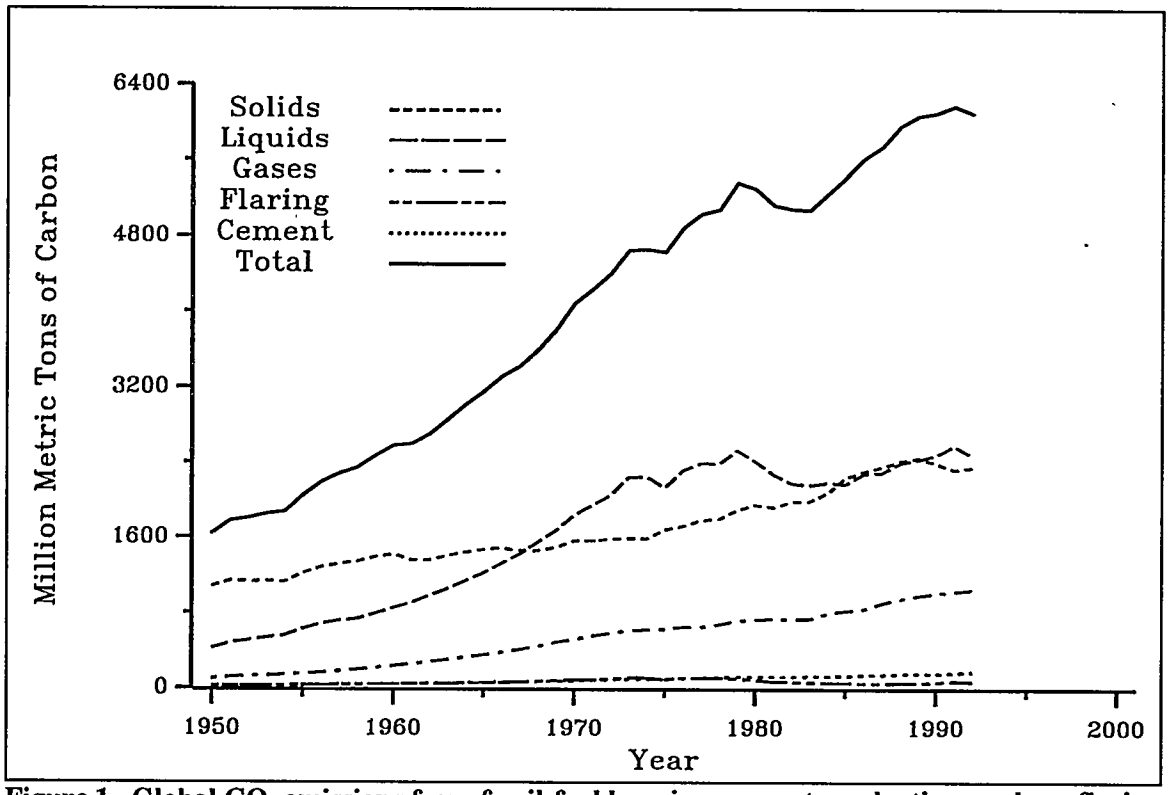

Figure 1. Global CO_2 emissions from fossil-fuel burning, cement production, and gas flaring for 1950–92.

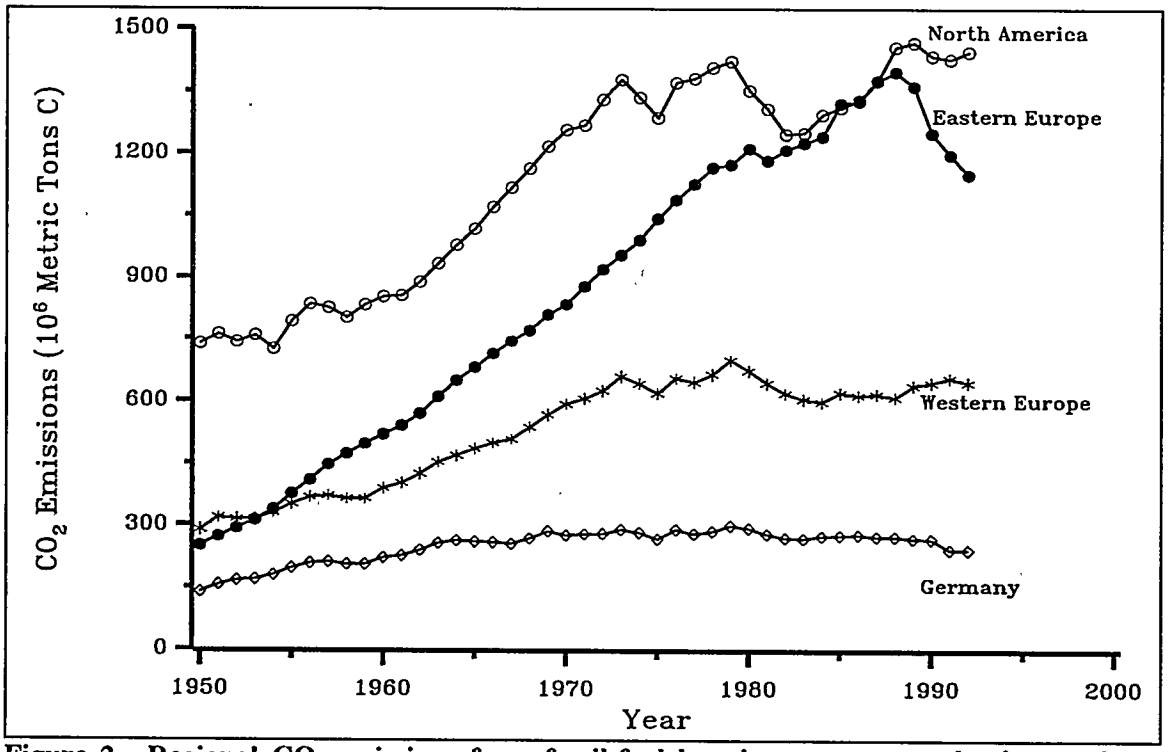

Figure 2. Regional CO_2 emissions from fossil-fuel burning, cement production, and gas flaring for North America and Europe, 1950–92. Germany is shown separately.

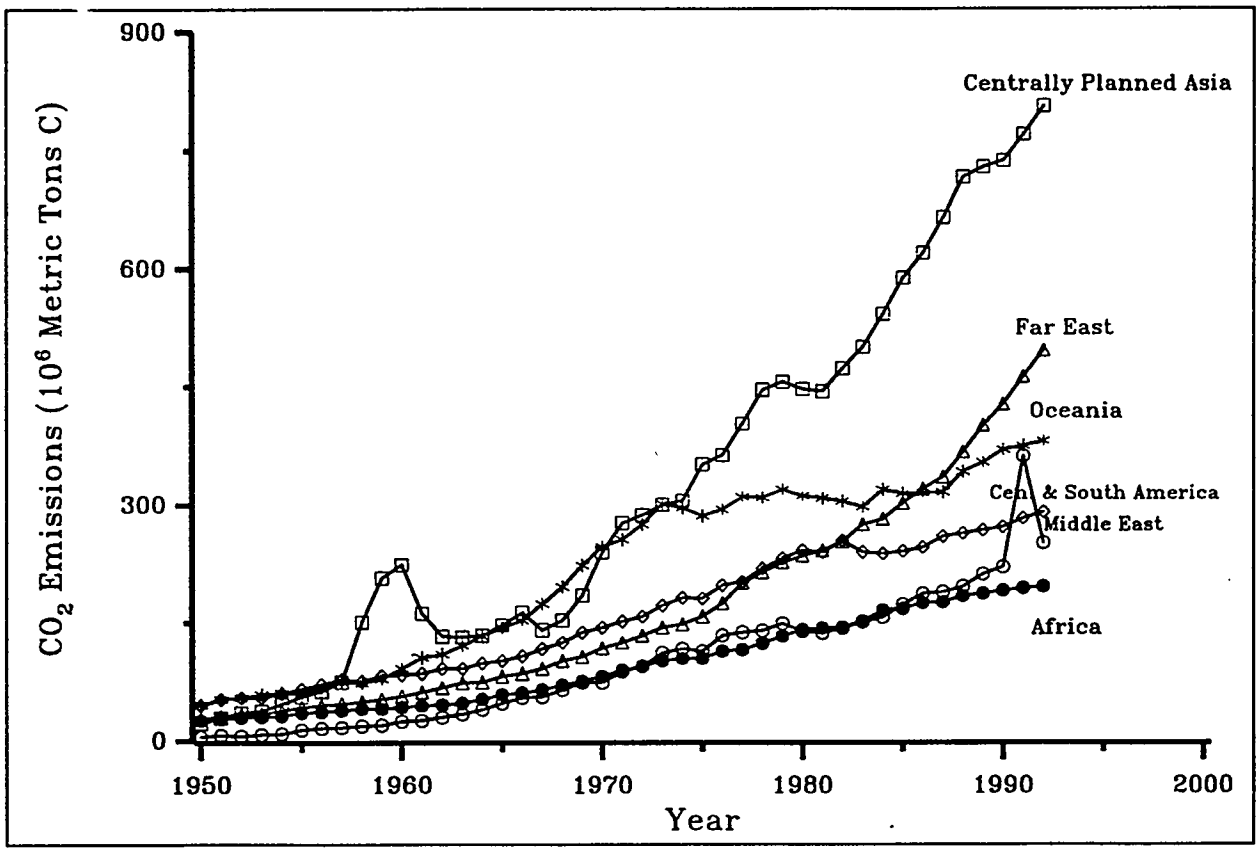

Figure 3. Regional CO_2 emissions from fossil-fuel burning, cement production, and gas flaring for 1950–92. The 1990–92 emissions spike for the Middle East is a result of the Kuwaiti oil fires of 1991.

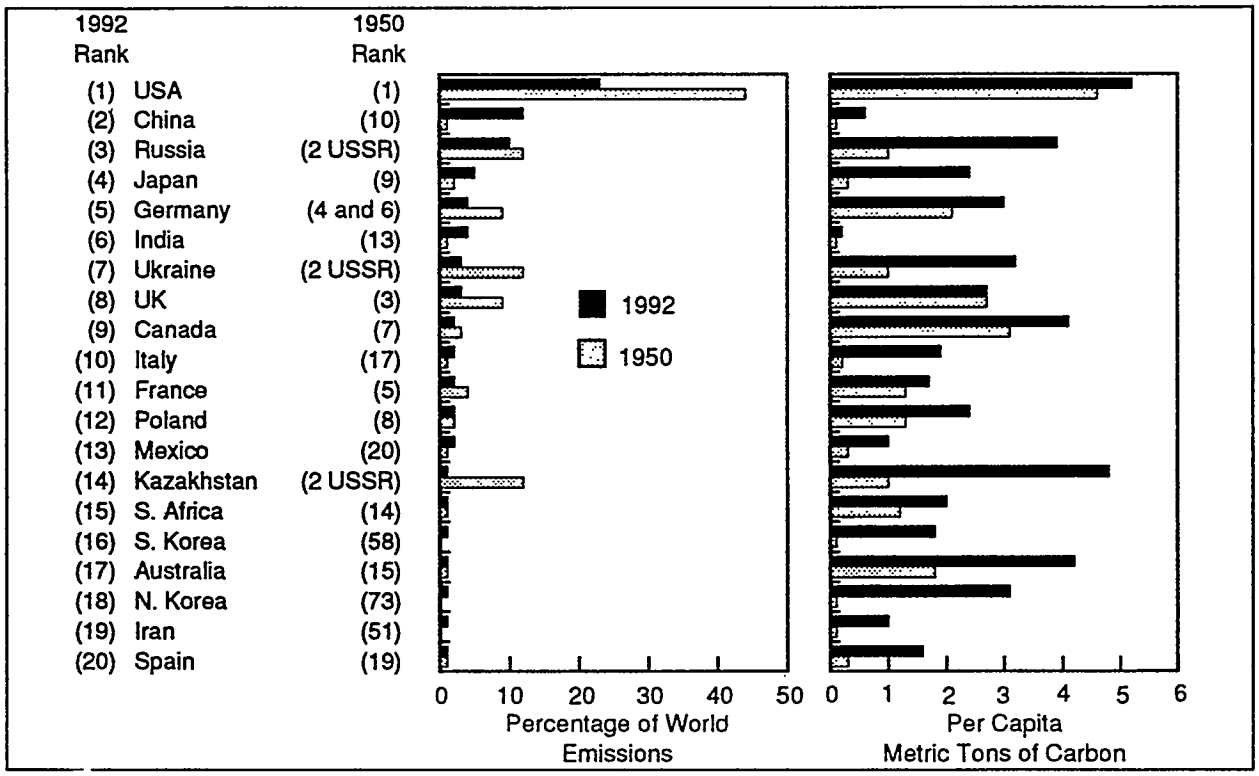

Figure 4. Ranking of the 20 highest CO_2-emitting countries in 1992 and their rank in 1950, contributions to global emissions, and per capita CO_2-emission rates.

Table 6. Listing of the countries assigned to each of ten global regions

Africa (AFR)

Albania
Angola
Benin
Botswana
Burundi
Republic of Cameroon
Cape Verde
Central African Republic
Chad
Comoros
Congo
Côte d'Ivoire
Equatorial Guinea
Ethiopia
French Equatorial Africa
French West Africa
Djibouti
Gabon
Gambia
Ghana
Guinea
Guinea Bissau
Kenya
Lesotho
Liberia
Liberia
Libyan Arab Jamahiriyah
Madagascar
Malawi
Mali
Mauritania
Mauritius
Morocco
Mozambique
Namibia
Niger
Nigeria
Reunion
Rwanda-Urundi
Rwanda
Saint Helena
Sao Tome & Principe
Senegal
Seychelles
Sierra Leone
Somalia
South Africa
Egypt
Sudan
Rhodesia-Nyasaland
Togo
Tunisia
Tanganyika
Tanzania
Burkina Faso
Uganda
Customs Union of South Africa
Western Sahara
Zaire
Zambia
Zanzibar
Zimbabwe

Central and South America (AMD)

Antigua & Barbuda
Argentina
Bahamas
Barbados
Bermuda
Bolivia
Brazil
Antarctic Fisheries
Belize
British Indian Ocean Territories
British Virgin Islands
Cayman Islands
Chile
Colombia
Costa Rica
Cuba
Dominica
Dominican Republic
Ecuador
El Salvador
Falkland Islands
French Guiana
Greenland
Grenada
Guadeloupe
Guatemala
Guyana
Haiti
Honduras
Jamaica
Leeward Islands
Martinique
Mexico
Montserrat
Netherland Antilles
Netherland Antilles & Aruba
Nicaragua
Panama
Former Panama Canal Zone
Paraguay
Peru
Puerto Rico
Saint Lucia
St. Kitts-Nevis-Anguilla
St. Kitts-Nevis
St. Pierre & Miquelon
St. Vincent & The Grenadines
Suriname
Trinidad & Tobago
Turks & Caicos Islands
Uruguay
U.S. Virgin Islands
Venezuela

Table 6. (continued)

Centrally Planned Asia (CPA)

China
French Indo-China
Mongolia
North Korea
North Vietnam
Vietnam
South Vietnam

Eastern Europe (CPE)

Albania
Armenia
Azerbaijan
Belarus
Bulgaria
Czechoslovakia
Czech Republic
Estonia
Georgia
Hungary
Kazakhstan
Kyrgyzstan
Latvia
Lithuania
Moldova
Poland
Romania
Russian Federation
Slovakia
Tajikistan
Turkmenistan
Ukraine
USSR
Uzbekistan

Far East (FEA)

Afghanistan
Bangladesh
Bhutan
Brunei Darussalam
Myanmar
Cambodia
East Timor
East & West Pakistan
Hong Kong
India
Indonesia
Laos
Macau
Malaya-Singapore
Malaysia
Maldives
Nepal
Pakistan
Peninsular Malaysia
Philippines
Sabah
Singapore
South Korea
Sri Lanka
Taiwan
Thailand

Germany (GER)

Federal Republic of Germany
German Democratic Republic
Germany

Middle East (MDE)

Bahrain
Cyprus
Iran
Iraq
Israel
Jordan
Kuwait
Lebanon
Oman
Qatar
Saudi Arabia
Syrian Arab Republic
Turkey
United Arab Emirates
Former Democratic Yemen
Former Yemen
Yemen

Table 6. (continued)

North America (NAM)

Canada
United States

Oceania (OCN)

American Samoa
Australia
Solomon Islands
Christmas Island
Cook Islands
Fiji
French Polynesia
Kiribati
Guam
Japan
Nauru
New Caledonia
New Zealand
Niue
Pacific Islands (Palau)
Papua New Guinea
Ryukyu Islands
Samoa
Tonga
Vanuatu
Wake Island

Western Europe (WEU)

Andorra
Austria
Belgium
Bosnia-Herzegovinia
Croatia
Denmark
Faeroe Islands
Finland
France
Gibraltar
Greece
Iceland
Ireland
Italy
Liechtenstein
Luxembourg
Malta
Monaco
Netherlands
Norway
Portugal
San Marino
Slovenia
Spain
Svalbard & Jan Mayen Islands
Sweden
Switzerland
Macedonia
United Kingdom
Yugoslavia
Federal Republic of Yugoslavia

5. DATA LIMITATIONS AND RESTRICTIONS

Marland and Rotty (1984) estimated that the uncertainty of the annual global CO_2-emission estimates derived from the UN's energy data was ~6 to 10%. The reliability of the national CO_2 estimates presented here are bounded by the accuracy and completeness of the commodity values reported by each country to the UN Statistical Office. Marland and Boden (1993) provides some insight on the accuracy of the national-level data. The values published by the UN are consistent with numbers published elsewhere and represent the best efforts of a staff dedicated to the sole task of bringing together all the available global energy information. It is not possible to independently verify each number reported by individual countries to the UN. When inconsistencies arise in the official data, the UN Statistical Office makes its own estimates based on governmental, professional, or commercial materials.

The issue of significant figures presents some interesting questions in presenting the data in this volume. While the suggestion that the final estimate is good within $\pm$10% hardly justifies reporting in four or more significant figures, we do not want to lose sight of small contributions, and many of the numbers which contribute to the sum are indeed significant in what shows in the 4th or 5th place in the regional and global sums. In other cases, growth over the period of record has been so great that digits which were certainly significant at the beginning of a time series would not be significant in the most recent entries of the same time series. In order to preserve the integrity of some small numbers, we have thus chosen to include more digits than are justified in some of the larger numbers. We leave it to the discretion and purposes of the user to truncate where appropriate. National emissions numbers are reported in thousands of tons of C, regional and global totals are reported in millions of tons of C, and per-capita values are reported to 0.01 tons of C.

CO_2-emission estimates for some individual countries and regions are less reliable than the global CO_2 emission estimates. Global totals depend on only production data with some representation of fuel chemistry and fractions of fuels that are oxidized. Regional and national data rely further on information for additional transactions (e.g., refinery product mix by country, imports, exports, bunker loadings). For some countries, it is difficult for the UN to obtain sufficient production, consumption, and trade data. Also, even though the authors account for all of these mass transfers, we do not attempt to deal with the different carbon content of various products.

Even the casual observer of Appendix A of this report will be struck with the broad year-to-year variability or singular anomalies in some of the plots of national emissions estimates. Some of this is no doubt real variability due to the vagaries of politics, economics, and weather; but other cases are certainly reflections of incompleteness or inadequacies of the data time series. These problems are difficult to verify and fix in the original data sets and it is only through focused attention by national experts, for example through exercises like the national greenhouse reporting exercises mandated by the FCCC, that we can hope to see these resolved. These kinds of data problems are concentrated in smaller countries where shut-down of a single large mine or power plant or omission of a single import stream can indeed have a major impact on the national statistics. We do not find any indication of systematic data problems and these variations in national statistics have little impact on regional or global sums. Data users should be particularly cautious of using data for the most recent year for a small developing country without looking at how it fits in with the trend of earlier values.

As noted earlier, the sum of the CO_2 emissions for all of the individual countries for a given year, as reported here, will **not** equal the global total. The difference between the sum of the individual countries and the global estimates is generally less than 5%.

Griffin (1987) reviewed the cement data and consulted with those responsible for data compilation and concluded that cement production figures from 1950 to 1985 were likely to be within 15% of true values. The conversion factor for cement (0.136 metric tons of carbon per metric ton of

cement manufactured) is based on the consensus that 63.5% of the world average cement is composed of calcium oxide. This estimate is based on the opinions of experts in the field as well as an inspection of composition data by type and country. The uncertainty associated with the conversion factor for cement is small with respect to the uncertainty in the cement production data.

The five countries of extreme southern Africa—Botswana, Lesotho, Namibia, South Africa, and Swaziland— are joined in the South Africa Customs Union and all international trade occurs through this customs union. Trade among these five nations is not captured in international trade statistics. Lesotho, for example has most of its trade with South Africa (which surrounds it) and this trade does not appear in UN trade statistics (Lesotho receives a fixed share of customs receipts from the customs union). The consequence of this in our energy-related analyses is that we cannot clearly distinguish what is attributable to South Africa. The UNSTAT Database distinguishes internal production of energy resources but imports and exports are identifiable only for the group as a whole. Consequently, our emissions estimates, for example, show energy consumption and CO_2 emissions as zero for Namibia and Lesotho and very tiny for Swaziland. Because South Africa dominates the five-nation customs union in population (86%) and clearly has the highest per-capita level of consumption, we have taken the position of assuming that all imports and exports attributed to the "Customs Union of South Africa" (i.e., country code 711) are in fact due to South Africa itself. This has the effect of slightly inflating both total and per capita energy consumption and CO_2 emissions for South Africa. Energy consumption and related emissions for the other four countries are most likely underestimated. Emissions from Swaziland and Botswana are those from domestically-produced coals only.

In addition to the uncertainty associated with the CO_2-emission estimates and the reliability of the data sets used to calculate these estimates, there are some other caveats in the data files that need explanation. Some of these caveats are created by using different types of data from various sources whereas others stem from the methods used to calculate regional and national CO_2 emissions. There are sixty-eight instances where CO_2-emission estimates from either gas, liquid, or solid fuel consumption were negative and eleven occurrences of negative total CO_2-emission estimates for individual countries (Table 7). There are many reasons for these negative values including accounting errors in the national production and trade data, missing data, and our accounting system. For example, envision a hypothetical nation (X) with coal but no crude oil resources. If the country were to produce 100 tons of coal, convert it to liquid fuels in a liquefaction plant, and then export 50 tons of liquid fuels, our algorithm would lead to the following report of fuel consumption.

	Solids	Liquids	Total
Country X	100	-50	50

The total fuel consumption (and subsequent CO_2-production) numbers would be correct even though the component numbers for solids and liquids are misleading. Because there are only small amounts of conversion among fuel forms, this seems to remain a useful accounting procedure in spite of a few misleading numbers. For similar reasons the per-capita CO_2 values of some small countries will not accurately reflect energy usage in the local economy. Data for Wake Island, for example, show large imports of liquid fuels and nearly the same values for bunker loadings. Inland consumption is the difference between these two large values. Calculations show that per-capita CO_2 consumption on Wake Island has been two-to-four times that in the United States since 1960, but with 95% of energy petroleum products allocated to bunker loadings it doesn't take much of a distortion in either the import or bunker numbers to produce a major change in the per-capita consumption number. Some of the population estimates used to calculate per-capita CO_2-emission rates were mid-year population estimates.

Table 7. Listing and explanation of all negative total CO_2-emission estimates

Country	Year	Negative value of CO_2 emission (10^3 tons C)	Explanation for negative CO_2 emission estimate
Iran	1950	-1626.78 (liquids)	Export of secondary liquid fuels exceeds gross production of primary liquid fuels by 9.5% — small difference between large numbers
Kuwait	1952 1953	-118.89 (liquids) -14.23 (liquids)	For both years, export and bunker use of liquid fuels barely exceeded gross production of crude oil — small differences between large numbers
Netherlands Antilles	1989 1990	-0.84 (liquids) -341.60 (liquids)	For both years, export, bunker use, and storage of liquid fuels exceeded imports of primary and secondary liquid fuels
Sarawak	1969	-276.29 (liquids)	Small differences between the sum of imports and gross production and the sum of exports, stock changes, and bunker fuel use
Saudi Arabia	1951 1952	-94.61 (liquids) -46.89 (liquids)	For both years, export, storage, and bunker use of liquid fuels barely exceeded gross production of crude oil — small differences between large numbers
Senegal	1968	-49.40 (liquids)	Accounting error — export and bunker use of liquid fuels exceeds gross production and imports
Somalia	1981	-4.19 (liquids)	Accounting error — crude oil was neither produced nor imported yet it was stored after importation (transaction code 062)
Democratic Yemen	1951	-7.326 (solids)	Accounting error — coal was neither produced nor imported yet it was stored after importation (transaction code 062)

6. QUALITY ASSURANCE CHECKS PERFORMED BY CDIAC

The CO_2-emissions database is derived from a variety of sources and requires considerable data processing, selection, and integration (Fig. 5). Each of the data sets used for calculating the CO_2-emission estimates is checked carefully. CDIAC works with the UN Statistical Division annually to quality assure each new version of the UNSTAT Database. Although the review process is unable to detect some kinds of data problems, it does confirm that the UNSTAT Database meets high standards of data management and internal consistency. The following highlights the quality-assurance checks performed routinely on the **entire** UNSTAT Database, not just on those data used in the CO_2-emission calculations.

6.1 Compare the New Database to the Previous Version

The 1992 UNSTAT Database, released in May 1994, was checked against the 1991 version to identify additions, deletions, and changes. In general, the oldest data (i.e., 1950–69) had no changes whereas in the newer data (1970–92), there were many (>1000) differences. This reflects the dynamic nature of the UNSTAT Database and the constant addition, deletion, and revision of data as new information is obtained. The dynamic nature of the UNSTAT Database also requires that users of the CO_2-emissions database replace previous versions of the database in their entirety, instead of simply appending the most recent years' emission estimates.

6.2 Check for Duplicate Entries

The 1992 UNSTAT Database was sorted by country, year, commodity, transaction code, quantity, and units in a search for duplicate entries. Duplicate entries were deleted from the database.

6.3 Check for Questionable Data

The UNSTAT data were examined to identify suspect data. The checks were performed to identify:

- Inappropriate years (outside of the 1950–92 range)
- Invalid country codes (checked against the UN documentation)
- Invalid transaction codes (certain transaction codes are valid for only some commodities)
- Questionable import/export quantities (in relation to production quantities)
- Inappropriate units
- Improper signs (some transactions can be only positive or only negative)
- Gaps or large changes in quantities between adjacent years for the same country, commodity, and transaction

These checks have identified many "suspicious values." Some are clearly errors, whereas most suggest

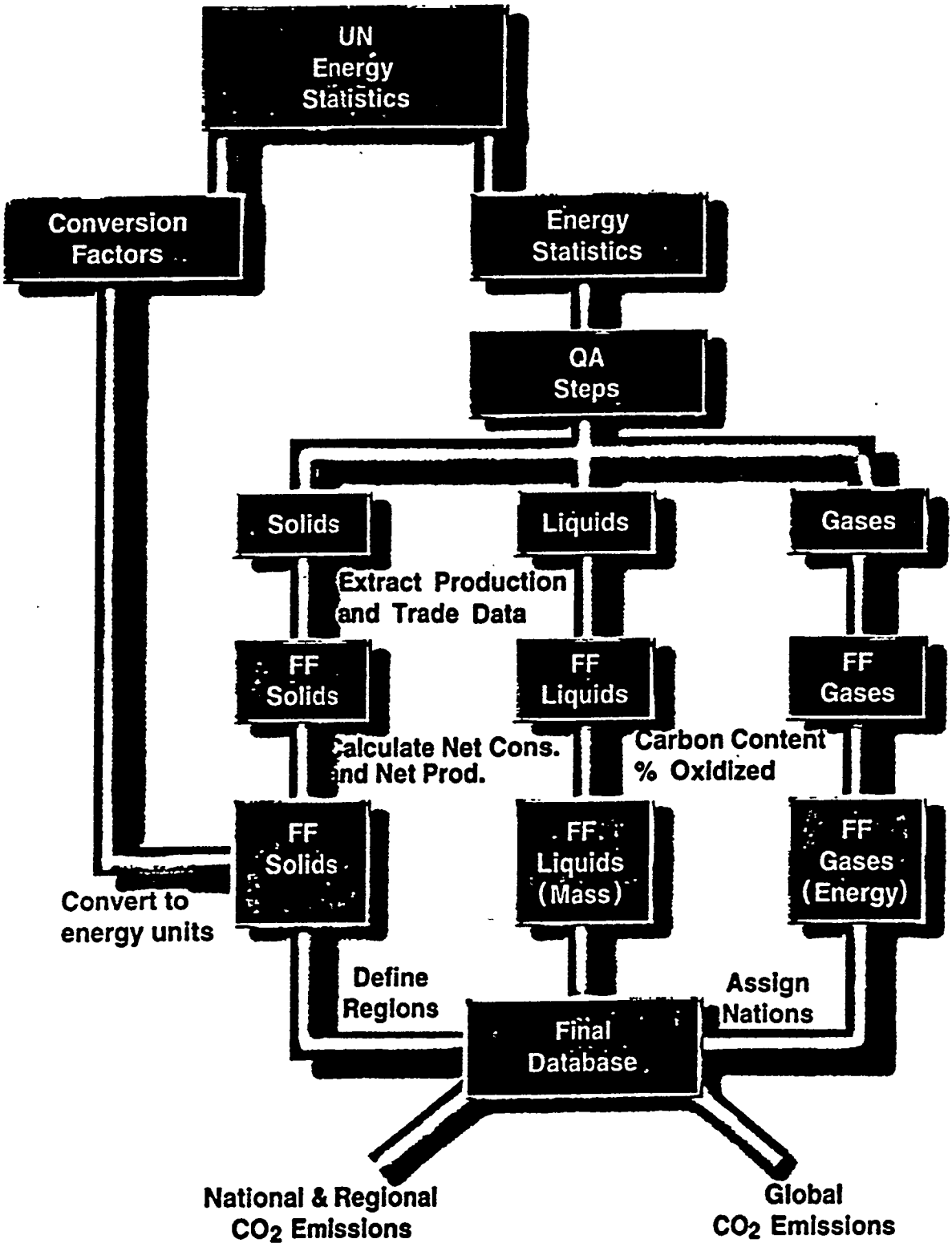

Figure 5. Data processing and selection of the United Nations Energy Statistics Database. FF denotes fossil fuels.

review by the UN Statistical Division and are referred back to them for consideration. Rarely, and only in the case of unmistakable errors and with the concurrence of the UN Statistical Division, do the authors purge or change values before calculating the CO_2-emission estimates. Having performed this exercise for 7 years, and continually refining the quality-assurance process, we now find few "suspicious values" during the annual quality-assurance exercise.

7. HOW TO OBTAIN THE DATA

The CO_2-emission estimates and underlying data are available in machine-readable form, upon request, from CDIAC, without charge. CDIAC will also distribute subsets of the database as requested. This database may be acquired from CDIAC's anonymous File Transfer Protocol (FTP) area (see FTP access instructions below), on 9-track magnetic or 8-mm tape, or on IBM- or Macintosh-formatted floppy diskettes. Requests for 9-track magnetic tapes should include preferred tape specifications (i.e., 1600 or 6250 BPI, labelled or nonlabelled, ASCII or EBCDIC characters, variable- or fixed-record lengths). Requests not accompanied by tape specifications will be filled on 9-track, 6250 BPI, nonlabelled tapes with ASCII characters, and having the file attributes shown on pages 40–42.

This documentation is available only from CDIAC. Requests should be addressed to

Carbon Dioxide Information Analysis Center
World Data Center–A for Atmospheric Trace Gases
Oak Ridge National Laboratory
Post Office Box 2008
Oak Ridge, TN 37831-6335, USA

Tapes, diskettes, and documentation may also be ordered by telephone, facsimile, or electronic mail:

Telephone: (423) 574-3645 or (423) 574-0390
Fax: (423) 574-2232

Electronic mail: cdiac@ornl.gov
CDIAC home page on the World Wide Web: http://cdiac.esd.ornl.gov

FTP access: ftp cdiac.esd.ornl.gov (or 128.219.24.36)
Enter "anonymous" as the userid
Enter your electronic mail address as the password (e.g., "tab@ornl.gov")
Change to the directory "/pub/ndp030r6"

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PART 2:

CONTENT AND FORMAT OF DATA FILES

9. LISTING OF FILES PROVIDED

The following is a listing of the files that comprise the CO_2-emissions database and are distributed along with this documentation. These files are available in numerous ways and on a variety of media (see Sect. 7, "*How To Obtain The Data*," page 35). This listing has been organized to reflect a 9-track magnetic tape request. The record formats, record lengths, and block sizes shown are the default file parameters for those not specifying these parameters when requesting machine-readable data files on 9-track magnetic tape. The default tape density, tape labelling, and file characters are 6250 BPI, nonlabelled, and ASCII, respectively.

File number, description, and name	File size (megabytes)	Logical records	Record format	Block size	Record length
1. General descriptive information file (**readme**)	0.029	622	FB[a]	8000	80
2. FORTRAN 77 data retrieval code to read and print the files (files 4 and 5) containing the United Nations gas and solid energy statistics used to calculate the global, regional, and national CO_2-emissions estimates (**energy92.for**)	0.001	30	FB	8000	80
3. SAS® code to read and print files 4 or 5 (**energy92.sas**)	0.001	14	FB	8000	80
4. Gas fuel energy statistics from the United Nations Energy Statistics Database that were used in calculating the CO_2-emissions estimates (**gas92.dat**)	0.391	9526	FB	4000	40
5. Solid fuel energy statistics from the United Nations Energy Statistics Database that were used in calculating the CO_2-emissions estimates (**solid92.dat**)	1.208	29454	FB	4000	40
6. FORTRAN 77 data retrieval code to read and print the file (file 8) containing the United Nations liquid energy statistics used to calculate the global, regional, and national CO_2-emissions estimates (**liquid92.for**)	0.001	30	FB	8000	80
7. SAS® code to read and print file 8 (**liquid92.sas**)	0.001	6	FB	8000	80
8. Liquid fuel energy statistics from the United Nations Energy Statistics Database that were used in calculating the CO_2-emissions estimates (**liquid92.dat**)	5.495	124909	FB	4300	43

File number[a] and description	File size (megabytes)	Logical records	Record format	Block size	Record length
9. Country codes that appear in the United Nations Energy Statistics Database (**country.cod**)	0.004	263	FB	6000	60
10. FORTRAN 77 data retrieval code to read and print the file (file 12) containing the conversion factors provided by the United Nations to convert solid fuel statistics from mass units to energy units (**factor92.for**)	0.001	31	FB	8000	80
11. SAS® code to read and print file 12 (**factor92.sas**)	0.001	7	FB	8000	80
12. Conversion factors furnished by the United Nations to convert solid fuel statistics from mass units to energy units (**factor92.dat**)	0.189	8977	FB	2400	24
13. FORTRAN 77 data retrieval code to read and print the file (file 15) containing the hydraulic cement production estimates published by the U.S. Department of Interior's Bureau of Mines (**cement92.for**)	0.001	25	FB	8000	80
14. SAS® code to read and print file 15 (**cement92.sas**)	0.001	14	FB	8000	80
15. Hydraulic cement production estimates published by the U.S. Department of Interior's Bureau of Mines (**cement92.dat**)	0.104	4698	FB	2100	21
16. FORTRAN 77 data retrieval code to read and print the file (file 18) containing UN and U.S. DOE EIA gas flaring estimates (**flare92.for**)	0.001	24	FB	8000	80
17. SAS® code to read and print file 16 (**flare92.sas**)	0.001	13	FB	8000	80
18. Gas flaring estimates from the United Nations Energy Statistics Database that were supplemented with gas flaring estimates provided by the U.S. Department of Energy's Energy Information Administration (**flare92.dat**)	0.027	1353	FB	2300	23
19. FORTRAN 77 data retrieval code to read and print the file (file 21) containing the national CO_2-emission estimates (**nation92.for**)	0.001	38	FB	8000	80

File number[a] and description	File size (megabytes)	Logical records	Record format	Block size	Record length
20. SAS® code to read and print file 21 (**nation92.sas**)	0.001	16	FB	8000	80
21. National annual CO_2-emission estimates from fossil-fuel consumption, cement production, and gas flaring for 1950–1992 (**nation92.ems**)	0.655	8080	FB	8000	80
22. FORTRAN 77 retrieval code to read and print the file (file 24) containing the regional CO_2-emission estimates (**region92.for**)	0.001	38	FB	8000	80
23. SAS® code to read and print file 23 (**region92.sas**)	0.001	14	FB	8000	80
24. Regional annual CO_2-emission estimates from fossil-fuel consumption, cement production, and gas flaring for 1950–1992 (**region92.ems**)	0.030	443	FB	6800	68
25. Country codes assigned to each of ten regions (**region.def**)	0.001	60	FB	5900	59
26. FORTRAN 77 retrieval code to read and print the file (file 28) containing the global CO_2-emission estimates (**global92.for**)	0.001	37	FB	8000	80
27. SAS® code to read and print file 28 (**global92.sas**)	0.001	14	FB	8000	80
28. Global annual CO_2-emission estimates from fossil-fuel consumption, cement production, and gas flaring for 1950–1992 (**global92.ems**)	0.001	56	FB	7300	73
Total size and number of records	8.155	188,792			

[a] FB = fixed block

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10. FILE DESCRIPTIONS

The following is a listing of the descriptive file (i.e., **readme**) provided by the Carbon Dioxide Information Analysis Center along with this documentation and the other data files that comprise the CO_2-emissions database. This file is intended to provide all the information (i.e., variable descriptions, formats, units) needed by the user to understand the content and format of each data file.

Dataset Title: Estimates of Global, Regional, and National Annual CO_2 Emissions from Fossil-Fuel Burning, Hydraulic Cement Production, and Gas Flaring: 1950–1992

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Source and Scope of the Data: The data files presented here include global, regional, and national estimates of CO_2 emissions from fossil-fuel burning, gas flaring, and cement production along with the data used to make these estimates. Global, regional, and national CO_2-emission estimates are provided for each year from 1950 to 1992. These CO_2-emission estimates were derived principally from energy statistics published by the United Nations (UN) and calculated using the methods of Marland and Rotty (1984). Emission estimates from cement production were derived solely from cement production data published by the U.S. Department of Interior's Bureau of Mines. Emission estimates from gas flaring were derived primarily from gas-flaring estimates provided in the UN Energy Statistics (UNSTAT) Database and were supplemented with flaring estimates furnished by the U.S. Department of Energy's Energy Information Administration (DOE/EIA). Per capita estimates of CO_2 emissions are provided and were calculated with population data provided by the UN.

Data files: The following 28 files comprise the CO_2-emissions database.

- this descriptive file (**readme**),
- eight FORTRAN 77 input/output routines (***.for**),
- eight SAS® input/output routines (***.sas**),
- three files containing subsets of the UNSTAT Database [gas (**gas92.dat**), liquid (**liquid92.dat**), and solid (**solid92.dat**) fuel energy statistics],
- one file that lists the UN country codes and the nations they represent (**country.cod**),
- one file containing UN conversion factors for converting solid fuel statistics from mass units to energy units (**factor92.dat**),
- one file containing U.S. Bureau of Mines hydraulic cement-production estimates (**cement92.dat**),
- one file containing gas-flaring estimates provided by the UN and DOE/EIA (**flare92.dat**),
- one file containing annual national CO_2-emission estimates (**nation92.ems**),
- one file containing annual regional CO_2-emission estimates (**region92.ems**),
- one file that lists the countries assigned to each of ten global regions (**region.def**), and
- one file containing annual global CO_2-emission estimates (**global92.ems**).

DATA FILE FORMATS

Three files (**gas92.dat**, **liquid92.dat**, and **solid92.dat**) are provided that collectively offer the energy statistics from the UNSTAT Database that were used to generate the global, regional, and national CO_2-emission estimates. A single file is presented for each major fuel category (i.e., gas, liquid, and solid fuels) and each file is sorted in ascending order by a country code, year, and commodity code (e.g., AV = aviation gasoline, CL = coal). Therefore, all the data for Afghanistan (country code 004) are presented first and all the data for Zambia (country code 894) are presented last. The file **gas92.dat** contains 9513 records from 109 countries; the file **liquid92.dat** contains 124,909 records from 238 countries; and the file **solid92.dat** contains 29,441 records from 171 countries. The gas and solid files (**gas92.dat** and **solid92.dat**) may be read by using the following FORTRAN 77 format:

```
      CHARACTER CDTY*2,FORM*4,TRANS*7,QCODE*3
      INTEGER COUNTRY,YEAR,QUANTITY
      READ(5,20,END=999) COUNTRY,YEAR,CDTY,FORM,TRANS,
     1 QUANTITY,QCODE
20    FORMAT(I3,1X,I4,1X,A2,1X,A4,1X,A7,1X,I11,1X,A3)
```

or by using the following SAS® input statement:

```
input country 1-3 year 5-8 cdty $ 10-11 form $ 13-16 trans $ 18-24
      quantity 26-36 qcode $ 38-40;
```

The file containing the UNSTAT liquid fuel energy statistics (**liquid92.dat**) is formatted in a slightly different manner than the gas and liquid files and may be read by using the following FORTRAN 77 format:

```
      CHARACTER CDTY*2,FORM*7,TRANS*7,QCODE*3
      INTEGER COUNTRY,YEAR,QUANTITY
      READ(5,20,END=999) COUNTRY,YEAR,CDTY,FORM,TRANS,
     1 QUANTITY,QCODE
20    FORMAT(I3,1X,I4,1X,A2,1X,A7,1X,A7,1X,I11,1X,A3)
```

or by using the following SAS® input statement:

```
input country 1-3 year 5-8 cdty $ 10-11 form $ 13-19 trans $ 21-27
      quantity 29-39 qcode $ 41-43;
```

Stated in tabular form, the energy statistics subsets include the following. Differences between the file containing the liquid fuel energy statistics and the files containing the gas and solid fuel energy statistics are noted in parentheses.

Variable	Variable type	Variable width	Starting column	Ending column
COUNTRY	Numeric	3	1	3
YEAR	Numeric	4	5	8

CDTY	Character	2	10	11
FORM	Alphanumeric	4 (7)	13	16 (19)
TRANS	Alphanumeric	6	18 (21)	24 (27)
QUANTITY	Numeric	11	26 (29)	36 (39)
QCODE	Character	3	38 (41)	40 (43)

where:

COUNTRY is a one-to-three-digit country code (4–894). A complete list of these codes and the nations they represent is provided in Tables 1 and 2 of the documentation or in the file **country.cod.**

YEAR is the year. Values range from 1950 to 1992.

CDTY is a two-letter commodity or fuel-type code. The codes and fuels they represent are as follows:

Gas fuels

GG - gasworks gas
NG - natural gas
OG - coke-oven gas
RG - refinery gas

Liquid fuels

AV - aviation gasoline
BT - bitumen/asphalt
CD - plant condensate
CR - crude petroleum
DL - gas-diesel oil
FS - feedstocks
GL - natural gas liquids
JF - jet fuel
KR - kerosene
LP - liquefied petroleum gas
LU - lubricants
MO - motor gasoline
NP - naphtha
NT - natural gasoline
PK - petroleum coke
PP - other petroleum products
PW - petroleum wax
RF - residual fuel oil
WS - white spirit/industrial spirit

Solid fuels

BB - lignite (brown coal) briquettes
BC - hard coal (patent fuel) briquettes
BK - brown coal coke
BP - peat briquettes
CL - coal
GK - gas coke
LB - lignite/brown coal
OK - coke-oven coke
OS - oil shale
PT - peat

FORM is an alphanumeric code that designates the type of fuel (i.e, GAS, LIQ, or SOL), whether the fuel is a primary or secondary fuel type (i.e., GAS1, GAS2, SOL1, SOL2, and LIQ1), and whether the fuel is a secondary liquid energy or nonenergy fuel type (i.e., LIQ2 or LIQ2NON). The form codes and fuels (commodity codes shown in parentheses) assigned to each form code are as follows:

GAS1 - natural gas (NG),
GAS2 - gasworks gas (GG), coke-oven gas (OG), and refinery gas (RG),
LIQ1 - crude petroleum (CR) and natural gas liquids (GL),
LIQ2 - aviation gasoline (AV), motor gasoline (MO), natural gasoline (NT), jet fuel (JF), kerosene (KR), gas-diesel oils (DL), residual fuel oils (RF), liquified petroleum gas (LP), feedstocks (FS), and plant condensate (CD),
LIQ2NON - naphthas (NP), white spirit/industrial spirit (WS), lubricants (LU), bitumen/asphalt (BT), petroleum wax (PW), petroleum coke (PK), and other petroleum products (PP),
SOL1 - coal (CL), lignite-brown coal (LB), peat (PT), and oil shale (OS),
SOL2 - coke-oven coke (OK), gas coke (GK), brown coal coke (BK), hard coal briquettes (BC), lignite-brown coal briquettes (BB), and peat briquettes (BP),

TRANS is a two-to-six character alphanumeric transaction code. The codes and their meanings are as follows.

Gas fuels

01	- gross production
03	- imports
03xxx	- imports from a specific country xxx
04	- exports
04xxx	- exports to a specific country xxx
061	- changes in stock at producers
062	- changes in stock at importers
103	- re-injected
104	- flared or lost
105	- extraction losses/shrinkages

Liquid fuels

01	- gross production
013	- gross production from refineries
014	- gross production from plants
03	- imports
04	- exports
05	- bunkers
061	- changes in stock at producers
062	- changes in stock at importers
063	- changes in stock at industrial consumers

Solid fuels

01	- gross production
03	- imports
03xxx	- imports from a specific country xxx
04	- exports
04xxx	- exports to a specific country xxx
05	- bunkers
061	- changes in stock at producers
062	- changes in stock at importers
063	- changes in stock at industrial consumers

QCODE is a three-letter code that defines the units for a given commodity. The unit codes and their meanings are as follows.

HSO - terajoules
WSO - metric tons
WSR - thousand metric tons
WSU - million metric tons

QUANTITY is the amount of a commodity (CDTY) for a given country (COUNTRY) during a given year (YEAR) that is produced, exported, imported, consumed, stored, or categorized as bunkers (TRANS) expressed in QCODE units. There are no missing values in any of the three UN energy statistics files, but zero values do exist.

The file **country.cod** provides a list of the 263 national and regional codes used in the UNSTAT Database and the countries or regions they denote (e.g., 004 Afghanistan). This file is needed to decipher the country codes in the files that contain the UN energy statistics and the file containing the national CO_2-emission estimates.

The file **factor92.dat** contains conversion factors provided by the UN to convert solid fuel statistics from mass units to energy units. It is necessary to use these conversion factors in order to account for differences in the heating values of different solid fuel commodities. The file contains conversion factors for domestic and imported solid fuels and is sorted by country, year, commodity,

and fuel source. The file contains 8,964 conversion factors for 62 countries, has no missing values, and may be read by using the following FORTRAN 77 format:

```
      READ(5,20,END=999) COUNTRY,YEAR,CDTY,SOURCE,CONVERT
20    FORMAT(I3,1X,I4,1X,A2,1X,A1,1X,I6)
```

or by using the following SAS® input statement:

```
input country 1-3 year 5-8 cdty $ 10-11 source $ 13 convert 15-20;
```

Stated in tabular form, the contents of the file containing the UN conversion factors includes:

Variable	Variable type	Variable width	Starting column	Ending column
COUNTRY	Numeric	3	1	3
YEAR	Numeric	4	5	8
CDTY	Character	2	10	11
SOURCE	Character	1	13	13
CONVERT	Numeric	6	15	20

where:

COUNTRY is a one-to-three-digit country code (4–894). A complete list of these codes and the nations they represent is provided in Tables 1 and 2 of the documentation that accompanies these files or in the file **country.cod**.

YEAR is the year. Values range from 1950 to 1992.

CDTY is a two-letter commodity or fuel type code. The codes and the fuels they represent are as follows:

BB - lignite (brown coal) briquettes
BC - hard coal (patent fuel) briquettes
BK - brown coal coke
BP - peat briquettes
CL - coal
GK - gas coke
LB - lignite/brown coal
OK - coke-oven coke
OS - oil shale
PT - peat

SOURCE is a one character code that reflects the source or use of the commodity. The codes and their meanings are as follows:

C - consumption (derived as the weighted average of the conversion factors for domestic production and imports)
D - domestic
I - imports

CONVERT is the conversion factor used to convert a solid fuel commodity from mass units (typically thousand metric tons) to energy units (terajoules). The conversion factors provided are from the UNSTAT Database and are expressed in kilocalories/kilogram.

The file **cement92.dat** contains estimates of the amount of hydraulic cement produced annually by individual countries for the years 1950 to 1992. These records are a composite of the estimates compiled by the U.S. Bureau of Mines and published annually in the *Cement Minerals Yearbook*. This file was used to calculate CO_2 emissions resulting from the release of CO_2 during cement production. The file contains 4685 records and provides annual cement production estimates for 166 countries. The file contains no missing values. Values of zero indicate that no cement was produced in a country during that year.

The file may be read by using the following FORTRAN 77 format:

```
      READ(5,10)
 10     FORMAT(//////)
 20     CONTINUE
        READ(5,25,END=999) COUNTRY,YEAR,QUANTITY,QCODE
 25     FORMAT(I3,1X,I4,1X,I8,1X,A3)
```

or by using the following SAS® input statement:

```
input country 1-3 year 5-8 quantity 10-17 qcode $ 19-21;
```

Stated in tabular form, the cement production data file includes the following.

Variable	Variable type	Variable width	Starting column	Ending column
COUNTRY	Numeric	3	1	3
YEAR	Numeric	4	5	8
QUANTITY	Numeric	8	10	17
QCODE	Character	3	19	21

where:

COUNTRY is a one-to-three-digit country code (4–894). A complete list of these codes and the nations they represent is provided in Tables 1 and 2 of the documentation that accompanies these files or in the file **country.cod.**

YEAR is the year. Values range from 1950 to 1992.

QUANTITY is the amount of hydraulic cement produced by a COUNTRY during a given YEAR expressed in QCODE units.

QCODE is a three-letter code that represents the units (BAR for barrels and TST for thousand short tons). The cement production estimates are expressed in barrels (BAR) before and during 1969 and thousand short tons (TST) after 1969.

The file **flare92.dat** contains the annual amount of natural gas flared by individual countries in their oil fields. These values are derived principally from the UNSTAT Database, but 64 values were furnished by the DOE/EIA. The values furnished by DOE/EIA supplement, complete, replace, or improve gas flaring series for China, France, Norway, Oman, and the former USSR.

The gas-flaring data file provides 1340 records for 57 countries. The file contains no bonafide missing values. Zero values generally indicate that no gas was flared, except for 14 instances where we inserted zero values to temporarily complete data records. For China and France, some periods (1985–90 and 1983–90, respectively) exist where no annual gas-flaring estimates were available. Although we recognize that flaring occurred in these countries at these times, we felt uncomfortable inserting our own estimates and instead inserted zeros with the hope that in the future we will be able to replace these markers with reasonable estimates from reliable sources.

The gas-flaring data file may be read by using the following FORTRAN 77 format statement:

```
      READ(5,20,END=999) COUNTRY,YEAR,QUANTITY
20    FORMAT(I3,1X,I4,1X,F10.2)
```

or by using the following SAS® input statement:

```
input country 1-3 year 5-8 quantity 10-19;
```

Stated in tabular form, the gas flaring data file includes the following:

Variable	Variable type	Variable width	Starting column	Ending column
COUNTRY	Numeric	3	1	3
YEAR	Numeric	2	5	8
QUANTITY	Numeric	8	10	19

where:

COUNTRY is a one-to-three-digit country code (values range from 4–890). A complete list of these codes and the nations they represent is provided in Tables 1 and 2 of the documentation that accompanies these files or in the file **country.cod.**

YEAR is the year. Values range from 1950 to 1992.

QUANTITY is the amount of natural gas flared by a COUNTRY during a given YEAR expressed in terajoules. There are no missing values. Zero values indicate that no natural gas was flared or have been placed in the file as a marker for incomplete time series.

File **nation92.ems** contains the national annual CO_2-emission and per capita CO_2-emission estimates for 240 countries. Most countries have emission records for the period 1950 to 1992. The file is sorted by country code, in ascending order, and year. These emission estimates were derived from the UN energy statistics, UN population data, DOE/EIA gas flaring estimates, and U.S. Bureau of Mines cement manufacturing data, respectively. All CO_2-emission estimates are expressed in **thousand metric tons of carbon.** The per capita CO_2-emission rates are expressed in tons of carbon $\cdot$ person^{-1} $\cdot$ year^{-1}. The file contains 8080 records and may be read by using the following FORTRAN 77 format:

```
      READ(5,20,END=999) COUNTRY,YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1  CO2SOL,CO2CEM,CO2FLA,PERCAP,BUNKER
 20    FORMAT(I3,1X,I4,1X,I11,1X,I9,1X,I9,1X,I9,1X,I7,1X,
     1  I7,1X,F6.2,1X,A6)
```

or by using the following SAS® input statement:

```
input country 1-3 year 5-8 co2tot 10-20 co2gas 22-30
      co2liq 32-40 co2sol 42-50 co2cem 52-58 co2fla 60-66
      @68 percap 6.2 bunker 75-80;
```

Stated in tabular form, the national CO_2-emissions data file includes the following:

Variable	Variable type	Variable width	Starting column	Ending column
COUNTRY	Numeric	3	1	3
YEAR	Numeric	4	5	8
CO2TOT	Numeric	11	10	20
CO2GAS	Numeric	9	22	30
CO2LIQ	Numeric	9	32	40
CO2SOL	Numeric	9	42	50
CO2CEM	Numeric	7	52	58
CO2FLA	Numeric	7	60	66
PERCAP	Numeric	6	68	73
BUNKER	Numeric	6	75	80

where:

COUNTRY — is a one-to-three-digit country code (4–894). A complete list of these codes and the nations they represent is provided in Tables 1 and 2 of the documentation that accompanies these files or in the file **country.cod.**

YEAR — is the year. Values range from 1950 to 1992;

CO2TOT — is the total annual CO_2-emission estimate for an individual COUNTRY resulting from the burning of fossil fuels, cement production, and gas flaring for a given YEAR, expressed in thousand metric tons of carbon;

CO2GAS — is the annual CO_2-emission estimate for an individual COUNTRY resulting from the burning of gas fuels, expressed in thousand metric tons of carbon;

CO2LIQ — is the annual CO_2-emission estimate for an individual COUNTRY resulting from the burning of liquid fuels, expressed in thousand metric tons of carbon;

CO2SOL — is the annual CO_2-emission estimate for an individual COUNTRY resulting from the burning of solid fuels, expressed in thousand metric tons of carbon;

CO2CEM — is the annual CO_2-emission estimate for an individual COUNTRY resulting from the production of cement, expressed in thousand metric tons of carbon;

CO2FLA — is the annual CO_2-emission estimate for an individual COUNTRY resulting from gas flaring, expressed in thousand metric tons of carbon;

PERCAP — is the annual estimate of the per capita emission rate for an individual COUNTRY, expressed in metric tons of carbon $\cdot$ person^{-1} $\cdot$ year^{-1}.

BUNKER — is the annual CO_2-emission estimate for bunker fuels for an individual COUNTRY, expressed in thousand metric tons of carbon. Bunker fuels are fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are not included in the national emission totals.

Missing values are represented as blank fields in the data file. Many countries will have missing values for the bunker emission estimates.

File **region92.ems** contains the regional CO_2-emission and per capita estimates. Annual emission estimates are provided for ten regions for the period 1950–1992. The file contains 430 observations, no missing values, and may be read by using the following FORTRAN 77 format:

```
      READ(5,20,END=999) REGION,YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1  CO2SOL,CO2CEM,CO2FLA,PERCAP
20     FORMAT(A3,1X,I4,1X,I9,1X,I9,1X,I9,1X,I9,1X,I6,1X,
     1  I6,1X,F5.2)
```

or by using the following SAS® input statement:

```
input region $ year co2tot co2gas co2liq co2sol co2cem co2fla percap;
```

Stated in tabular form, the regional CO_2-emissions data file includes the following:

Variable	Variable type	Variable width	Starting column	Ending column
REGION	Character	3	1	3
YEAR	Numeric	4	5	8
CO2TOT	Numeric	9	10	18
CO2GAS	Numeric	9	20	28
CO2LIQ	Numeric	9	30	38
CO2SOL	Numeric	9	40	48
CO2CEM	Numeric	6	50	55
CO2FLA	Numeric	6	57	62
PERCAP	Numeric	5	64	68

where:

REGION — is a three letter region code. The ten codes and the regions they represent are listed below. A list of the countries assigned to each region is provided in Table 6 of the documentation that accompanies these files or in the file **region.def**:

AFR - Africa
AMD - Latin, Central, and South America
CPA - Centrally Planned Asia
CPE - Centrally Planned Europe or Eastern Europe
FEA - Far East
GER - Germany
MDE - Middle East
NAM - North America
OCN - Oceania
WEU - Western Europe

YEAR — is the year. Values range from 1950 to 1992.

CO2TOT — is the total annual CO_2-emission estimate for a region resulting from the burning of fossil fuels, including gas flaring, and from hydraulic cement production, expressed in thousand metric tons of carbon;

CO2GAS is the annual CO_2-emission estimate for a region resulting from the burning of gas fuels, expressed in thousand metric tons of carbon;

CO2LIQ is the annual CO_2-emission estimate for a region resulting from the burning of liquid fuels, expressed in thousand metric tons of carbon;

CO2SOL is the annual CO_2-emission estimate for a region resulting from the burning of solid fuels, expressed in thousand metric tons of carbon;

CO2CEM is the annual CO_2-emission estimate for a region resulting from cement production, expressed in thousand metric tons of carbon;

CO2FLA is the annual CO_2-emission estimate for a region resulting from gas flaring, expressed in thousand metric tons of carbon;

PERCAP is the annual per capita CO_2-emission rate for each person in a region, expressed in metric tons of carbon $\cdot$ person^{-1} $\cdot$ year^{-1}.

The file **region.def** lists the country codes assigned to each of ten global regions. The user will need to refer to Tables 1 or 2 of the documentation or the file **country.cod** to translate the country codes.

The file **global92.ems** contains the global annual CO_2-emission and per capita estimates for the period 1950–1992. All CO_2-emission estimates are expressed in **million metric tons of carbon.** The per capita CO_2-emission rates are given in metric tons of carbon $\cdot$ person^{-1} $\cdot$ year^{-1}. The file contains 43 observations, no missing values, and may be read by using the following FORTRAN 77 format:

```
        REAL PERCAP
       INTEGER YEAR,CO2TOT,CO2GAS,CO2LIQ,CO2SOL,CO2CEM,
     1    CO2FLA
       READ(5,10)
 10    FORMAT(//////)
 15    CONTINUE
       READ(5,20,END=999) YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1 CO2SOL,CO2CEM,CO2FLA,PERCAP
 20    FORMAT(I4,5X,I4,6X,I4,6X,I4,6X,I4,7X,I3,7X,
     1  I3,6X,F4.2)
```

or by using the following SAS® input statement:

```
input year co2tot co2gas co2liq co2sol co2cem co2fla percap;
```

Stated in tabular form, the global annual CO_2-emissions data file includes the following:

Variable	Variable type	Variable width	Starting column	Ending column
YEAR	Numeric	4	1	4
CO2TOT	Numeric	4	10	13
CO2GAS	Numeric	4	20	23
CO2LIQ	Numeric	4	30	33
CO2SOL	Numeric	4	40	43
CO2CEM	Numeric	3	51	53
CO2FLA	Numeric	3	61	63
PERCAP	Numeric	4	70	73

where:

YEAR is the year. Values range from 1950 to 1992.

CO2TOT is the total global annual CO_2-emission estimate resulting from the burning of fossil fuels, including gas flaring, and from hydraulic cement production for a given YEAR, expressed in million metric tons of carbon.

CO2GAS is the annual global CO_2-emission estimate resulting from the burning of gas fuels, expressed in million metric tons of carbon.

CO2LIQ is the annual global CO_2-emission estimate resulting from the burning of liquid fuels, expressed in million metric tons of carbon.

CO2SOL is the annual global CO_2-emission estimate resulting from the burning of solid fuels, expressed in million metric tons of carbon.

CO2CEM is the annual global CO_2-emission estimate resulting from hydraulic cement production, expressed in million metric tons of carbon.

CO2FLA is the annual global CO_2-emission estimate resulting from gas flaring in oil fields, expressed in million metric tons of carbon.

PERCAP is the annual global per capita emission estimate, expressed in metric tons of carbon $\cdot$ person^{-1} $\cdot$ year^{-1}.

11. LISTING OF THE FORTRAN 77 DATA RETRIEVAL PROGRAMS

The following is a listing of the FORTRAN 77 data retrieval program (**energy92.for**) to read and print the files containing the gas or solid fuel statistics extracted from the United Nations Energy Statistics Database.

```
c   ******************************************
c   ** FORTRAN 77 code to read and print     ***
c   ** the United Nations energy statistics  ***
c   ** used in calculating global, regional, ***
c   ** and national CO2 emissions from       ***
c   ** 1950-1992                             ***
c   ******************************************
        CHARACTER CDTY*2,FORM*4,TRANS*7,QCODE*3
        INTEGER COUNTRY,YEAR,QUANTITY
        OPEN(UNIT=5,FILE='solid92.dat')
        WRITE(6,5)
  5     FORMAT('Country',23X,'Primary or',3X,'Transaction',4X,
     1  'Amount of',5X,'Units',/,2X,'Code',3X,'Year',3X,'Commodity',3X,
     2  'Secondary Fuel',4X,'Code',5X,'Fuel Transacted',3X,
     3  'Code')
        READ(5,10)
 10     FORMAT(////////////)
 15     CONTINUE
        READ(5,20,END=999) COUNTRY,YEAR,CDTY,FORM,TRANS,
     1   QUANTITY,QCODE
 20     FORMAT(I3,1X,I4,1X,A2,1X,A4,1X,A7,1X,I11,1X,A3)
        WRITE(6,25) COUNTRY,YEAR,CDTY,FORM,TRANS,QUANTITY,
     1   QCODE
 25     FORMAT(3X,I3,3X,I4,6X,A2,12X,A4,9X,A7,5X,I11,5X,A3)
        GOTO 15
999     CONTINUE
        CLOSE(UNIT=5)
        CLOSE(UNIT=6)
        STOP
        END
```

The following is a listing of the FORTRAN 77 data retrieval program (**liquid92.for**) to read and print the file containing the liquid fuel statistics extracted from the United Nations Energy Statistics Database.

```
c   ******************************************
c   ** FORTRAN 77 code to read and print     ***
c   ** the United Nations liquid energy      ***
c   ** statistics used in calculating global,***
c   ** regional, and national CO2 emissions  ***
c   ** from 1950-1992                        ***
c   ******************************************
        CHARACTER CDTY*2,FORM*7,TRANS*7,QCODE*3
        INTEGER COUNTRY,YEAR,QUANTITY
        OPEN(UNIT=5,FILE='liquid92.dat')
        WRITE(6,5)
  5     FORMAT('Country',23X,'Primary or',3X,'Transaction',7X,
     1  'Amount of',5X,'Units',/,2X,'Code',3X,'Year',3X,'Commodity',3X,
     2  'Secondary Fuel',4X,'Code',8X,'Fuel Transacted',3X,
     3  'Code')
        READ(5,10)
 10     FORMAT(////////////)
 15     CONTINUE
        READ(5,20,END=999) COUNTRY,YEAR,CDTY,FORM,TRANS,
     1   QUANTITY,QCODE
 20     FORMAT(I3,1X,I4,1X,A2,1X,A7,1X,A7,1X,I11,1X,A3)
        WRITE(6,25) COUNTRY,YEAR,CDTY,FORM,TRANS,QUANTITY,
     1   QCODE
 25     FORMAT(3X,I3,3X,I4,6X,A2,12X,A7,9X,A7,5X,I1I,5X,A3)
        GOTO 15
999     CONTINUE
        CLOSE(UNIT=5)
        CLOSE(UNIT=6)
        STOP
        END
```

The following is a listing of the FORTRAN 77 data retrieval program (**factor92.for**) to read and print the UN conversion factor file.

```
c   ******************************************
c   ** FORTRAN 77 code to read and print     ***
c   ** the file containing the conversion    ***
c   ** factors to used to convert solid fuels***
c   ** reported in mass units to energy units***
c   ******************************************
        CHARACTER CDTY*2,SOURCE*1
        INTEGER COUNTRY,YEAR,CONVERT
        OPEN(UNIT=5,FILE='factor92.dat')
        WRITE(6,5)
  5     FORMAT('Country',11X,'Fuel',5X,'Fuel',3X,'Conversion',
      1 /,2X,'Code',3X,'Year',2X,'Commodity',2X,'Source',4X,
      2 'Factor')
        READ(5,10)
 10     FORMAT(////////////)
 15     CONTINUE
        READ(5,20,END=999) COUNTRY,YEAR,CDTY,SOURCE,CONVERT
 20     FORMAT(I3,1X,I4,1X,A2,1X,A1,1X,I6)
        WRITE(6,25) COUNTRY,YEAR,CDTY,SOURCE,CONVERT
 25     FORMAT(3X,I3,3X,I4,6X,A2,8X,A1,5X,I6)
        GOTO 15
999     CONTINUE
        WRITE(6,30)
 30     FORMAT('Source refers to the commodity source (i.e., D=domestic,
      1 I=imports,',/,'  and C=weighted average of the conversion factor
      2 for domestic production and imports).',/,'Conversion factors are
      3 expressed in Kcal/Kg.')
        CLOSE(UNIT=5)
        CLOSE(UNIT=6)
        STOP
        END
```

The following is a listing of the FORTRAN 77 data retrieval program (**cement92.for**) to read and print the hydraulic cement production data file.

```
c   ******************************************
c   ** FORTRAN 77 code to read and print     ***
c   ** the 1950-92 annual cement production  ***
c   ** estimates for individual countries    ***
c   ** provided by the U.S. Bureau of Mines  ***
c   ******************************************
        CHARACTER QCODE*3
        INTEGER COUNTRY,YEAR,QUANTITY
        OPEN(UNIT=5,FILE='cement92.dat')
        WRITE(6,5)
  5     FORMAT(14X,'AMOUNT OF',/,16X,'CEMENT',4X,'UNIT',
      1 /,'COUNTRY',2X,'YEAR',2X,'PRODUCED',2X,'CODES')
        READ(5,10)
 10     FORMAT(////////////)
 20     CONTINUE
        READ(5,25,END=999) COUNTRY,YEAR,QUANTITY,QCODE
 25     FORMAT(I3,1X,I4,1X,I8,1X,A3)
        WRITE(6,30) COUNTRY,YEAR,QUANTITY,QCODE
 30     FORMAT(2X,I3,4X,I4,2X,I8,3X,A3)
        GOTO 20
999     CONTINUE
        CLOSE(UNIT=5)
        CLOSE(UNIT=6)
        STOP
        END
```

The following is a listing of the FORTRAN 77 data retrieval program (**flare92.for**) to read and print the gas-flaring data file.

```
c   ******************************************
c   ** FORTRAN 77 code to read and print     ***
c   ** the 1950-92 annual gas flaring        ***
c   ** estimates for individual countries    ***
c   ******************************************
        REAL QUANTITY
        INTEGER COUNTRY,YEAR
        OPEN(UNIT=5,FILE='flare92.dat')
        WRITE(6,5)
  5     FORMAT(16X,'AMOUNT OF',/,'COUNTRY',9X,
      1 'GAS FLARED',/,2X,'CODE',3X,'YEAR',2X,'(TERAJOULES)')
        READ(5,10)
 10     FORMAT(////////////)
 15     CONTINUE
        READ(5,20,END=999) COUNTRY,YEAR,QUANTITY
 20     FORMAT(I3,1X,I4,1X,F10.2)
        WRITE(6,25) COUNTRY,YEAR,QUANTITY
 25     FORMAT(2X,I3,4X,I4,2X,F10.2)
        GOTO 15
999     CONTINUE
        CLOSE(UNIT=5)
        CLOSE(UNIT=6)
        STOP
        END
```

The following is a listing of the FORTRAN 77 data retrieval program (**nation92.for**) to read and print the file containing the national CO_2-emission estimates.

```
c   ******************************************
c   ** FORTRAN 77 code to read and print     ***
c   ** the 1950-92 national CO2 emission     ***
c   ** estimates from fossil fuel burning,   ***
c   ** hydraulic cement production, and gas  ***
c   ** flaring                               ***
c   ******************************************
        CHARACTER*6 BUNKER
        REAL PERCAP
        INTEGER COUNTRY,YEAR,CO2TOT,CO2GAS,CO2LIQ,CO2SOL,
     1     CO2CEM,CO2FLA
        OPEN(UNIT=5,FILE='nation92.ems')
        WRITE(6,5)
  5     FORMAT(24X,'CO2 Emissions (thousand metric tons of carbon)',
     1 //,'Country',23X,'Gas',5X,'Liquid',5X,'Solid',6X,'Cement',
     2 7X,'Gas',6X,'Per',/,2X,'Code',3X,'Year',6X,'Total',5X,'Fuels',
     3 5X,'Fuels',5X,'Fuels',4X,'Production',3X,'Flaring',2X,
     4 'Capita',3X,'Bunkers')
        READ(5,10)
 10     FORMAT(////////////)
 15     CONTINUE
        READ(5,20,END=999) COUNTRY,YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1  CO2SOL,CO2CEM,CO2FLA,PERCAP,BUNKER
 20     FORMAT(I3,1X,I4,1X,I11,1X,I9,1X,I9,1X,I9,1X,I7,1X,
     1  I7,1X,F6.2,1X,A6)
        WRITE(6,25) COUNTRY,YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1  CO2SOL,CO2CEM,CO2FLA,PERCAP,BUNKER
 25     FORMAT(3X,I3,3X,I4,I11,1X,I9,1X,I9,1X,I9,6X,I7,4X,
     1  I7,2X,F6.2,4X,A6)
        GOTO 15
999     CONTINUE
        WRITE(6,30)
 30     FORMAT('Per capita emission estimates are expressed in metric ton
     1s of carbon.')
        CLOSE(UNIT=5)
        CLOSE(UNIT=6)
        STOP
        END
```

The following is a listing of the FORTRAN 77 data retrieval program (**region92.for**) to read and print the file containing the regional CO_2-emission estimates.

```
c   ******************************************
c   ** FORTRAN 77 code to read and print     ***
c   ** the 1950-92 regional CO2 emission     ***
c   ** estimates from fossil fuel burning,   ***
c   ** hydraulic cement production, and gas  ***
c   ** flaring                               ***
c   ******************************************
      CHARACTER REGION*3
      REAL PERCAP
      INTEGER YEAR,CO2TOT,CO2GAS,CO2LIQ,CO2SOL,CO2CEM,
     1   CO2FLA
      OPEN(UNIT=5,FILE='region92.ems')
      WRITE(6,5)
 5    FORMAT(22X,'CO2 Emissions (thousand metric tons of carbon)',
     1 //,'Region',22X,'Gas',5X,'Liquid',5X,'Solid',6X,'Cement',
     2 7X,'Gas',6X,'Per',/,1X,'Code',3X,'Year',5X,'Total',5X,'Fuels',
     3 5X,'Fuels',5X,'Fuels',4X,'Production',3X,'Flaring',2X,
     4 'Capita')
      READ(5,10)
 10   FORMAT(////////////)
 15   CONTINUE
      READ(5,20,END=999) REGION,YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1 CO2SOL,CO2CEM,CO2FLA,PERCAP
 20   FORMAT(A3,1X,I4,1X,I9,1X,I9,1X,I9,1X,I9,1X,I6,1X,
     1 I6,1X,F5.2)
      WRITE(6,25) REGION,YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1 CO2SOL,CO2CEM,CO2FLA,PERCAP
 25   FORMAT(2X,A3,3X,I4,1X,I9,1X,I9,1X,I9,1X,I9,6X,I6,4X,
     1 I6,4X,F5.2)
      GOTO 15
999   CONTINUE
      WRITE(6,30)
 30   FORMAT('Per capita emission estimates are expressed in metric ton
     1s of carbon.')
      CLOSE(UNIT=5)
      CLOSE(UNIT=6)
      STOP
      END
```

The following is a listing of the FORTRAN 77 data retrieval program (**global92.for**) provided to read and print the file containing the global annual CO_2-emission estimates.

```
c   ******************************************
c   ** FORTRAN 77 code to read and print     ***
c   ** the 1950-92 global CO2 emission       ***
c   ** estimates from fossil fuel burning,   ***
c   ** hydraulic cement production, and gas  ***
c   ** flaring                               ***
c   ******************************************
        REAL PERCAP
        INTEGER YEAR,CO2TOT,CO2GAS,CO2LIQ,CO2SOL,CO2CEM,
     1    CO2FLA
        OPEN(UNIT=5,FILE='global92.ems')
        WRITE(6,5)
  5     FORMAT(13X,'CO2 Emissions (million metric tons of carbon)',
     1 //,20X,'Gas',5X,'Liquid',4X,'Solid',5X,'Cement',
     2 7X,'Gas',6X,'Per',/,'Year',5X,'Total',5X,'Fuels',5X,
     3 'Fuels',4X,'Fuels',3X,'Production',3X,'Flaring',2X,
     4 'Capita')
        READ(5,10)
 10     FORMAT(////////////)
 15     CONTINUE
        READ(5,20,END=999) YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1  CO2SOL,CO2CEM,CO2FLA,PERCAP
 20     FORMAT(I4,5X,I4,6X,I4,6X,I4,6X,I4,7X,I3,7X,
     1  I3,6X,F4.2)
        WRITE(6,25) YEAR,CO2TOT,CO2GAS,CO2LIQ,
     1  CO2SOL,CO2CEM,CO2FLA,PERCAP
 25     FORMAT(I4,5X,I4,6X,I4,6X,I4,6X,I4,7X,I3,7X,
     1  I3,6X,F4.2)
        GOTO 15
999     CONTINUE
        WRITE(6,30)
 30     FORMAT('Per capita emission estimates are expressed in metric ton
     1s of carbon.')
        CLOSE(UNIT=5)
        CLOSE(UNIT=6)
        STOP
        END
```

12. LISTING OF THE SAS® DATA RETRIEVAL PROGRAMS

The following is a listing of the SAS® data retrieval program (**energy92.sas**) provided by CDIAC to read and print the files containing the UN gas or solid energy statistics.

```
data energy;
infile 'gas92.dat' firstobs=14;
input country 1-3 year 5-8 cdty  $ 10-11 form $ 13-16 trans $ 18-24
      quantity 26-36 qcode $ 38-40;
proc print;
run;
```

The following is a listing of the SAS® data retrieval program (**liquid92.sas**) provided by CDIAC to read and print the file containing the UN liquid energy statistics.

```
data liquid;
infile 'liquid92.dat' firstobs=14;
input country 1-3 year 5-8 cdty $ 10-11 form $ 13-19 trans $ 21-27
    quantity 29-39 qcode $ 41-43;
proc print;
run;
```

The following is a listing of the SAS® data retrieval program (**factor92.sas**) provided by CDIAC to read and print the file containing the United Nations conversion factors.

```
data factor;
infile 'factor92.dat' firstobs=14;
input country 1-3 year 5-8 cdty $ 10-11 source $ 13 convert 15-20;
proc print;
var year cdty source convert;
id country;
run;
```

The following is a listing of the SAS® data retrieval program (**cement92.sas**) provided by CDIAC to read and print the cement production data file.

```
data cement;
infile 'cement92.dat' firstobs=14;
;
*********************************************************************
*** SAS code to read and print the file containing the 1950-1992  ***
*** annual hydraulic cement production estimates for individual   ***
*** countries                                                     ***
*********************************************************************
;
input country 1-3 year 5-8 quantity 10-17 qcode $ 19-21;
proc print;
var year quantity qcode;
id country;
run;
```

The following is a listing of the SAS® data retrieval program (**flare92.sas**) provided by CDIAC to read and print the natural gas-flaring data file.

```
data flare;
infile 'flare92.dat' firstobs=14;
;
*********************************************************************
*** SAS code to read and print the file containing the 1950-1992  ***
*** annual gas flaring estimates for individual countries         ***
*********************************************************************
;
input country 1-3 year 5-8 quantity 10-19;
proc print;
var year quantity;
id country;
run;
```

The following is a listing of the SAS® data retrieval program (**nation92.sas**) provided by CDIAC to read and print the file containing the national CO_2-emission estimates.

```
data nation;
infile 'nation92.ems' firstobs=14;
*****************************************************
*** read and print the data file (nation92.ems)   ***
*** containing national CO2 emissions from fossil***
*** fuel burning, cement production, and gas      ***
*** flaring for 1950-1992                         ***
*****************************************************
;
input country 1-3 year 5-8 co2tot 10-20 co2gas 22-30
      co2liq 32-40 co2sol 42-50 co2cem 52-58 co2fla 60-66
      @68 percap 6.2 bunker 75-80;
proc print;
var year co2tot co2gas co2liq co2sol co2cem co2fla percap bunker;
id country;
run;
```

The following is a listing of the SAS® data retrieval program (**region92.sas**) provided by CDIAC to read and print the file containing the regional CO_2-emission estimates.

```
data region;
infile 'region92.ems' firstobs=14;
*****************************************************
*** read and print the data file (region92.ems)   ***
*** containing regional CO2 emissions from fossil***
*** fuel burning, cement production, and gas      ***
*** flaring for 1950-1992                         ***
*****************************************************
;
input region $ year co2tot co2gas co2liq co2sol co2cem co2fla percap;
proc print;
var year co2tot co2gas co2liq co2sol co2cem co2fla percap;
id region;
run;
```

The following is a listing of the SAS® data retrieval program (**global92.sas**) provided by CDIAC to read and print the file containing the global annual CO_2-emission estimates.

```
data globe;
infile 'global92.ems' firstobs=14;
**************************************************
*** read and print the data file (global92.ems)  ***
*** containing global CO2 emissions from fossil  ***
*** fuel burning, cement production, and gas     ***
*** flaring for 1950-1992                        ***
**************************************************
;
input year co2tot co2gas co2liq co2sol co2cem co2fla percap;
proc print;
var co2tot co2gas co2liq co2sol co2cem co2fla percap;
id year;
run;
```

13. VERIFICATION OF DATA TRANSPORT

The files containing the CO_2-emission estimates, cement production data, gas-flaring estimates, and energy statistics may be read using the FORTRAN 77 or SAS® input/output routines provided. Users should verify that the data have been correctly transported to their systems by generating some or all of the statistics presented in Tables 8–16. These statistics were generated in SAS® (using the PROC MEANS procedure), but may be duplicated by using other statistical packages or languages. If the statistics generated by the user differ from those presented here, the data sets may have been corrupted in transport.

These statistics are presented only as a tool to ensure proper reading of the data sets. They are not to be construed as summarizing the CO_2 emissions results or energy statistics.

Table 8. Characteristics of numeric variables for the file (gas92.dat) containing the gas fuel statistics from the United Nations Energy Statistics Database

Variable	Number of observations	Minimum value	Maximum value	Mean
COUNTRY	9513	4.00	891.00	401.97
YEAR	9513	1950.00	1992.00	1975.47
QUANTITY	9513	-486480.00	27907965.00	316082.78

The following is a listing of the SAS® program used to generate the statistics in Table 8.

```
data energy;
infile 'gas92.dat' firstobs=14;
input country 1-3 year 5-8 cdty  $ 10-11 form $ 13-16 trans $ 18-24
      quantity 26-36 qcode $ 38-40;
proc means n min max mean maxdec=2;
run;
```

Table 9. Characteristics of numeric variables for the file (liquid92.dat) containing the liquid fuel statistics from the United Nations Energy Statistics Database

Variable	Number of observations	Minimum value	Maximum value	Mean
COUNTRY	124909	4.00	894.00	431.90
YEAR	124909	1950.00	1992.00	1974.17
QUANTITY	124909	-461873.00	606800.00	614.67

The following is a listing of the SAS® program used to generate the statistics in Table 9.

```
data liquid;
infile 'liquid92.dat' firstobs=14;
input country 1-3 year 5-8 cdty $ 10-11 form $ 13-19 trans $ 21-27
    quantity 29-39 qcode $ 41-43;
proc means n min max mean maxdec=2;
run;
```

Table 10. Characteristics of numeric variables for the file (solid92.dat) containing the solid fuel statistics from the United Nations Energy Statistics Database

Variable	Number of observations	Minimum value	Maximum value	Mean
COUNTRY	29441	4.00	894.00	432.55
YEAR	29441	1950.00	1992.00	1972.88
QUANTITY	29441	-30755.00	1116369.00	5426.74

The following is a listing of the SAS® program used to generate the statistics in Table 10.

```
data energy;
infile 'solid92.dat' firstobs=14;
input country 1-3 year 5-8 cdty  $ 10-11 form $ 13-16 trans $ 18-24
      quantity 26-36 qcode $ 38-40;
proc means n min max mean maxdec=2;
run;
```

Table 11. Characteristics of numeric variables for the file (factor92.dat) containing the United Nations conversion factors

Variable	Number of observations	Minimum value	Maximum value	Mean
COUNTRY	8964	8.00	894.00	440.68
YEAR	8964	1950.00	1992.00	1977.69
CONVERT	8964	1244.00	8198.00	5349.44

The following is a listing of the SAS® program used to generate the statistics in Table 11.

```
data factor;
infile 'factor92.dat' firstobs=14;
input country 1-3 year 5-8 cdty $ 10-11 source $ 13 convert 15-20;
proc means n min max mean maxdec=2;
run;
```

Table 12. Characteristics of numeric variables for the file (cement92.dat) containing the annual hydraulic cement production estimates from the U.S. Bureau of Mines

Variable	Number of observations	Minimum value	Maximum value	Mean
COUNTRY	4685	4.000	894.000	433.064
YEAR	4685	1950.000	1992.000	1972.854
QUANTITY	4685	0.000	526530.000	12758.425

The following is a listing of the SAS® program used to generate the statistics in Table 12.

```
data cement;
infile 'cement92.dat' firstobs=14;
input country 1-3 year 5-8 quantity 10-17 qcode $ 19-21;
proc means n min max mean maxdec=3;
run;
```

Table 13. Characteristics of numeric variables for the file (flare92.dat) containing the gas-flaring estimates

Variable	Number of observations	Minimum value	Maximum value	Mean
COUNTRY	1340	4.00	890.00	427.61
YEAR	1340	1950.00	1992.00	1976.86
QUANTITY	1340	0.00	1525214.00	135389.33

The following is a listing of the SAS® program used to generate the statistics in Table 13.

```
data flare;
infile 'flare92.dat' firstobs=14;
input country 1-3 year 5-8 quantity 10-19;
proc means n min max mean maxdec=2;
run;
```

Table 14. Characteristics of numeric variables for the file (nation92.ems) containing the national CO_2-emission estimates

Variable	Number of observations	Minimum value	Maximum value	Mean
COUNTRY	8080	4.00	894.00	429.59
YEAR	8080	1950.00	1992.00	1971.61
CO2TOT	8080	-1471.00	1347634.00	20397.87
CO2GAS	8080	-40.00	327598.00	2757.89
CO2LIQ	8080	-1627.00	655535.00	7970.91
CO2SOL	8080	-16.00	569872.00	8913.52
CO2CEM	8080	0.00	41331.00	453.50
CO2FLA	8080	0.00	20520.00	302.09
PERCAP	7974	-1.95	49.82	1.26
BUNKER	832	0.00	30533.00	2873.79

The following is a listing of the SAS[∞] program used to generate the statistics in Table 14.

```
data nation;
infile 'nation92.ems' firstobs=14;
input country 1-3 year 5-8 co2tot 10-20 co2gas 22-30 co2liq 32-40
    co2sol 42-50 co2cem 52-58 co2fla 60-66 @68 percap 6.2 bunker
75-80;
proc means n min max mean maxdec=2;
run;
```

Table 15. Characteristics of numeric variables for the file (region92.ems) containing the regional CO_2-emission estimates

Variable	Number of observations	Minimum value	Maximum value	Mean
YEAR	430	1950.00	1992.00	1971.00
CO2TOT	430	4676.00	1466075.00	383290.02
CO2GAS	430	0.00	353697.00	51822.65
CO2LIQ	430	381.00	721165.00	149778.68
CO2SOL	430	2307.00	637934.00	167491.21
CO2CEM	430	129.00	44094.00	8521.07
CO2FLA	430	0.00	55321.00	5676.38
PERCAP	430	0.04	5.89	1.60

The following is a listing of the SAS® program used to generate the statistics in Table 15.

```
data region;
infile 'region92.ems' firstobs=14;
input region $ year co2tot co2gas co2liq co2sol co2cem co2fla percap;
proc means n min max mean maxdec=2;
run;
```

Table 16. Characteristics of numeric variables for the file (global92.ems) containing the global annual CO_2-emission estimates

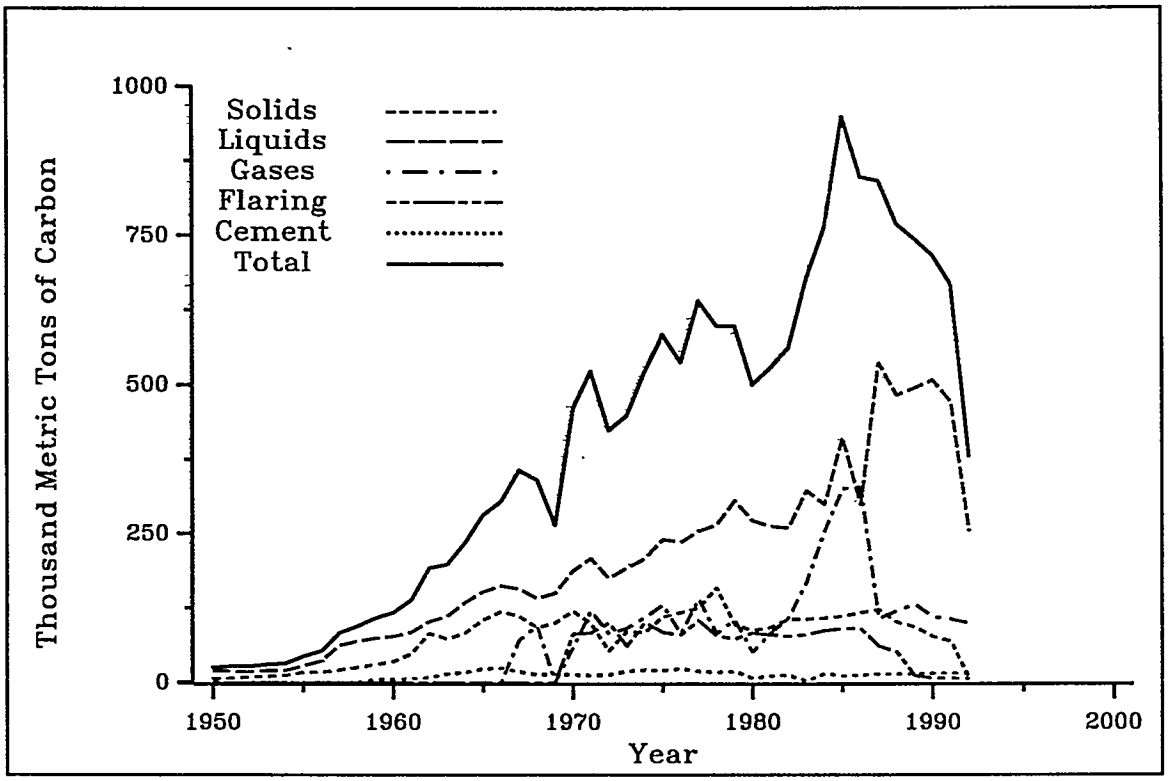
Variable	Number of observations	Minimum value	Maximum value	Mean
YEAR	43	1950.00	1992.00	1971.00
CO2TOT	43	1638.00	6172.00	3982.88
CO2GAS	43	97.00	1045.00	521.88
CO2LIQ	43	423.00	2587.00	1640.23
CO2SOL	43	1077.00	2447.00	1673.16
CO2CEM	43	18.00	171.00	85.23
CO2FLA	43	23.00	110.00	62.51
PERCAP	43	0.65	1.23	1.00

The following is a listing of the SAS® program used to generate the statistics in Table 16.

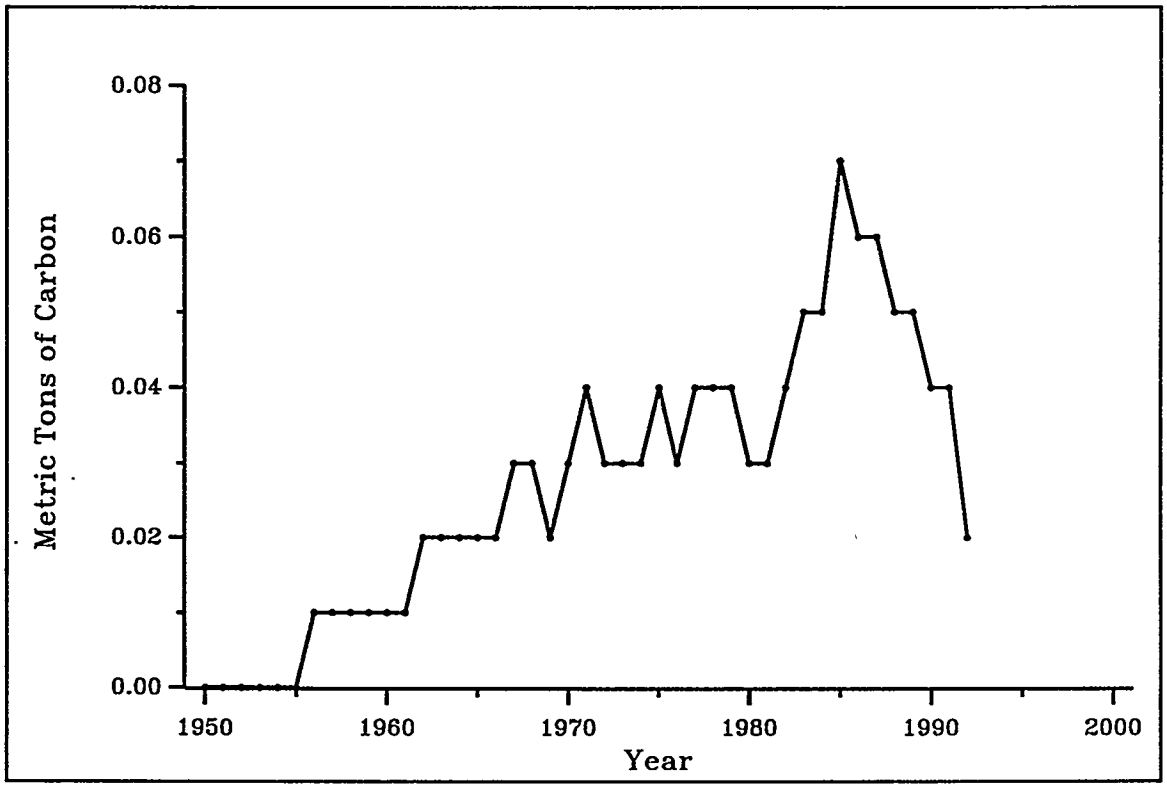
```
data globe;
infile 'global92.ems' firstobs=14;
input year co2tot co2gas co2liq co2sol co2cem co2fla percap;
proc means n min max mean maxdec=2;
run;
```

APPENDIX A

Tabular Listings and Graphical Displays of all National CO_2-Emissions Estimates



Total CO_2 emissions for Afghanistan

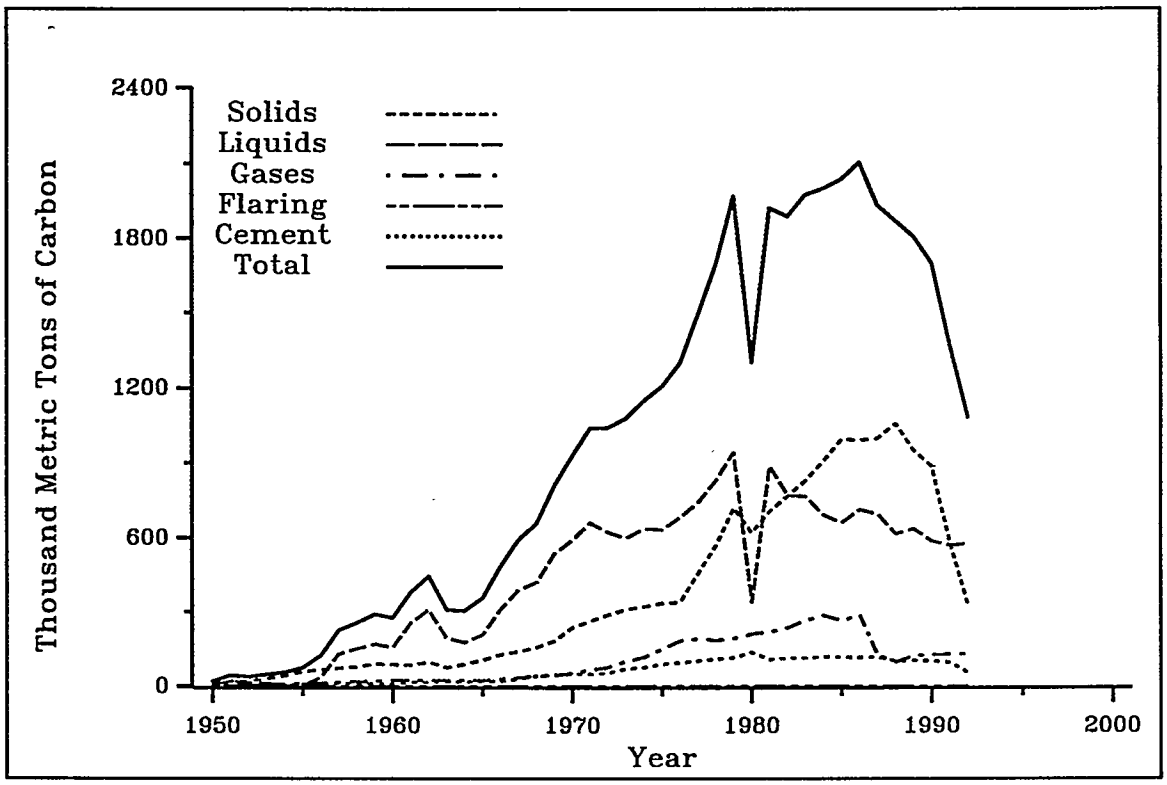


Per capita CO_2 emission rates for Afghanistan

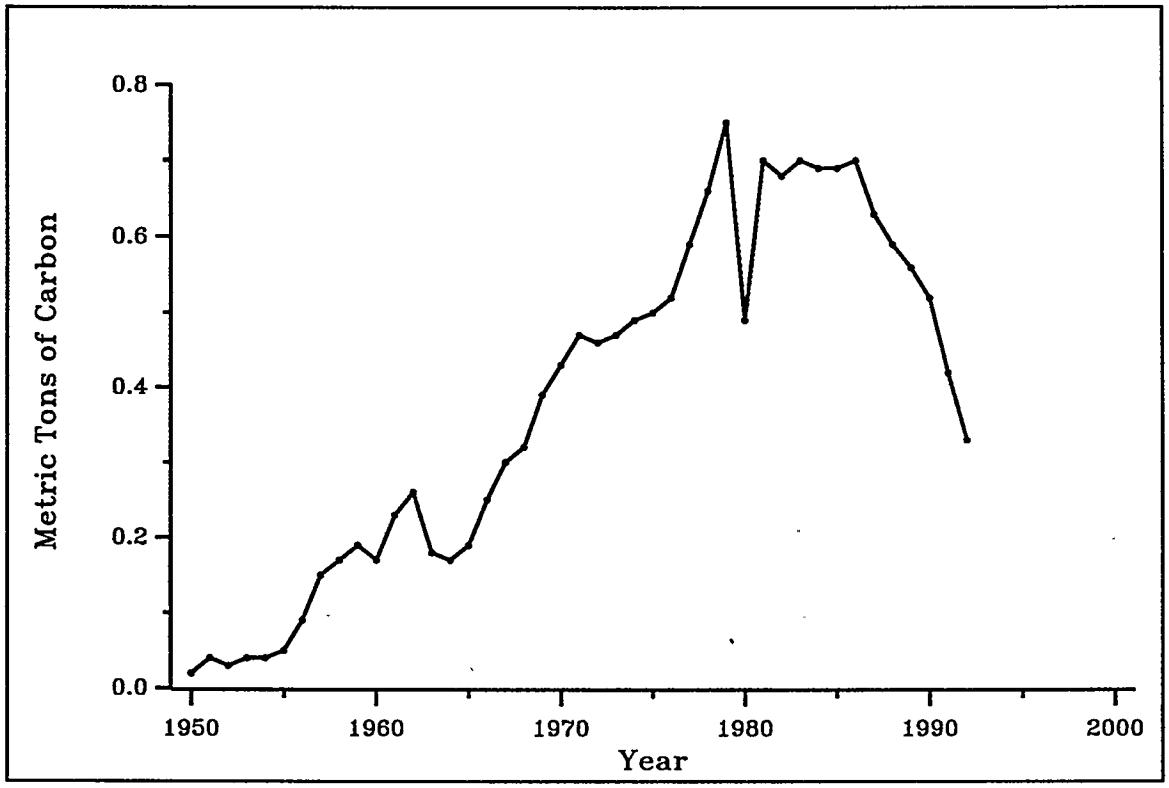
Afghanistan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	25	6	19	0	0	0	0.00	.
1951	27	7	19	0	0	0	0.00	.
1952	27	9	18	0	0	0	0.00	.
1953	30	10	20	0	0	0	0.00	.
1954	32	12	20	0	0	0	0.00	.
1955	44	17	28	0	0	0	0.00	.
1956	53	17	36	0	0	0	0.01	.
1957	83	21	62	0	0	0	0.01	.
1958	94	25	69	0	0	0	0.01	.
1959	108	30	74	0	5	0	0.01	.
1960	117	35	77	0	5	0	0.01	.
1961	138	48	84	0	6	0	0.01	.
1962	192	82	102	0	8	0	0.02	.
1963	198	73	111	0	14	0	0.02	.
1964	234	83	134	0	17	0	0.02	.
1965	281	105	152	0	23	0	0.02	.
1966	304	119	162	0	24	0	0.02	.
1967	356	111	157	71	18	0	0.03	.
1968	340	92	141	95	13	0	0.03	.
1969	264	100	150	0	14	0	0.02	.
1970	460	120	187	59	13	81	0.03	.
1971	522	99	208	120	12	83	0.04	.
1972	423	53	175	82	13	100	0.03	.
1973	448	86	192	91	19	61	0.03	.
1974	522	84	208	109	21	101	0.03	.
1975	583	110	240	130	20	84	0.04	.
1976	537	117	235	82	23	80	0.03	.
1977	640	125	254	140	19	104	0.04	.
1978	599	159	264	82	17	78	0.04	.
1979	599	97	305	105	19	73	0.04	.
1980	500	87	271	51	7	83	0.03	.
1981	528	92	262	83	11	80	0.03	.
1982	562	106	259	108	12	77	0.04	.
1983	677	106	322	168	2	80	0.05	.
1984	762	108	298	254	15	87	0.05	.
1985	948	111	411	325	11	90	0.07	.
1986	846	117	298	328	12	90	0.06	.
1987	839	122	536	107	14	61	0.06	.
1988	768	101	482	120	14	51	0.05	.
1989	743	93	494	131	14	11	0.05	.
1990	716	77	507	110	15	7	0.04	.
1991	668	69	471	106	15	7	0.04	.
1992	380	6	253	99	16	6	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Albania

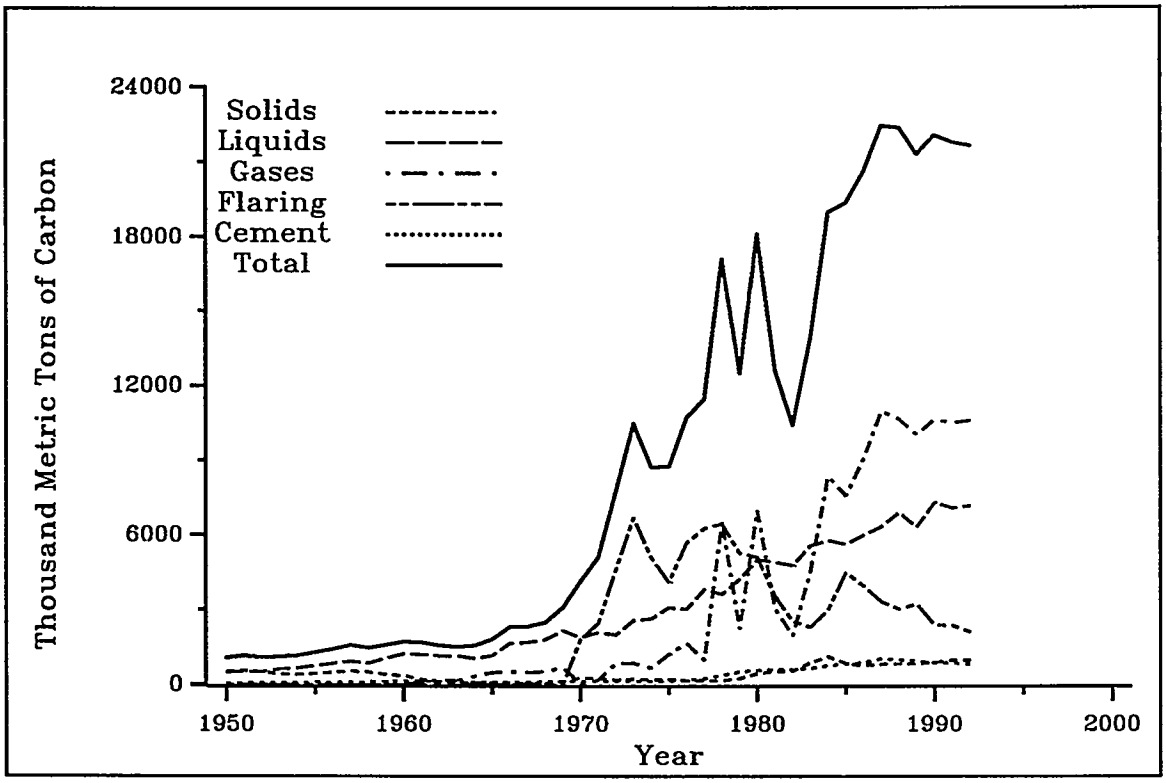


Per capita CO_2 emission rates for Albania

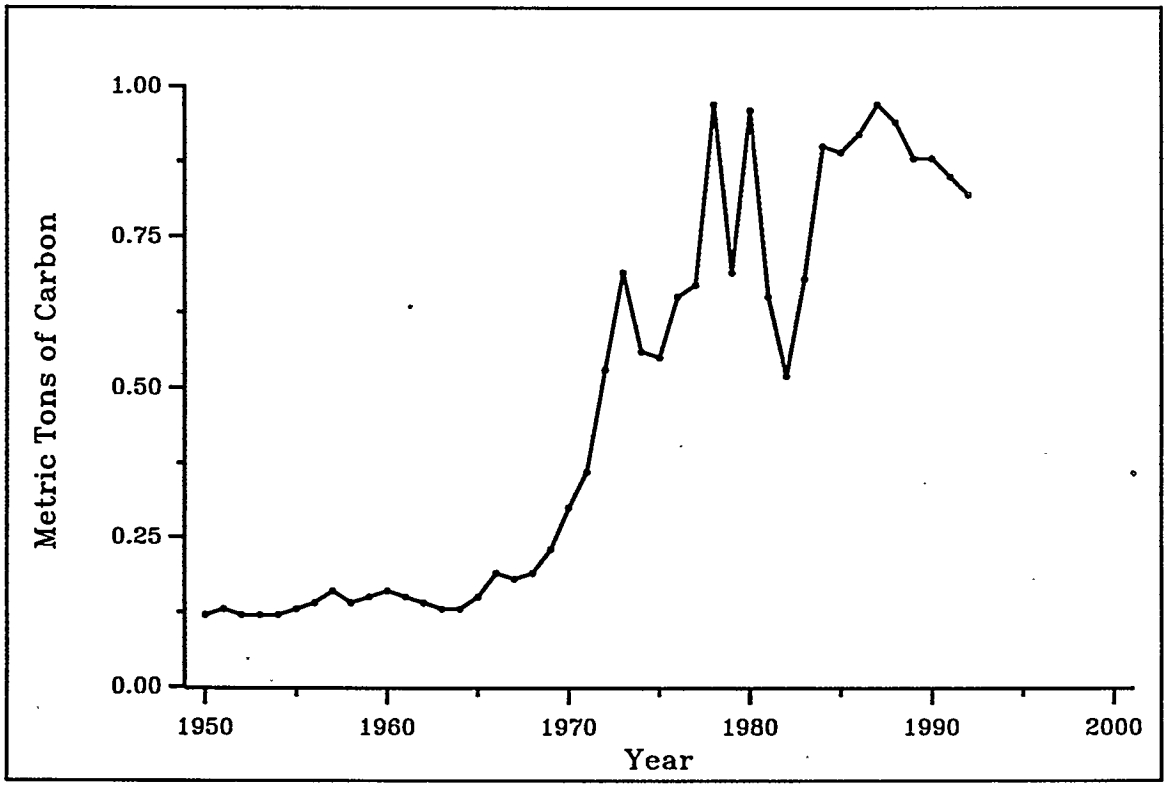
Albania

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	19	12	6	0	2	0	0.02	.
1951	44	19	20	3	2	0	0.04	.
1952	37	20	12	3	2	0	0.03	.
1953	47	30	11	5	2	0	0.04	.
1954	55	42	3	8	2	0	0.04	.
1955	75	58	1	10	6	0	0.05	.
1956	124	66	35	13	9	0	0.09	.
1957	227	73	129	16	10	0	0.15	.
1958	256	77	151	18	11	0	0.17	.
1959	291	90	170	21	10	0	0.19	.
1960	277	87	157	23	10	0	0.17	.
1961	379	85	255	23	16	0	0.23	.
1962	444	97	309	23	16	0	0.26	.
1963	309	75	194	23	18	0	0.18	.
1964	305	89	177	23	17	0	0.17	.
1965	356	105	208	23	20	0	0.19	.
1966	484	127	310	28	19	0	0.25	.
1967	592	140	388	35	30	0	0.30	.
1968	657	157	419	40	41	0	0.32	.
1969	809	183	535	46	45	0	0.39	.
1970	928	237	590	51	49	0	0.43	.
1971	1038	263	660	66	49	0	0.47	.
1972	1040	288	622	76	54	0	0.46	.
1973	1078	310	598	100	70	0	0.47	.
1974	1150	321	636	117	76	0	0.49	.
1975	1206	334	632	151	89	0	0.50	.
1976	1299	338	682	183	95	0	0.52	.
1977	1489	455	741	191	102	0	0.59	.
1978	1691	569	829	185	109	0	0.66	.
1979	1968	719	942	193	115	0	0.75	.
1980	1303	620	337	211	136	0	0.49	.
1981	1921	706	887	220	107	0	0.70	.
1982	1888	768	770	236	113	0	0.68	.
1983	1975	829	766	266	114	0	0.70	.
1984	2000	908	691	285	117	0	0.69	.
1985	2036	995	660	265	116	0	0.69	.
1986	2105	990	712	287	115	0	0.70	.
1987	1933	998	695	123	117	0	0.63	.
1988	1870	1056	615	97	101	0	0.59	.
1989	1807	949	635	122	103	0	0.56	.
1990	1702	886	586	127	102	0	0.52	.
1991	1373	581	569	128	95	0	0.42	.
1992	1083	325	575	129	54	0	0.33	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Algeria

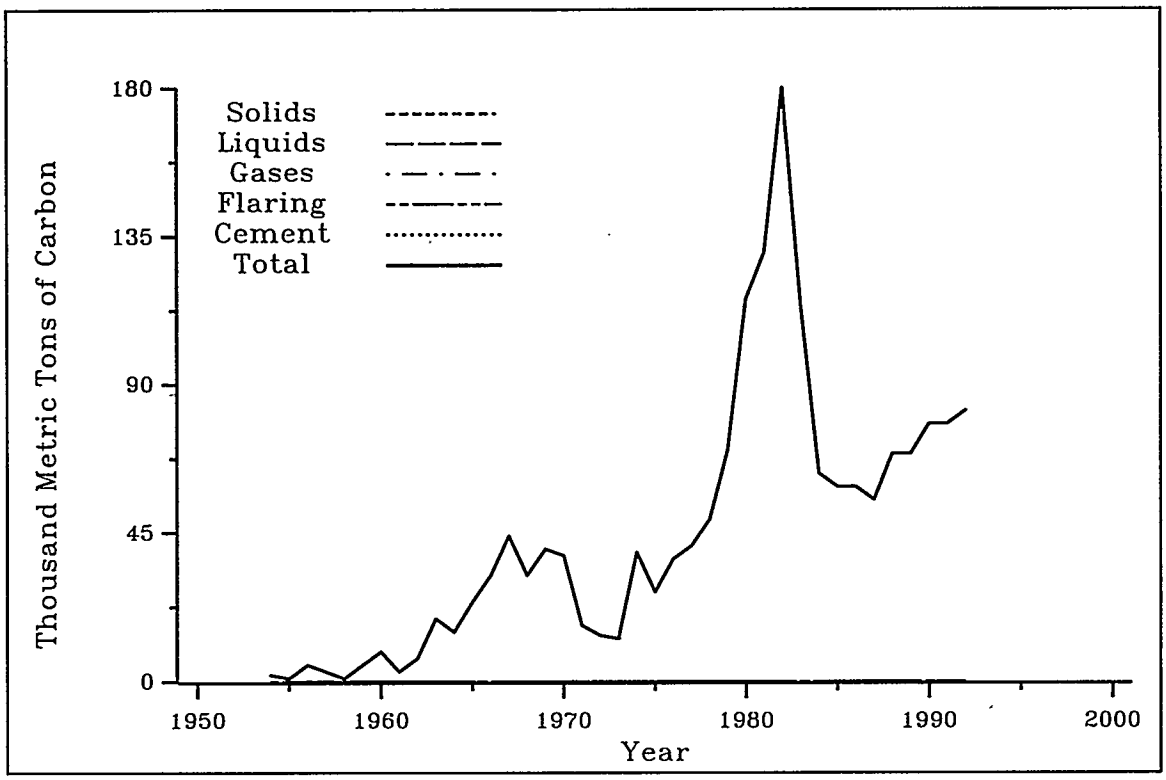


Per capita CO_2 emission rates for Algeria

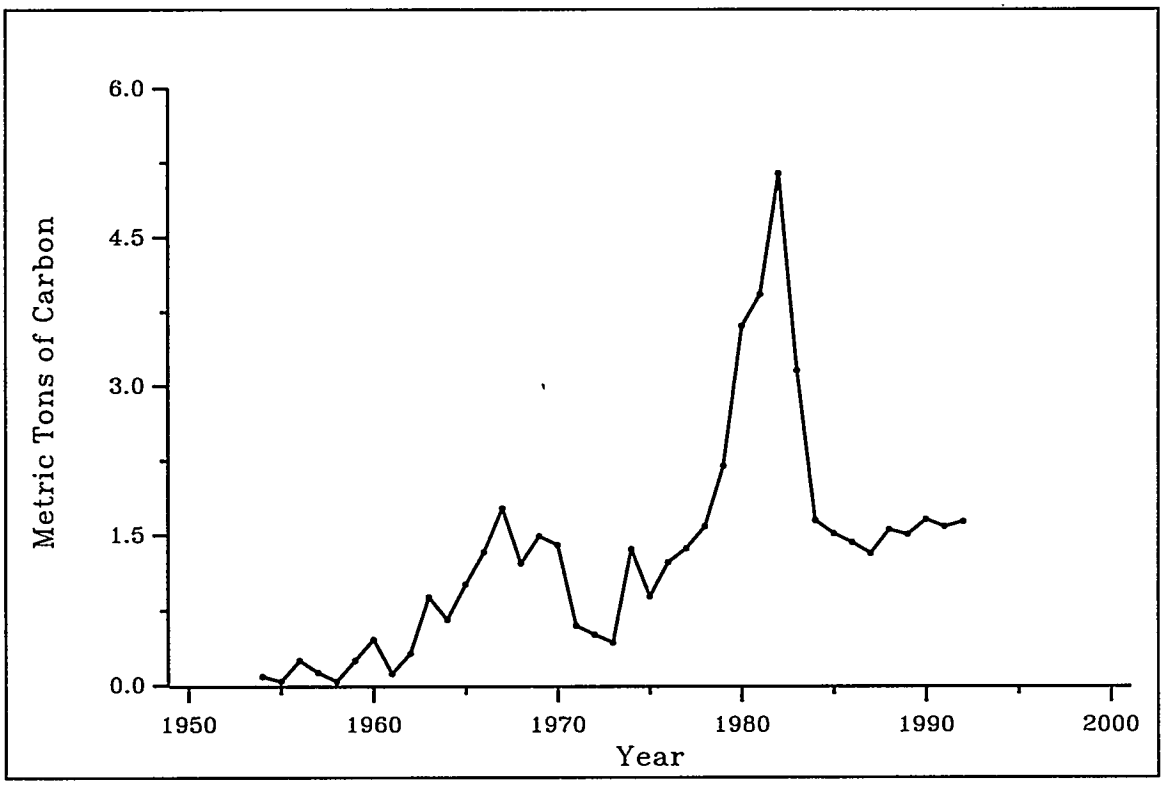
Algeria

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1068	520	504	0	44	0	0.12	.
1951	1154	564	529	0	61	0	0.13	.
1952	1087	509	512	0	66	0	0.12	.
1953	1115	427	618	0	70	0	0.12	.
1954	1161	410	662	0	90	0	0.12	.
1955	1292	440	760	0	92	0	0.13	.
1956	1418	486	843	0	89	0	0.14	.
1957	1573	546	930	0	97	0	0.16	.
1958	1468	500	854	0	115	0	0.14	.
1959	1592	404	1058	0	130	0	0.15	.
1960	1717	347	1225	0	144	0	0.16	.
1961	1678	211	1198	123	146	0	0.15	.
1962	1564	112	1145	188	119	0	0.14	.
1963	1497	70	1142	165	120	0	0.13	.
1964	1554	78	1045	325	107	0	0.13	.
1965	1815	73	1156	485	101	0	0.15	.
1966	2313	75	1644	505	90	0	0.19	.
1967	2318	53	1678	489	99	0	0.18	.
1968	2486	56	1798	514	118	0	0.19	.
1969	3085	124	2156	676	129	0	0.23	.
1970	4126	268	1878	37	126	1817	0.30	.
1971	5099	249	2084	184	131	2452	0.36	.
1972	7741	179	1988	856	126	4591	0.53	.
1973	10456	226	2565	859	137	6669	0.69	.
1974	8709	193	2628	669	128	5091	0.56	.
1975	8737	218	3081	1217	129	4092	0.55	.
1976	10688	161	3015	1655	190	5666	0.65	.
1977	11440	167	3800	984	242	6248	0.67	.
1978	17071	158	3610	6511	367	6425	0.97	.
1979	12464	247	4213	2229	513	5263	0.69	.
1980	18063	444	5000	6954	565	5100	0.96	.
1981	12609	528	4895	3047	607	3533	0.65	.
1982	10398	545	4771	1957	598	2527	0.52	.
1983	13902	869	5551	4533	654	2294	0.68	.
1984	18955	1112	5767	8327	753	2997	0.90	.
1985	19330	850	5614	7560	829	4478	0.89	.
1986	20575	752	5976	9030	878	3937	0.92	.
1987	22409	819	6309	10949	1026	3307	0.97	.
1988	22334	822	6878	10637	979	3019	0.94	.
1989	21270	824	6297	10009	927	3213	0.88	.
1990	22023	894	7276	10619	862	2373	0.88	.
1991	21744	971	7063	10488	859	2362	0.85	.
1992	21608	971	7141	10582	814	2100	0.82	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for American Samoa

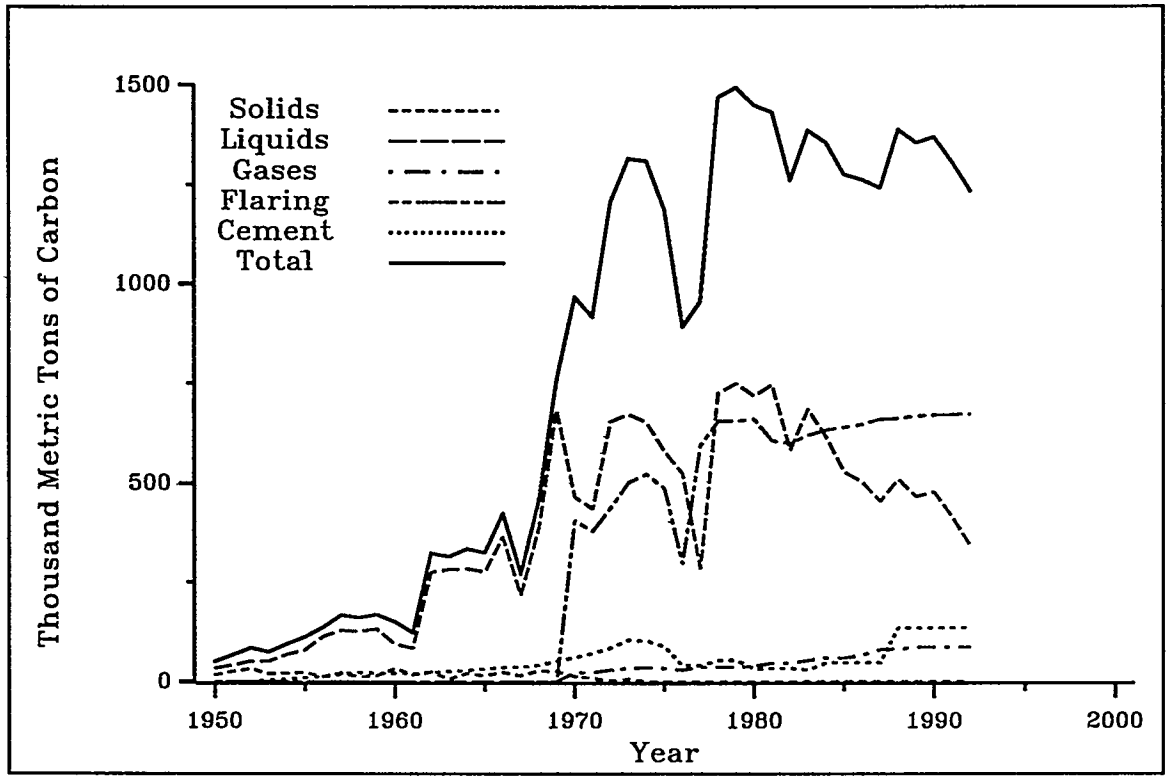


Per capita CO_2 emission rates for American Samoa

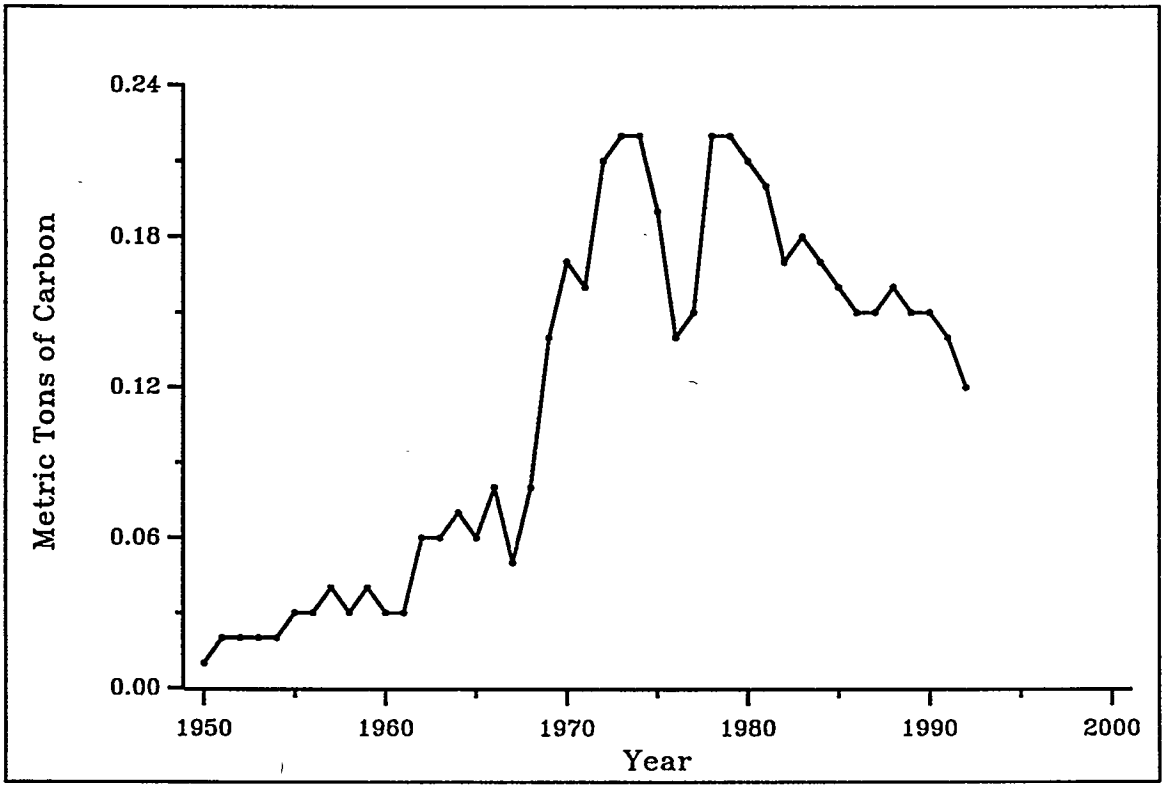
American Samoa

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1954	2	0	2	0	0	0	0.09	.
1955	1	0	1	0	0	0	0.04	.
1956	5	0	5	0	0	0	0.25	.
1957	3	0	3	0	0	0	0.13	.
1958	1	0	1	0	0	0	0.04	.
1959	5	0	5	0	0	0	0.25	.
1960	9	0	9	0	0	0	0.46	.
1961	3	0	3	0	0	0	0.12	.
1962	7	0	7	0	0	0	0.32	.
1963	19	0	19	0	0	0	0.88	.
1964	15	0	15	0	0	0	0.66	.
1965	24	0	24	0	0	0	1.01	.
1966	32	0	32	0	0	0	1.33	.
1967	44	0	44	0	0	0	1.77	.
1968	32	0	32	0	0	0	1.22	.
1969	40	0	40	0	0	0	1.49	.
1970	38	0	38	0	0	0	1.40	.
1971	17	0	17	0	0	0	0.60	.
1972	14	0	14	0	0	0	0.51	.
1973	13	0	13	0	0	0	0.43	.
1974	39	0	39	0	0	0	1.36	.
1975	27	0	27	0	0	0	0.89	.
1976	37	0	37	0	0	0	1.23	.
1977	41	0	41	0	0	0	1.37	.
1978	49	0	49	0	0	0	1.59	.
1979	70	0	70	0	0	0	2.20	.
1980	116	0	116	0	0	0	3.61	.
1981	130	0	130	0	0	0	3.93	.
1982	180	0	180	0	0	0	5.14	.
1983	114	0	114	0	0	0	3.16	.
1984	63	0	63	0	0	0	1.65	.
1985	59	0	59	0	0	0	1.52	.
1986	59	0	59	0	0	0	1.43	.
1987	55	0	55	0	0	0	1.32	.
1988	69	0	69	0	0	0	1.56	.
1989	69	0	69	0	0	0	1.51	.
1990	78	0	78	0	0	0	1.66	.
1991	78	0	78	0	0	0	1.59	.
1992	82	0	82	0	0	0	1.64	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Angola

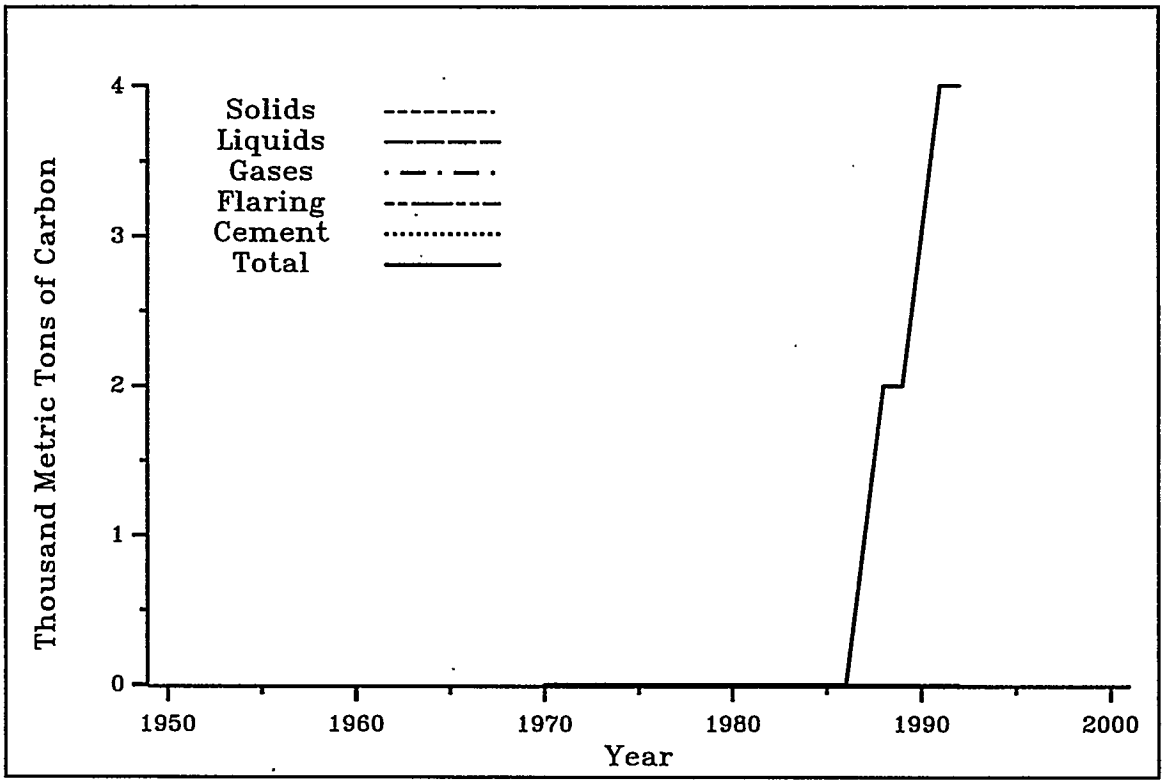


Per capita CO_2 emission rates for Angola

Angola

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	51	17	34	0	0	0	0.01	.
1951	68	26	42	0	0	0	0.02	.
1952	85	33	52	0	0	0	0.02	.
1953	75	20	52	0	4	0	0.02	.
1954	95	21	69	0	6	0	0.02	.
1955	113	23	80	0	10	0	0.03	.
1956	137	12	114	0	12	0	0.03	.
1957	168	22	129	0	18	0	0.04	.
1958	162	12	127	0	23	0	0.03	.
1959	169	15	133	0	21	0	0.04	.
1960	151	34	95	0	22	0	0.03	.
1961	124	17	85	0	21	0	0.03	.
1962	323	25	275	0	23	0	0.06	.
1963	315	6	282	0	26	0	0.06	.
1964	334	21	284	0	29	0	0.07	.
1965	325	15	276	0	33	0	0.06	.
1966	424	24	364	0	36	0	0.08	.
1967	271	15	218	0	38	0	0.05	.
1968	457	28	387	0	42	0	0.08	.
1969	760	26	682	0	52	0	0.14	.
1970	966	13	465	23	61	405	0.17	.
1971	916	8	435	23	72	379	0.16	.
1972	1207	2	653	30	85	437	0.21	.
1973	1316	6	671	34	105	501	0.22	.
1974	1311	0	651	36	103	522	0.22	.
1975	1188	0	579	34	89	486	0.19	.
1976	891	0	524	30	41	297	0.14	.
1977	955	0	285	37	41	593	0.15	.
1978	1469	0	724	37	54	654	0.22	.
1979	1493	0	748	37	54	654	0.22	.
1980	1449	0	717	40	33	659	0.21	.
1981	1432	0	745	47	34	605	0.20	.
1982	1262	0	582	47	34	599	0.17	.
1983	1386	0	684	54	30	619	0.18	.
1984	1356	0	615	60	48	632	0.17	.
1985	1276	0	528	60	48	639	0.16	.
1986	1263	0	502	67	48	646	0.15	.
1987	1242	0	454	81	48	659	0.15	.
1988	1388	0	509	82	136	661	0.16	.
1989	1355	0	466	87	136	666	0.15	.
1990	1369	0	477	87	136	669	0.15	.
1991	1307	0	414	87	136	670	0.14	.
1992	1235	0	341	87	136	671	0.12	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.

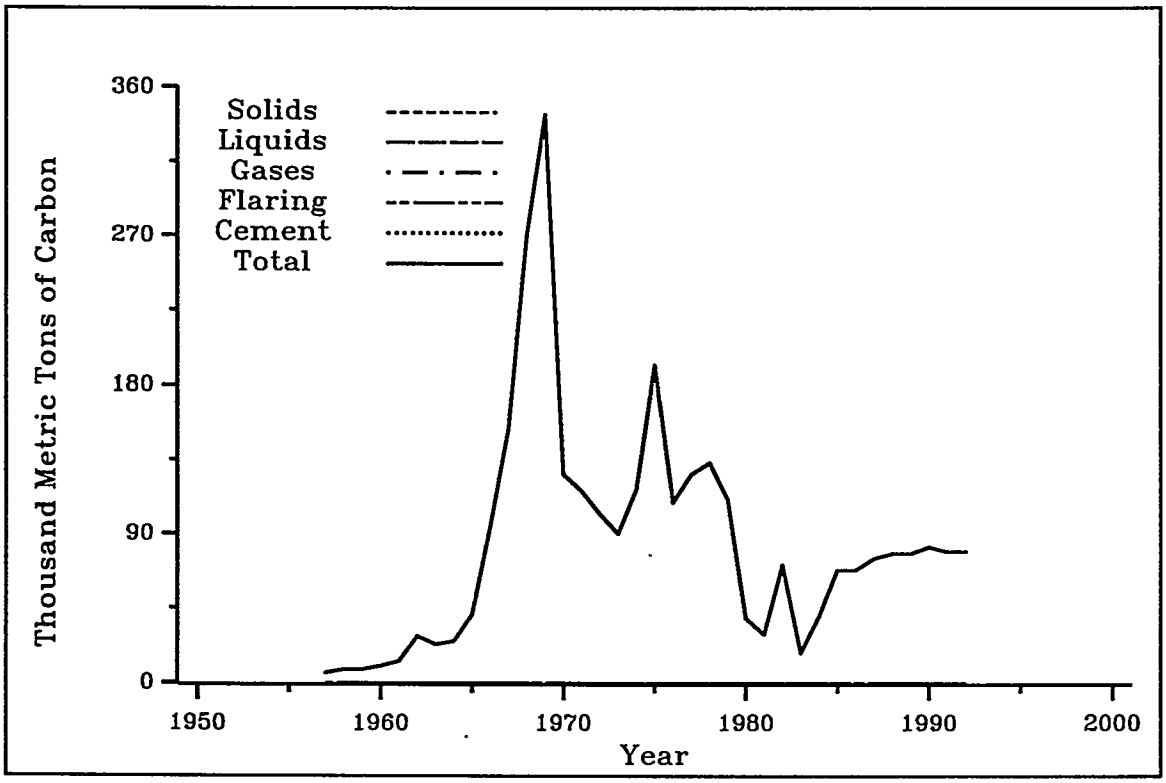


Total CO_2 emissions for Antarctic Fisheries

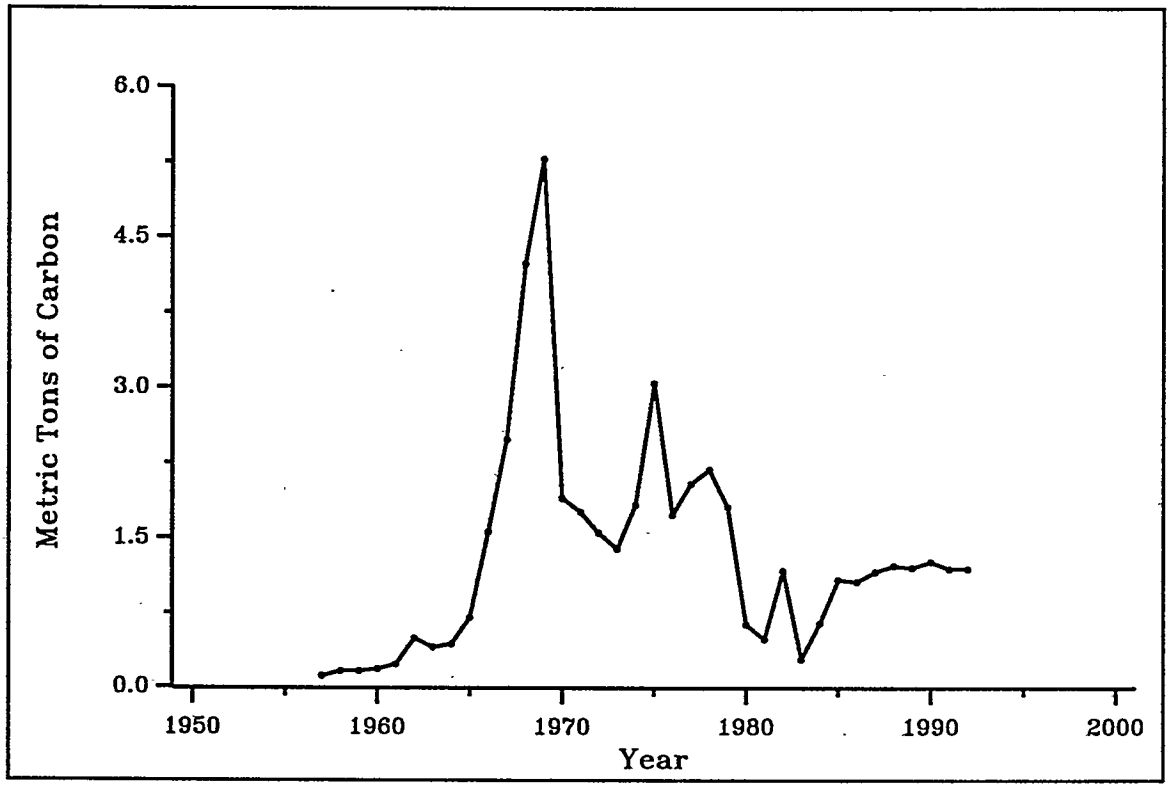
Antarctic Fisheries

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	0	0	0	0	0	0	.	.
1971	0	0	0	0	0	0	.	.
1972	0	0	0	0	0	0	.	.
1973	0	0	0	0	0	0	.	.
1974	0	0	0	0	0	0	.	.
1975	0	0	0	0	0	0	.	.
1976	0	0	0	0	0	0	.	.
1977	0	0	0	0	0	0	.	.
1978	0	0	0	0	0	0	.	.
1979	0	0	0	0	0	0	.	.
1980	0	0	0	0	0	0	.	.
1981	0	0	0	0	0	0	.	.
1982	0	0	0	0	0	0	.	.
1983	0	0	0	0	0	0	.	.
1984	0	0	0	0	0	0	.	.
1985	0	0	0	0	0	0	.	.
1986	0	0	0	0	0	0	.	.
1987	1	0	1	0	0	0	.	.
1988	2	0	2	0	0	0	.	.
1989	2	0	2	0	0	0	.	.
1990	3	0	3	0	0	0	.	.
1991	4	0	4	0	0	0	.	.
1992	4	0	4	0	0	0	.	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Antigua and Barbuda



Per capita CO_2 emission rates for Antigua and Barbuda

Antigua and Barbuda

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1957	6	0	6	0	0	0	0.11	.
1958	8	0	8	0	0	0	0.16	.
1959	8	0	8	0	0	0	0.16	.
1960	10	0	10	0	0	0	0.18	.
1961	13	0	13	0	0	0	0.23	.
1962	28	0	28	0	0	0	0.49	.
1963	23	0	23	0	0	0	0.40	.
1964	25	0	25	0	0	0	0.43	.
1965	41	0	41	0	0	0	0.70	.
1966	95	0	95	0	0	0	1.56	.
1967	154	0	154	0	0	0	2.48	.
1968	270	0	270	0	0	0	4.23	.
1969	343	0	343	0	0	0	5.28	.
1970	126	0	126	0	0	0	1.90	.
1971	116	0	116	0	0	0	1.76	.
1972	102	0	102	0	0	0	1.55	.
1973	90	0	90	0	0	0	1.39	.
1974	117	0	117	0	0	0	1.83	.
1975	192	0	192	0	0	0	3.04	.
1976	109	0	109	0	0	0	1.73	.
1977	126	0	126	0	0	0	2.04	.
1978	133	0	133	0	0	0	2.18	.
1979	111	0	111	0	0	0	1.81	.
1980	39	0	39	0	0	0	0.63	.
1981	29	0	29	0	0	0	0.48	.
1982	71	0	71	0	0	0	1.17	.
1983	18	0	18	0	0	0	0.28	.
1984	40	0	40	0	0	0	0.64	.
1985	68	0	68	0	0	0	1.08	.
1986	68	0	68	0	0	0	1.06	.
1987	75	0	75	0	0	0	1.16	.
1988	78	0	78	0	0	0	1.22	.
1989	78	0	78	0	0	0	1.20	.
1990	82	0	82	0	0	0	1.26	.
1991	79	0	79	0	0	0	1.19	.
1992	79	0	79	0	0	0	1.19	.

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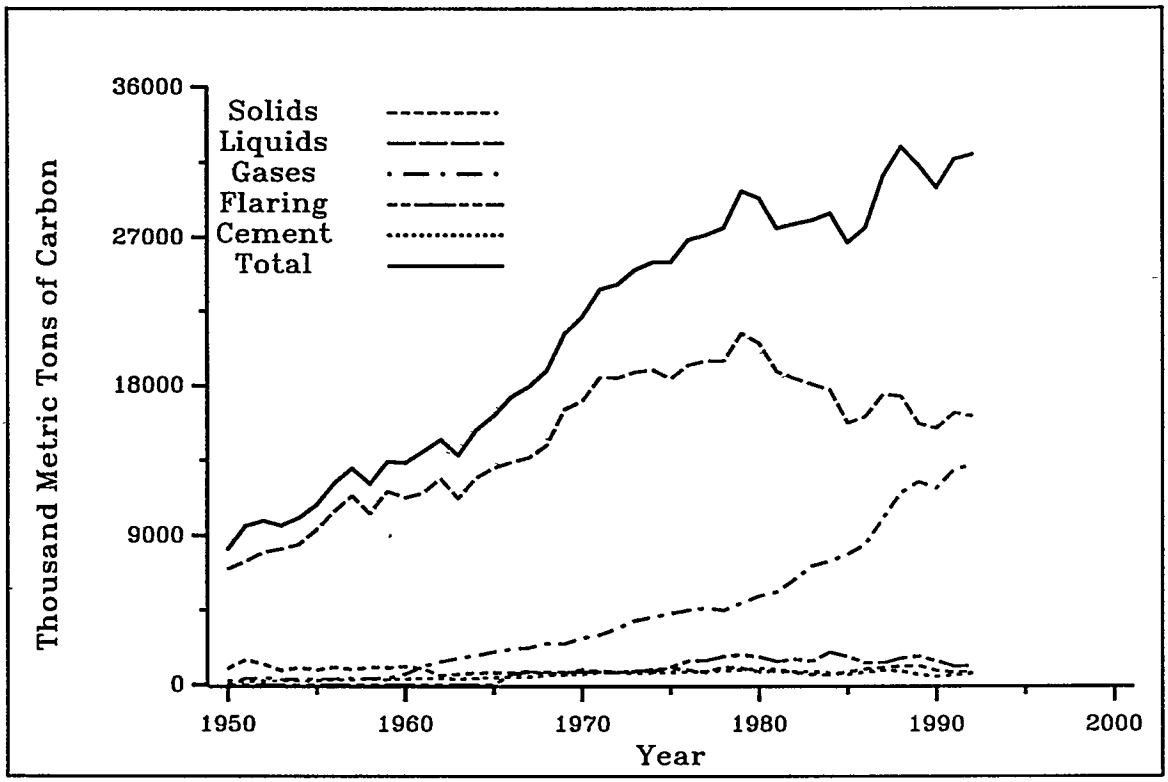
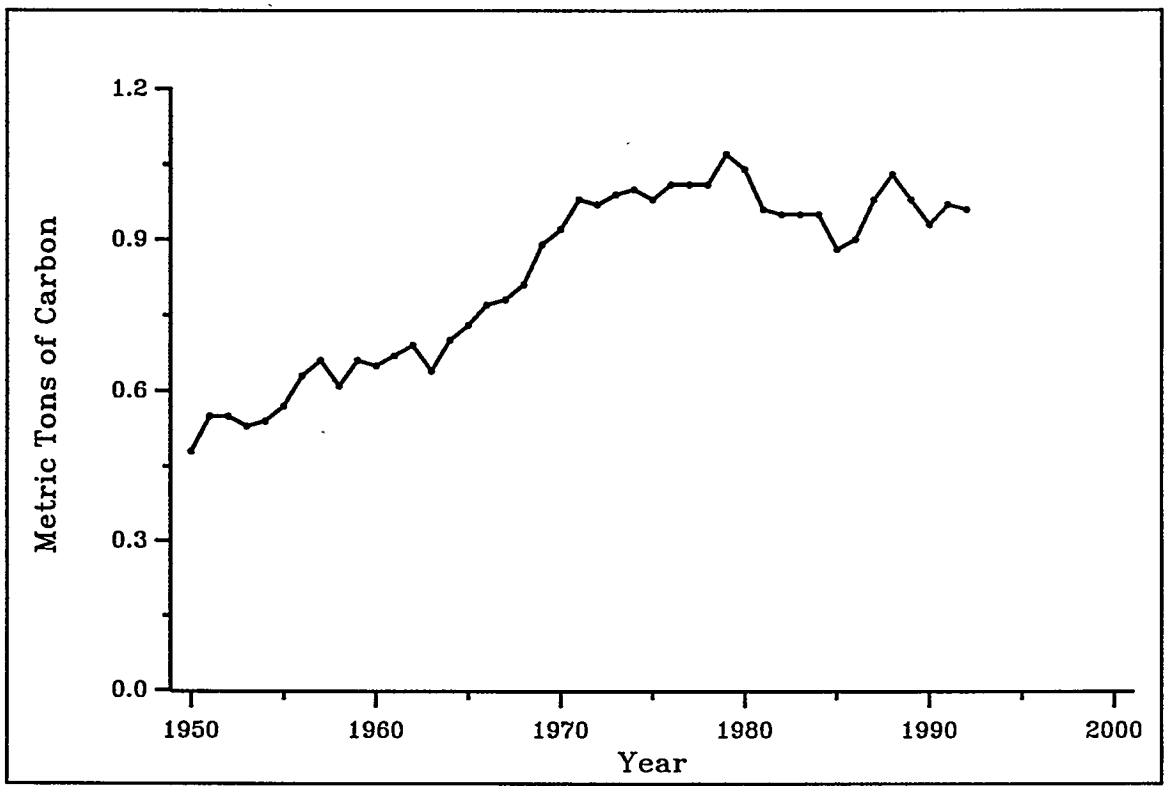


Total CO_2 emissions for Argentina

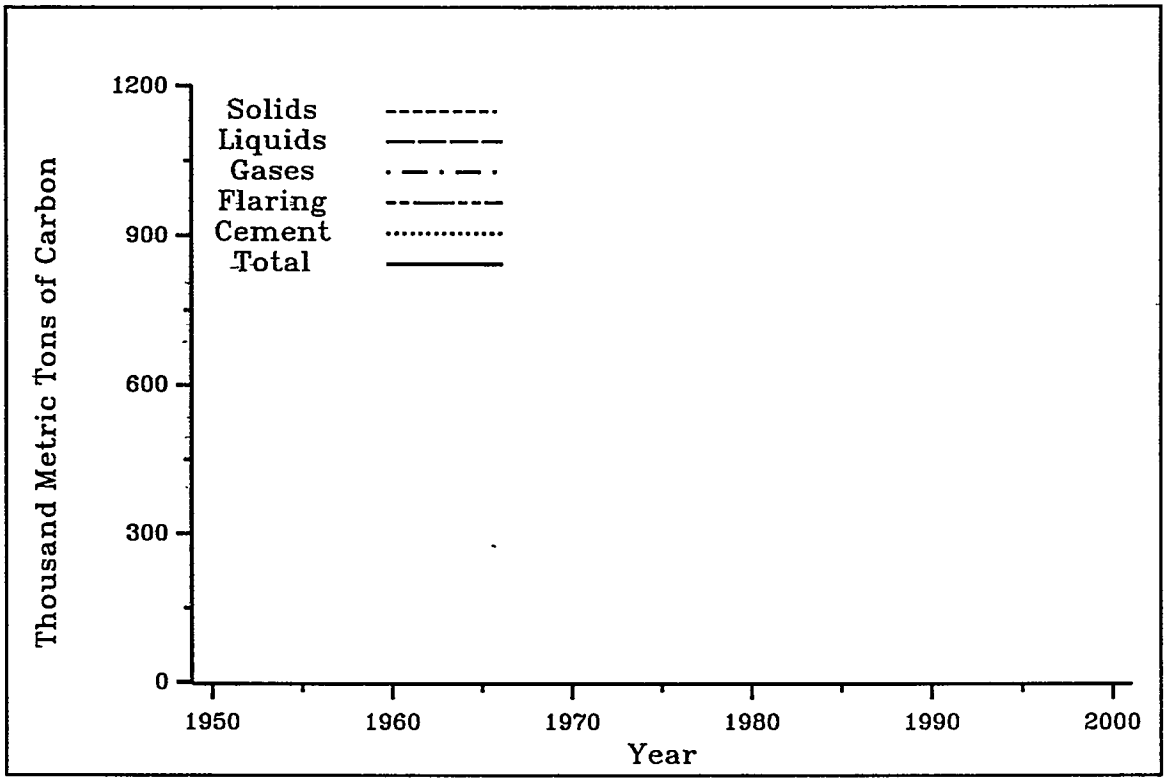


Per capita CO_2 emission rates for Argentina

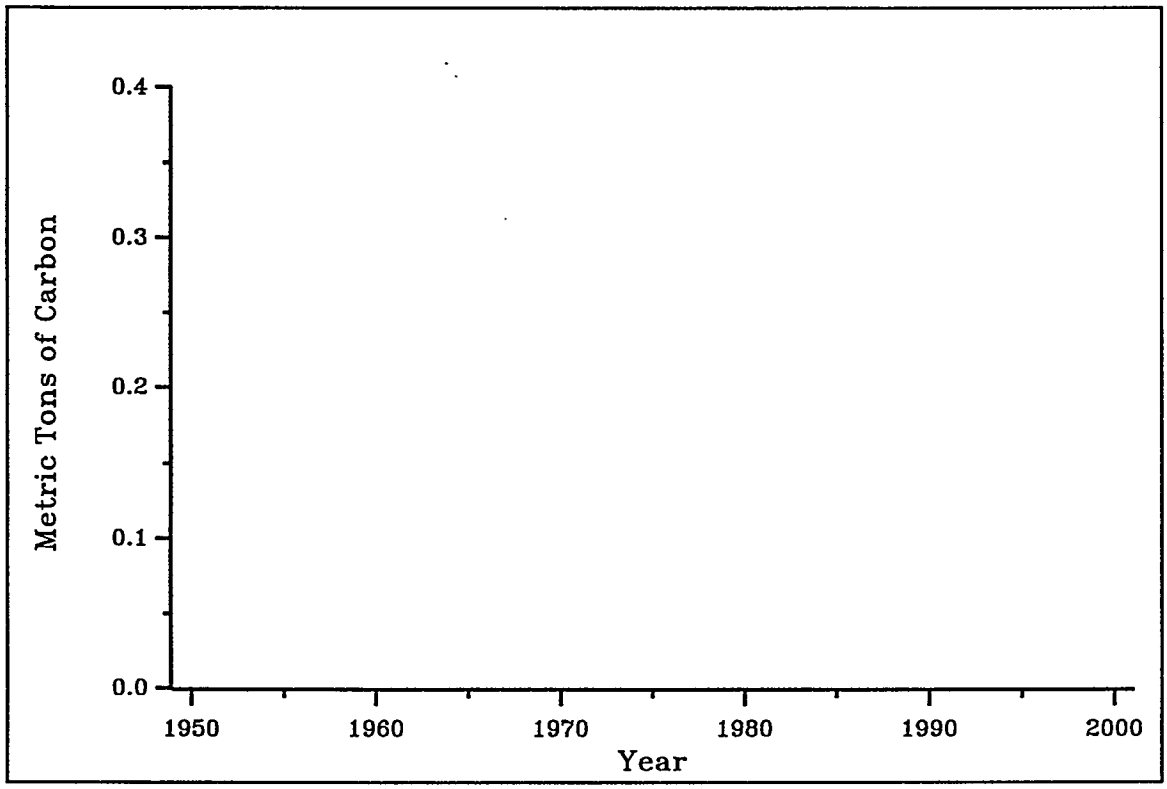
Argentina

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	8179	983	6982	0	214	0	0.48	.
1951	9562	1510	7452	387	212	0	0.55	.
1952	9867	1245	7993	419	211	0	0.55	.
1953	9601	860	8190	326	225	0	0.53	.
1954	10045	1028	8455	330	232	0	0.54	.
1955	10810	886	9334	335	254	0	0.57	.
1956	12104	1053	10414	356	281	0	0.63	.
1957	13006	928	11359	398	322	0	0.66	.
1958	12076	1044	10292	404	336	0	0.61	.
1959	13374	1030	11620	402	322	0	0.66	.
1960	13325	1079	11242	645	359	0	0.65	.
1961	13985	977	11514	1100	395	0	0.67	.
1962	14708	554	12362	1394	398	0	0.69	.
1963	13763	636	11191	1591	345	0	0.64	.
1964	15284	706	12417	1765	396	0	0.70	.
1965	16165	718	13019	1978	450	0	0.73	.
1966	17312	714	13342	2142	474	640	0.77	.
1967	17934	812	13635	2240	483	764	0.78	.
1968	18888	653	14387	2495	568	785	0.81	.
1969	21108	715	16543	2485	591	773	0.89	.
1970	22157	907	17031	2806	645	768	0.92	.
1971	23818	809	18472	3008	753	776	0.98	.
1972	24132	789	18451	3403	741	749	0.97	.
1973	25016	795	18790	3872	705	854	0.99	.
1974	25489	930	18917	4073	733	836	1.00	.
1975	25490	993	18399	4291	743	1065	0.98	.
1976	26827	895	19219	4494	777	1442	1.01	.
1977	27115	747	19463	4614	816	1476	1.01	.
1978	27568	1059	19461	4483	859	1706	1.01	.
1979	29751	994	21132	4917	907	1801	1.07	.
1980	29337	791	20556	5340	970	1680	1.04	.
1981	27536	817	18820	5591	905	1404	0.96	.
1982	27777	735	18404	6345	765	1527	0.95	.
1983	28005	605	18049	7168	765	1418	0.95	.
1984	28416	593	17710	7451	710	1951	0.95	.
1985	26649	766	15702	7863	630	1689	0.88	.
1986	27555	937	16101	8451	755	1311	0.90	.
1987	30663	1043	17442	10016	857	1304	0.98	.
1988	32393	1111	17331	11526	823	1602	1.03	.
1989	31307	1144	15671	12175	608	1709	0.98	.
1990	29961	848	15392	11794	494	1434	0.93	.
1991	31670	742	16326	12905	596	1100	0.97	.
1992	31933	812	16129	13183	693	1116	0.96	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Armenia

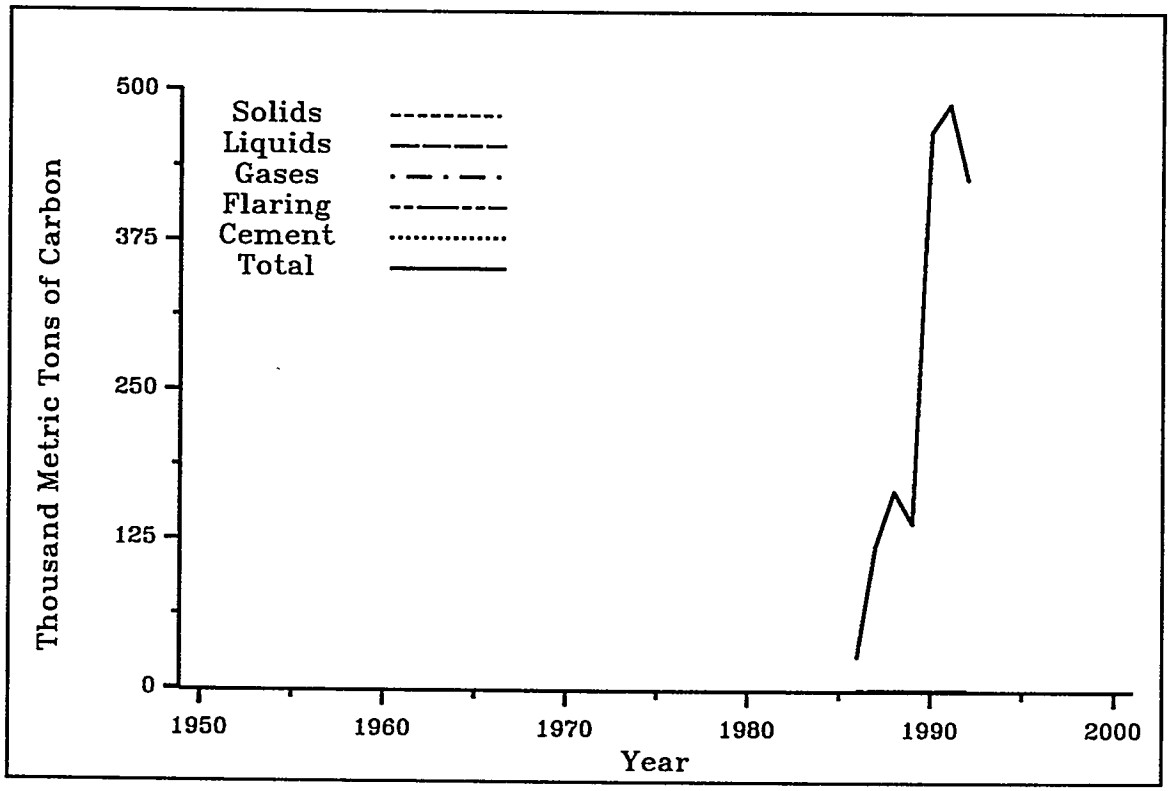


Per capita CO_2 emission rates for Armenia

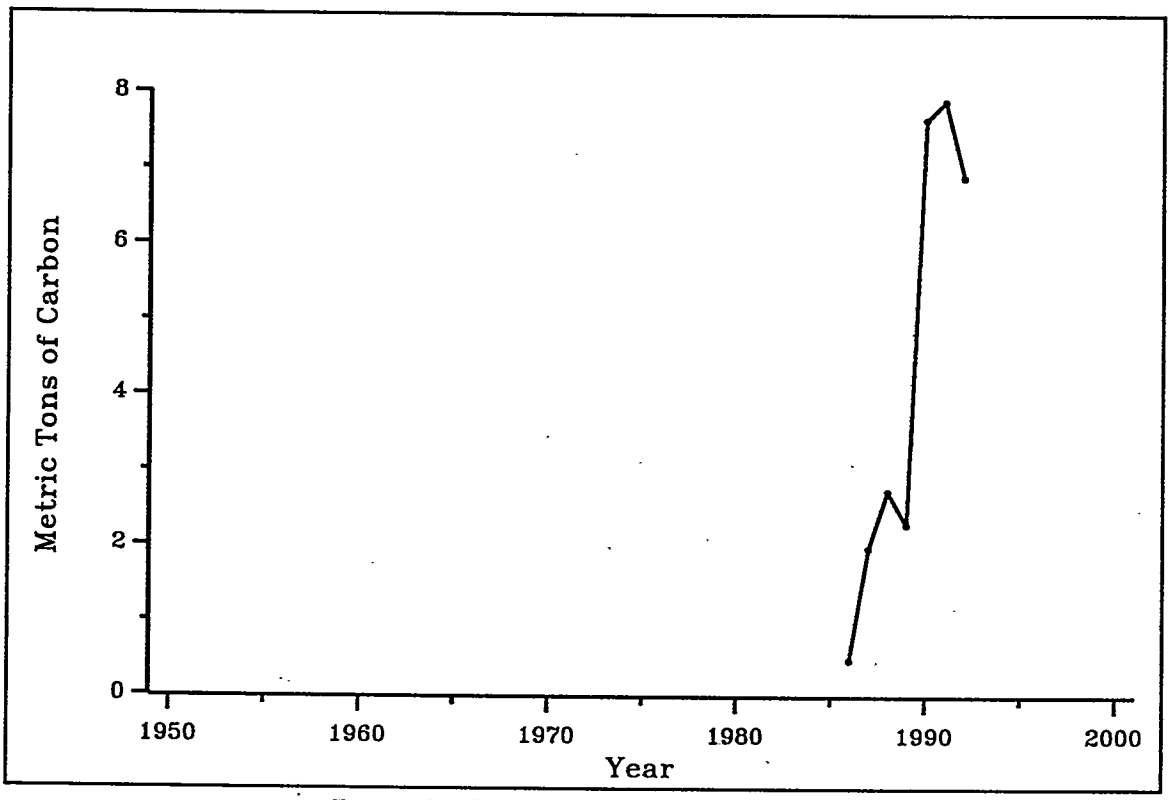
Armenia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	1146	103	0	974	68	0	0.33	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Aruba

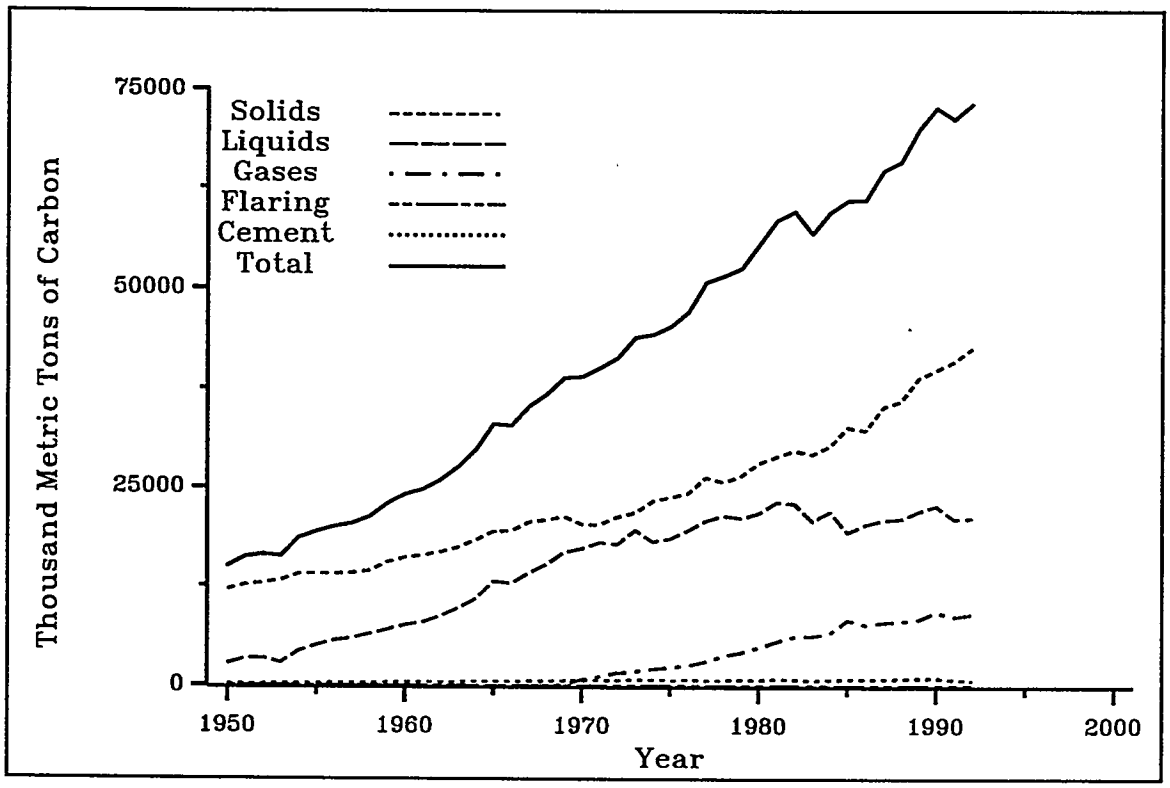


Per capita CO_2 emission rates for Aruba

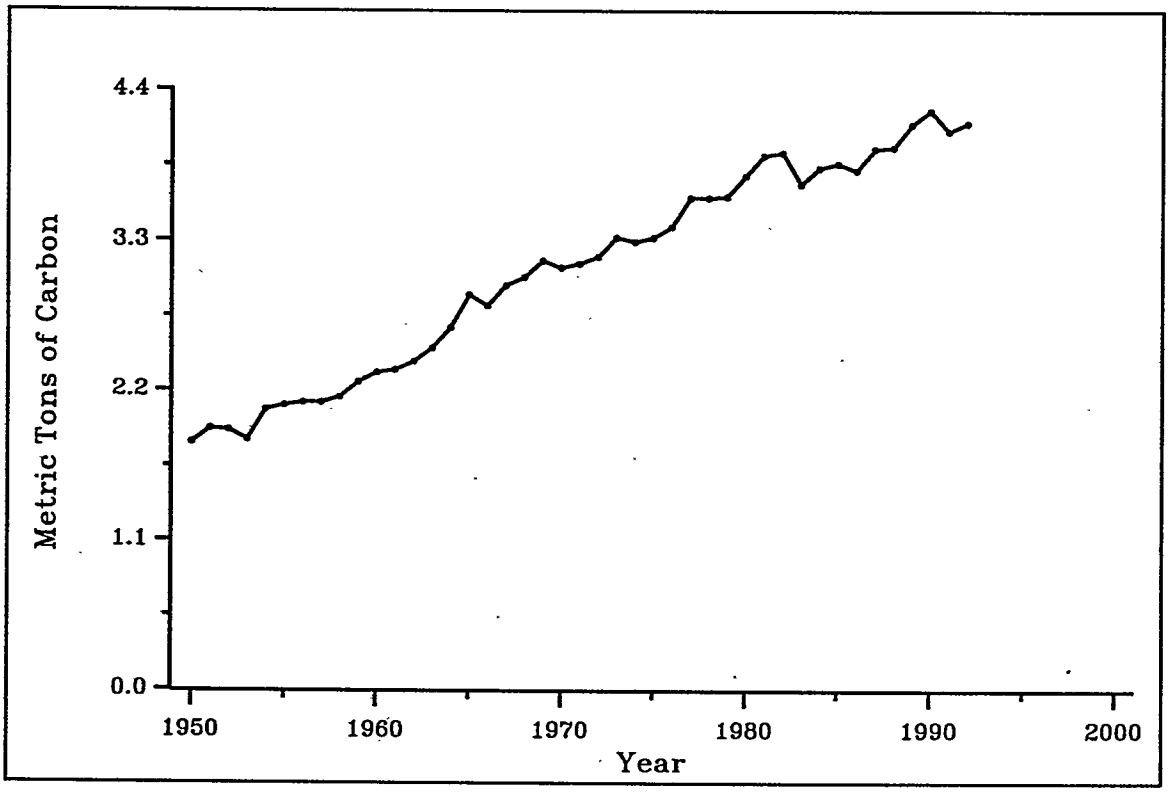
Aruba

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1986	28	0	28	0	0	0	0.47	.
1987	120	0	120	0	0	0	1.96	.
1988	166	0	166	0	0	0	2.72	.
1989	139	0	139	0	0	0	2.28	.
1990	466	0	466	0	0	0	7.65	.
1991	489	0	489	0	0	0	7.89	.
1992	427	0	427	0	0	0	6.89	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Australia

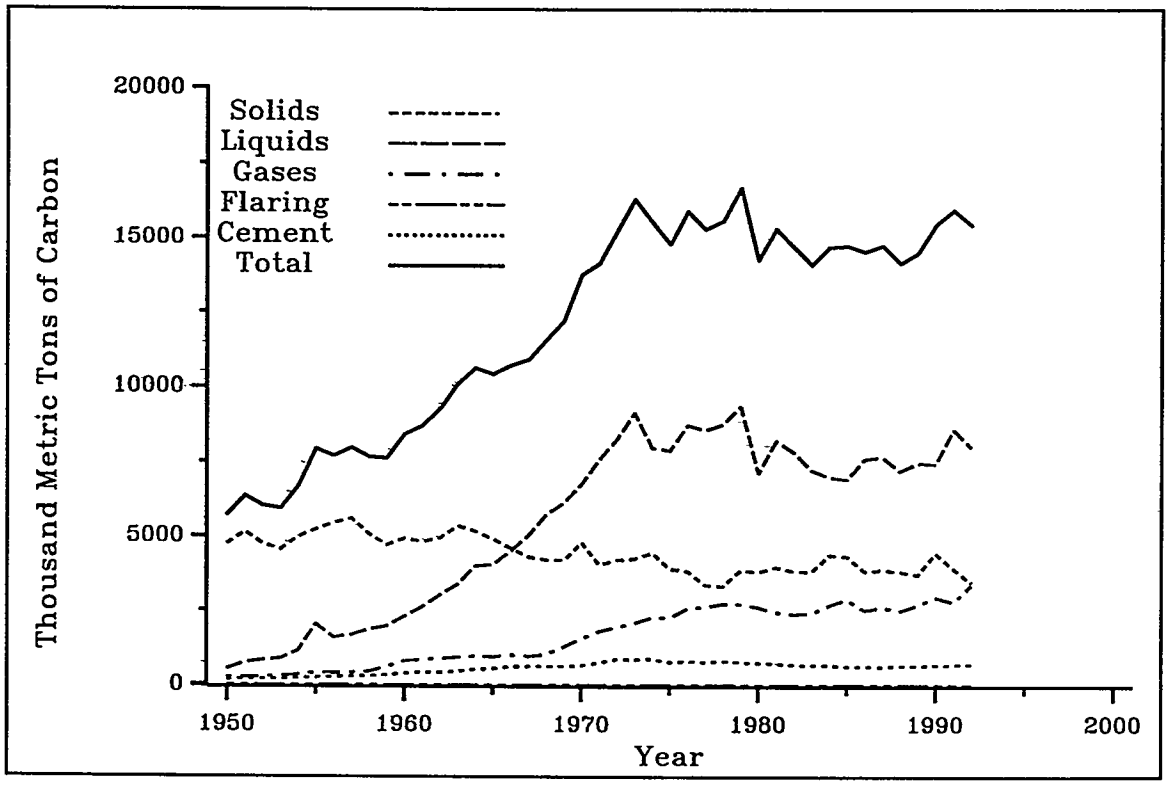


Per capita CO_2 emission rates for Australia

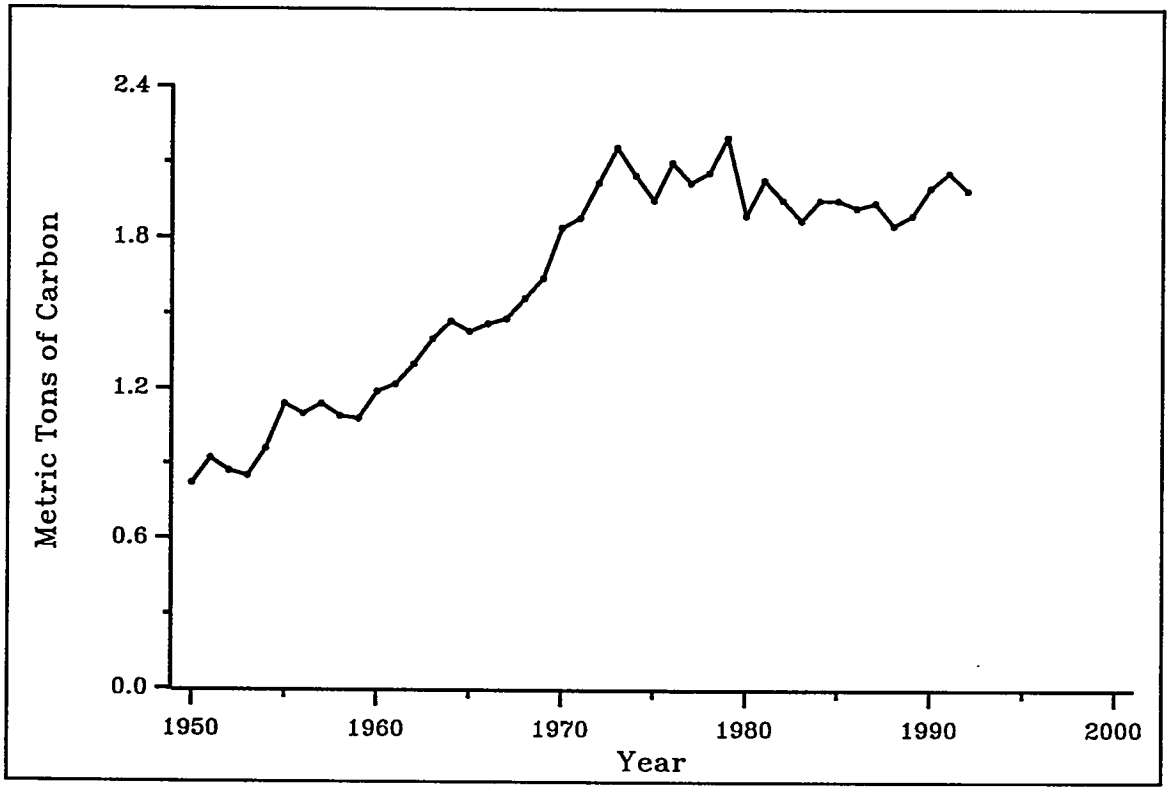
Australia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	14993	12081	2739	0	174	0	1.82	759
1951	16165	12634	3363	0	168	0	1.92	826
1952	16484	12888	3412	0	185	0	1.91	753
1953	16277	13218	2842	0	217	0	1.84	677
1954	18567	14006	4301	0	260	0	2.06	719
1955	19332	14029	5033	0	271	0	2.09	983
1956	19970	14022	5657	0	291	0	2.11	1123
1957	20375	14125	5934	0	316	0	2.11	1221
1958	21212	14399	6479	0	334	0	2.15	1137
1959	22873	15496	7021	0	356	0	2.26	1088
1960	24060	16090	7590	0	380	0	2.33	1219
1961	24698	16363	7946	0	389	0	2.35	1236
1962	25872	16771	8702	1	399	0	2.41	1147
1963	27531	17374	9732	2	424	0	2.51	1253
1964	29704	18307	10902	2	493	0	2.66	1400
1965	32966	19372	13075	2	517	0	2.90	1520
1966	32779	19452	12826	2	500	0	2.82	1662
1967	35210	20539	14149	2	520	0	2.97	1884
1968	36679	20869	15273	3	534	0	3.03	2154
1969	38766	21255	16793	133	586	0	3.15	2127
1970	38884	20273	17246	752	613	0	3.10	2187
1971	40015	20272	17986	1119	637	0	3.13	2369
1972	41250	21228	17756	1595	671	0	3.18	2283
1973	43819	21761	19574	1770	714	0	3.32	2637
1974	44175	23259	18104	2104	708	0	3.29	2672
1975	45198	23728	18503	2284	682	0	3.32	2444
1976	47002	24247	19539	2527	688	0	3.40	1766
1977	50695	26249	20748	3016	683	0	3.61	1895
1978	51486	25661	21379	3767	679	0	3.61	1953
1979	52423	26457	21081	4172	713	0	3.62	1741
1980	55348	28066	21727	4823	733	0	3.77	1627
1981	58383	28904	23105	5557	817	0	3.92	1572
1982	59508	29649	22929	6149	781	0	3.94	1389
1983	56730	29169	20683	6220	658	0	3.71	1382
1984	59407	30231	21870	6564	743	0	3.83	1273
1985	60861	32570	19263	8227	801	0	3.86	998
1986	60925	32188	20264	7667	806	0	3.81	1172
1987	64650	35124	20821	7907	798	0	3.97	1246
1988	65786	35868	20945	8102	870	0	3.98	1407
1989	69870	38737	21913	8282	938	0	4.15	1616
1990	72608	39797	22612	9238	961	0	4.25	1725
1991	71177	40840	20925	8650	763	0	4.10	1717
1992	73127	42468	21048	8934	676	0	4.16	1772

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Austria

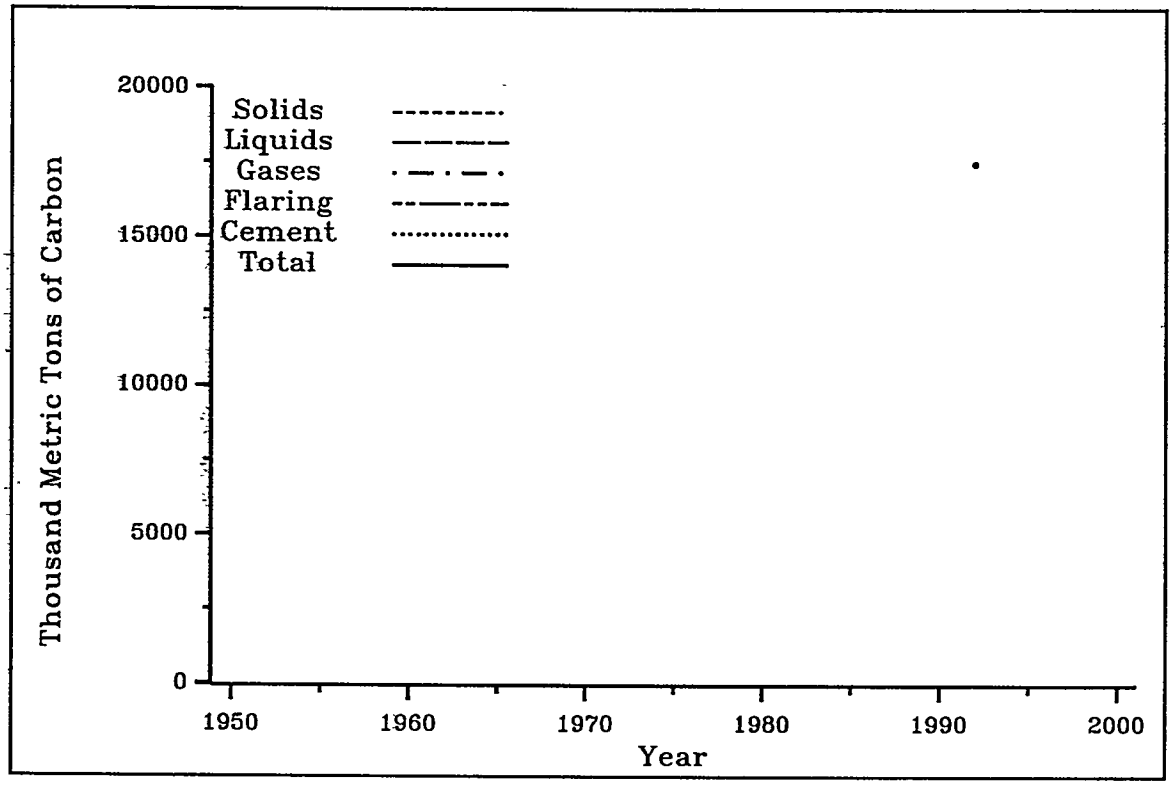


Per capita CO_2 emission rates for Austria

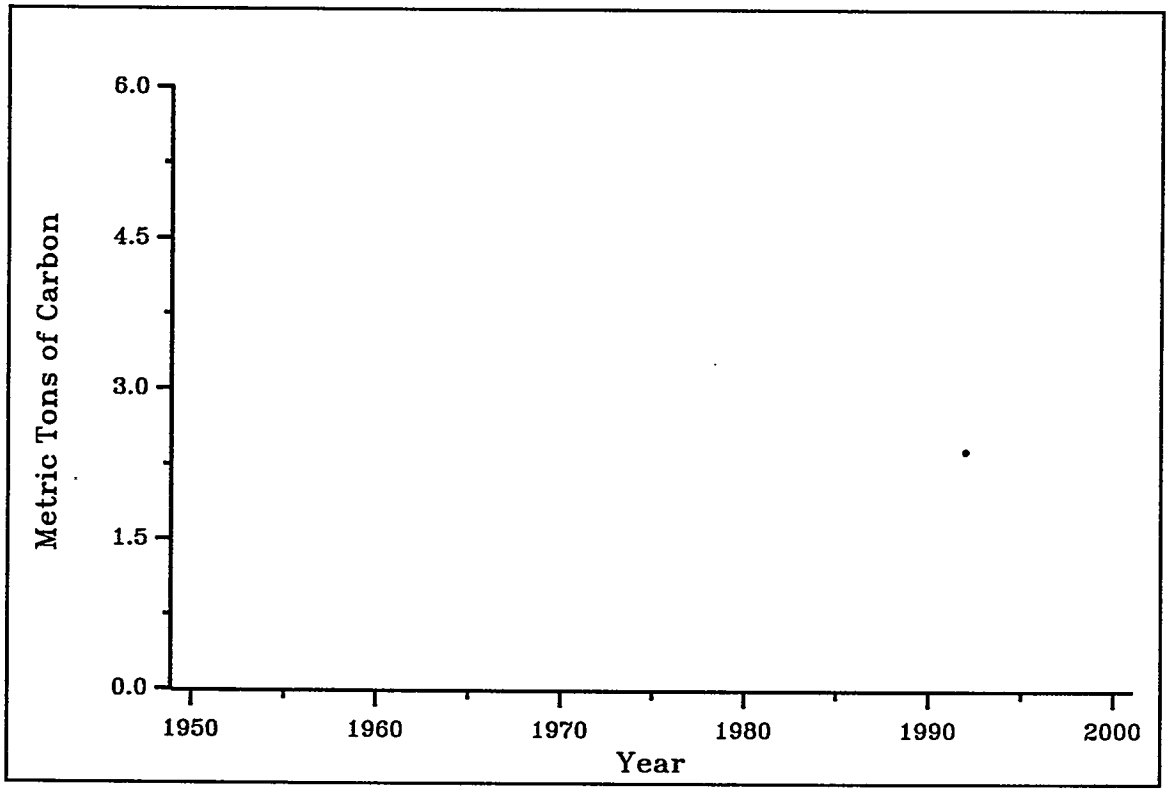
Austria

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	5704	4743	532	253	175	0	0.82	.
1951	6344	5139	744	260	201	0	0.92	.
1952	6015	4737	826	263	189	0	0.87	.
1953	5913	4549	875	299	190	0	0.85	.
1954	6671	4974	1141	336	221	0	0.96	.
1955	7916	5221	2031	412	253	0	1.14	.
1956	7682	5435	1583	400	263	0	1.10	.
1957	7948	5585	1664	409	290	0	1.14	.
1958	7649	5056	1857	443	293	0	1.09	.
1959	7602	4700	1964	609	329	0	1.08	.
1960	8394	4915	2297	797	385	0	1.19	.
1961	8678	4809	2607	843	419	0	1.22	.
1962	9233	4923	3009	884	416	0	1.30	.
1963	10080	5338	3370	922	450	0	1.40	.
1964	10612	5158	3980	961	513	0	1.47	.
1965	10409	4894	4031	934	550	0	1.43	.
1966	10702	4590	4498	1002	612	0	1.46	.
1967	10896	4294	5024	960	618	0	1.48	.
1968	11552	4198	5712	1022	619	0	1.56	.
1969	12193	4185	6113	1275	620	0	1.64	.
1970	13729	4780	6747	1548	654	0	1.84	.
1971	14123	4032	7555	1790	747	0	1.88	.
1972	15211	4186	8230	1933	863	0	2.02	.
1973	16278	4237	9110	2080	851	0	2.16	.
1974	15515	4434	7949	2258	875	0	2.05	.
1975	14778	3892	7863	2258	766	0	1.95	.
1976	15890	3816	8703	2571	800	0	2.10	.
1977	15286	3354	8546	2620	766	0	2.02	.
1978	15567	3312	8730	2725	800	0	2.06	.
1979	16664	3851	9341	2709	763	0	2.20	.
1980	14247	3795	7105	2605	742	0	1.89	.
1981	15299	3951	8184	2444	719	0	2.03	.
1982	14684	3819	7813	2371	682	0	1.95	.
1983	14078	3794	7215	2402	667	0	1.87	.
1984	14676	4359	6977	2674	666	0	1.95	.
1985	14715	4321	6901	2872	620	0	1.95	.
1986	14524	3811	7580	2512	621	0	1.92	.
1987	14724	3866	7644	2599	615	0	1.94	.
1988	14130	3805	7188	2490	648	0	1.85	.
1989	14478	3698	7448	2686	646	0	1.89	.
1990	15445	4426	7415	2937	667	0	2.00	.
1991	15921	3909	8554	2776	682	0	2.06	.
1992	15440	3435	7974	3338	693	0	1.99	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Azerbaijan

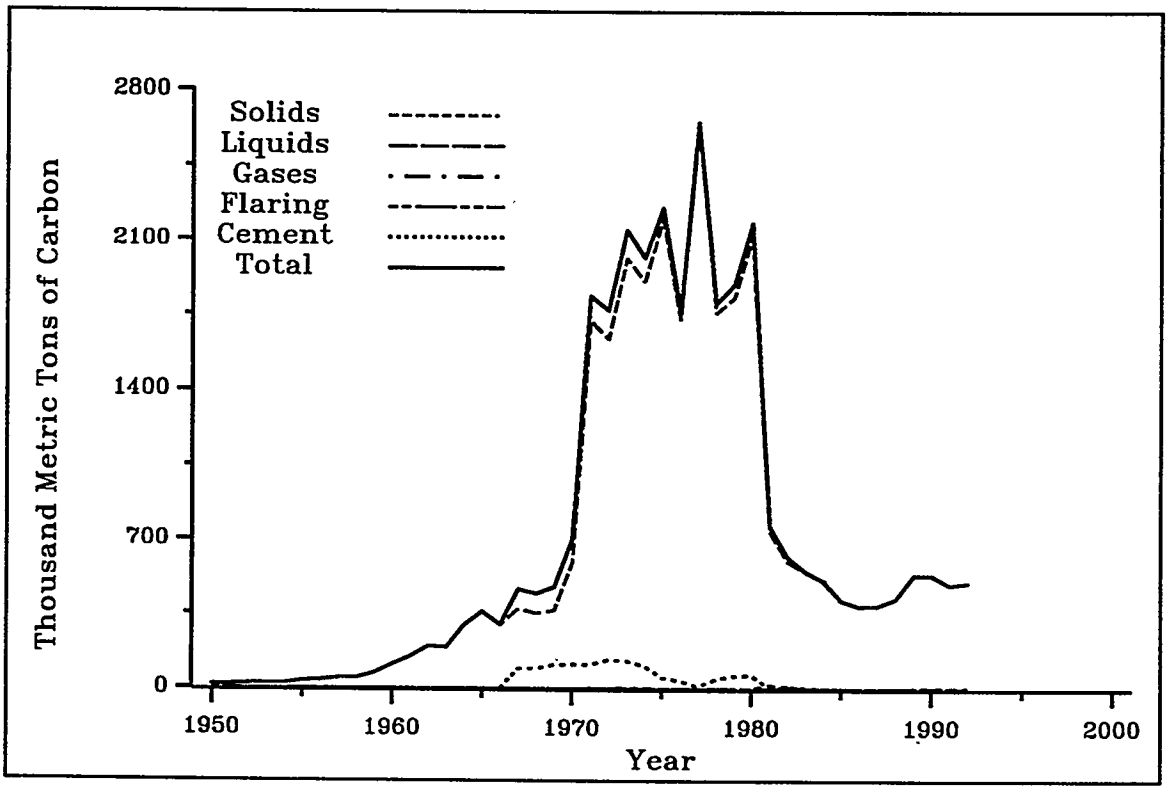


Per capita CO_2 emission rates for Azerbaijan

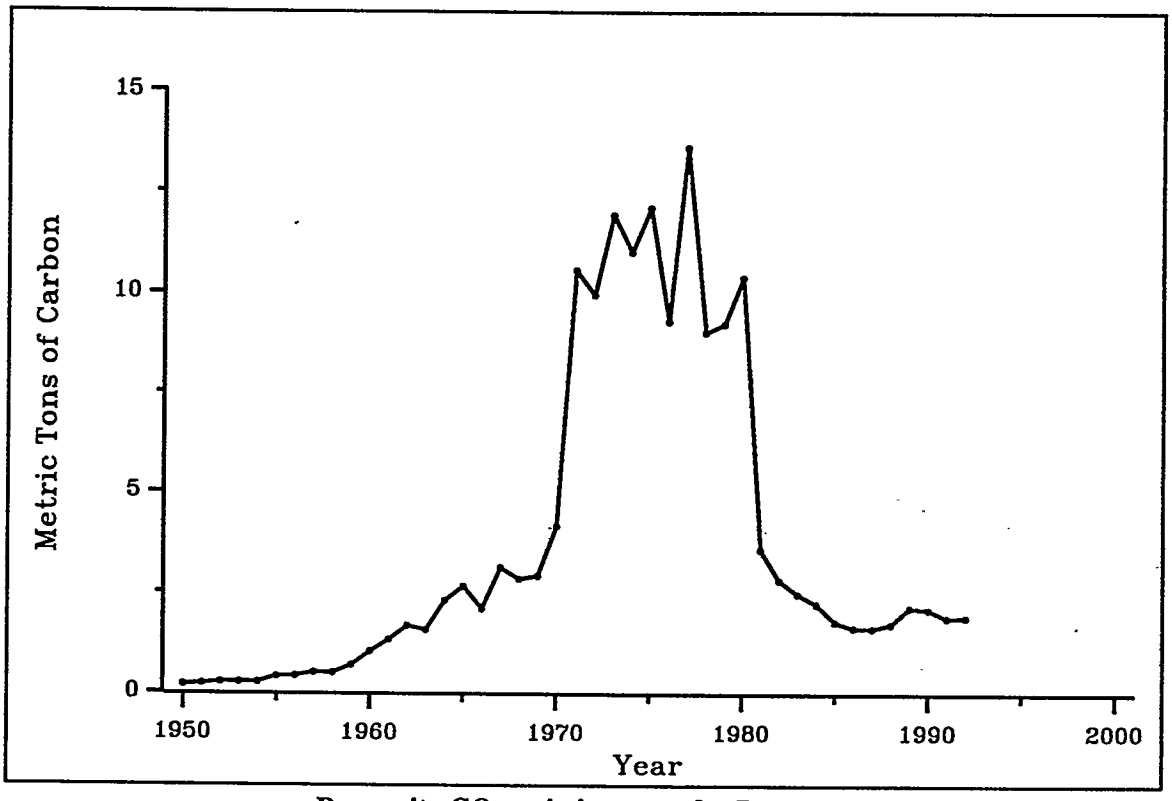
Azerbaijan

	Carbon dioxide emissions (thousand metric tons of carbon)						Per capita CO_2 emissions (metric tons of carbon)	
Year	Total	Solid	Liquid	Gas	Cement	Gas flaring		Bunkers[a]
1992	17434	20	10760	6053	81	520	2.39	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Bahamas

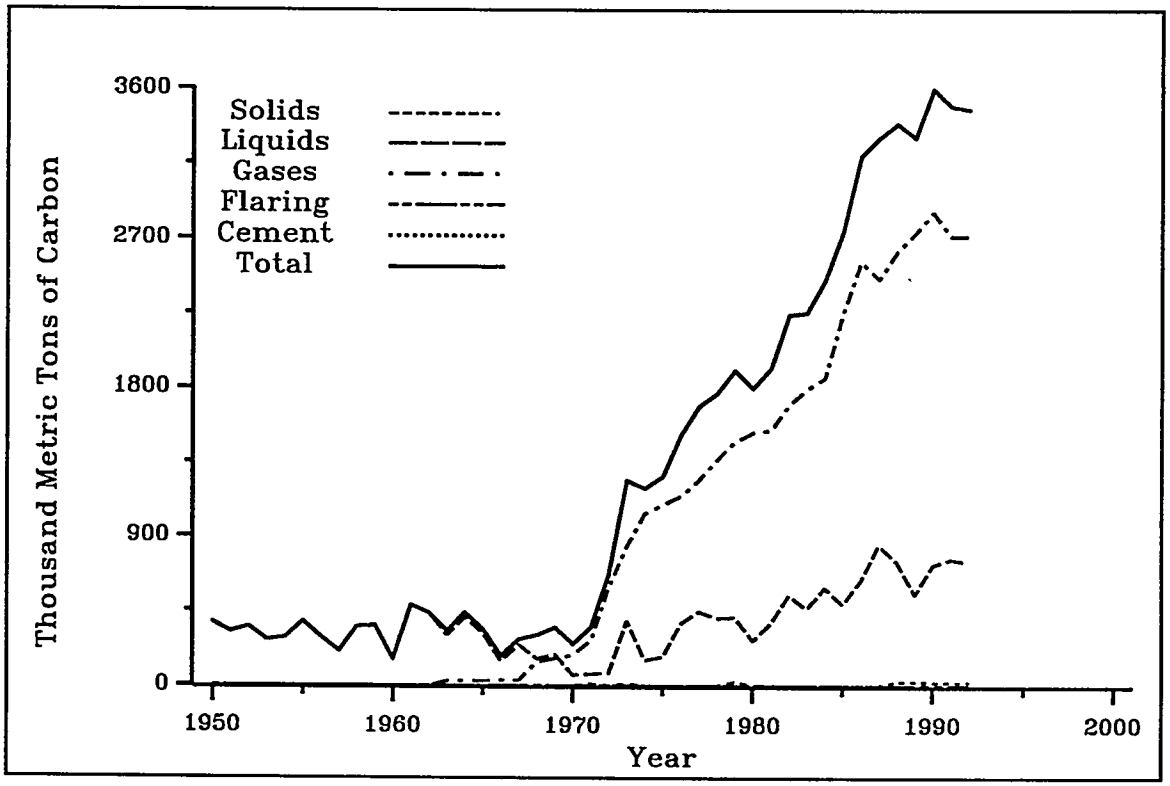


Per capita CO_2 emission rates for Bahamas

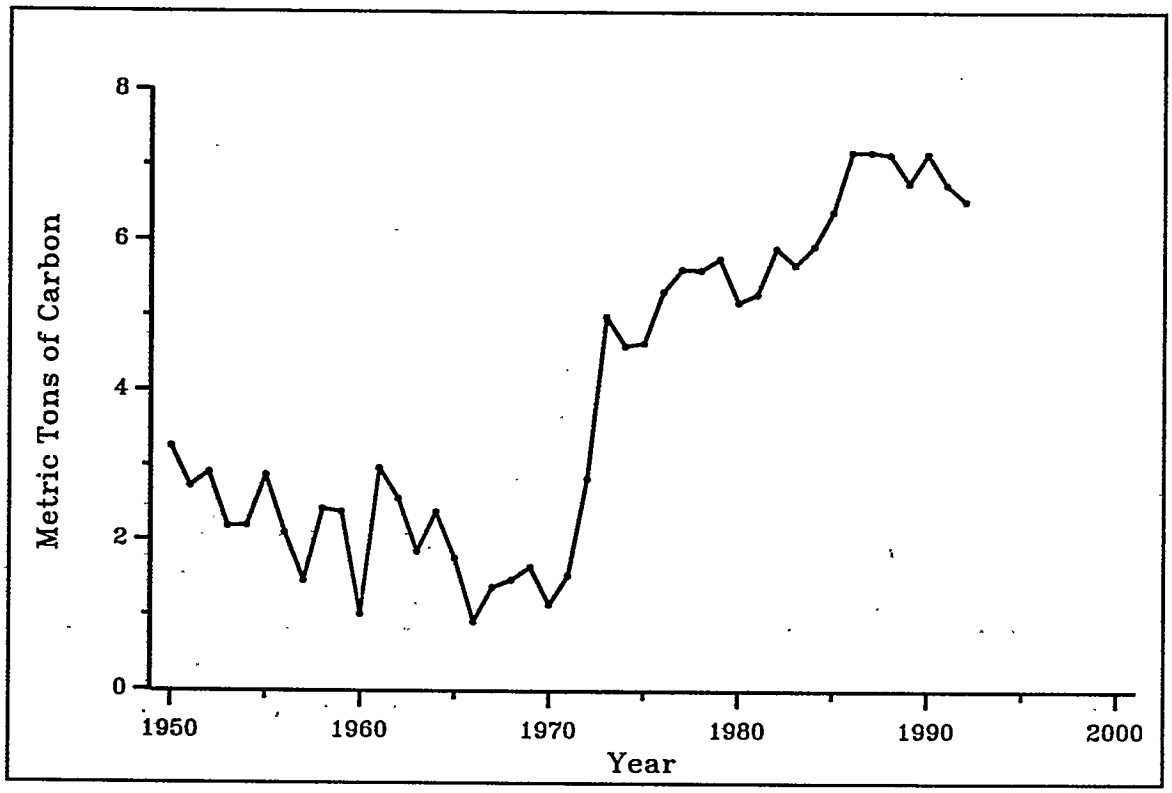
Bahamas

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	15	0	15	0	0	0	0.19	.
1951	18	0	18	0	0	0	0.22	.
1952	21	0	21	0	0	0	0.26	.
1953	22	0	22	0	0	0	0.26	.
1954	23	0	23	0	0	0	0.26	.
1955	35	0	35	0	0	0	0.40	.
1956	38	0	38	0	0	0	0.41	.
1957	48	0	48	0	0	0	0.50	.
1958	49	0	49	0	0	0	0.49	.
1959	71	0	71	0	0	0	0.68	.
1960	112	0	112	0	0	0	1.02	.
1961	149	0	149	0	0	0	1.31	.
1962	198	0	198	0	0	0	1.66	.
1963	193	0	193	0	0	0	1.56	.
1964	296	0	296	0	0	0	2.28	.
1965	359	0	359	0	0	0	2.64	.
1966	298	0	298	0	0	0	2.08	.
1967	464	0	372	0	93	0	3.10	.
1968	445	0	352	0	93	0	2.82	.
1969	476	0	365	0	111	0	2.90	.
1970	703	0	589	0	113	0	4.13	.
1971	1836	1	1722	0	113	0	10.55	.
1972	1770	0	1636	0	134	0	9.94	.
1973	2146	4	2013	0	130	0	11.92	.
1974	2014	3	1904	0	108	0	11.01	.
1975	2250	0	2199	0	52	0	12.10	.
1976	1762	0	1726	0	37	0	9.28	.
1977	2649	0	2640	0	10	0	13.59	.
1978	1802	0	1757	0	45	0	9.01	.
1979	1890	0	1829	0	61	0	9.22	.
1980	2179	0	2115	0	64	0	10.38	.
1981	764	18	742	0	4	0	3.55	.
1982	617	10	598	0	9	0	2.80	.
1983	550	0	547	0	4	0	2.46	.
1984	506	0	506	0	0	0	2.21	.
1985	412	0	412	0	0	0	1.77	.
1986	385	0	385	0	0	0	1.62	.
1987	388	0	388	0	0	0	1.61	.
1988	420	0	420	0	0	0	1.71	.
1989	531	1	530	0	0	0	2.12	.
1990	532	1	531	0	0	0	2.08	.
1991	486	1	485	0	0	0	1.87	.
1992	496	1	496	0	0	0	1.88	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Bahrain

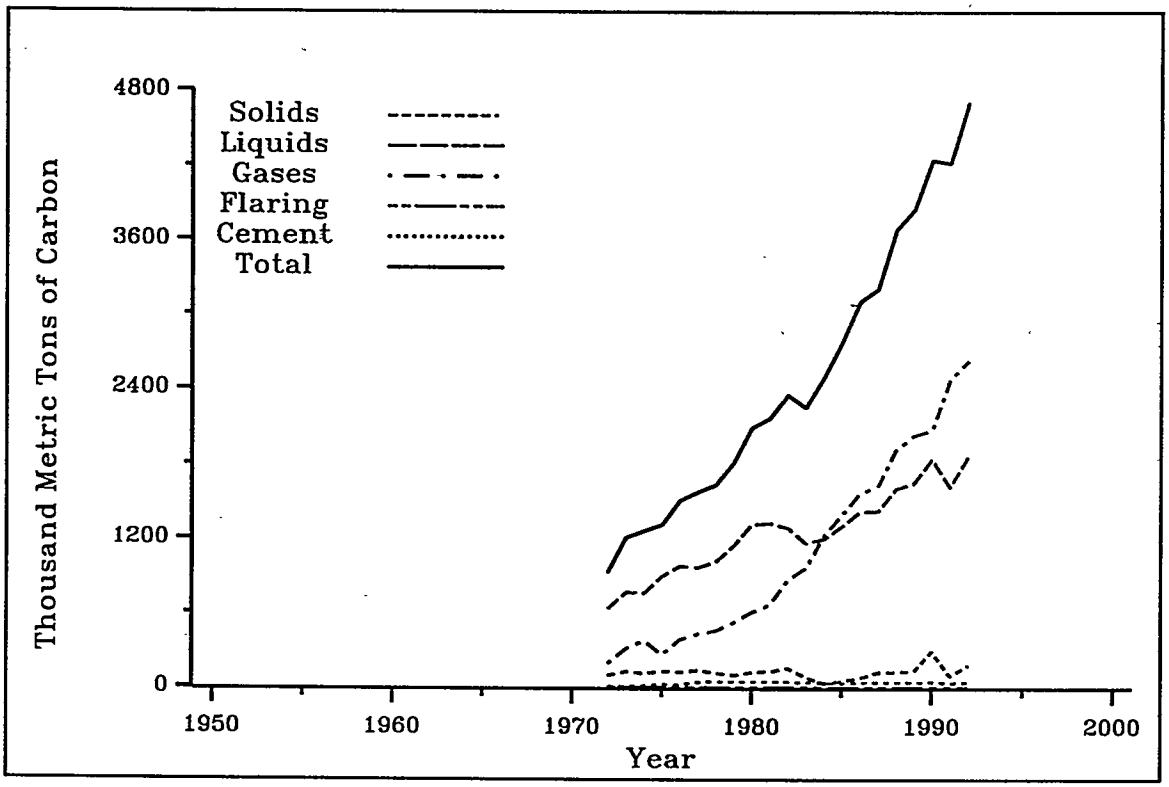


Per capita CO_2 emission rates for Bahrain

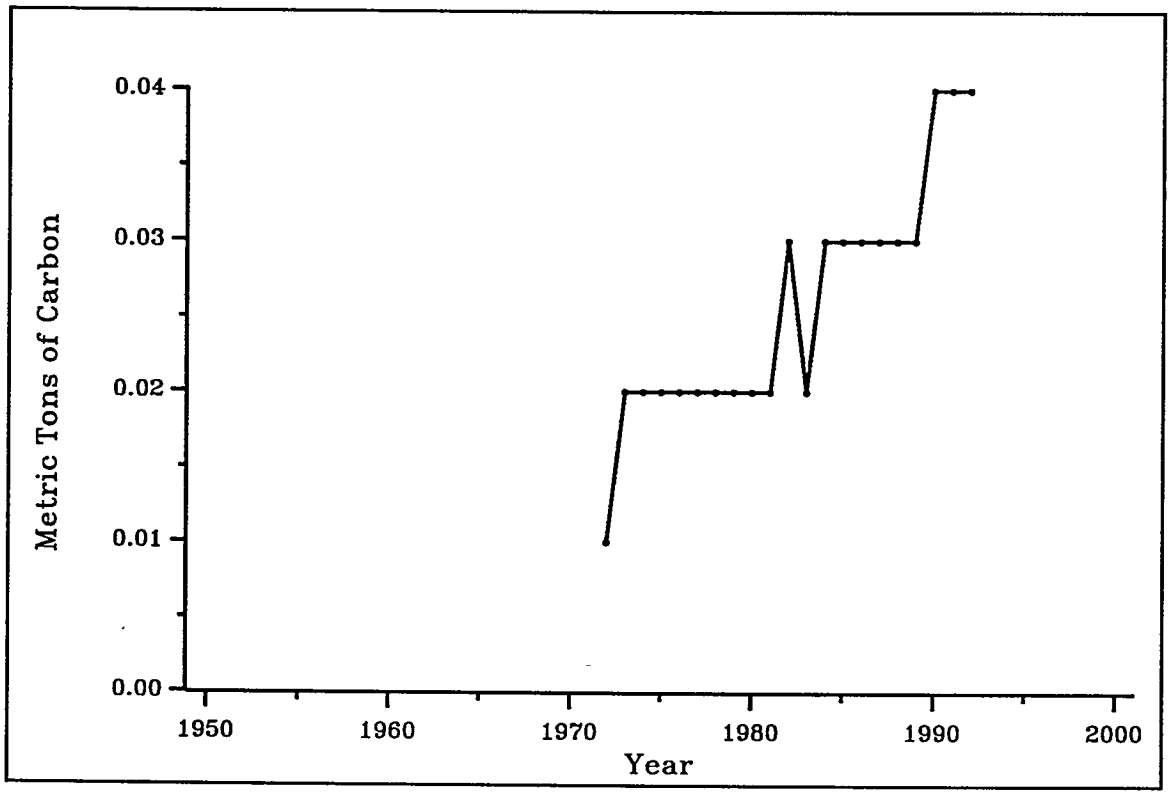
Bahrain

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	377	0	377	0	0	0	3.25	.
1951	321	0	321	0	0	0	2.72	.
1952	351	0	351	0	0	0	2.90	.
1953	272	0	272	0	0	0	2.18	.
1954	285	0	285	0	0	0	2.19	.
1955	383	0	383	0	0	0	2.86	.
1956	288	0	288	0	0	0	2.09	.
1957	206	0	206	0	0	0	1.45	.
1958	352	0	352	0	0	0	2.41	.
1959	358	0	358	0	0	0	2.37	.
1960	157	0	157	0	0	0	1.00	.
1961	483	0	483	0	0	0	2.96	.
1962	434	0	434	0	0	0	2.55	.
1963	326	0	300	26	0	0	1.84	.
1964	436	0	409	26	0	0	2.37	.
1965	335	0	309	26	0	0	1.75	.
1966	177	0	146	31	0	0	0.90	.
1967	274	0	243	31	0	0	1.36	.
1968	301	0	160	141	0	0	1.46	.
1969	347	0	185	162	0	0	1.63	.
1970	248	0	64	183	0	0	1.13	.
1971	347	10	70	267	0	0	1.52	.
1972	668	0	76	592	0	0	2.82	.
1973	1236	10	387	839	0	0	4.98	.
1974	1188	0	153	1035	0	0	4.59	.
1975	1261	0	172	1089	0	0	4.63	.
1976	1513	0	372	1141	0	0	5.31	.
1977	1684	0	445	1239	0	0	5.61	.
1978	1765	0	404	1361	0	0	5.60	.
1979	1904	22	410	1472	0	0	5.75	.
1980	1795	0	268	1527	0	0	5.17	.
1981	1916	0	374	1541	0	0	5.28	.
1982	2239	0	544	1695	0	0	5.89	.
1983	2252	0	462	1790	0	0	5.67	.
1984	2445	0	588	1858	0	0	5.92	.
1985	2737	0	488	2249	0	0	6.38	.
1986	3192	0	632	2559	0	0	7.17	.
1987	3299	0	846	2453	0	0	7.17	.
1988	3385	0	744	2619	22	0	7.14	.
1989	3300	0	548	2730	22	0	6.76	.
1990	3598	0	725	2853	20	0	7.15	.
1991	3493	0	760	2712	20	0	6.74	.
1992	3475	0	743	2712	20	0	6.52	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Bangladesh

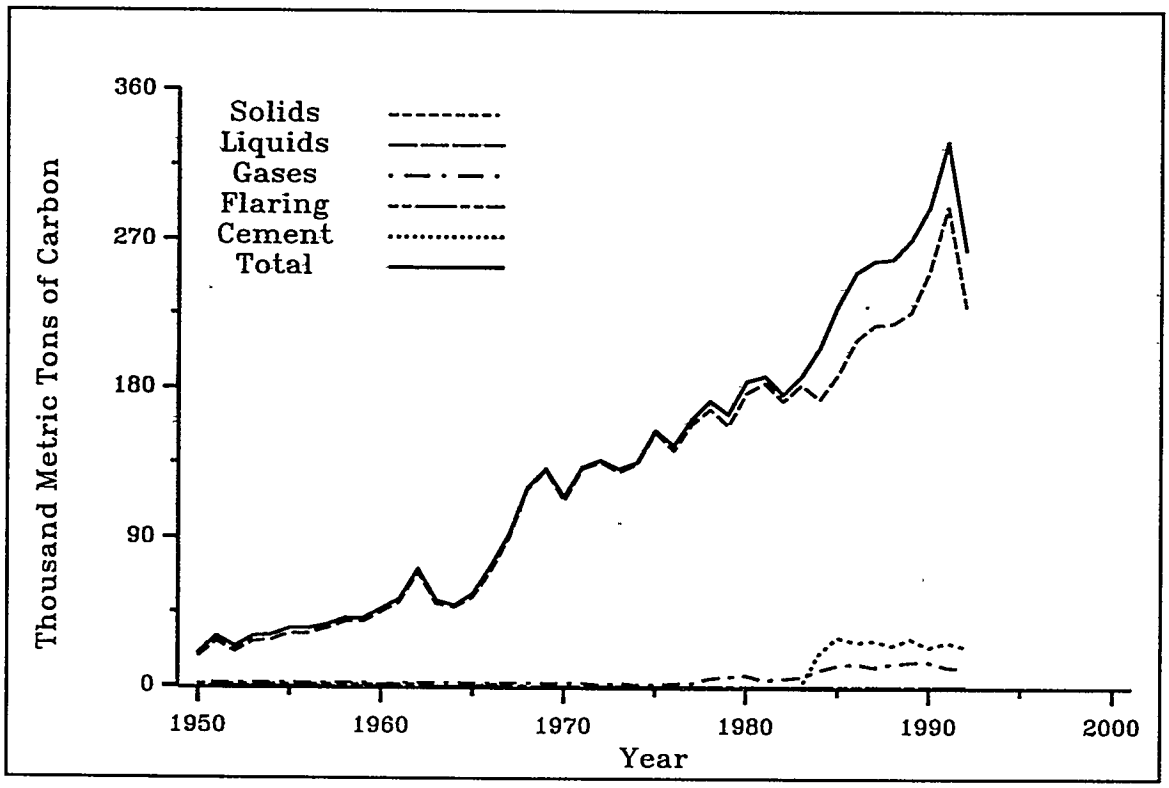


Per capita CO_2 emission rates for Bangladesh

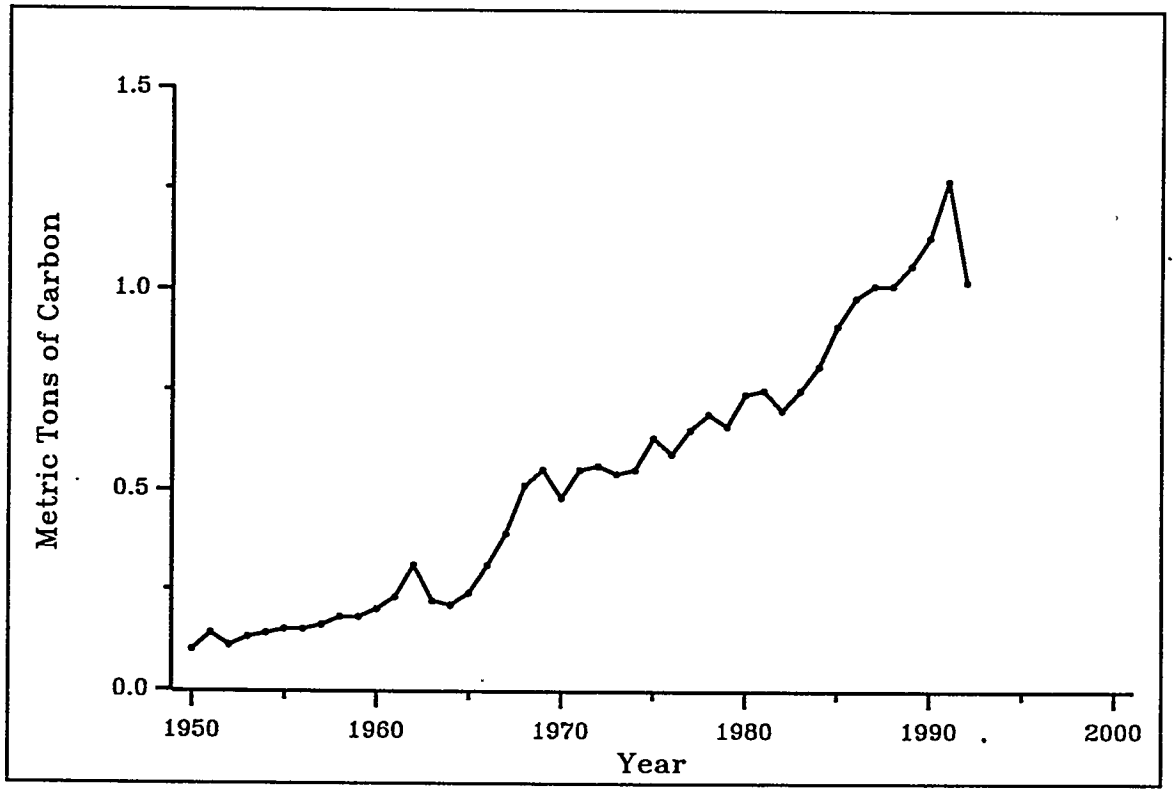
Bangladesh

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1972	928	98	632	195	3	0	0.01	.
1973	1205	127	762	312	4	0	0.02	.
1974	1258	113	755	377	12	0	0.02	.
1975	1309	131	892	263	23	0	0.02	.
1976	1505	124	975	385	21	0	0.02	.
1977	1573	138	962	431	42	0	0.02	.
1978	1630	116	1011	457	46	0	0.02	.
1979	1807	99	1141	523	44	0	0.02	.
1980	2084	123	1311	605	46	0	0.02	.
1981	2164	129	1323	666	47	0	0.02	.
1982	2347	156	1283	864	44	0	0.03	.
1983	2247	84	1160	961	42	0	0.02	.
1984	2484	32	1195	1219	37	0	0.03	.
1985	2768	51	1296	1388	33	0	0.03	.
1986	3098	77	1416	1565	40	0	0.03	.
1987	3200	122	1418	1618	42	0	0.03	.
1988	3678	126	1600	1910	42	0	0.03	.
1989	3843	131	1646	2024	43	0	0.03	.
1990	4241	292	1837	2068	44	0	0.04	.
1991	4217	94	1613	2472	37	0	0.04	.
1992	4699	177	1860	2622	40	0	0.04	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Barbados

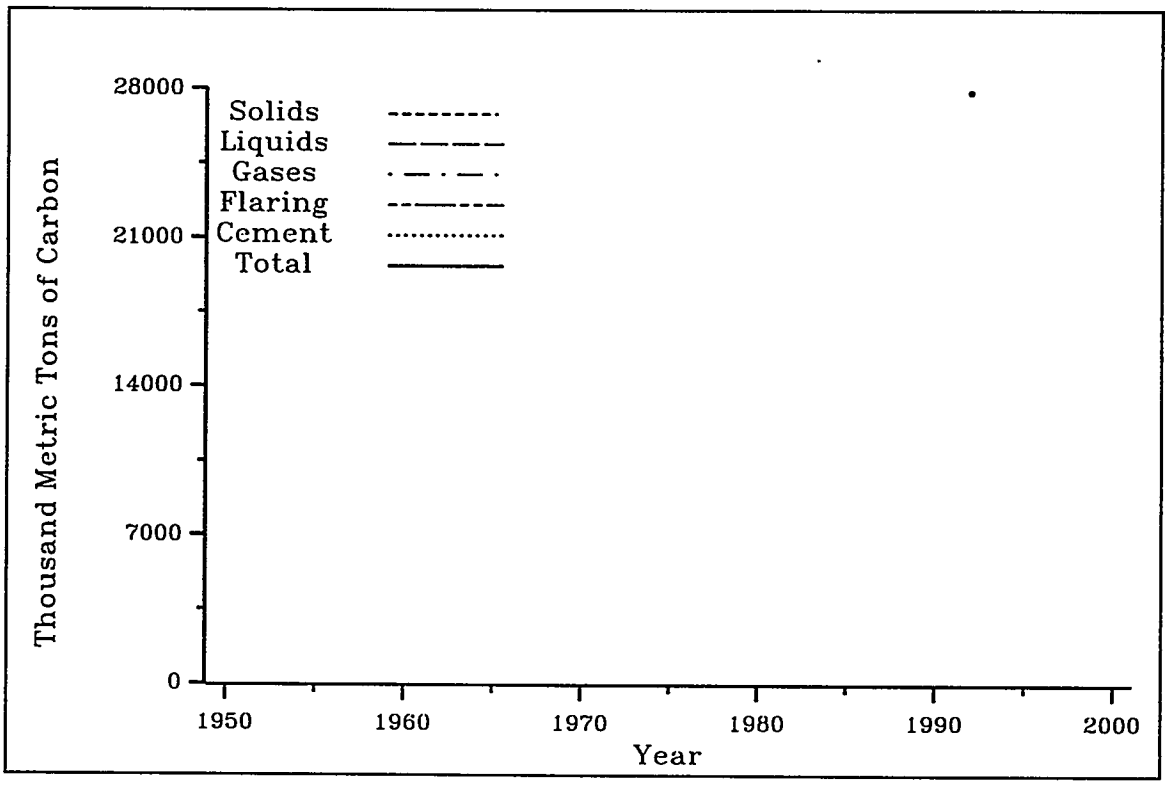


Per capita CO_2 emission rates for Barbados

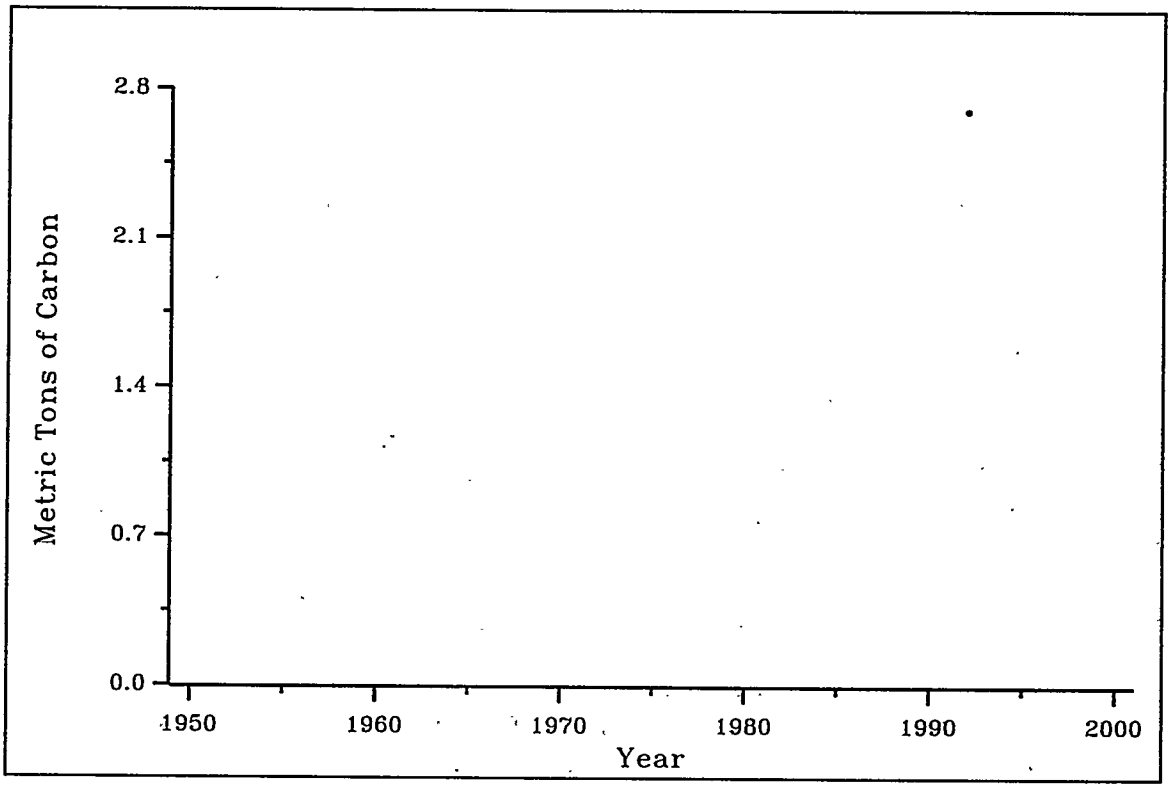
Barbados

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	20	1	18	1	0	0	0.10	.
1951	30	1	27	2	0	0	0.14	.
1952	24	1	21	2	0	0	0.11	.
1953	30	1	27	2	0	0	0.13	.
1954	31	1	28	2	0	0	0.14	.
1955	35	1	32	2	0	0	0.15	.
1956	35	1	32	2	0	0	0.15	.
1957	37	1	35	2	0	0	0.16	.
1958	41	1	39	2	0	0	0.18	.
1959	41	1	39	2	0	0	0.18	.
1960	47	1	45	1	0	0	0.20	.
1961	53	1	51	2	0	0	0.23	.
1962	71	1	69	2	0	0	0.31	.
1963	52	0	50	2	0	0	0.22	.
1964	49	0	48	2	0	0	0.21	.
1965	56	0	54	2	0	0	0.24	.
1966	73	1	70	2	0	0	0.31	.
1967	92	1	90	2	0	0	0.39	.
1968	120	0	119	2	0	0	0.51	.
1969	131	0	130	2	0	0	0.55	.
1970	114	0	112	2	0	0	0.48	.
1971	132	0	131	2	0	0	0.55	.
1972	136	0	135	1	0	0	0.56	.
1973	131	0	129	2	0	0	0.54	.
1974	135	0	134	1	0	0	0.55	.
1975	154	0	153	1	0	0	0.63	.
1976	145	0	142	2	0	0	0.59	.
1977	161	0	158	2	0	0	0.65	.
1978	172	0	167	5	0	0	0.69	.
1979	164	0	157	6	0	0	0.66	.
1980	184	0	177	7	0	0	0.74	.
1981	187	0	183	4	0	0	0.75	.
1982	176	0	172	5	0	0	0.70	.
1983	187	0	182	6	0	0	0.75	.
1984	204	0	173	10	20	0	0.81	.
1985	230	0	188	13	30	0	0.91	.
1986	250	0	209	14	27	0	0.98	.
1987	257	0	218	12	28	0	1.01	.
1988	258	0	219	14	25	0	1.01	.
1989	270	0	226	15	29	0	1.06	.
1990	290	0	251	15	24	0	1.13	.
1991	329	0	290	12	27	0	1.27	.
1992	264	0	229	11	24	0	1.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Belarus

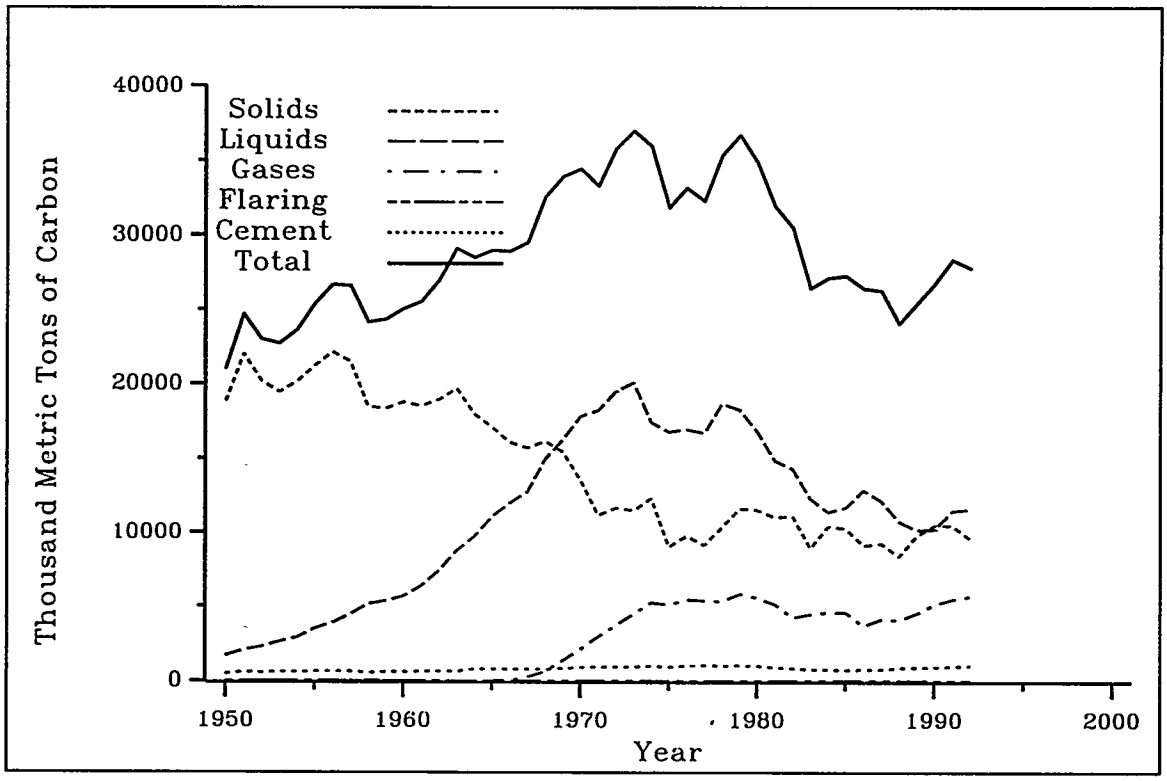


Per capita CO_2 emission rates for Belarus

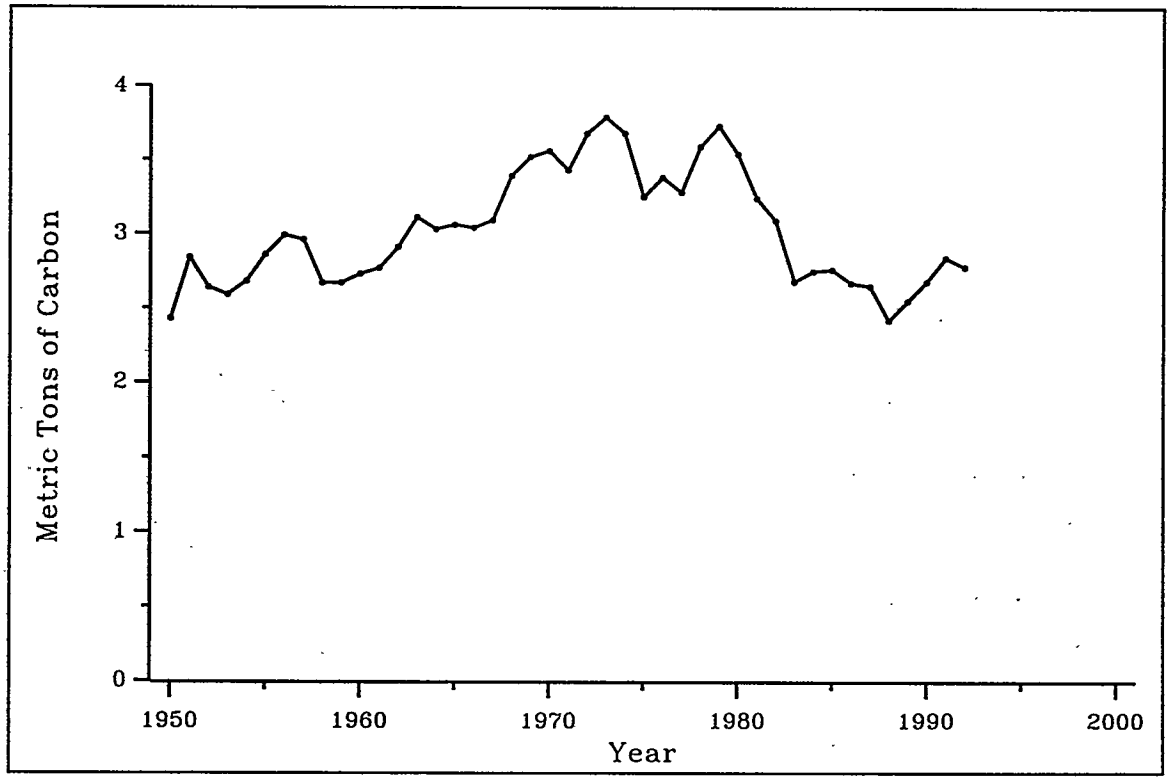
Belarus

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	27846	2604	16686	8334	222	0	2.70	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Belgium

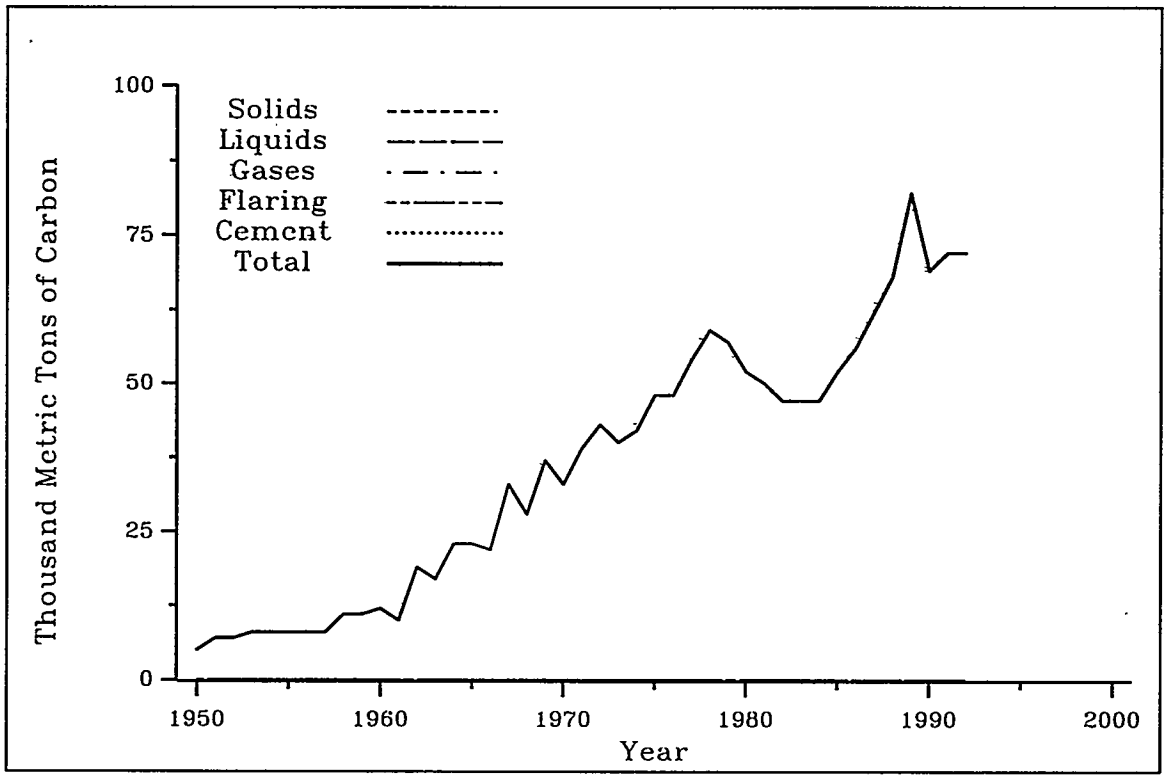


Per capita CO_2 emission rates for Belgium

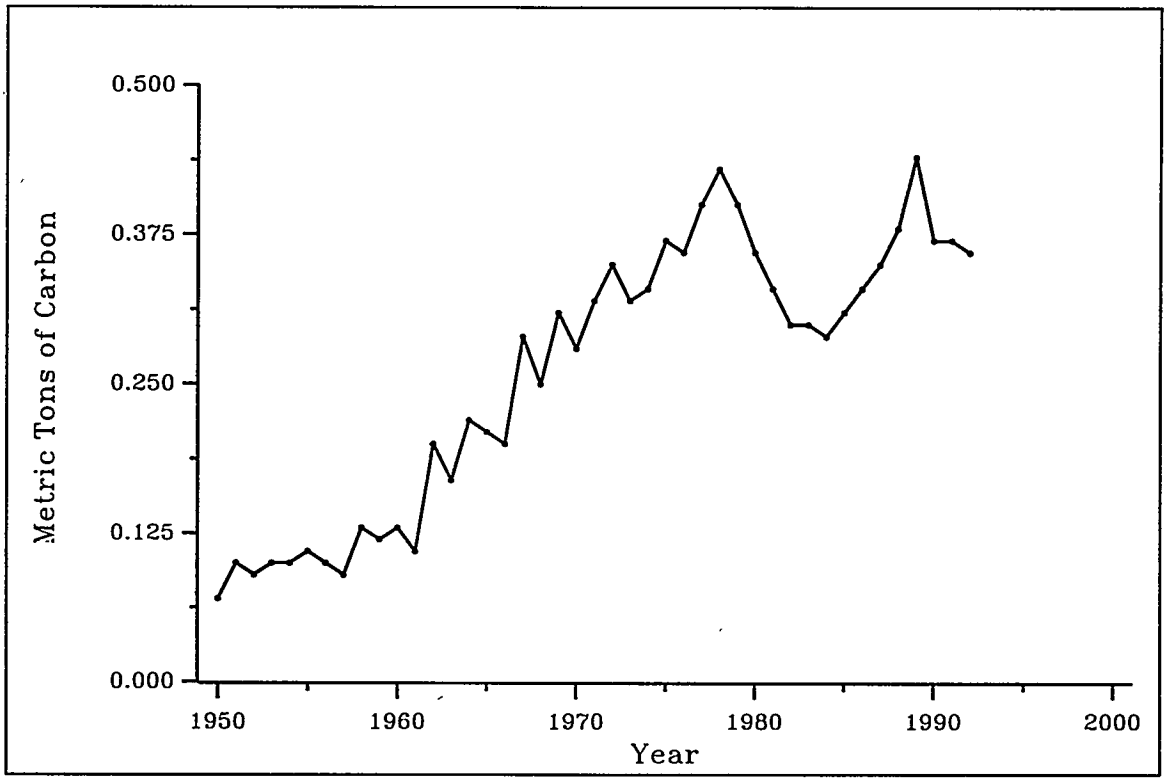
Belgium

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	21018	18830	1703	2	484	0	2.43	265
1951	24672	22003	2063	8	598	0	2.84	435
1952	23017	20162	2280	16	559	0	2.64	413
1953	22712	19445	2619	19	629	0	2.59	364
1954	23637	20137	2890	15	595	0	2.68	385
1955	25364	21208	3498	21	638	0	2.86	493
1956	26675	22129	3887	25	634	0	2.99	626
1957	26587	21475	4442	29	640	0	2.96	494
1958	24148	18432	5136	29	552	0	2.67	460
1959	24319	18339	5351	25	604	0	2.67	585
1960	25033	18750	5668	17	597	0	2.73	657
1961	25518	18497	6356	19	647	0	2.77	901
1962	26976	18925	7379	21	651	0	2.91	1139
1963	29075	19682	8734	19	640	0	3.11	1313
1964	28477	17954	9708	20	795	0	3.03	1559
1965	28951	17075	11048	26	803	0	3.06	1758
1966	28876	16067	11966	55	788	0	3.04	1816
1967	29490	15704	12742	253	791	0	3.09	1773
1968	32518	16144	14940	653	781	0	3.39	1916
1969	33889	15431	16254	1352	853	0	3.52	2515
1970	34396	13530	17812	2139	915	0	3.56	2615
1971	33257	11155	18208	2952	943	0	3.43	2570
1972	35794	11633	19486	3711	964	0	3.68	2845
1973	36974	11473	20072	4471	958	0	3.79	3100
1974	35939	12291	17406	5227	1016	0	3.68	2643
1975	31811	9018	16765	5091	936	0	3.25	2685
1976	33132	9747	16930	5435	1021	0	3.38	2595
1977	32243	9129	16689	5369	1056	0	3.28	2654
1978	35342	10345	18644	5323	1030	0	3.59	2686
1979	36695	11587	18244	5817	1048	0	3.73	2439
1980	34860	11493	16784	5565	1018	0	3.54	2423
1981	31884	11010	14831	5133	910	0	3.24	2794
1982	30483	11092	14294	4237	860	0	3.09	2529
1983	26427	8926	12276	4447	778	0	2.68	2474
1984	27107	10387	11355	4589	776	0	2.75	2485
1985	27254	10256	11668	4577	753	0	2.76	2477
1986	26398	9095	12841	3680	783	0	2.67	2986
1987	26239	9237	12108	4120	774	0	2.65	3382
1988	24039	8360	10735	4067	877	0	2.42	3792
1989	25352	9765	10154	4519	914	0	2.55	4014
1990	26711	10465	10201	5102	942	0	2.68	4381
1991	28323	10467	11423	5455	977	0	2.84	4442
1992	27775	9553	11545	5652	1024	0	2.78	4407

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Belize

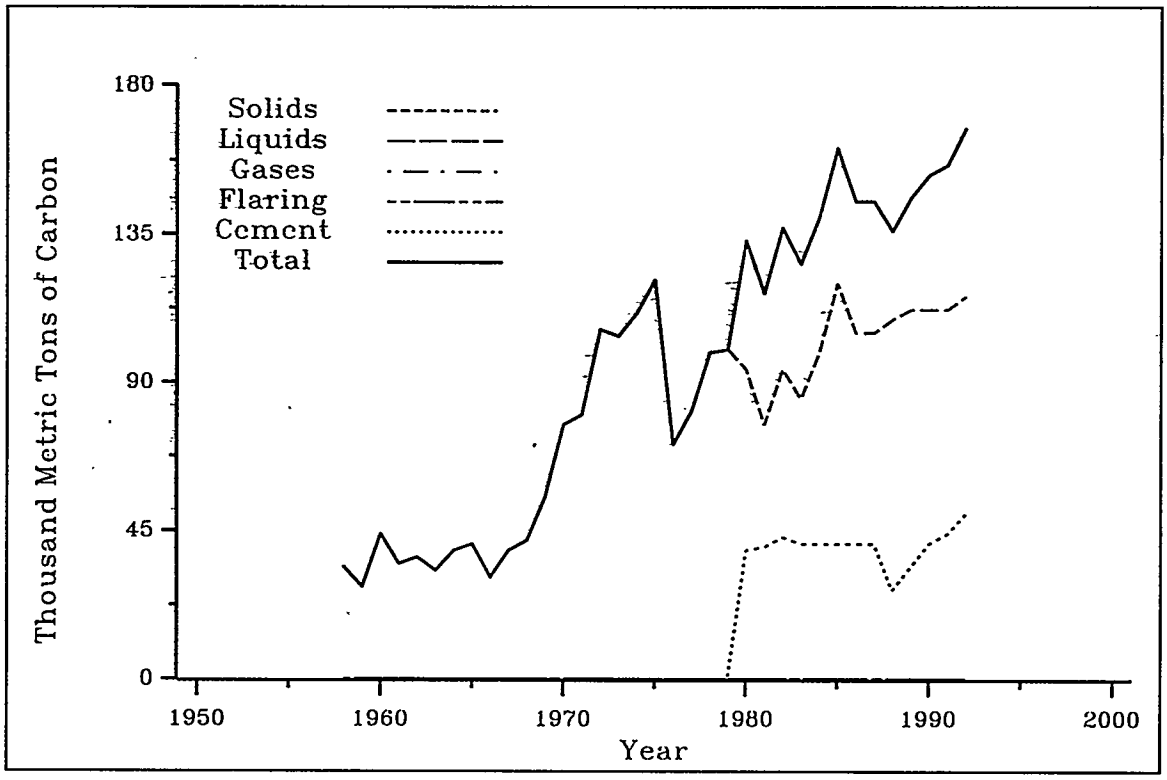


Per capita CO_2 emission rates for Belize

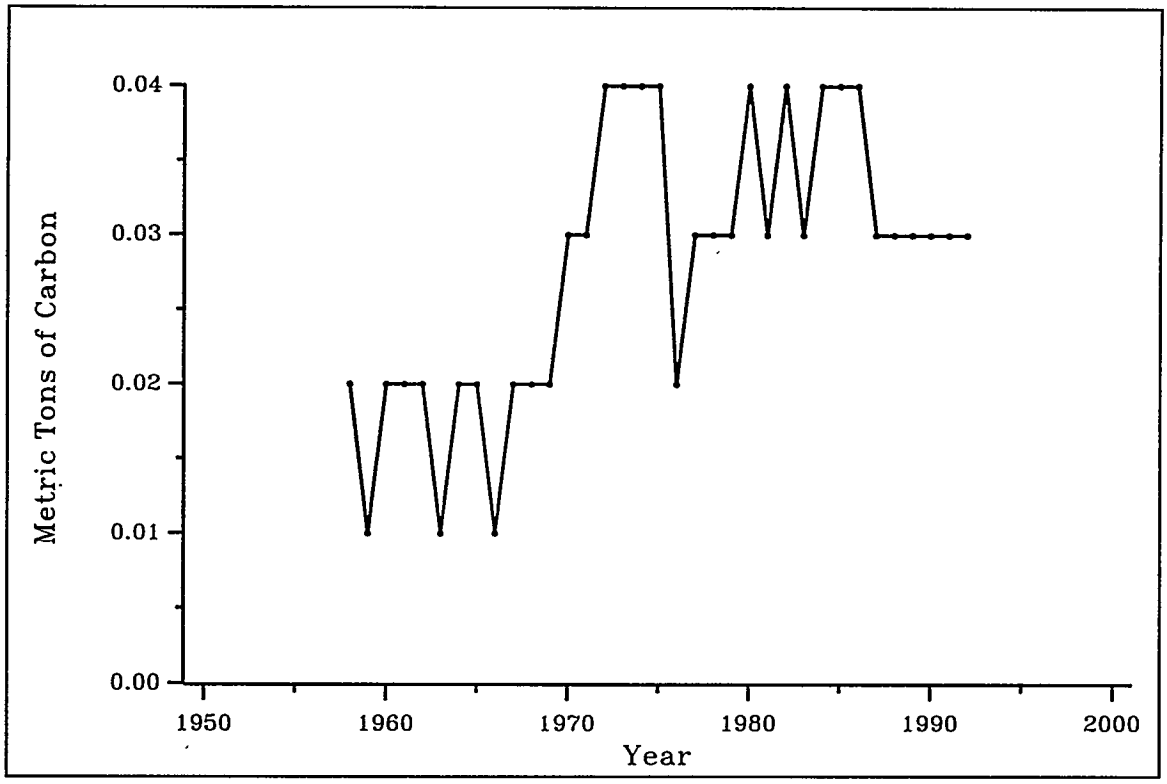
Belize

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	5	0	5	0	0	0	0.07	.
1951	7	0	7	0	0	0	0.10	.
1952	7	0	7	0	0	0	0.09	.
1953	8	0	8	0	0	0	0.10	.
1954	8	0	8	0	0	0	0.10	.
1955	8	0	8	0	0	0	0.11	.
1956	8	0	8	0	0	0	0.10	.
1957	8	0	8	0	0	0	0.09	.
1958	11	0	11	0	0	0	0.13	.
1959	11	0	11	0	0	0	0.12	.
1960	12	0	12	0	0	0	0.13	.
1961	10	0	10	0	0	0	0.11	.
1962	19	0	19	0	0	0	0.20	.
1963	17	0	17	0	0	0	0.17	.
1964	23	0	23	0	0	0	0.22	.
1965	23	0	23	0	0	0	0.21	.
1966	22	0	22	0	0	0	0.20	.
1967	33	0	33	0	0	0	0.29	.
1968	28	0	28	0	0	0	0.25	.
1969	37	0	37	0	0	0	0.31	.
1970	33	0	33	0	0	0	0.28	.
1971	39	0	39	0	0	0	0.32	.
1972	43	0	43	0	0	0	0.35	.
1973	40	0	40	0	0	0	0.32	.
1974	42	0	42	0	0	0	0.33	.
1975	48	0	48	0	0	0	0.37	.
1976	48	0	48	0	0	0	0.36	.
1977	54	0	54	0	0	0	0.40	.
1978	59	0	59	0	0	0	0.43	.
1979	57	0	57	0	0	0	0.40	.
1980	52	0	52	0	0	0	0.36	.
1981	50	0	50	0	0	0	0.33	.
1982	47	0	47	0	0	0	0.30	.
1983	47	0	47	0	0	0	0.30	.
1984	47	0	47	0	0	0	0.29	.
1985	52	0	52	0	0	0	0.31	.
1986	56	0	56	0	0	0	0.33	.
1987	62	0	62	0	0	0	0.35	.
1988	68	0	68	0	0	0	0.38	.
1989	82	0	82	0	0	0	0.44	.
1990	69	0	69	0	0	0	0.37	.
1991	72	0	72	0	0	0	0.37	.
1992	72	0	72	0	0	0	0.36	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Benin

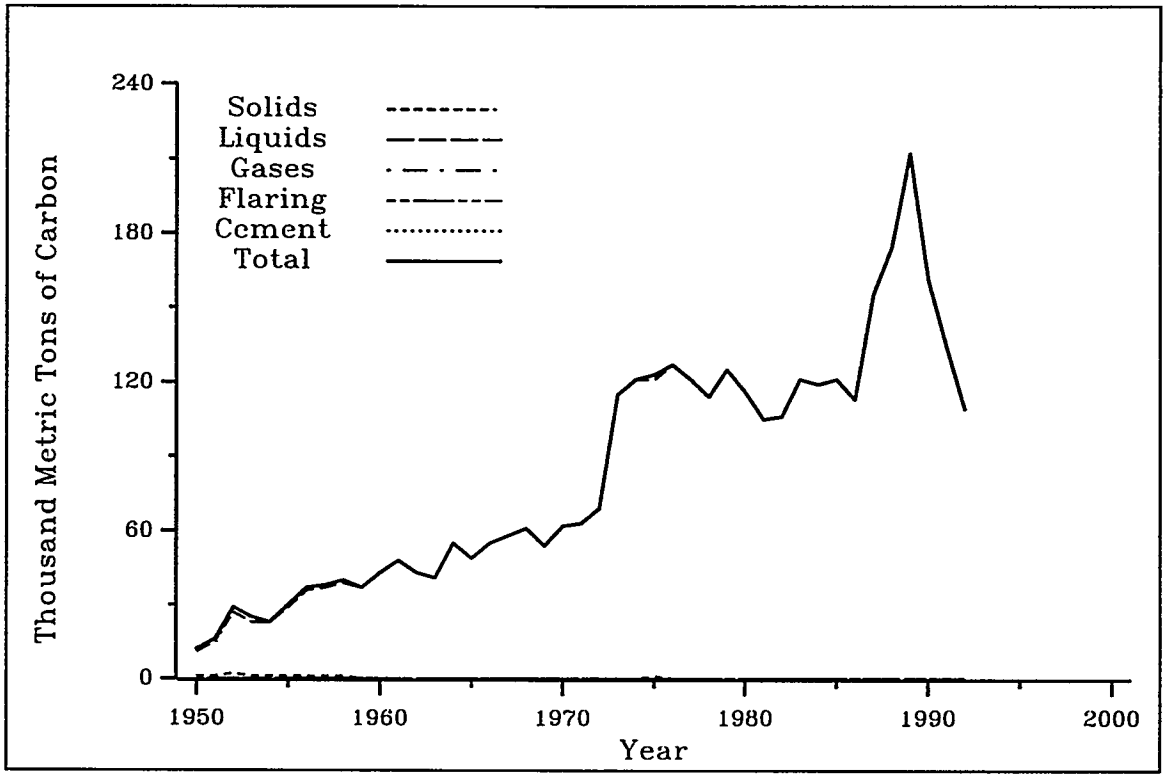


Per capita CO_2 emission rates for Benin

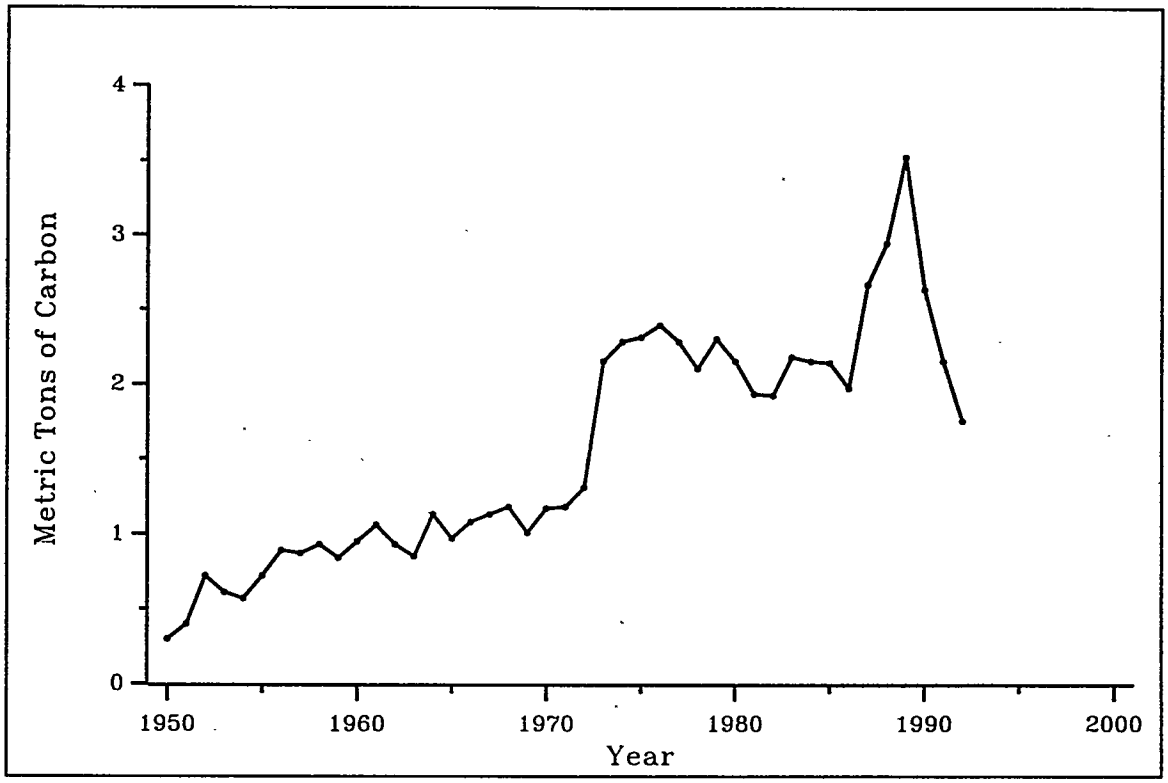
Benin

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1958	34	0	34	0	0	0	0.02	.
1959	28	0	28	0	0	0	0.01	.
1960	44	0	44	0	0	0	0.02	.
1961	35	0	35	0	0	0	0.02	.
1962	37	0	37	0	0	0	0.02	.
1963	33	0	33	0	0	0	0.01	.
1964	39	0	39	0	0	0	0.02	.
1965	41	0	41	0	0	0	0.02	.
1966	31	0	31	0	0	0	0.01	.
1967	39	0	39	0	0	0	0.02	.
1968	42	0	42	0	0	0	0.02	.
1969	55	0	55	0	0	0	0.02	.
1970	77	0	77	0	0	0	0.03	.
1971	80	0	80	0	0	0	0.03	.
1972	106	0	106	0	0	0	0.04	.
1973	104	0	104	0	0	0	0.04	.
1974	111	0	111	0	0	0	0.04	.
1975	121	0	121	0	0	0	0.04	.
1976	71	0	71	0	0	0	0.02	.
1977	81	0	81	0	0	0	0.03	.
1978	99	0	99	0	0	0	0.03	.
1979	100	0	100	0	0	0	0.03	.
1980	133	0	94	0	39	0	0.04	.
1981	117	0	77	0	40	0	0.03	.
1982	137	0	94	0	43	0	0.04	.
1983	126	0	85	0	41	0	0.03	.
1984	140	0	99	0	41	0	0.04	.
1985	161	0	120	0	41	0	0.04	.
1986	145	0	105	0	41	0	0.04	.
1987	145	0	105	0	41	0	0.03	.
1988	136	0	109	0	27	0	0.03	.
1989	146	0	112	0	34	0	0.03	.
1990	153	0	112	0	41	0	0.03	.
1991	156	0	112	0	44	0	0.03	.
1992	167	0	116	0	50	0	0.03	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Bermuda

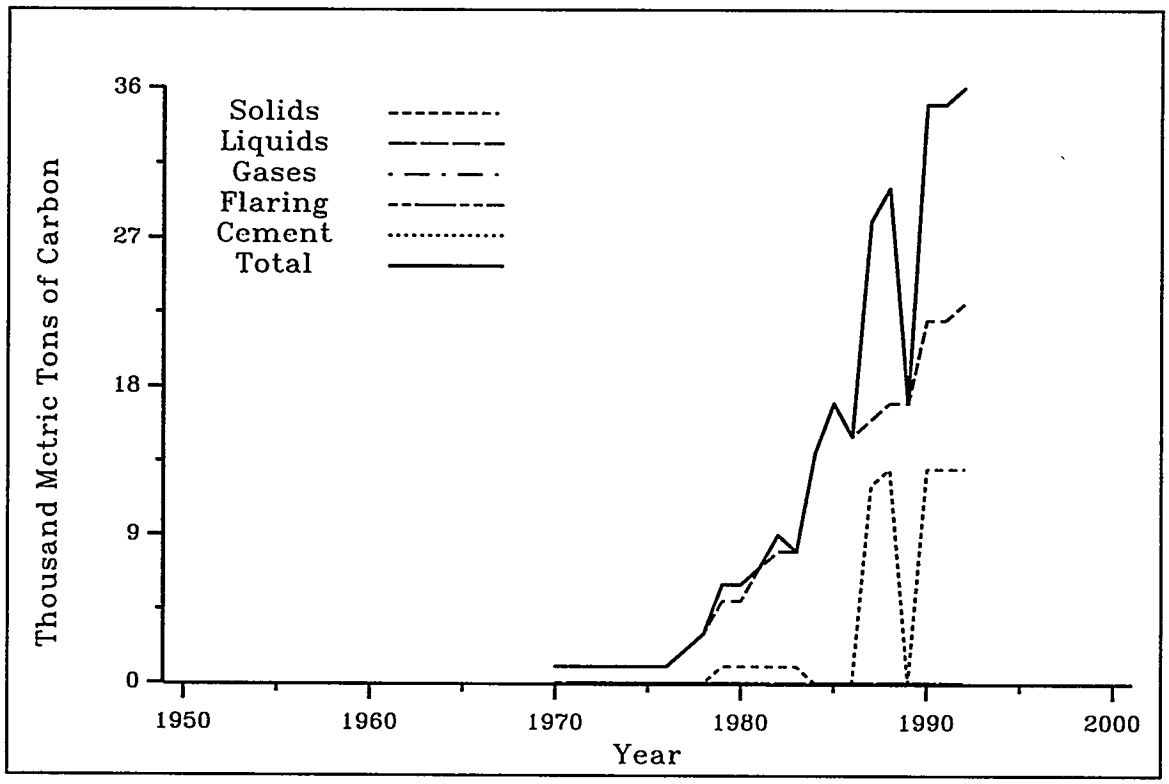


Per capita CO_2 emission rates for Bermuda

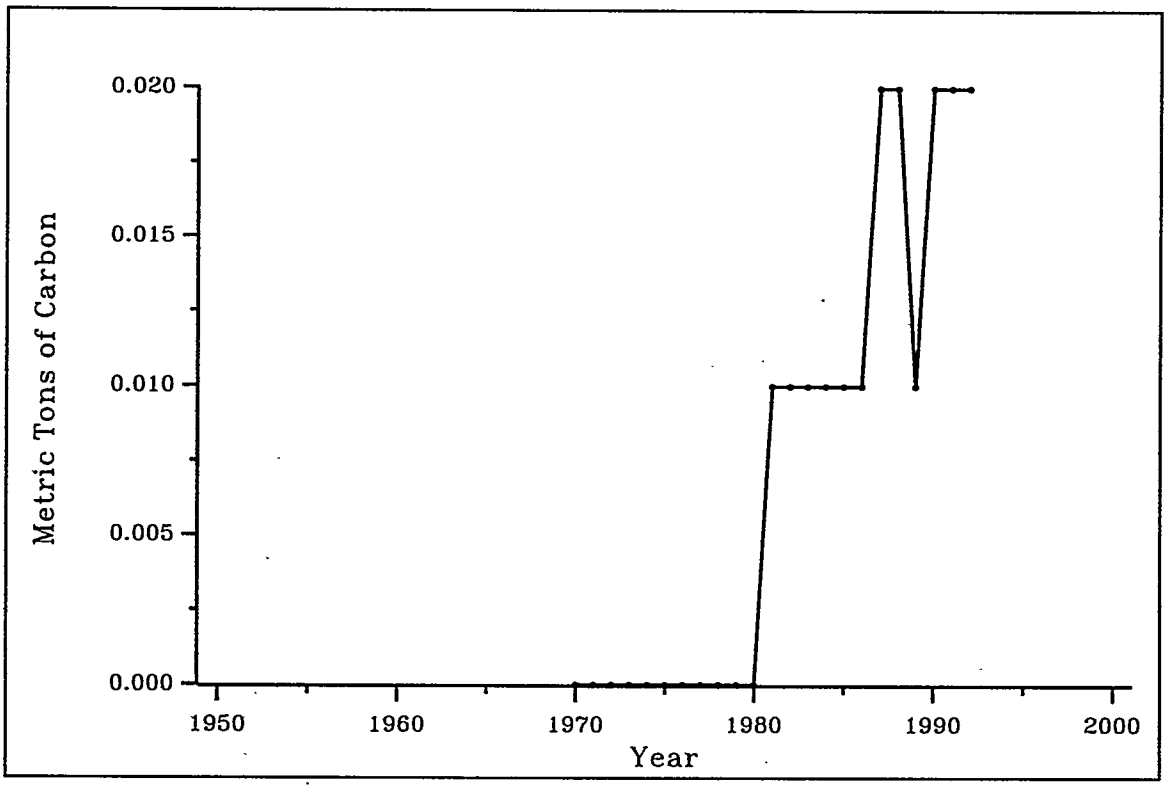
Bermuda

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	12	1	11	0	0	0	0.30	.
1951	16	1	15	0	0	0	0.40	.
1952	29	2	27	0	0	0	0.72	.
1953	25	1	23	0	0	0	0.61	.
1954	23	1	23	0	0	0	0.57	.
1955	30	1	29	0	0	0	0.72	.
1956	37	1	36	0	0	0	0.89	.
1957	38	1	37	0	0	0	0.87	.
1958	40	1	39	0	0	0	0.93	.
1959	37	0	37	0	0	0	0.84	.
1960	43	0	43	0	0	0	0.95	.
1961	48	0	48	0	0	0	1.06	.
1962	43	0	43	0	0	0	0.93	.
1963	41	0	41	0	0	0	0.85	.
1964	55	0	55	0	0	0	1.13	.
1965	49	0	49	0	0	0	0.97	.
1966	55	0	55	0	0	0	1.08	.
1967	58	0	58	0	0	0	1.13	.
1968	61	0	61	0	0	0	1.18	.
1969	54	0	54	0	0	0	1.01	.
1970	62	0	62	0	0	0	1.17	.
1971	63	0	63	0	0	0	1.18	.
1972	69	0	69	0	0	0	1.31	.
1973	115	0	115	0	0	0	2.16	.
1974	121	0	121	0	0	0	2.29	.
1975	123	1	121	0	0	0	2.32	.
1976	127	0	127	0	0	0	2.40	.
1977	121	0	121	0	0	0	2.29	.
1978	114	0	114	0	0	0	2.11	.
1979	125	0	125	0	0	0	2.31	.
1980	116	0	116	0	0	0	2.16	.
1981	105	0	105	0	0	0	1.94	.
1982	106	0	106	0	0	0	1.93	.
1983	121	0	121	0	0	0	2.19	.
1984	119	0	119	0	0	0	2.16	.
1985	121	0	121	0	0	0	2.15	.
1986	113	0	113	0	0	0	1.98	.
1987	155	0	155	0	0	0	2.67	.
1988	174	0	174	0	0	0	2.95	.
1989	212	0	212	0	0	0	3.53	.
1990	161	0	161	0	0	0	2.64	.
1991	134	0	134	0	0	0	2.16	.
1992	109	0	109	0	0	0	1.76	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Bhutan

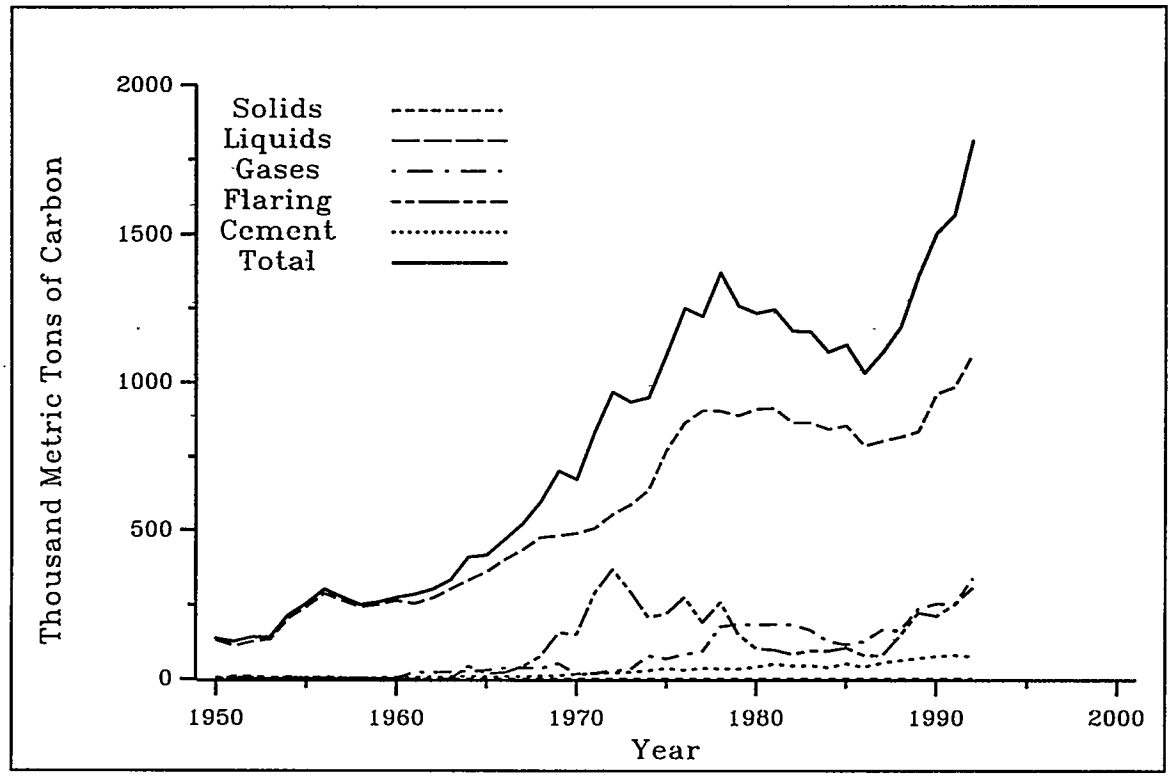


Per capita CO_2 emission rates for Bhutan

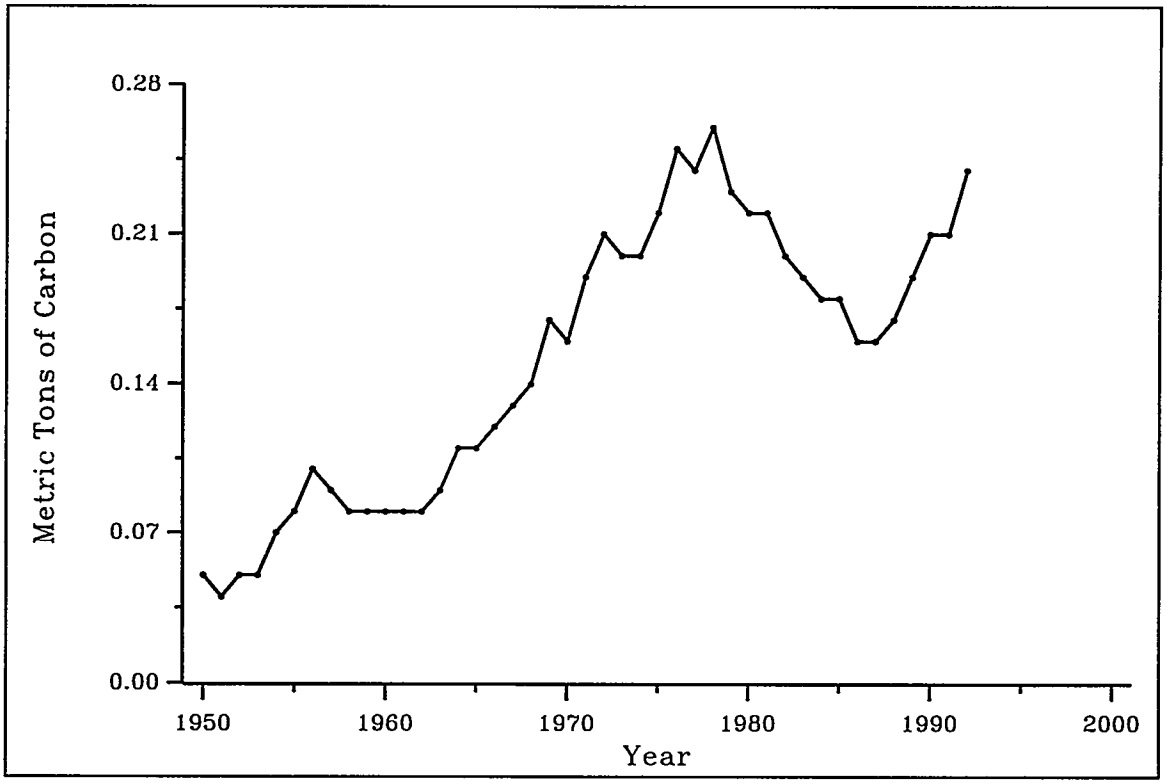
Bhutan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	1	0	1	0	0	0	0.00	.
1971	1	0	1	0	0	0	0.00	.
1972	1	0	1	0	0	0	0.00	.
1973	1	0	1	0	0	0	0.00	.
1974	1	0	1	0	0	0	0.00	.
1975	1	0	1	0	0	0	0.00	.
1976	1	0	1	0	0	0	0.00	.
1977	2	0	2	0	0	0	0.00	.
1978	3	0	3	0	0	0	0.00	.
1979	6	1	5	0	0	0	0.00	.
1980	6	1	5	0	0	0	0.00	.
1981	7	1	7	0	0	0	0.01	.
1982	9	1	8	0	0	0	0.01	.
1983	8	1	8	0	0	0	0.01	.
1984	14	0	14	0	0	0	0.01	.
1985	17	0	17	0	0	0	0.01	.
1986	15	0	15	0	0	0	0.01	.
1987	28	12	16	0	0	0	0.02	.
1988	30	13	17	0	0	0	0.02	.
1989	17	0	17	0	0	0	0.01	.
1990	35	13	22	0	0	0	0.02	.
1991	35	13	22	0	0	0	0.02	.
1992	36	13	23	0	0	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Bolivia

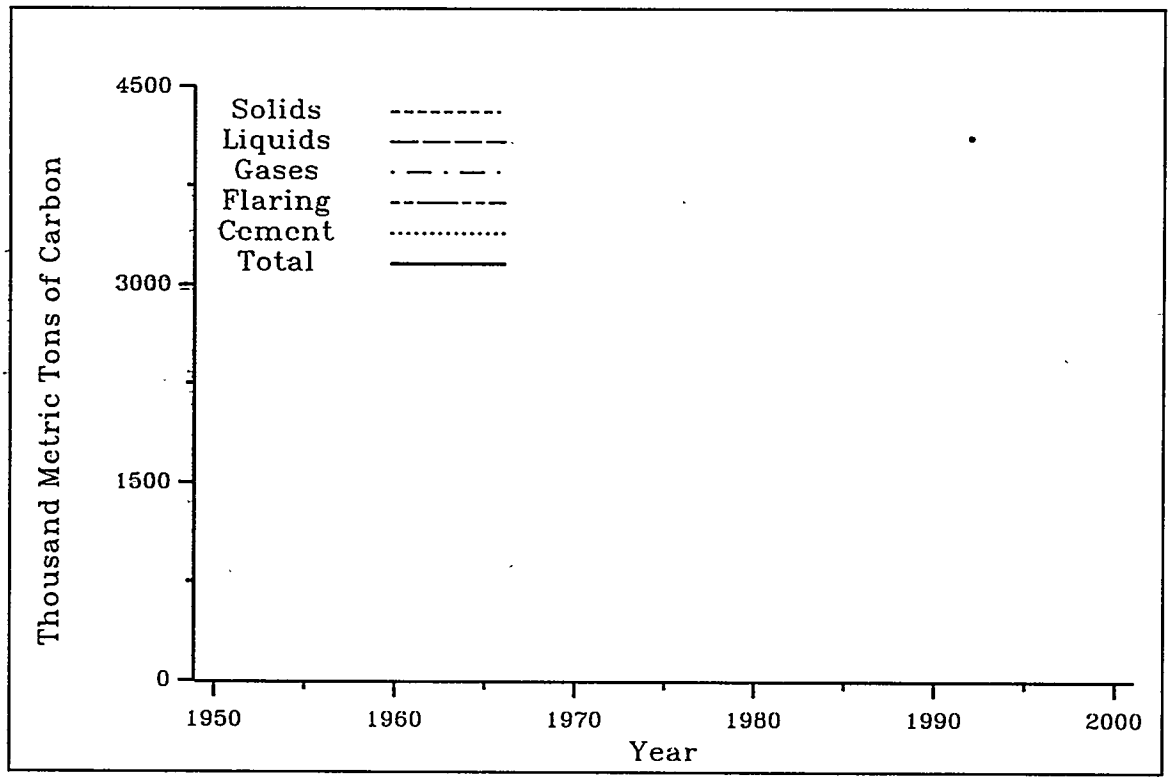


Per capita CO_2 emission rates for Bolivia

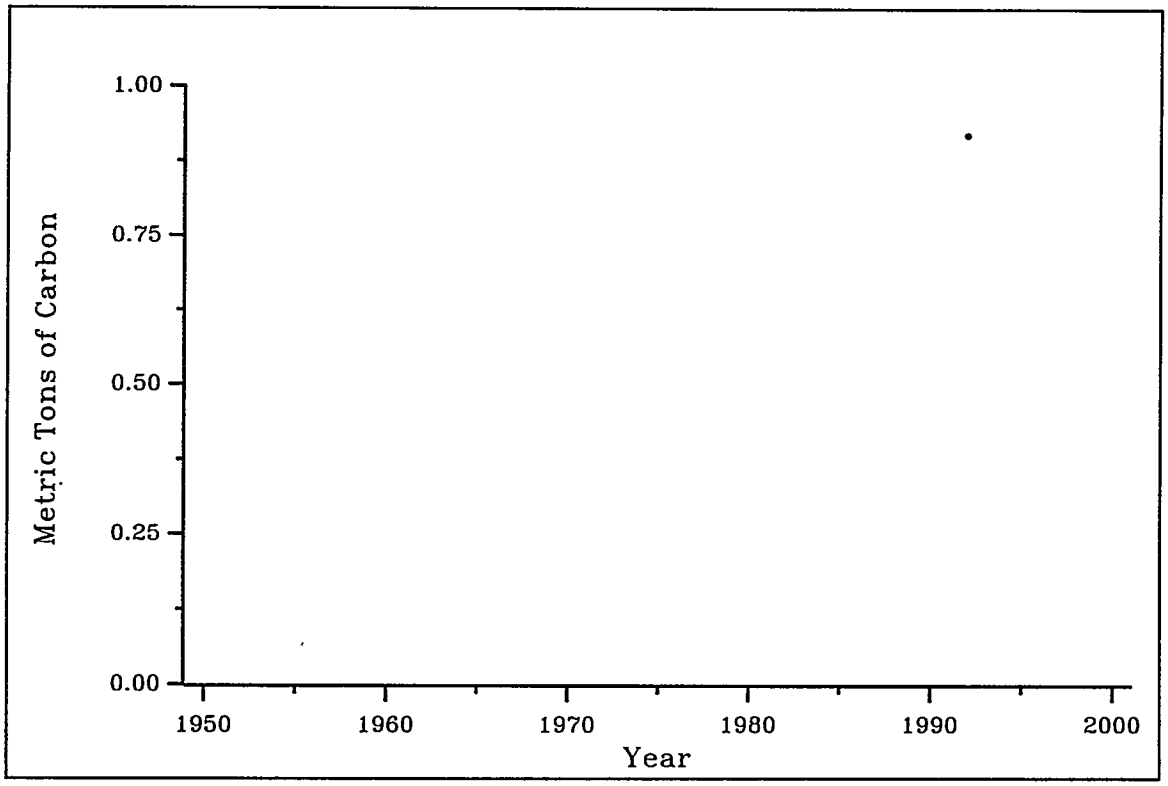
Bolivia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	136	1	130	0	5	0	0.05	.
1951	126	9	112	0	5	0	0.04	.
1952	140	9	126	0	5	0	0.05	.
1953	141	4	133	0	5	0	0.05	.
1954	215	7	204	0	5	0	0.07	.
1955	254	3	243	3	5	0	0.08	.
1956	302	7	287	3	5	0	0.10	.
1957	274	4	264	4	3	0	0.09	.
1958	250	1	243	3	4	0	0.08	.
1959	259	1	251	3	4	0	0.08	.
1960	274	2	264	3	5	0	0.08	.
1961	285	1	254	23	6	0	0.08	.
1962	302	1	272	22	7	0	0.08	.
1963	334	1	302	23	8	0	0.09	.
1964	409	1	332	25	9	43	0.11	.
1965	415	1	359	29	8	18	0.11	.
1966	467	1	400	36	9	21	0.12	.
1967	521	0	433	38	8	42	0.13	.
1968	596	1	474	35	10	76	0.14	.
1969	700	1	481	52	11	156	0.17	.
1970	672	1	488	17	16	150	0.16	.
1971	831	1	505	19	17	289	0.19	.
1972	967	0	552	27	21	368	0.21	.
1973	933	0	585	32	23	293	0.20	.
1974	948	0	635	78	28	207	0.20	.
1975	1095	1	771	68	36	220	0.22	.
1976	1249	0	862	83	30	275	0.25	.
1977	1222	0	904	92	36	190	0.24	.
1978	1370	0	902	176	35	258	0.26	.
1979	1257	1	887	185	34	151	0.23	.
1980	1232	1	908	182	40	102	0.22	.
1981	1245	1	911	184	51	98	0.22	.
1982	1172	1	863	182	44	83	0.20	.
1983	1169	1	863	165	45	95	0.19	.
1984	1101	0	841	127	39	94	0.18	.
1985	1125	0	853	115	52	105	0.18	.
1986	1030	0	785	126	40	79	0.16	.
1987	1098	0	801	165	54	78	0.16	.
1988	1184	0	815	162	62	146	0.17	.
1989	1360	0	833	236	69	223	0.19	.
1990	1501	0	960	253	76	211	0.21	.
1991	1564	0	983	251	80	250	0.21	.
1992	1810	0	1093	337	75	306	0.24	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Bosnia-Herzegovinia

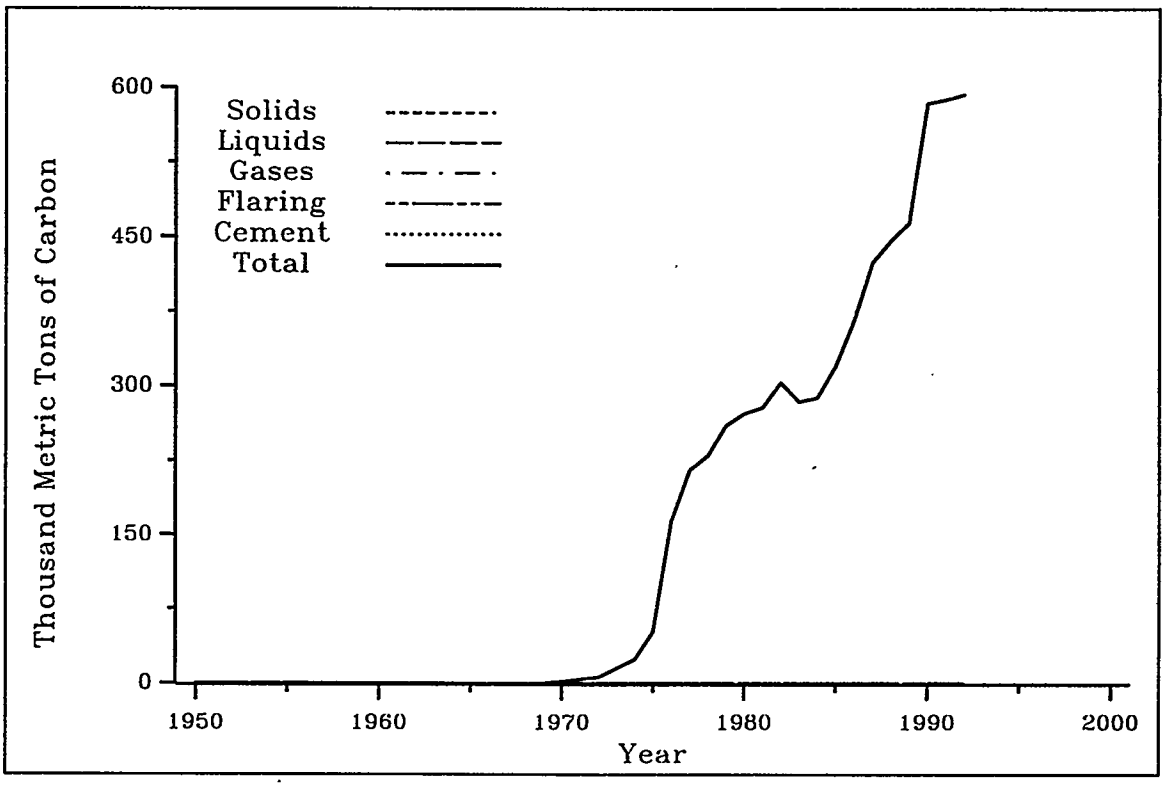


Per capita CO_2 emission rates for Bosnia-Herzegovinia

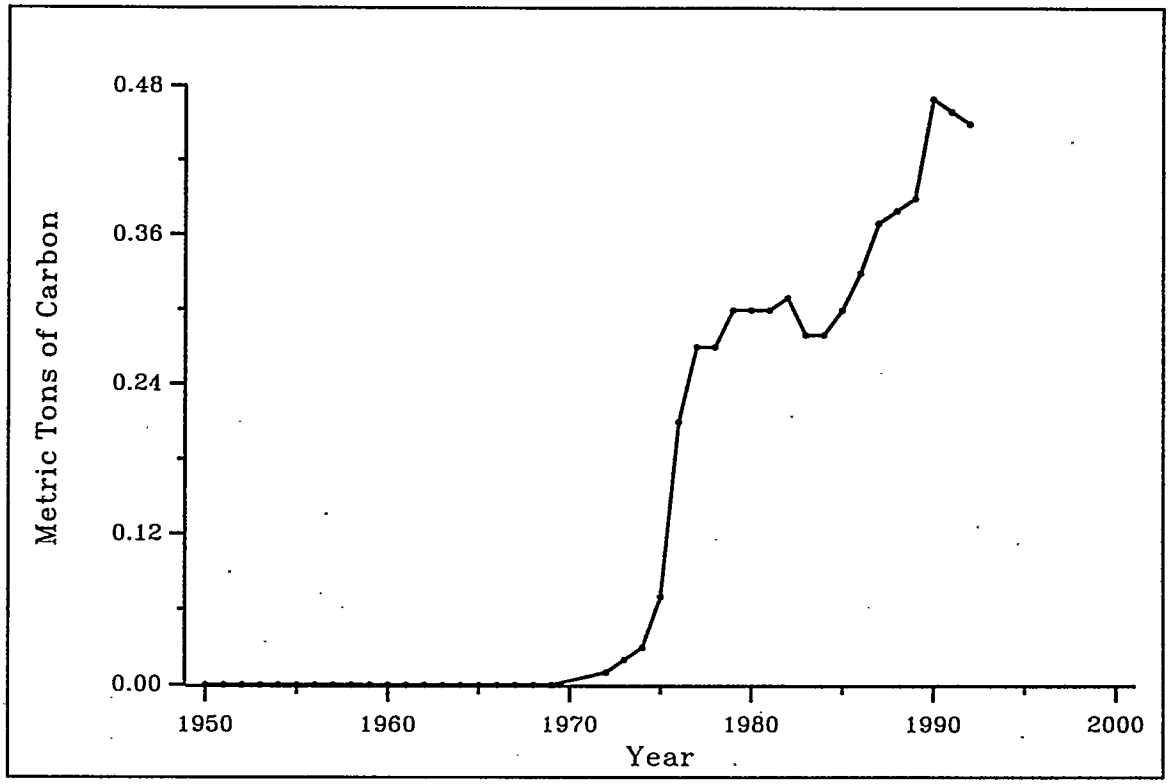
Bosnia-Herzegovinia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	4109	2286	1541	228	54	0	0.92	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Botswana

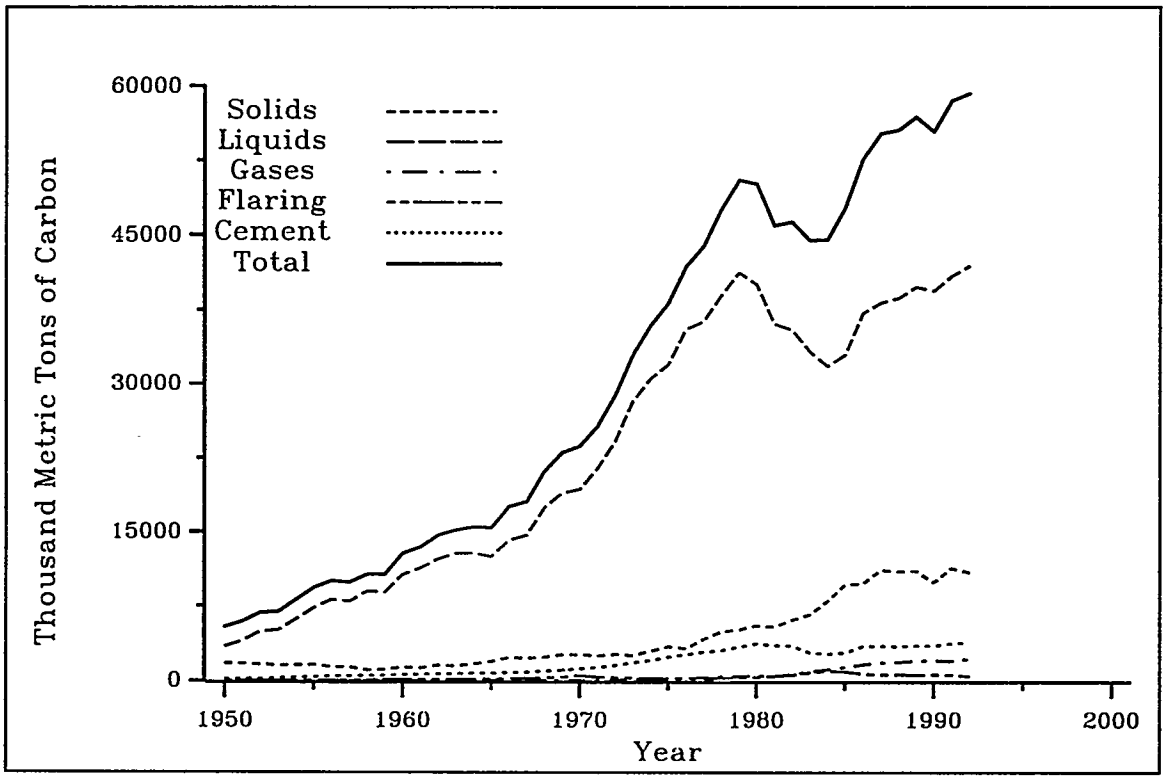


Per capita CO_2 emission rates for Botswana

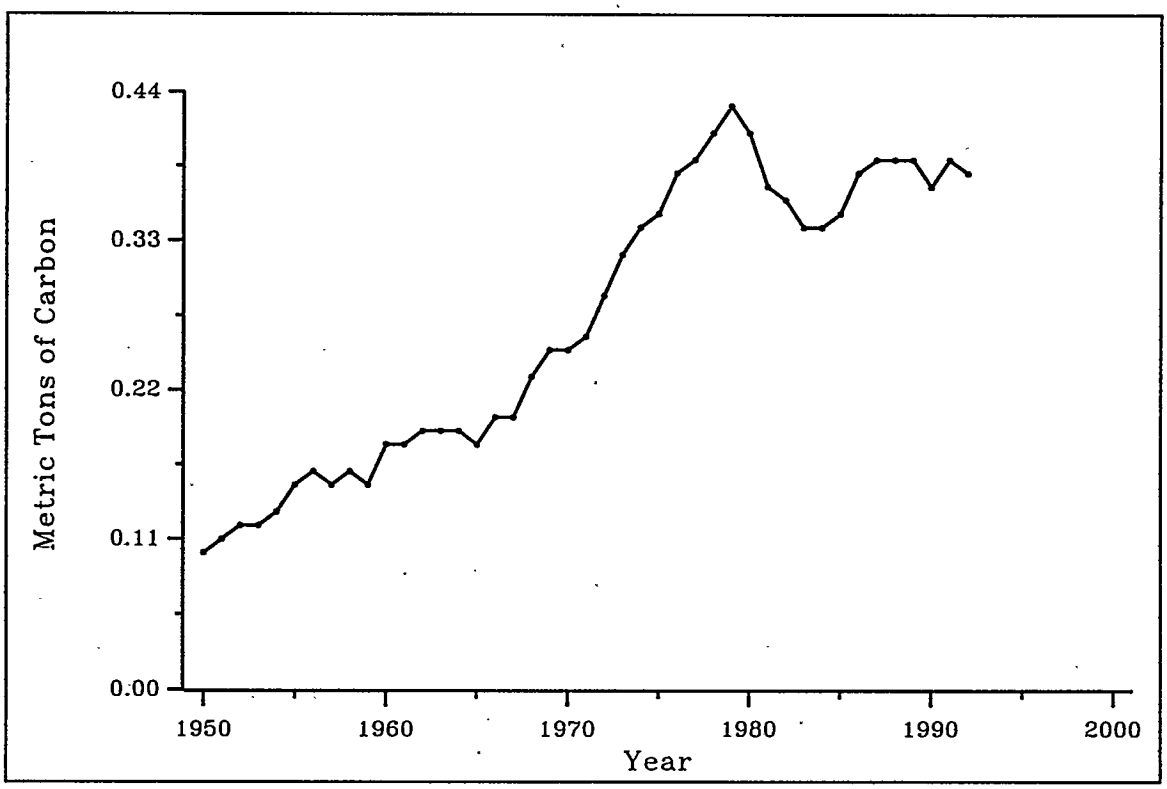
Botswana

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	0	0	0	0	0	0	0.00	.
1953	0	0	0	0	0	0	0.00	.
1954	0	0	0	0	0	0	0.00	.
1955	0	0	0	0	0	0	0.00	.
1956	0	0	0	0	0	0	0.00	.
1957	0	0	0	0	0	0	0.00	.
1958	0	0	0	0	0	0	0.00	.
1959	0	0	0	0	0	0	0.00	.
1960	0	0	0	0	0	0	0.00	.
1961	0	0	0	0	0	0	0.00	.
1962	0	0	0	0	0	0	0.00	.
1963	0	0	0	0	0	0	0.00	.
1964	0	0	0	0	0	0	0.00	.
1965	0	0	0	0	0	0	0.00	.
1966	0	0	0	0	0	0	0.00	.
1967	0	0	0	0	0	0	0.00	.
1968	0	0	0	0	0	0	0.00	.
1969	0	0	0	0	0	0	0.00	.
1970	0	0	0	0	0	0	0.00	.
1971	0	0	0	0	0	0	0.00	.
1972	6	6	0	0	0	0	0.01	.
1973	15	15	0	0	0	0	0.02	.
1974	24	24	0	0	0	0	0.03	.
1975	52	52	0	0	0	0	0.07	.
1976	164	164	0	0	0	0	0.21	.
1977	215	215	0	0	0	0	0.27	.
1978	230	230	0	0	0	0	0.27	.
1979	260	260	0	0	0	0	0.30	.
1980	272	272	0	0	0	0	0.30	.
1981	278	278	0	0	0	0	0.30	.
1982	303	303	0	0	0	0	0.31	.
1983	284	284	0	0	0	0	0.28	.
1984	288	288	0	0	0	0	0.28	.
1985	320	320	0	0	0	0	0.30	.
1986	366	366	0	0	0	0	0.33	.
1987	424	424	0	0	0	0	0.37	.
1988	446	446	0	0	0	0	0.38	.
1989	464	464	0	0	0	0	0.39	.
1990	584	584	0	0	0	0	0.47	.
1991	588	588	0	0	0	0	0.46	.
1992	593	593	0	0	0	0	0.45	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Brazil

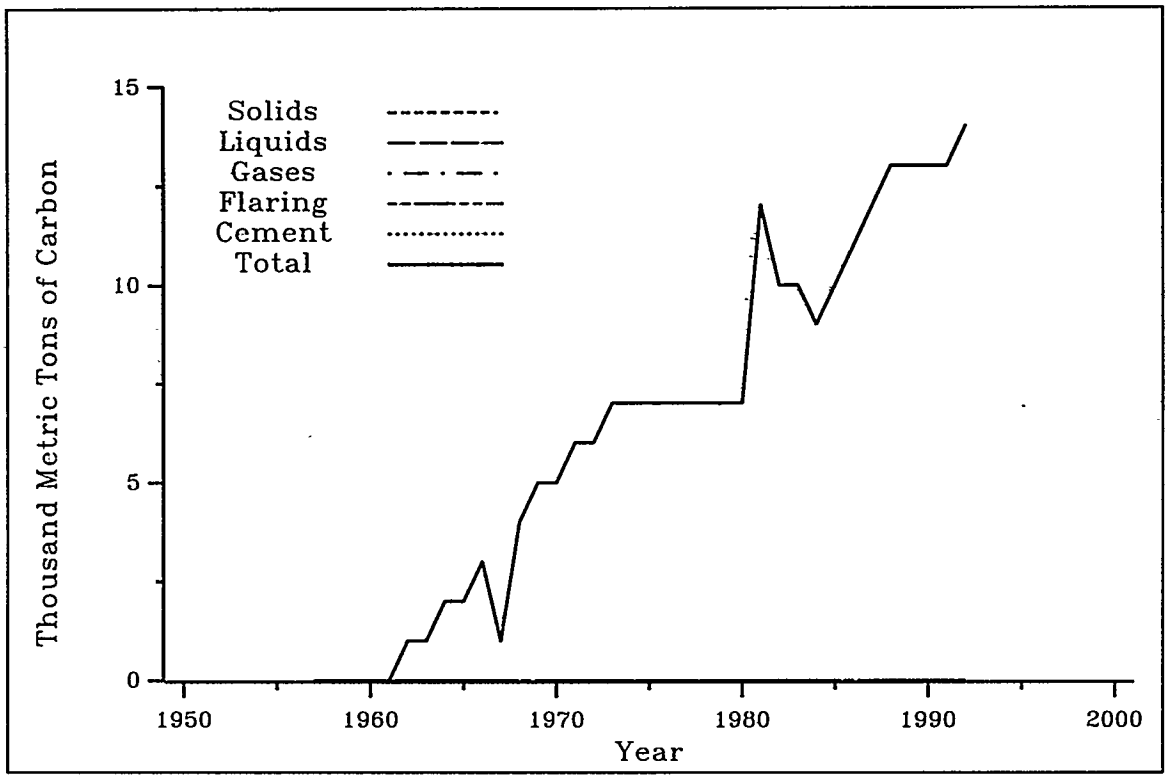


Per capita CO_2 emission rates for Brazil

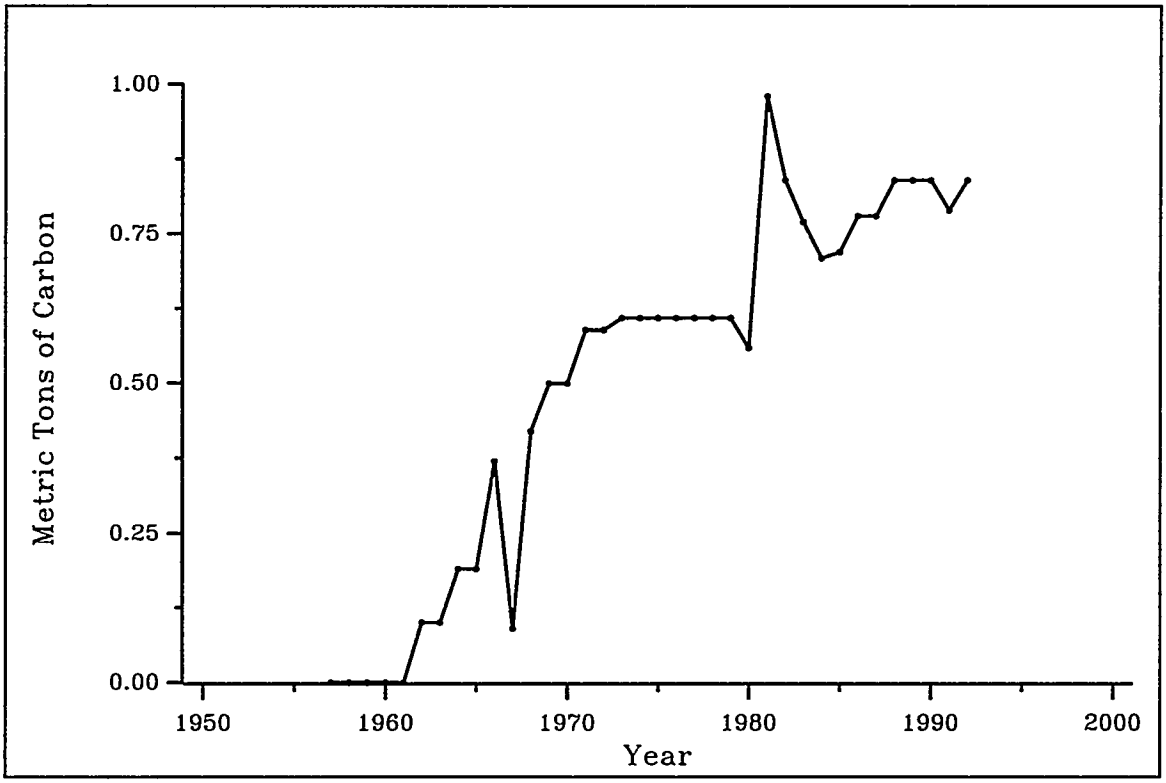
Brazil

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	5387	1763	3433	1	189	2	0.10	.
1951	5933	1733	3997	1	198	4	0.11	.
1952	6826	1659	4943	1	220	4	0.12	.
1953	6903	1551	5060	2	276	14	0.12	.
1954	8120	1589	6155	4	340	34	0.13	.
1955	9308	1619	7276	4	377	33	0.15	.
1956	10011	1400	8116	5	445	45	0.16	.
1957	9838	1388	7930	9	462	49	0.15	.
1958	10676	1091	8967	18	515	85	0.16	.
1959	10667	1134	8863	25	522	122	0.15	.
1960	12808	1370	10649	31	608	149	0.18	.
1961	13432	1292	11318	31	641	150	0.18	.
1962	14661	1565	12235	30	690	142	0.19	.
1963	15184	1497	12803	45	705	135	0.19	.
1964	15492	1703	12828	44	765	152	0.19	.
1965	15402	1917	12490	53	764	177	0.18	.
1966	17563	2310	14153	67	822	211	0.20	.
1967	18076	2243	14663	70	871	230	0.20	.
1968	21141	2356	17462	63	990	270	0.23	.
1969	23023	2600	18947	64	1064	348	0.25	.
1970	23699	2601	19316	42	1224	515	0.25	.
1971	25691	2482	21431	68	1333	377	0.26	.
1972	28761	2648	24156	75	1548	334	0.29	.
1973	32914	2533	28202	103	1822	253	0.32	.
1974	35929	2965	30518	189	2028	229	0.34	.
1975	38169	3414	31950	213	2371	220	0.35	.
1976	41832	3204	35544	250	2604	230	0.38	.
1977	43889	4148	36335	309	2873	224	0.39	.
1978	47545	4900	38933	405	3030	278	0.41	.
1979	50477	5086	41249	445	3383	315	0.43	.
1980	50122	5509	40043	514	3698	357	0.41	.
1981	45932	5387	36065	460	3543	477	0.37	.
1982	46277	6062	35496	650	3488	581	0.36	.
1983	44473	6603	33277	922	2838	833	0.34	.
1984	44520	7946	31769	1138	2685	983	0.34	.
1985	47675	9630	32937	1363	2803	941	0.35	.
1986	52621	9700	37128	1634	3440	718	0.38	.
1987	55186	11111	38184	1812	3464	615	0.39	.
1988	55570	10984	38646	1867	3445	628	0.39	.
1989	56908	11027	39784	1994	3526	577	0.39	.
1990	55419	9865	39399	2025	3515	614	0.37	.
1991	58508	11323	40880	1981	3739	585	0.39	.
1992	59245	10883	41892	2191	3822	457	0.38	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the British Virgin Islands

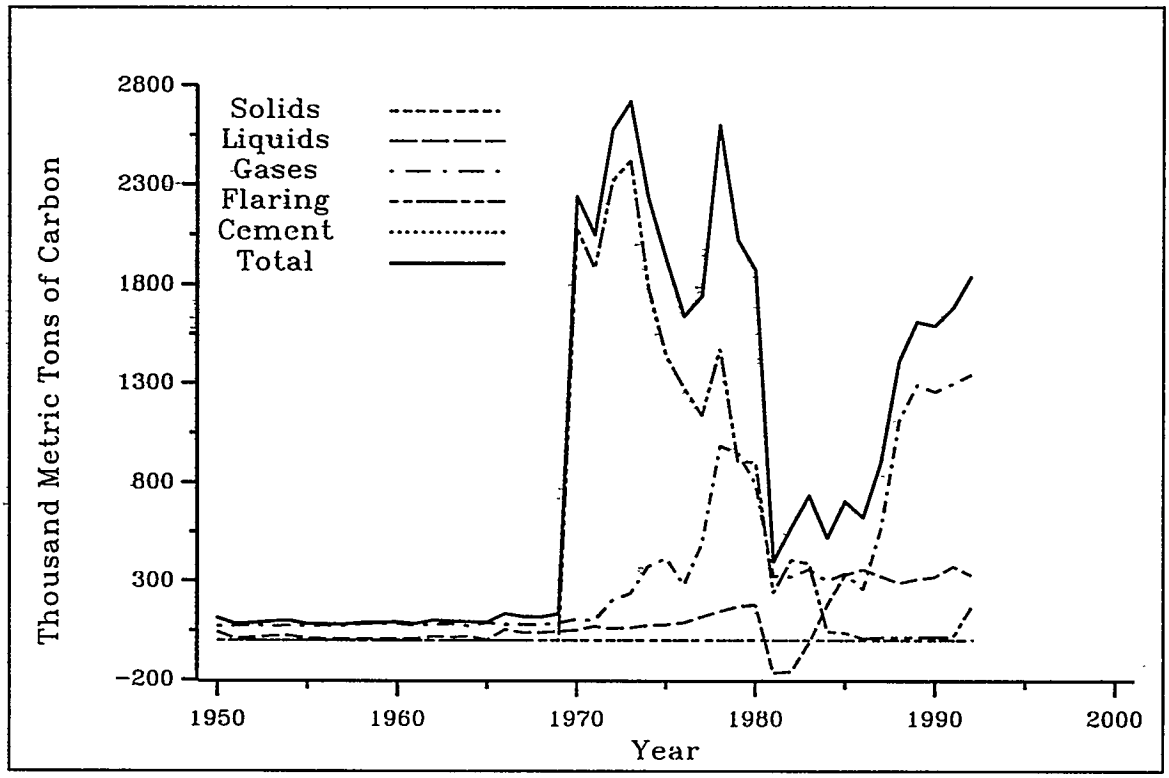


Per capita CO_2 emission rates for the British Virgin Islands

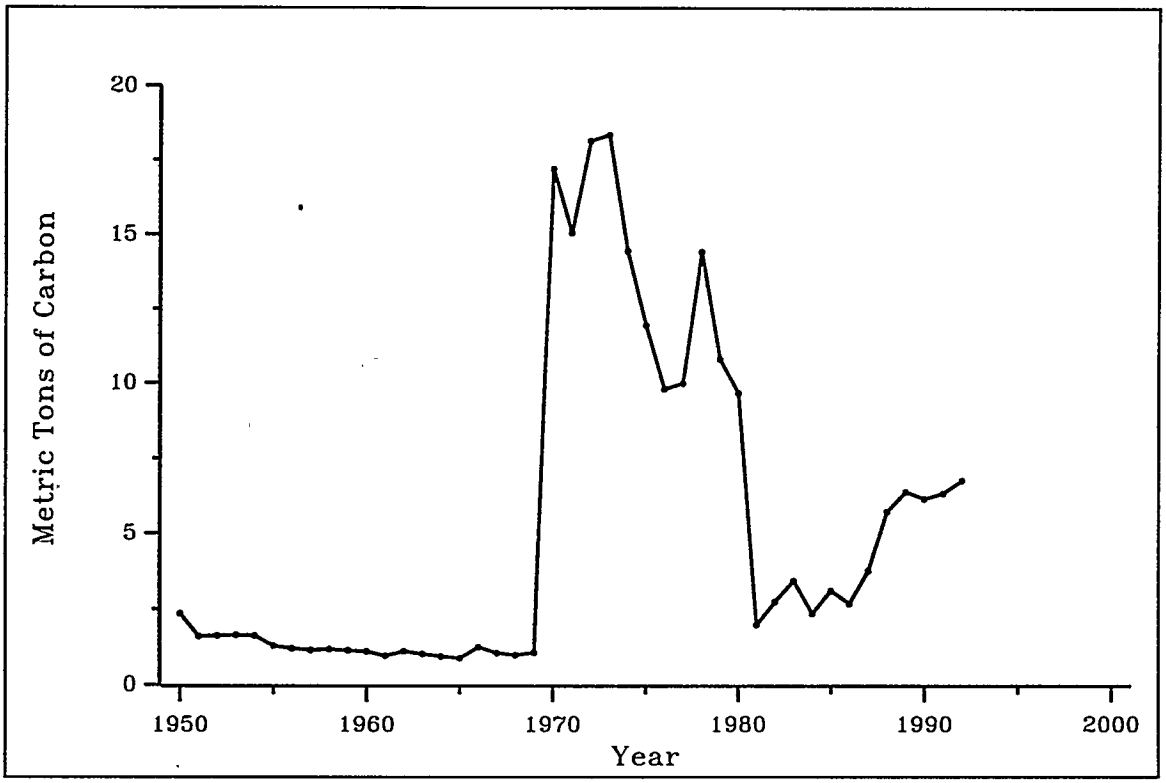
British Virgin Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1957	0	0	0	0	0	0	0.00	.
1958	0	0	0	0	0	0	0.00	.
1959	0	0	0	0	0	0	0.00	.
1960	0	0	0	0	0	0	0.00	.
1961	0	0	0	0	0	0	0.00	.
1962	1	0	1	0	0	0	0.10	.
1963	1	0	1	0	0	0	0.10	.
1964	2	0	2	0	0	0	0.19	.
1965	2	0	2	0	0	0	0.19	.
1966	3	0	3	0	0	0	0.37	.
1967	1	0	1	0	0	0	0.09	.
1968	4	0	4	0	0	0	0.42	.
1969	5	0	5	0	0	0	0.50	.
1970	5	0	5	0	0	0	0.50	.
1971	6	0	6	0	0	0	0.59	.
1972	6	0	6	0	0	0	0.59	.
1973	7	0	7	0	0	0	0.61	.
1974	7	0	7	0	0	0	0.61	.
1975	7	0	7	0	0	0	0.61	.
1976	7	0	7	0	0	0	0.61	.
1977	7	0	7	0	0	0	0.61	.
1978	7	0	7	0	0	0	0.61	.
1979	7	0	7	0	0	0	0.61	.
1980	7	0	7	0	0	0	0.56	.
1981	12	0	12	0	0	0	0.98	.
1982	10	0	10	0	0	0	0.84	.
1983	10	0	10	0	0	0	0.77	.
1984	9	0	9	0	0	0	0.71	.
1985	10	0	10	0	0	0	0.72	.
1986	11	0	11	0	0	0	0.78	.
1987	12	0	12	0	0	0	0.78	.
1988	13	0	13	0	0	0	0.84	.
1989	13	0	13	0	0	0	0.84	.
1990	13	0	13	0	0	0	0.84	.
1991	13	0	13	0	0	0	0.79	.
1992	14	0	14	0	0	0	0.84	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Brunei Darussalam

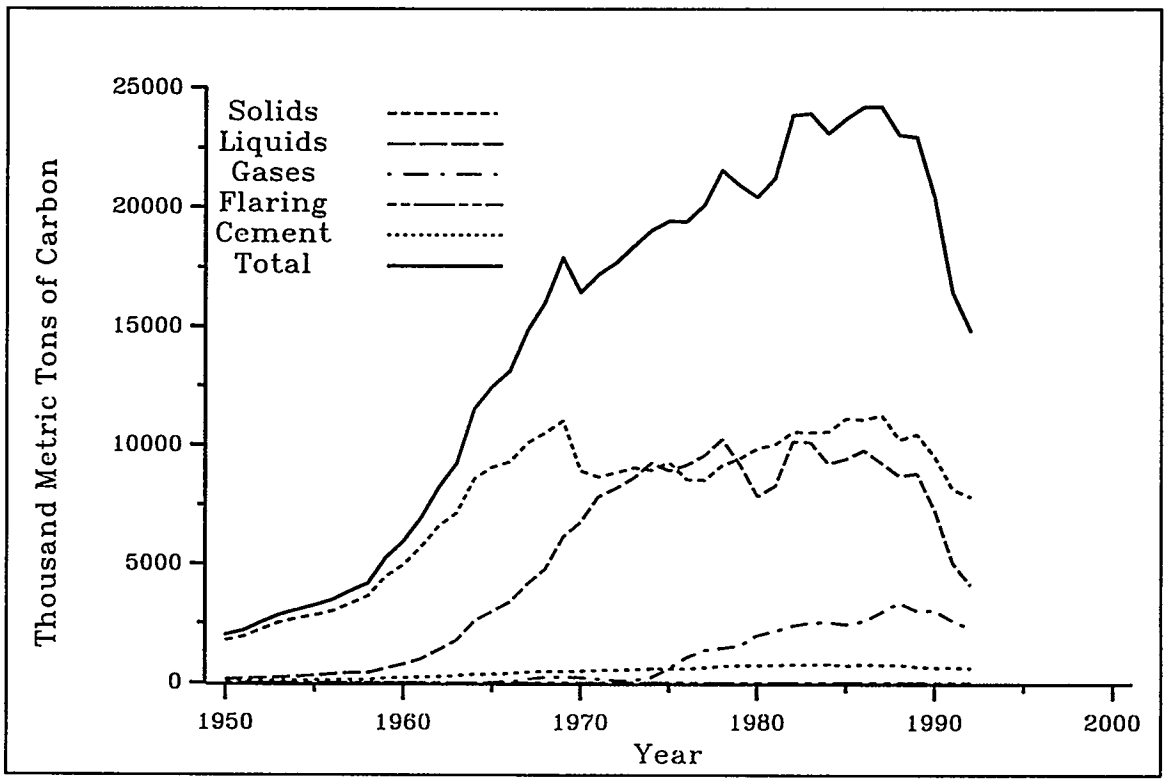


Per capita CO_2 emission rates for Brunei Darussalam

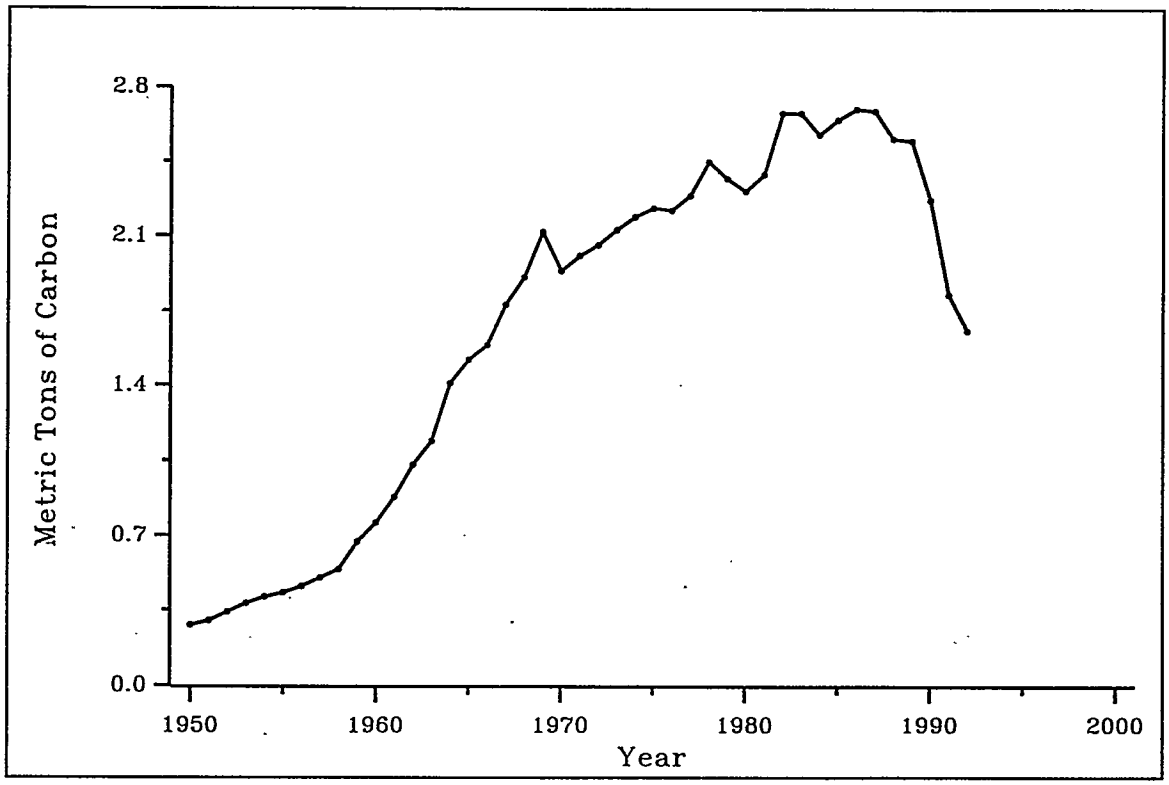
Brunei Darussalam

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	113	0	42	71	0	0	2.35	.
1951	82	0	9	73	0	0	1.61	.
1952	88	0	14	74	0	0	1.63	.
1953	94	0	21	73	0	0	1.65	.
1954	98	0	23	74	0	0	1.63	.
1955	82	0	9	73	0	0	1.30	.
1956	81	0	8	74	0	0	1.21	.
1957	80	0	8	72	0	0	1.15	.
1958	87	0	6	82	0	0	1.18	.
1959	89	0	8	82	0	0	1.14	.
1960	91	0	8	83	0	0	1.11	.
1961	83	0	8	75	0	0	0.97	.
1962	101	0	20	80	0	0	1.12	.
1963	97	0	15	82	0	0	1.03	.
1964	93	0	20	73	0	0	0.95	.
1965	91	0	3	89	0	0	0.89	.
1966	134	0	55	79	0	0	1.25	.
1967	120	0	39	80	0	0	1.06	.
1968	117	0	39	78	0	0	0.99	.
1969	133	0	45	88	0	0	1.07	.
1970	2238	0	51	106	0	2081	17.21	.
1971	2049	0	70	99	0	1880	15.07	.
1972	2579	0	59	201	0	2319	18.16	.
1973	2718	0	64	235	0	2420	18.36	.
1974	2227	0	75	373	0	1780	14.46	.
1975	1927	0	78	414	0	1435	11.97	.
1976	1639	0	89	279	0	1271	9.82	.
1977	1741	0	118	488	0	1135	10.01	.
1978	2598	0	145	983	0	1471	14.44	.
1979	2024	0	170	948	0	907	10.83	.
1980	1871	1	178	792	0	900	9.69	.
1981	398	0	-164	323	0	239	1.99	.
1982	569	0	-158	321	0	405	2.75	.
1983	733	0	-13	358	0	388	3.44	.
1984	519	0	176	299	0	44	2.36	.
1985	704	0	330	337	0	37	3.11	.
1986	623	0	357	257	0	9	2.69	.
1987	902	0	322	567	0	14	3.77	.
1988	1409	0	287	1109	0	14	5.75	.
1989	1608	0	307	1288	0	14	6.41	.
1990	1588	0	319	1253	0	16	6.18	.
1991	1680	0	372	1295	0	14	6.36	.
1992	1834	0	328	1340	0	165	6.79	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Bulgaria

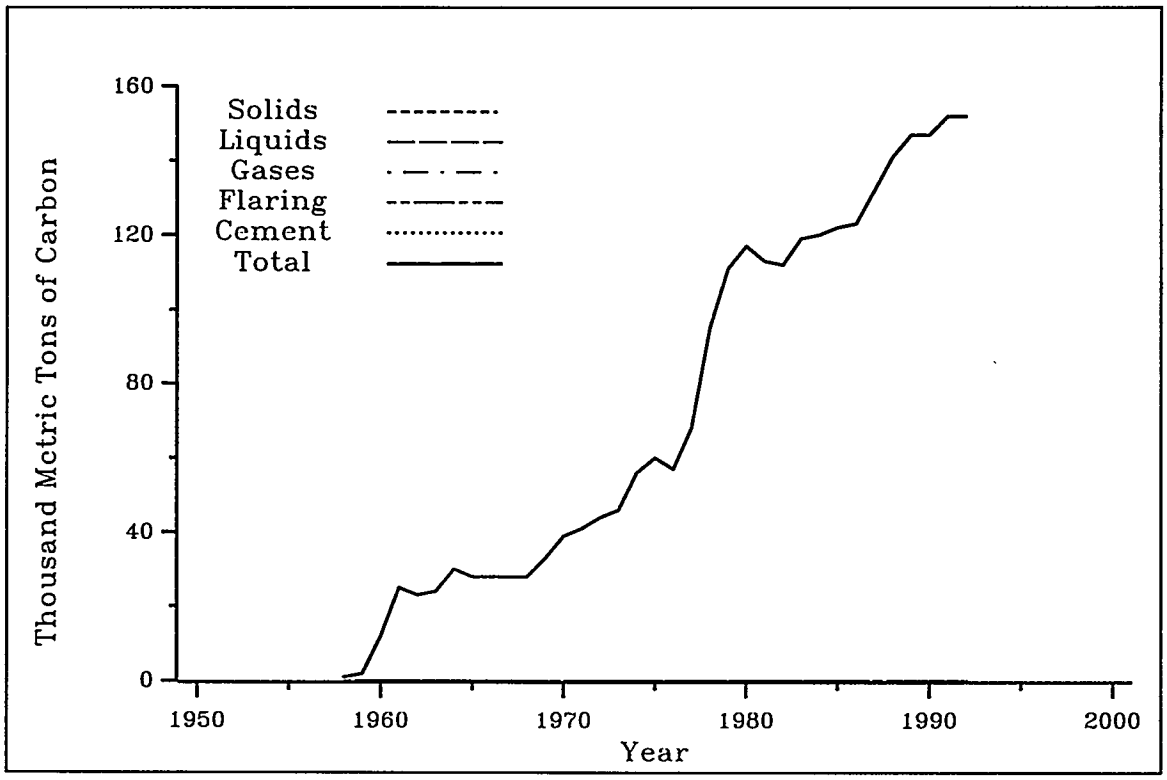


Per capita CO_2 emission rates for Bulgaria

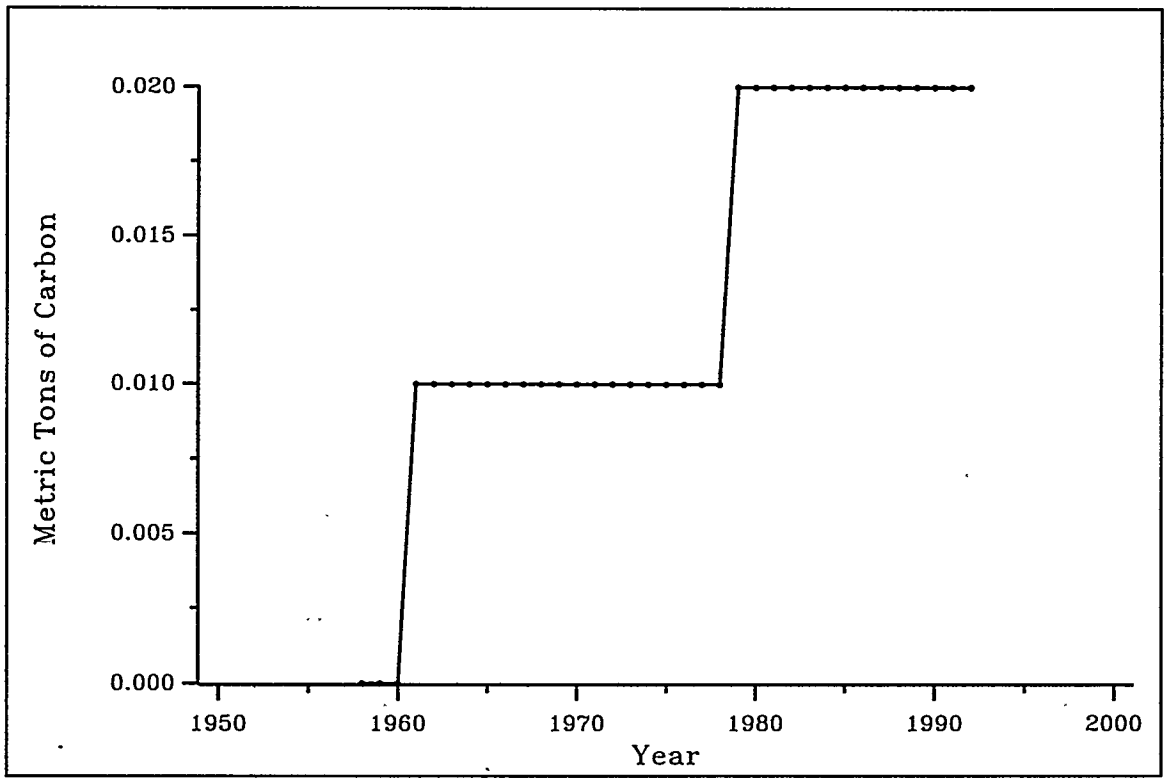
Bulgaria

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1999	1769	148	0	82	0	0.28	.
1951	2179	1921	172	0	86	0	0.30	.
1952	2515	2227	197	0	92	0	0.34	.
1953	2824	2506	223	0	95	0	0.38	.
1954	3040	2681	253	0	106	0	0.41	.
1955	3227	2815	301	0	110	0	0.43	.
1956	3461	2982	363	0	117	0	0.46	.
1957	3842	3295	427	0	120	0	0.50	.
1958	4173	3624	421	0	127	0	0.54	.
1959	5245	4449	601	0	195	0	0.67	.
1960	5956	4960	780	0	216	0	0.76	.
1961	6950	5715	996	0	238	0	0.88	.
1962	8234	6601	1376	0	257	0	1.03	.
1963	9229	7155	1774	0	300	0	1.14	.
1964	11511	8587	2572	0	352	0	1.41	.
1965	12448	9073	2976	34	365	0	1.52	.
1966	13118	9301	3377	51	388	0	1.59	.
1967	14847	10092	4143	155	456	0	1.78	.
1968	16023	10514	4792	239	478	0	1.91	.
1969	17892	11018	6143	248	483	0	2.12	.
1970	16440	8929	6788	225	499	0	1.94	.
1971	17201	8675	7844	155	528	0	2.01	.
1972	17692	8855	8201	104	532	0	2.06	.
1973	18370	9059	8637	105	568	0	2.13	.
1974	19037	8961	9262	229	584	0	2.19	.
1975	19425	9287	8938	607	593	0	2.23	.
1976	19401	8564	9182	1062	593	0	2.22	.
1977	20108	8543	9576	1355	634	0	2.29	.
1978	21558	9164	10248	1445	700	0	2.45	.
1979	20925	9445	9200	1546	735	0	2.37	.
1980	20436	9873	7857	1978	729	0	2.31	.
1981	21227	10033	8299	2154	740	0	2.39	.
1982	23866	10555	10160	2388	764	0	2.68	.
1983	23929	10532	10119	2511	768	0	2.68	.
1984	23106	10566	9226	2536	778	0	2.58	.
1985	23708	11115	9430	2443	720	0	2.65	.
1986	24197	11063	9783	2575	775	0	2.70	.
1987	24216	11268	9257	2943	747	0	2.69	.
1988	23043	10231	8712	3347	753	0	2.56	.
1989	22940	10444	8812	3008	676	0	2.55	.
1990	20432	9508	7255	3033	637	0	2.27	.
1991	16445	8157	5051	2595	642	0	1.83	.
1992	14836	7829	4104	2286	617	0	1.66	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Burkina Faso

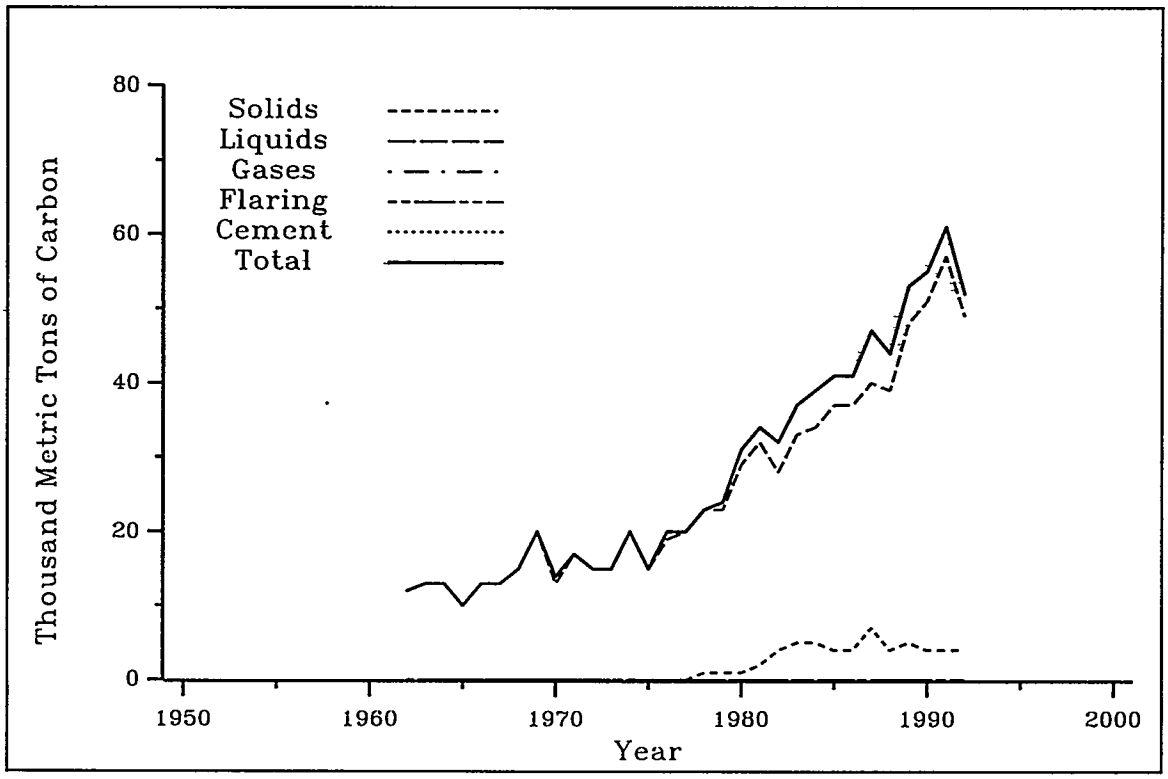


Per capita CO_2 emission rates for Burkina Faso

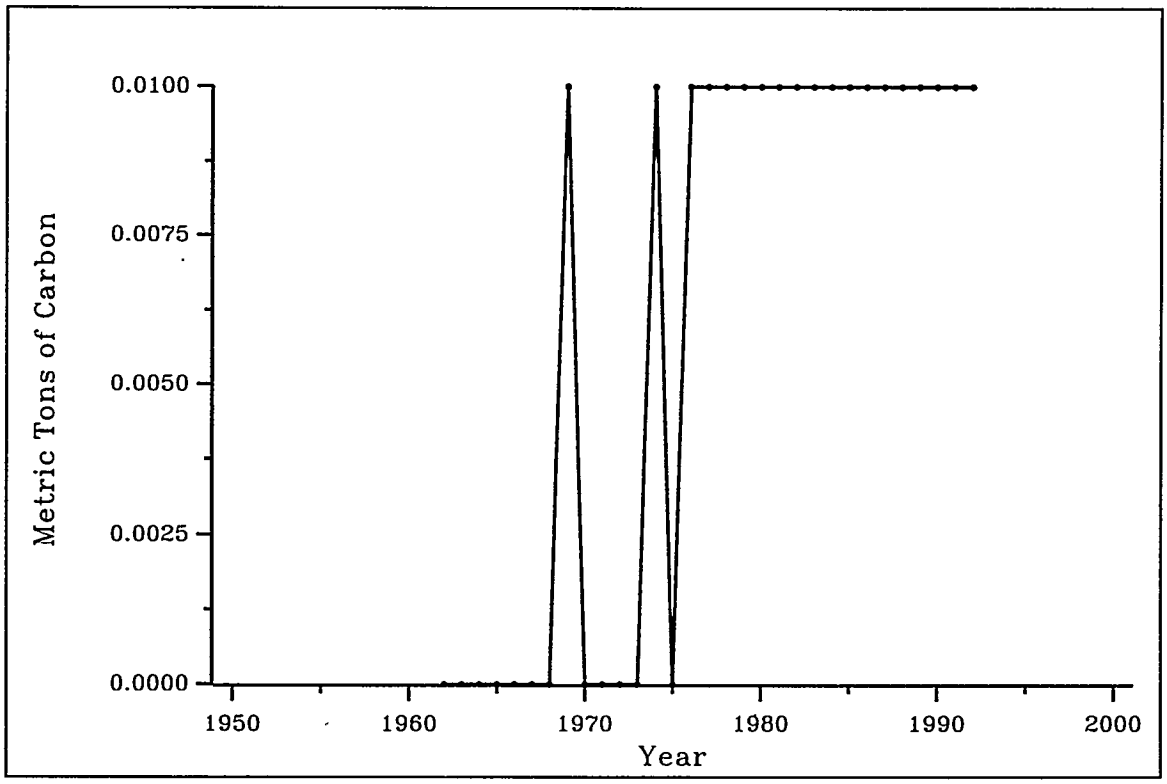
Burkina Faso

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1958	1	0	1	0	0	0	0.00	.
1959	2	0	2	0	0	0	0.00	.
1960	12	0	12	0	0	0	0.00	.
1961	25	0	25	0	0	0	0.01	.
1962	23	0	23	0	0	0	0.01	.
1963	24	0	24	0	0	0	0.01	.
1964	30	0	30	0	0	0	0.01	.
1965	28	0	28	0	0	0	0.01	.
1966	28	0	28	0	0	0	0.01	.
1967	28	0	28	0	0	0	0.01	.
1968	28	0	28	0	0	0	0.01	.
1969	33	0	33	0	0	0	0.01	.
1970	39	0	39	0	0	0	0.01	.
1971	41	0	41	0	0	0	0.01	.
1972	44	0	44	0	0	0	0.01	.
1973	46	0	46	0	0	0	0.01	.
1974	56	0	56	0	0	0	0.01	.
1975	60	0	60	0	0	0	0.01	.
1976	57	0	57	0	0	0	0.01	.
1977	68	0	68	0	0	0	0.01	.
1978	95	0	95	0	0	0	0.01	.
1979	111	0	111	0	0	0	0.02	.
1980	117	0	117	0	0	0	0.02	.
1981	113	0	113	0	0	0	0.02	.
1982	112	0	112	0	0	0	0.02	.
1983	119	0	119	0	0	0	0.02	.
1984	120	0	120	0	0	0	0.02	.
1985	122	0	122	0	0	0	0.02	.
1986	123	0	123	0	0	0	0.02	.
1987	132	0	132	0	0	0	0.02	.
1988	141	0	141	0	0	0	0.02	.
1989	147	0	147	0	0	0	0.02	.
1990	147	0	147	0	0	0	0.02	.
1991	152	0	152	0	0	0	0.02	.
1992	152	0	152	0	0	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Burundi

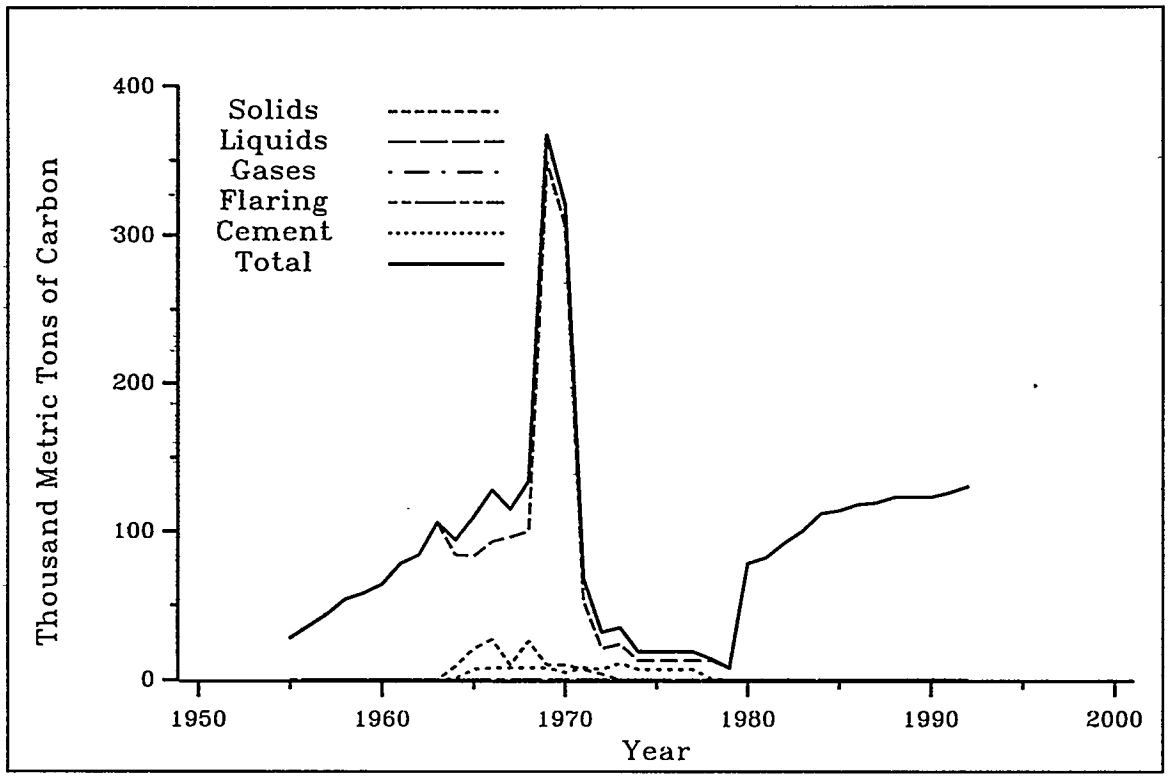


Per capita CO_2 emission rates for Burundi

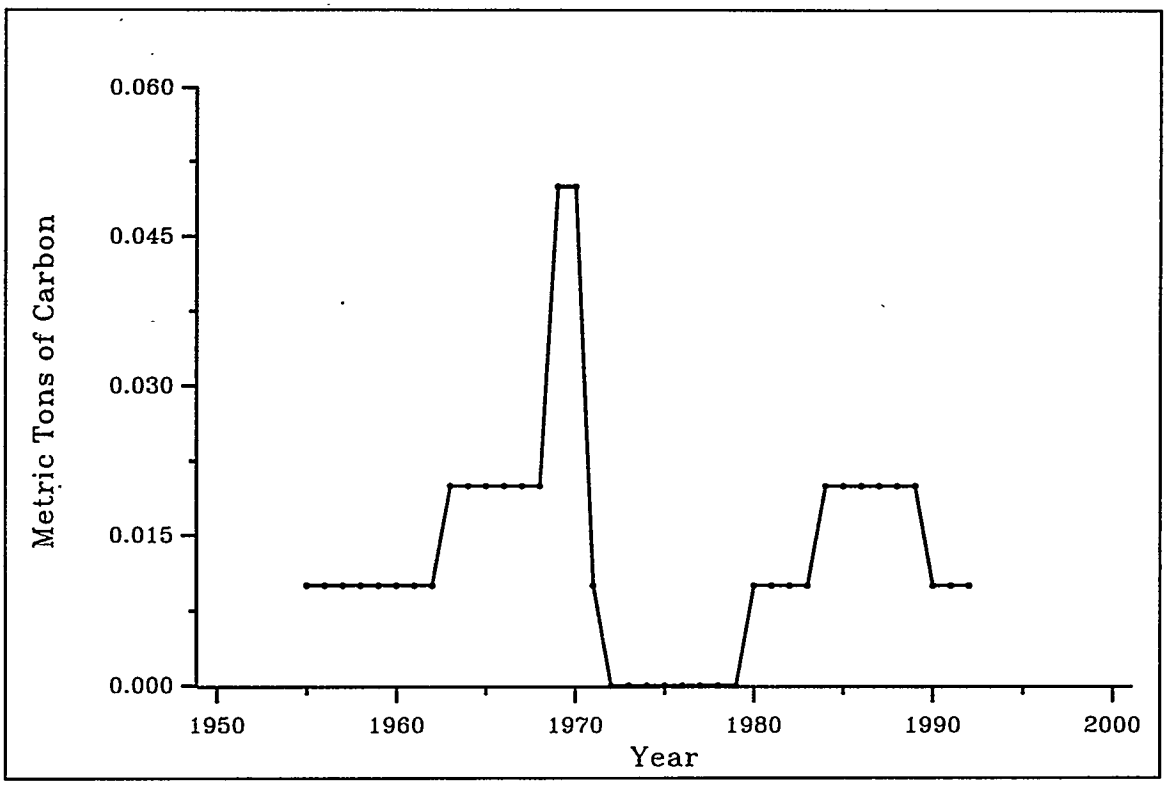
Burundi

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1962	12	0	12	0	0	0	0.00	.
1963	13	0	13	0	0	0	0.00	.
1964	13	0	13	0	0	0	0.00	.
1965	10	0	10	0	0	0	0.00	.
1966	13	0	13	0	0	0	0.00	.
1967	13	0	13	0	0	0	0.00	.
1968	15	0	15	0	0	0	0.00	.
1969	20	0	20	0	0	0	0.01	.
1970	14	0	13	0	0	0	0.00	.
1971	17	0	17	0	0	0	0.00	.
1972	15	0	15	0	0	0	0.00	.
1973	15	0	15	0	0	0	0.00	.
1974	20	0	20	0	0	0	0.01	.
1975	15	0	15	0	0	0	0.00	.
1976	20	0	19	0	0	0	0.01	.
1977	20	0	20	0	0	0	0.01	.
1978	23	1	23	0	0	0	0.01	.
1979	24	1	23	0	0	0	0.01	.
1980	31	1	29	0	0	0	0.01	.
1981	34	2	32	0	0	0	0.01	.
1982	32	4	28	0	0	0	0.01	.
1983	37	5	33	0	0	0	0.01	.
1984	39	5	34	0	0	0	0.01	.
1985	41	4	37	0	0	0	0.01	.
1986	41	4	37	0	0	0	0.01	.
1987	47	7	40	0	0	0	0.01	.
1988	44	4	39	0	0	0	0.01	.
1989	53	5	48	0	0	0	0.01	.
1990	55	4	51	0	0	0	0.01	.
1991	61	4	57	0	0	0	0.01	.
1992	52	4	49	0	0	0	0.01	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Cambodia

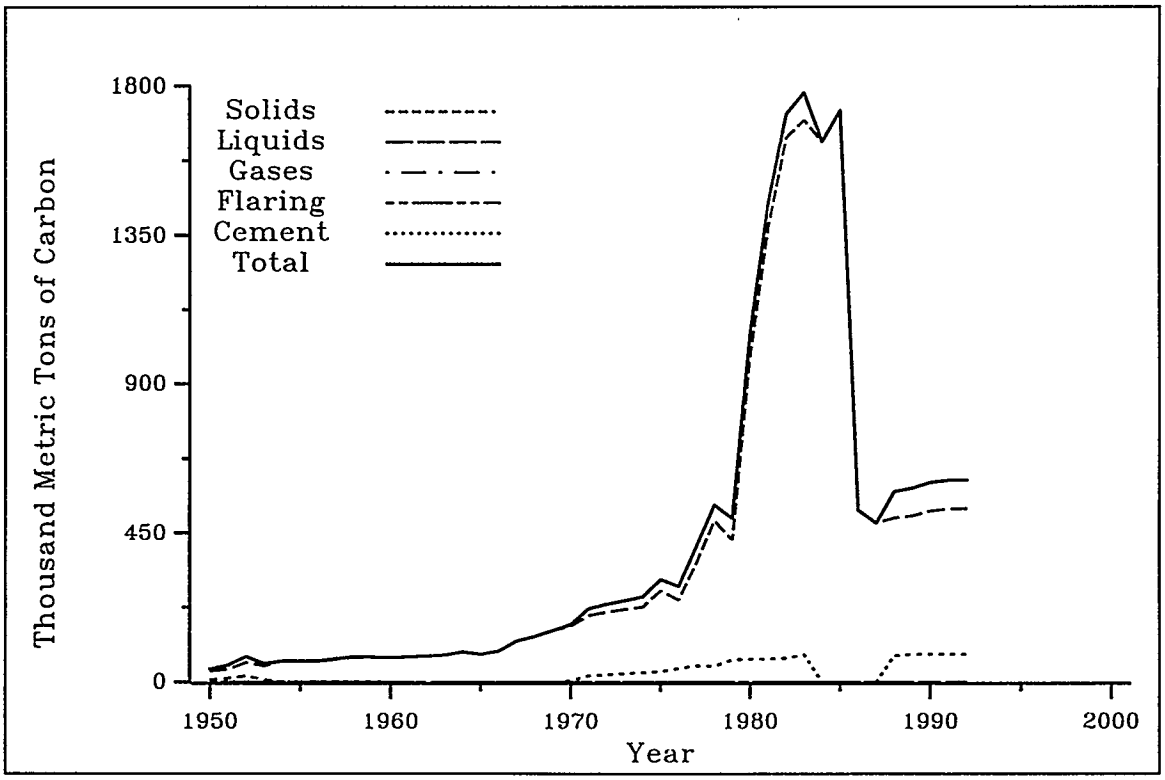


Per capita CO_2 emission rates for Cambodia

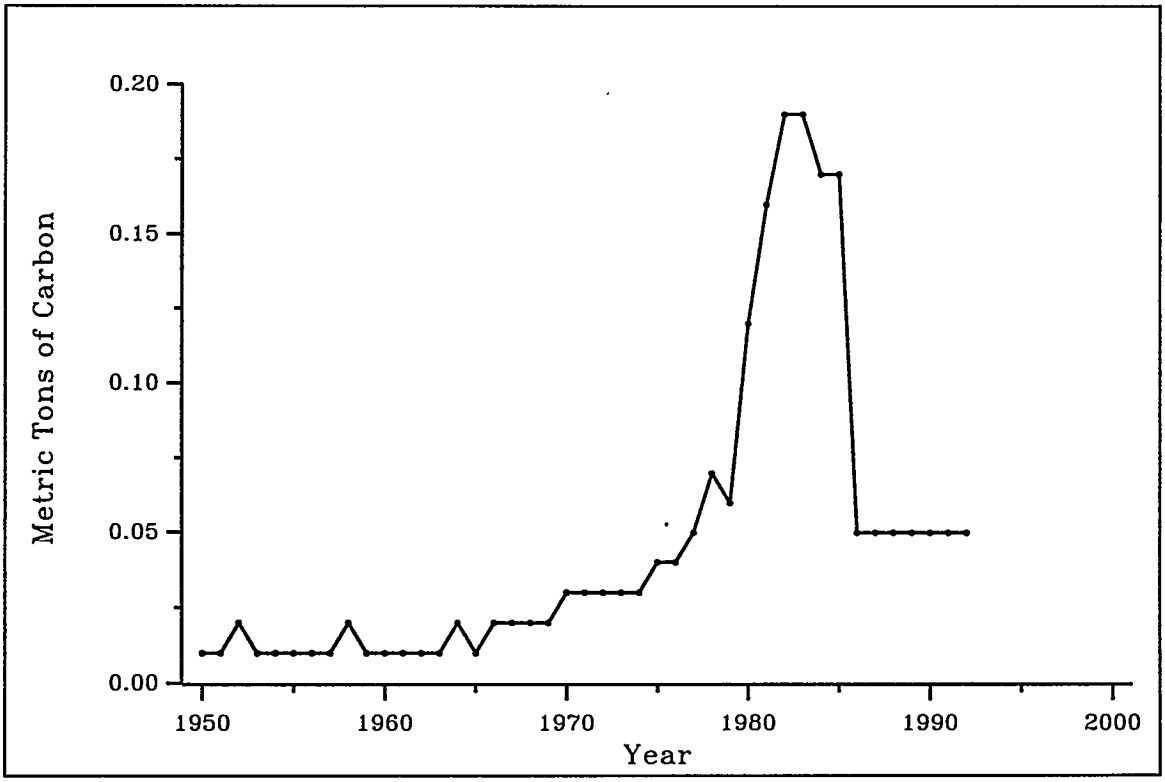
Cambodia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1955	28	0	28	0	0	0	0.01	.
1956	36	0	36	0	0	0	0.01	.
1957	44	0	44	0	0	0	0.01	.
1958	54	0	54	0	0	0	0.01	.
1959	58	0	58	0	0	0	0.01	.
1960	64	0	64	0	0	0	0.01	.
1961	78	0	78	0	0	0	0.01	.
1962	84	0	84	0	0	0	0.01	.
1963	106	0	106	0	0	0	0.02	.
1964	94	9	84	0	1	0	0.02	.
1965	110	21	83	0	7	0	0.02	.
1966	128	27	93	0	8	0	0.02	.
1967	115	10	96	0	8	0	0.02	.
1968	134	26	100	0	8	0	0.02	.
1969	367	10	349	0	8	0	0.05	.
1970	320	10	306	0	5	0	0.05	.
1971	68	7	53	0	8	0	0.01	.
1972	32	4	21	0	7	0	0.00	.
1973	35	0	24	0	11	0	0.00	.
1974	19	0	13	0	7	0	0.00	.
1975	19	0	13	0	7	0	0.00	.
1976	19	0	13	0	7	0	0.00	.
1977	19	0	13	0	7	0	0.00	.
1978	14	0	13	0	1	0	0.00	.
1979	8	0	8	0	0	0	0.00	.
1980	78	0	78	0	0	0	0.01	.
1981	82	0	82	0	0	0	0.01	.
1982	92	0	92	0	0	0	0.01	.
1983	100	0	100	0	0	0	0.01	.
1984	112	0	112	0	0	0	0.02	.
1985	114	0	114	0	0	0	0.02	.
1986	118	0	118	0	0	0	0.02	.
1987	119	0	119	0	0	0	0.02	.
1988	123	0	123	0	0	0	0.02	.
1989	123	0	123	0	0	0	0.02	.
1990	123	0	123	0	0	0	0.01	.
1991	126	0	126	0	0	0	0.01	.
1992	130	0	130	0	0	0	0.01	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Republic of Cameroon

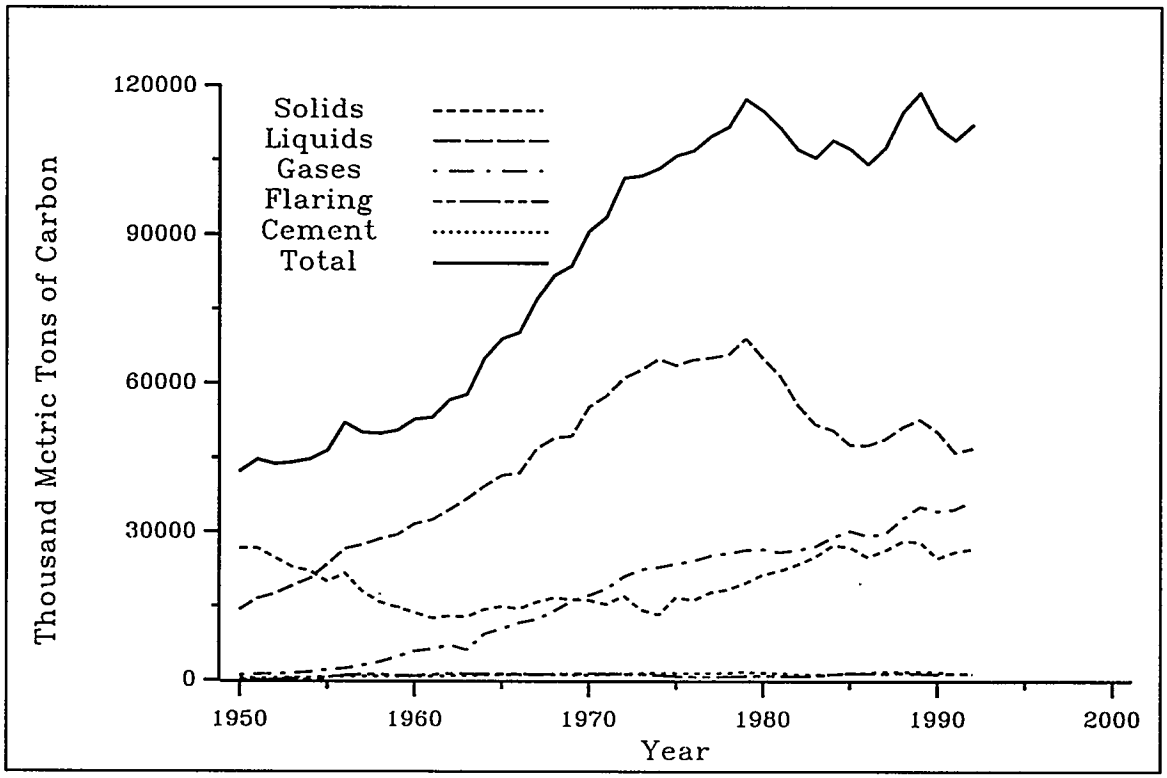


Per capita CO_2 emission rates for the Republic of Cameroon

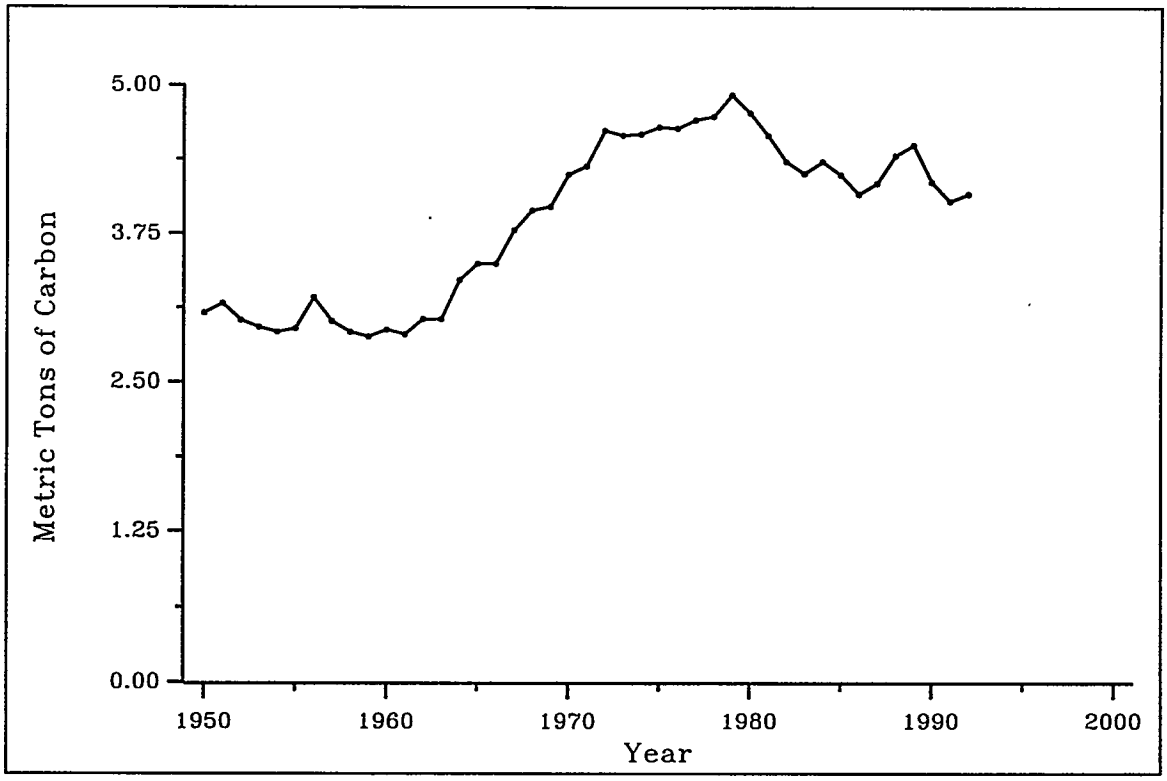
Republic of Cameroon

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	39	6	33	0	0	0	0.01	.
1951	50	11	39	0	0	0	0.01	.
1952	77	18	59	0	0	0	0.02	.
1953	55	7	49	0	0	0	0.01	.
1954	63	0	63	0	0	0	0.01	.
1955	63	0	63	0	1	0	0.01	.
1956	64	1	62	0	2	0	0.01	.
1957	71	1	69	0	2	0	0.01	.
1958	77	1	75	0	2	0	0.02	.
1959	76	0	75	0	2	0	0.01	.
1960	74	1	73	0	0	0	0.01	.
1961	77	1	76	0	0	0	0.01	.
1962	79	0	79	0	0	0	0.01	.
1963	82	0	82	0	0	0	0.01	.
1964	92	0	92	0	0	0	0.02	.
1965	85	0	85	0	0	0	0.01	.
1966	94	0	94	0	0	0	0.02	.
1967	125	1	125	0	0	0	0.02	.
1968	138	1	137	0	0	0	0.02	.
1969	156	1	156	0	0	0	0.02	.
1970	174	1	169	0	4	0	0.03	.
1971	221	1	201	0	19	0	0.03	.
1972	235	1	211	0	23	0	0.03	.
1973	245	1	219	0	26	0	0.03	.
1974	256	1	226	0	29	0	0.03	.
1975	309	1	275	0	32	0	0.04	.
1976	288	0	247	0	41	0	0.04	.
1977	409	0	360	0	49	0	0.05	.
1978	535	0	487	0	48	0	0.07	.
1979	495	0	429	0	67	0	0.06	.
1980	1057	0	988	0	69	0	0.12	.
1981	1446	1	1375	0	70	0	0.16	.
1982	1715	1	1643	0	72	0	0.19	.
1983	1780	1	1696	0	83	0	0.19	.
1984	1632	1	1631	0	0	0	0.17	.
1985	1725	1	1723	0	0	0	0.17	.
1986	520	1	519	0	0	0	0.05	.
1987	480	1	480	0	0	0	0.05	.
1988	576	1	496	0	80	0	0.05	.
1989	586	1	502	0	84	0	0.05	.
1990	603	1	517	0	85	0	0.05	.
1991	609	1	523	0	85	0	0.05	.
1992	609	1	524	0	84	0	0.05	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Canada

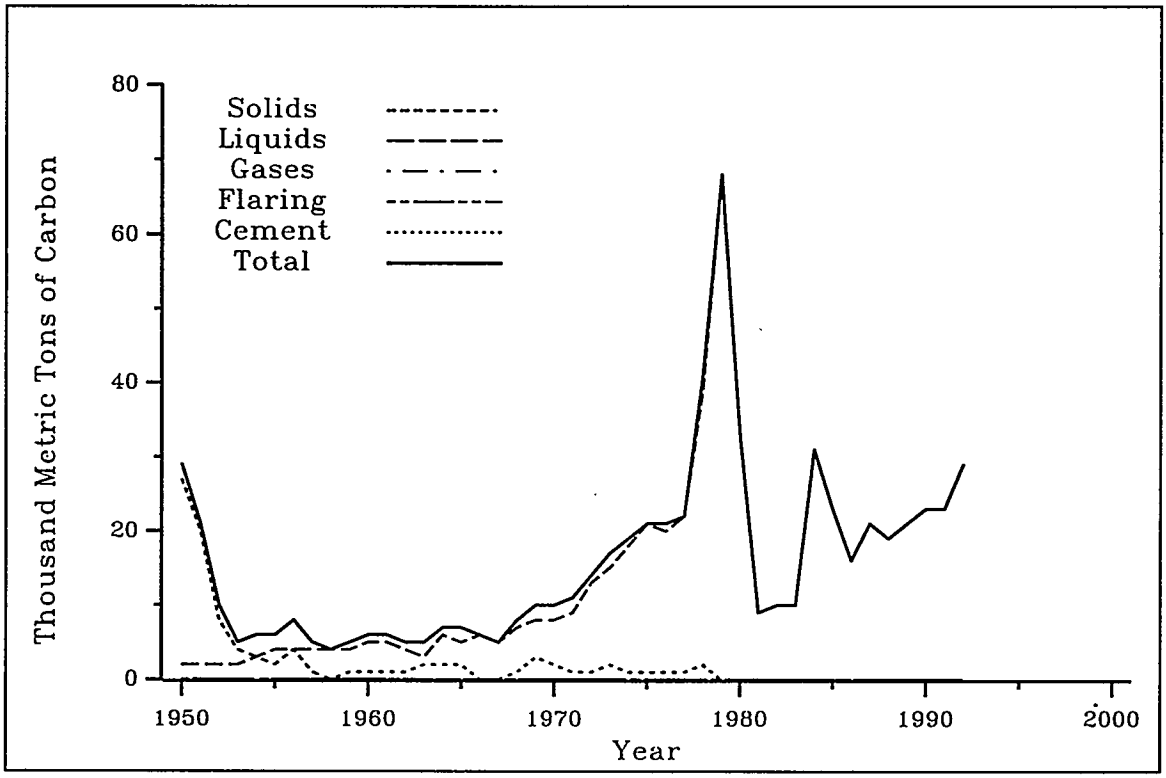


Per capita CO_2 emission rates for Canada

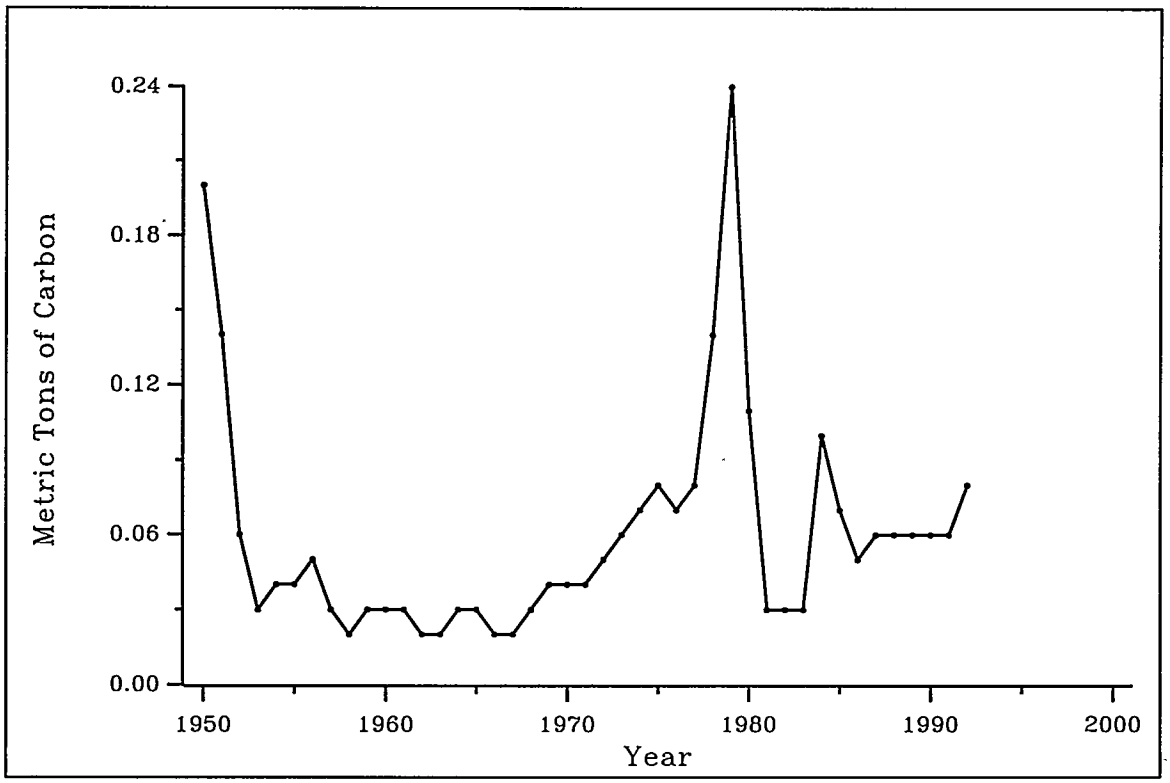
Canada

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	42284	26638	14314	970	362	0	3.08	1234
1951	44626	26666	16479	1114	367	0	3.16	1339
1952	43725	24729	17429	1167	400	0	3.02	1373
1953	44021	22826	19055	1313	480	347	2.96	1492
1954	44666	22041	20518	1623	484	0	2.92	1339
1955	46412	19862	23405	2030	544	571	2.95	1484
1956	51982	21596	26530	2331	620	906	3.21	1539
1957	50039	17858	27326	2965	746	1144	3.01	1806
1958	49841	15748	28539	3665	759	1129	2.92	1544
1959	50471	14729	29383	4723	775	861	2.88	1830
1960	52700	13645	31589	5878	714	875	2.94	1853
1961	53047	12538	32386	6268	766	1090	2.90	1939
1962	56588	12925	34467	7090	849	1258	3.03	2046
1963	57660	12808	36646	6104	866	1237	3.03	2150
1964	64946	14267	39225	9323	976	1155	3.36	2223
1965	68857	14881	41416	10381	1031	1149	3.50	2457
1966	70127	14440	41851	11578	1101	1158	3.50	2689
1967	76977	15747	46804	12299	986	1142	3.78	2733
1968	81713	16638	48909	13987	1008	1172	3.95	2976
1969	83664	16234	49281	15911	1018	1221	3.98	3121
1970	90610	16110	55116	17092	980	1311	4.25	2782
1971	93457	15308	57375	18414	1119	1241	4.32	2645
1972	101248	17022	60932	20875	1231	1189	4.62	2859
1973	101657	14210	62579	22344	1373	1152	4.58	3163
1974	103138	13232	64737	22794	1411	965	4.59	2915
1975	105759	16741	63486	23448	1355	728	4.65	2416
1976	106797	16111	64630	24083	1309	664	4.64	2350
1977	109734	17707	64981	25100	1311	635	4.71	2308
1978	111587	18295	65630	25567	1403	691	4.74	2580
1979	117229	19613	68945	26266	1600	805	4.92	1992
1980	114811	21299	64851	26378	1428	855	4.77	1896
1981	111307	22085	61215	25817	1380	811	4.58	1336
1982	106972	23334	55476	26235	1146	781	4.36	1077
1983	105354	24887	51601	26958	1070	837	4.26	955
1984	108825	27169	50490	28820	1171	1175	4.36	913
1985	107111	26782	47468	30107	1386	1367	4.25	758
1986	104008	24812	47421	29040	1442	1294	4.09	774
1987	107368	26150	48664	29557	1712	1285	4.18	994
1988	114603	27950	51056	32544	1637	1417	4.41	1112
1989	118441	27882	52548	35026	1712	1272	4.50	1309
1990	111571	24592	50090	34101	1597	1191	4.19	1322
1991	108836	25847	45916	34499	1278	1297	4.03	1237
1992	111862	26444	46770	36277	1154	1218	4.09	1234

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Cape Verde

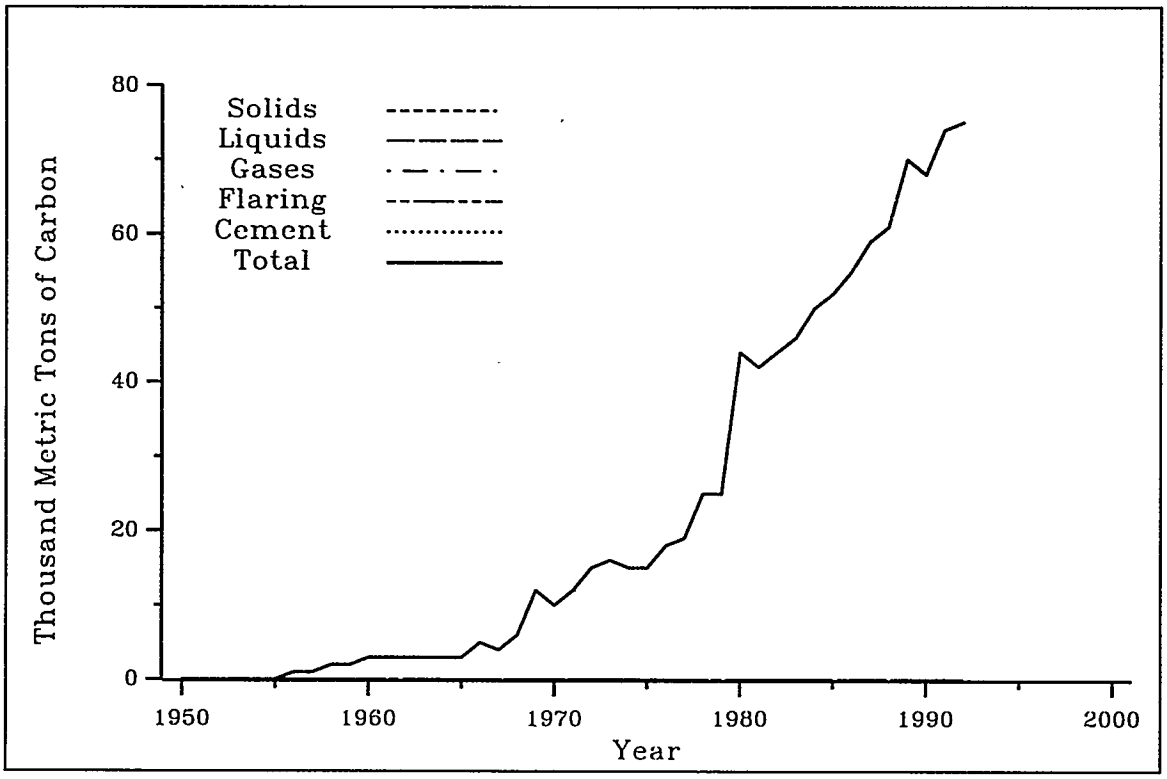


Per capita CO_2 emission rates for Cape Verde

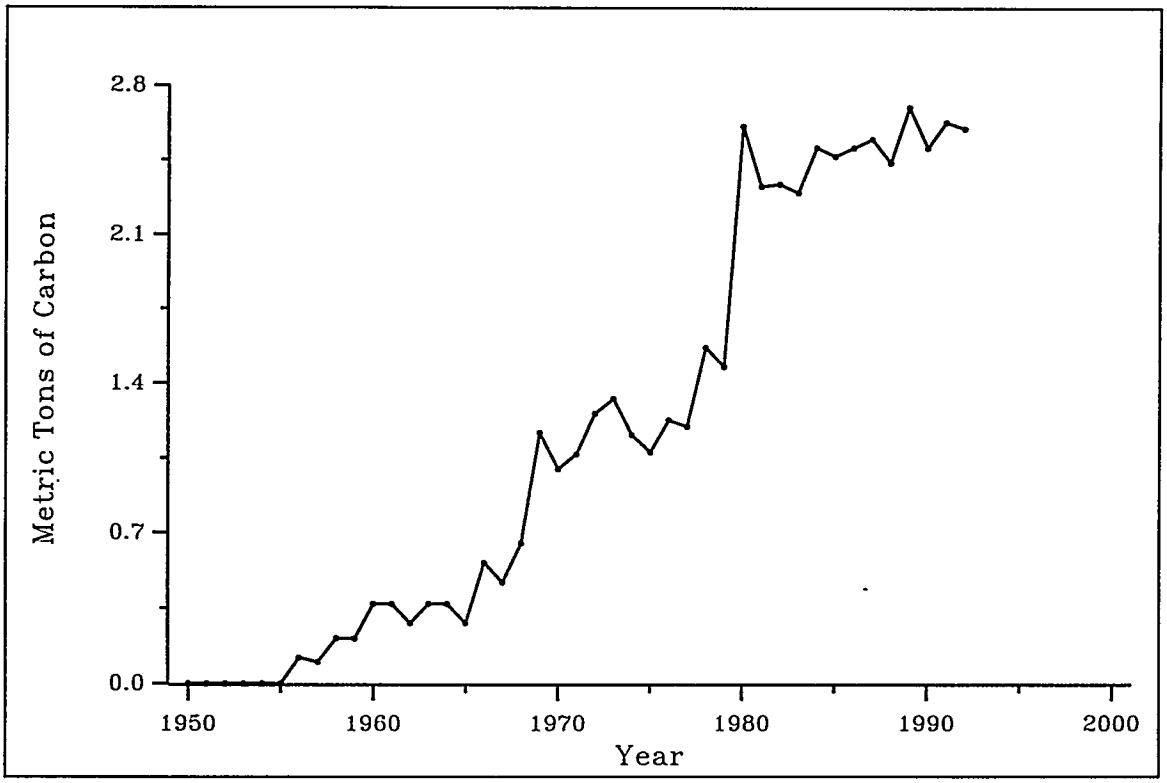
Cape Verde

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	29	27	2	0	0	0	0.20	.
1951	21	20	2	0	0	0	0.14	.
1952	10	8	2	0	0	0	0.06	.
1953	5	4	2	0	0	0	0.03	.
1954	6	3	3	0	0	0	0.04	.
1955	6	2	4	0	0	0	0.04	.
1956	8	4	4	0	0	0	0.05	.
1957	5	1	4	0	0	0	0.03	.
1958	4	0	4	0	0	0	0.02	.
1959	5	0	4	0	1	0	0.03	.
1960	6	0	5	0	1	0	0.03	.
1961	6	0	5	0	1	0	0.03	.
1962	5	0	4	0	1	0	0.02	.
1963	5	0	3	0	2	0	0.02	.
1964	7	0	6	0	2	0	0.03	.
1965	7	0	5	0	2	0	0.03	.
1966	6	0	6	0	0	0	0.02	.
1967	5	0	5	0	0	0	0.02	.
1968	8	0	7	0	1	0	0.03	.
1969	10	0	8	0	3	0	0.04	.
1970	10	0	8	0	2	0	0.04	.
1971	11	0	9	0	1	0	0.04	.
1972	14	0	13	0	1	0	0.05	.
1973	17	0	15	0	2	0	0.06	.
1974	19	0	18	0	1	0	0.07	.
1975	21	0	21	0	1	0	0.08	.
1976	21	0	20	0	1	0	0.07	.
1977	22	0	22	0	1	0	0.08	.
1978	41	0	39	0	2	0	0.14	.
1979	68	0	68	0	0	0	0.24	.
1980	33	0	33	0	0	0	0.11	.
1981	9	0	9	0	0	0	0.03	.
1982	10	0	10	0	0	0	0.03	.
1983	10	0	10	0	0	0	0.03	.
1984	31	0	31	0	0	0	0.10	.
1985	23	0	23	0	0	0	0.07	.
1986	16	0	16	0	0	0	0.05	.
1987	21	0	21	0	0	0	0.06	.
1988	19	0	19	0	0	0	0.06	.
1989	21	0	21	0	0	0	0.06	.
1990	23	0	23	0	0	0	0.06	.
1991	23	0	23	0	0	0	0.06	.
1992	29	0	29	0	0	0	0.08	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Cayman Islands

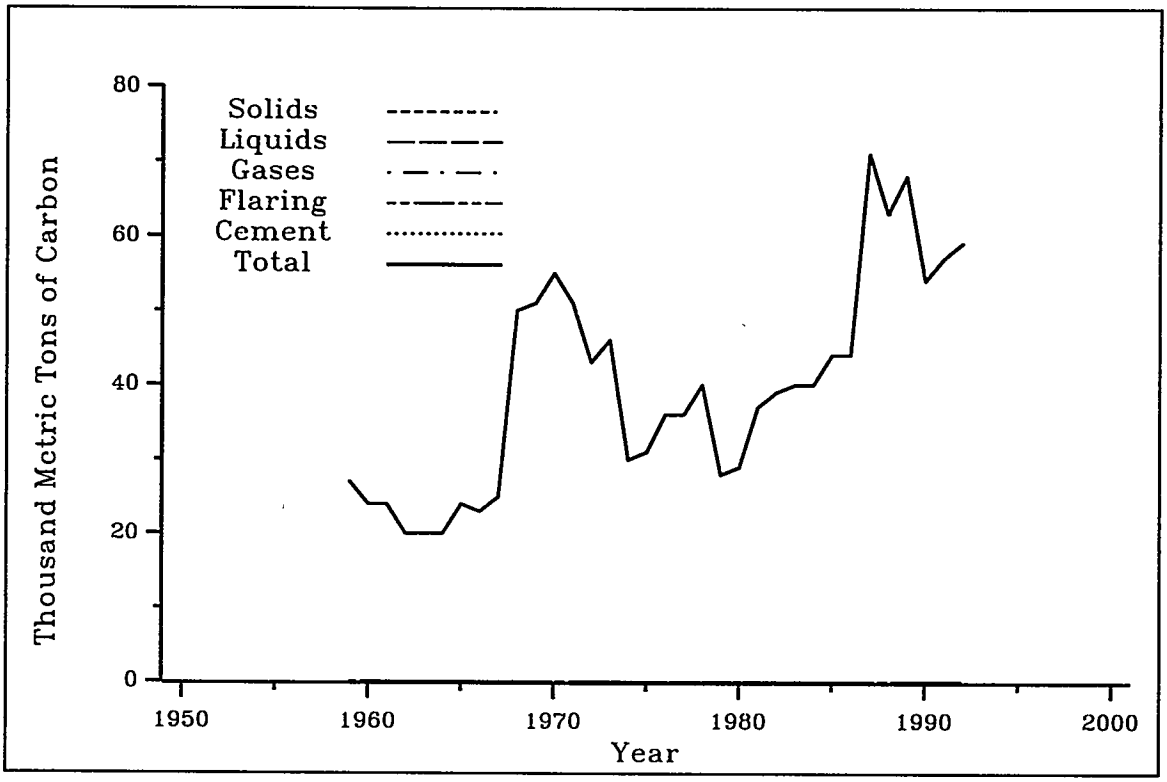


Per capita CO_2 emission rates for Cayman Islands

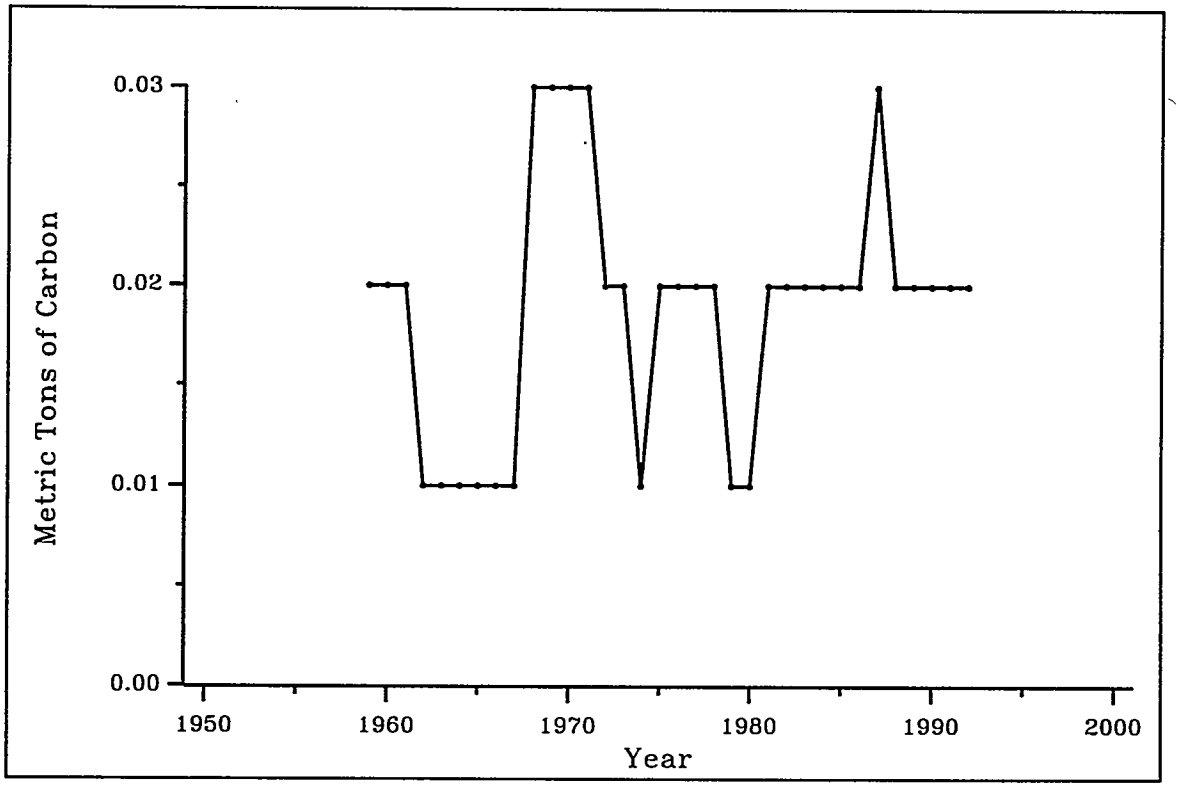
Cayman Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	0	0	0	0	0	0	0.00	.
1953	0	0	0	0	0	0	0.00	.
1954	0	0	0	0	0	0	0.00	.
1955	0	0	0	0	0	0	0.00	.
1956	1	0	1	0	0	0	0.12	.
1957	1	0	1	0	0	0	0.10	.
1958	2	0	2	0	0	0	0.21	.
1959	2	0	2	0	0	0	0.21	.
1960	3	0	3	0	0	0	0.37	.
1961	3	0	3	0	0	0	0.37	.
1962	3	0	3	0	0	0	0.28	.
1963	3	0	3	0	0	0	0.37	.
1964	3	0	3	0	0	0	0.37	.
1965	3	0	3	0	0	0	0.28	.
1966	5	0	5	0	0	0	0.56	.
1967	4	0	4	0	0	0	0.47	.
1968	6	0	6	0	0	0	0.65	.
1969	12	0	12	0	0	0	1.17	.
1970	10	0	10	0	0	0	1.00	.
1971	12	0	12	0	0	0	1.07	.
1972	15	0	15	0	0	0	1.26	.
1973	16	0	16	0	0	0	1.33	.
1974	15	0	15	0	0	0	1.16	.
1975	15	0	15	0	0	0	1.08	.
1976	18	0	18	0	0	0	1.23	.
1977	19	0	19	0	0	0	1.20	.
1978	25	0	25	0	0	0	1.57	.
1979	25	0	25	0	0	0	1.48	.
1980	44	0	44	0	0	0	2.61	.
1981	42	0	42	0	0	0	2.33	.
1982	44	0	44	0	0	0	2.34	.
1983	46	0	46	0	0	0	2.30	.
1984	50	0	50	0	0	0	2.51	.
1985	52	0	52	0	0	0	2.47	.
1986	55	0	55	0	0	0	2.51	.
1987	59	0	59	0	0	0	2.55	.
1988	61	0	61	0	0	0	2.44	.
1989	70	0	70	0	0	0	2.70	.
1990	68	0	68	0	0	0	2.51	.
1991	74	0	74	0	0	0	2.63	.
1992	75	0	75	0	0	0	2.60	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Central African Republic

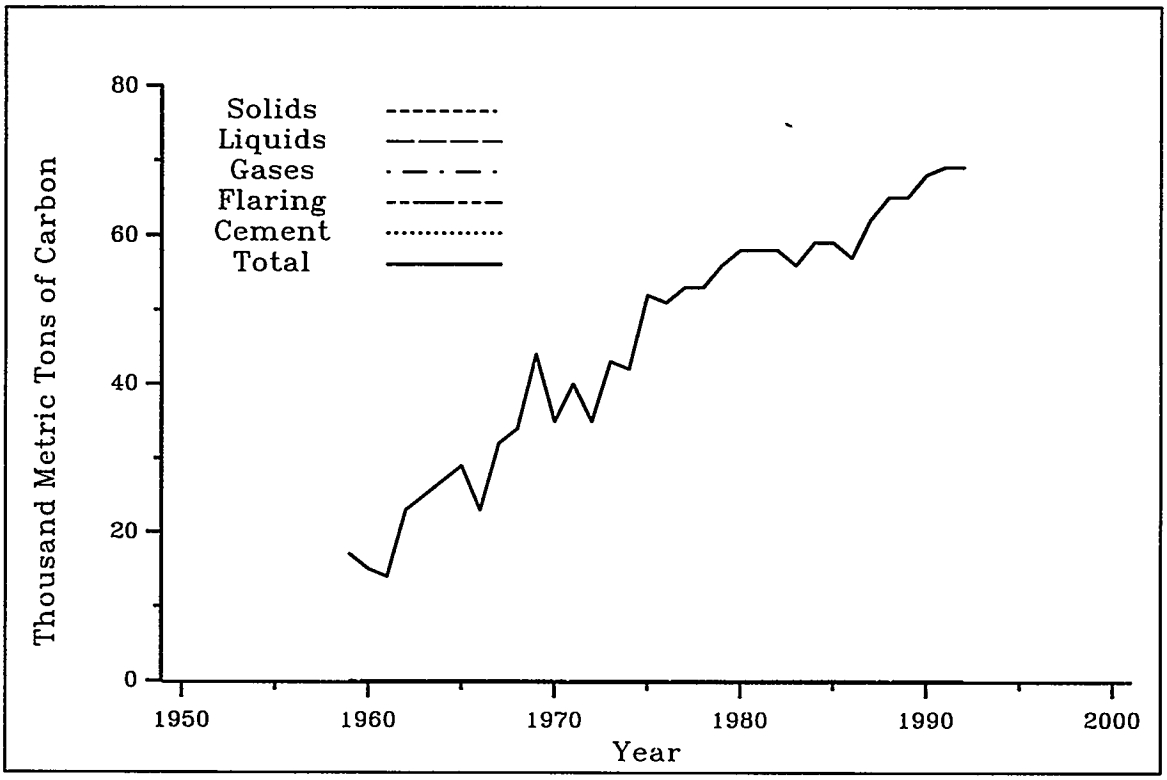


Per capita CO_2 emission rates for Central African Republic

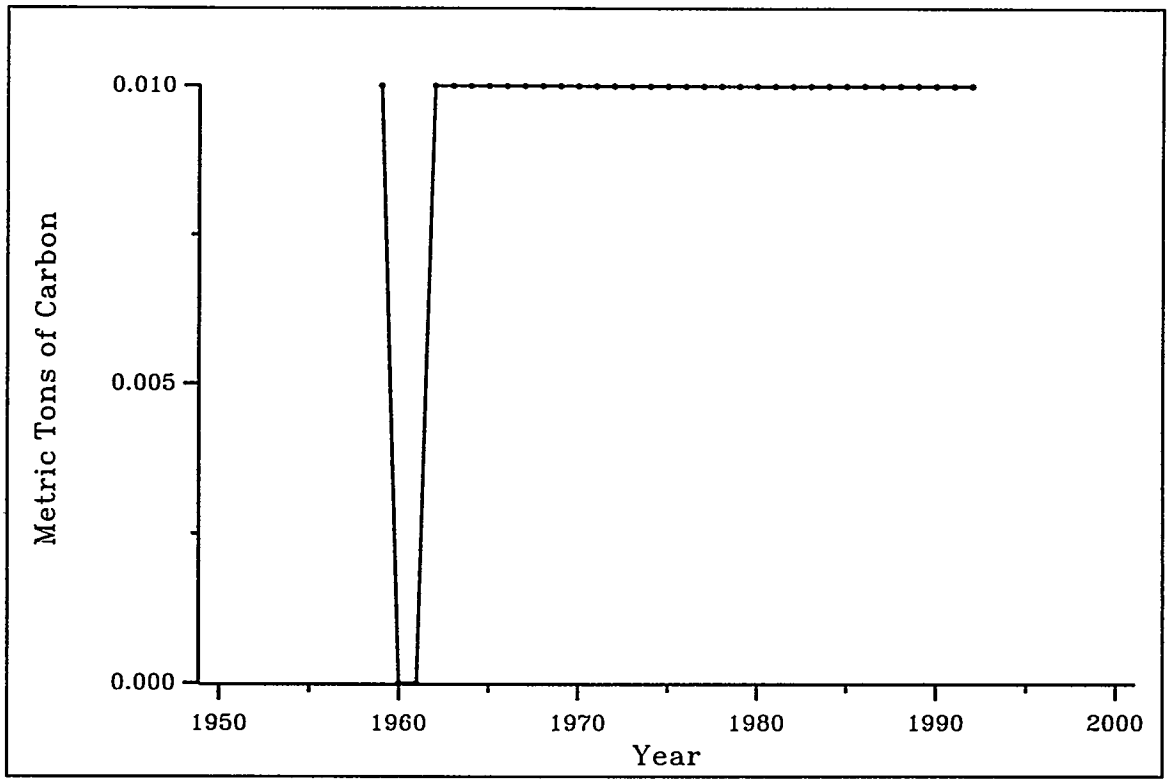
Central African Republic

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1959	27	0	27	0	0	0	0.02	.
1960	24	0	24	0	0	0	0.02	.
1961	24	0	24	0	0	0	0.02	.
1962	20	0	20	0	0	0	0.01	.
1963	20	0	20	0	0	0	0.01	.
1964	20	0	20	0	0	0	0.01	.
1965	24	0	24	0	0	0	0.01	.
1966	23	0	23	0	0	0	0.01	.
1967	25	0	25	0	0	0	0.01	.
1968	50	0	50	0	0	0	0.03	.
1969	51	0	51	0	0	0	0.03	.
1970	55	0	55	0	0	0	0.03	.
1971	51	0	51	0	0	0	0.03	.
1972	43	0	43	0	0	0	0.02	.
1973	46	0	46	0	0	0	0.02	.
1974	30	0	30	0	0	0	0.01	.
1975	31	0	31	0	0	0	0.02	.
1976	36	0	36	0	0	0	0.02	.
1977	36	0	36	0	0	0	0.02	.
1978	40	0	40	0	0	0	0.02	.
1979	28	0	28	0	0	0	0.01	.
1980	29	0	29	0	0	0	0.01	.
1981	37	0	37	0	0	0	0.02	.
1982	39	0	39	0	0	0	0.02	.
1983	40	0	40	0	0	0	0.02	.
1984	40	0	40	0	0	0	0.02	.
1985	44	0	44	0	0	0	0.02	.
1986	44	0	44	0	0	0	0.02	.
1987	71	0	71	0	0	0	0.03	.
1988	63	0	63	0	0	0	0.02	.
1989	68	0	68	0	0	0	0.02	.
1990	54	0	54	0	0	0	0.02	.
1991	57	0	57	0	0	0	0.02	.
1992	59	0	59	0	0	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Chad

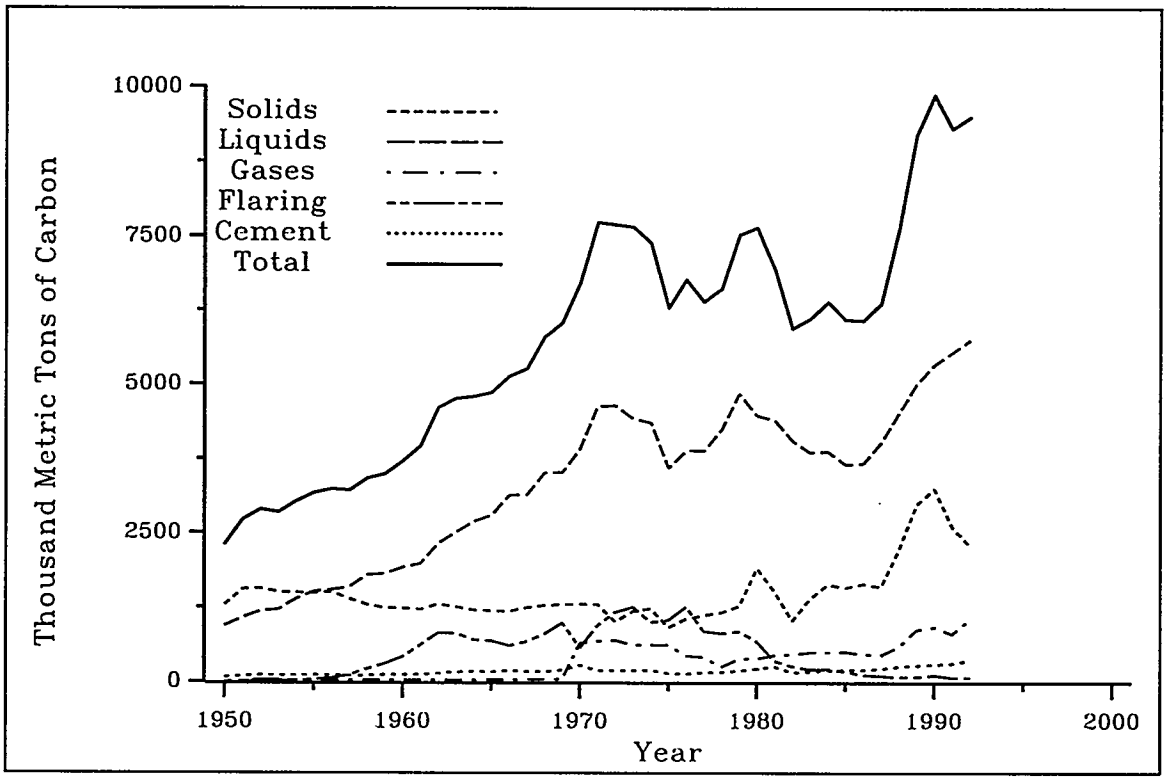


Per capita CO_2 emission rates for Chad

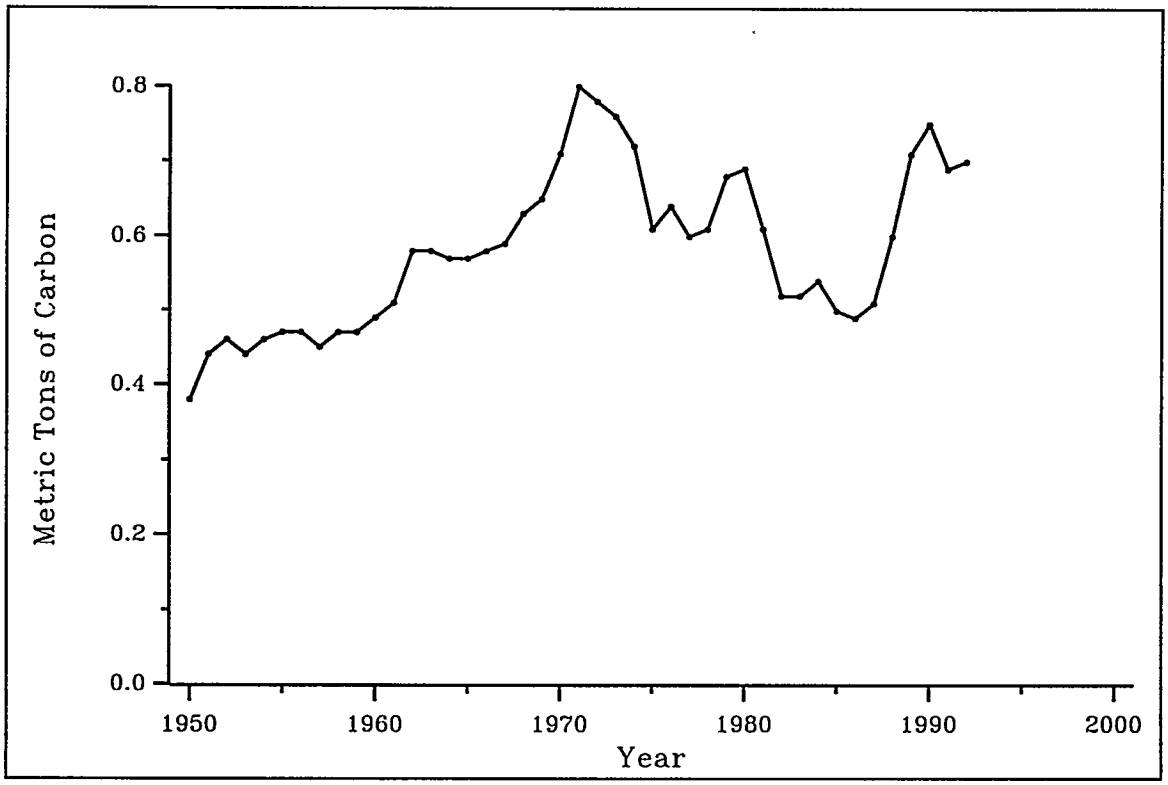
Chad

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1959	17	0	17	0	0	0	0.01	.
1960	15	0	15	0	0	0	0.00	.
1961	14	0	14	0	0	0	0.00	.
1962	23	0	23	0	0	0	0.01	.
1963	25	0	25	0	0	0	0.01	.
1964	27	0	27	0	0	0	0.01	.
1965	29	0	29	0	0	0	0.01	.
1966	23	0	23	0	0	0	0.01	.
1967	32	0	32	0	0	0	0.01	.
1968	34	0	34	0	0	0	0.01	.
1969	44	0	44	0	0	0	0.01	.
1970	35	0	35	0	0	0	0.01	.
1971	40	0	40	0	0	0	0.01	.
1972	35	0	35	0	0	0	0.01	.
1973	43	0	43	0	0	0	0.01	.
1974	42	0	42	0	0	0	0.01	.
1975	52	0	52	0	0	0	0.01	.
1976	51	0	51	0	0	0	0.01	.
1977	53	0	53	0	0	0	0.01	.
1978	53	0	53	0	0	0	0.01	.
1979	56	0	56	0	0	0	0.01	.
1980	58	0	58	0	0	0	0.01	.
1981	58	0	58	0	0	0	0.01	.
1982	58	0	58	0	0	0	0.01	.
1983	56	0	56	0	0	0	0.01	.
1984	59	0	59	0	0	0	0.01	.
1985	59	0	59	0	0	0	0.01	.
1986	57	0	57	0	0	0	0.01	.
1987	62	0	62	0	0	0	0.01	.
1988	65	0	65	0	0	0	0.01	.
1989	65	0	65	0	0	0	0.01	.
1990	68	0	68	0	0	0	0.01	.
1991	69	0	69	0	0	0	0.01	.
1992	69	0	69	0	0	0	0.01	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Chile

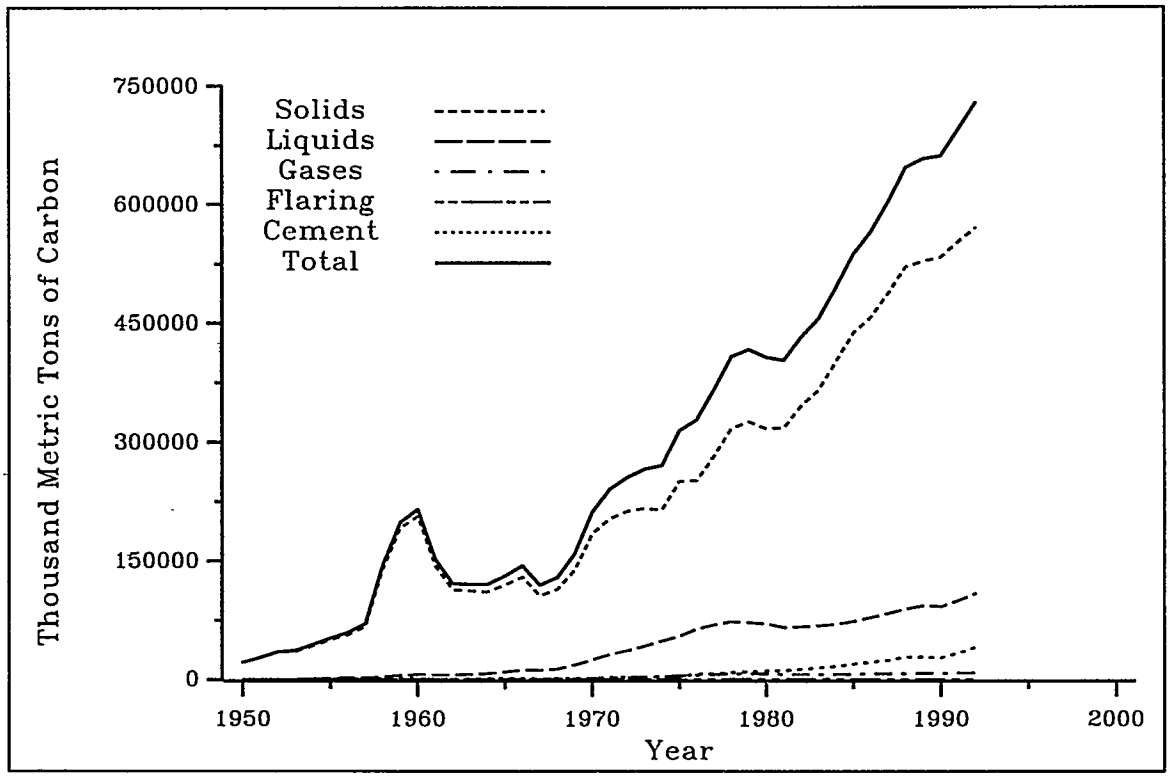


Per capita CO_2 emission rates for Chile

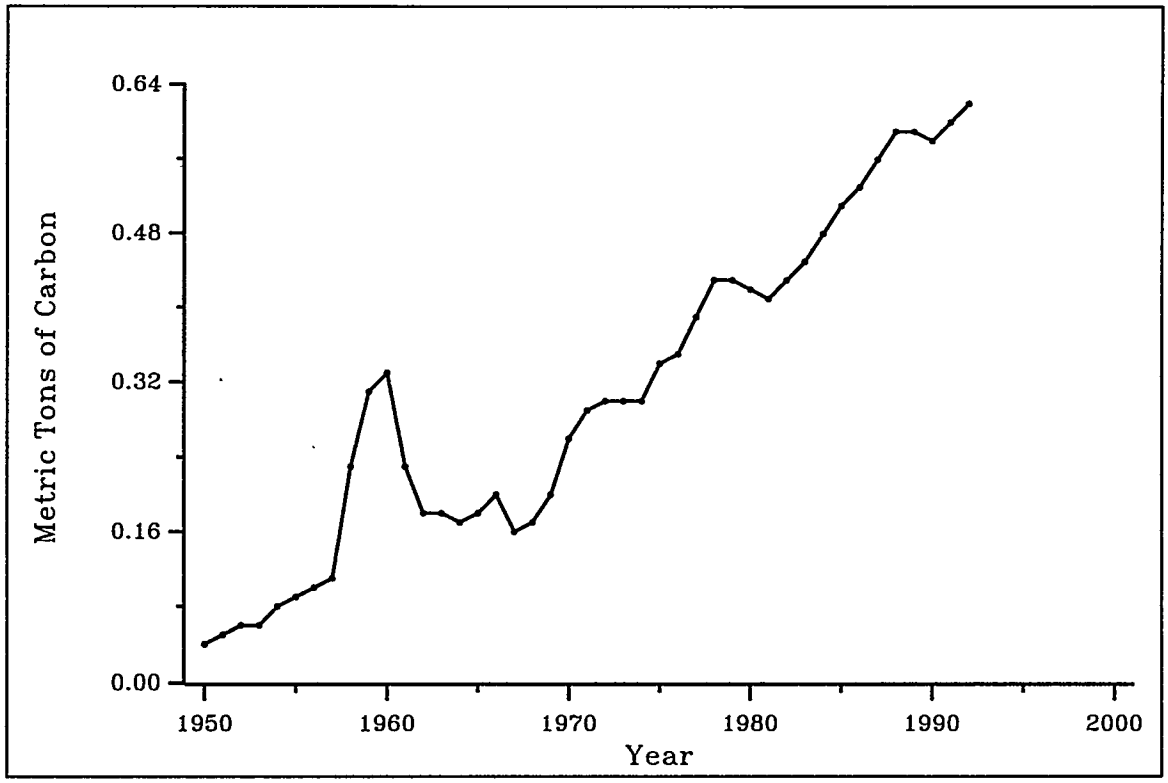
Chile

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2302	1292	941	0	70	0	0.38	.
1951	2720	1551	1074	0	95	0	0.44	.
1952	2894	1565	1186	0	111	32	0.46	.
1953	2845	1503	1210	0	104	28	0.44	.
1954	3027	1493	1388	25	105	15	0.46	.
1955	3168	1485	1511	25	109	37	0.47	.
1956	3233	1506	1540	25	105	58	0.47	.
1957	3210	1385	1587	25	99	113	0.45	.
1958	3415	1289	1788	25	99	214	0.47	.
1959	3486	1238	1806	25	114	304	0.47	.
1960	3702	1231	1913	25	114	419	0.49	.
1961	3950	1209	1976	28	120	617	0.51	.
1962	4596	1299	2312	28	139	817	0.58	.
1963	4752	1254	2503	28	159	808	0.58	.
1964	4781	1200	2682	28	172	700	0.57	.
1965	4850	1187	2786	31	162	684	0.57	.
1966	5125	1180	3123	31	186	606	0.58	.
1967	5251	1241	3136	34	168	673	0.59	.
1968	5789	1278	3505	35	168	802	0.63	.
1969	6026	1292	3513	39	195	987	0.65	.
1970	6703	1299	3909	646	278	571	0.71	.
1971	7725	1295	4618	680	186	945	0.80	.
1972	7693	1007	4633	697	188	1168	0.78	.
1973	7653	1185	4411	618	187	1252	0.76	.
1974	7379	1227	4344	616	194	998	0.72	.
1975	6284	910	3587	616	138	1034	0.61	.
1976	6759	1055	3881	436	131	1257	0.64	.
1977	6387	1110	3871	411	153	843	0.60	.
1978	6608	1161	4228	249	160	810	0.61	.
1979	7512	1268	4832	387	184	841	0.68	.
1980	7639	1898	4463	391	215	673	0.69	.
1981	6945	1509	4389	445	253	349	0.61	.
1982	5934	1023	4041	459	154	257	0.52	.
1983	6101	1389	3845	492	171	205	0.52	.
1984	6379	1627	3862	491	190	208	0.54	.
1985	6082	1573	3645	500	194	171	0.50	.
1986	6067	1637	3664	461	195	111	0.49	.
1987	6352	1586	4007	445	217	98	0.51	.
1988	7613	2200	4497	585	256	75	0.60	.
1989	9184	2969	4993	867	273	82	0.71	.
1990	9854	3232	5317	913	288	105	0.75	.
1991	9289	2594	5524	799	306	65	0.69	.
1992	9481	2271	5734	1047	360	69	0.70	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Peoples Republic of China

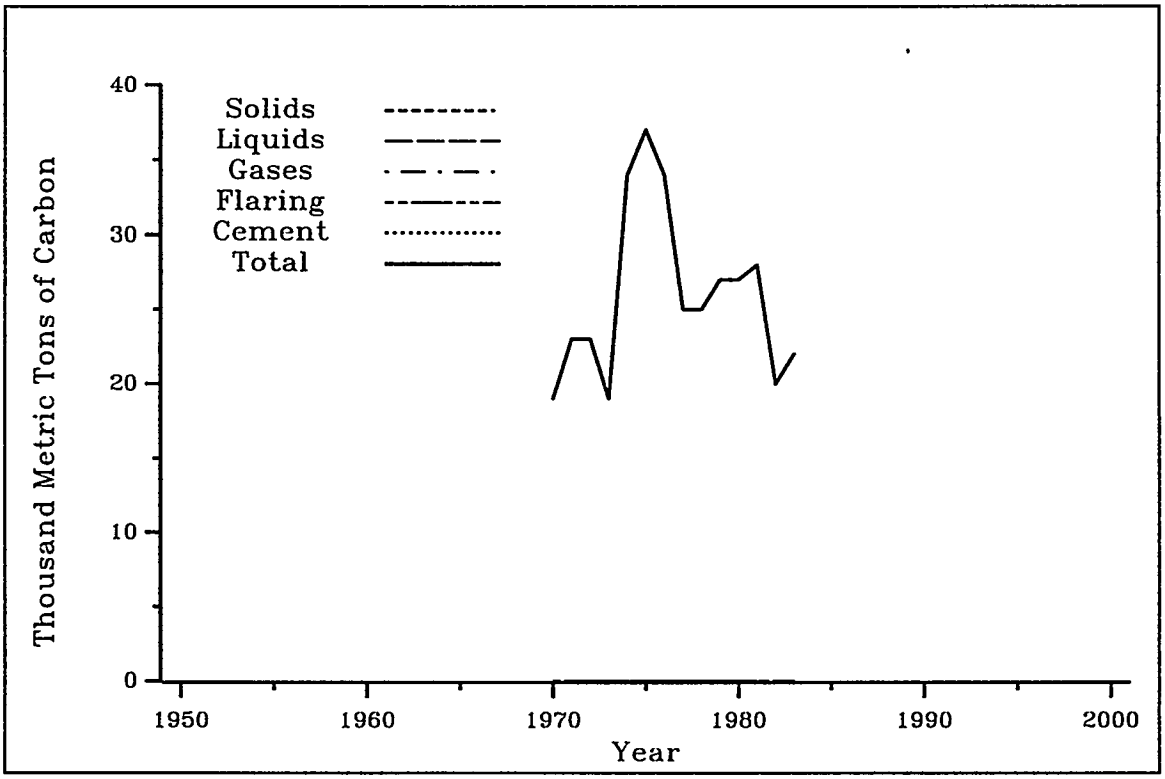


Per capita CO_2 emission rates for the Peoples Republic of China

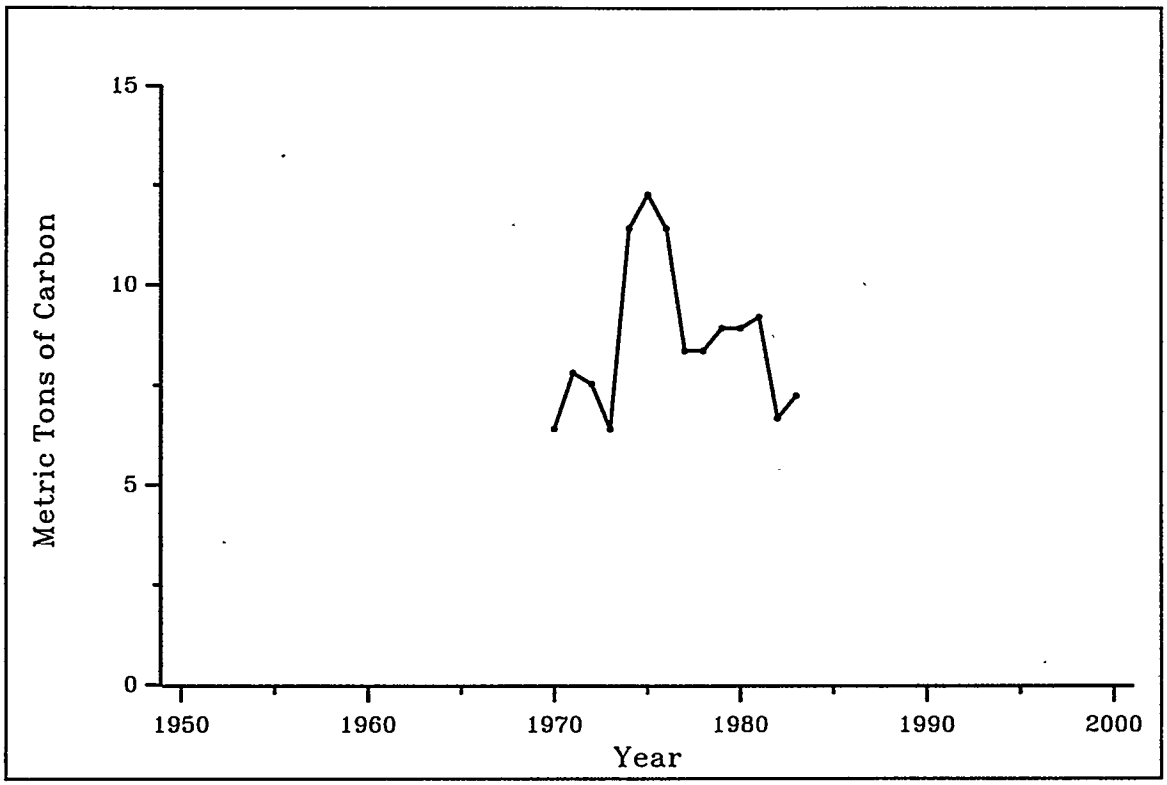
Peoples Republic of China

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	21713	21431	169	4	109	0	0.04	.
1951	28083	27649	256	2	176	0	0.05	.
1952	35396	34637	365	4	389	0	0.06	.
1953	37016	35961	521	6	528	0	0.06	.
1954	44508	42962	912	8	626	0	0.08	.
1955	52683	50584	1479	9	612	0	0.09	.
1956	59702	56611	2209	13	869	0	0.10	.
1957	70742	67320	2453	36	933	0	0.11	.
1958	145012	140316	3373	58	1265	0	0.23	.
1959	199043	192023	5199	152	1669	0	0.31	.
1960	215295	206640	6275	544	1836	0	0.33	.
1961	152218	144265	6096	769	1088	0	0.23	.
1962	121402	113740	5940	634	1088	0	0.18	.
1963	120384	112139	6351	534	1360	0	0.18	.
1964	120432	110881	7568	554	1428	0	0.17	.
1965	131182	119557	9552	576	1496	0	0.18	.
1966	144066	129711	12158	701	1496	0	0.20	.
1967	119369	105919	11599	764	1087	0	0.16	.
1968	129195	113959	13278	733	1225	0	0.17	.
1969	159014	138384	18245	1026	1359	0	0.20	.
1970	211607	183857	24891	1502	1357	0	0.26	.
1971	240461	203341	31826	1958	3121	216	0.29	.
1972	255513	212810	36763	2533	3128	279	0.30	.
1973	265676	216406	42395	3130	3400	345	0.30	.
1974	270967	214296	48884	3941	3400	446	0.30	.
1975	314304	250339	54729	4632	4084	520	0.34	.
1976	328181	251375	64296	5286	6705	520	0.35	.
1977	366184	282309	69370	6342	7568	595	0.39	.
1978	407398	317248	73358	7174	8873	747	0.43	.
1979	416244	325436	72340	7581	10050	836	0.43	.
1980	406440	316598	70703	7456	10861	822	0.42	.
1981	402598	317474	66309	6656	11424	734	0.41	.
1982	431541	345053	66755	6250	12794	689	0.43	.
1983	455215	364996	68371	6397	14722	729	0.45	.
1984	494786	400851	69980	6612	16467	877	0.48	.
1985	536666	437010	73500	6774	19383	0	0.51	.
1986	564391	456803	78435	7192	21961	0	0.53	.
1987	602467	487327	83451	7260	24429	0	0.56	.
1988	646047	520769	89325	7454	28500	0	0.59	.
1989	657086	528004	93085	7866	28130	0	0.59	.
1990	660736	533049	92054	7997	27637	0	0.58	.
1991	694154	552422	99650	8400	33682	0	0.60	.
1992	728161	569872	108704	8253	41331	0	0.62	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Christmas Island

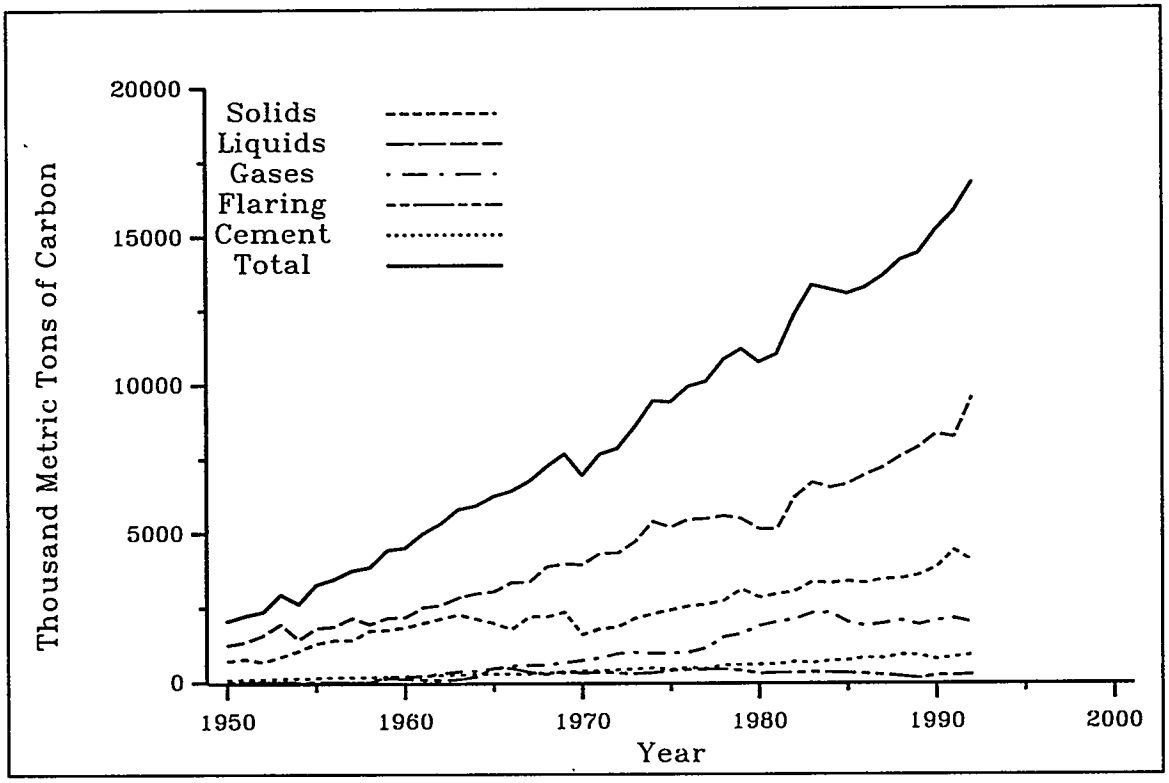


Per capita CO_2 emission rates for Christmas Island

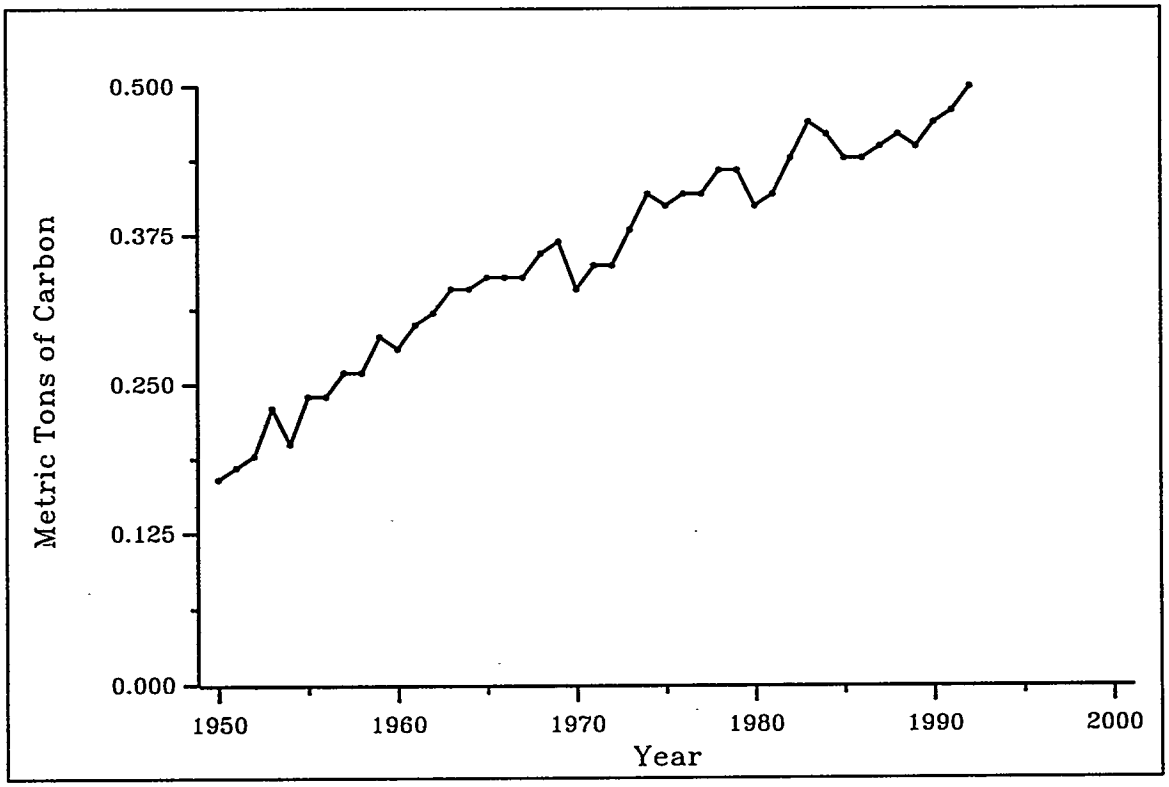
Christmas Island

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	19	0	19	0	0	0	6.42	.
1971	23	0	23	0	0	0	7.81	.
1972	23	0	23	0	0	0	7.54	.
1973	19	0	19	0	0	0	6.42	.
1974	34	0	34	0	0	0	11.44	.
1975	37	0	37	0	0	0	12.28	.
1976	34	0	34	0	0	0	11.44	.
1977	25	0	25	0	0	0	8.37	.
1978	25	0	25	0	0	0	8.37	.
1979	27	0	27	0	0	0	8.93	.
1980	27	0	27	0	0	0	8.93	.
1981	28	0	28	0	0	0	9.21	.
1982	20	0	20	0	0	0	6.70	.
1983	22	0	22	0	0	0	7.26	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Columbia

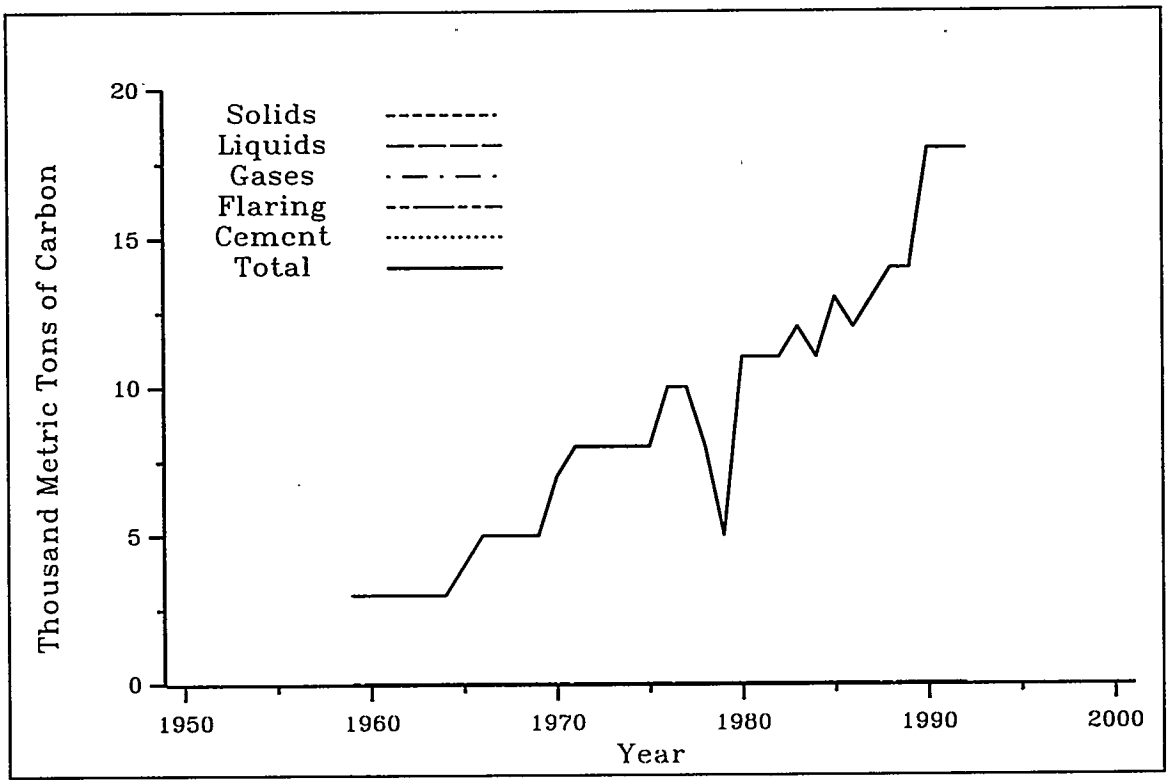


Per capita CO_2 emission rates for Columbia

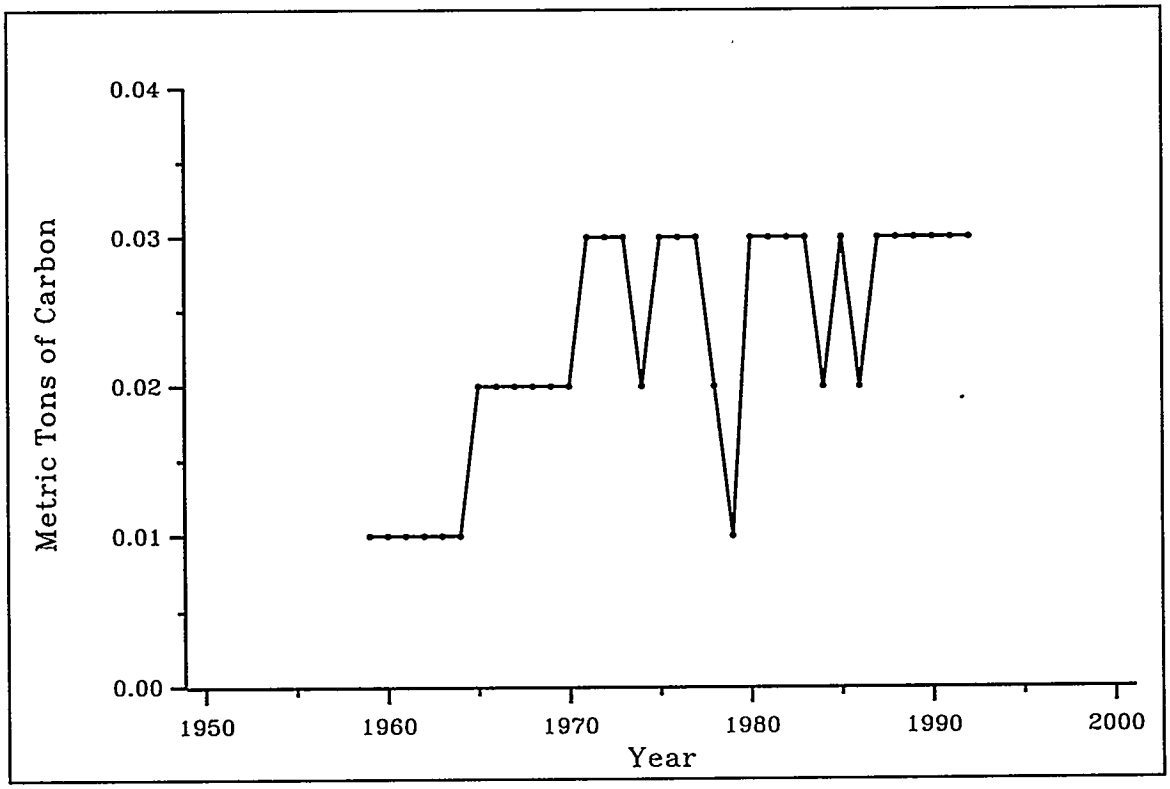
Columbia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2055	716	1262	0	77	0	0.17	.
1951	2239	791	1360	0	88	0	0.18	.
1952	2365	685	1585	0	95	0	0.19	.
1953	2948	872	1957	0	119	0	0.23	.
1954	2639	1064	1444	0	131	0	0.20	.
1955	3276	1312	1822	0	142	0	0.24	.
1956	3456	1419	1871	0	166	0	0.24	.
1957	3743	1419	2158	0	167	0	0.26	.
1958	3849	1731	1951	0	167	0	0.26	.
1959	4424	1759	2159	184	185	137	0.29	.
1960	4511	1844	2180	188	199	100	0.28	.
1961	4987	1986	2507	194	217	84	0.30	.
1962	5321	2128	2589	293	237	74	0.31	.
1963	5806	2268	2839	356	250	93	0.33	.
1964	5930	2127	2976	377	267	183	0.33	.
1965	6248	1985	3040	465	279	478	0.34	.
1966	6422	1773	3348	552	282	467	0.34	.
1967	6759	2197	3357	575	287	342	0.34	.
1968	7248	2197	3866	594	322	269	0.36	.
1969	7674	2351	3966	662	325	369	0.37	.
1970	6952	1604	3927	741	380	301	0.33	.
1971	7665	1795	4316	822	387	344	0.35	.
1972	7852	1847	4319	965	415	307	0.35	.
1973	8583	2145	4709	1006	438	285	0.38	.
1974	9435	2294	5386	974	474	308	0.41	.
1975	9400	2424	5182	982	420	392	0.40	.
1976	9917	2546	5455	1010	491	416	0.41	.
1977	10091	2599	5470	1147	449	427	0.41	.
1978	10823	2732	5575	1520	565	430	0.43	.
1979	11180	3108	5472	1630	579	390	0.43	.
1980	10734	2844	5130	1885	592	283	0.40	.
1981	11000	2944	5122	2015	606	313	0.41	.
1982	12325	3034	6191	2108	684	308	0.44	.
1983	13331	3352	6693	2312	642	332	0.47	.
1984	13194	3312	6524	2325	718	316	0.46	.
1985	13050	3371	6639	2006	734	302	0.44	.
1986	13251	3324	6955	1882	818	273	0.44	.
1987	13648	3442	7194	1961	811	239	0.45	.
1988	14198	3465	7574	2056	920	183	0.46	.
1989	14412	3580	7878	1928	904	123	0.45	.
1990	15208	3834	8325	2058	772	220	0.47	.
1991	15826	4410	8216	2130	844	226	0.48	.
1992	16783	4047	9556	2001	926	252	0.50	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Comoros

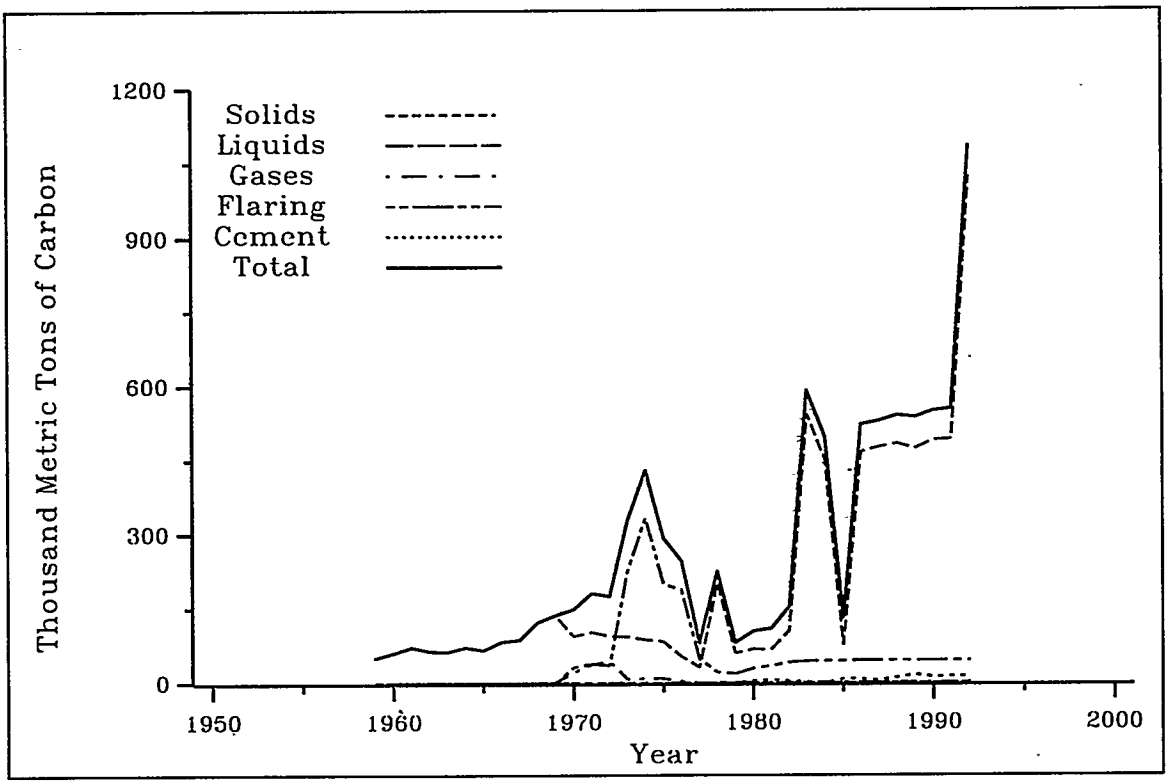


Per capita CO_2 emission rates for Comoros

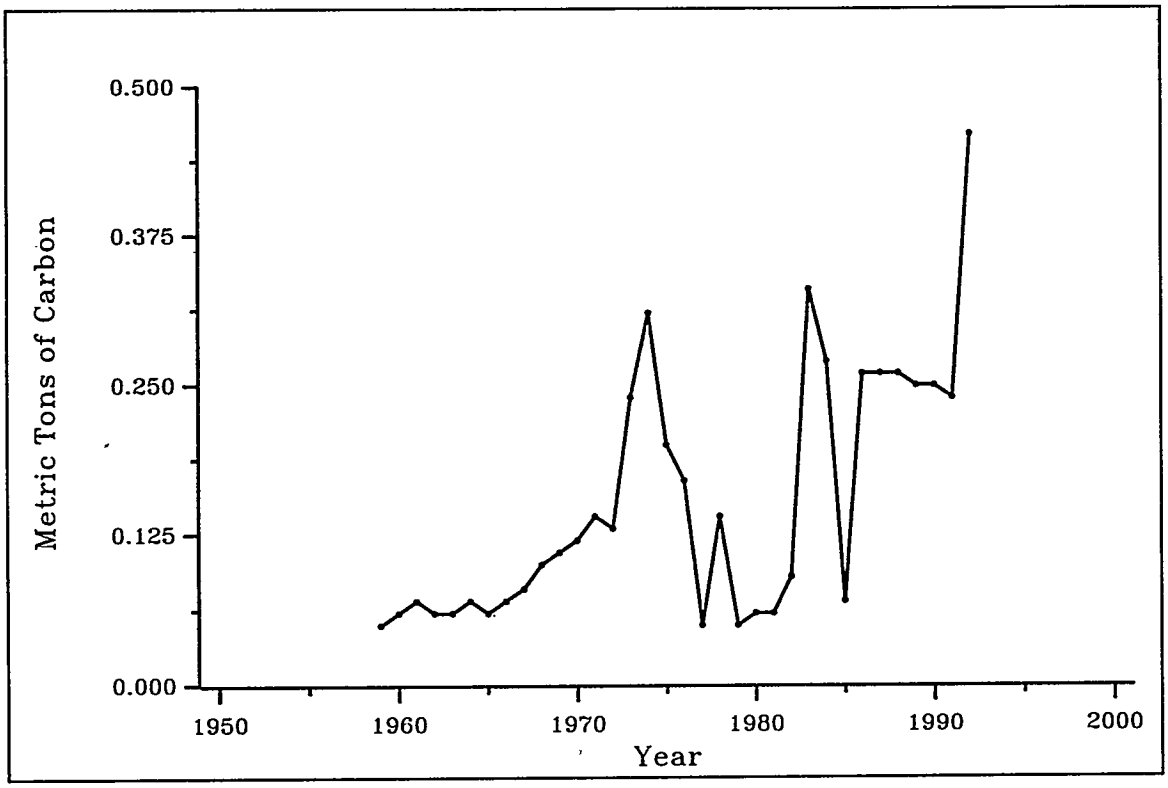
Comoros

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1959	3	0	3	0	0	0	0.01	.
1960	3	0	3	0	0	0	0.01	.
1961	3	0	3	0	0	0	0.01	.
1962	3	0	3	0	0	0	0.01	.
1963	3	0	3	0	0	0	0.01	.
1964	3	0	3	0	0	0	0.01	.
1965	4	0	4	0	0	0	0.02	.
1966	5	0	5	0	0	0	0.02	.
1967	5	0	5	0	0	0	0.02	.
1968	5	0	5	0	0	0	0.02	.
1969	5	0	5	0	0	0	0.02	.
1970	7	0	7	0	0	0	0.02	.
1971	8	0	8	0	0	0	0.03	.
1972	8	0	8	0	0	0	0.03	.
1973	8	0	8	0	0	0	0.03	.
1974	8	0	8	0	0	0	0.02	.
1975	8	0	8	0	0	0	0.03	.
1976	10	0	10	0	0	0	0.03	.
1977	10	0	10	0	0	0	0.03	.
1978	8	0	8	0	0	0	0.02	.
1979	5	0	5	0	0	0	0.01	.
1980	11	0	11	0	0	0	0.03	.
1981	11	0	11	0	0	0	0.03	.
1982	11	0	11	0	0	0	0.03	.
1983	12	0	12	0	0	0	0.03	.
1984	11	0	11	0	0	0	0.02	.
1985	13	0	13	0	0	0	0.03	.
1986	12	0	12	0	0	0	0.02	.
1987	13	0	13	0	0	0	0.03	.
1988	14	0	14	0	0	0	0.03	.
1989	14	0	14	0	0	0	0.03	.
1990	18	0	18	0	0	0	0.03	.
1991	18	0	18	0	0	0	0.03	.
1992	18	0	18	0	0	0	0.03	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Congo

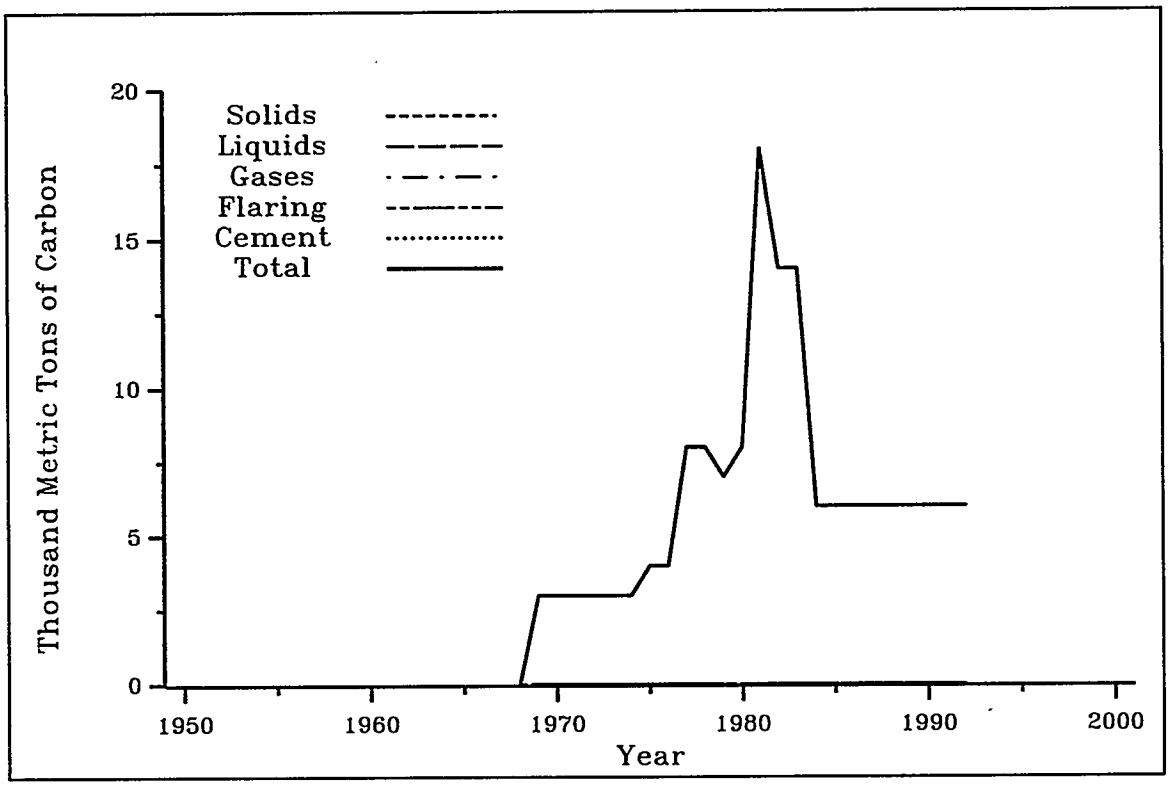


Per capita CO_2 emission rates for Congo

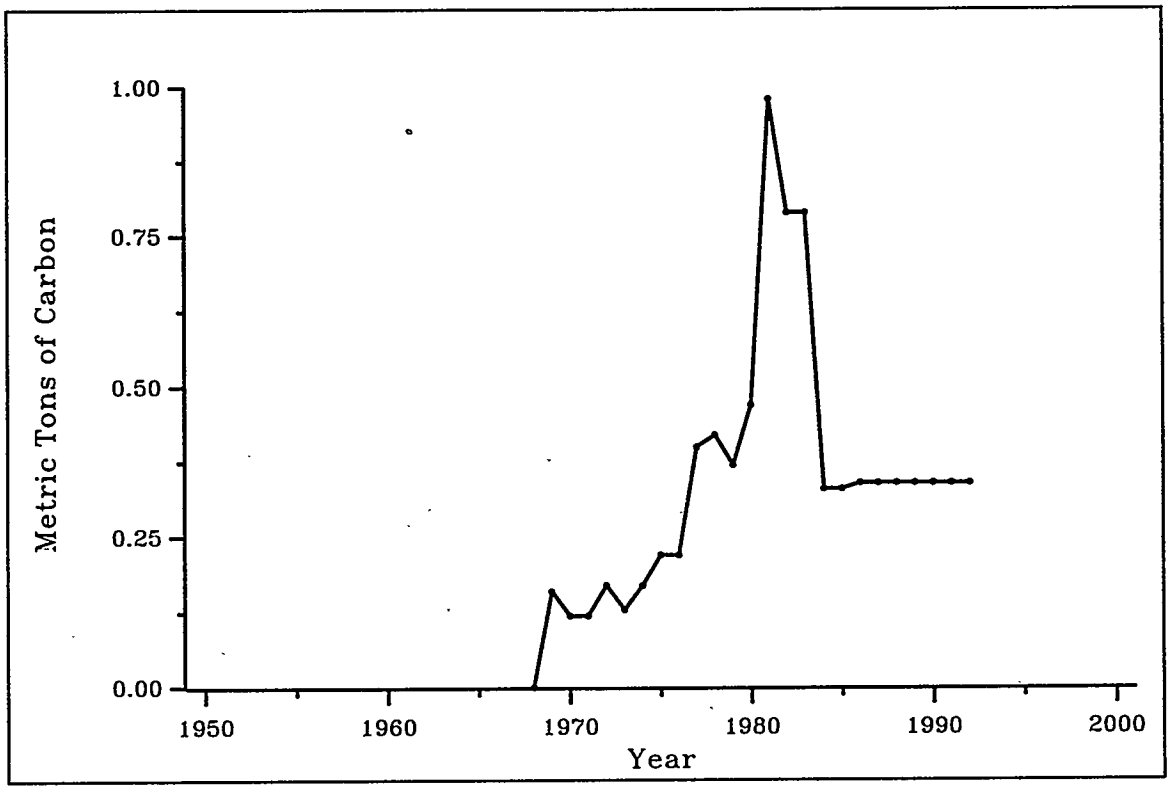
Congo

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1959	51	0	51	0	0	0	0.05	.
1960	61	0	61	0	0	0	0.06	.
1961	73	0	73	0	0	0	0.07	.
1962	65	0	65	0	0	0	0.06	.
1963	64	0	64	0	0	0	0.06	.
1964	73	0	73	0	0	0	0.07	.
1965	67	0	67	0	0	0	0.06	.
1966	84	0	84	0	0	0	0.07	.
1967	88	0	88	0	0	0	0.08	.
1968	123	0	123	0	0	0	0.10	.
1969	137	0	136	2	0	0	0.11	.
1970	149	0	95	22	0	32	0.12	.
1971	181	0	103	38	0	39	0.14	.
1972	175	0	95	44	0	36	0.13	.
1973	328	0	94	8	0	226	0.24	.
1974	430	0	88	9	0	333	0.31	.
1975	292	0	84	9	0	199	0.20	.
1976	246	0	54	4	0	188	0.17	.
1977	81	0	32	0	0	49	0.05	.
1978	225	0	202	1	0	22	0.14	.
1979	82	0	61	1	0	19	0.05	.
1980	105	0	69	1	5	30	0.06	.
1981	110	0	68	0	7	35	0.06	.
1982	154	0	106	1	5	42	0.09	.
1983	591	0	543	1	2	44	0.33	.
1984	497	0	451	1	0	45	0.27	.
1985	131	0	77	2	8	45	0.07	.
1986	522	0	467	1	8	46	0.26	.
1987	529	0	477	1	5	46	0.26	.
1988	541	0	484	1	11	46	0.26	.
1989	537	0	474	1	17	46	0.25	.
1990	550	0	491	1	12	46	0.25	.
1991	554	0	493	1	14	46	0.24	.
1992	1084	0	1023	2	14	46	0.46	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Cook Islands

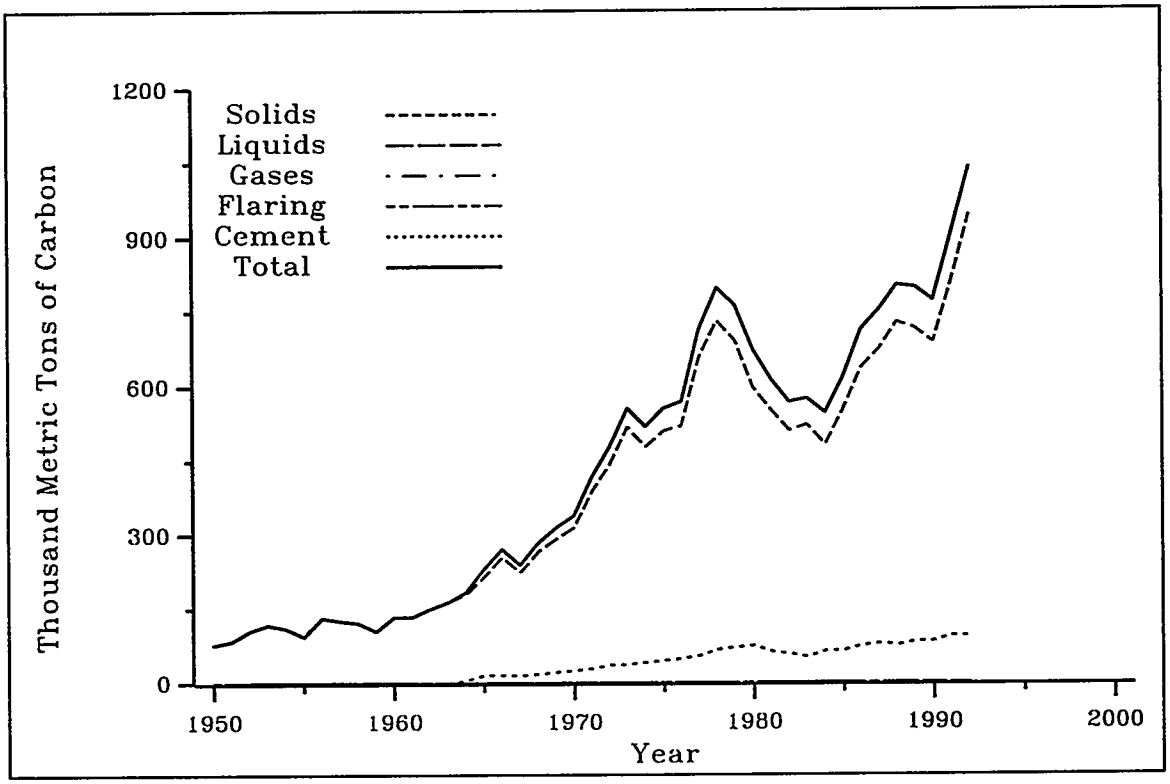


Per capita CO_2 emission rates for the Cook Islands

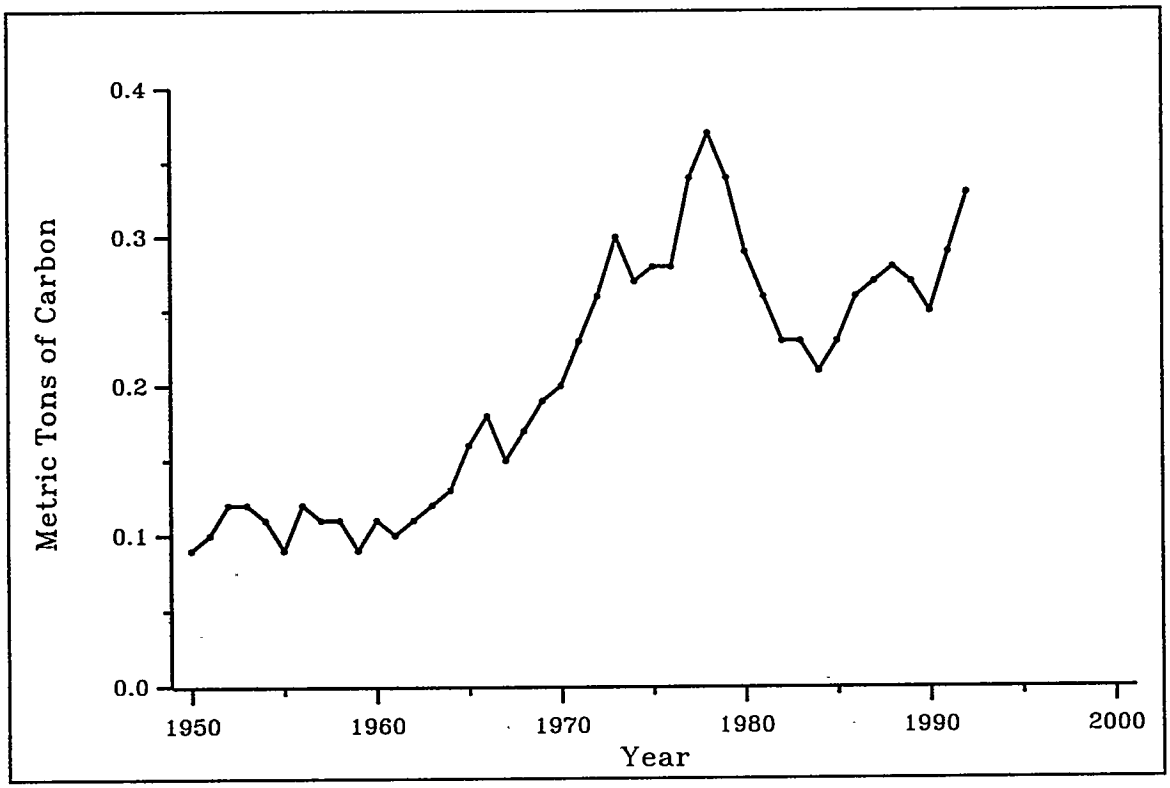
Cook Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1968	0	0	0	0	0	0	0.00	.
1969	3	0	3	0	0	0	0.16	.
1970	3	0	3	0	0	0	0.12	.
1971	3	0	3	0	0	0	0.12	.
1972	3	0	3	0	0	0	0.17	.
1973	3	0	3	0	0	0	0.13	.
1974	3	0	3	0	0	0	0.17	.
1975	4	0	4	0	0	0	0.22	.
1976	4	0	4	0	0	0	0.22	.
1977	8	0	8	0	0	0	0.40	.
1978	8	0	8	0	0	0	0.42	.
1979	7	0	7	0	0	0	0.37	.
1980	8	0	8	0	0	0	0.47	.
1981	18	0	18	0	0	0	0.98	.
1982	14	0	14	0	0	0	0.79	.
1983	14	0	14	0	0	0	0.79	.
1984	6	0	6	0	0	0	0.33	.
1985	6	0	6	0	0	0	0.33	.
1986	6	0	6	0	0	0	0.34	.
1987	6	0	6	0	0	0	0.34	.
1988	6	0	6	0	0	0	0.34	.
1989	6	0	6	0	0	0	0.34	.
1990	6	0	6	0	0	0	0.34	.
1991	6	0	6	0	0	0	0.34	.
1992	6	0	6	0	0	0	0.34	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Costa Rica

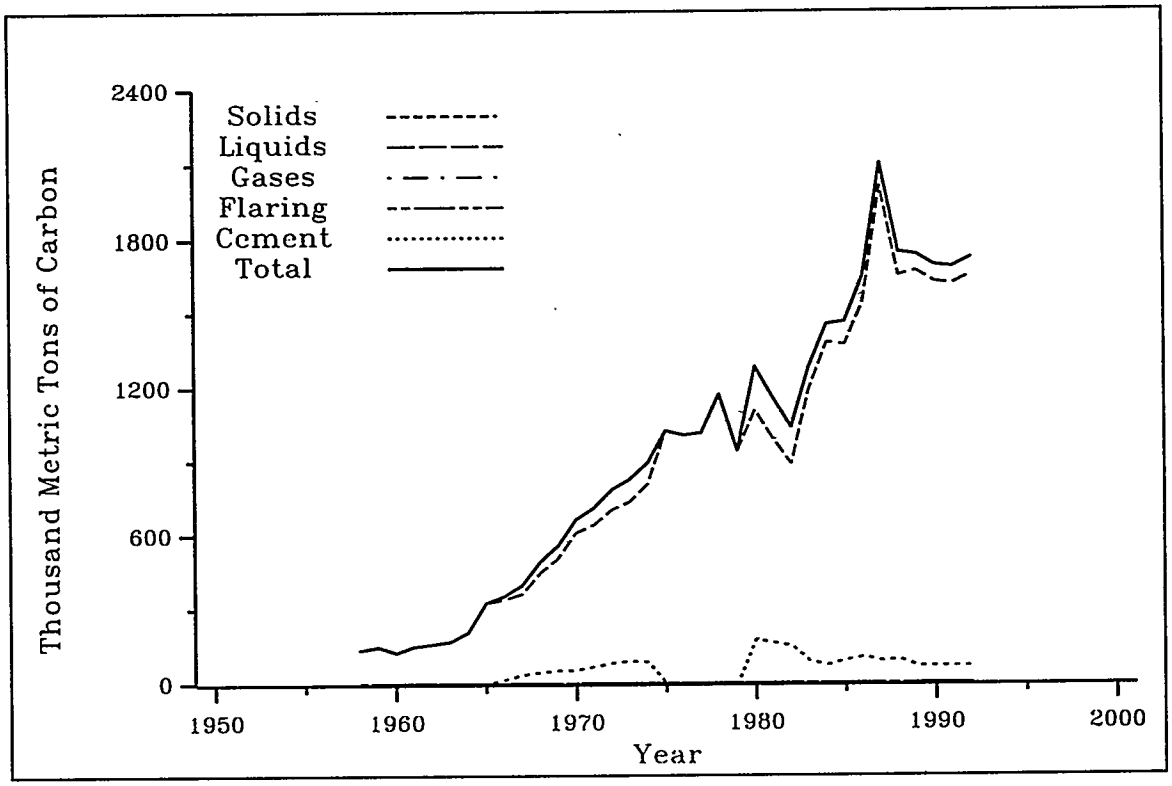


Per capita CO_2 emission rates for Costa Rica

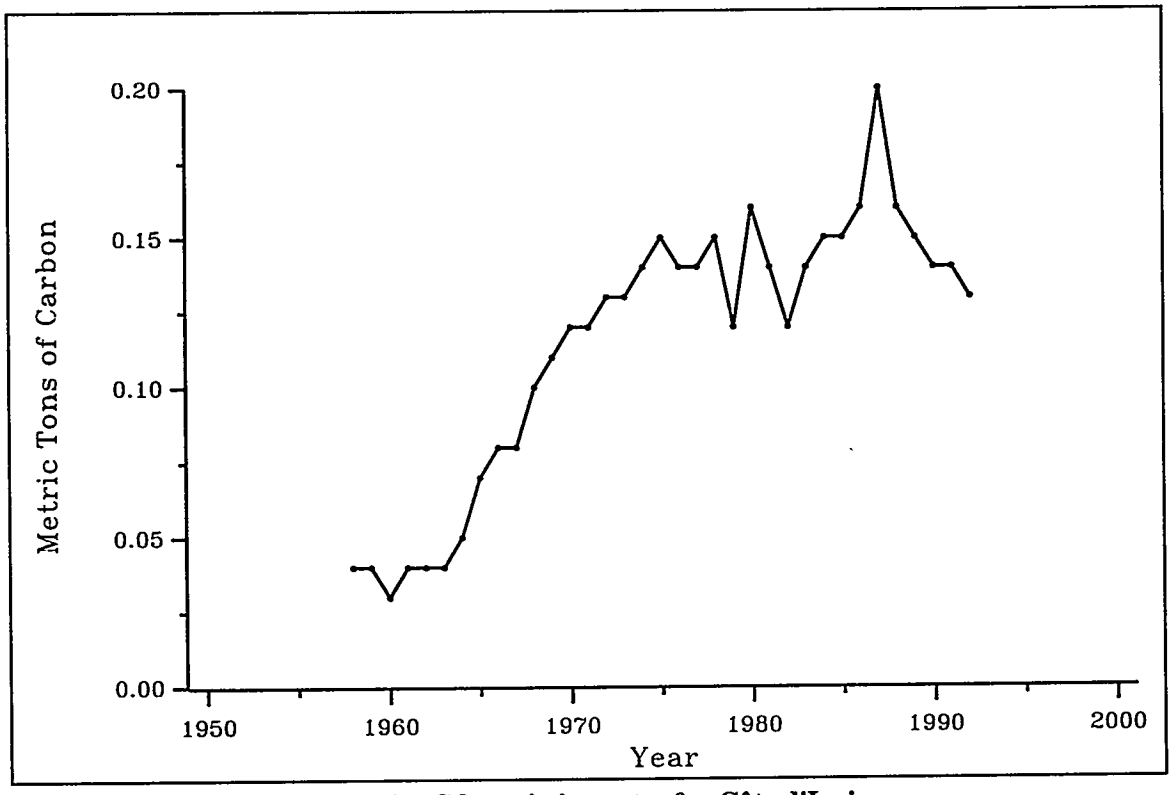
Costa Rica

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	78	0	78	0	0	0	0.09	.
1951	85	0	85	0	0	0	0.10	.
1952	106	0	106	0	0	0	0.12	.
1953	118	0	118	0	0	0	0.12	.
1954	111	0	111	0	0	0	0.11	.
1955	95	0	95	0	0	0	0.09	.
1956	132	0	132	0	0	0	0.12	.
1957	126	0	126	0	0	0	0.11	.
1958	122	0	122	0	0	0	0.11	.
1959	105	0	105	0	0	0	0.09	.
1960	134	0	134	0	0	0	0.11	.
1961	134	0	134	0	0	0	0.10	.
1962	150	0	150	0	0	0	0.11	.
1963	164	0	164	0	0	0	0.12	.
1964	184	0	180	0	5	0	0.13	.
1965	231	0	215	0	16	0	0.16	.
1966	271	0	255	0	16	0	0.18	.
1967	239	0	224	0	15	0	0.15	.
1968	283	0	265	0	18	0	0.17	.
1969	314	0	291	0	22	0	0.19	.
1970	339	0	314	0	25	0	0.20	.
1971	416	0	387	0	29	0	0.23	.
1972	478	0	442	0	36	0	0.26	.
1973	555	0	518	0	37	0	0.30	.
1974	519	0	478	0	41	0	0.27	.
1975	555	0	510	0	45	0	0.28	.
1976	569	0	520	0	49	0	0.28	.
1977	713	0	658	0	55	0	0.34	.
1978	797	0	730	0	67	0	0.37	.
1979	762	0	690	0	72	0	0.34	.
1980	672	0	597	0	75	0	0.29	.
1981	613	0	551	0	63	0	0.26	.
1982	568	0	511	0	58	0	0.23	.
1983	575	0	522	0	52	0	0.23	.
1984	546	0	482	0	64	0	0.21	.
1985	618	0	553	0	65	0	0.23	.
1986	712	0	636	0	75	0	0.26	.
1987	752	0	673	0	79	0	0.27	.
1988	802	0	727	0	76	0	0.28	.
1989	798	0	715	0	83	0	0.27	.
1990	772	0	687	0	84	0	0.25	.
1991	903	0	808	0	95	0	0.29	.
1992	1039	0	944	0	95	0	0.33	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Côte d'Ivoire

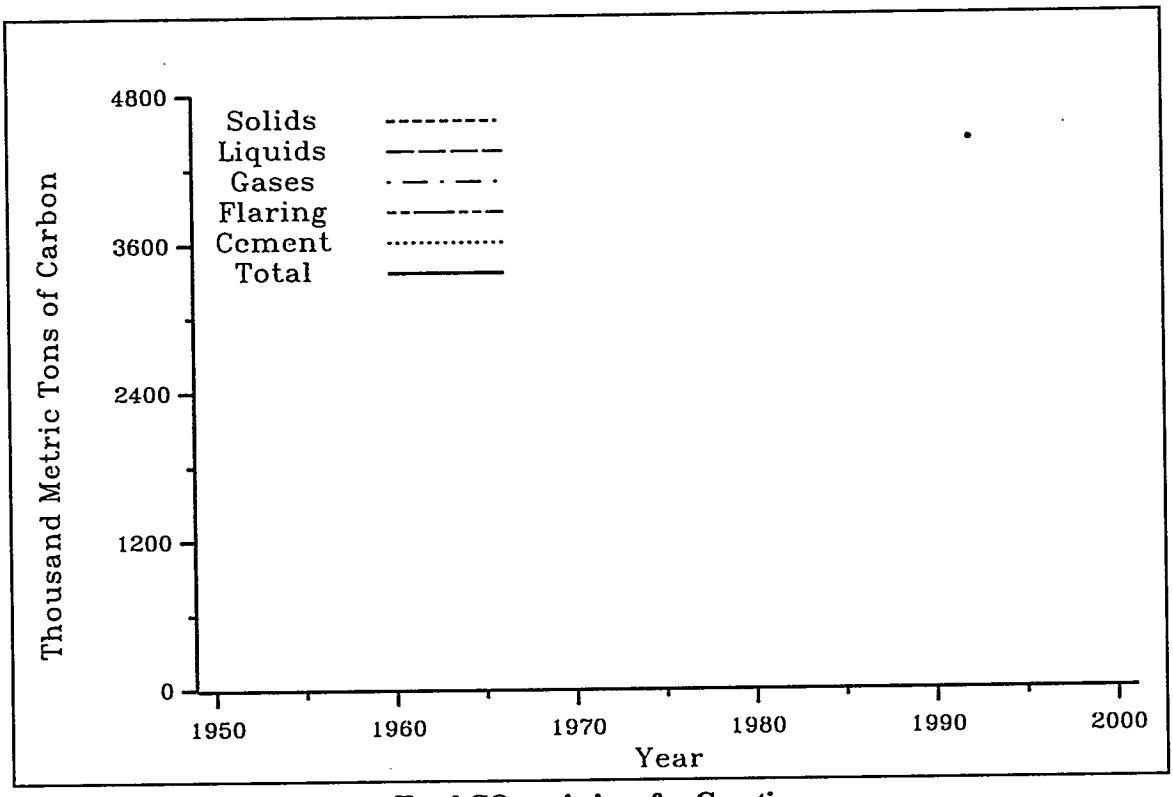


Per capita CO_2 emission rates for Côte d'Ivoire

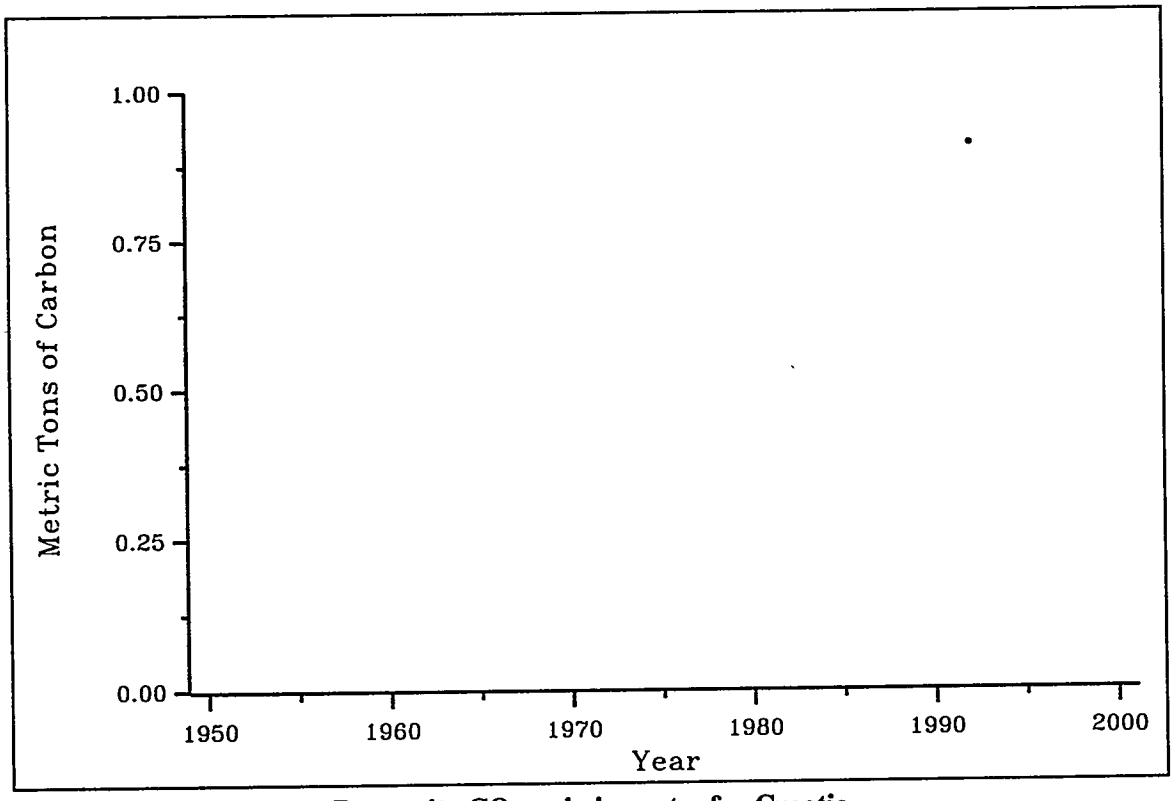
Côte d'Ivoire

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1958	136	0	136	0	0	0	0.04	.
1959	149	0	149	0	0	0	0.04	.
1960	126	0	126	0	0	0	0.03	.
1961	151	0	151	0	0	0	0.04	.
1962	160	0	160	0	0	0	0.04	.
1963	170	0	170	0	0	0	0.04	.
1964	208	0	208	0	0	0	0.05	.
1965	326	0	326	0	0	0	0.07	.
1966	354	0	340	0	15	0	0.08	.
1967	398	0	363	0	35	0	0.08	.
1968	493	0	448	0	45	0	0.10	.
1969	558	0	506	0	53	0	0.11	.
1970	663	0	609	0	54	0	0.12	.
1971	709	0	641	0	68	0	0.12	.
1972	784	0	702	0	82	0	0.13	.
1973	825	0	734	0	90	0	0.13	.
1974	892	0	806	0	86	0	0.14	.
1975	1023	0	1023	0	0	0	0.15	.
1976	1006	0	1006	0	0	0	0.14	.
1977	1015	0	1015	0	0	0	0.14	.
1978	1170	0	1170	0	0	0	0.15	.
1979	942	0	942	0	0	0	0.12	.
1980	1282	0	1105	0	177	0	0.16	.
1981	1154	0	990	0	163	0	0.14	.
1982	1037	0	887	0	150	0	0.12	.
1983	1278	0	1191	0	87	0	0.14	.
1984	1453	0	1380	0	73	0	0.15	.
1985	1464	0	1371	0	92	0	0.15	.
1986	1643	0	1537	0	106	0	0.16	.
1987	2101	0	2013	0	89	0	0.20	.
1988	1746	0	1651	0	95	0	0.16	.
1989	1736	0	1669	0	68	0	0.15	.
1990	1693	0	1625	0	68	0	0.14	.
1991	1685	0	1617	0	68	0	0.14	.
1992	1722	0	1654	0	68	0	0.13	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Croatia

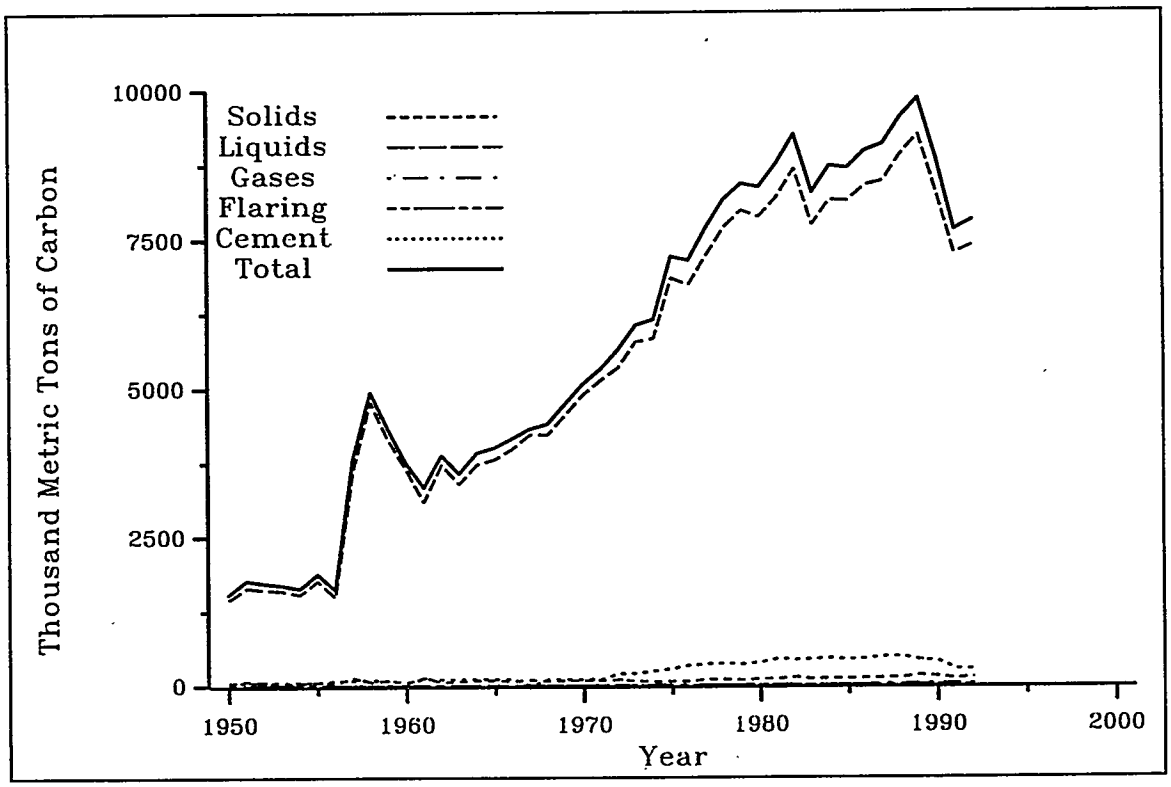


Per capita CO_2 emission rates for Croatia

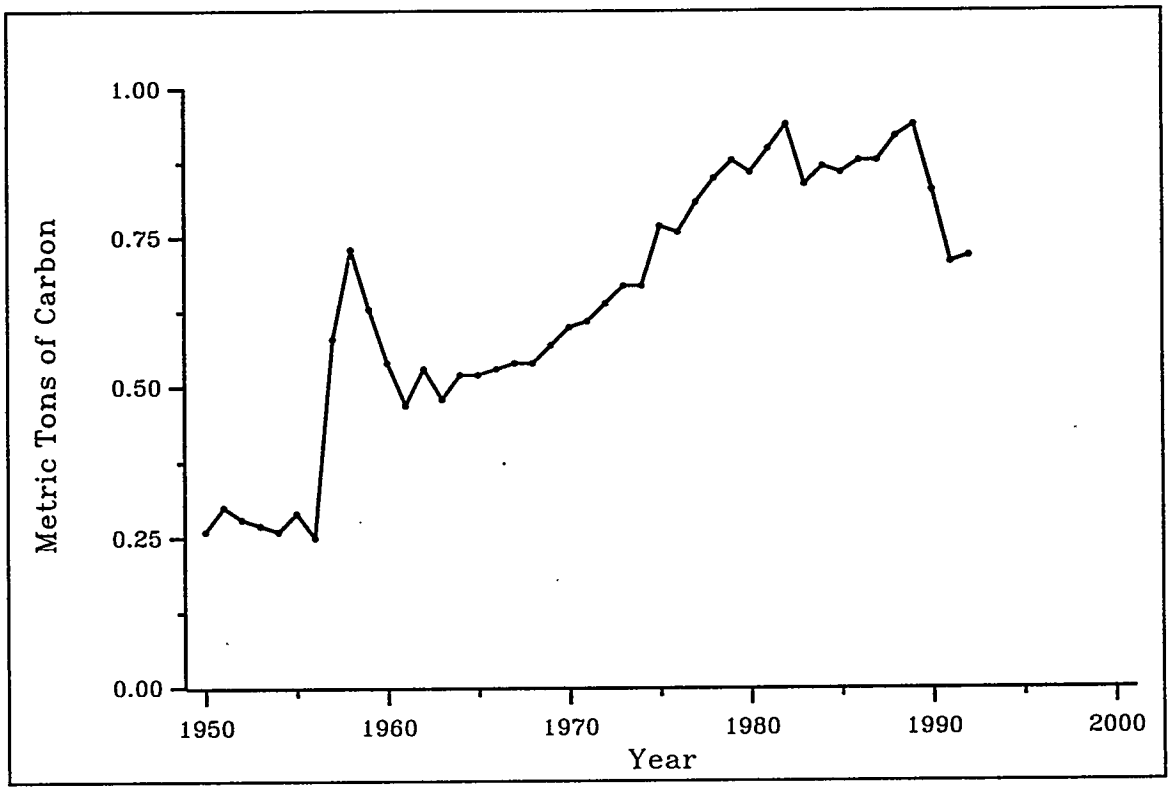
Croatia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	4424	432	2436	1316	241	0	0.91	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Cuba



Per capita CO_2 emission rates for Cuba

Cuba

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1543	46	1454	0	43	0	0.26	.
1951	1773	71	1650	0	52	0	0.30	.
1952	1729	54	1618	0	57	0	0.28	.
1953	1693	33	1605	0	55	0	0.27	.
1954	1640	40	1542	0	57	0	0.26	.
1955	1883	55	1769	0	59	0	0.29	.
1956	1621	40	1500	0	82	0	0.25	.
1957	3813	131	3593	0	88	0	0.58	.
1958	4940	62	4781	0	97	0	0.73	.
1959	4323	89	4149	0	85	0	0.63	.
1960	3751	46	3650	0	54	0	0.54	.
1961	3341	134	3089	0	119	0	0.47	.
1962	3883	53	3724	0	106	0	0.53	.
1963	3575	70	3395	0	110	0	0.48	.
1964	3920	87	3723	0	110	0	0.52	.
1965	4009	91	3809	0	109	0	0.52	.
1966	4167	72	3986	0	109	0	0.53	.
1967	4326	98	4228	0	0	0	0.54	.
1968	4405	74	4225	0	106	0	0.54	.
1969	4742	85	4551	0	106	0	0.57	.
1970	5075	86	4888	0	101	0	0.60	.
1971	5321	88	5130	1	102	0	0.61	.
1972	5643	96	5342	4	201	0	0.64	.
1973	6055	72	5772	8	204	0	0.67	.
1974	6146	62	5827	10	247	0	0.67	.
1975	7206	69	6845	9	283	0	0.77	.
1976	7144	65	6728	11	340	0	0.76	.
1977	7691	96	7225	9	361	0	0.81	.
1978	8163	99	7689	6	369	0	0.85	.
1979	8428	86	7977	9	355	0	0.88	.
1980	8369	105	7871	9	385	0	0.86	.
1981	8756	108	8193	7	448	0	0.90	.
1982	9246	135	8676	5	430	0	0.94	.
1983	8284	103	7738	4	440	0	0.84	.
1984	8724	112	8155	2	455	0	0.87	.
1985	8684	109	8139	3	433	0	0.86	.
1986	8971	121	8398	3	450	0	0.88	.
1987	9082	121	8469	12	481	0	0.88	.
1988	9535	127	8913	11	485	0	0.92	.
1989	9853	164	9246	17	427	0	0.94	.
1990	8848	145	8277	19	407	0	0.83	.
1991	7657	108	7258	19	271	0	0.71	.
1992	7812	134	7388	19	271	0	0.72	.

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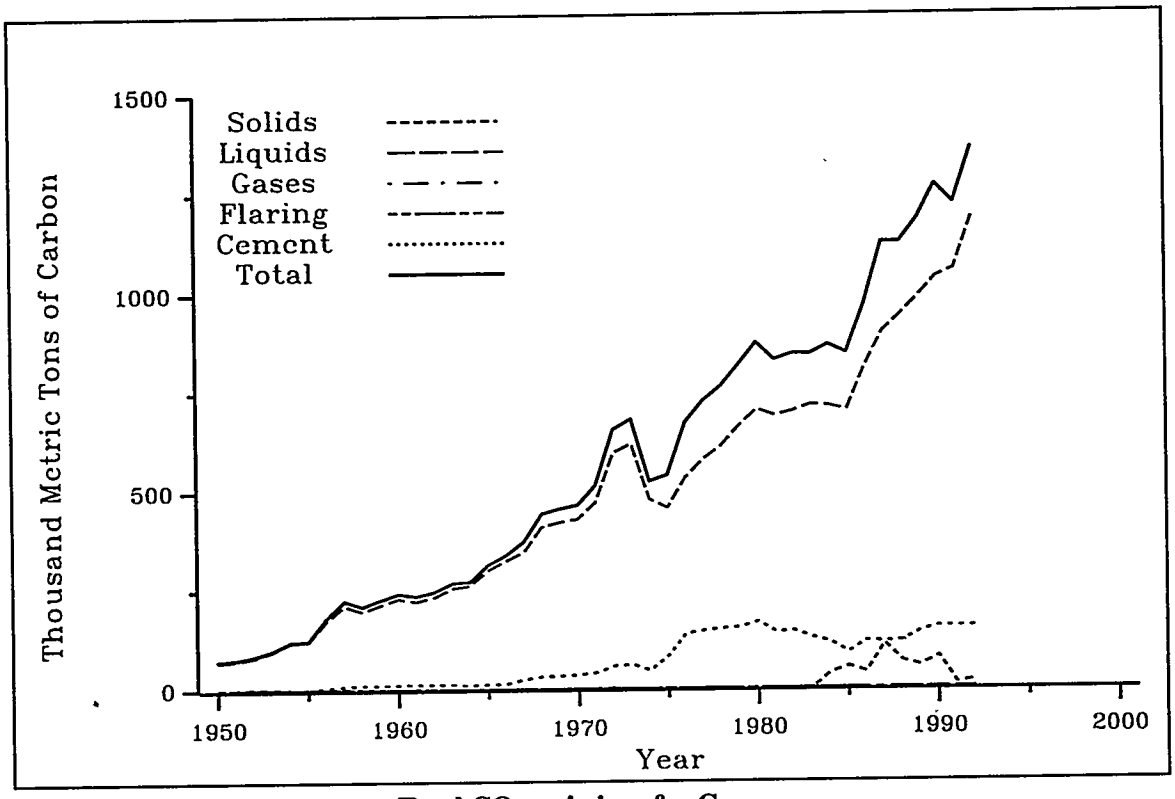
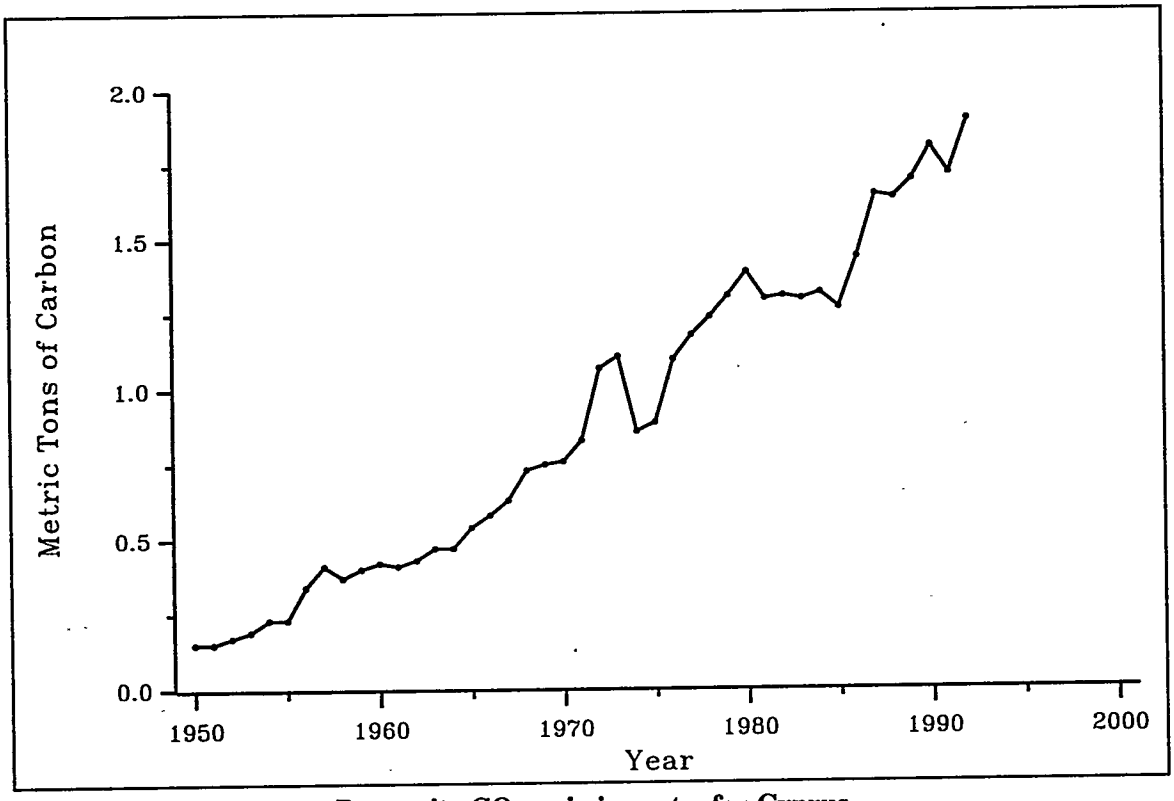


Total CO_2 emissions for Cyprus

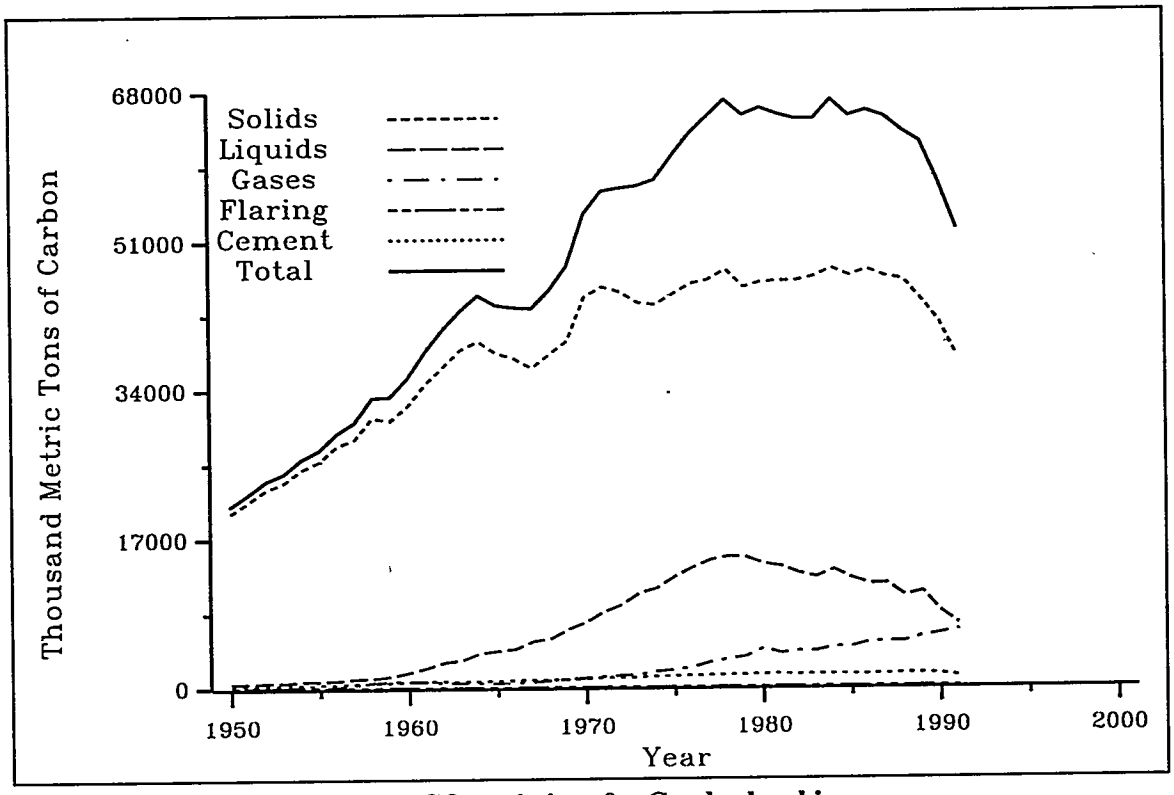


Per capita CO_2 emission rates for Cyprus

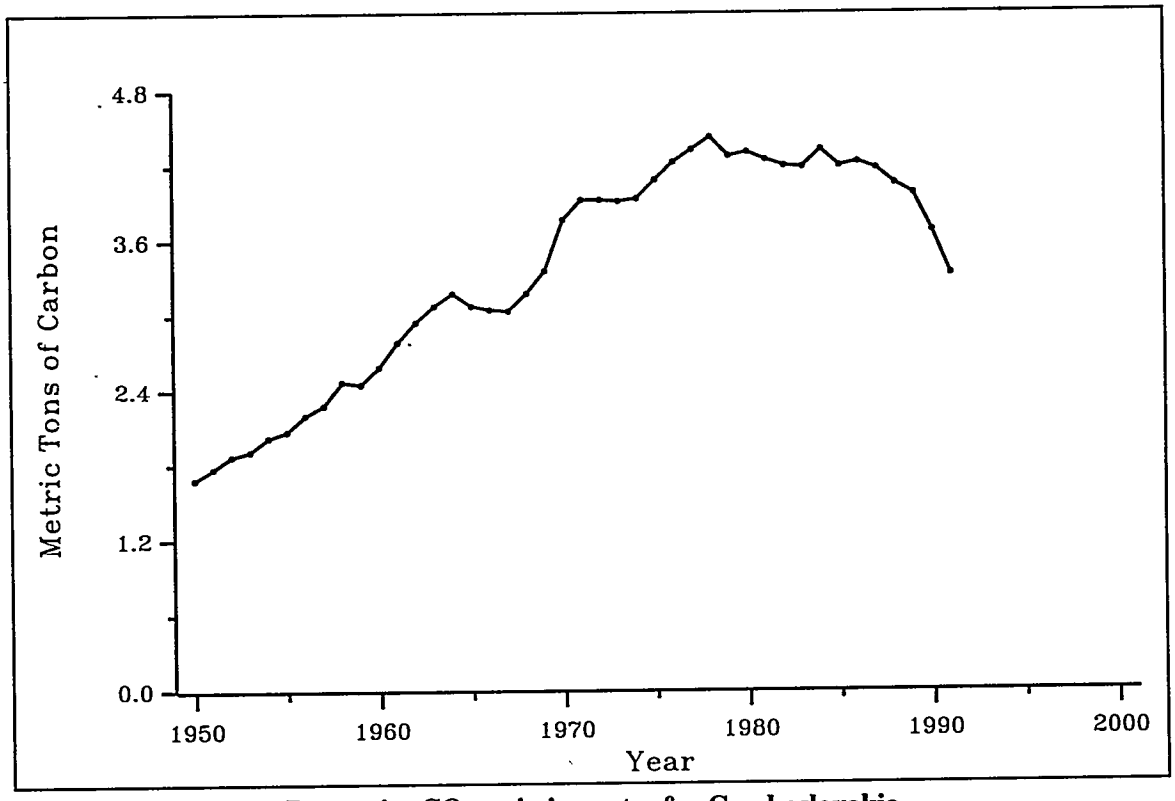
Cyprus

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	73	1	71	0	0	0	0.15	.
1951	77	1	75	0	0	0	0.15	.
1952	86	3	83	0	0	0	0.17	.
1953	100	2	98	0	0	0	0.19	.
1954	121	1	120	0	0	0	0.23	.
1955	124	1	123	0	0	0	0.23	.
1956	181	1	175	0	5	0	0.34	.
1957	225	2	213	0	9	0	0.41	.
1958	210	1	198	0	11	0	0.37	.
1959	227	1	215	0	11	0	0.40	.
1960	242	0	230	0	12	0	0.42	.
1961	236	0	223	0	13	0	0.41	.
1962	247	0	234	0	13	0	0.43	.
1963	269	0	256	0	13	0	0.47	.
1964	272	0	263	0	10	0	0.47	.
1965	314	0	301	0	13	0	0.54	.
1966	339	1	325	0	14	0	0.58	.
1967	373	0	347	0	25	0	0.63	.
1968	443	1	410	0	32	0	0.73	.
1969	456	1	422	0	33	0	0.75	.
1970	465	0	429	0	36	0	0.76	.
1971	514	1	472	0	41	0	0.83	.
1972	656	2	597	0	58	0	1.07	.
1973	682	1	620	0	61	0	1.11	.
1974	525	0	479	0	46	0	0.86	.
1975	540	0	457	0	83	0	0.89	.
1976	673	0	533	0	139	0	1.10	.
1977	726	0	579	0	146	0	1.18	.
1978	763	0	613	0	151	0	1.24	.
1979	817	0	663	0	154	0	1.31	.
1980	873	0	705	0	168	0	1.39	.
1981	830	0	689	0	141	0	1.30	.
1982	845	0	700	0	145	0	1.31	.
1983	844	0	716	0	128	0	1.30	.
1984	867	38	713	0	116	0	1.32	.
1985	846	54	702	0	90	0	1.27	.
1986	967	40	810	0	118	0	1.44	.
1987	1125	111	898	0	116	0	1.65	.
1988	1126	67	941	0	118	0	1.64	.
1989	1184	55	987	0	142	0	1.70	.
1990	1270	79	1037	0	154	0	1.81	.
1991	1223	11	1057	0	154	0	1.72	.
1992	1360	19	1187	0	154	0	1.90	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Czechoslovakia

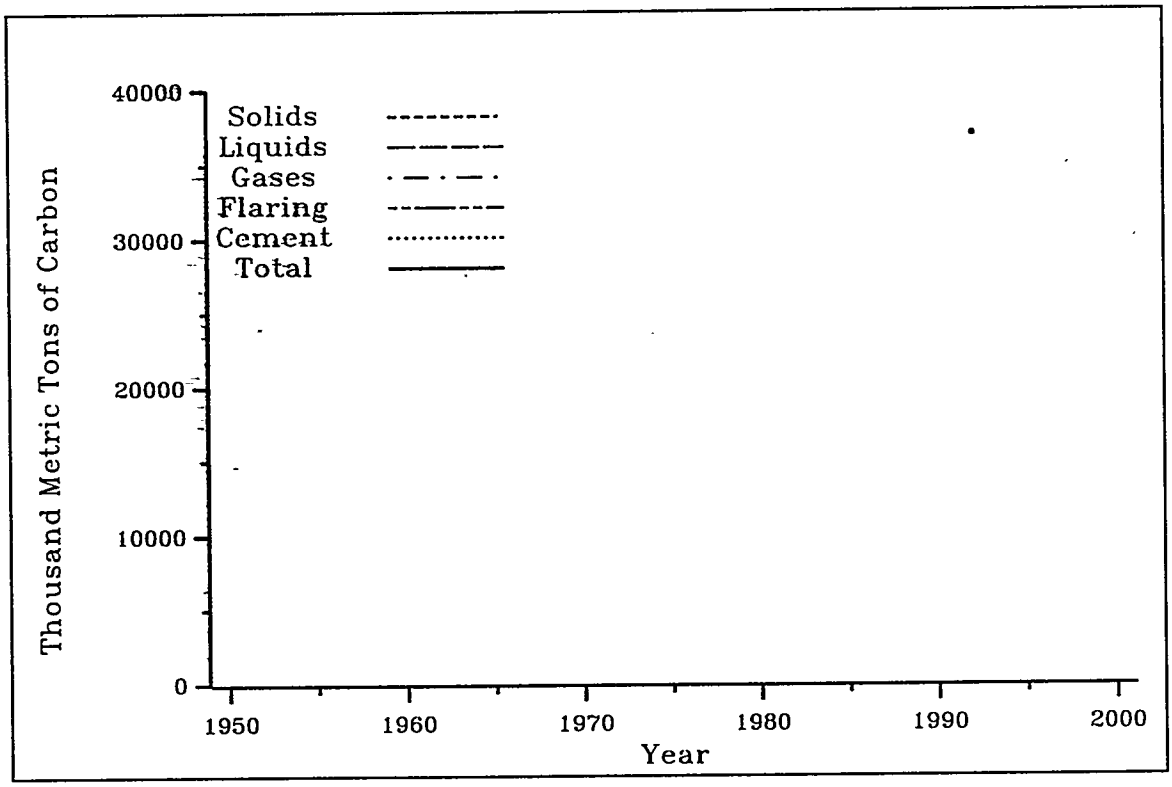


Per capita CO_2 emission rates for Czechoslovakia

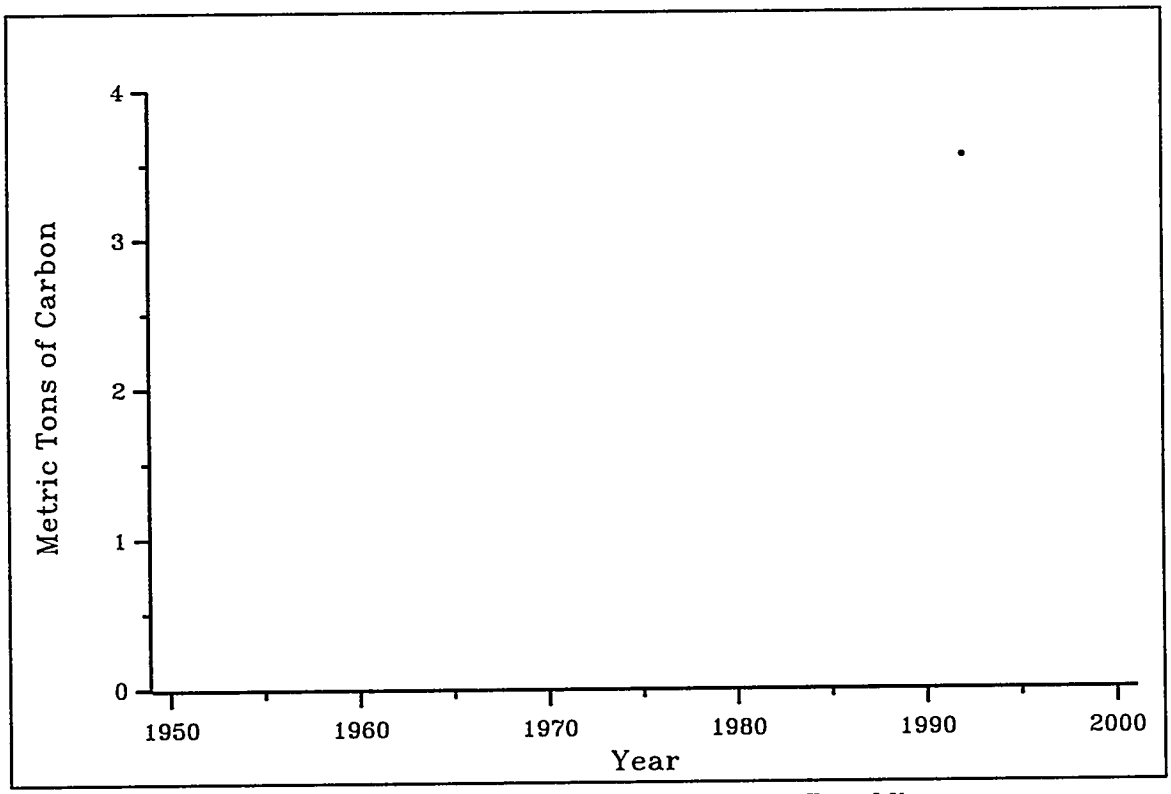
Czechoslovakia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	20786	19980	534	18	255	0	1.68	.
1951	22126	21279	527	37	283	0	1.77	.
1952	23642	22659	622	60	301	0	1.87	.
1953	24502	23465	641	80	316	0	1.91	.
1954	26151	24940	780	82	348	0	2.02	.
1955	27133	25854	803	82	393	0	2.07	.
1956	29083	27653	872	131	428	0	2.20	.
1957	30345	28396	1058	391	499	0	2.28	.
1958	33136	30843	1104	630	559	0	2.47	.
1959	33200	30452	1362	747	639	0	2.45	.
1960	35394	32211	1770	725	687	0	2.59	.
1961	38389	34643	2312	708	727	0	2.79	.
1962	40923	36632	2916	598	777	0	2.95	.
1963	43036	38592	3181	559	704	0	3.08	.
1964	44785	39535	3975	528	747	0	3.18	.
1965	43637	38183	4200	476	777	0	3.08	.
1966	43369	37591	4416	528	834	0	3.05	.
1967	43293	36464	5304	646	878	0	3.04	.
1968	45283	38014	5600	785	883	0	3.18	.
1969	48066	39511	6671	968	916	0	3.36	.
1970	54052	44525	7465	1056	1007	0	3.77	.
1971	56639	45699	8637	1220	1082	0	3.93	.
1972	56985	45128	9425	1338	1094	0	3.93	.
1973	57205	43891	10723	1450	1140	0	3.92	.
1974	57919	43629	11294	1777	1220	0	3.94	.
1975	60612	44817	12552	1977	1266	0	4.09	.
1976	63121	45993	13591	2238	1299	0	4.23	.
1977	65045	46460	14439	2821	1326	0	4.33	.
1978	66973	47585	14834	3166	1388	0	4.43	.
1979	65246	45600	14792	3460	1395	0	4.28	.
1980	66029	46170	14043	4382	1434	0	4.31	.
1981	65304	46297	13738	3821	1448	0	4.25	.
1982	64747	46319	12943	4081	1404	0	4.20	.
1983	64756	46784	12479	4065	1428	0	4.19	.
1984	66935	47679	13296	4527	1432	0	4.33	.
1985	65119	46855	12327	4541	1396	0	4.20	.
1986	65677	47546	11659	5072	1401	0	4.23	.
1987	65003	46751	11719	5122	1410	0	4.18	.
1988	63367	46407	10327	5141	1493	0	4.06	.
1989	62129	44108	10807	5733	1481	0	3.98	.
1990	57571	41572	8578	6032	1389	0	3.68	.
1991	52226	37550	7130	6417	1129	0	3.33	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Czech Republic

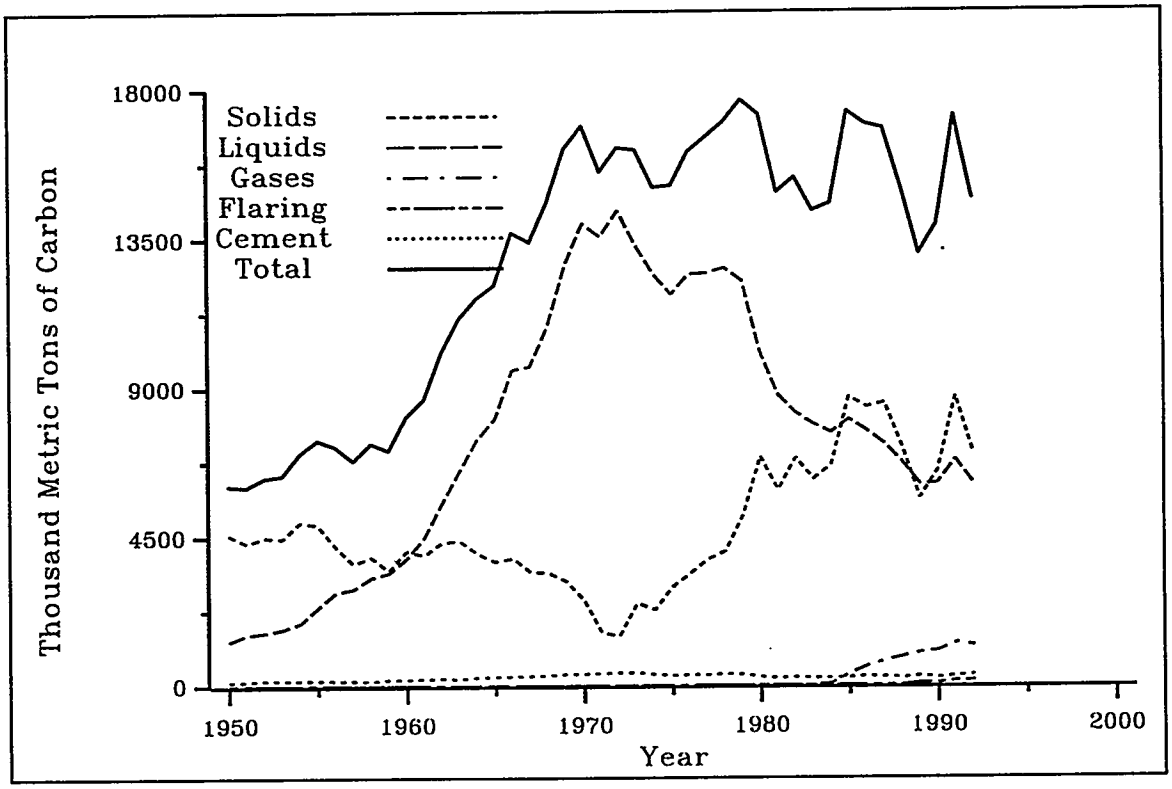


Per capita CO_2 emission rates for the Czech Republic

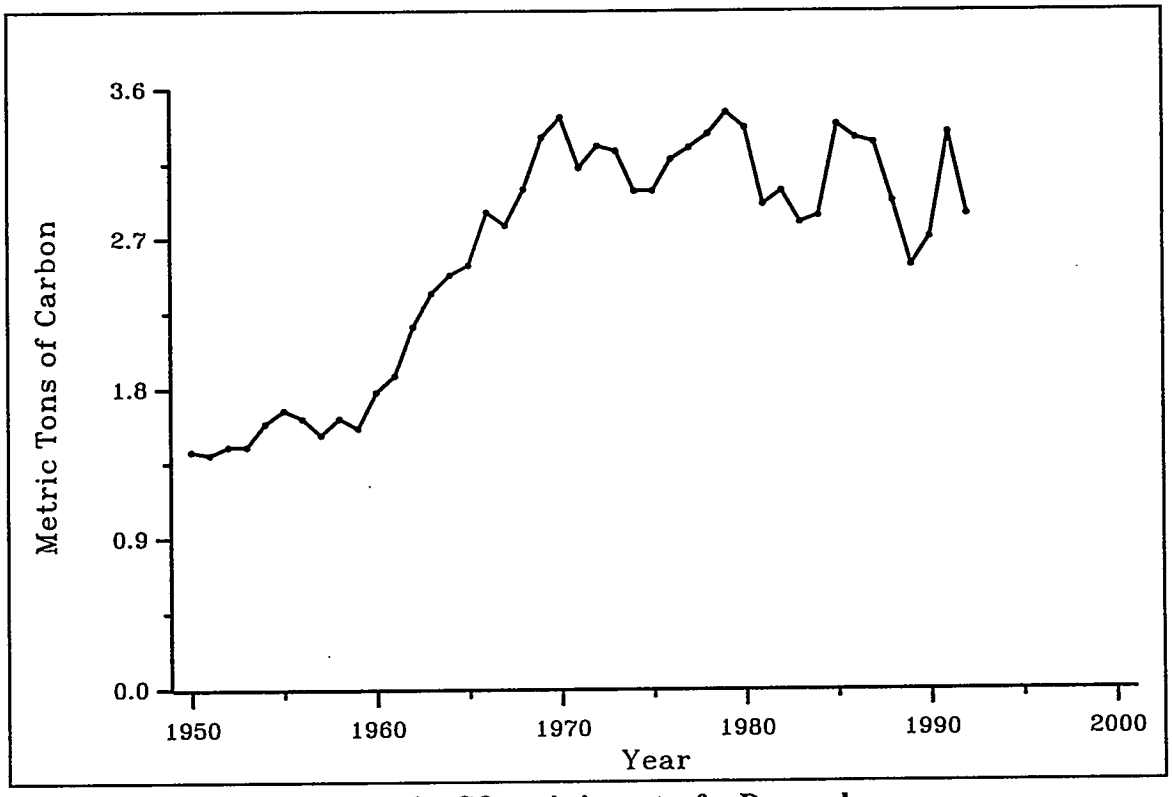
Czech Republic

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	37011	27313	5240	3373	1086	0	3.56	.

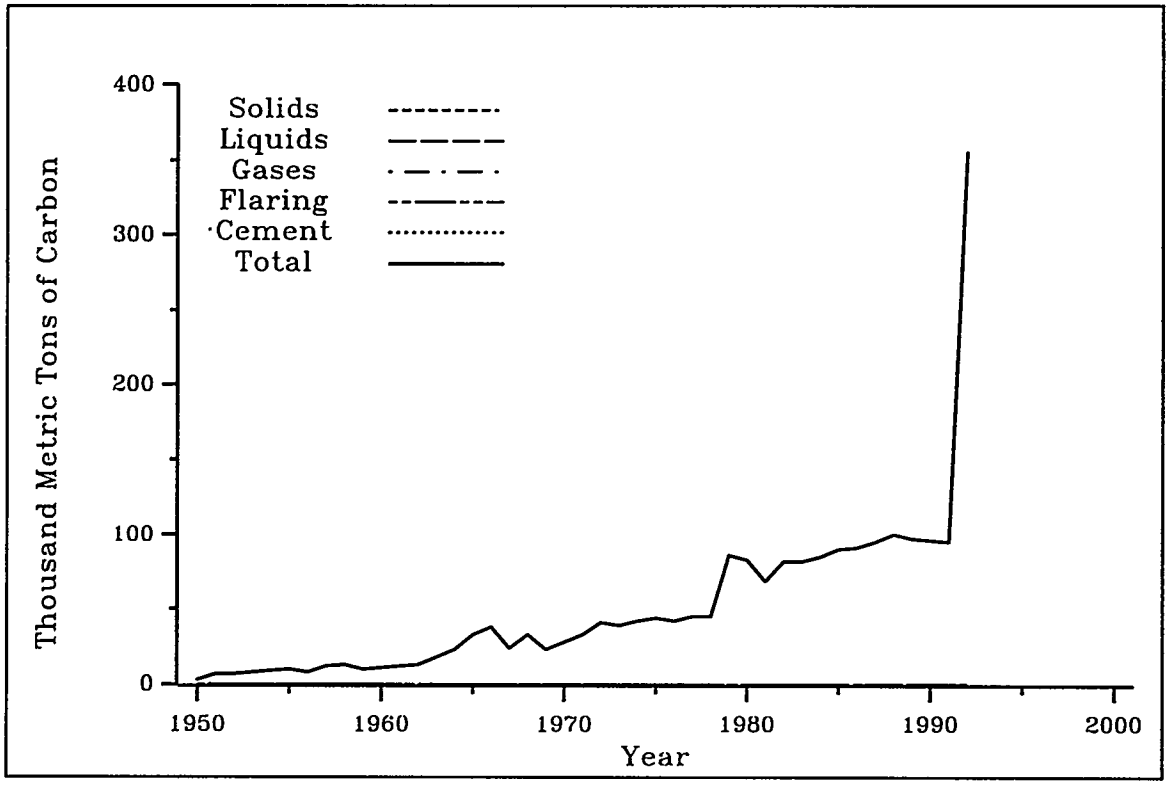
[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



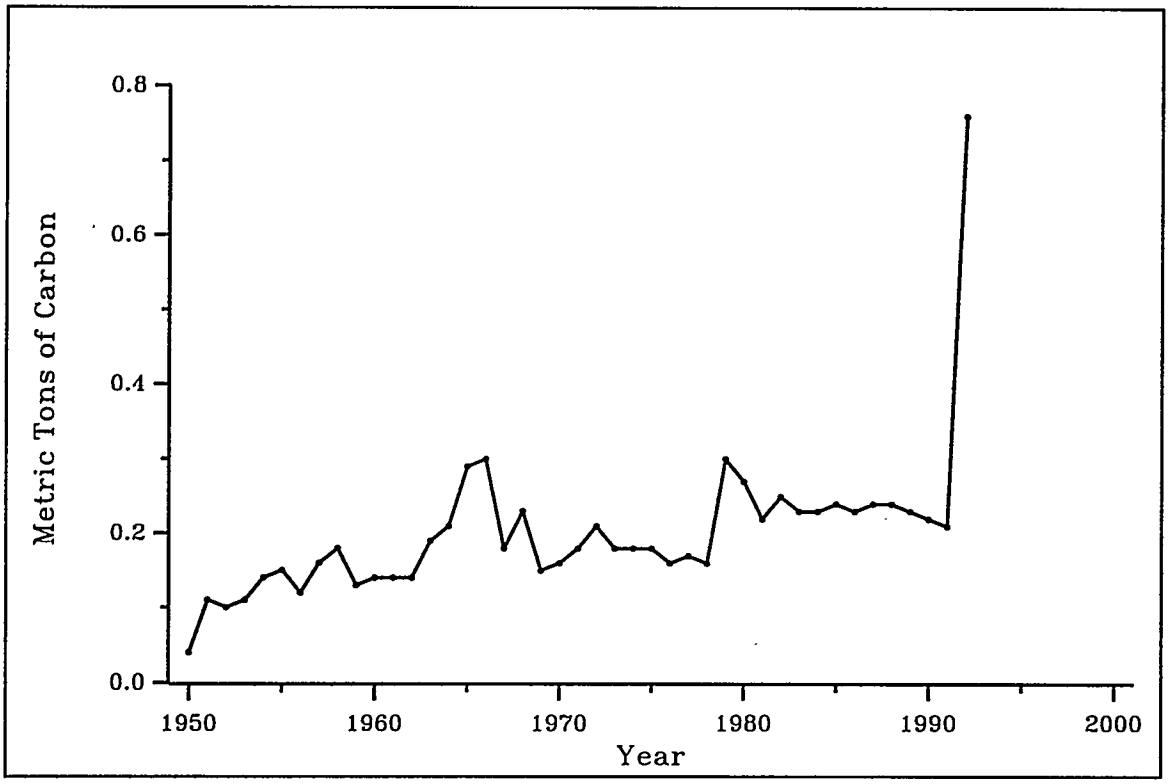
Total CO_2 emissions for Denmark



Per capita CO_2 emission rates for Denmark



Total CO_2 emissions for Djibouti



Per capita CO_2 emission rates for Djibouti

Denmark

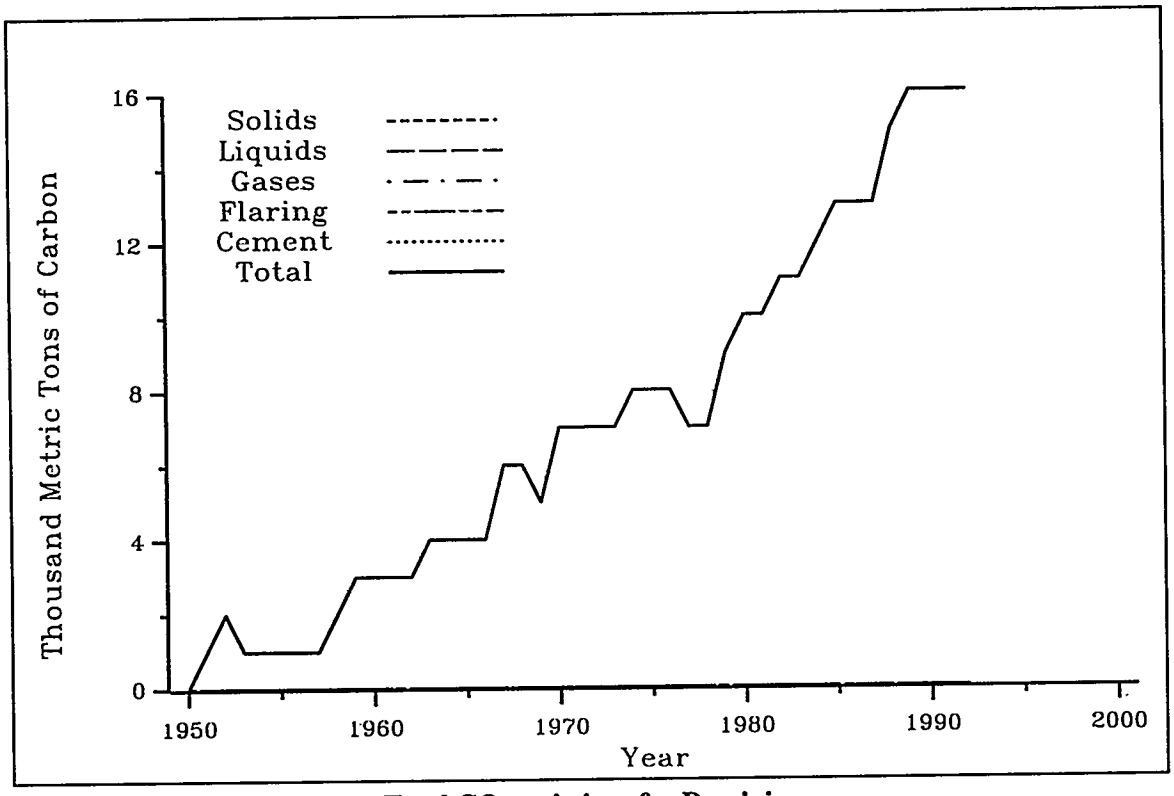
Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	6045	4573	1354	0	119	0	1.42	27
1951	6016	4324	1558	0	134	0	1.40	33
1952	6284	4501	1618	0	165	0	1.45	33
1953	6363	4464	1727	0	171	0	1.45	34
1954	7032	4954	1911	0	166	0	1.59	206
1955	7435	4875	2389	0	171	0	1.67	255
1956	7231	4225	2845	0	161	0	1.62	233
1957	6810	3703	2949	0	158	0	1.52	251
1958	7329	3897	3287	0	145	0	1.62	270
1959	7120	3501	3430	0	189	0	1.56	281
1960	8141	4080	3866	0	196	0	1.78	252
1961	8670	3962	4493	0	215	0	1.88	234
1962	10083	4349	5512	0	222	0	2.17	63
1963	11098	4396	6495	0	207	0	2.37	76
1964	11714	4004	7452	0	258	0	2.48	82
1965	12108	3761	8075	0	271	0	2.54	97
1966	13691	3858	9548	0	285	0	2.86	112
1967	13403	3449	9654	0	299	0	2.78	111
1968	14601	3425	10866	0	310	0	3.00	157
1969	16231	3170	12706	0	355	0	3.31	686
1970	16920	2598	13968	0	354	0	3.43	917
1971	15536	1599	13566	0	372	0	3.13	1121
1972	16253	1504	14359	0	391	0	3.26	1219
1973	16195	2506	13296	0	393	0	3.23	1215
1974	15067	2296	12432	0	339	0	2.99	839
1975	15112	2993	11815	0	304	0	2.99	900
1976	16135	3383	12431	0	320	0	3.18	901
1977	16577	3809	12454	0	314	0	3.25	875
1978	17031	4064	12610	0	357	0	3.33	930
1979	17685	5126	12231	0	328	0	3.46	874
1980	17254	6907	10086	0	261	0	3.37	811
1981	14909	5907	8784	0	218	0	2.91	820
1982	15350	6867	8242	0	241	0	2.99	834
1983	14351	6225	7894	8	225	0	2.80	799
1984	14562	6638	7638	59	227	0	2.84	833
1985	17338	8714	8036	351	237	0	3.39	808
1986	16964	8409	7693	581	276	6	3.31	863
1987	16834	8539	7294	738	257	6	3.28	1105
1988	15049	7205	6744	865	229	6	2.93	1293
1989	13038	5650	6065	986	273	64	2.54	1312
1990	13918	6477	6101	1050	225	66	2.71	1430
1991	17211	8725	6807	1276	274	129	3.34	1260
1992	14710	6991	6081	1197	308	133	2.85	1283

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.

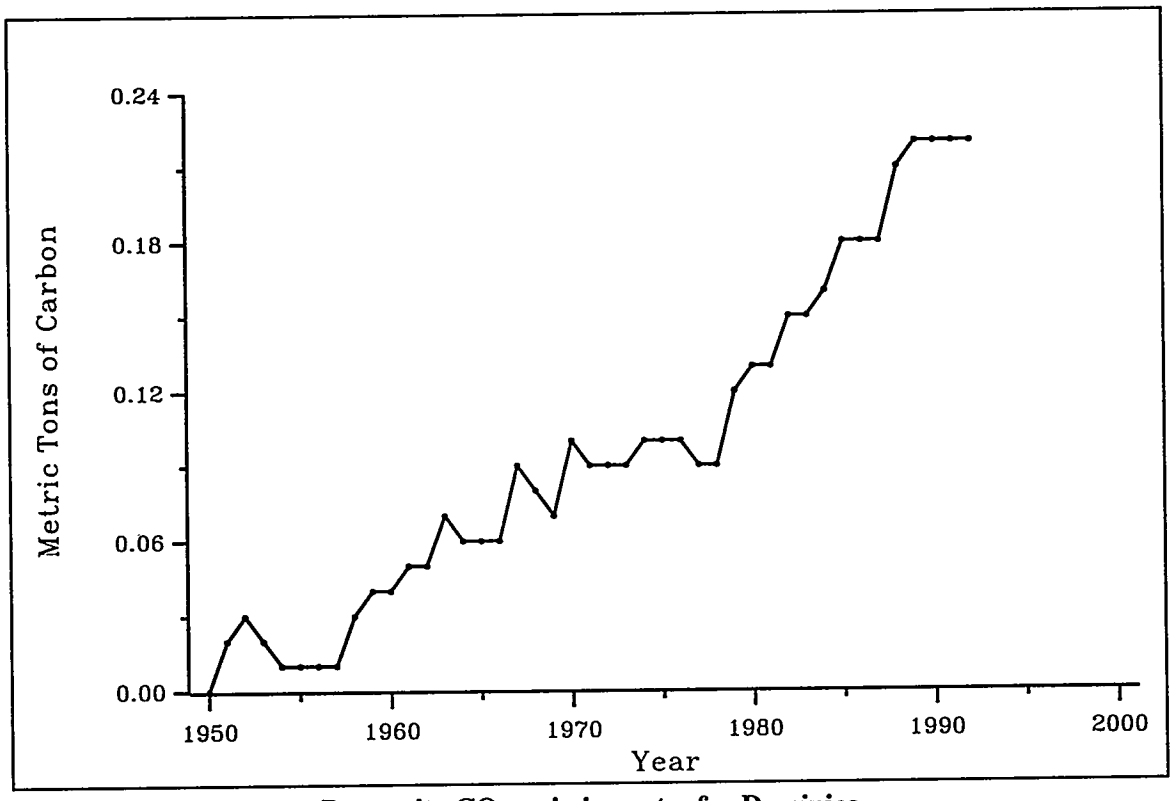
Djibouti

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	3	0	3	0	0	0	0.04	.
1951	7	0	7	0	0	0	0.11	.
1952	7	0	7	0	0	0	0.10	.
1953	8	0	8	0	0	0	0.11	.
1954	9	0	9	0	0	0	0.14	.
1955	10	0	10	0	0	0	0.15	.
1956	8	0	8	0	0	0	0.12	.
1957	12	0	12	0	0	0	0.16	.
1958	13	0	13	0	0	0	0.18	.
1959	10	0	10	0	0	0	0.13	.
1960	11	0	11	0	0	0	0.14	.
1961	12	0	12	0	0	0	0.14	.
1962	13	0	13	0	0	0	0.14	.
1963	18	0	18	0	0	0	0.19	.
1964	23	0	23	0	0	0	0.21	.
1965	33	0	33	0	0	0	0.29	.
1966	38	0	38	0	0	0	0.30	.
1967	24	0	24	0	0	0	0.18	.
1968	33	0	33	0	0	0	0.23	.
1969	23	0	23	0	0	0	0.15	.
1970	28	0	28	0	0	0	0.16	.
1971	33	0	33	0	0	0	0.18	.
1972	41	0	41	0	0	0	0.21	.
1973	39	0	39	0	0	0	0.18	.
1974	42	0	42	0	0	0	0.18	.
1975	44	0	44	0	0	0	0.18	.
1976	42	0	42	0	0	0	0.16	.
1977	45	0	45	0	0	0	0.17	.
1978	45	0	45	0	0	0	0.16	.
1979	86	0	86	0	0	0	0.30	.
1980	83	0	83	0	0	0	0.27	.
1981	69	0	69	0	0	0	0.22	.
1982	82	0	82	0	0	0	0.25	.
1983	82	0	82	0	0	0	0.23	.
1984	85	0	85	0	0	0	0.23	.
1985	90	0	90	0	0	0	0.24	.
1986	91	0	91	0	0	0	0.23	.
1987	95	0	95	0	0	0	0.24	.
1988	100	0	100	0	0	0	0.24	.
1989	97	0	97	0	0	0	0.23	.
1990	96	0	96	0	0	0	0.22	.
1991	95	0	95	0	0	0	0.21	.
1992	355	0	355	0	0	0	0.76	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Dominica

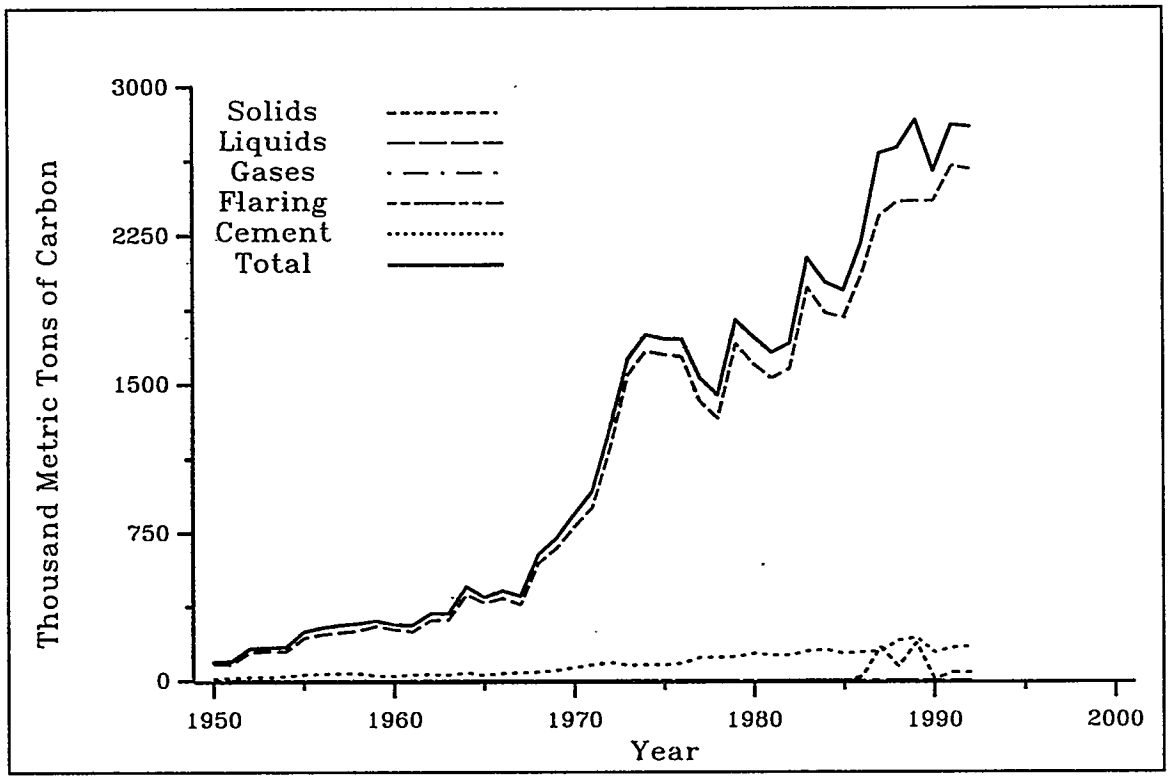


Per capita CO_2 emission rates for Dominica

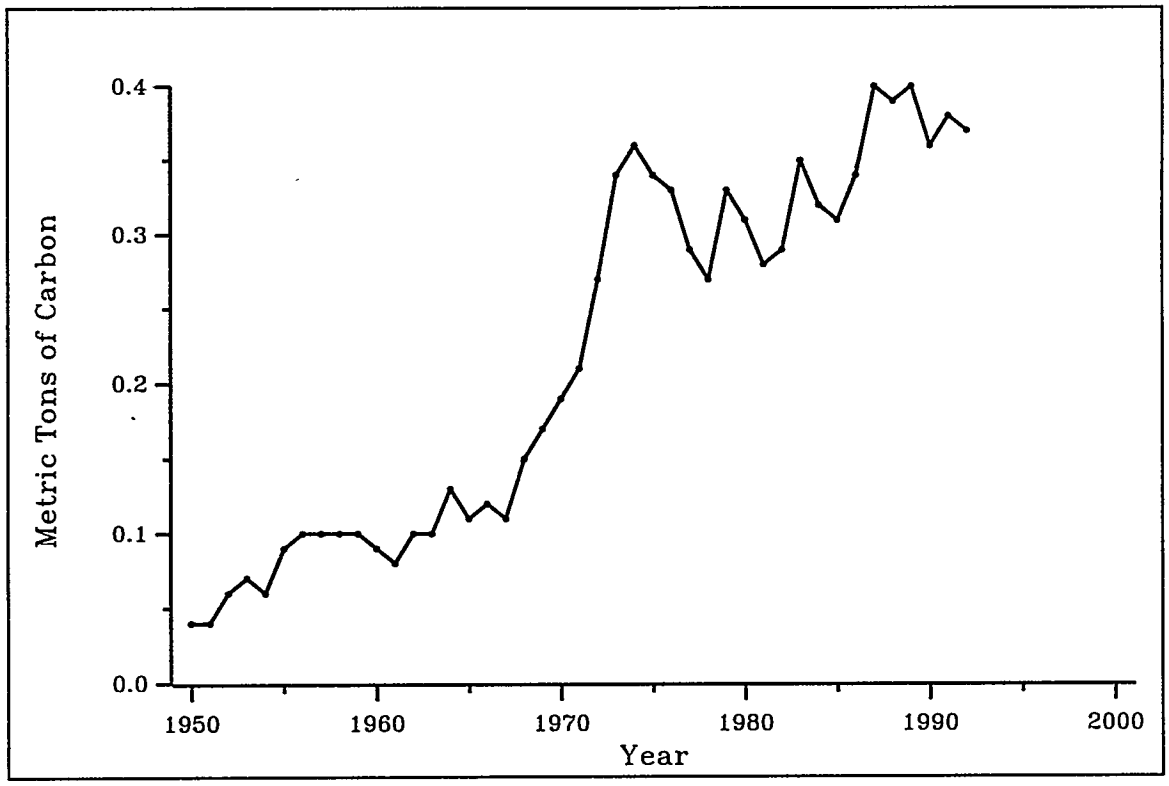
Dominica

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	1	0	1	0	0	0	0.02	.
1952	2	0	2	0	0	0	0.03	.
1953	1	0	1	0	0	0	0.02	.
1954	1	0	1	0	0	0	0.01	.
1955	1	0	1	0	0	0	0.01	.
1956	1	0	1	0	0	0	0.01	.
1957	1	0	1	0	0	0	0.01	.
1958	2	0	2	0	0	0	0.03	.
1959	3	0	3	0	0	0	0.04	.
1960	3	0	3	0	0	0	0.04	.
1961	3	0	3	0	0	0	0.05	.
1962	3	0	3	0	0	0	0.05	.
1963	4	0	4	0	0	0	0.07	.
1964	4	0	4	0	0	0	0.06	.
1965	4	0	4	0	0	0	0.06	.
1966	4	0	4	0	0	0	0.06	.
1967	6	0	6	0	0	0	0.09	.
1968	6	0	6	0	0	0	0.08	.
1969	5	0	5	0	0	0	0.07	.
1970	7	0	7	0	0	0	0.10	.
1971	7	0	7	0	0	0	0.09	.
1972	7	0	7	0	0	0	0.09	.
1973	7	0	7	0	0	0	0.09	.
1974	8	0	8	0	0	0	0.10	.
1975	8	0	8	0	0	0	0.10	.
1976	8	0	8	0	0	0	0.10	.
1977	7	0	7	0	0	0	0.09	.
1978	7	0	7	0	0	0	0.09	.
1979	9	0	9	0	0	0	0.12	.
1980	10	0	10	0	0	0	0.13	.
1981	10	0	10	0	0	0	0.13	.
1982	11	0	11	0	0	0	0.15	.
1983	11	0	11	0	0	0	0.15	.
1984	12	0	12	0	0	0	0.16	.
1985	13	0	13	0	0	0	0.18	.
1986	13	0	13	0	0	0	0.18	.
1987	13	0	13	0	0	0	0.18	.
1988	15	0	15	0	0	0	0.21	.
1989	16	0	16	0	0	0	0.22	.
1990	16	0	16	0	0	0	0.22	.
1991	16	0	16	0	0	0	0.22	.
1992	16	0	16	0	0	0	0.22	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Dominican Republic

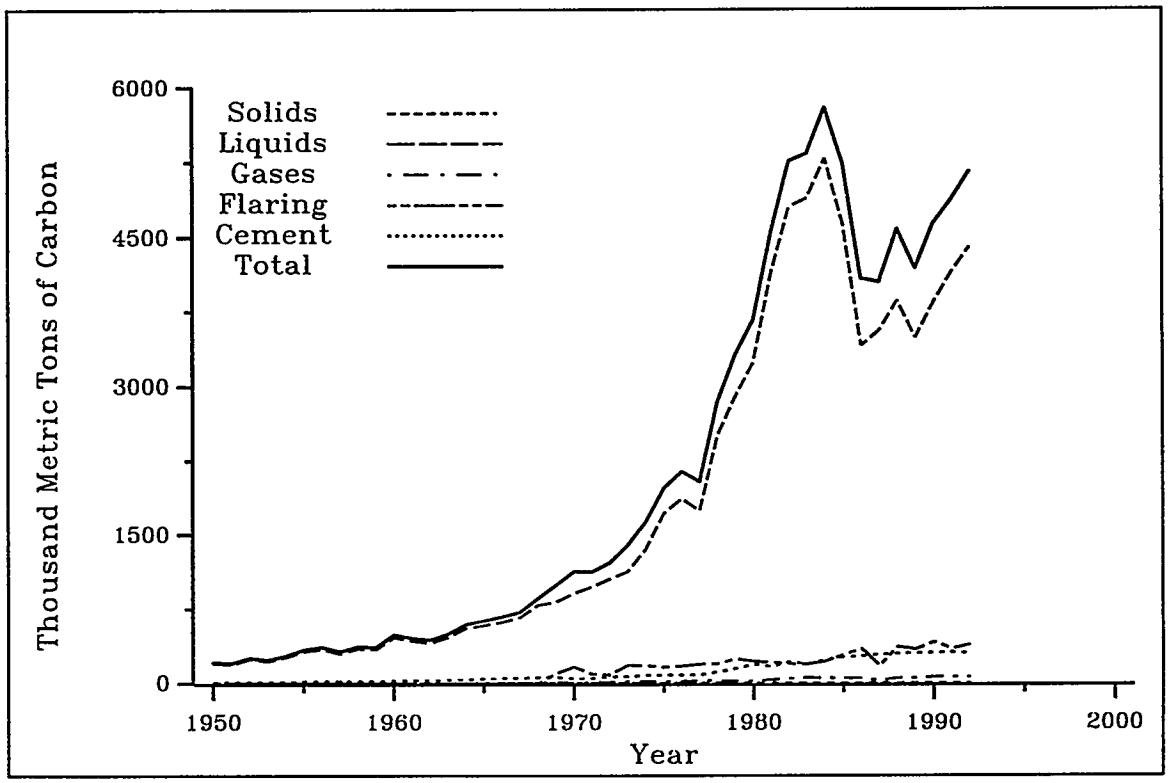


Per capita CO_2 emission rates for the Dominican Republic

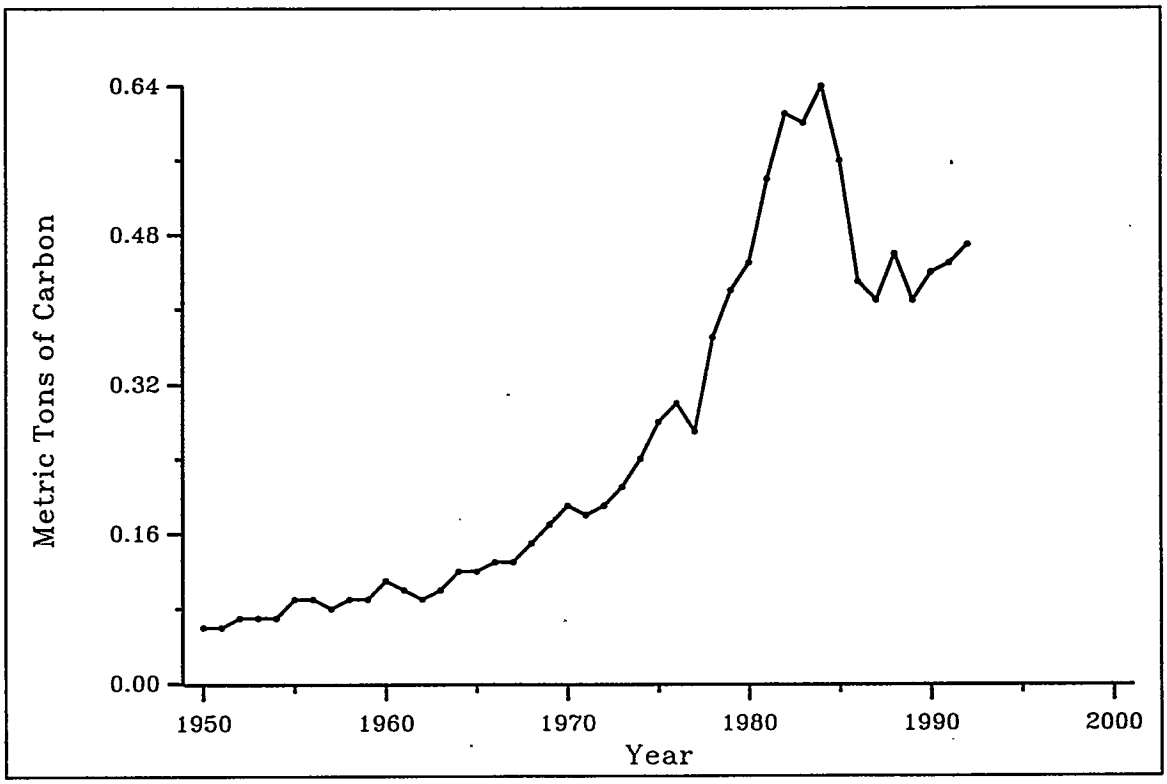
Dominican Republic

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	94	0	85	0	10	0	0.04	.
1951	98	0	84	0	14	0	0.04	.
1952	162	0	143	0	19	0	0.06	.
1953	169	1	151	0	18	0	0.07	.
1954	171	1	148	0	22	0	0.06	.
1955	249	1	217	0	32	0	0.09	.
1956	269	1	234	0	34	0	0.10	.
1957	282	0	244	0	38	0	0.10	.
1958	290	1	253	0	37	0	0.10	.
1959	304	1	277	0	26	0	0.10	.
1960	284	1	260	0	23	0	0.09	.
1961	282	1	249	0	32	0	0.08	.
1962	339	0	306	0	33	0	0.10	.
1963	341	1	309	0	31	0	0.10	.
1964	477	1	435	0	41	0	0.13	.
1965	422	1	393	0	29	0	0.11	.
1966	455	1	417	0	38	0	0.12	.
1967	428	1	385	0	42	0	0.11	.
1968	641	1	596	0	45	0	0.15	.
1969	724	1	671	0	53	0	0.17	.
1970	848	1	780	0	67	0	0.19	.
1971	961	1	879	0	81	0	0.21	.
1972	1275	1	1182	0	92	0	0.27	.
1973	1627	1	1547	0	79	0	0.34	.
1974	1750	1	1667	0	82	0	0.36	.
1975	1729	1	1649	0	80	0	0.34	.
1976	1727	1	1638	0	89	0	0.33	.
1977	1531	1	1413	0	117	0	0.29	.
1978	1445	0	1327	0	118	0	0.27	.
1979	1824	0	1704	0	121	0	0.33	.
1980	1738	0	1600	0	138	0	0.31	.
1981	1660	0	1530	0	129	0	0.28	.
1982	1706	0	1577	0	129	0	0.29	.
1983	2137	0	1987	0	150	0	0.35	.
1984	2015	0	1860	0	156	0	0.32	.
1985	1973	0	1836	0	137	0	0.31	.
1986	2215	21	2050	0	145	0	0.34	.
1987	2661	170	2343	0	148	0	0.40	.
1988	2691	71	2416	0	203	0	0.39	.
1989	2831	192	2421	0	218	0	0.40	.
1990	2572	7	2421	0	144	0	0.36	.
1991	2806	42	2597	0	167	0	0.38	.
1992	2797	42	2582	0	173	0	0.37	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Ecuador

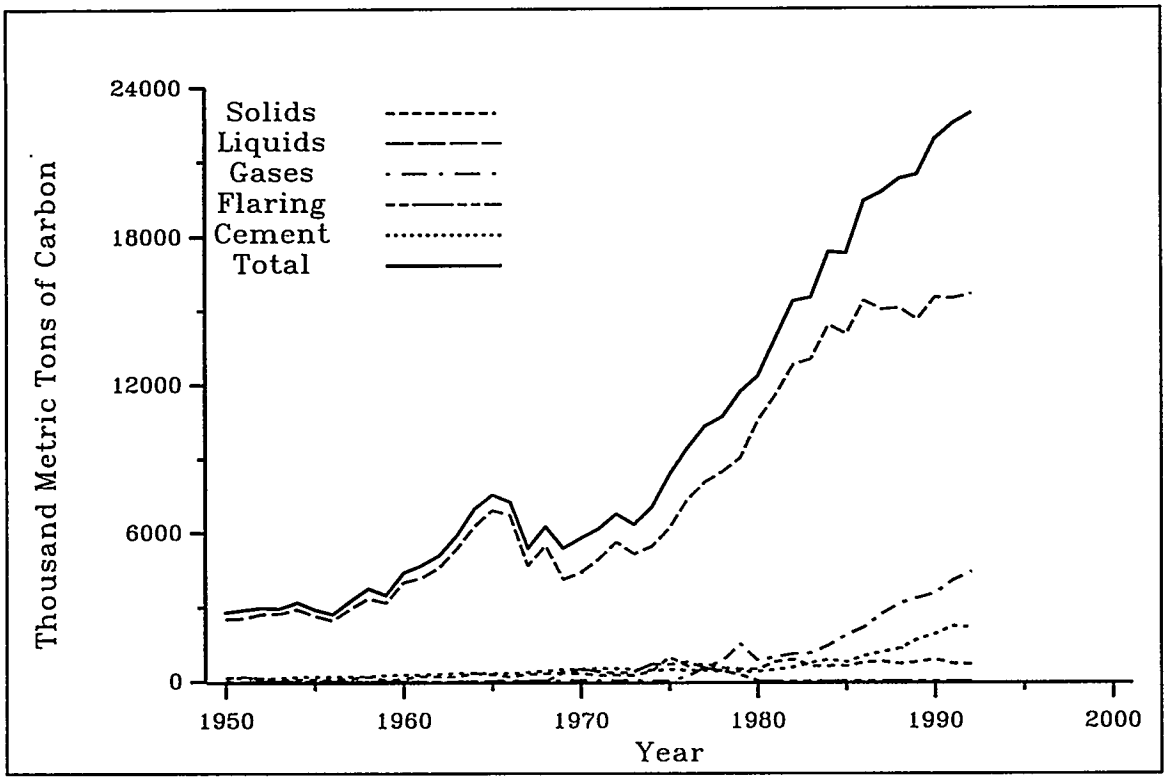


Per capita CO_2 emission rates for Ecuador

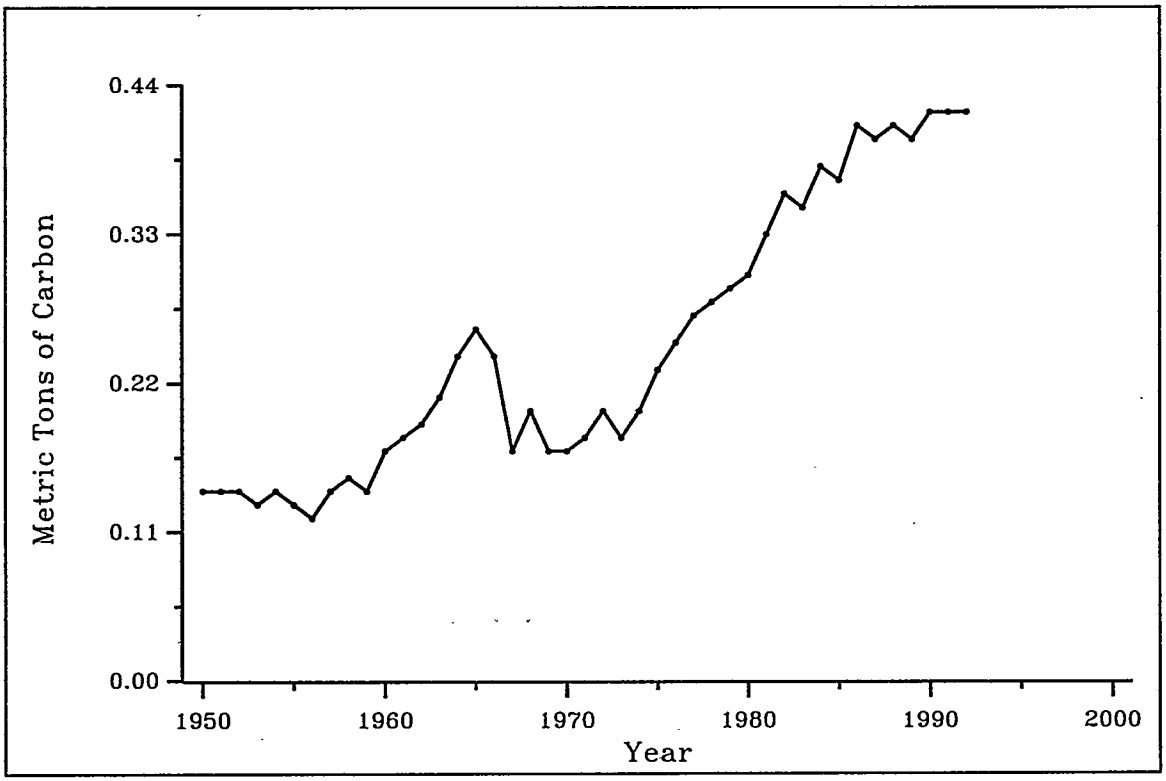
Ecuador

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	211	0	203	0	8	0	0.06	.
1951	202	0	191	0	11	0	0.06	.
1952	256	0	244	0	12	0	0.07	.
1953	236	0	224	0	12	0	0.07	.
1954	277	0	264	0	13	0	0.07	.
1955	341	0	322	0	20	0	0.09	.
1956	368	0	347	0	21	0	0.09	.
1957	322	0	301	0	21	0	0.08	.
1958	374	0	352	0	22	0	0.09	.
1959	365	0	344	0	21	0	0.09	.
1960	492	0	465	0	27	0	0.11	.
1961	459	0	430	0	30	0	0.10	.
1962	438	0	409	0	29	0	0.09	.
1963	501	0	466	0	35	0	0.10	.
1964	597	0	558	0	39	0	0.12	.
1965	632	0	588	0	44	0	0.12	.
1966	670	0	619	0	51	0	0.13	.
1967	718	0	665	0	53	0	0.13	.
1968	860	0	792	9	59	0	0.15	.
1969	992	0	822	9	62	98	0.17	.
1970	1132	0	911	9	45	167	0.19	.
1971	1125	0	974	9	50	93	0.18	.
1972	1220	0	1057	11	66	86	0.19	.
1973	1398	0	1130	18	66	183	0.21	.
1974	1631	0	1356	18	79	177	0.24	.
1975	1973	0	1711	20	81	162	0.28	.
1976	2142	0	1866	20	83	173	0.30	.
1977	2040	0	1738	26	85	192	0.27	.
1978	2844	0	2508	26	113	197	0.37	.
1979	3318	0	2901	23	149	245	0.42	.
1980	3666	0	3237	20	189	220	0.45	.
1981	4553	0	4139	36	168	209	0.54	.
1982	5260	0	4801	47	216	196	0.61	.
1983	5333	0	4890	55	193	194	0.60	.
1984	5796	0	5286	53	236	222	0.64	.
1985	5236	0	4633	51	267	286	0.56	.
1986	4083	0	3408	52	274	349	0.43	.
1987	4049	0	3555	26	292	176	0.41	.
1988	4581	0	3859	52	299	371	0.46	.
1989	4186	0	3485	52	306	343	0.41	.
1990	4630	0	3839	65	308	417	0.44	.
1991	4873	0	4145	65	313	350	0.45	.
1992	5155	0	4400	65	301	390	0.47	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Egypt

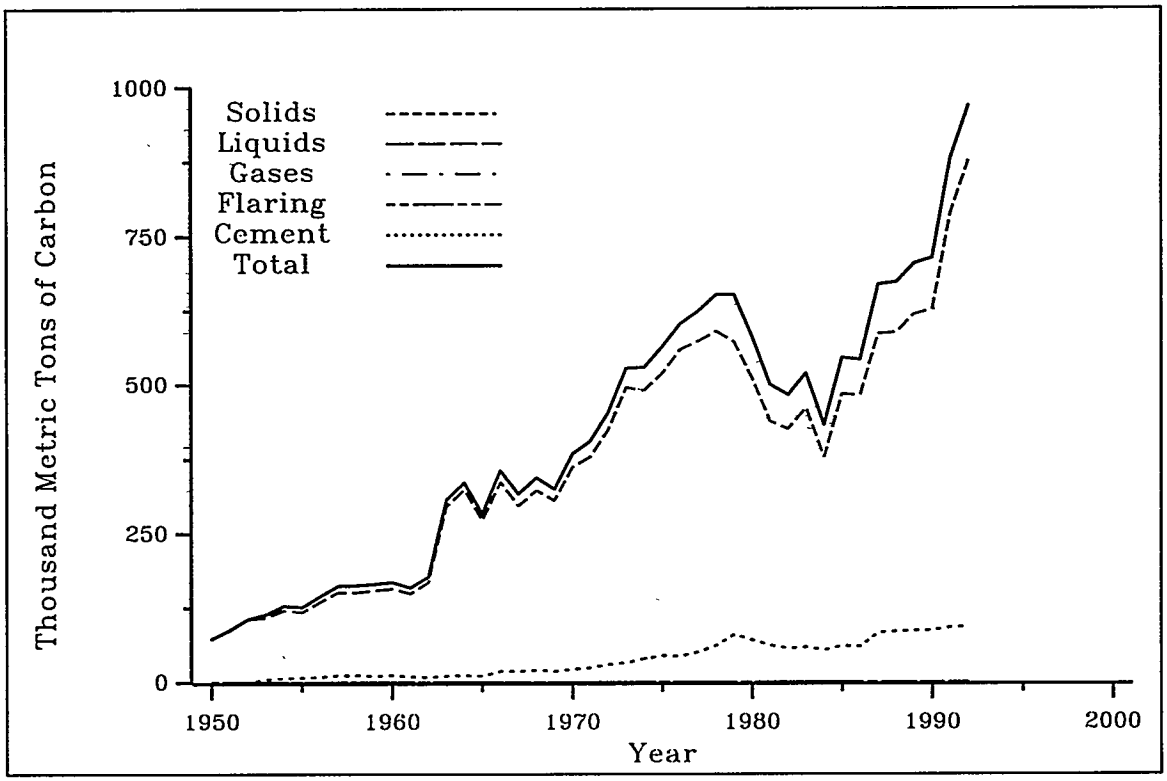


Per capita CO_2 emission rates for Egypt

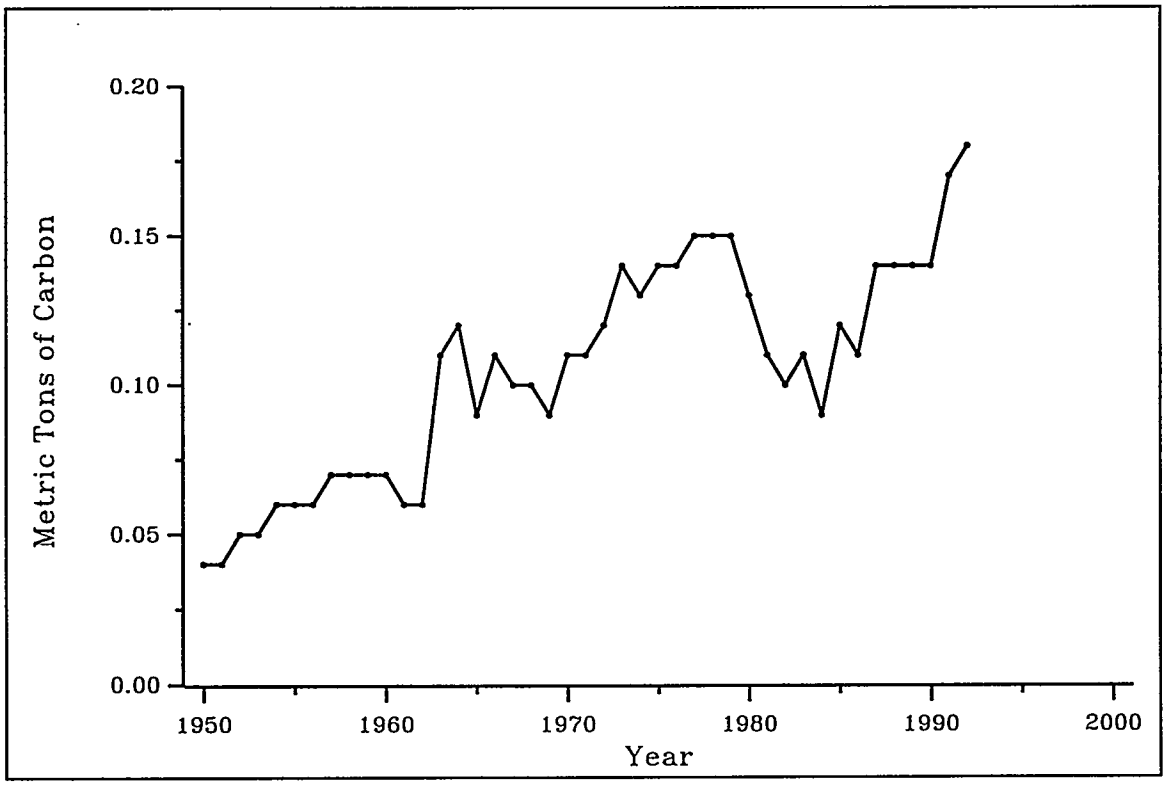
Egypt

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2805	141	2525	0	139	0	0.14	.
1951	2896	186	2556	0	154	0	0.14	.
1952	2984	131	2724	0	129	0	0.14	.
1953	2949	51	2749	0	149	0	0.13	.
1954	3190	89	2919	0	182	0	0.14	.
1955	2912	72	2654	0	187	0	0.13	.
1956	2720	65	2471	0	184	0	0.12	.
1957	3260	121	2940	0	199	0	0.14	.
1958	3745	184	3355	0	206	0	0.15	.
1959	3479	58	3178	0	243	0	0.14	.
1960	4388	114	3995	0	278	0	0.17	.
1961	4670	216	4174	0	280	0	0.18	.
1962	5080	195	4581	0	304	0	0.19	.
1963	5886	195	5350	0	341	0	0.21	.
1964	6970	335	6265	27	343	0	0.24	.
1965	7546	283	6908	26	329	0	0.26	.
1966	7251	186	6703	29	332	0	0.24	.
1967	5374	306	4663	29	374	0	0.17	.
1968	6254	318	5478	29	428	0	0.20	.
1969	5377	348	4121	37	491	379	0.17	.
1970	5783	339	4393	45	501	506	0.17	.
1971	6160	253	4920	44	533	410	0.18	.
1972	6764	259	5619	37	520	330	0.20	.
1973	6332	248	5142	46	492	404	0.18	.
1974	7040	426	5442	22	444	705	0.20	.
1975	8366	983	6183	24	488	688	0.23	.
1976	9408	630	7328	199	457	793	0.25	.
1977	10317	701	8054	572	443	547	0.27	.
1978	10714	549	8483	840	408	434	0.28	.
1979	11707	501	9026	1509	402	269	0.29	.
1980	12329	502	10549	840	412	26	0.30	.
1981	13867	799	11582	999	476	11	0.33	.
1982	15383	889	12787	1114	579	14	0.36	.
1983	15533	623	13016	1146	748	0	0.35	.
1984	17377	623	14410	1460	884	0	0.38	.
1985	17322	628	14034	1878	782	0	0.37	.
1986	19391	763	15398	2195	1035	0	0.41	.
1987	19753	808	15031	2725	1190	0	0.40	.
1988	20286	713	15097	3145	1331	0	0.41	.
1989	20457	782	14618	3360	1697	0	0.40	.
1990	21887	892	15523	3552	1919	0	0.42	.
1991	22507	716	15488	4068	2234	0	0.42	.
1992	22925	689	15653	4399	2184	0	0.42	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for El Salvador

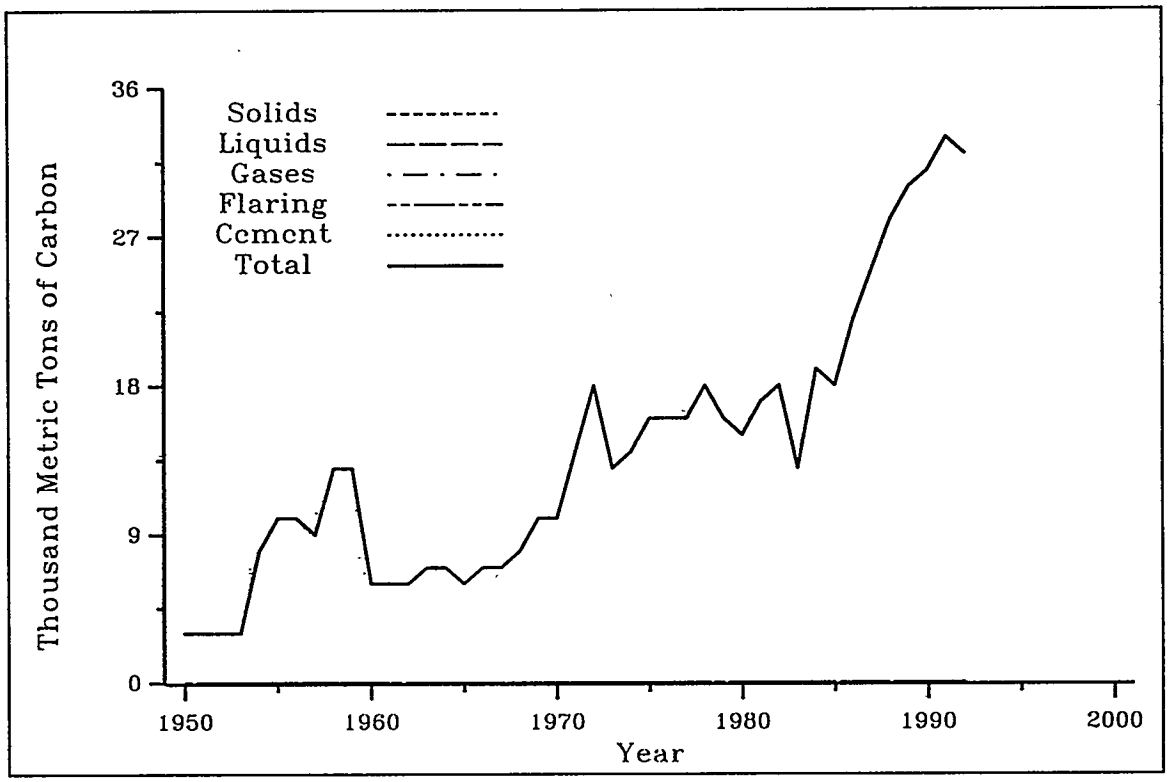


Per capita CO_2 emission rates for El Salvador

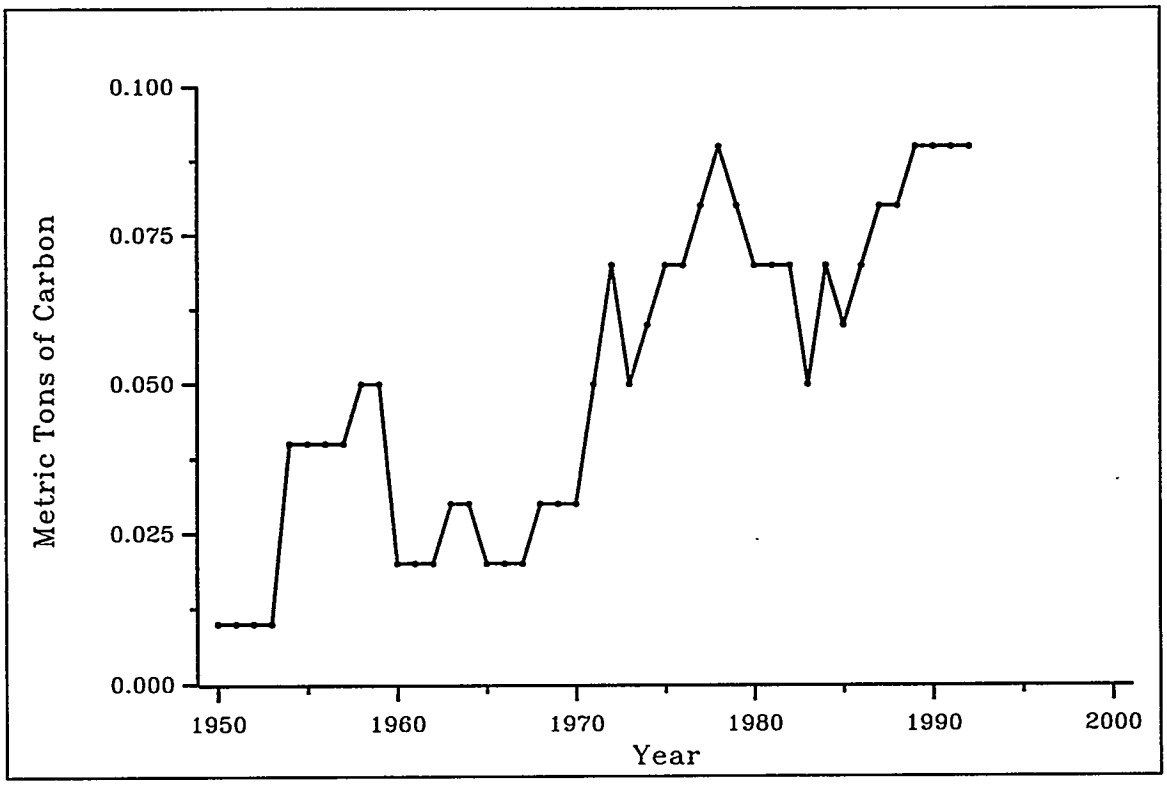
El Salvador

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	73	0	73	0	0	0	0.04	.
1951	88	0	88	0	0	0	0.04	.
1952	106	0	106	0	0	0	0.05	.
1953	114	0	109	0	5	0	0.05	.
1954	128	0	121	0	7	0	0.06	.
1955	126	0	118	0	8	0	0.06	.
1956	144	0	135	0	9	0	0.06	.
1957	162	0	151	0	12	0	0.07	.
1958	163	0	151	0	12	0	0.07	.
1959	165	0	154	0	11	0	0.07	.
1960	168	0	157	0	12	0	0.07	.
1961	159	0	149	0	10	0	0.06	.
1962	177	0	168	0	9	0	0.06	.
1963	307	0	296	0	11	0	0.11	.
1964	336	0	324	0	12	0	0.12	.
1965	284	0	273	0	11	0	0.09	.
1966	356	0	337	0	19	0	0.11	.
1967	317	0	297	0	19	0	0.10	.
1968	344	0	323	0	21	0	0.10	.
1969	325	0	306	0	19	0	0.09	.
1970	384	0	362	0	22	0	0.11	.
1971	405	0	379	0	25	0	0.11	.
1972	453	0	424	0	30	0	0.12	.
1973	528	0	495	0	33	0	0.14	.
1974	529	0	490	0	40	0	0.13	.
1975	564	0	519	0	45	0	0.14	.
1976	603	0	559	0	44	0	0.14	.
1977	624	0	573	0	51	0	0.15	.
1978	652	0	590	0	62	0	0.15	.
1979	652	0	572	0	80	0	0.15	.
1980	581	0	511	0	71	0	0.13	.
1981	500	0	438	0	62	0	0.11	.
1982	482	0	425	0	57	0	0.10	.
1983	519	0	460	0	59	0	0.11	.
1984	432	0	378	0	54	0	0.09	.
1985	545	0	484	0	61	0	0.12	.
1986	542	0	481	0	60	0	0.11	.
1987	669	0	586	0	83	0	0.14	.
1988	673	0	588	0	85	0	0.14	.
1989	705	0	619	0	86	0	0.14	.
1990	714	0	627	0	87	0	0.14	.
1991	880	0	788	0	92	0	0.17	.
1992	969	0	877	0	93	0	0.18	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Equatorial Guinea

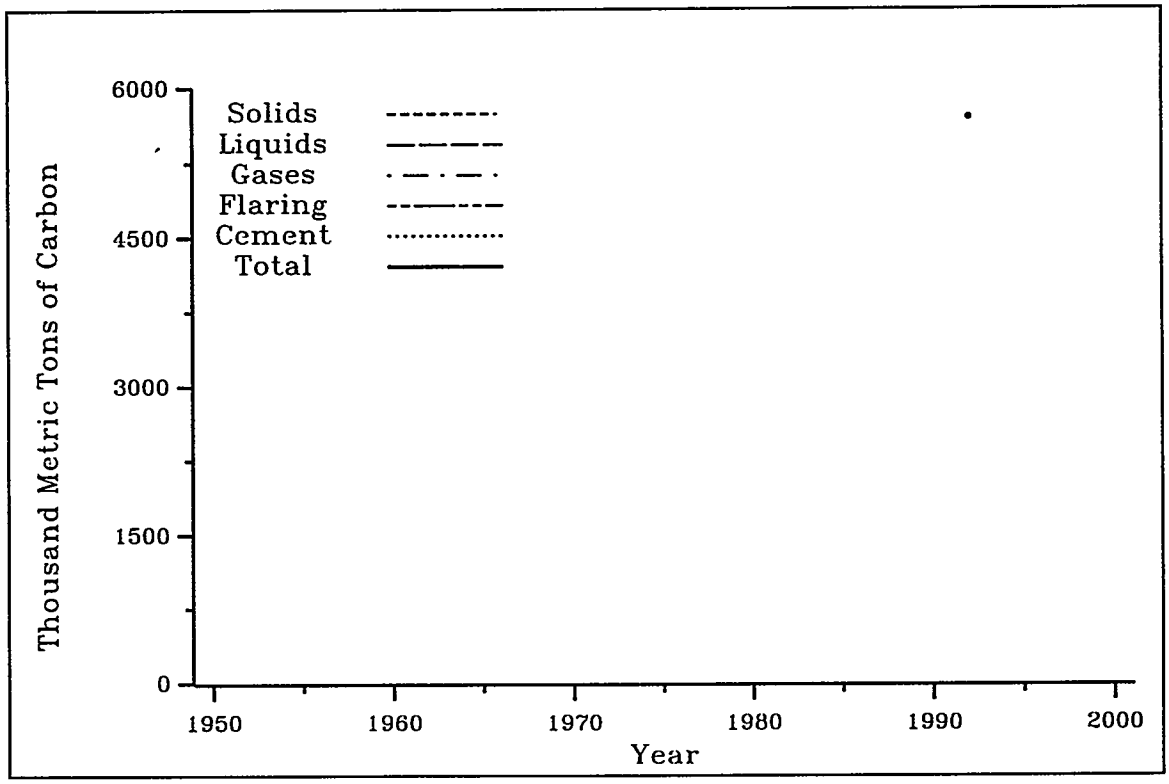


Per capita CO_2 emission rates for Equatorial Guinea

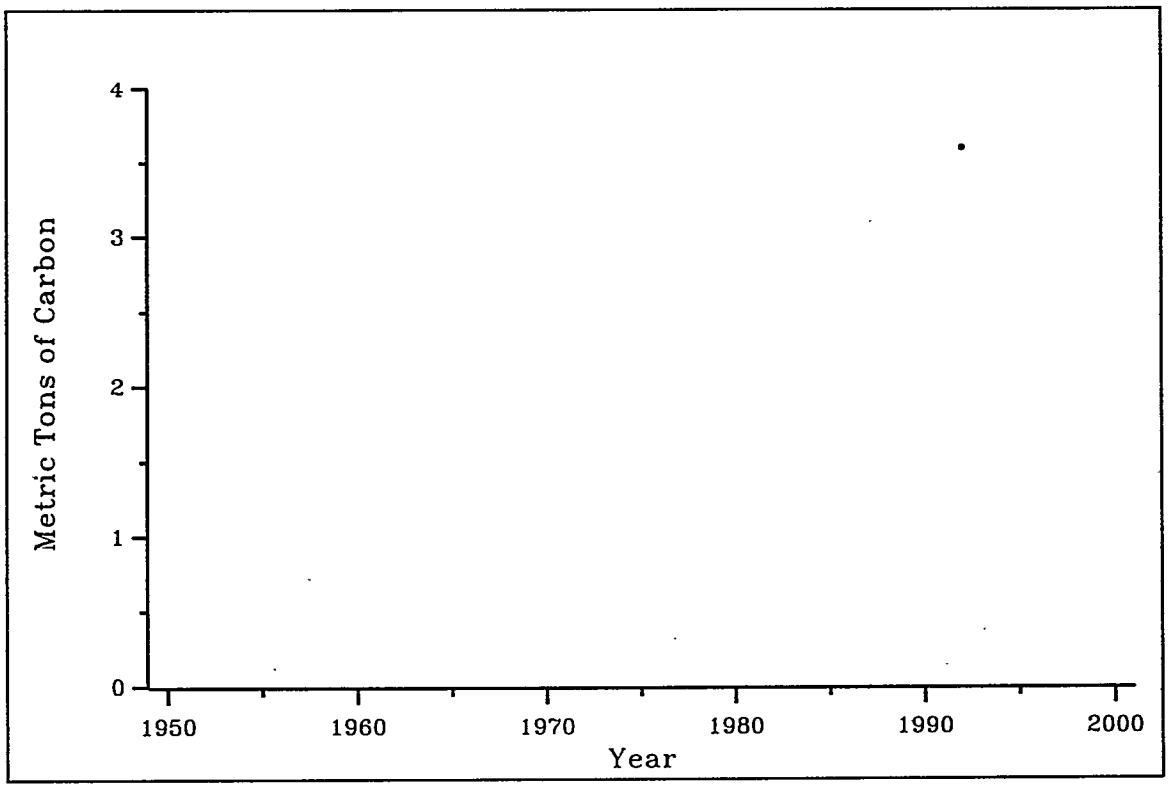
Equatorial Guinea

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	3	0	3	0	0	0	0.01	.
1951	3	0	3	0	0	0	0.01	.
1952	3	0	3	0	0	0	0.01	.
1953	3	0	3	0	0	0	0.01	.
1954	8	0	8	0	0	0	0.04	.
1955	10	0	10	0	0	0	0.04	.
1956	10	0	10	0	0	0	0.04	.
1957	9	0	9	0	0	0	0.04	.
1958	13	0	13	0	0	0	0.05	.
1959	13	0	13	0	0	0	0.05	.
1960	6	0	6	0	0	0	0.02	.
1961	6	0	6	0	0	0	0.02	.
1962	6	0	6	0	0	0	0.02	.
1963	7	0	7	0	0	0	0.03	.
1964	7	0	7	0	0	0	0.03	.
1965	6	0	6	0	0	0	0.02	.
1966	7	0	7	0	0	0	0.02	.
1967	7	0	7	0	0	0	0.02	.
1968	8	0	8	0	0	0	0.03	.
1969	10	0	10	0	0	0	0.03	.
1970	10	0	10	0	0	0	0.03	.
1971	14	0	14	0	0	0	0.05	.
1972	18	0	18	0	0	0	0.07	.
1973	13	0	13	0	0	0	0.05	.
1974	14	0	14	0	0	0	0.06	.
1975	16	0	16	0	0	0	0.07	.
1976	16	0	16	0	0	0	0.07	.
1977	16	0	16	0	0	0	0.08	.
1978	18	0	18	0	0	0	0.09	.
1979	16	0	16	0	0	0	0.08	.
1980	15	0	15	0	0	0	0.07	.
1981	17	0	17	0	0	0	0.07	.
1982	18	0	18	0	0	0	0.07	.
1983	13	0	13	0	0	0	0.05	.
1984	19	0	19	0	0	0	0.07	.
1985	18	0	18	0	0	0	0.06	.
1986	22	0	22	0	0	0	0.07	.
1987	25	0	25	0	0	0	0.08	.
1988	28	0	28	0	0	0	0.08	.
1989	30	0	30	0	0	0	0.09	.
1990	31	0	31	0	0	0	0.09	.
1991	33	0	33	0	0	0	0.09	.
1992	32	0	32	0	0	0	0.09	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Estonia

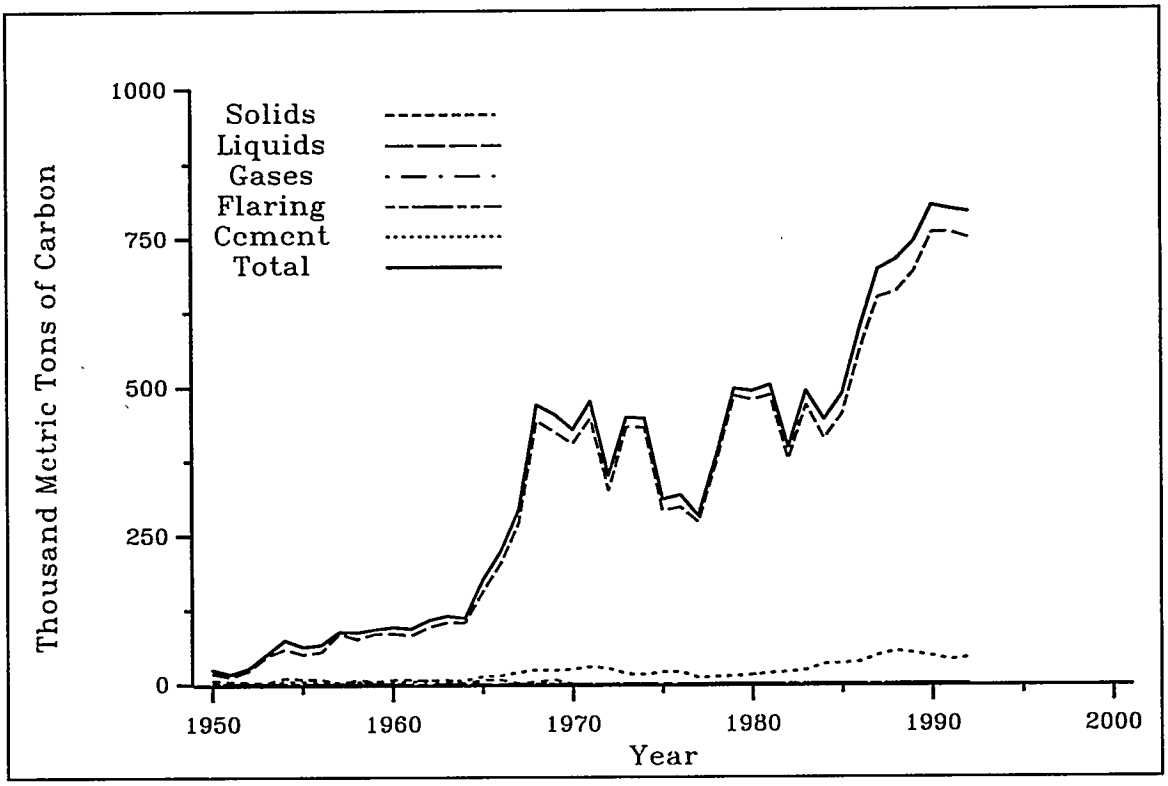


Per capita CO_2 emission rates for Estonia

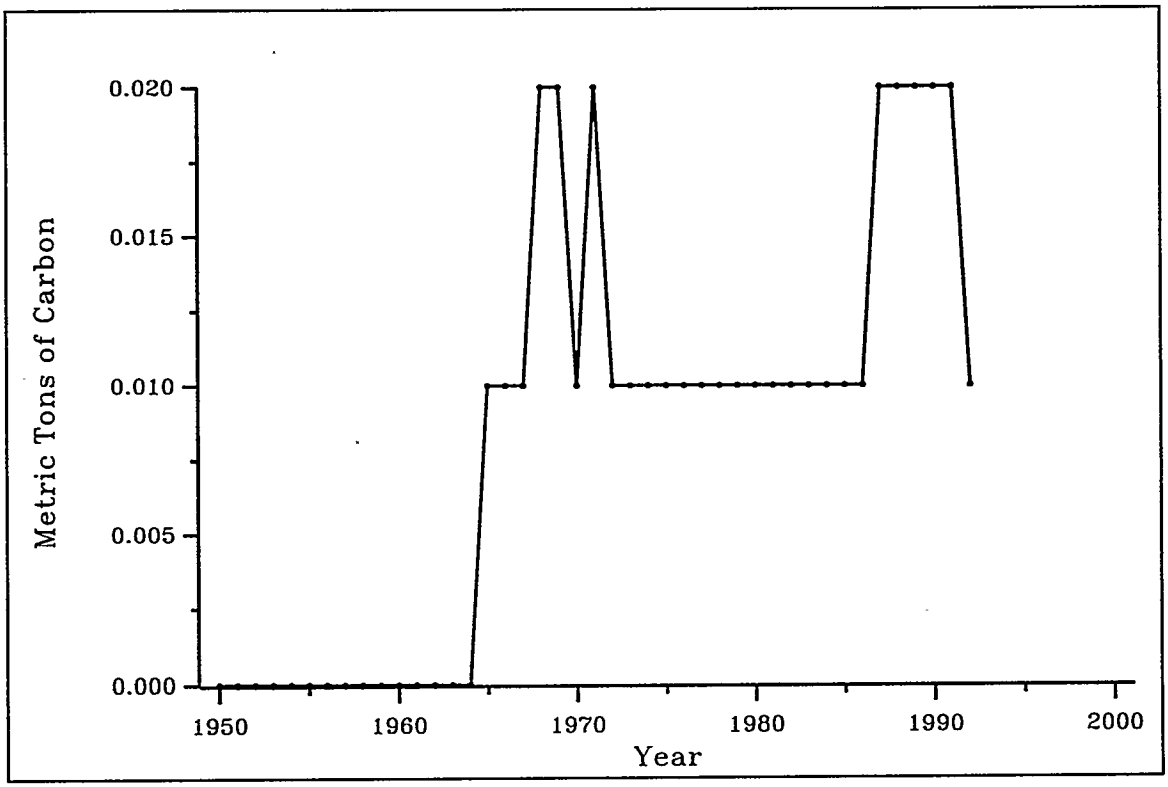
Estonia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	5700	4209	999	411	81	0	3.60	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Ethiopia



Per capita CO_2 emission rates for Ethiopia

Ethiopia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	24	6	18	0	1	0	0.00	.
1951	17	4	12	0	1	0	0.00	.
1952	26	3	23	0	1	0	0.00	.
1953	50	2	47	0	1	0	0.00	.
1954	74	10	59	0	4	0	0.00	.
1955	63	8	50	0	4	0	0.00	.
1956	66	8	54	0	4	0	0.00	.
1957	88	0	85	0	3	0	0.00	.
1958	87	7	76	0	4	0	0.00	.
1959	92	4	85	0	3	0	0.00	.
1960	96	7	85	0	4	0	0.00	.
1961	93	7	82	0	4	0	0.00	.
1962	108	6	96	0	6	0	0.00	.
1963	115	7	104	0	5	0	0.00	.
1964	111	1	104	0	6	0	0.00	.
1965	176	7	157	0	13	0	0.01	.
1966	224	7	204	0	14	0	0.01	.
1967	293	1	272	0	20	0	0.01	.
1968	470	4	443	0	24	0	0.02	.
1969	454	7	424	0	23	0	0.02	.
1970	428	0	404	0	25	0	0.01	.
1971	476	0	447	0	29	0	0.02	.
1972	350	0	325	0	26	0	0.01	.
1973	449	0	432	0	17	0	0.01	.
1974	447	0	431	0	16	0	0.01	.
1975	310	0	291	0	20	0	0.01	.
1976	317	0	297	0	20	0	0.01	.
1977	282	0	272	0	10	0	0.01	.
1978	383	0	372	0	12	0	0.01	.
1979	497	0	485	0	13	0	0.01	.
1980	493	0	478	0	15	0	0.01	.
1981	503	0	486	0	18	0	0.01	.
1982	397	0	377	0	20	0	0.01	.
1983	493	0	470	0	23	0	0.01	.
1984	445	0	412	0	33	0	0.01	.
1985	488	0	454	0	34	0	0.01	.
1986	599	0	563	0	37	0	0.01	.
1987	696	0	649	0	48	0	0.02	.
1988	713	0	658	0	55	0	0.02	.
1989	744	0	693	0	51	0	0.02	.
1990	804	0	758	0	46	0	0.02	.
1991	798	0	759	0	40	0	0.02	.
1992	793	0	749	0	44	0	0.01	.

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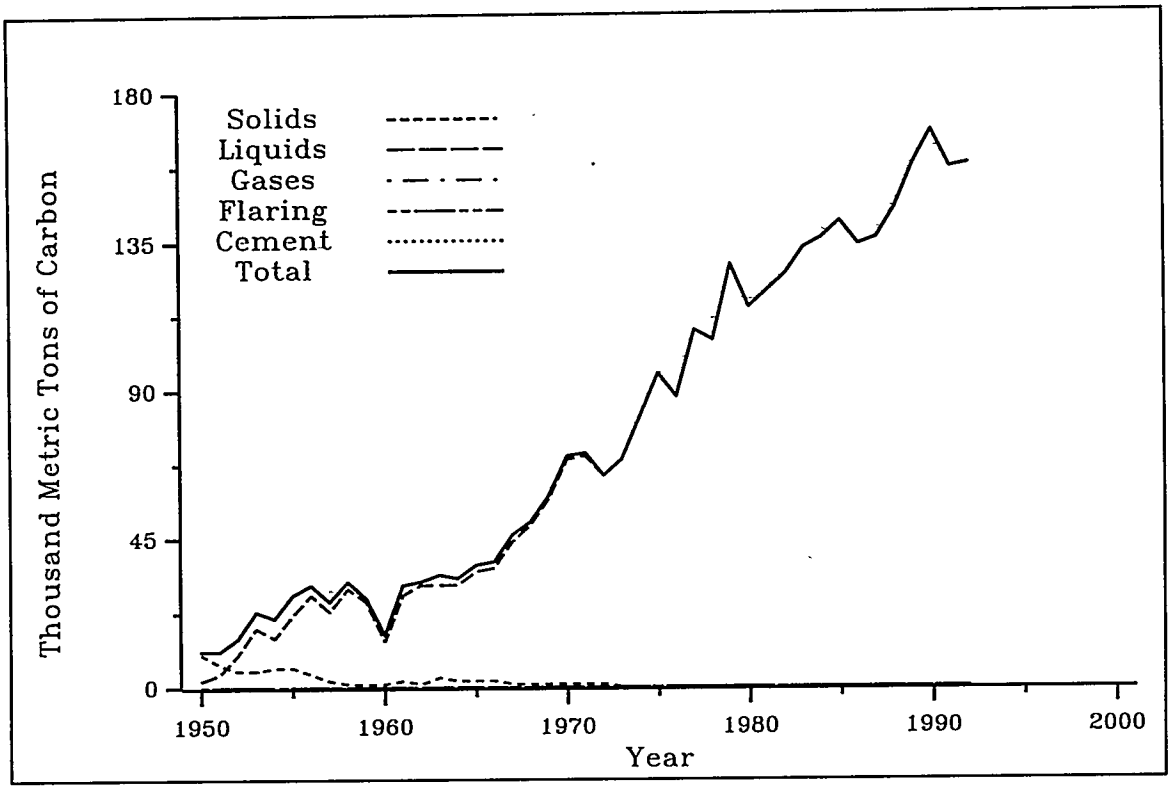
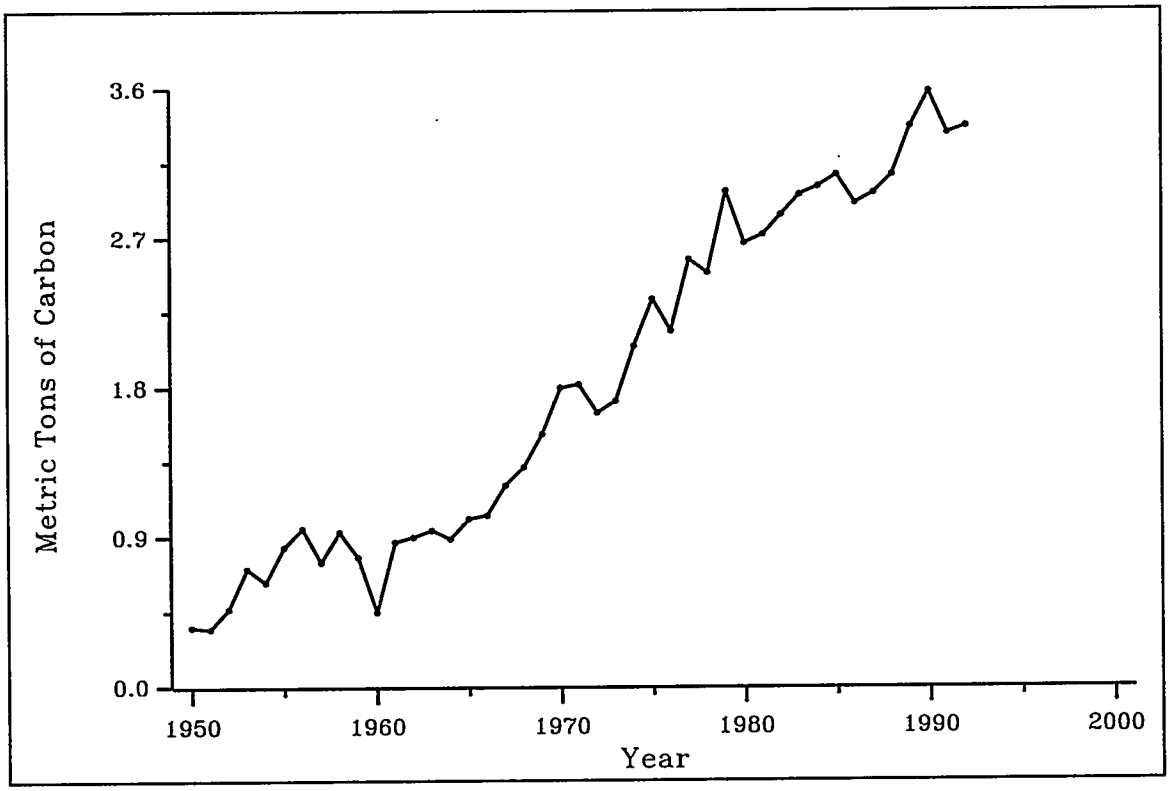


Total CO_2 emissions for the Faeroe Islands

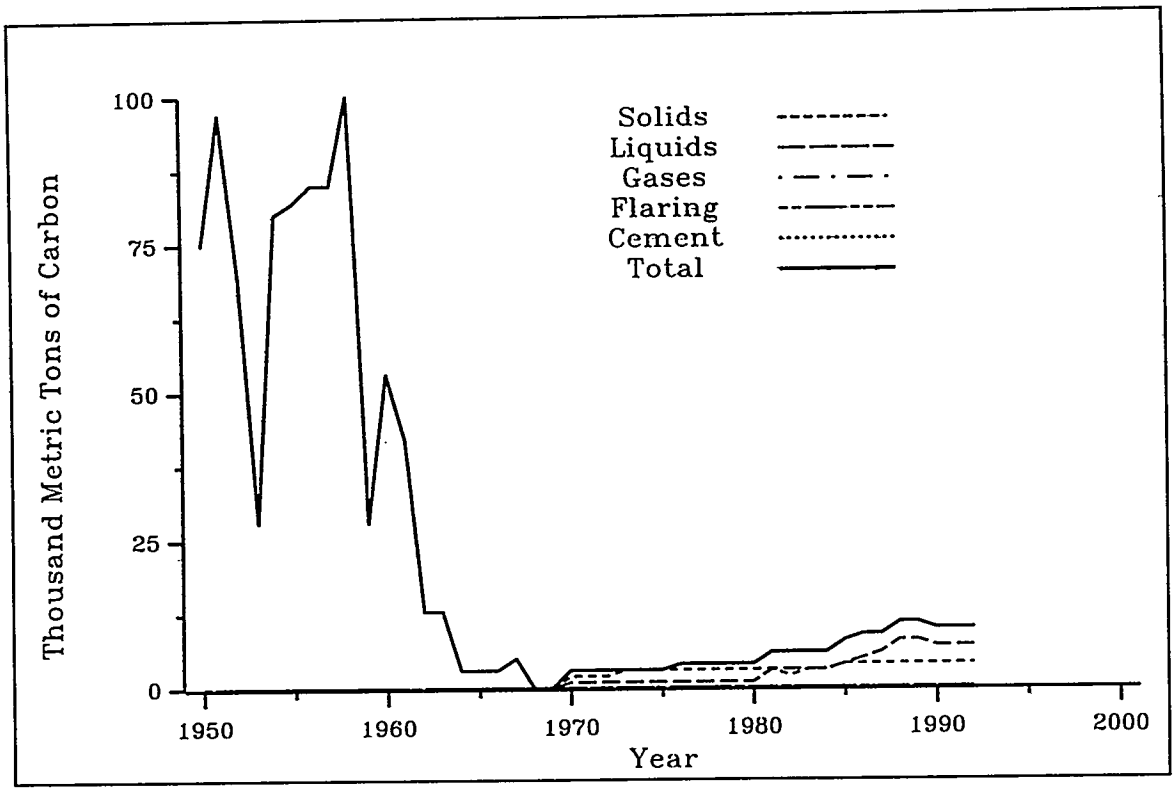


Per capita CO_2 emission rates for the Faeroe Islands

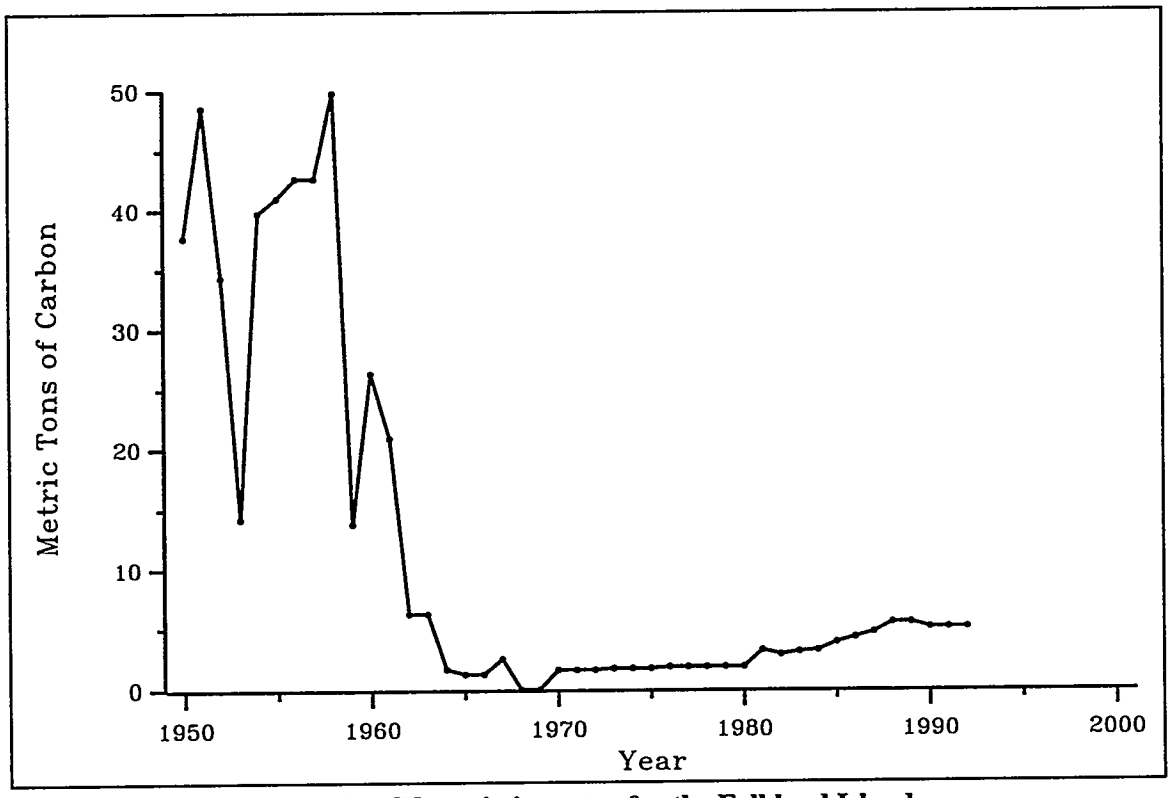
Faeroe Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	11	10	2	0	0	0	0.36	.
1951	11	7	4	0	0	0	0.35	.
1952	15	5	10	0	0	0	0.47	.
1953	23	5	18	0	0	0	0.71	.
1954	21	6	15	0	0	0	0.63	.
1955	28	6	22	0	0	0	0.84	.
1956	31	4	28	0	0	0	0.95	.
1957	26	2	23	0	0	0	0.75	.
1958	32	1	30	0	0	0	0.93	.
1959	27	1	26	0	0	0	0.78	.
1960	16	1	14	0	0	0	0.45	.
1961	31	2	28	0	0	0	0.87	.
1962	32	1	31	0	0	0	0.90	.
1963	34	3	31	0	0	0	0.94	.
1964	33	2	31	0	0	0	0.89	.
1965	37	2	35	0	0	0	1.01	.
1966	38	2	36	0	0	0	1.03	.
1967	46	1	44	0	0	0	1.21	.
1968	50	1	49	0	0	0	1.32	.
1969	58	1	57	0	0	0	1.52	.
1970	70	1	69	0	0	0	1.80	.
1971	71	1	70	0	0	0	1.82	.
1972	64	1	64	0	0	0	1.65	.
1973	69	0	69	0	0	0	1.72	.
1974	82	0	82	0	0	0	2.05	.
1975	95	0	95	0	0	0	2.33	.
1976	88	0	88	0	0	0	2.14	.
1977	108	0	108	0	0	0	2.57	.
1978	105	0	105	0	0	0	2.49	.
1979	128	0	128	0	0	0	2.98	.
1980	115	0	115	0	0	0	2.67	.
1981	120	0	120	0	0	0	2.72	.
1982	125	0	125	0	0	0	2.84	.
1983	133	0	133	0	0	0	2.96	.
1984	136	0	136	0	0	0	3.01	.
1985	141	0	141	0	0	0	3.08	.
1986	134	0	134	0	0	0	2.91	.
1987	136	0	136	0	0	0	2.97	.
1988	145	0	145	0	0	0	3.08	.
1989	158	0	158	0	0	0	3.37	.
1990	168	0	168	0	0	0	3.58	.
1991	157	0	157	0	0	0	3.33	.
1992	158	0	158	0	0	0	3.37	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Falkland Islands

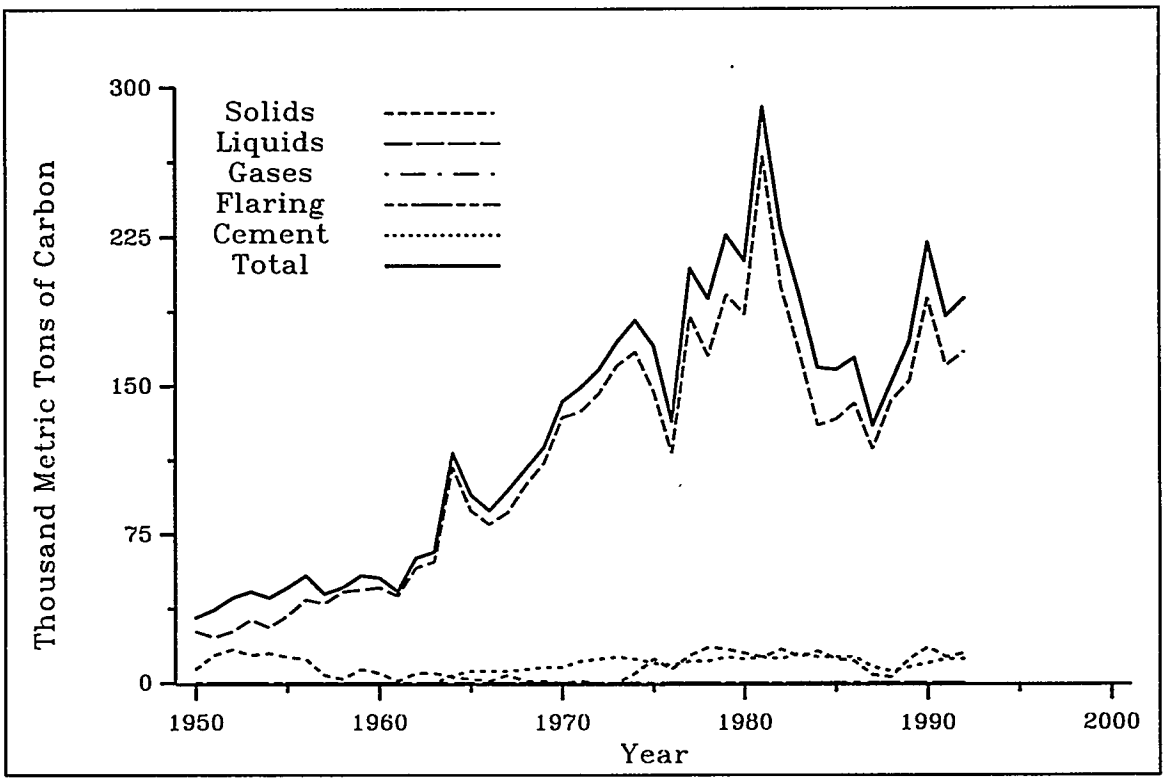


Per capita CO_2 emission rates for the Falkland Islands

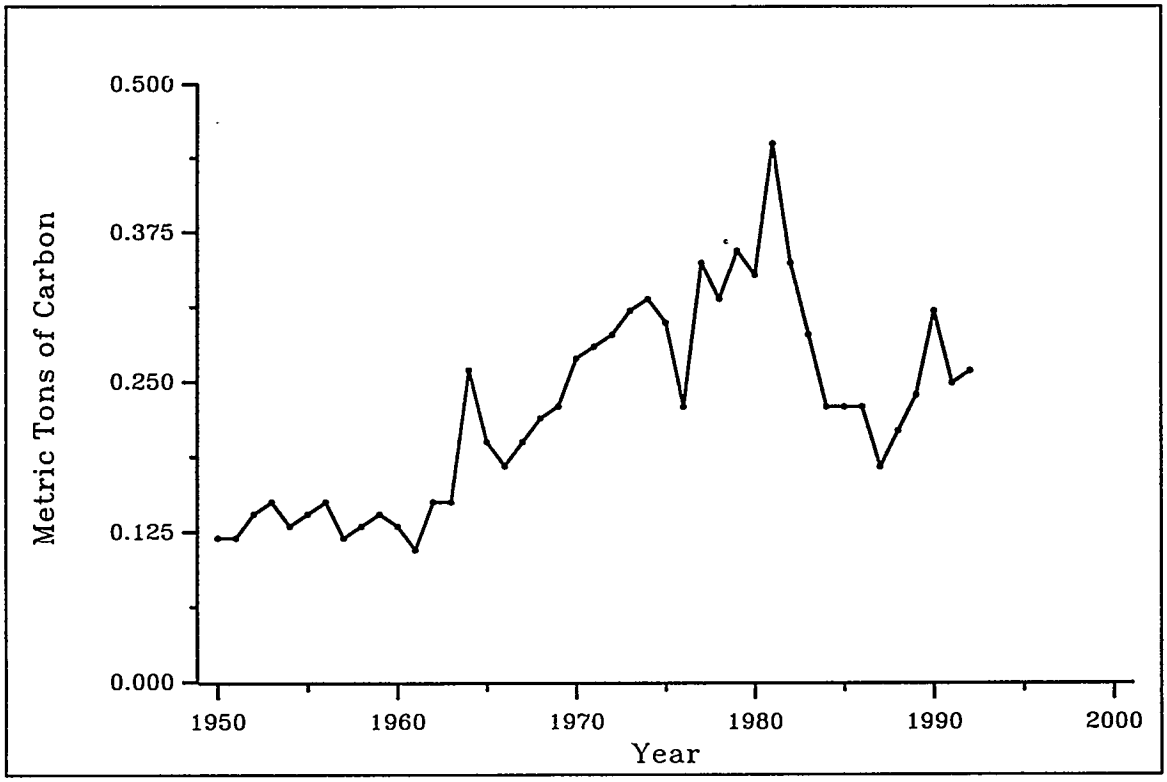
Falkland Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	75	0	75	0	0	0	37.68	.
1951	97	0	97	0	0	0	48.56	.
1952	69	0	69	0	0	0	34.33	.
1953	28	0	28	0	0	0	14.23	.
1954	80	0	80	0	0	0	39.77	.
1955	82	0	82	0	0	0	41.03	.
1956	85	0	85	0	0	0	42.70	.
1957	85	0	85	0	0	0	42.70	.
1958	100	0	100	0	0	0	49.82	.
1959	28	0	28	0	0	0	13.81	.
1960	53	0	53	0	0	0	26.37	.
1961	42	0	42	0	0	0	20.93	.
1962	13	0	13	0	0	0	6.28	.
1963	13	0	13	0	0	0	6.28	.
1964	3	0	3	0	0	0	1.67	.
1965	3	0	3	0	0	0	1.26	.
1966	3	0	3	0	0	0	1.26	.
1967	5	0	5	0	0	0	2.51	.
1968	0	0	0	0	0	0	0.00	.
1969	0	0	0	0	0	0	0.00	.
1970	3	2	1	0	0	0	1.61	.
1971	3	2	1	0	0	0	1.61	.
1972	3	2	1	0	0	0	1.61	.
1973	3	3	1	0	0	0	1.73	.
1974	3	3	1	0	0	0	1.73	.
1975	3	3	1	0	0	0	1.73	.
1976	4	3	1	0	0	0	1.85	.
1977	4	3	1	0	0	0	1.85	.
1978	4	3	1	0	0	0	1.85	.
1979	4	3	1	0	0	0	1.85	.
1980	4	3	1	0	0	0	1.85	.
1981	6	3	3	0	0	0	3.22	.
1982	6	2	3	0	0	0	2.86	.
1983	6	3	3	0	0	0	3.10	.
1984	6	3	3	0	0	0	3.22	.
1985	8	4	4	0	0	0	3.88	.
1986	9	4	5	0	0	0	4.30	.
1987	9	4	6	0	0	0	4.72	.
1988	11	4	8	0	0	0	5.55	.
1989	11	4	8	0	0	0	5.55	.
1990	10	4	7	0	0	0	5.13	.
1991	10	4	7	0	0	0	5.13	.
1992	10	4	7	0	0	0	5.13	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Fiji

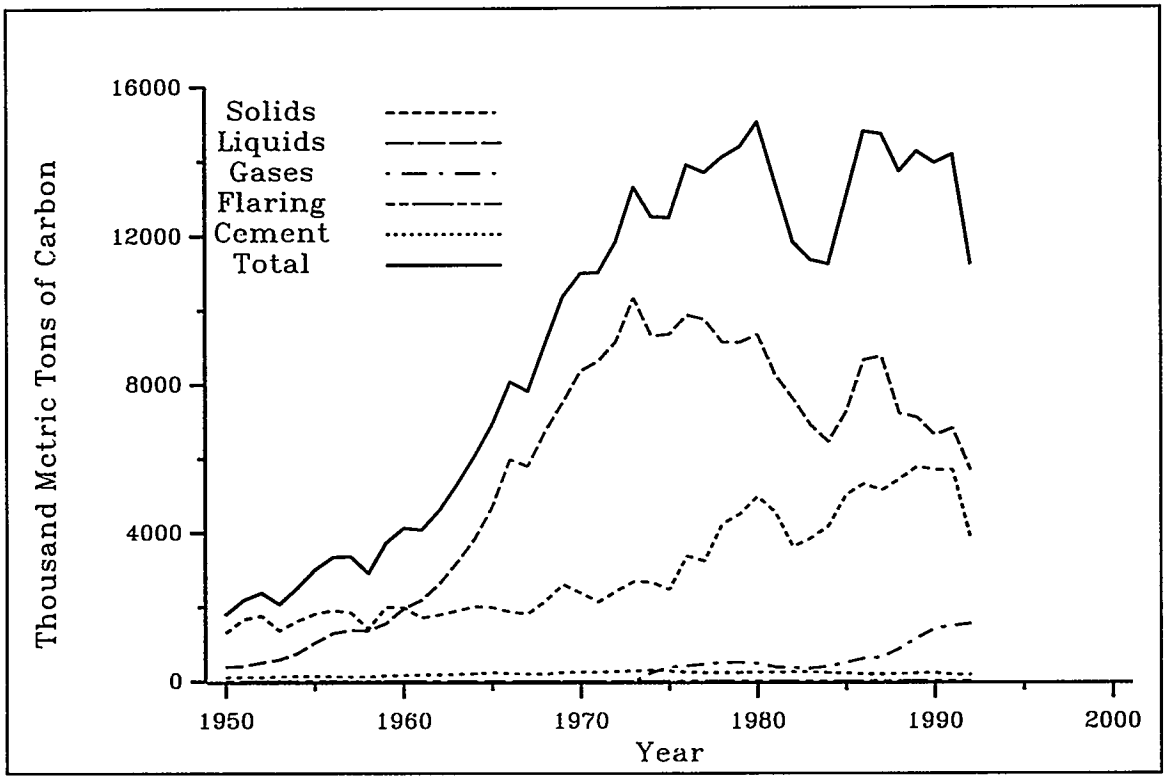


Per capita CO_2 emission rates for Fiji

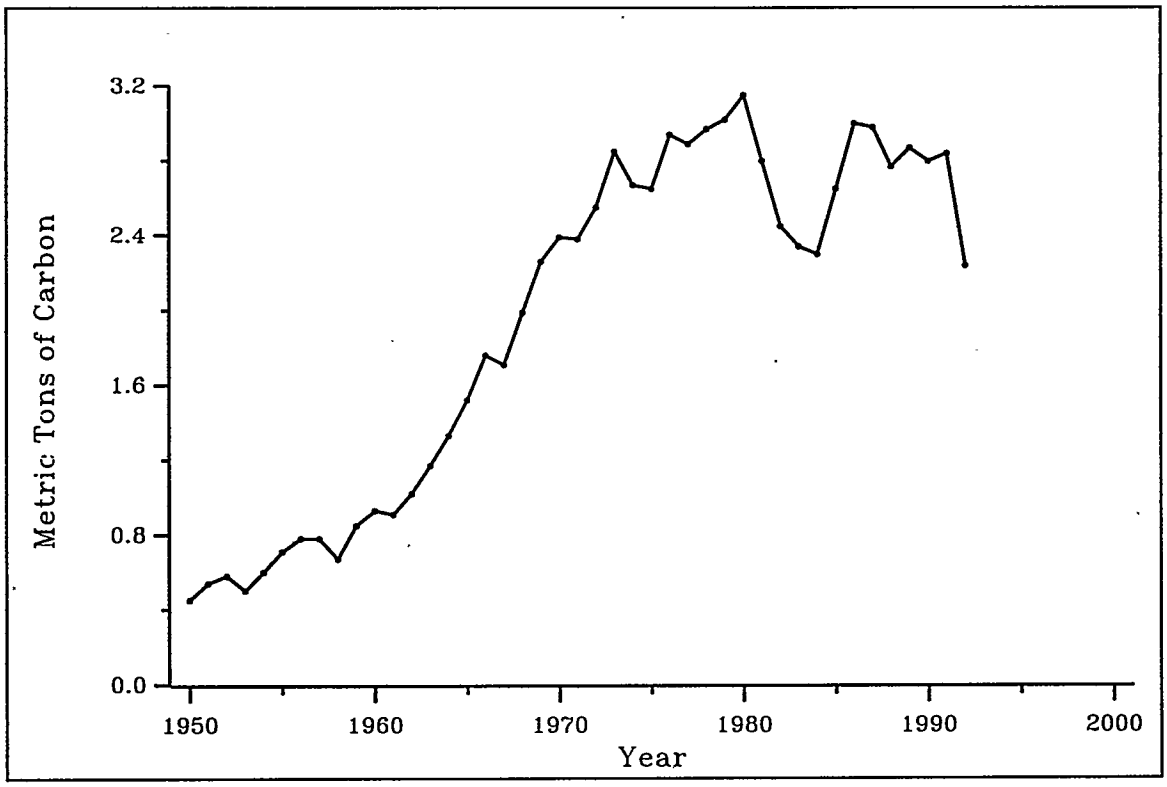
Fiji

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	33	7	26	0	0	0	0.12	.
1951	37	14	23	0	0	0	0.12	.
1952	43	17	26	0	0	0	0.14	.
1953	46	14	32	0	0	0	0.15	.
1954	43	15	28	0	0	0	0.13	.
1955	48	13	34	0	0	0	0.14	.
1956	54	12	42	0	0	0	0.15	.
1957	45	4	40	0	0	0	0.12	.
1958	48	2	46	0	0	0	0.13	.
1959	54	7	47	0	0	0	0.14	.
1960	53	5	48	0	0	0	0.13	.
1961	46	1	44	0	0	0	0.11	.
1962	63	5	58	0	0	0	0.15	.
1963	66	5	61	0	0	0	0.15	.
1964	116	3	109	0	4	0	0.26	.
1965	95	2	87	0	6	0	0.20	.
1966	87	1	80	0	6	0	0.18	.
1967	97	4	86	0	6	0	0.20	.
1968	108	1	100	0	7	0	0.22	.
1969	119	1	111	0	8	0	0.23	.
1970	142	0	134	0	8	0	0.27	.
1971	149	1	137	0	11	0	0.28	.
1972	158	0	146	0	12	0	0.29	.
1973	172	0	160	0	13	0	0.31	.
1974	183	5	167	0	12	0	0.32	.
1975	170	12	147	0	10	0	0.30	.
1976	132	7	116	0	9	0	0.23	.
1977	209	14	185	0	11	0	0.35	.
1978	194	18	165	0	11	0	0.32	.
1979	226	17	196	0	13	0	0.36	.
1980	213	15	186	0	12	0	0.34	.
1981	290	13	265	0	13	0	0.45	.
1982	229	17	200	0	12	0	0.35	.
1983	196	13	167	0	15	0	0.29	.
1984	159	16	130	0	13	0	0.23	.
1985	158	12	133	0	13	0	0.23	.
1986	164	11	141	0	13	0	0.23	.
1987	130	4	118	0	8	0	0.18	.
1988	151	3	142	0	6	0	0.21	.
1989	172	12	152	0	8	0	0.24	.
1990	222	18	194	0	10	0	0.31	.
1991	185	13	160	0	12	0	0.25	.
1992	194	15	167	0	12	0	0.26	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Finland

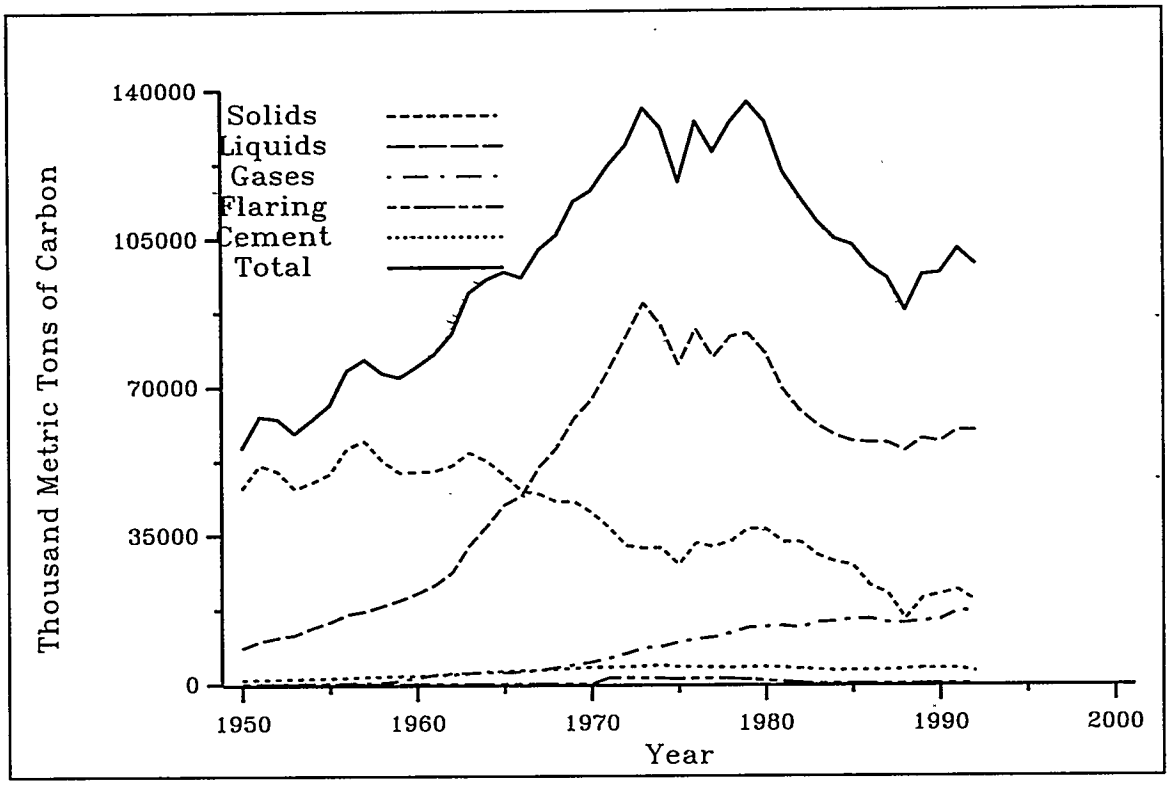


Per capita CO_2 emission rates for Finland

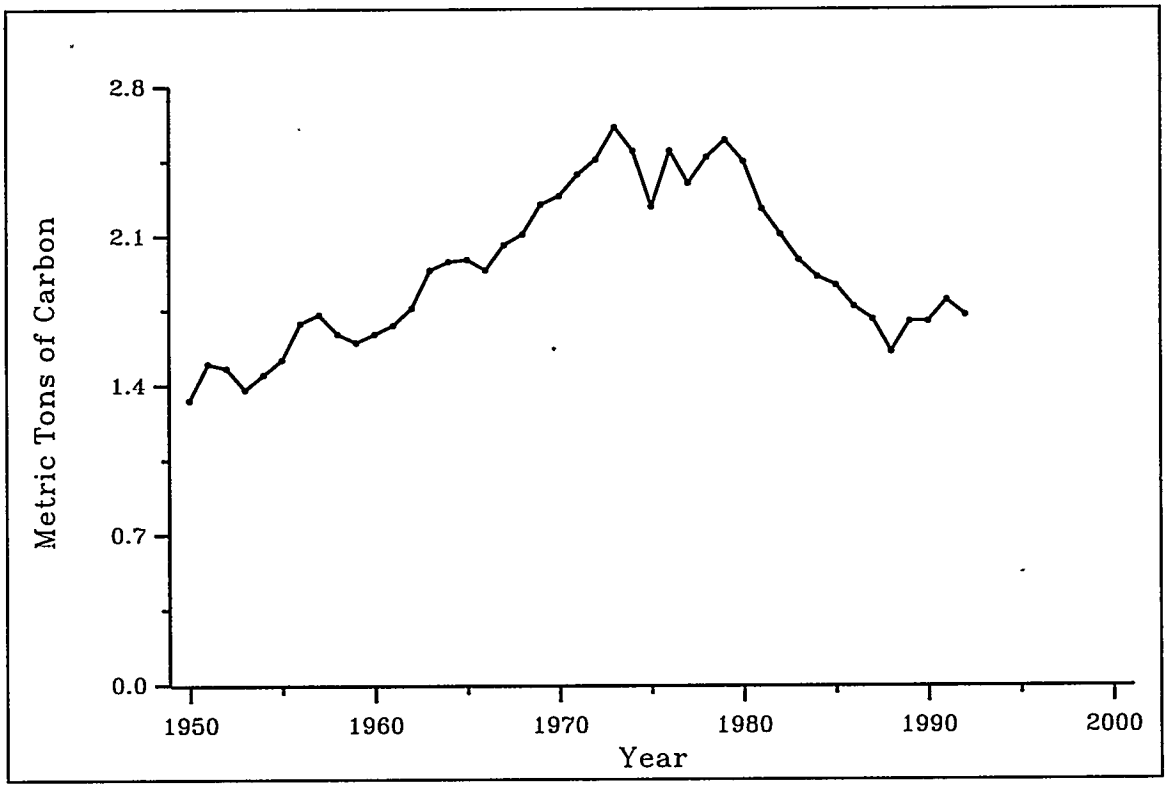
Finland

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1801	1310	390	0	101	0	0.45	.
1951	2196	1669	414	0	113	0	0.54	.
1952	2382	1766	511	0	106	0	0.58	.
1953	2081	1364	589	0	127	0	0.50	.
1954	2518	1623	754	0	141	0	0.60	.
1955	3003	1819	1042	0	142	0	0.71	.
1956	3343	1914	1298	0	131	0	0.78	.
1957	3362	1858	1375	0	129	0	0.78	.
1958	2911	1412	1373	0	126	0	0.67	.
1959	3724	2002	1562	0	159	0	0.85	.
1960	4132	1995	1966	0	171	0	0.93	.
1961	4083	1710	2189	0	184	0	0.91	.
1962	4598	1793	2621	0	185	0	1.02	.
1963	5294	1904	3196	0	194	0	1.17	.
1964	6065	2020	3831	0	214	0	1.33	.
1965	6929	1994	4694	0	241	0	1.52	.
1966	8070	1873	5983	0	214	0	1.76	.
1967	7823	1819	5798	0	206	0	1.71	.
1968	9108	2171	6737	0	201	0	1.99	.
1969	10373	2607	7523	0	244	0	2.26	.
1970	10997	2379	8363	0	255	0	2.39	.
1971	11024	2142	8632	0	250	0	2.38	.
1972	11850	2426	9154	0	270	0	2.55	.
1973	13308	2690	10333	0	285	0	2.85	.
1974	12514	2667	9311	237	300	0	2.67	.
1975	12482	2468	9346	387	281	0	2.65	.
1976	13898	3368	9866	416	248	0	2.94	.
1977	13687	3235	9751	469	233	0	2.89	.
1978	14104	4227	9135	510	232	0	2.97	.
1979	14376	4499	9126	513	238	0	3.02	.
1980	15036	4971	9337	482	247	0	3.15	.
1981	13430	4548	8252	383	247	0	2.80	.
1982	11840	3612	7613	361	253	0	2.45	.
1983	11347	3842	6896	350	259	0	2.34	.
1984	11242	4173	6446	399	224	0	2.30	.
1985	12993	5011	7255	508	219	0	2.65	.
1986	14780	5316	8653	617	193	0	3.00	.
1987	14717	5129	8748	647	194	0	2.98	.
1988	13720	5437	7203	875	205	0	2.77	.
1989	14248	5773	7096	1163	217	0	2.87	.
1990	13946	5684	6623	1412	227	0	2.80	.
1991	14168	5690	6805	1492	180	0	2.84	.
1992	11238	3833	5682	1547	176	0	2.24	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for France (includes Monaco)

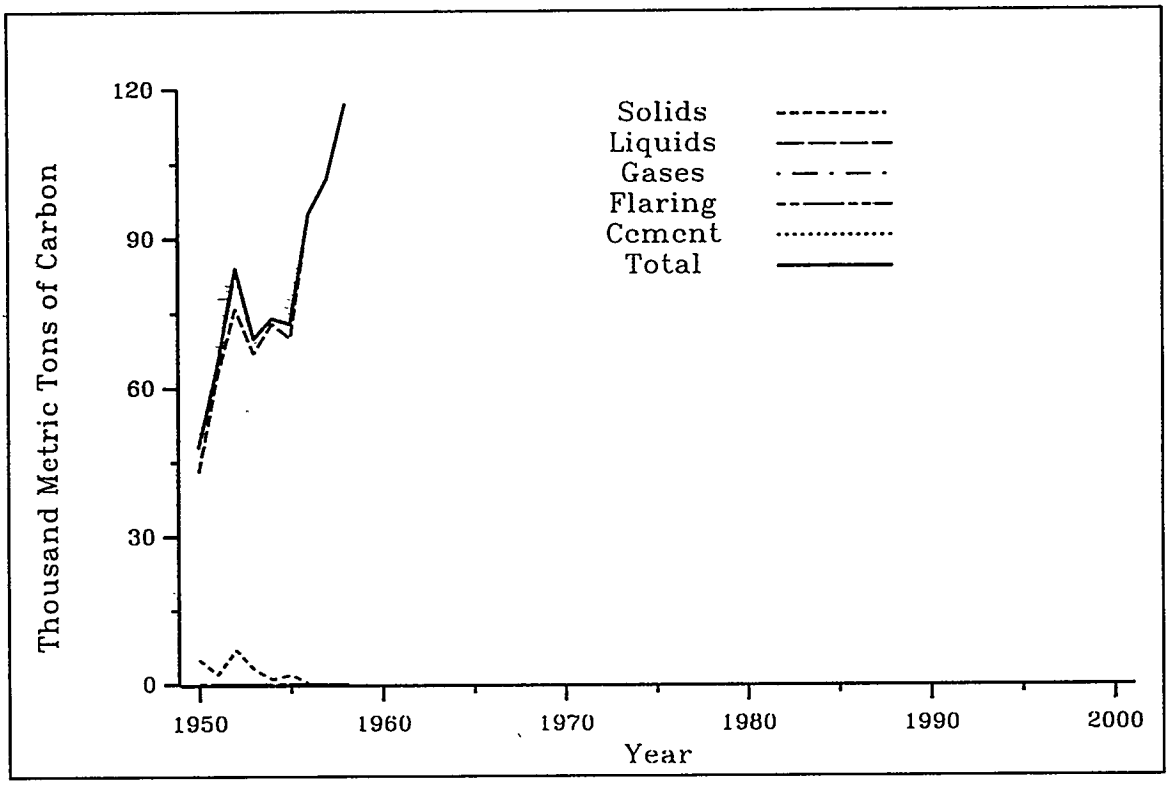


Per capita CO_2 emission rates for France (includes Monaco)

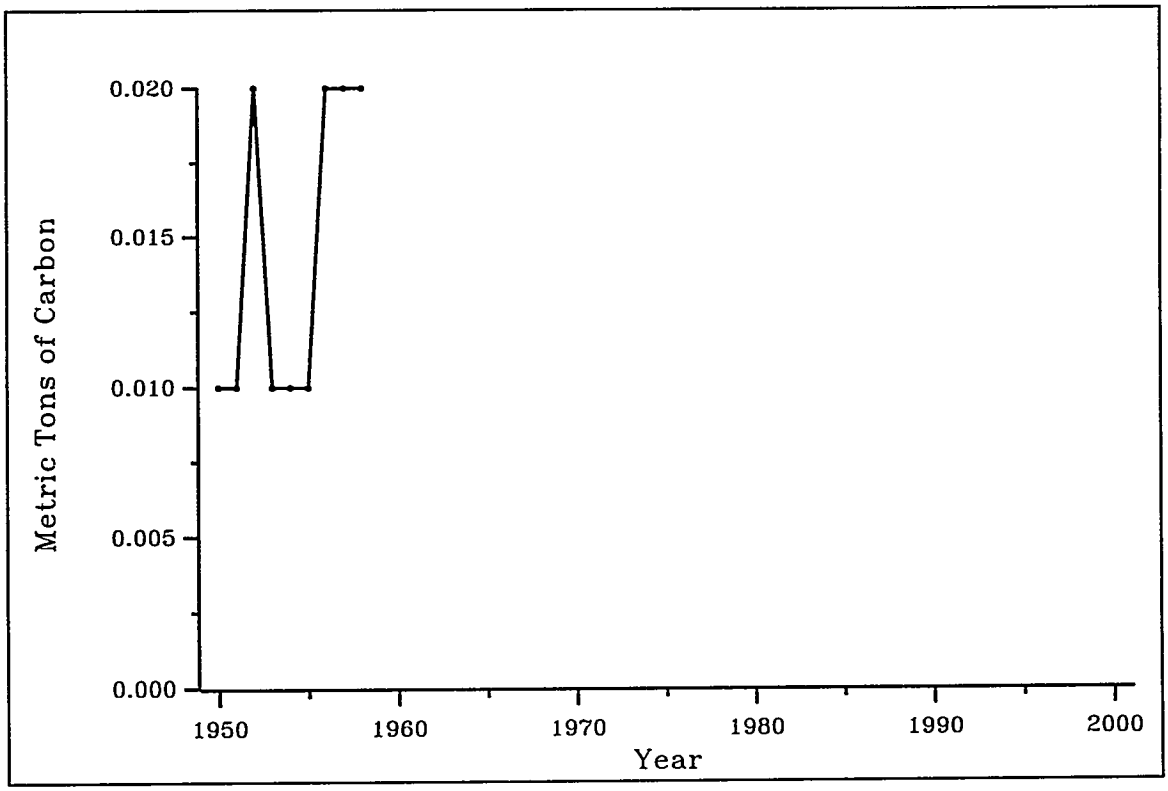
France (includes Monaco)

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	55750	46050	8597	122	980	0	1.33	1016
1951	63033	51602	10174	152	1105	0	1.50	1509
1952	62542	50184	11027	154	1176	0	1.48	1624
1953	59093	45987	11696	143	1266	0	1.38	1514
1954	62336	47508	13337	165	1325	0	1.45	1508
1955	65807	49510	14654	198	1444	0	1.52	1598
1956	73935	55671	16465	243	1556	0	1.69	1816
1957	76423	57265	17129	313	1715	0	1.73	1539
1958	73300	52669	18433	373	1824	0	1.64	1752
1959	72210	49768	19762	776	1904	0	1.60	1537
1960	74791	49907	21404	1552	1928	0	1.64	1583
1961	77712	50144	23313	2163	2092	0	1.68	1824
1962	82478	51409	26230	2543	2296	0	1.76	1959
1963	92177	54509	32586	2616	2466	0	1.94	1891
1964	95260	52511	37080	2740	2929	0	1.98	2020
1965	97073	49154	42128	2749	3042	0	1.99	2007
1966	95663	45384	44219	2891	3169	0	1.94	2152
1967	102332	44673	51050	3292	3317	0	2.06	2572
1968	105735	42826	55552	3903	3453	0	2.11	2930
1969	113636	42892	62470	4528	3746	0	2.25	3426
1970	116176	40272	66810	5149	3945	0	2.29	4349
1971	122077	36695	73905	6087	3937	1453	2.39	4546
1972	126833	32440	81692	7215	4068	1417	2.46	5322
1973	135473	31860	89563	8489	4177	1384	2.61	6066
1974	130826	31946	84340	8829	4398	1313	2.50	5541
1975	118189	28014	75121	9839	4024	1191	2.24	5356
1976	132272	32998	83410	10574	3998	1292	2.50	5902
1977	125165	32171	76768	11017	3921	1288	2.35	6088
1978	132156	33439	81646	11984	3811	1275	2.47	5584
1979	136919	36349	82402	13228	3920	1020	2.55	5919
1980	132129	36310	77696	13400	3958	765	2.45	5027
1981	120494	33231	69242	13671	3839	510	2.23	4839
1982	114426	33228	64205	13182	3556	255	2.11	4193
1983	108731	30136	60769	14494	3333	0	1.99	3794
1984	104705	28578	58401	14637	3091	0	1.91	3640
1985	103279	27820	57020	15236	3202	0	1.87	3884
1986	98164	23050	56722	15196	3196	0	1.77	3936
1987	95412	21206	56644	14358	3204	0	1.71	4519
1988	87787	15272	54781	14293	3441	0	1.56	4691
1989	96169	20129	57653	14737	3650	0	1.70	4304
1990	96601	21035	56910	15067	3589	0	1.70	5393
1991	102306	22048	59558	17095	3605	0	1.80	4749
1992	98820	19411	59479	16992	2938	0	1.73	5039

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for French Equatorial Africa

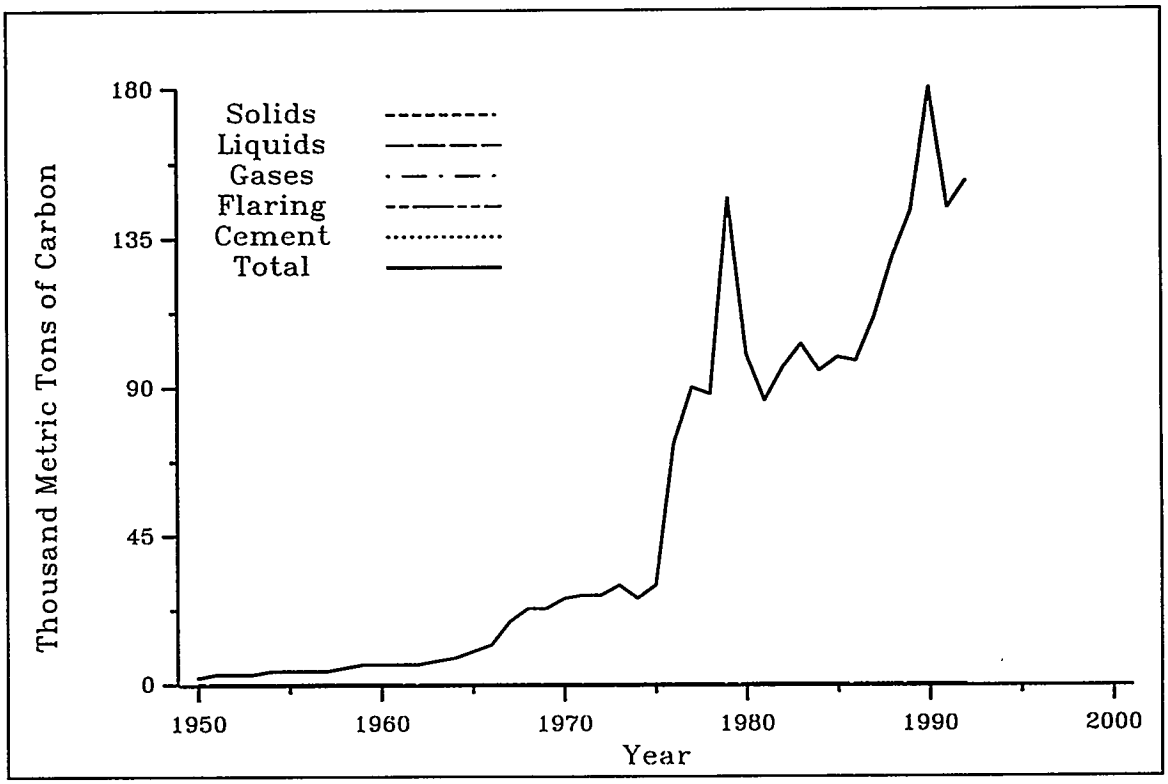


Per capita CO_2 emission rates for French Equatorial Africa

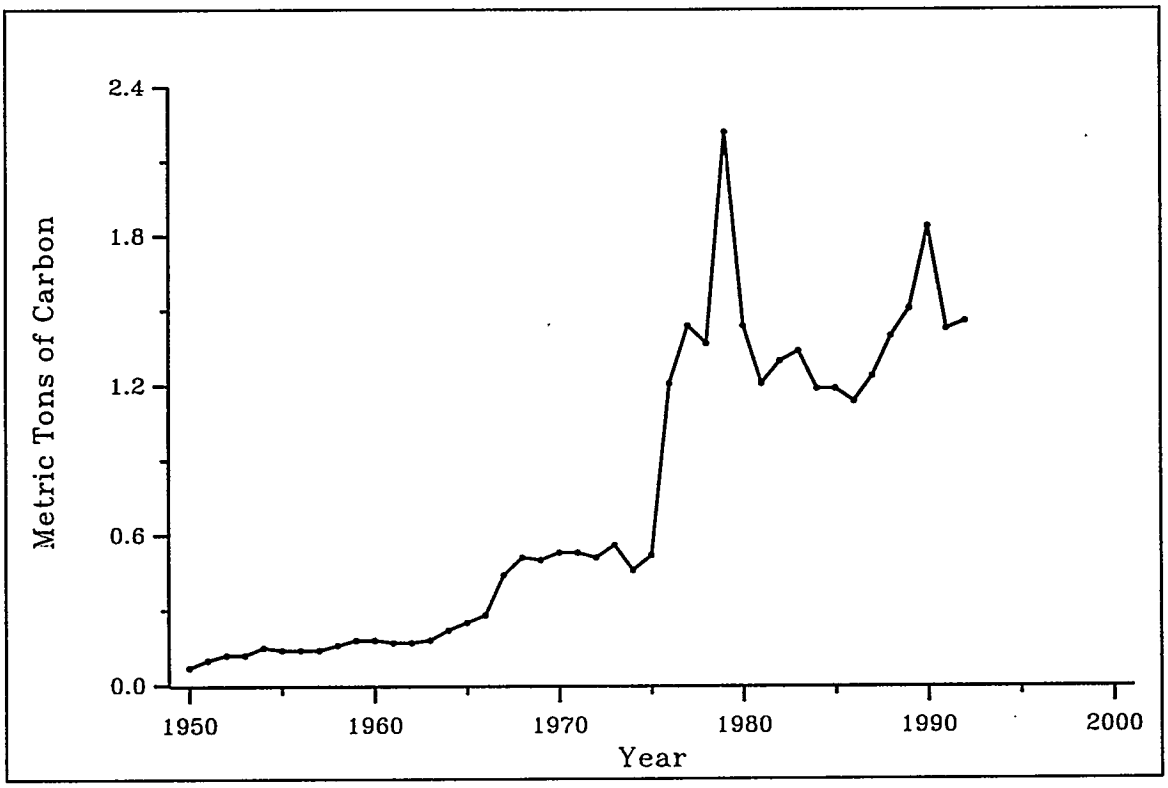
French Equatorial Africa

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	48	5	43	0	0	0	0.01	.
1951	64	2	62	0	0	0	0.01	.
1952	84	7	76	0	0	0	0.02	.
1953	70	3	67	0	0	0	0.01	.
1954	74	1	73	0	0	0	0.01	.
1955	73	2	70	0	0	0	0.01	.
1956	95	0	95	0	0	0	0.02	.
1957	102	0	102	0	0	0	0.02	.
1958	117	0	117	0	0	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for French Guiana

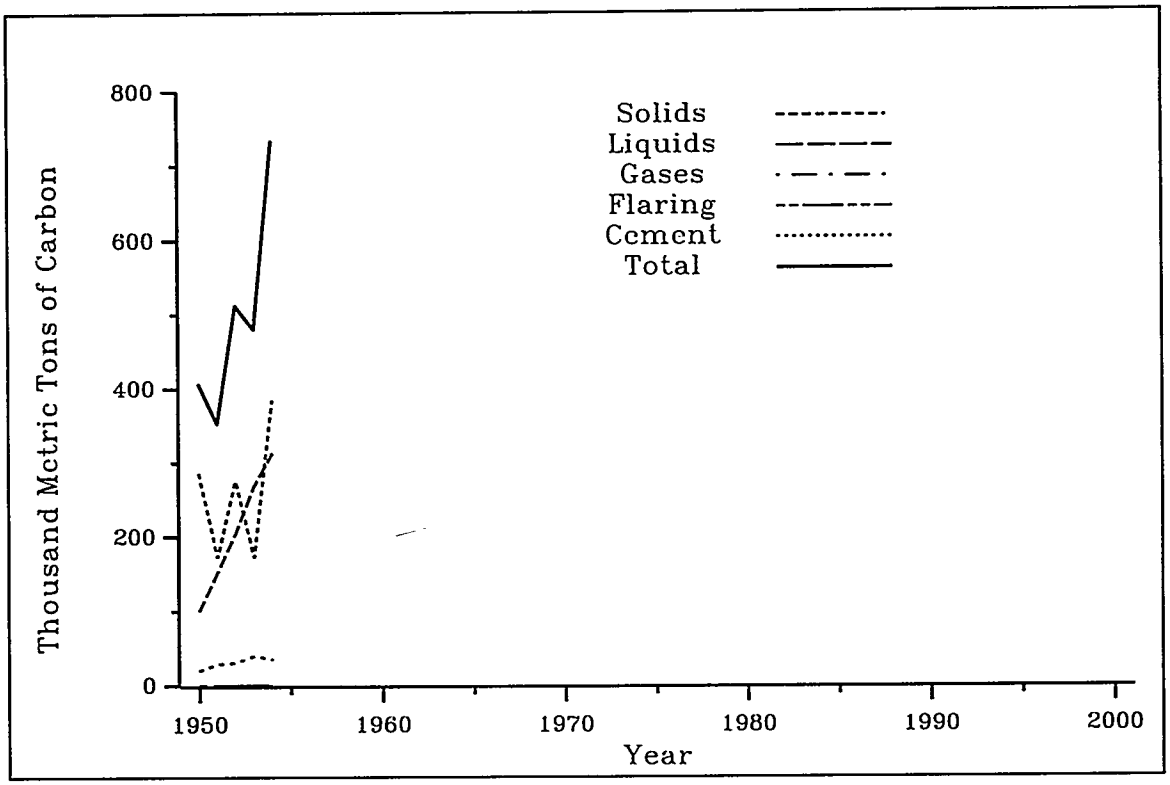


Per capita CO_2 emission rates for French Guiana

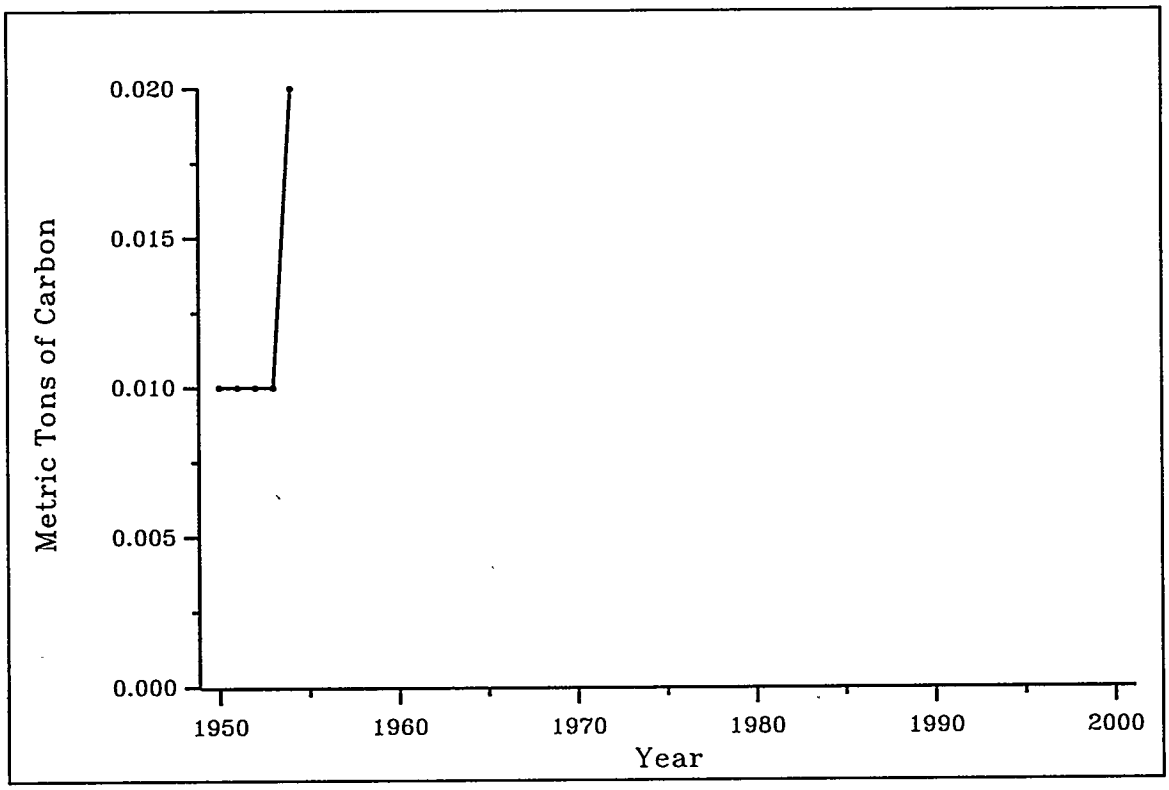
French Guiana

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2	0	2	0	0	0	0.07	.
1951	3	0	3	0	0	0	0.10	.
1952	3	0	3	0	0	0	0.12	.
1953	3	0	3	0	0	0	0.12	.
1954	4	0	4	0	0	0	0.15	.
1955	4	0	4	0	0	0	0.14	.
1956	4	0	4	0	0	0	0.14	.
1957	4	0	4	0	0	0	0.14	.
1958	5	0	5	0	0	0	0.16	.
1959	6	0	6	0	0	0	0.18	.
1960	6	0	6	0	0	0	0.18	.
1961	6	0	6	0	0	0	0.17	.
1962	6	0	6	0	0	0	0.17	.
1963	7	0	7	0	0	0	0.18	.
1964	8	0	8	0	0	0	0.22	.
1965	10	0	10	0	0	0	0.25	.
1966	12	0	12	0	0	0	0.28	.
1967	19	0	19	0	0	0	0.44	.
1968	23	0	23	0	0	0	0.51	.
1969	23	0	23	0	0	0	0.50	.
1970	26	0	26	0	0	0	0.53	.
1971	27	0	27	0	0	0	0.53	.
1972	27	0	27	0	0	0	0.51	.
1973	30	0	30	0	0	0	0.56	.
1974	26	0	26	0	0	0	0.46	.
1975	30	0	30	0	0	0	0.52	.
1976	73	0	73	0	0	0	1.21	.
1977	90	0	90	0	0	0	1.44	.
1978	88	0	88	0	0	0	1.37	.
1979	147	0	147	0	0	0	2.22	.
1980	100	0	100	0	0	0	1.44	.
1981	86	0	86	0	0	0	1.21	.
1982	96	0	96	0	0	0	1.30	.
1983	103	0	103	0	0	0	1.34	.
1984	95	0	95	0	0	0	1.19	.
1985	99	0	99	0	0	0	1.19	.
1986	98	0	98	0	0	0	1.14	.
1987	111	0	111	0	0	0	1.24	.
1988	129	0	129	0	0	0	1.40	.
1989	143	0	143	0	0	0	1.51	.
1990	180	0	180	0	0	0	1.84	.
1991	144	0	144	0	0	0	1.43	.
1992	152	0	152	0	0	0	1.46	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for French Indo-China

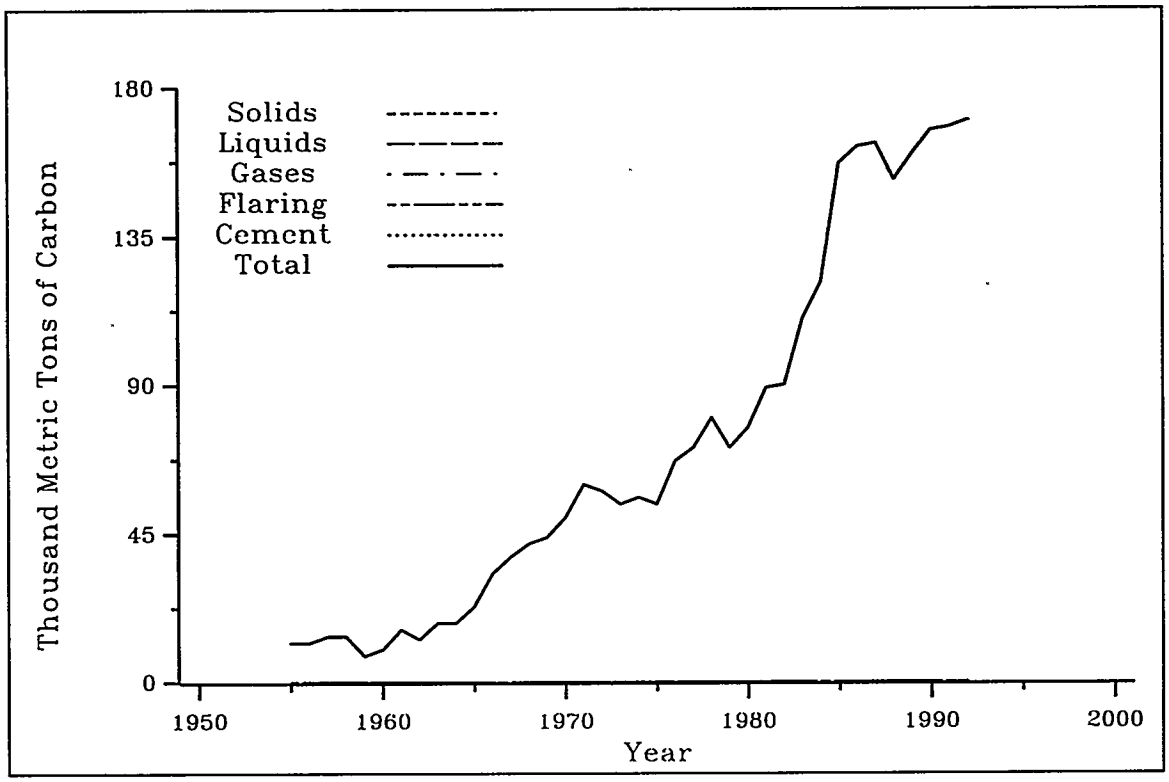


Per capita CO_2 emission rates for French Indo-China

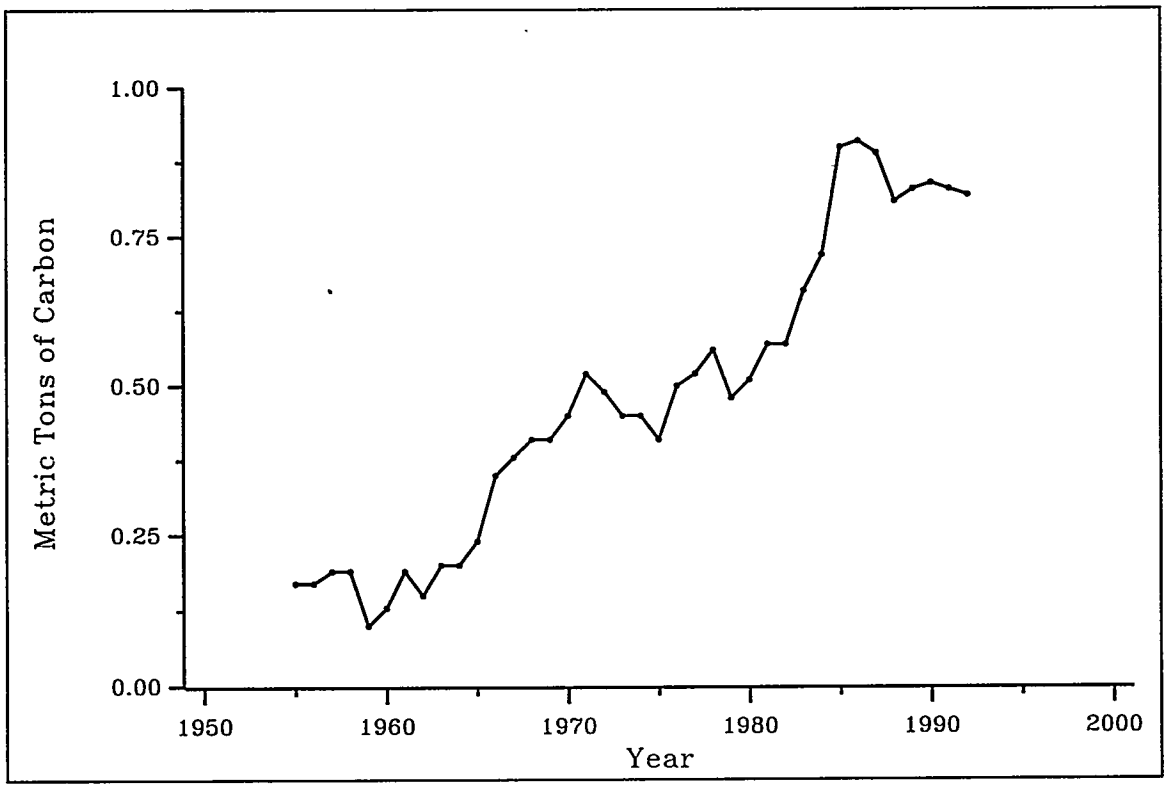
French Indo-China

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	406	286	100	0	20	0	0.01	43
1951	353	172	152	0	29	0	0.01	156
1952	512	276	205	0	31	0	0.01	168
1953	480	172	268	0	40	0	0.01	270
1954	733	385	313	0	35	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for French Polynesia

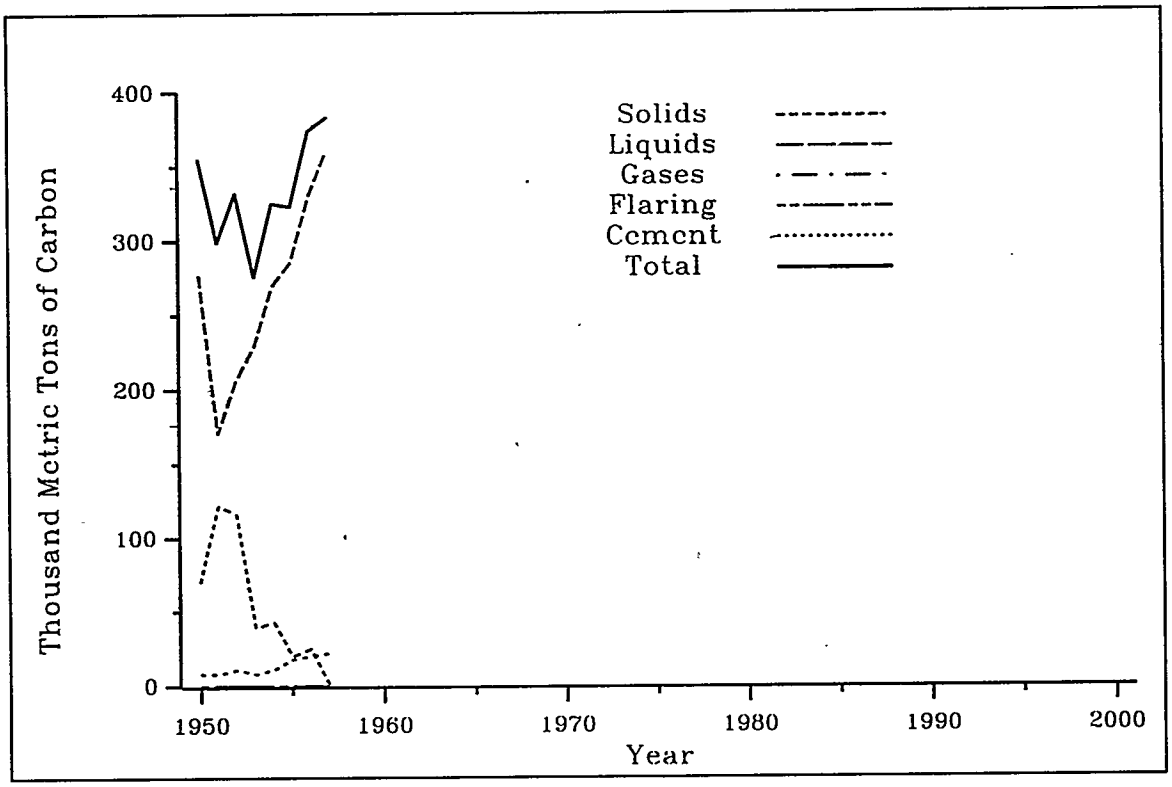


Per capita CO_2 emission rates for French Polynesia

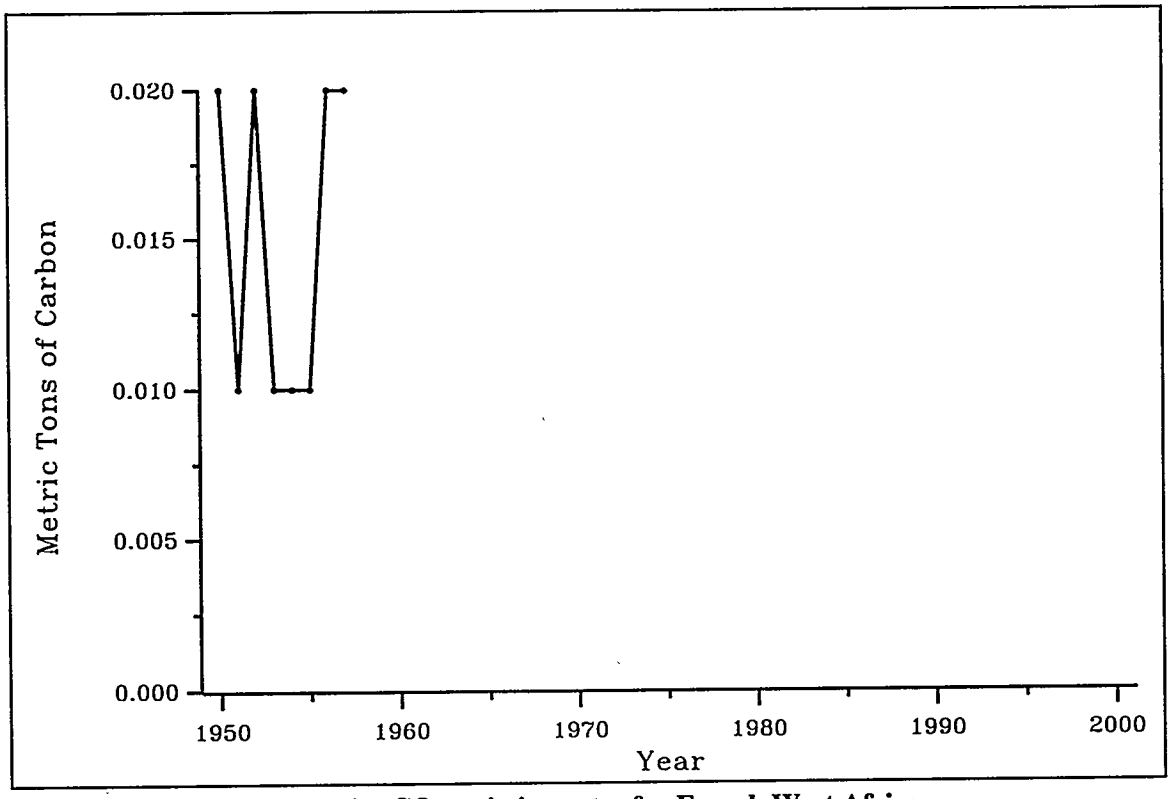
French Polynesia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1955	12	0	12	0	0	0	0.17	.
1956	12	0	12	0	0	0	0.17	.
1957	14	0	14	0	0	0	0.19	.
1958	14	0	14	0	0	0	0.19	.
1959	8	0	8	0	0	0	0.10	.
1960	10	0	10	0	0	0	0.13	.
1961	16	0	16	0	0	0	0.19	.
1962	13	0	13	0	0	0	0.15	.
1963	18	0	18	0	0	0	0.20	.
1964	18	0	18	0	0	0	0.20	.
1965	23	0	23	0	0	0	0.24	.
1966	33	0	33	0	0	0	0.35	.
1967	38	0	38	0	0	0	0.38	.
1968	42	0	42	0	0	0	0.41	.
1969	44	0	44	0	0	0	0.41	.
1970	50	0	50	0	0	0	0.45	.
1971	60	0	60	0	0	0	0.52	.
1972	58	0	58	0	0	0	0.49	.
1973	54	0	54	0	0	0	0.45	.
1974	56	0	56	0	0	0	0.45	.
1975	54	0	54	0	0	0	0.41	.
1976	67	0	67	0	0	0	0.50	.
1977	71	0	71	0	0	0	0.52	.
1978	80	0	80	0	0	0	0.56	.
1979	71	0	71	0	0	0	0.48	.
1980	77	0	77	0	0	0	0.51	.
1981	89	0	89	0	0	0	0.57	.
1982	90	0	90	0	0	0	0.57	.
1983	110	0	110	0	0	0	0.66	.
1984	121	0	121	0	0	0	0.72	.
1985	157	0	157	0	0	0	0.90	.
1986	162	0	162	0	0	0	0.91	.
1987	163	0	163	0	0	0	0.89	.
1988	152	0	152	0	0	0	0.81	.
1989	160	0	160	0	0	0	0.83	.
1990	167	0	167	0	0	0	0.84	.
1991	168	0	168	0	0	0	0.83	.
1992	170	0	170	0	0	0	0.82	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for French West Africa

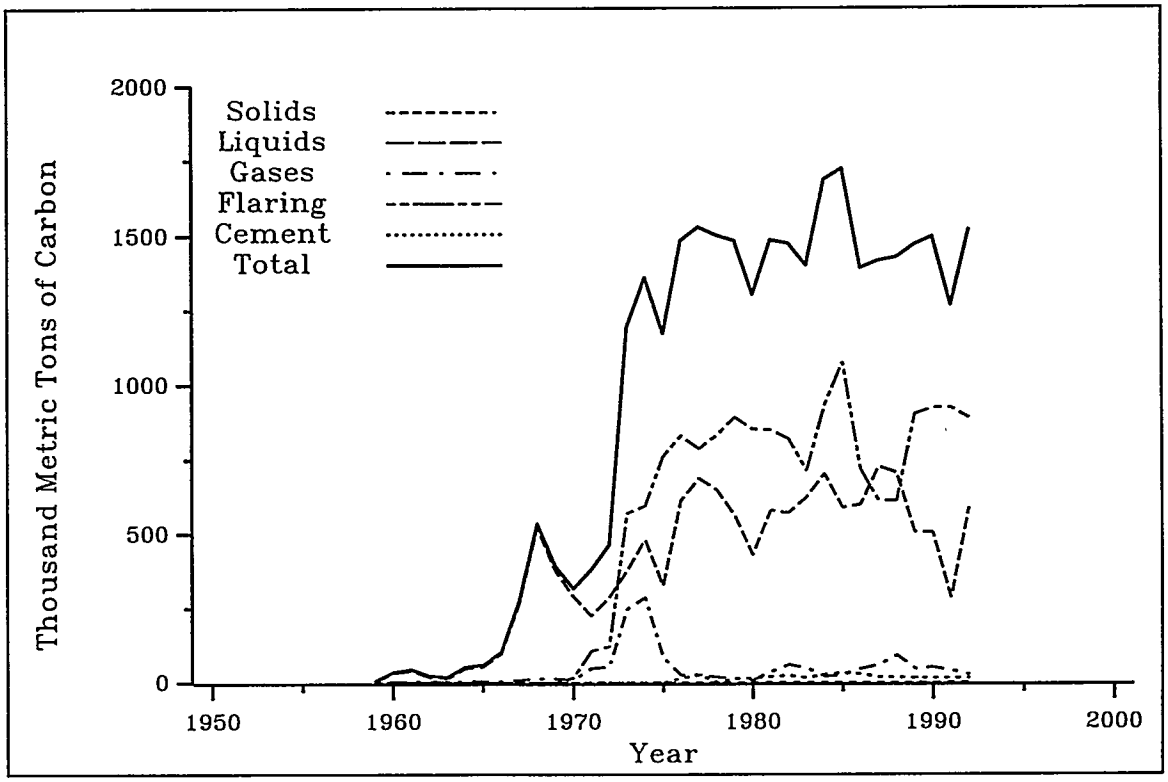


Per capita CO_2 emission rates for French West Africa

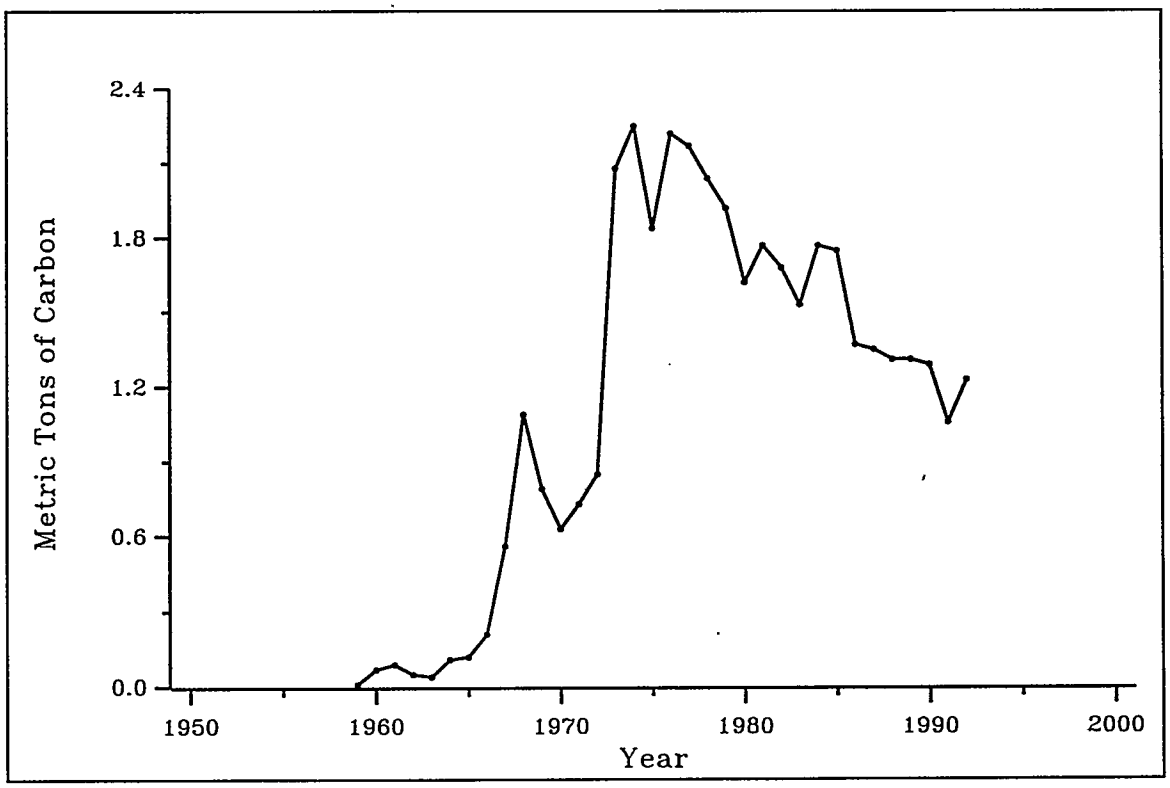
French West Africa

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	355	70	277	0	8	0	0.02	577
1951	299	122	170	0	8	0	0.01	904
1952	332	116	206	0	11	0	0.02	936
1953	276	39	229	0	8	0	0.01	962
1954	325	43	270	0	11	0	0.01	985
1955	323	20	286	0	18	0	0.01	950
1956	374	25	330	0	20	0	0.02	1114
1957	383	1	361	0	22	0	0.02	1452

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Gabon

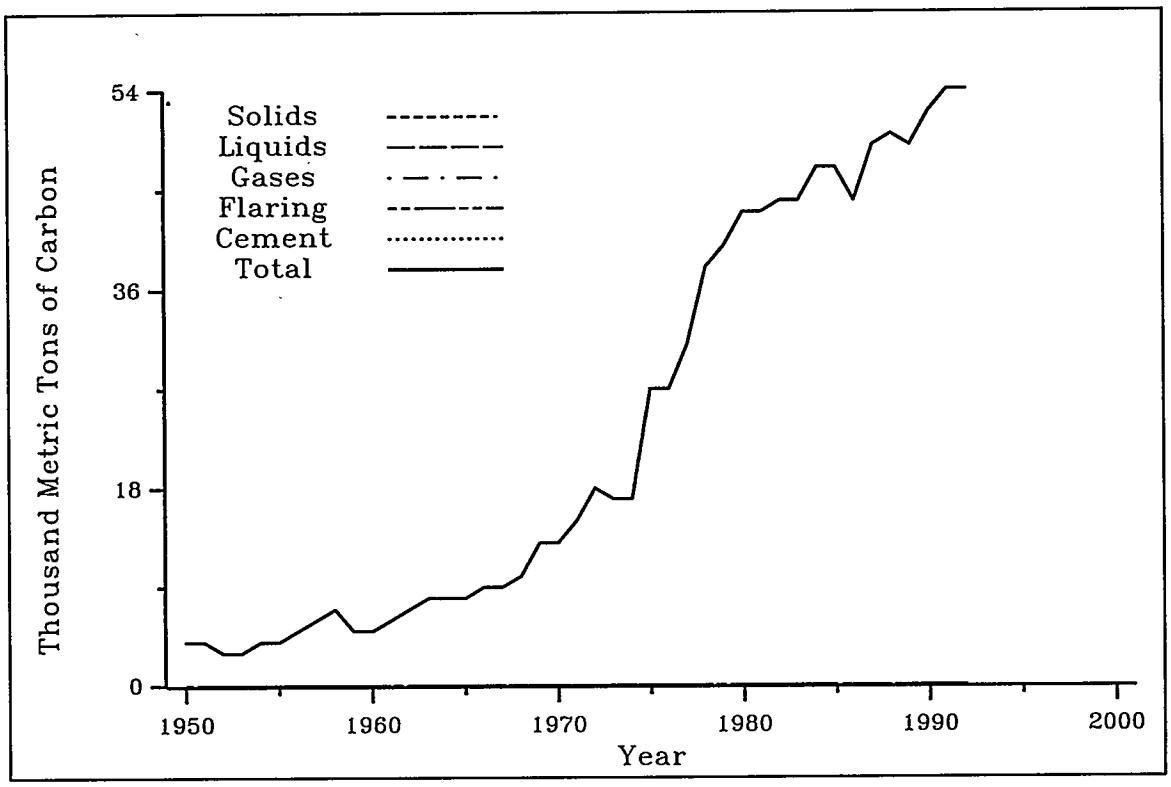


Per capita CO_2 emission rates for Gabon

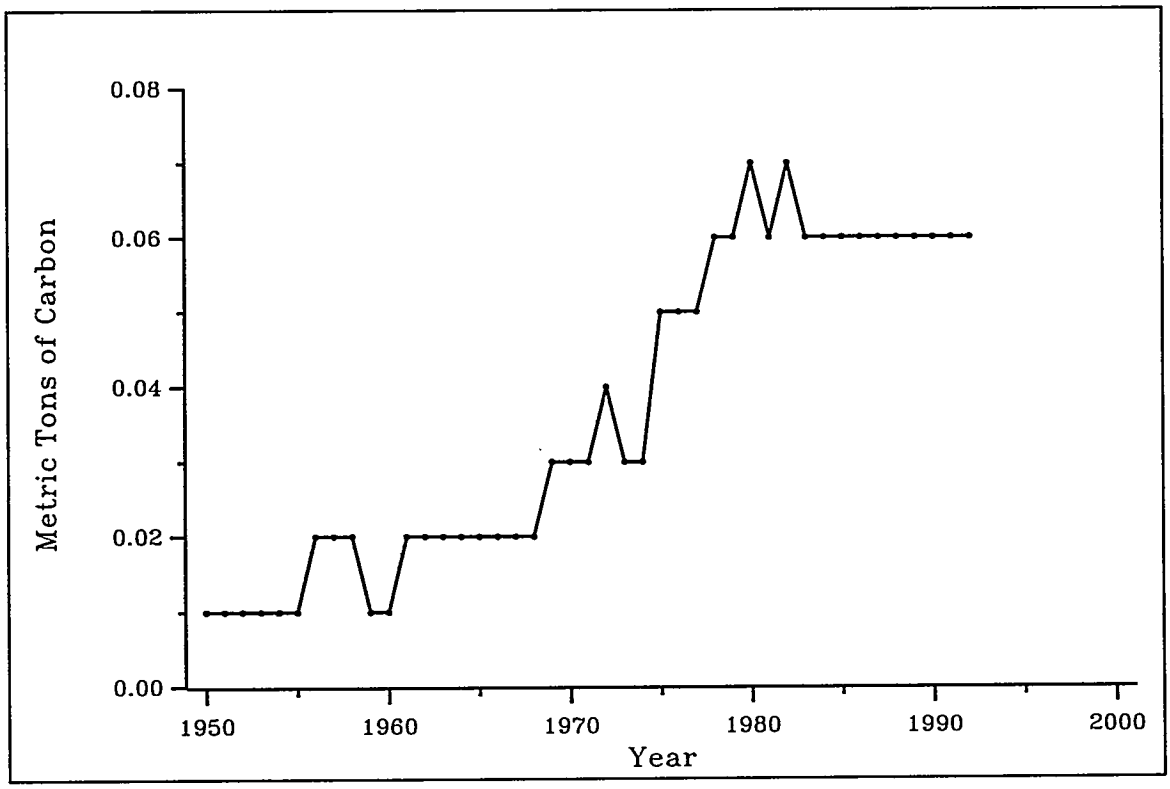
Gabon

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1959	6	0	3	4	0	0	0.01	.
1960	36	0	33	4	0	0	0.07	.
1961	45	0	41	4	0	0	0.09	.
1962	24	0	19	5	0	0	0.05	.
1963	20	0	15	5	0	0	0.04	.
1964	54	0	49	5	0	0	0.11	.
1965	60	0	54	6	0	0	0.12	.
1966	105	0	99	6	0	0	0.21	.
1967	277	0	268	9	0	0	0.56	.
1968	535	0	522	13	0	0	1.09	.
1969	391	0	378	13	0	0	0.79	.
1970	318	0	291	10	0	17	0.63	.
1971	381	0	226	49	0	107	0.73	.
1972	464	0	287	54	0	122	0.85	.
1973	1196	0	378	248	0	570	2.08	.
1974	1361	0	480	287	0	595	2.25	.
1975	1173	0	327	85	0	761	1.84	.
1976	1484	0	613	26	15	831	2.22	.
1977	1529	0	688	27	26	787	2.17	.
1978	1502	0	649	19	2	832	2.04	.
1979	1484	0	563	15	13	892	1.92	.
1980	1304	0	429	8	15	852	1.62	.
1981	1486	0	579	37	20	850	1.77	.
1982	1475	0	571	60	24	820	1.68	.
1983	1402	0	624	49	16	714	1.53	.
1984	1686	0	703	21	28	934	1.77	.
1985	1724	0	589	26	33	1075	1.75	.
1986	1393	0	599	47	29	719	1.37	.
1987	1418	0	727	60	19	612	1.35	.
1988	1429	0	707	92	18	612	1.31	.
1989	1472	0	507	48	16	903	1.31	.
1990	1497	0	505	52	16	924	1.29	.
1991	1269	0	286	42	16	925	1.06	.
1992	1520	0	588	27	16	890	1.23	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Gambia

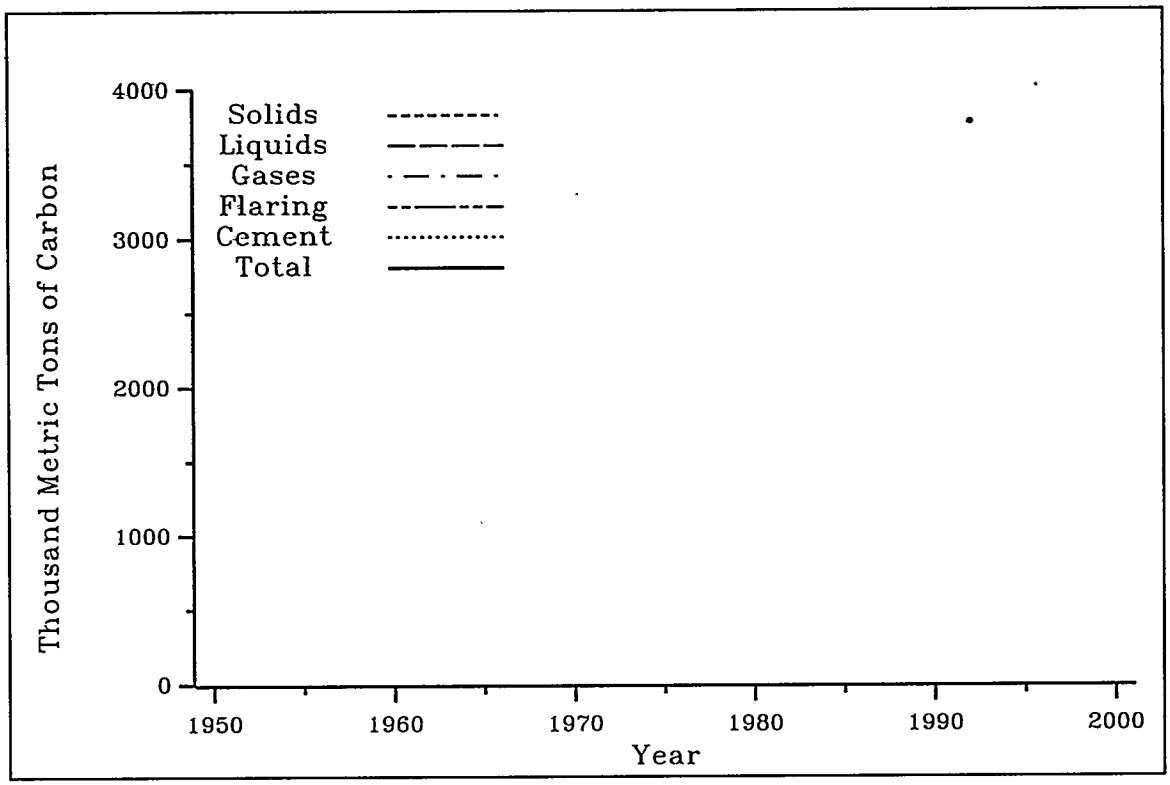


Per capita CO_2 emission rates for Gambia

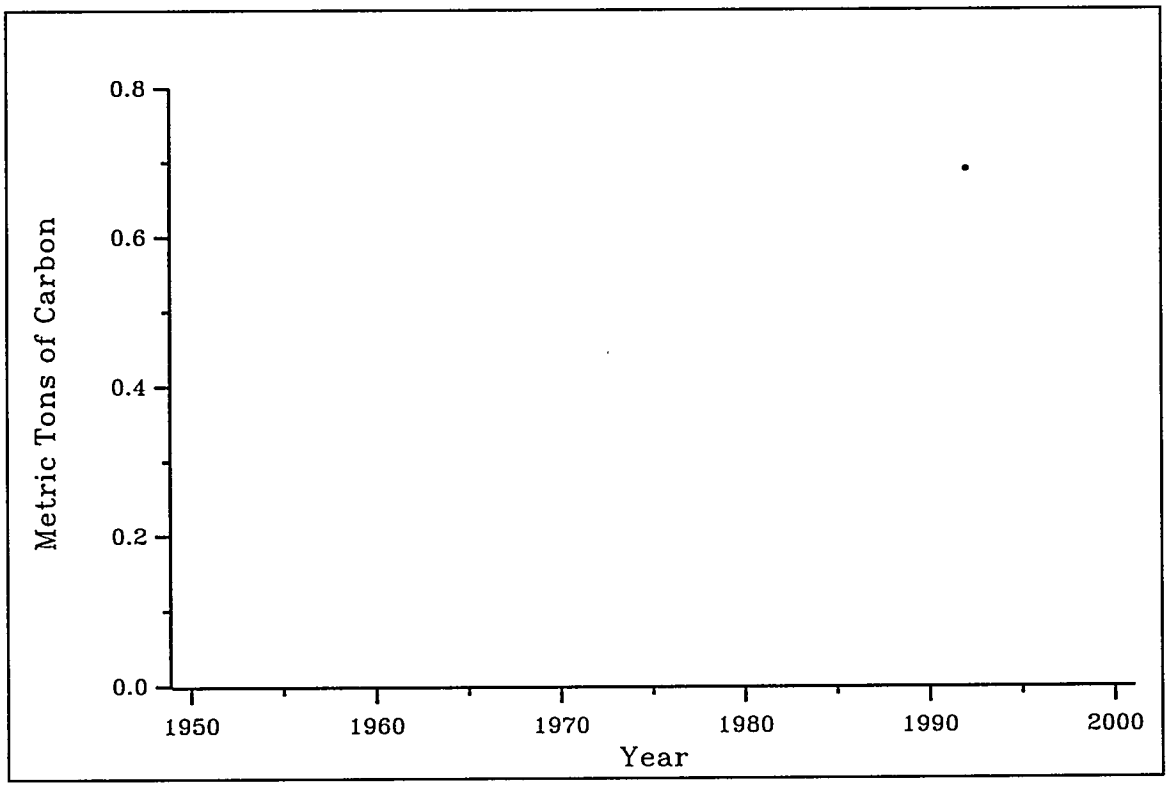
Gambia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	4	0	4	0	0	0	0.01	.
1951	4	0	4	0	0	0	0.01	.
1952	3	0	3	0	0	0	0.01	.
1953	3	0	3	0	0	0	0.01	.
1954	4	0	4	0	0	0	0.01	.
1955	4	0	4	0	0	0	0.01	.
1956	5	0	5	0	0	0	0.02	.
1957	6	0	6	0	0	0	0.02	.
1958	7	0	7	0	0	0	0.02	.
1959	5	0	5	0	0	0	0.01	.
1960	5	0	5	0	0	0	0.01	.
1961	6	0	6	0	0	0	0.02	.
1962	7	0	7	0	0	0	0.02	.
1963	8	0	8	0	0	0	0.02	.
1964	8	0	8	0	0	0	0.02	.
1965	8	0	8	0	0	0	0.02	.
1966	9	0	9	0	0	0	0.02	.
1967	9	0	9	0	0	0	0.02	.
1968	10	0	10	0	0	0	0.02	.
1969	13	0	13	0	0	0	0.03	.
1970	13	0	13	0	0	0	0.03	.
1971	15	0	15	0	0	0	0.03	.
1972	18	0	18	0	0	0	0.04	.
1973	17	0	17	0	0	0	0.03	.
1974	17	0	17	0	0	0	0.03	.
1975	27	0	27	0	0	0	0.05	.
1976	27	0	27	0	0	0	0.05	.
1977	31	0	31	0	0	0	0.05	.
1978	38	0	38	0	0	0	0.06	.
1979	40	0	40	0	0	0	0.06	.
1980	43	0	43	0	0	0	0.07	.
1981	43	0	43	0	0	0	0.06	.
1982	44	0	44	0	0	0	0.07	.
1983	44	0	44	0	0	0	0.06	.
1984	47	0	47	0	0	0	0.06	.
1985	47	0	47	0	0	0	0.06	.
1986	44	0	44	0	0	0	0.06	.
1987	49	0	49	0	0	0	0.06	.
1988	50	0	50	0	0	0	0.06	.
1989	49	0	49	0	0	0	0.06	.
1990	52	0	52	0	0	0	0.06	.
1991	54	0	54	0	0	0	0.06	.
1992	54	0	54	0	0	0	0.06	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Georgia

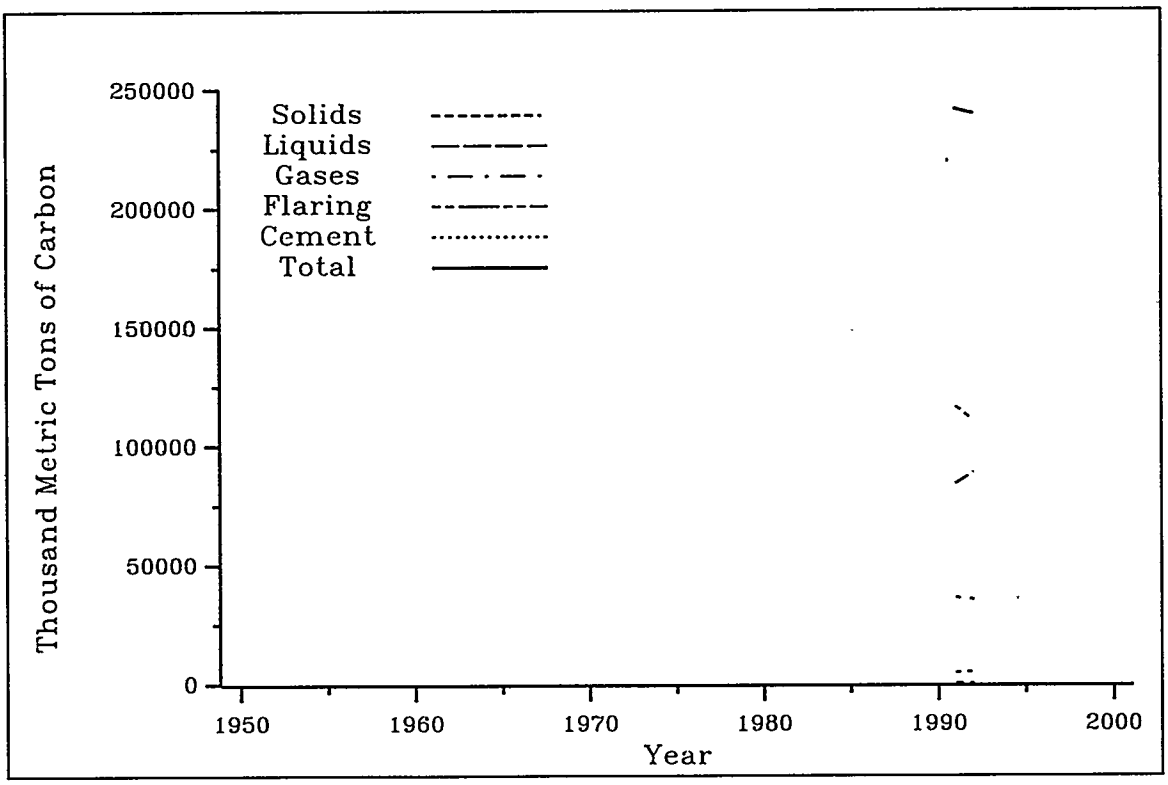


Per capita CO_2 emission rates for Georgia

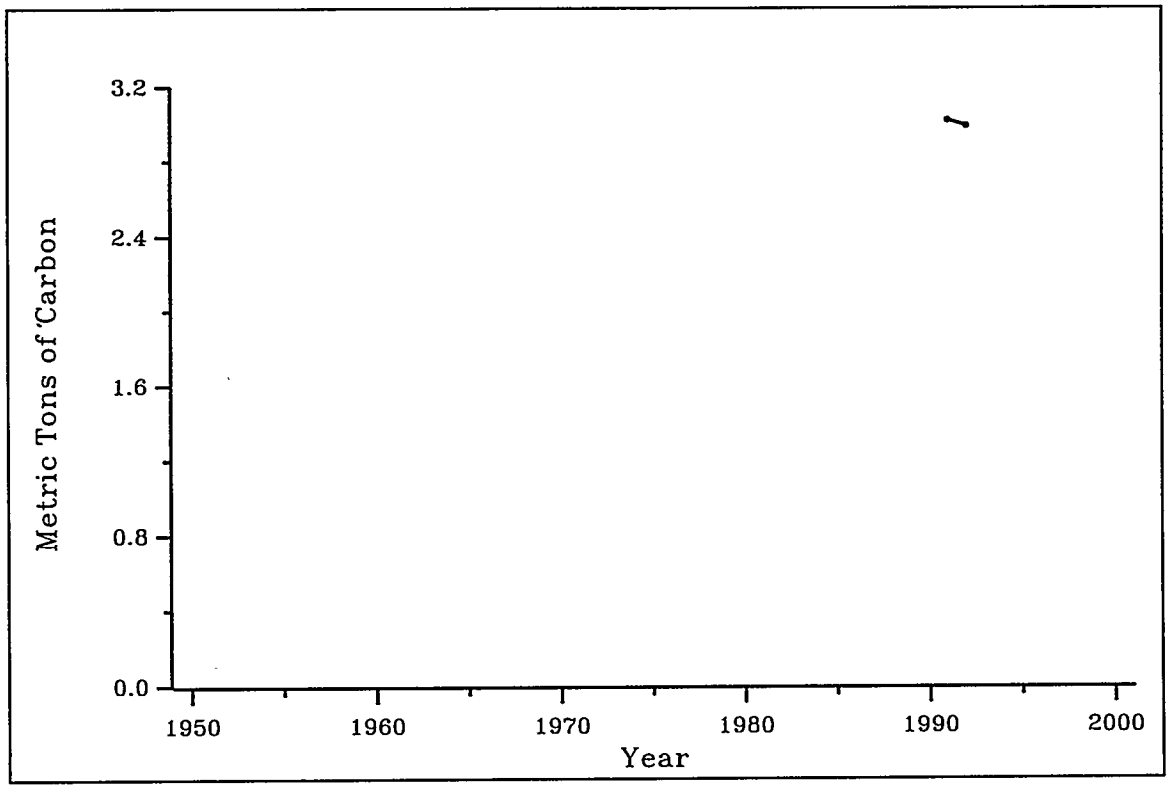
Georgia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	3777	451	646	2544	136	0	0.69	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Germany

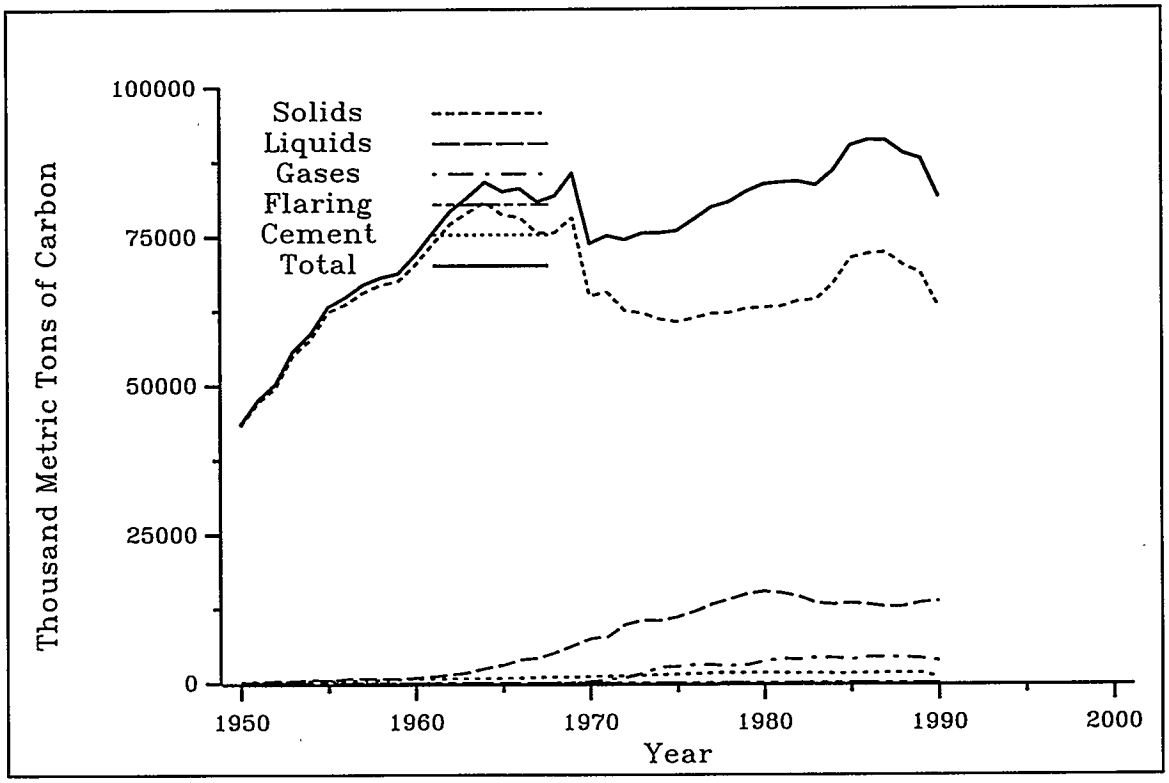


Per capita CO_2 emission rates for Germany

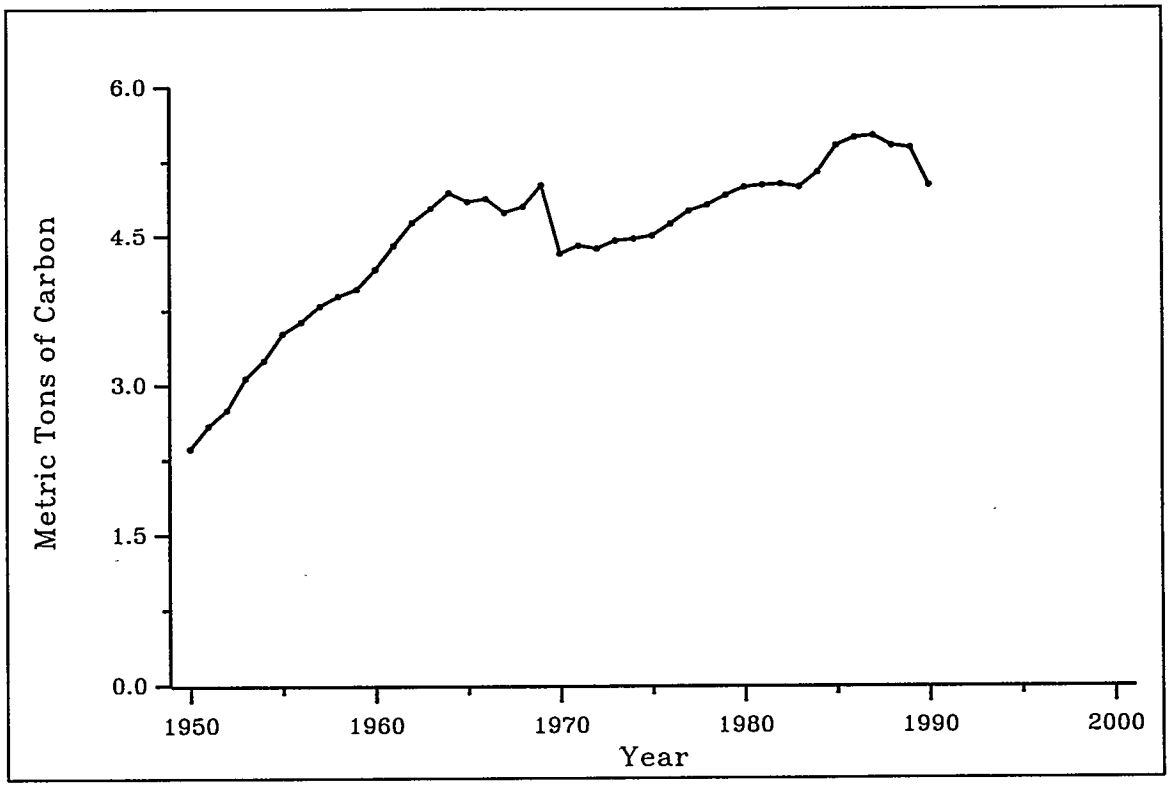
Germany

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1991	241444	116364	84041	36051	4678	310	3.02	.
1992	239666	110448	88641	35270	5100	207	2.99	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the former German Democratic Republic

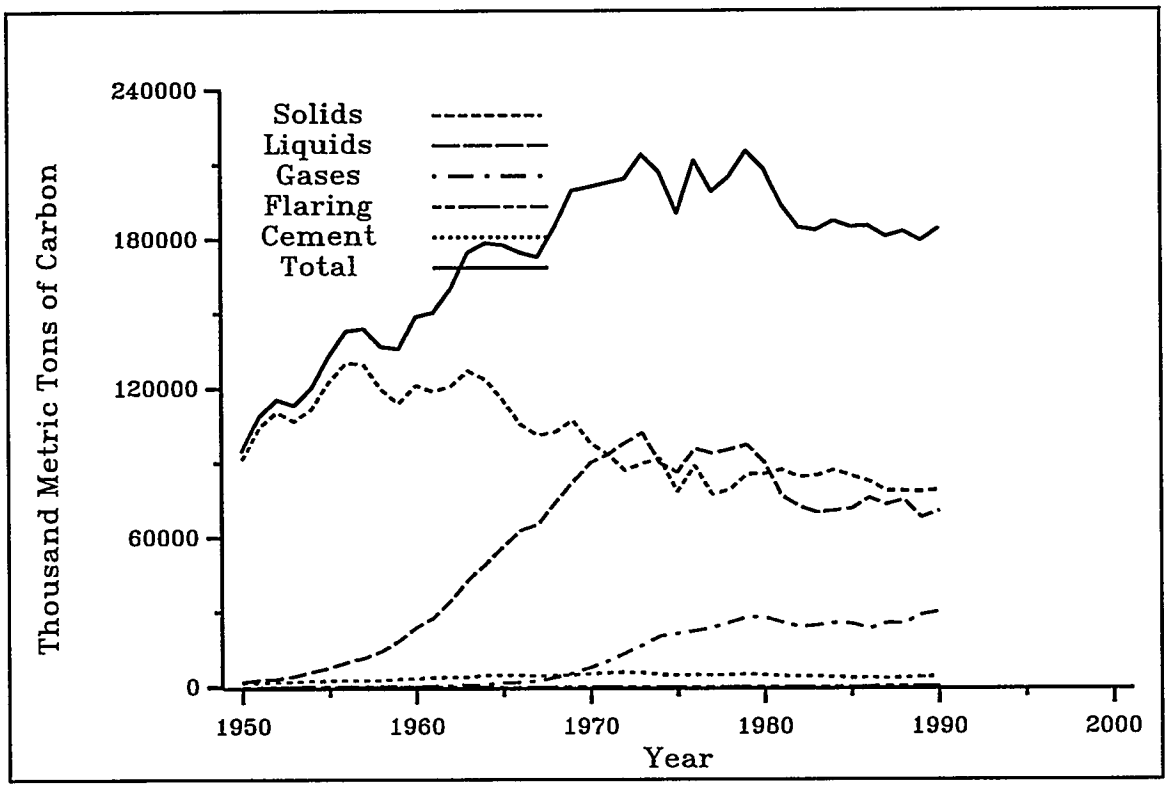


Per capita CO_2 emission rates for the former German Democratic Republic

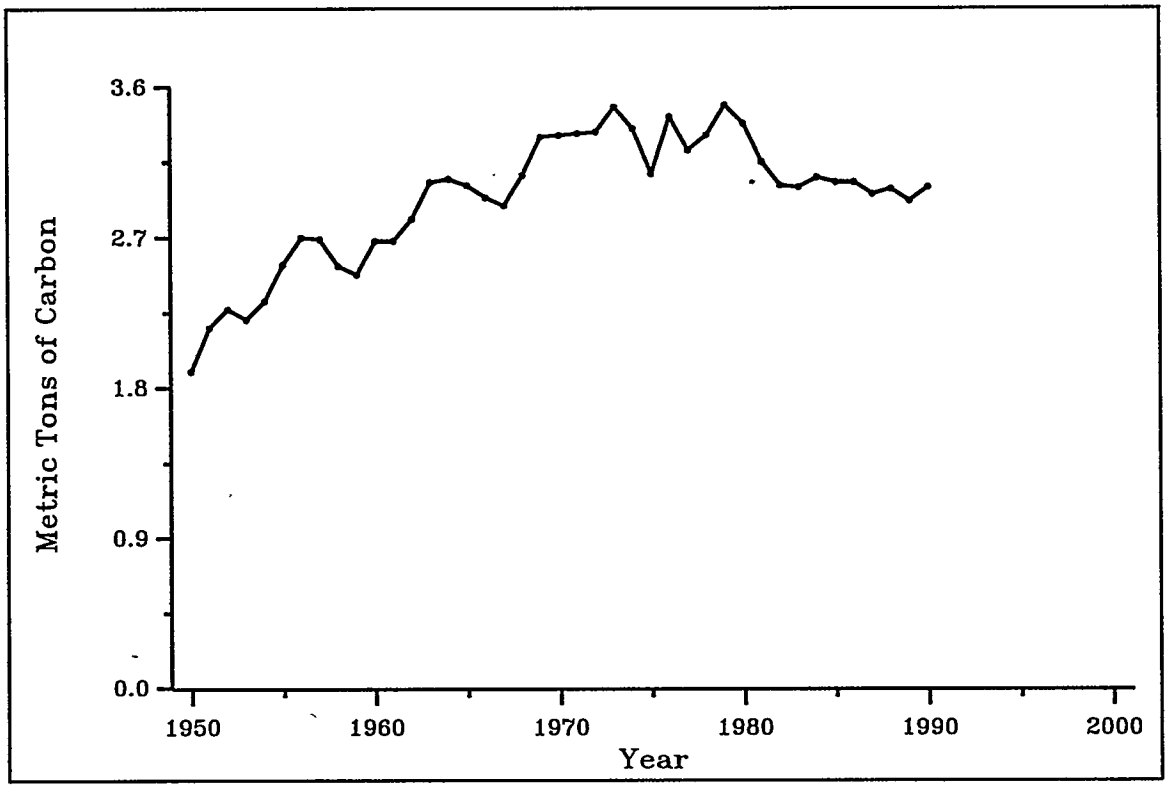
German Democratic Republic (former)

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	43472	43259	18	5	190	0	2.36	.
1951	47606	47165	209	10	222	0	2.59	.
1952	50362	49714	371	8	269	0	2.75	.
1953	55818	55099	379	6	333	0	3.07	.
1954	58709	57765	571	14	358	0	3.25	.
1955	63225	62370	431	20	404	0	3.52	.
1956	64831	63654	710	22	445	0	3.64	.
1957	66960	65631	821	37	471	0	3.80	.
1958	68193	66954	726	29	484	0	3.90	.
1959	68838	67526	712	27	572	0	3.97	.
1960	71940	70308	911	36	684	0	4.17	.
1961	75657	73788	1119	33	717	0	4.41	.
1962	79265	77108	1386	33	739	0	4.64	.
1963	81563	79009	1768	44	742	0	4.78	.
1964	84131	80810	2496	41	784	0	4.94	.
1965	82581	78672	3037	45	828	0	4.85	.
1966	83076	78229	3923	46	877	0	4.88	.
1967	80804	75597	4194	37	976	0	4.74	.
1968	81847	75646	5122	52	1027	0	4.80	.
1969	85587	78167	6289	123	1008	0	5.02	.
1970	73845	65035	7433	290	1086	0	4.33	.
1971	75126	65666	7772	536	1152	0	4.41	.
1972	74486	62566	9819	896	1205	0	4.38	.
1973	75556	62124	10538	1594	1299	0	4.46	.
1974	75602	61102	10471	2656	1373	0	4.48	.
1975	75936	60651	11073	2763	1449	0	4.51	.
1976	77864	61287	12005	3028	1543	0	4.63	.
1977	79866	61993	13208	3019	1646	0	4.76	.
1978	80746	62150	14031	2861	1703	0	4.82	.
1979	82440	62862	14921	2988	1669	0	4.92	.
1980	83678	63053	15334	3598	1692	0	5.00	.
1981	83989	63209	15094	4026	1660	0	5.02	.
1982	84141	64154	14474	3919	1594	0	5.03	.
1983	83521	64347	13381	4191	1602	0	5.00	.
1984	86014	67092	13188	4163	1572	0	5.15	.
1985	90216	71384	13387	3866	1579	0	5.42	.
1986	91123	72068	13131	4295	1630	0	5.50	.
1987	91040	72310	12774	4265	1691	0	5.52	.
1988	88945	70172	12834	4237	1702	0	5.42	.
1989	88012	68817	13465	4062	1668	0	5.40	.
1990	81641	63228	13713	3717	983	0	5.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Federal Republic of Germany

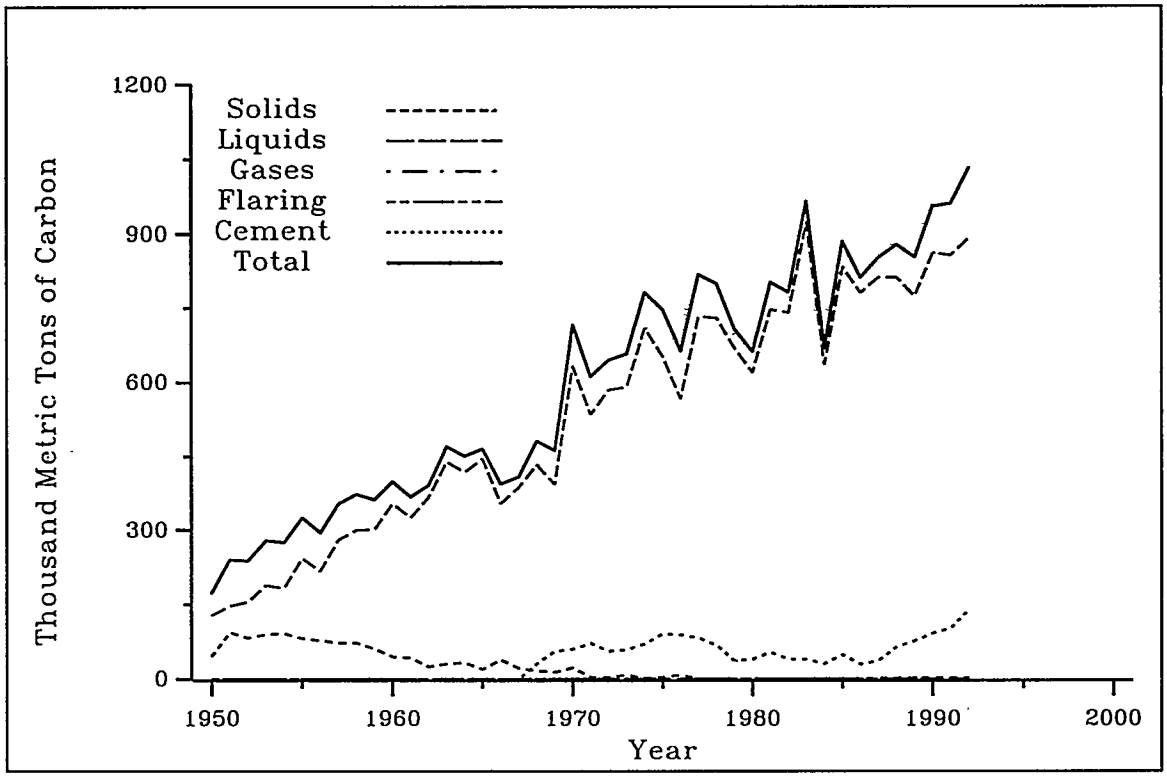


Per capita CO_2 emission rates for the Federal Republic of Germany

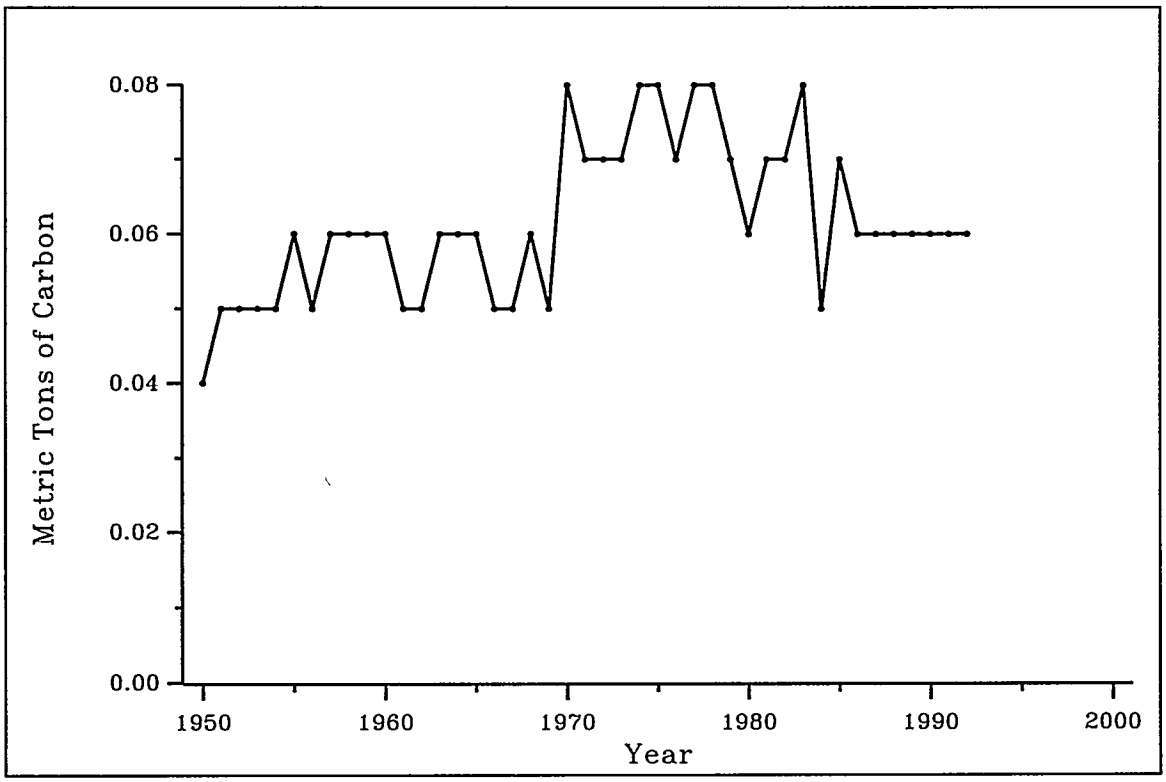
Federal Republic of Germany

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	94911	91349	2047	7	1508	0	1.90	1435
1951	108802	104290	2814	5	1693	0	2.16	1687
1952	115365	110370	3192	19	1785	0	2.27	1836
1953	113152	106671	4295	56	2130	0	2.21	1502
1954	120092	111663	6092	85	2251	0	2.32	1714
1955	132921	122489	7741	179	2511	0	2.54	2117
1956	142953	130152	9923	267	2611	0	2.70	2415
1957	143942	129472	11614	250	2606	0	2.69	2168
1958	136735	119468	14336	254	2677	0	2.53	1910
1959	135869	113895	18526	297	3150	0	2.48	2010
1960	148614	121052	23842	332	3387	0	2.68	2346
1961	150468	118647	27760	369	3692	0	2.68	2437
1962	159943	120781	34768	504	3889	0	2.81	2649
1963	174610	126931	43051	655	3974	0	3.03	2602
1964	178336	123374	49385	1003	4574	0	3.05	3068
1965	177540	115015	56413	1470	4642	0	3.01	3351
1966	174634	105366	62763	1782	4724	0	2.94	3776
1967	172787	100865	65259	2353	4310	0	2.89	3358
1968	184876	102267	74166	3895	4548	0	3.07	3708
1969	199404	106924	82217	5492	4771	0	3.30	4050
1970	200840	98025	89785	7818	5212	0	3.31	4828
1971	202483	93237	93229	10439	5578	0	3.32	5027
1972	204082	86871	97893	13450	5868	0	3.33	5347
1973	213783	89552	101819	16834	5578	0	3.48	5161
1974	206495	91576	89700	20326	4893	0	3.35	4735
1975	190267	78304	86109	21299	4556	0	3.08	4325
1976	211358	88622	95533	22387	4817	0	3.42	4380
1977	198927	77201	93651	23530	4544	0	3.22	4560
1978	204745	78969	95194	25780	4801	0	3.31	4464
1979	215114	85211	97021	27846	5037	0	3.49	4611
1980	207883	85497	89975	27762	4649	0	3.38	4638
1981	193646	87059	76596	25707	4284	0	3.15	4852
1982	184492	84136	72343	23922	4091	0	3.01	4429
1983	183390	84759	69968	24520	4143	0	3.00	4251
1984	187014	86988	70614	25481	3932	0	3.06	4205
1985	184643	84568	71400	25173	3503	0	3.03	4951
1986	184989	82413	75800	23162	3615	0	3.03	6046
1987	180872	78515	73130	25425	3436	366	2.96	5398
1988	182867	78579	75046	25347	3565	330	2.99	5062
1989	179213	78316	68018	28842	3876	161	2.92	5019
1990	183931	79039	70406	30027	4142	317	3.00	5015

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Ghana

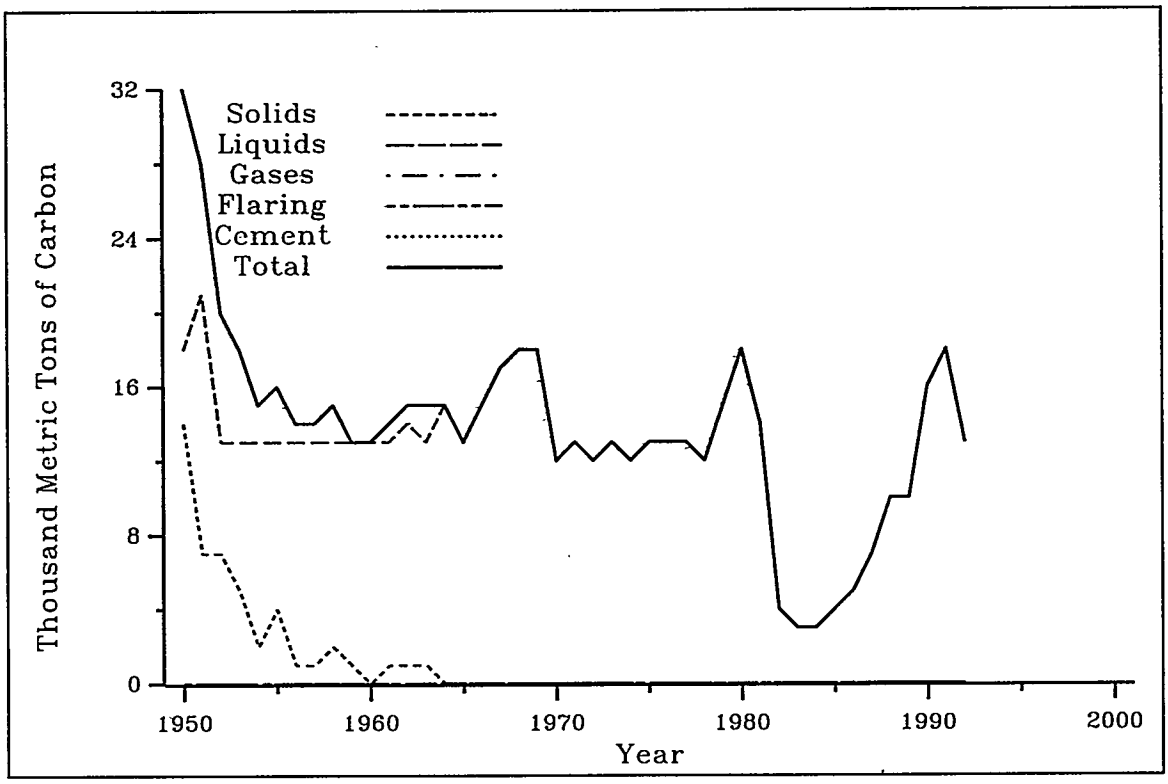


Per capita CO_2 emission rates for Ghana

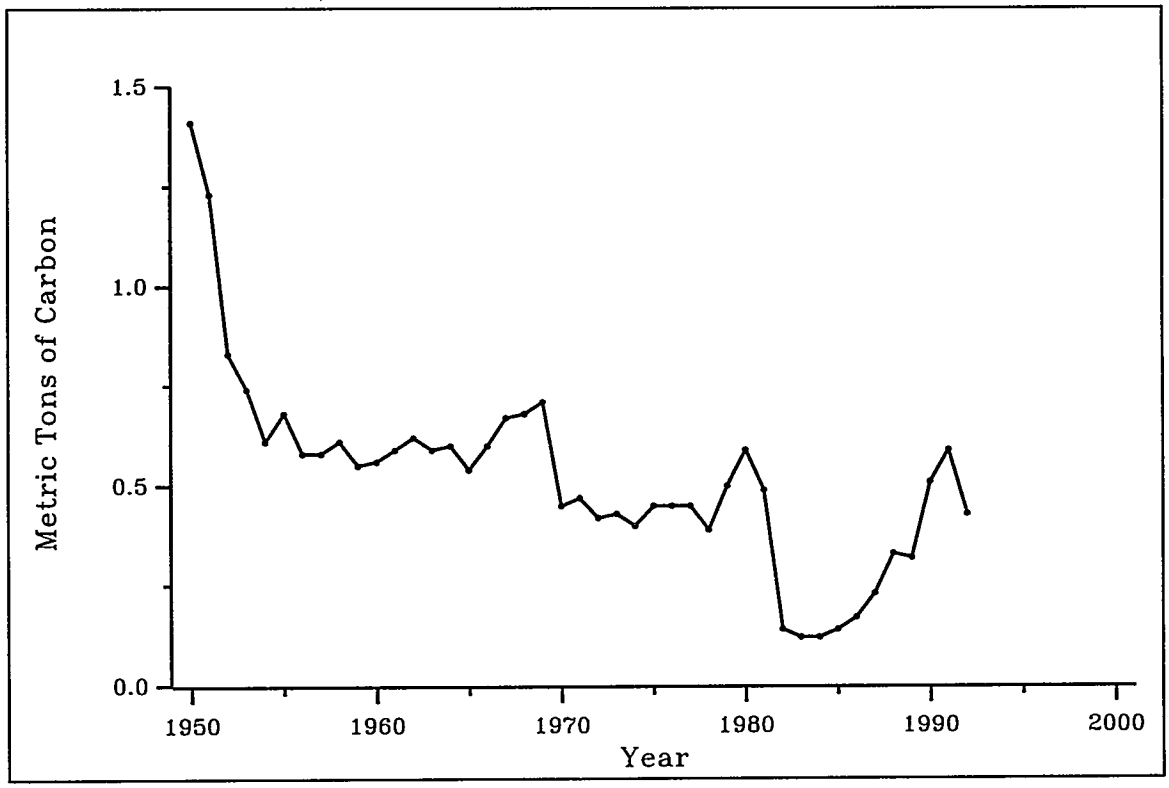
Ghana

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	174	46	128	0	0	0	0.04	.
1951	240	94	147	0	0	0	0.05	.
1952	238	83	155	0	0	0	0.05	.
1953	279	90	189	0	0	0	0.05	.
1954	275	92	183	0	0	0	0.05	.
1955	325	82	243	0	0	0	0.06	.
1956	295	78	217	0	0	0	0.05	.
1957	354	73	280	0	0	0	0.06	.
1958	373	73	300	0	0	0	0.06	.
1959	362	61	301	0	0	0	0.06	.
1960	399	45	354	0	0	0	0.06	.
1961	368	43	325	0	0	0	0.05	.
1962	392	25	367	0	0	0	0.05	.
1963	470	31	439	0	0	0	0.06	.
1964	451	33	418	0	0	0	0.06	.
1965	465	20	445	0	0	0	0.06	.
1966	394	39	354	0	0	0	0.05	.
1967	409	22	387	0	0	0	0.05	.
1968	481	17	433	0	31	0	0.06	.
1969	462	14	393	0	56	0	0.05	.
1970	716	23	633	0	60	0	0.08	.
1971	612	4	535	0	72	0	0.07	.
1972	645	4	585	0	56	0	0.07	.
1973	658	8	590	0	59	0	0.07	.
1974	782	2	709	0	71	0	0.08	.
1975	747	4	653	0	91	0	0.08	.
1976	664	8	567	0	89	0	0.07	.
1977	818	1	733	0	83	0	0.08	.
1978	800	1	730	0	68	0	0.08	.
1979	707	1	669	0	37	0	0.07	.
1980	662	1	620	0	40	0	0.06	.
1981	802	1	747	0	54	0	0.07	.
1982	782	1	741	0	40	0	0.07	.
1983	965	1	924	0	40	0	0.08	.
1984	669	1	636	0	31	0	0.05	.
1985	885	1	834	0	49	0	0.07	.
1986	812	1	781	0	30	0	0.06	.
1987	852	2	812	0	37	0	0.06	.
1988	879	2	812	0	65	0	0.06	.
1989	853	2	774	0	77	0	0.06	.
1990	955	2	861	0	92	0	0.06	.
1991	961	2	857	0	102	0	0.06	.
1992	1032	2	891	0	139	0	0.06	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Gibraltar

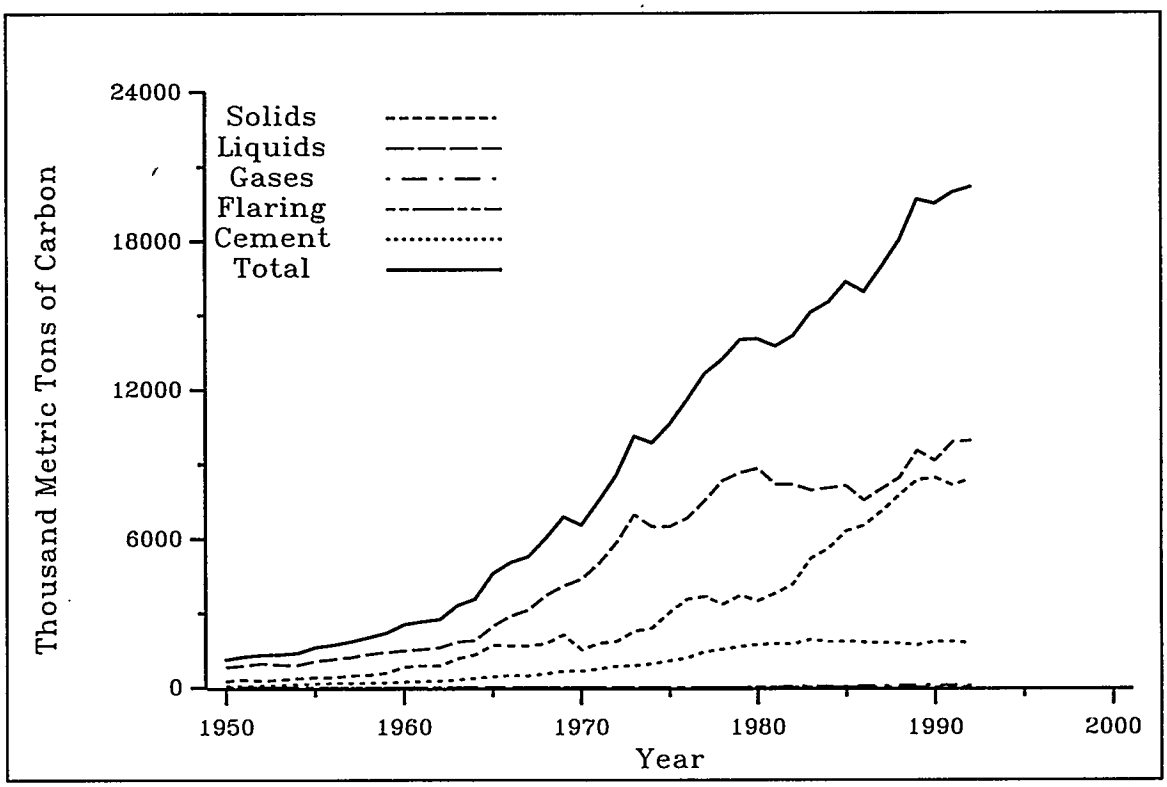


Per capita CO_2 emission rates for Gibraltar

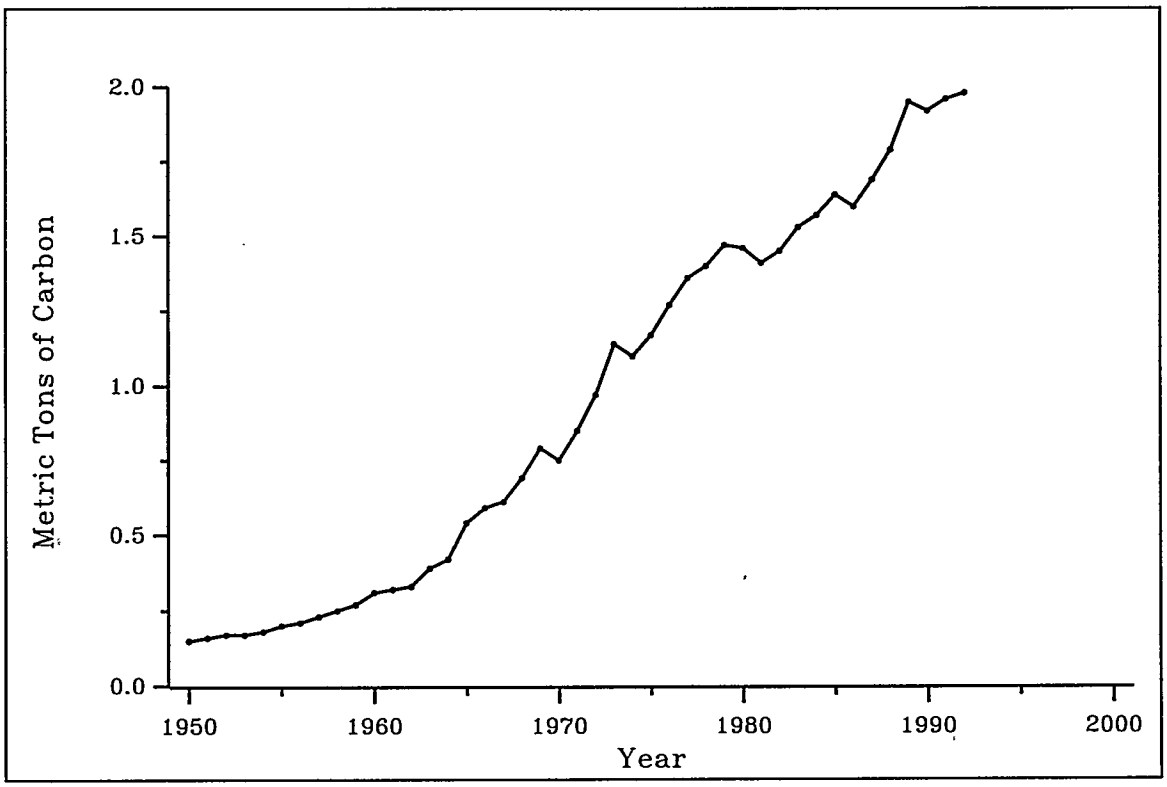
Gibraltar

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	32	14	18	0	0	0	1.41	452
1951	28	7	21	0	0	0	1.23	476
1952	20	7	13	0	0	0	0.83	440
1953	18	5	13	0	0	0	0.74	311
1954	15	2	13	0	0	0	0.61	274
1955	16	4	13	0	0	0	0.68	276
1956	14	1	13	0	0	0	0.58	388
1957	14	1	13	0	0	0	0.58	437
1958	15	2	13	0	0	0	0.61	239
1959	13	1	13	0	0	0	0.55	157
1960	13	0	13	0	0	0	0.56	156
1961	14	1	13	0	0	0	0.59	146
1962	15	1	14	0	0	0	0.62	144
1963	15	1	13	0	0	0	0.59	171
1964	15	0	15	0	0	0	0.60	160
1965	13	0	13	0	0	0	0.54	144
1966	15	0	15	0	0	0	0.60	131
1967	17	0	17	0	0	0	0.67	168
1968	18	0	18	0	0	0	0.68	129
1969	18	0	18	0	0	0	0.71	120
1970	12	0	12	0	0	0	0.45	127
1971	13	0	13	0	0	0	0.47	150
1972	12	0	12	0	0	0	0.42	163
1973	13	0	13	0	0	0	0.43	181
1974	12	0	12	0	0	0	0.40	197
1975	13	0	13	0	0	0	0.45	175
1976	13	0	13	0	0	0	0.45	186
1977	13	0	13	0	0	0	0.45	180
1978	12	0	12	0	0	0	0.39	135
1979	15	0	15	0	0	0	0.50	151
1980	18	0	18	0	0	0	0.59	121
1981	14	0	14	0	0	0	0.49	141
1982	4	0	4	0	0	0	0.14	134
1983	3	0	3	0	0	0	0.12	106
1984	3	0	3	0	0	0	0.12	99
1985	4	0	4	0	0	0	0.14	246
1986	5	0	5	0	0	0	0.17	327
1987	7	0	7	0	0	0	0.23	307
1988	10	0	10	0	0	0	0.33	398
1989	10	0	10	0	0	0	0.32	378
1990	16	0	16	0	0	0	0.51	385
1991	18	0	18	0	0	0	0.59	397
1992	13	0	13	0	0	0	0.43	734

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Greece

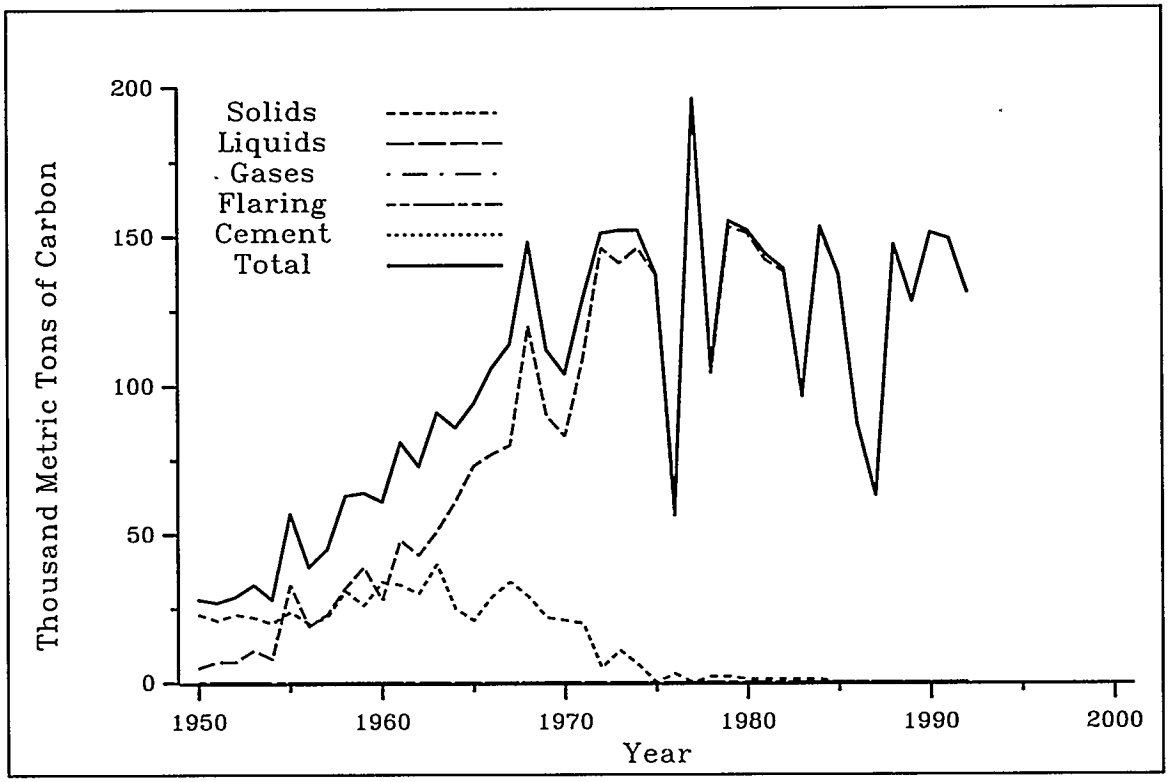


Per capita CO_2 emission rates for Greece

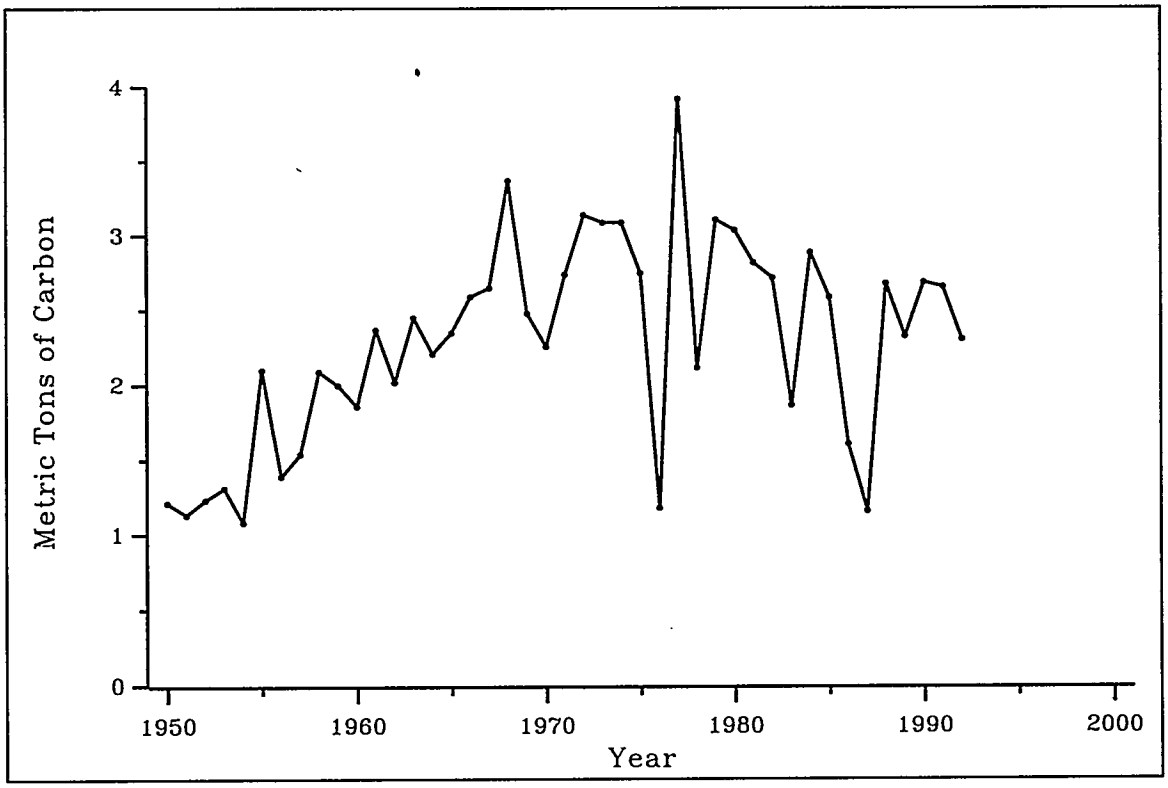
Greece

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1128	250	824	0	54	0	0.15	.
1951	1251	310	882	0	59	0	0.16	.
1952	1310	265	965	0	81	0	0.17	.
1953	1333	312	919	0	102	0	0.17	.
1954	1385	364	904	0	116	0	0.18	.
1955	1621	404	1063	0	154	0	0.20	.
1956	1712	403	1141	0	168	0	0.21	.
1957	1854	476	1212	0	167	0	0.23	.
1958	2026	501	1343	0	182	0	0.25	.
1959	2207	591	1419	0	196	0	0.27	.
1960	2545	831	1490	0	223	0	0.31	.
1961	2659	876	1533	0	250	0	0.32	.
1962	2752	879	1611	0	262	0	0.33	.
1963	3316	1166	1838	0	312	0	0.39	.
1964	3576	1317	1896	0	363	0	0.42	.
1965	4602	1699	2466	0	437	0	0.54	.
1966	5046	1682	2877	0	488	0	0.59	.
1967	5284	1680	3135	0	469	0	0.61	.
1968	6040	1770	3716	0	555	0	0.69	.
1969	6893	2128	4107	0	658	0	0.79	.
1970	6559	1523	4376	0	659	0	0.75	.
1971	7541	1781	5006	0	753	0	0.85	.
1972	8568	1859	5855	0	854	0	0.97	.
1973	10118	2268	6968	0	883	0	1.14	.
1974	9844	2400	6490	0	955	0	1.10	.
1975	10598	3029	6489	0	1080	0	1.17	.
1976	11580	3568	6823	0	1189	0	1.27	.
1977	12639	3669	7530	0	1439	0	1.36	.
1978	13208	3352	8322	0	1534	0	1.40	.
1979	14007	3716	8646	0	1645	0	1.47	.
1980	14031	3493	8814	0	1724	0	1.46	.
1981	13738	3797	8181	0	1760	0	1.41	.
1982	14156	4175	8173	59	1749	0	1.45	.
1983	15106	5194	7939	43	1931	0	1.53	.
1984	15514	5597	8031	47	1839	0	1.57	.
1985	16322	6308	8110	45	1859	0	1.64	.
1986	15925	6524	7531	56	1814	0	1.60	.
1987	16936	7093	7989	64	1791	0	1.69	.
1988	18026	7745	8434	72	1775	1	1.79	.
1989	19665	8348	9527	84	1705	1	1.95	.
1990	19487	8437	9118	86	1844	1	1.92	.
1991	19944	8131	9881	84	1847	1	1.96	.
1992	20158	8396	9907	77	1777	1	1.98	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Greenland

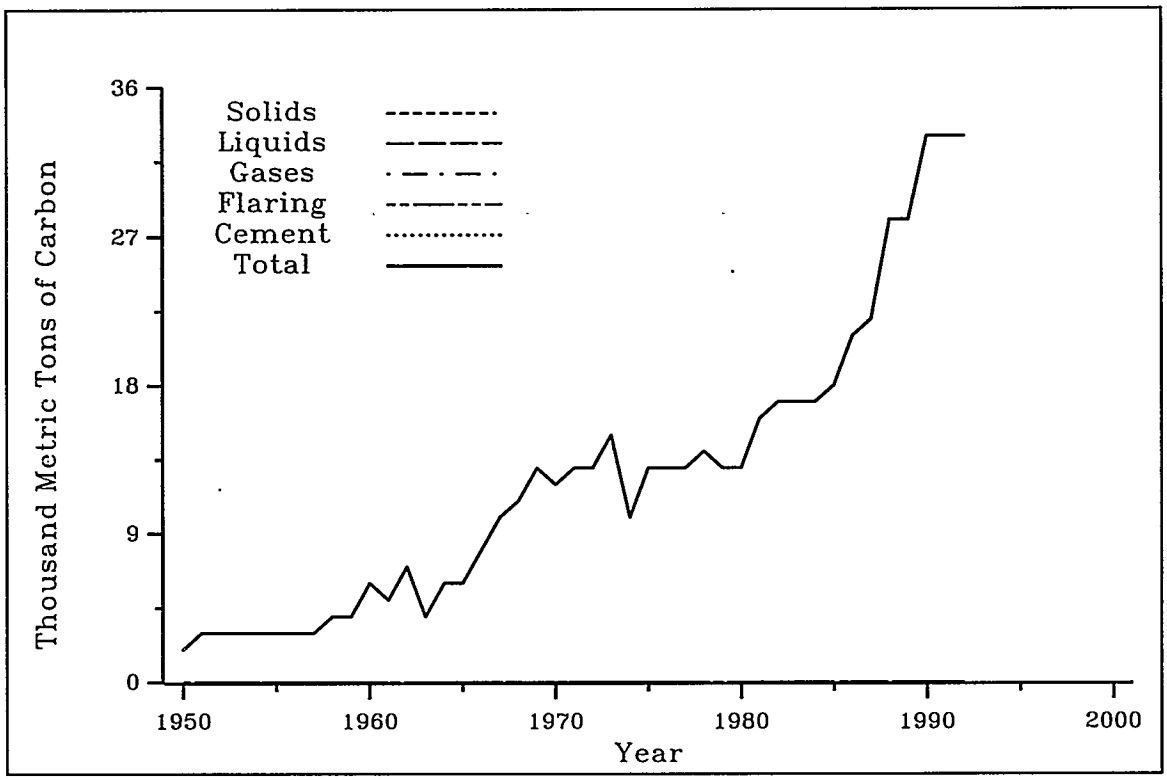


Per capita CO_2 emission rates for Greenland

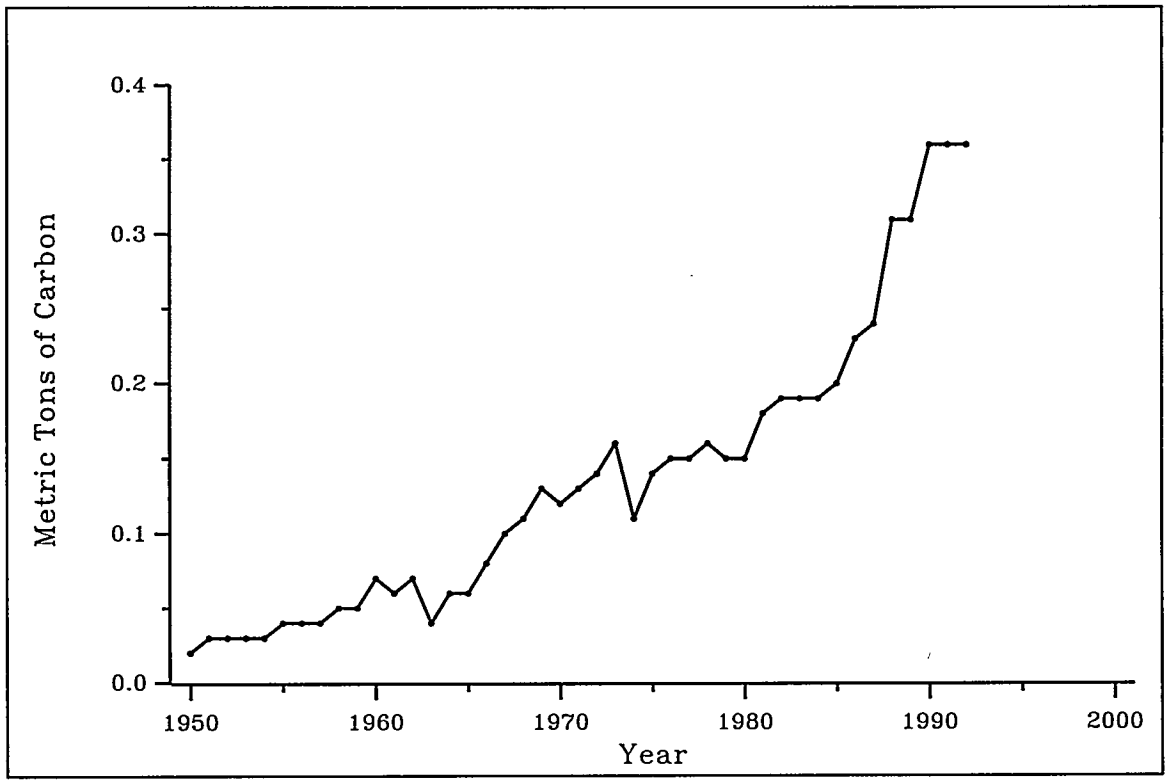
Greenland

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	28	23	5	0	0	0	1.21	.
1951	27	21	7	0	0	0	1.13	.
1952	29	23	7	0	0	0	1.23	.
1953	33	22	11	0	0	0	1.31	.
1954	28	20	8	0	0	0	1.08	.
1955	57	24	33	0	0	0	2.10	.
1956	39	20	19	0	0	0	1.39	.
1957	45	22	23	0	0	0	1.54	.
1958	63	31	32	0	0	0	2.09	.
1959	64	26	39	0	0	0	2.00	.
1960	61	34	28	0	0	0	1.86	.
1961	81	33	48	0	0	0	2.37	.
1962	73	30	43	0	0	0	2.02	.
1963	91	40	51	0	0	0	2.45	.
1964	86	25	61	0	0	0	2.21	.
1965	94	21	73	0	0	0	2.35	.
1966	106	29	77	0	0	0	2.59	.
1967	114	34	80	0	0	0	2.65	.
1968	148	29	120	0	0	0	3.37	.
1969	112	22	90	0	0	0	2.48	.
1970	104	21	83	0	0	0	2.26	.
1971	129	20	109	0	0	0	2.74	.
1972	151	5	146	0	0	0	3.14	.
1973	152	11	141	0	0	0	3.09	.
1974	152	6	146	0	0	0	3.09	.
1975	137	0	137	0	0	0	2.75	.
1976	59	3	56	0	0	0	1.18	.
1977	196	0	196	0	0	0	3.92	.
1978	106	2	104	0	0	0	2.12	.
1979	155	2	153	0	0	0	3.11	.
1980	152	1	151	0	0	0	3.04	.
1981	144	1	142	0	0	0	2.82	.
1982	139	1	138	0	0	0	2.72	.
1983	97	1	96	0	0	0	1.87	.
1984	153	1	152	0	0	0	2.89	.
1985	137	0	137	0	0	0	2.59	.
1986	87	0	87	0	0	0	1.61	.
1987	63	0	63	0	0	0	1.16	.
1988	147	0	147	0	0	0	2.68	.
1989	128	0	128	0	0	0	2.33	.
1990	151	0	151	0	0	0	2.69	.
1991	149	0	149	0	0	0	2.66	.
1992	131	0	131	0	0	0	2.31	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Grenada

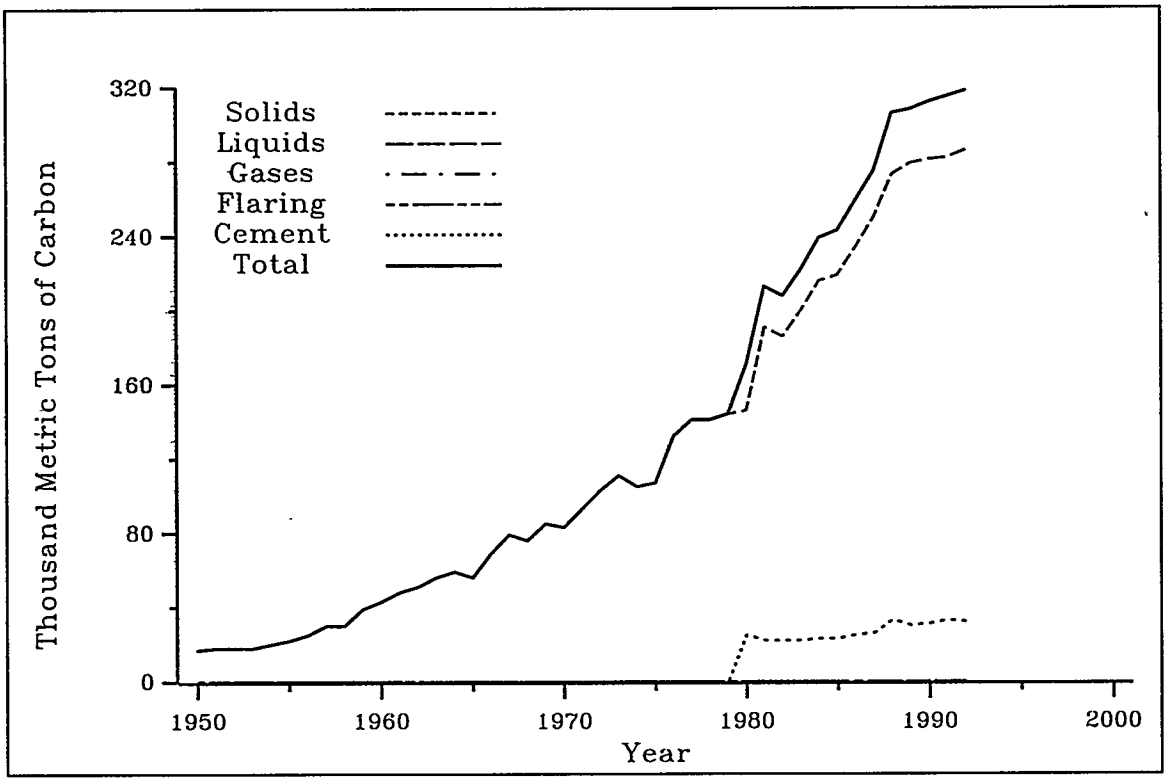


Per capita CO_2 emission rates for Grenada

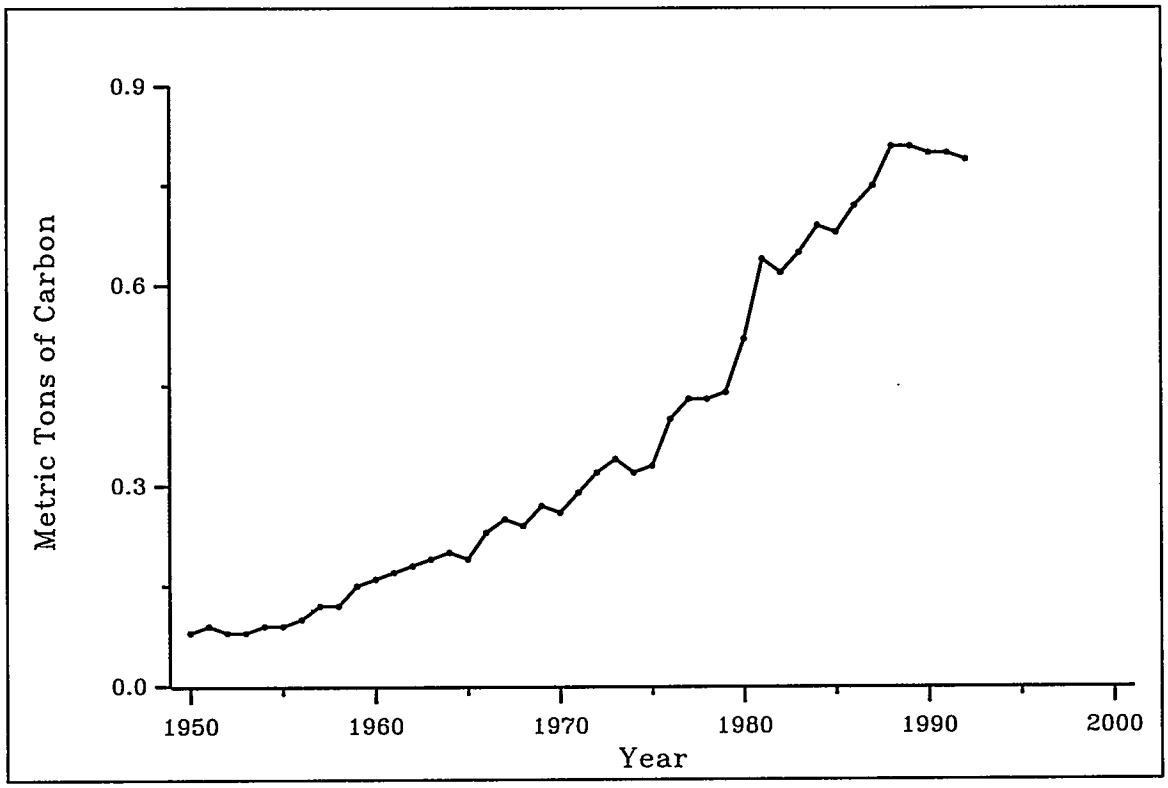
Grenada

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2	0	2	0	0	0	0.02	.
1951	3	0	3	0	0	0	0.03	.
1952	3	0	3	0	0	0	0.03	.
1953	3	0	3	0	0	0	0.03	.
1954	3	0	3	0	0	0	0.03	.
1955	3	0	3	0	0	0	0.04	.
1956	3	0	3	0	0	0	0.04	.
1957	3	0	3	0	0	0	0.04	.
1958	4	0	4	0	0	0	0.05	.
1959	4	0	4	0	0	0	0.05	.
1960	6	0	6	0	0	0	0.07	.
1961	5	0	5	0	0	0	0.06	.
1962	7	0	7	0	0	0	0.07	.
1963	4	0	4	0	0	0	0.04	.
1964	6	0	6	0	0	0	0.06	.
1965	6	0	6	0	0	0	0.06	.
1966	8	0	8	0	0	0	0.08	.
1967	10	0	10	0	0	0	0.10	.
1968	11	0	11	0	0	0	0.11	.
1969	13	0	13	0	0	0	0.13	.
1970	12	0	12	0	0	0	0.12	.
1971	13	0	13	0	0	0	0.13	.
1972	13	0	13	0	0	0	0.14	.
1973	15	0	15	0	0	0	0.16	.
1974	10	0	10	0	0	0	0.11	.
1975	13	0	13	0	0	0	0.14	.
1976	13	0	13	0	0	0	0.15	.
1977	13	0	13	0	0	0	0.15	.
1978	14	0	14	0	0	0	0.16	.
1979	13	0	13	0	0	0	0.15	.
1980	13	0	13	0	0	0	0.15	.
1981	16	0	16	0	0	0	0.18	.
1982	17	0	17	0	0	0	0.19	.
1983	17	0	17	0	0	0	0.19	.
1984	17	0	17	0	0	0	0.19	.
1985	18	0	18	0	0	0	0.20	.
1986	21	0	21	0	0	0	0.23	.
1987	22	0	22	0	0	0	0.24	.
1988	28	0	28	0	0	0	0.31	.
1989	28	0	28	0	0	0	0.31	.
1990	33	0	33	0	0	0	0.36	.
1991	33	0	33	0	0	0	0.36	.
1992	33	0	33	0	0	0	0.36	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Guadeloupe

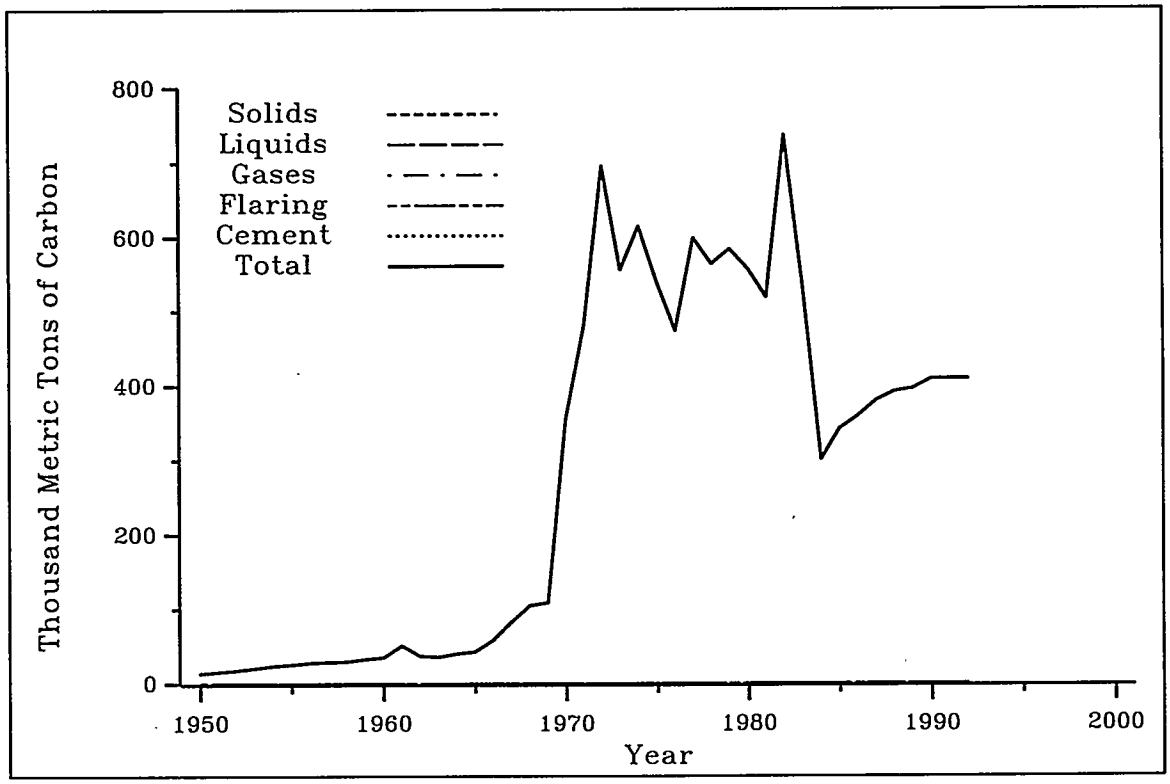


Per capita CO_2 emission rates for Guadeloupe

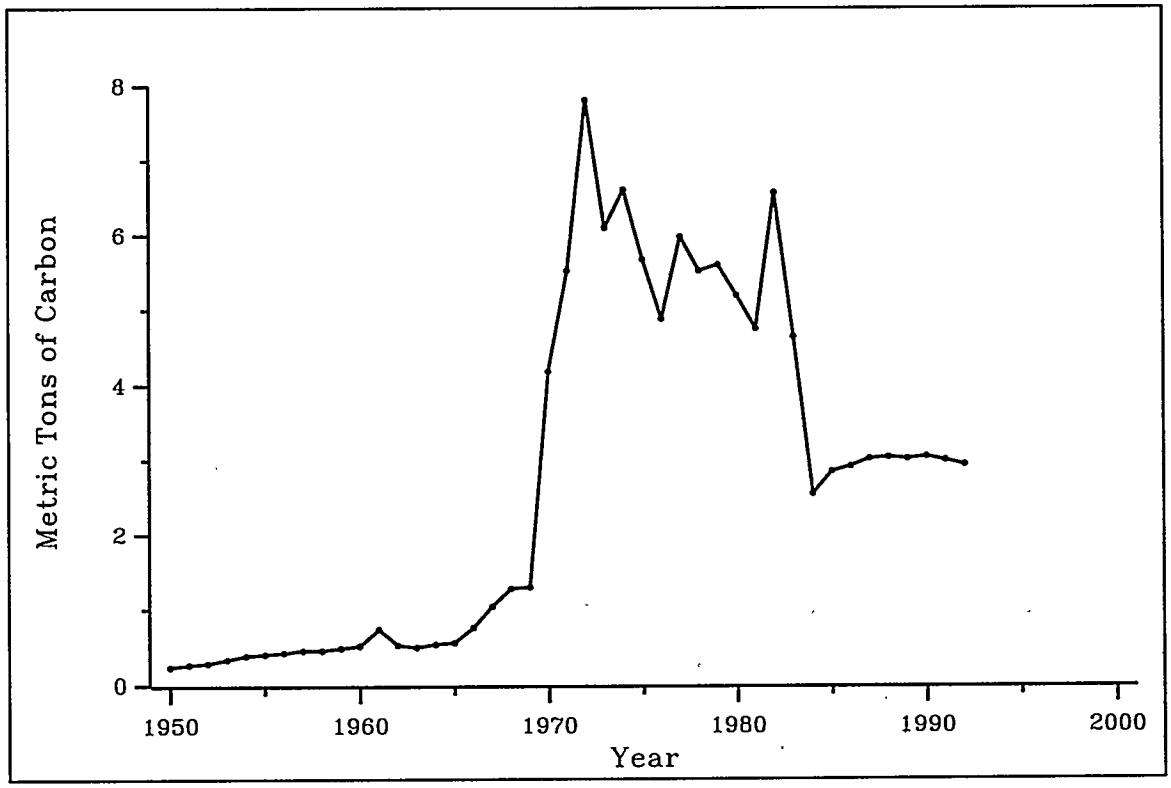
Guadeloupe

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	17	0	17	0	0	0	0.08	.
1951	18	0	18	0	0	0	0.09	.
1952	18	0	18	0	0	0	0.08	.
1953	18	0	18	0	0	0	0.08	.
1954	20	0	20	0	0	0	0.09	.
1955	22	0	22	0	0	0	0.09	.
1956	25	0	25	0	0	0	0.10	.
1957	30	0	30	0	0	0	0.12	.
1958	30	0	30	0	0	0	0.12	.
1959	39	0	39	0	0	0	0.15	.
1960	43	0	43	0	0	0	0.16	.
1961	48	0	48	0	0	0	0.17	.
1962	51	0	51	0	0	0	0.18	.
1963	56	0	56	0	0	0	0.19	.
1964	59	0	59	0	0	0	0.20	.
1965	56	0	56	0	0	0	0.19	.
1966	69	0	69	0	0	0	0.23	.
1967	79	0	79	0	0	0	0.25	.
1968	76	0	76	0	0	0	0.24	.
1969	85	0	85	0	0	0	0.27	.
1970	83	0	83	0	0	0	0.26	.
1971	93	0	93	0	0	0	0.29	.
1972	103	0	103	0	0	0	0.32	.
1973	111	0	111	0	0	0	0.34	.
1974	105	0	105	0	0	0	0.32	.
1975	107	0	107	0	0	0	0.33	.
1976	132	0	132	0	0	0	0.40	.
1977	141	0	141	0	0	0	0.43	.
1978	141	0	141	0	0	0	0.43	.
1979	144	0	144	0	0	0	0.44	.
1980	171	0	146	0	25	0	0.52	.
1981	213	0	191	0	22	0	0.64	.
1982	208	0	186	0	22	0	0.62	.
1983	222	0	200	0	22	0	0.65	.
1984	239	0	216	0	23	0	0.69	.
1985	243	0	219	0	23	0	0.68	.
1986	259	0	234	0	25	0	0.72	.
1987	275	0	250	0	26	0	0.75	.
1988	306	0	273	0	33	0	0.81	.
1989	308	0	279	0	30	0	0.81	.
1990	312	0	281	0	31	0	0.80	.
1991	315	0	282	0	33	0	0.80	.
1992	318	0	286	0	32	0	0.79	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Guam

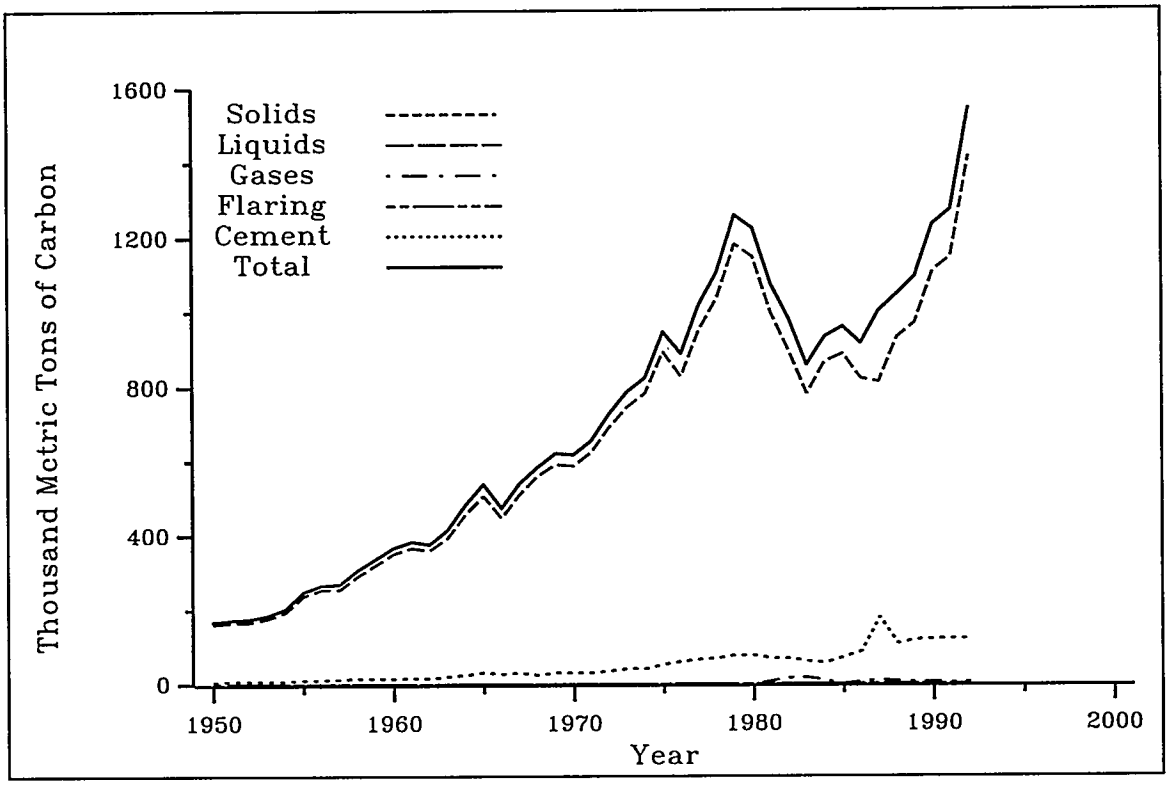


Per capita CO_2 emission rates for Guam

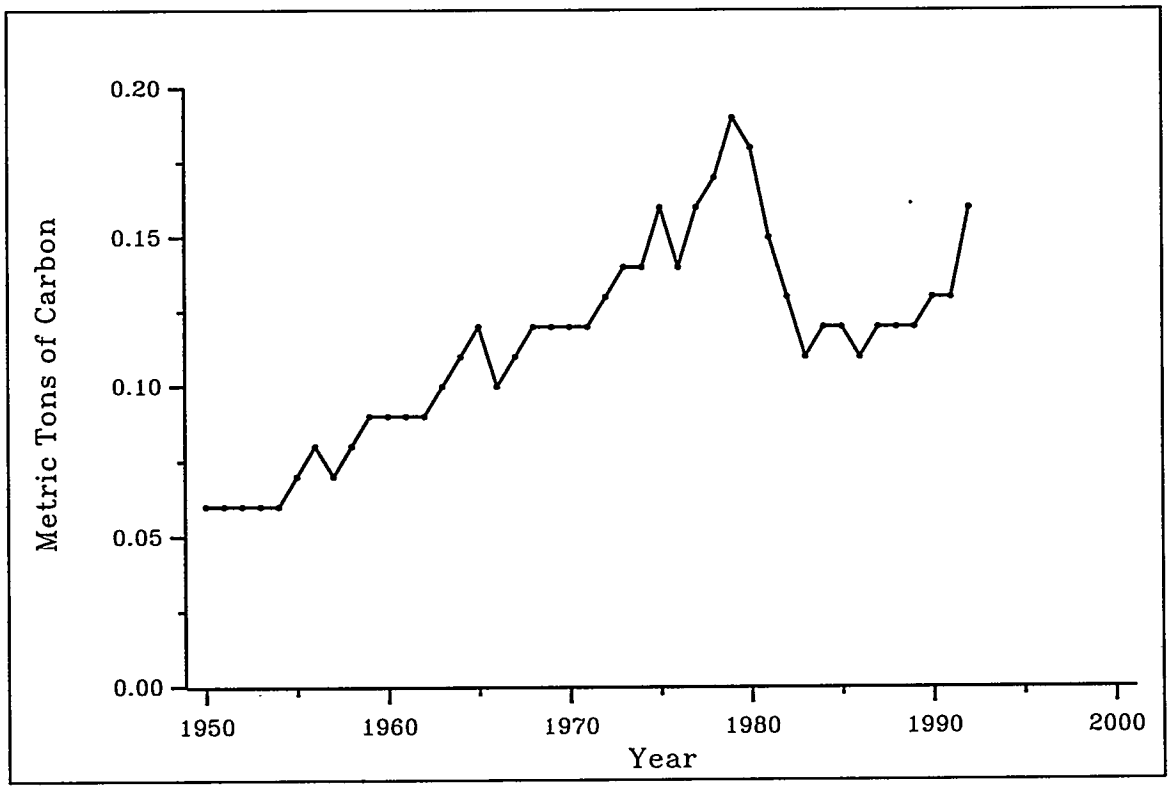
Guam

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	14	0	14	0	0	0	0.24	.
1951	16	0	16	0	0	0	0.27	.
1952	18	0	18	0	0	0	0.29	.
1953	21	0	21	0	0	0	0.34	.
1954	24	0	24	0	0	0	0.39	.
1955	26	0	26	0	0	0	0.41	.
1956	28	0	28	0	0	0	0.43	.
1957	29	0	29	0	0	0	0.46	.
1958	30	0	30	0	0	0	0.46	.
1959	33	0	33	0	0	0	0.49	.
1960	35	0	35	0	0	0	0.52	.
1961	51	0	51	0	0	0	0.74	.
1962	37	0	37	0	0	0	0.53	.
1963	36	0	36	0	0	0	0.50	.
1964	40	0	40	0	0	0	0.54	.
1965	43	0	43	0	0	0	0.56	.
1966	59	0	59	0	0	0	0.76	.
1967	83	0	83	0	0	0	1.04	.
1968	105	0	105	0	0	0	1.28	.
1969	109	0	109	0	0	0	1.30	.
1970	356	0	356	0	0	0	4.19	.
1971	481	0	481	0	0	0	5.53	.
1972	696	0	696	0	0	0	7.82	.
1973	556	0	556	0	0	0	6.11	.
1974	615	0	615	0	0	0	6.62	.
1975	539	0	539	0	0	0	5.68	.
1976	474	0	474	0	0	0	4.89	.
1977	599	0	599	0	0	0	5.99	.
1978	564	0	564	0	0	0	5.53	.
1979	584	0	584	0	0	0	5.61	.
1980	557	0	557	0	0	0	5.20	.
1981	519	0	519	0	0	0	4.76	.
1982	737	0	737	0	0	0	6.58	.
1983	535	0	535	0	0	0	4.65	.
1984	301	0	301	0	0	0	2.55	.
1985	342	0	342	0	0	0	2.85	.
1986	359	0	359	0	0	0	2.92	.
1987	380	0	380	0	0	0	3.02	.
1988	392	0	392	0	0	0	3.04	.
1989	396	0	396	0	0	0	3.02	.
1990	409	0	409	0	0	0	3.05	.
1991	409	0	409	0	0	0	3.00	.
1992	409	0	409	0	0	0	2.94	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Guatemala

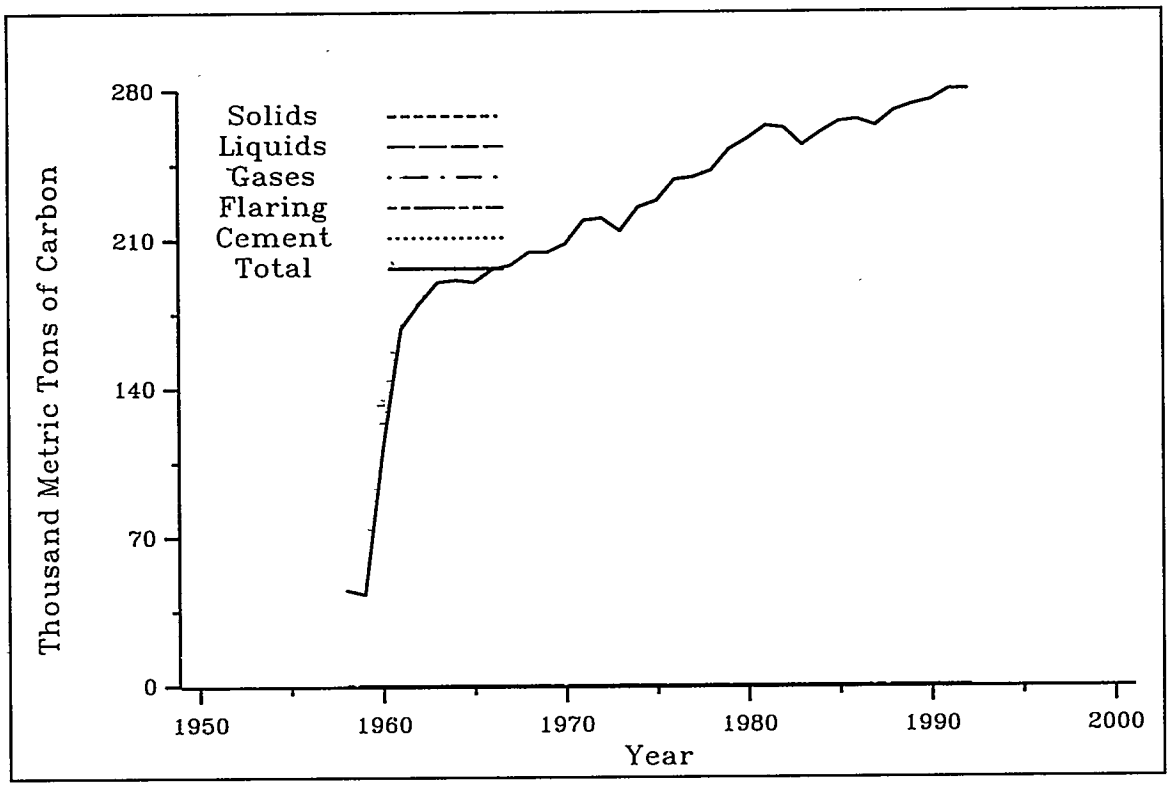


Per capita CO_2 emission rates for Guatemala

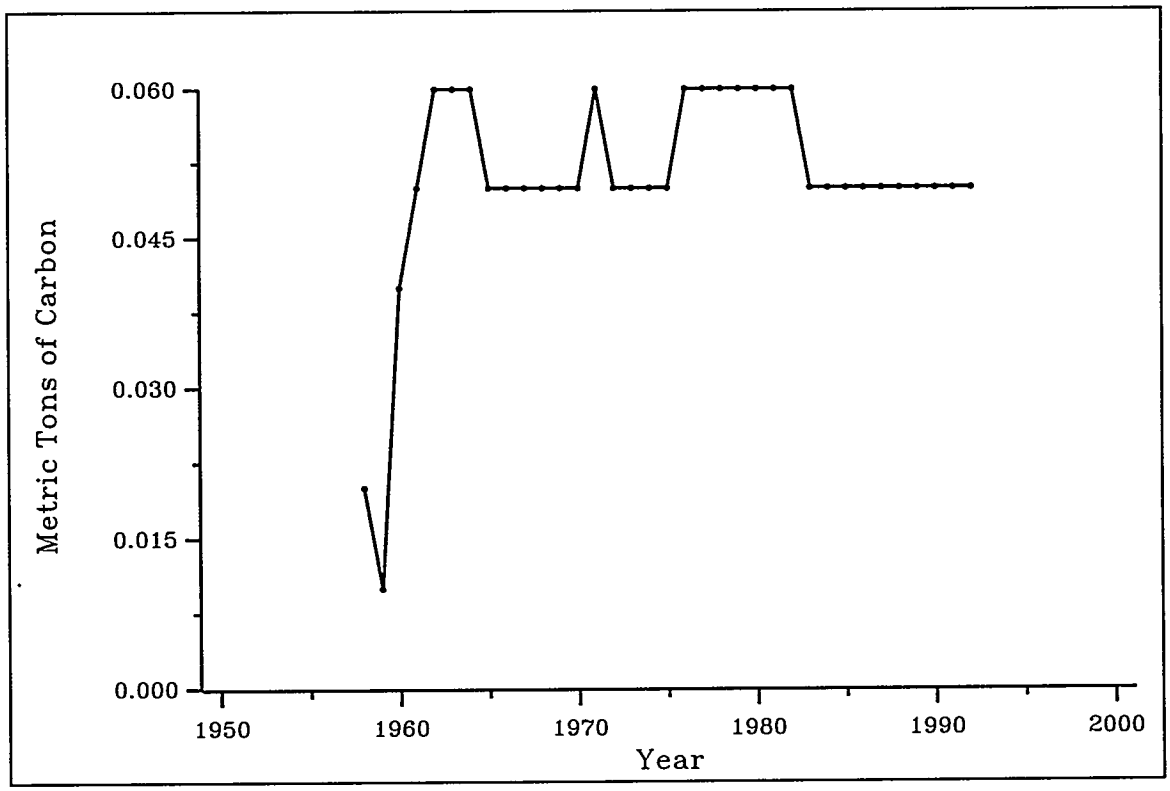
Guatemala

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	169	0	163	0	6	0	0.06	.
1951	174	0	166	0	8	0	0.06	.
1952	177	0	168	0	8	0	0.06	.
1953	186	0	178	0	8	0	0.06	.
1954	204	0	195	0	8	0	0.06	.
1955	250	0	239	0	11	0	0.07	.
1956	267	0	256	0	11	0	0.08	.
1957	270	0	256	0	13	0	0.07	.
1958	308	0	292	0	16	0	0.08	.
1959	338	0	322	0	16	0	0.09	.
1960	368	0	352	0	15	0	0.09	.
1961	384	0	367	0	17	0	0.09	.
1962	377	0	361	0	16	0	0.09	.
1963	416	0	394	0	21	0	0.10	.
1964	483	0	458	0	25	0	0.11	.
1965	539	0	507	0	32	0	0.12	.
1966	475	0	448	0	28	0	0.10	.
1967	541	0	511	0	31	0	0.11	.
1968	585	0	560	0	25	0	0.12	.
1969	622	0	592	0	31	0	0.12	.
1970	618	0	588	0	31	0	0.12	.
1971	656	0	625	0	31	0	0.12	.
1972	728	0	692	0	36	0	0.13	.
1973	788	0	746	0	42	0	0.14	.
1974	825	0	783	0	42	0	0.14	.
1975	947	0	894	0	53	0	0.16	.
1976	889	0	828	0	61	0	0.14	.
1977	1018	0	951	0	67	0	0.16	.
1978	1106	0	1036	0	70	0	0.17	.
1979	1260	0	1182	0	78	0	0.19	.
1980	1225	0	1148	0	77	0	0.18	.
1981	1075	0	997	8	70	0	0.15	.
1982	981	0	896	16	69	0	0.13	.
1983	859	0	781	17	61	0	0.11	.
1984	933	0	867	9	57	0	0.12	.
1985	960	0	888	0	72	0	0.12	.
1986	916	0	822	6	88	0	0.11	.
1987	1002	0	813	10	180	0	0.12	.
1988	1047	0	931	7	109	0	0.12	.
1989	1094	0	970	5	119	0	0.12	.
1990	1234	0	1109	5	121	0	0.13	.
1991	1274	0	1148	4	122	0	0.13	.
1992	1544	0	1417	5	122	0	0.16	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Guinea

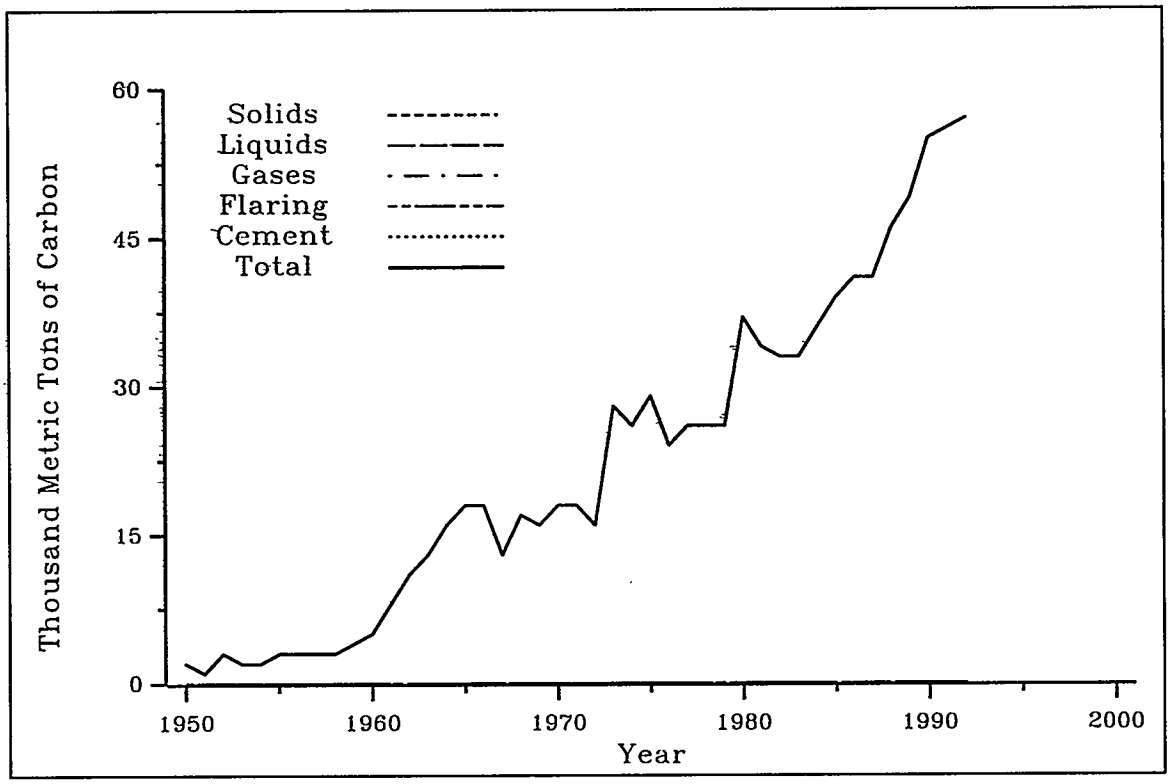


Per capita CO_2 emission rates for Guinea

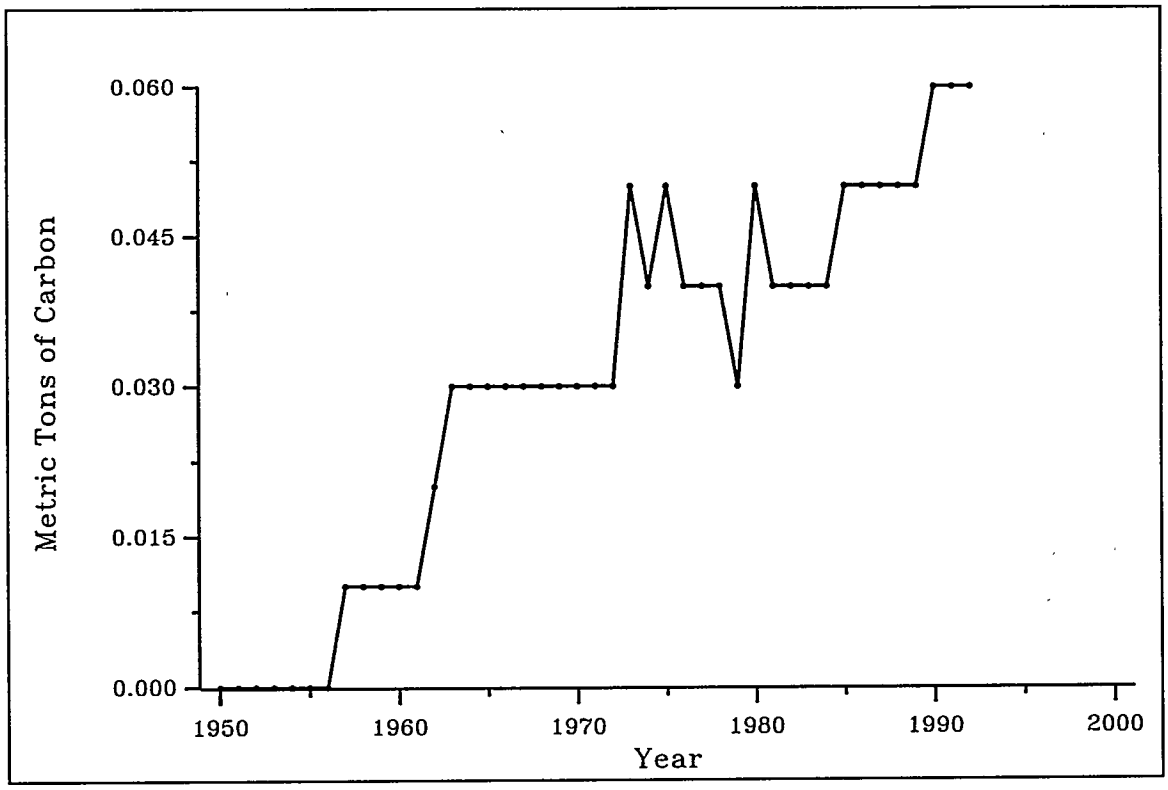
Guinea

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1958	45	0	45	0	0	0	0.02	.
1959	43	0	43	0	0	0	0.01	.
1960	112	0	112	0	0	0	0.04	.
1961	168	0	168	0	0	0	0.05	.
1962	180	0	180	0	0	0	0.06	.
1963	190	0	190	0	0	0	0.06	.
1964	191	0	191	0	0	0	0.06	.
1965	190	0	190	0	0	0	0.05	.
1966	196	0	196	0	0	0	0.05	.
1967	198	0	198	0	0	0	0.05	.
1968	204	0	204	0	0	0	0.05	.
1969	204	0	204	0	0	0	0.05	.
1970	208	0	208	0	0	0	0.05	.
1971	219	0	219	0	0	0	0.06	.
1972	220	0	220	0	0	0	0.05	.
1973	214	0	214	0	0	0	0.05	.
1974	225	0	225	0	0	0	0.05	.
1975	228	0	228	0	0	0	0.05	.
1976	238	0	238	0	0	0	0.06	.
1977	239	0	239	0	0	0	0.06	.
1978	242	0	242	0	0	0	0.06	.
1979	252	0	252	0	0	0	0.06	.
1980	257	0	257	0	0	0	0.06	.
1981	263	0	263	0	0	0	0.06	.
1982	262	0	262	0	0	0	0.06	.
1983	254	0	254	0	0	0	0.05	.
1984	260	0	260	0	0	0	0.05	.
1985	265	0	265	0	0	0	0.05	.
1986	266	0	266	0	0	0	0.05	.
1987	263	0	263	0	0	0	0.05	.
1988	270	0	270	0	0	0	0.05	.
1989	273	0	273	0	0	0	0.05	.
1990	275	0	275	0	0	0	0.05	.
1991	280	0	280	0	0	0	0.05	.
1992	280	0	280	0	0	0	0.05	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Guinea-Bissau

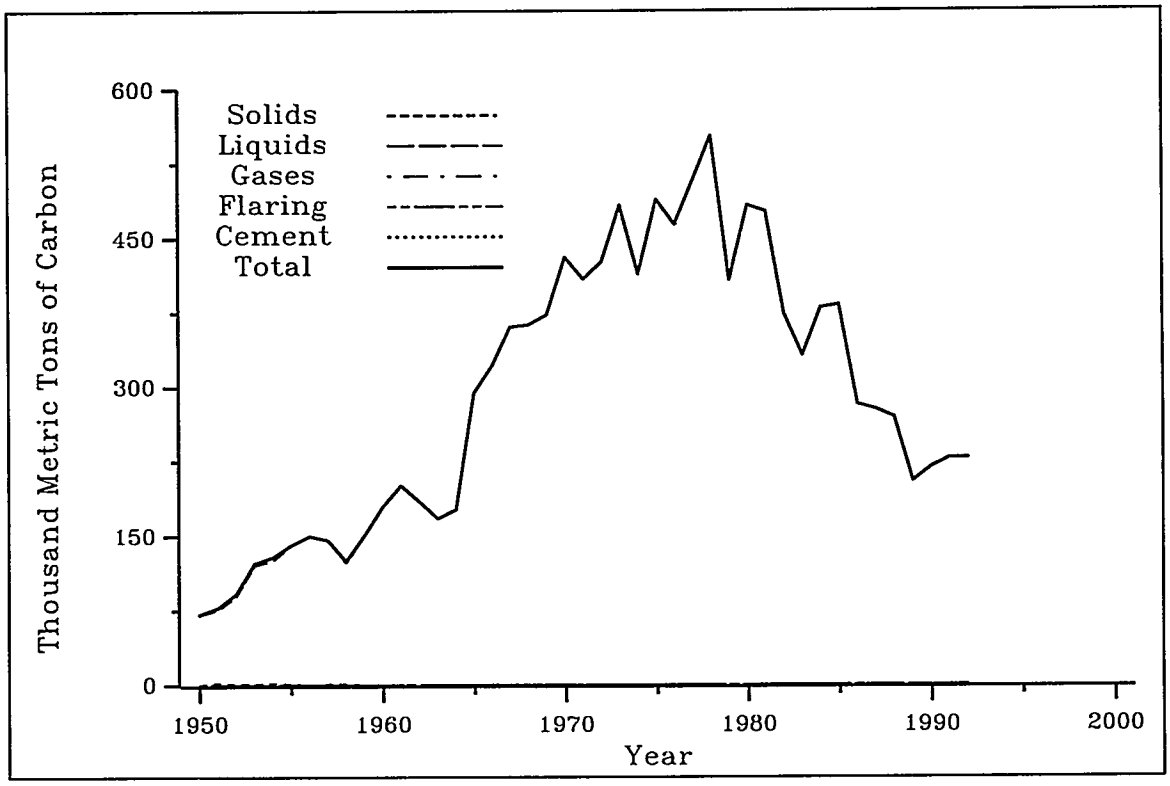


Per capita CO_2 emission rates for Guinea-Bissau

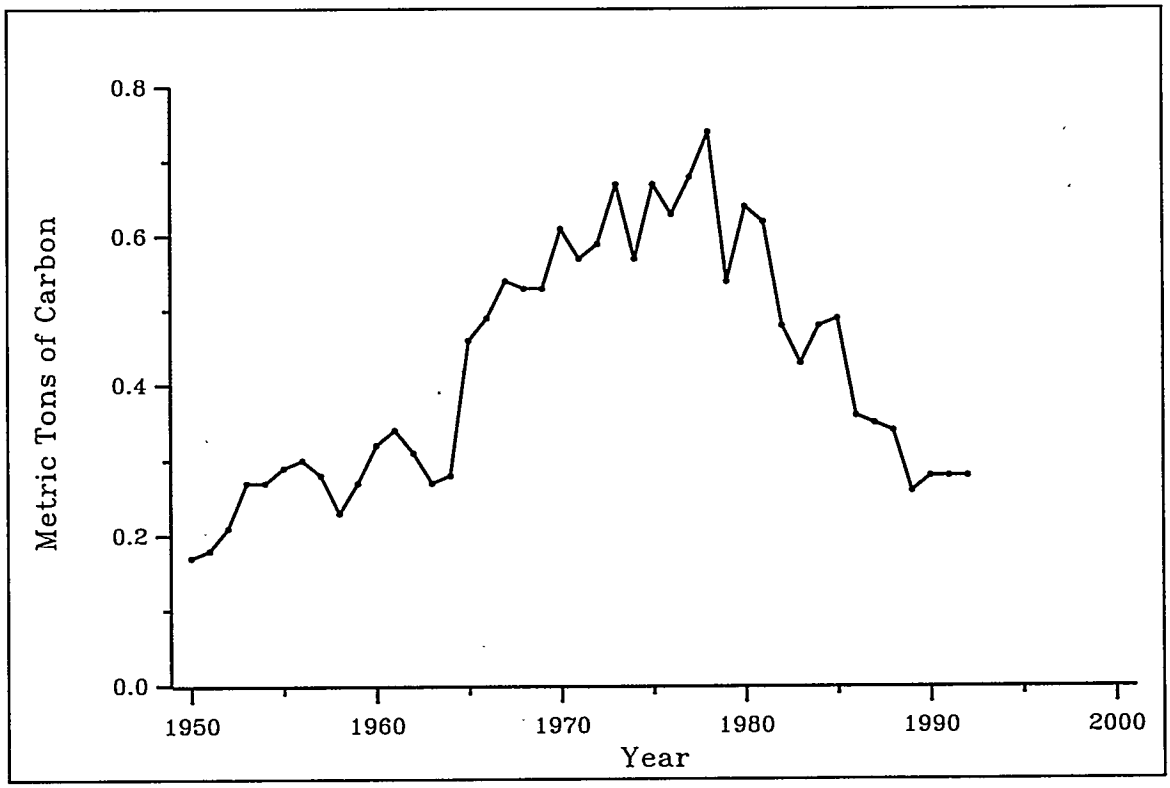
Guinea-Bissau

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2	0	2	0	0	0	0.00	.
1951	1	0	1	0	0	0	0.00	.
1952	3	0	3	0	0	0	0.00	.
1953	2	0	2	0	0	0	0.00	.
1954	2	0	2	0	0	0	0.00	.
1955	3	0	3	0	0	0	0.00	.
1956	3	0	3	0	0	0	0.00	.
1957	3	0	3	0	0	0	0.01	.
1958	3	0	3	0	0	0	0.01	.
1959	4	0	4	0	0	0	0.01	.
1960	5	0	5	0	0	0	0.01	.
1961	8	0	8	0	0	0	0.01	.
1962	11	0	11	0	0	0	0.02	.
1963	13	0	13	0	0	0	0.03	.
1964	16	0	16	0	0	0	0.03	.
1965	18	0	18	0	0	0	0.03	.
1966	18	0	18	0	0	0	0.03	.
1967	13	0	13	0	0	0	0.03	.
1968	17	0	17	0	0	0	0.03	.
1969	16	0	16	0	0	0	0.03	.
1970	18	0	18	0	0	0	0.03	.
1971	18	0	18	0	0	0	0.03	.
1972	16	0	16	0	0	0	0.03	.
1973	28	0	28	0	0	0	0.05	.
1974	26	0	26	0	0	0	0.04	.
1975	29	0	29	0	0	0	0.05	.
1976	24	0	24	0	0	0	0.04	.
1977	26	0	26	0	0	0	0.04	.
1978	26	0	26	0	0	0	0.04	.
1979	26	0	26	0	0	0	0.03	.
1980	37	0	37	0	0	0	0.05	.
1981	34	0	34	0	0	0	0.04	.
1982	33	0	33	0	0	0	0.04	.
1983	33	0	33	0	0	0	0.04	.
1984	36	0	36	0	0	0	0.04	.
1985	39	0	39	0	0	0	0.05	.
1986	41	0	41	0	0	0	0.05	.
1987	41	0	41	0	0	0	0.05	.
1988	46	0	46	0	0	0	0.05	.
1989	49	0	49	0	0	0	0.05	.
1990	55	0	55	0	0	0	0.06	.
1991	56	0	56	0	0	0	0.06	.
1992	57	0	57	0	0	0	0.06	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Guyana

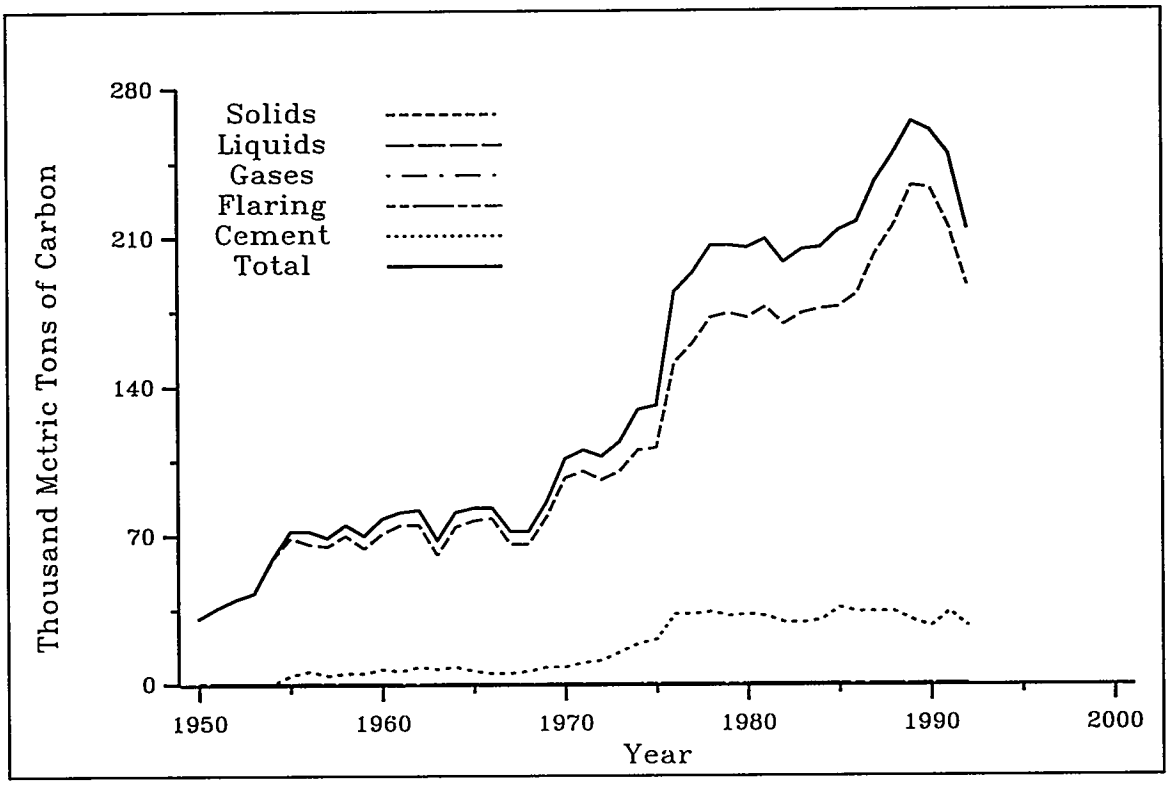


Per capita CO_2 emission rates for Guyana

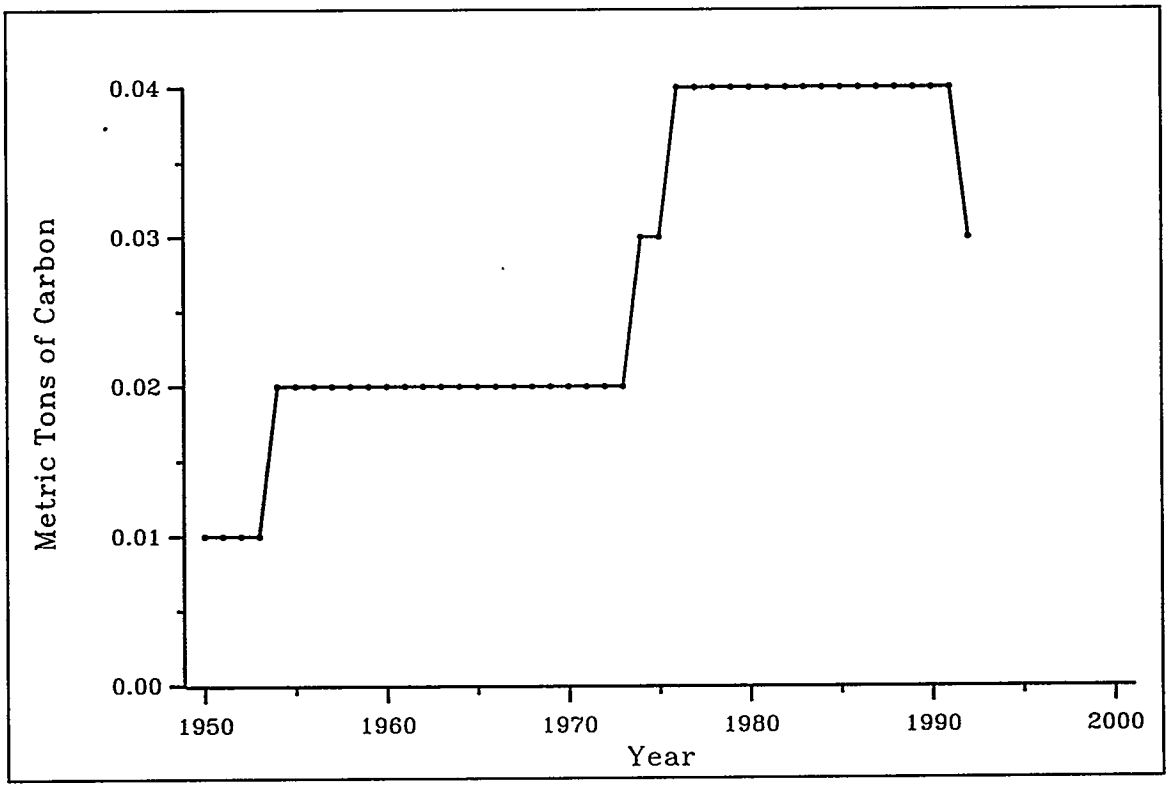
Guyana

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	71	0	71	0	0	0	0.17	.
1951	78	2	76	0	0	0	0.18	.
1952	92	1	90	0	0	0	0.21	.
1953	123	1	121	0	0	0	0.27	.
1954	129	2	126	0	0	0	0.27	.
1955	141	1	141	0	0	0	0.29	.
1956	150	0	150	0	0	0	0.30	.
1957	146	1	146	0	0	0	0.28	.
1958	125	1	124	0	0	0	0.23	.
1959	151	0	151	0	0	0	0.27	.
1960	180	0	180	0	0	0	0.32	.
1961	201	0	201	0	0	0	0.34	.
1962	185	0	185	0	0	0	0.31	.
1963	168	0	168	0	0	0	0.27	.
1964	177	0	177	0	0	0	0.28	.
1965	294	0	294	0	0	0	0.46	.
1966	322	0	322	0	0	0	0.49	.
1967	361	0	361	0	0	0	0.54	.
1968	363	0	363	0	0	0	0.53	.
1969	373	0	373	0	0	0	0.53	.
1970	431	0	431	0	0	0	0.61	.
1971	409	0	409	0	0	0	0.57	.
1972	426	0	426	0	0	0	0.59	.
1973	483	0	483	0	0	0	0.67	.
1974	414	0	414	0	0	0	0.57	.
1975	489	0	489	0	0	0	0.67	.
1976	464	0	464	0	0	0	0.63	.
1977	508	0	508	0	0	0	0.68	.
1978	553	0	553	0	0	0	0.74	.
1979	408	0	408	0	0	0	0.54	.
1980	483	0	483	0	0	0	0.64	.
1981	477	0	477	0	0	0	0.62	.
1982	374	0	374	0	0	0	0.48	.
1983	332	0	332	0	0	0	0.43	.
1984	380	0	380	0	0	0	0.48	.
1985	383	0	383	0	0	0	0.49	.
1986	282	0	282	0	0	0	0.36	.
1987	277	0	277	0	0	0	0.35	.
1988	269	0	269	0	0	0	0.34	.
1989	205	0	205	0	0	0	0.26	.
1990	219	0	219	0	0	0	0.28	.
1991	228	0	228	0	0	0	0.28	.
1992	228	0	228	0	0	0	0.28	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Haiti

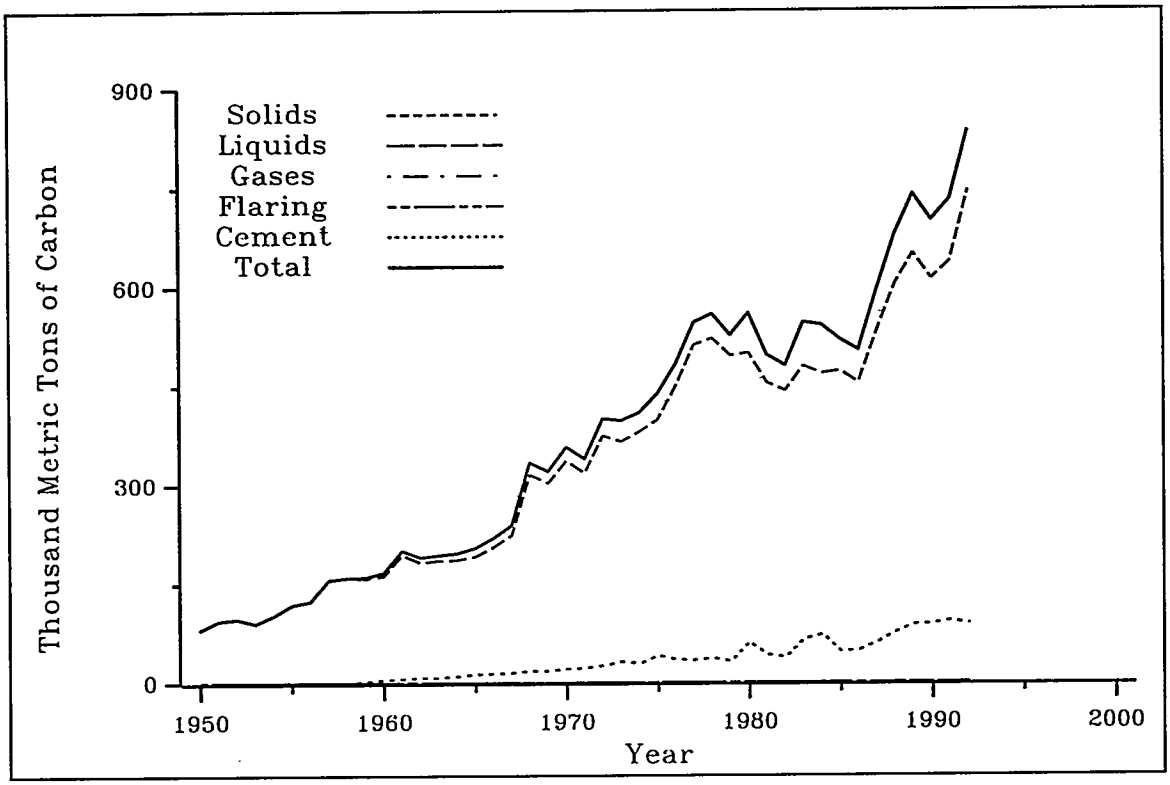


Per capita CO_2 emission rates for Haiti

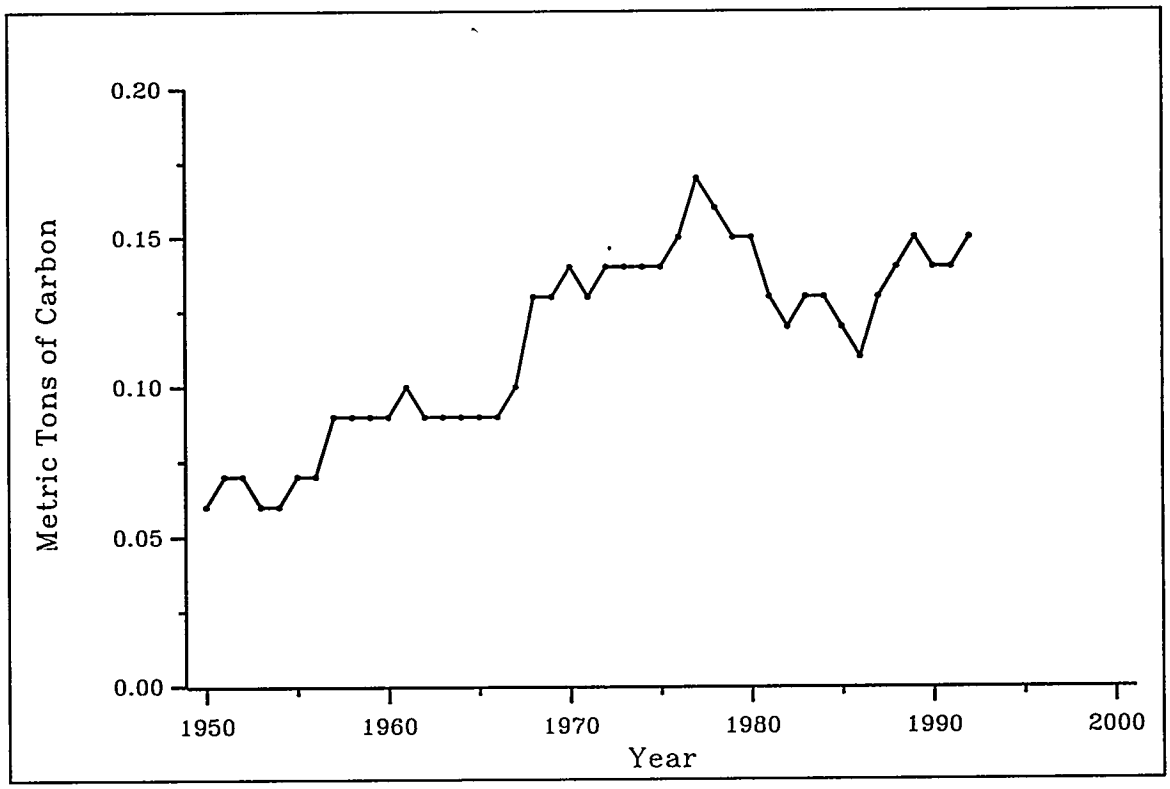
Haiti

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	31	0	31	0	0	0	0.01	.
1951	36	0	36	0	0	0	0.01	.
1952	40	0	40	0	0	0	0.01	.
1953	43	0	43	0	0	0	0.01	.
1954	59	0	59	0	0	0	0.02	.
1955	72	0	69	0	4	0	0.02	.
1956	72	0	66	0	6	0	0.02	.
1957	69	0	65	0	4	0	0.02	.
1958	75	0	70	0	5	0	0.02	.
1959	70	0	64	0	5	0	0.02	.
1960	78	0	71	0	7	0	0.02	.
1961	81	0	75	0	6	0	0.02	.
1962	82	0	75	0	8	0	0.02	.
1963	68	0	61	0	7	0	0.02	.
1964	81	0	74	0	8	0	0.02	.
1965	83	0	77	0	6	0	0.02	.
1966	83	0	78	0	5	0	0.02	.
1967	72	0	66	0	5	0	0.02	.
1968	72	0	66	0	6	0	0.02	.
1969	86	0	79	0	8	0	0.02	.
1970	106	0	97	0	8	0	0.02	.
1971	110	0	100	0	10	0	0.02	.
1972	107	0	96	0	11	0	0.02	.
1973	114	0	100	0	15	0	0.02	.
1974	129	0	110	0	19	0	0.03	.
1975	131	0	111	0	21	0	0.03	.
1976	184	0	151	0	33	0	0.04	.
1977	193	0	160	0	33	0	0.04	.
1978	206	0	172	0	34	0	0.04	.
1979	206	0	174	0	32	0	0.04	.
1980	205	0	172	0	33	0	0.04	.
1981	209	0	177	0	32	0	0.04	.
1982	198	0	169	0	29	0	0.04	.
1983	204	0	174	0	29	0	0.04	.
1984	205	0	176	0	30	0	0.04	.
1985	213	0	177	0	36	0	0.04	.
1986	217	0	183	0	34	0	0.04	.
1987	236	0	202	0	34	0	0.04	.
1988	249	0	215	0	34	0	0.04	.
1989	264	0	234	0	30	0	0.04	.
1990	260	0	233	0	27	0	0.04	.
1991	249	0	215	0	34	0	0.04	.
1992	214	0	187	0	27	0	0.03	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Honduras

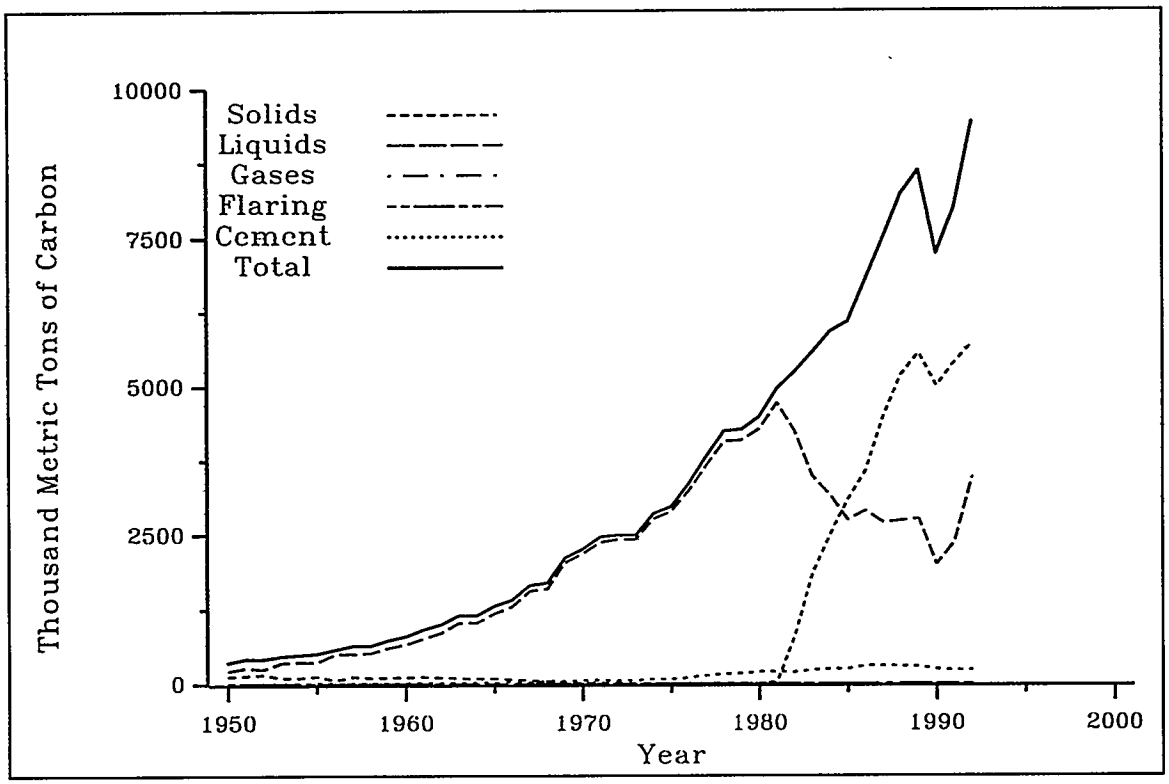


Per capita CO_2 emission rates for Honduras

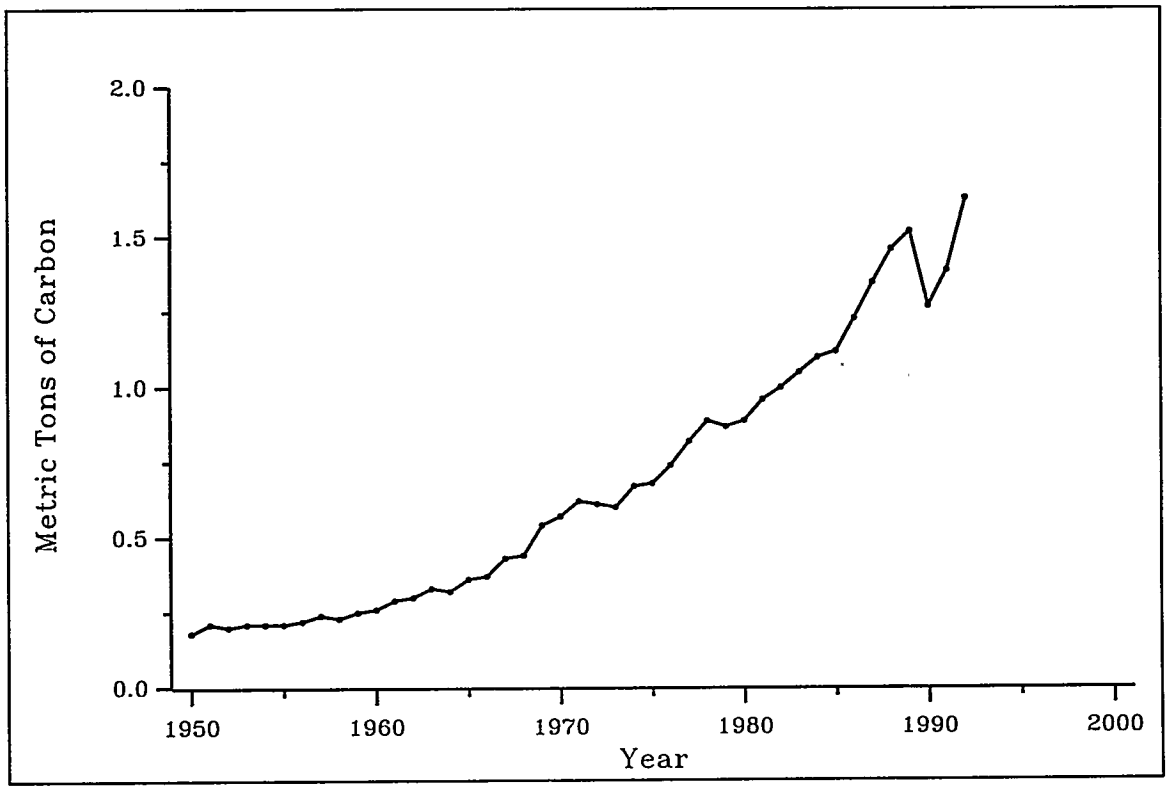
Honduras

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	82	0	82	0	0	0	0.06	.
1951	95	0	95	0	0	0	0.07	.
1952	98	0	98	0	0	0	0.07	.
1953	91	0	91	0	0	0	0.06	.
1954	103	0	103	0	0	0	0.06	.
1955	119	0	119	0	0	0	0.07	.
1956	124	0	124	0	0	0	0.07	.
1957	157	0	157	0	0	0	0.09	.
1958	160	0	160	0	0	0	0.09	.
1959	161	0	159	0	2	0	0.09	.
1960	168	0	163	0	5	0	0.09	.
1961	201	0	195	0	6	0	0.10	.
1962	191	0	183	0	8	0	0.09	.
1963	194	0	186	0	8	0	0.09	.
1964	197	0	187	0	10	0	0.09	.
1965	205	0	192	0	13	0	0.09	.
1966	220	0	206	0	14	0	0.09	.
1967	239	0	224	0	15	0	0.10	.
1968	334	0	316	0	18	0	0.13	.
1969	321	0	303	0	18	0	0.13	.
1970	358	0	337	0	21	0	0.14	.
1971	340	0	318	0	22	0	0.13	.
1972	401	0	375	0	26	0	0.14	.
1973	398	0	366	0	32	0	0.14	.
1974	410	0	381	0	29	0	0.14	.
1975	439	0	399	0	41	0	0.14	.
1976	484	0	450	0	35	0	0.15	.
1977	546	0	512	0	34	0	0.17	.
1978	559	0	522	0	37	0	0.16	.
1979	527	0	496	0	32	0	0.15	.
1980	560	0	500	0	61	0	0.15	.
1981	497	0	455	0	42	0	0.13	.
1982	481	0	443	0	38	0	0.12	.
1983	546	0	480	0	66	0	0.13	.
1984	542	0	469	0	73	0	0.13	.
1985	520	0	473	0	47	0	0.12	.
1986	504	0	455	0	49	0	0.11	.
1987	594	0	532	0	61	0	0.13	.
1988	679	0	603	0	76	0	0.14	.
1989	740	0	651	0	88	0	0.15	.
1990	701	0	612	0	89	0	0.14	.
1991	732	0	638	0	94	0	0.14	.
1992	835	0	746	0	89	0	0.15	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Hong Kong

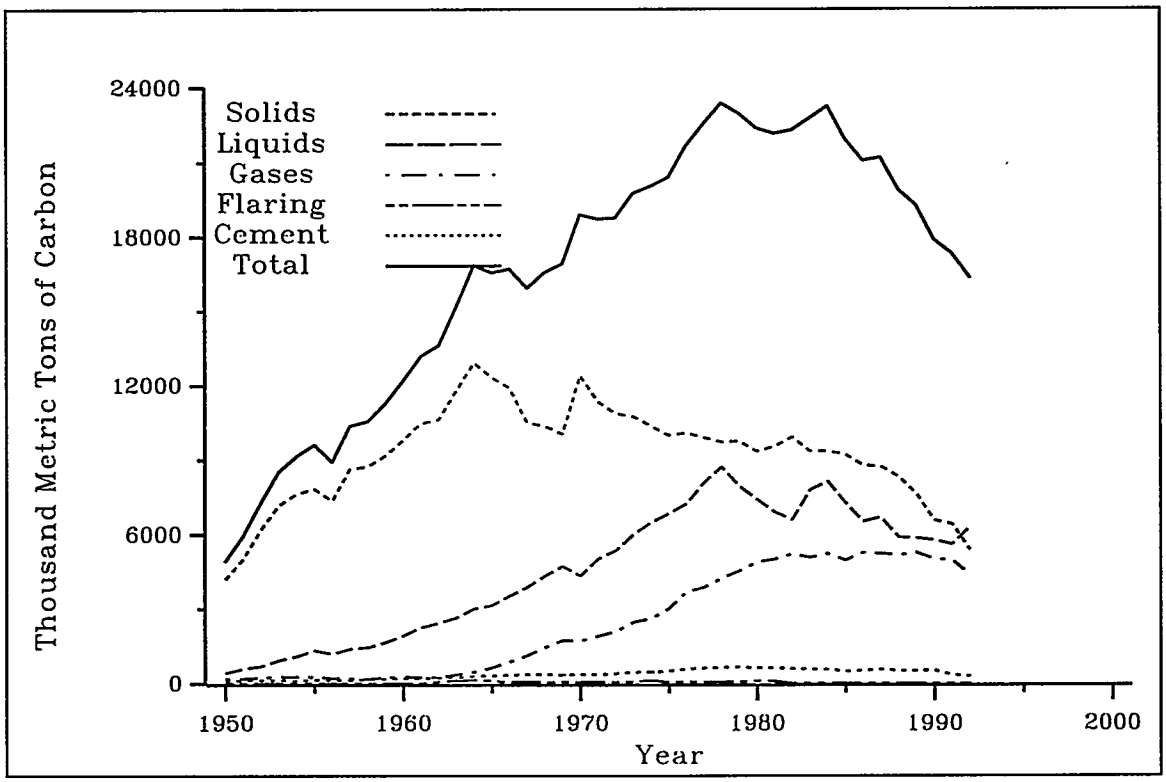


Per capita CO_2 emission rates for Hong Kong

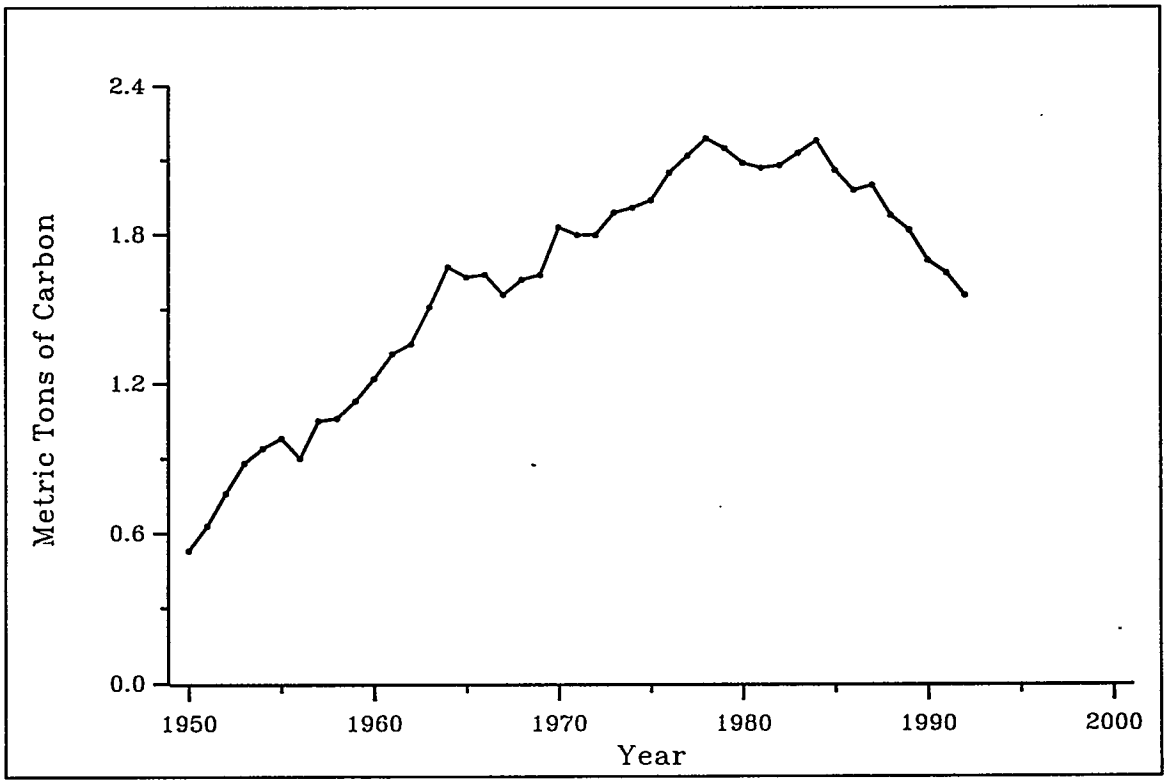
Hong Kong

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	362	130	223	0	9	0	0.18	.
1951	427	142	275	0	10	0	0.21	.
1952	421	160	252	0	9	0	0.20	.
1953	472	105	359	0	9	0	0.21	.
1954	492	105	373	0	14	0	0.21	.
1955	515	131	368	0	16	0	0.21	.
1956	580	61	503	0	16	0	0.22	.
1957	647	123	510	0	14	0	0.24	.
1958	649	107	522	0	21	0	0.23	.
1959	740	110	610	0	19	0	0.25	.
1960	807	116	671	0	20	0	0.26	.
1961	922	125	772	0	25	0	0.29	.
1962	1006	113	864	0	29	0	0.30	.
1963	1160	99	1031	0	30	0	0.33	.
1964	1154	92	1032	0	29	0	0.32	.
1965	1312	92	1187	0	33	0	0.36	.
1966	1410	78	1298	0	34	0	0.37	.
1967	1653	64	1560	0	29	0	0.43	.
1968	1693	47	1595	0	51	0	0.44	.
1969	2117	29	2037	0	51	0	0.54	.
1970	2263	17	2188	0	59	0	0.57	.
1971	2468	22	2377	0	70	0	0.62	.
1972	2494	15	2424	0	56	0	0.61	.
1973	2492	6	2426	0	60	0	0.60	.
1974	2858	9	2771	0	78	0	0.67	.
1975	2976	7	2891	0	78	0	0.68	.
1976	3364	11	3249	0	104	0	0.74	.
1977	3822	9	3673	0	140	0	0.82	.
1978	4249	8	4072	0	168	0	0.89	.
1979	4277	8	4095	0	174	0	0.87	.
1980	4489	6	4281	0	203	0	0.89	.
1981	4960	32	4722	0	206	0	0.96	.
1982	5241	802	4244	0	195	0	1.00	.
1983	5569	1846	3490	0	233	0	1.05	.
1984	5921	2500	3169	0	251	0	1.10	.
1985	6092	3095	2747	0	250	0	1.12	.
1986	6793	3581	2908	0	304	0	1.23	.
1987	7494	4487	2704	0	303	0	1.35	.
1988	8225	5190	2737	0	298	0	1.46	.
1989	8617	5559	2766	0	291	0	1.52	.
1990	7245	5002	1997	0	246	0	1.27	.
1991	7997	5395	2374	0	228	0	1.39	.
1992	9434	5719	3480	0	234	0	1.63	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Hungary

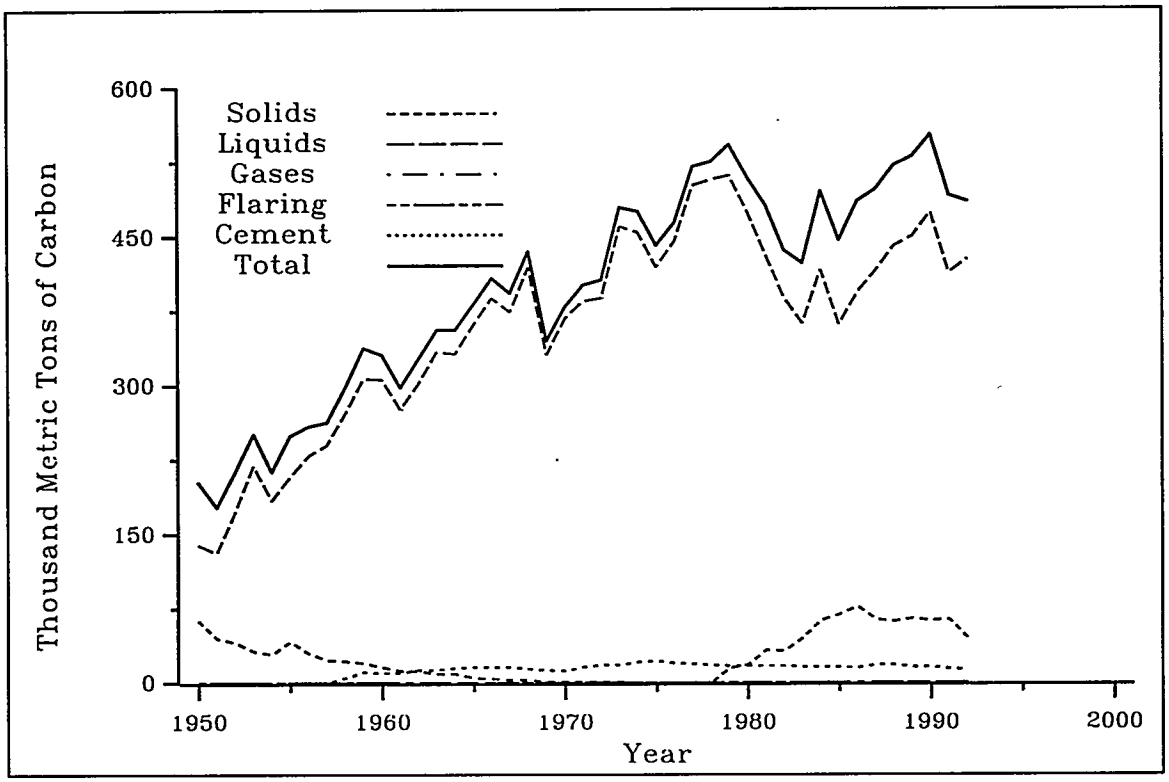


Per capita CO_2 emission rates for Hungary

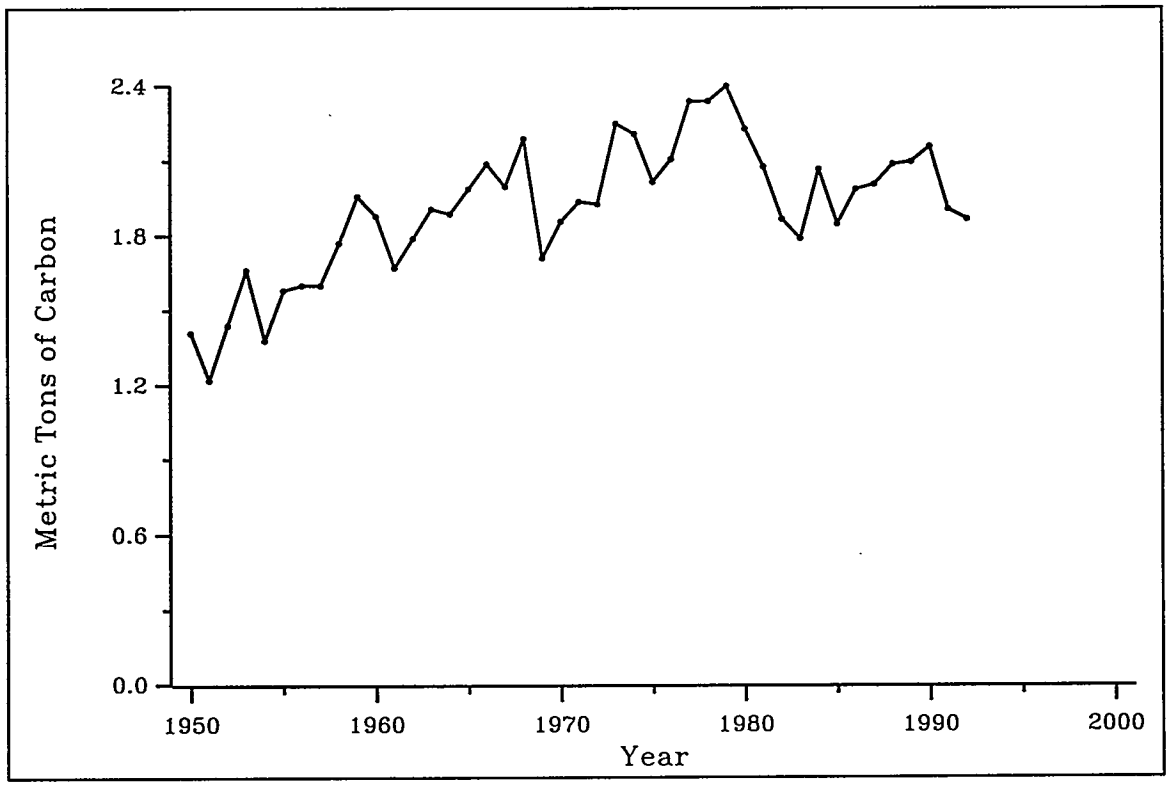
Hungary

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	4937	4205	432	192	109	0	0.53	.
1951	5962	5030	599	204	129	0	0.63	.
1952	7309	6210	703	252	144	0	0.76	.
1953	8539	7182	937	277	144	0	0.88	.
1954	9155	7651	1095	280	129	0	0.94	.
1955	9613	7844	1333	275	160	0	0.98	.
1956	8924	7365	1196	229	135	0	0.90	.
1957	10369	8632	1395	208	135	0	1.05	.
1958	10560	8735	1455	193	177	0	1.06	.
1959	11279	9167	1659	258	195	0	1.13	.
1960	12208	9795	1923	276	214	0	1.22	.
1961	13204	10477	2256	253	218	0	1.32	.
1962	13637	10619	2436	261	236	87	1.36	.
1963	15191	11807	2648	368	245	123	1.51	.
1964	16864	12931	3013	469	307	145	1.67	.
1965	16559	12339	3146	639	324	111	1.63	.
1966	16718	11901	3531	873	354	60	1.64	.
1967	15949	10505	3882	1128	361	72	1.56	.
1968	16579	10359	4324	1454	381	60	1.62	.
1969	16928	10038	4731	1738	349	72	1.64	.
1970	18893	12402	4337	1710	377	67	1.83	.
1971	18722	11351	5016	1909	369	77	1.80	.
1972	18768	10867	5360	2088	404	49	1.80	.
1973	19755	10744	6002	2468	463	78	1.89	.
1974	20047	10361	6480	2612	468	126	1.91	.
1975	20409	9983	6841	3011	511	63	1.94	.
1976	21668	10082	7238	3689	585	75	2.05	.
1977	22546	9891	8079	3871	628	77	2.12	.
1978	23372	9707	8708	4230	648	79	2.19	.
1979	22964	9747	7947	4533	661	77	2.15	.
1980	22374	9324	7421	4886	634	110	2.09	.
1981	22168	9532	6905	5002	630	99	2.07	.
1982	22304	9909	6588	5213	594	0	2.08	.
1983	22773	9336	7786	5074	577	0	2.13	.
1984	23259	9333	8137	5226	564	0	2.18	.
1985	21946	9205	7278	4962	500	0	2.06	.
1986	21075	8771	6517	5264	523	0	1.98	.
1987	21199	8728	6680	5226	565	0	2.00	.
1988	19893	8311	5883	5172	527	0	1.88	.
1989	19273	7631	5852	5266	525	0	1.82	.
1990	17888	6564	5779	5010	535	0	1.70	.
1991	17328	6411	5605	4968	344	0	1.65	.
1992	16351	5382	6298	4367	304	0	1.56	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Iceland

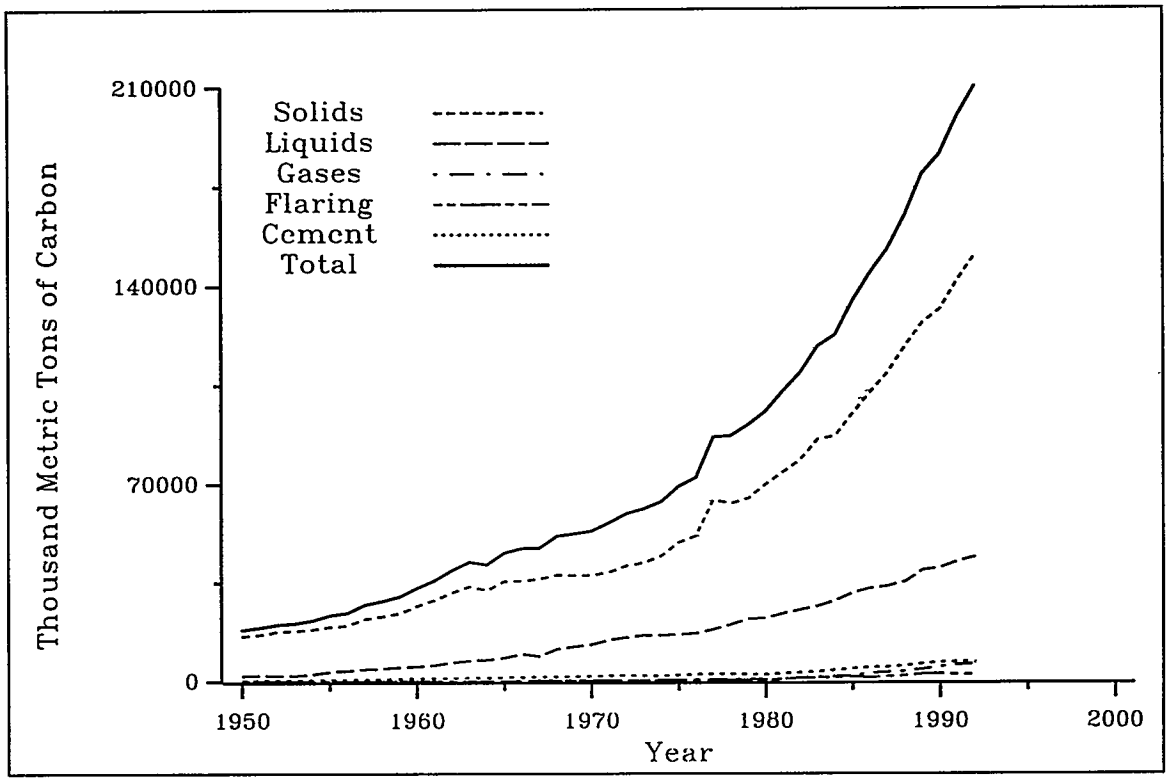


Per capita CO_2 emission rates for Iceland

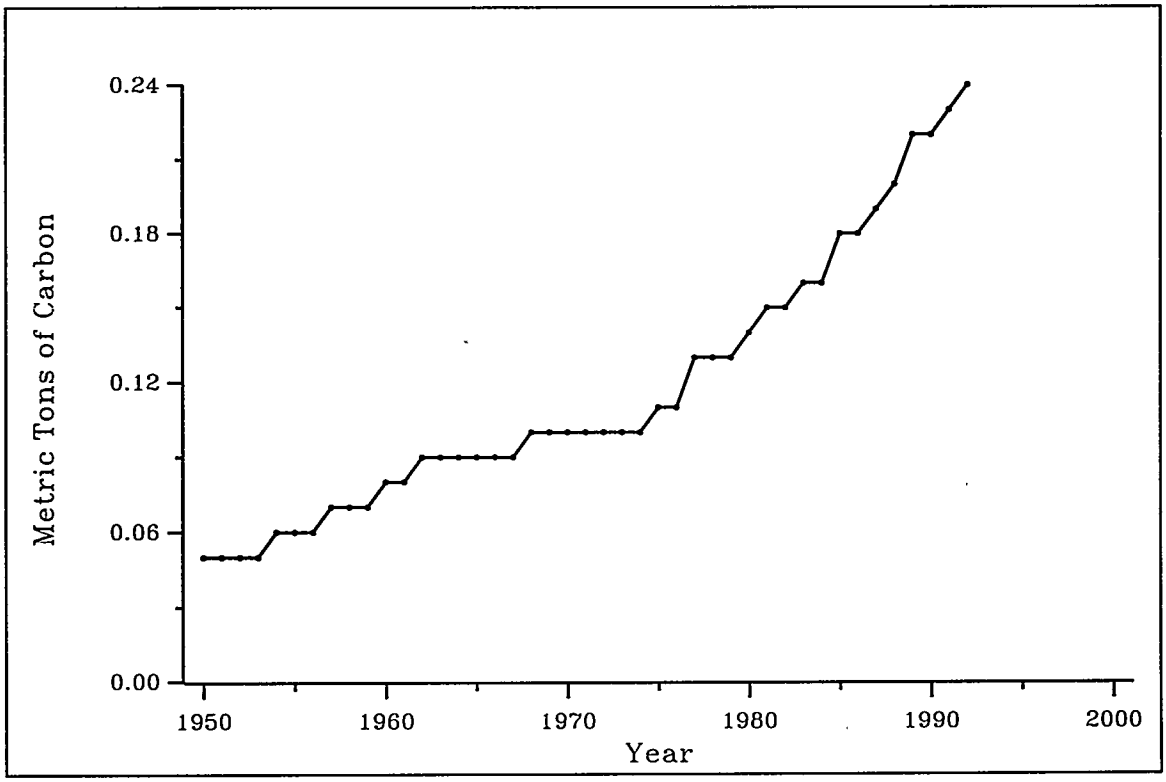
Iceland

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	202	63	139	0	0	0	1.41	.
1951	177	45	131	0	0	0	1.22	.
1952	213	41	172	0	0	0	1.44	.
1953	251	32	219	0	0	0	1.66	.
1954	213	29	184	0	0	0	1.38	.
1955	249	42	208	0	0	0	1.58	.
1956	259	30	229	0	0	0	1.60	.
1957	263	23	240	0	0	0	1.60	.
1958	298	22	272	0	5	0	1.77	.
1959	338	20	307	0	11	0	1.96	.
1960	331	16	306	0	10	0	1.88	.
1961	298	12	276	0	10	0	1.67	.
1962	327	12	302	0	13	0	1.79	.
1963	356	9	334	0	13	0	1.91	.
1964	356	9	332	0	15	0	1.89	.
1965	382	5	361	0	16	0	1.99	.
1966	408	4	388	0	16	0	2.09	.
1967	393	3	374	0	16	0	2.00	.
1968	435	3	419	0	14	0	2.19	.
1969	345	1	331	0	13	0	1.71	.
1970	379	1	367	0	12	0	1.86	.
1971	401	1	385	0	16	0	1.94	.
1972	406	1	388	0	18	0	1.93	.
1973	479	1	460	0	18	0	2.25	.
1974	475	0	454	0	21	0	2.21	.
1975	441	0	419	0	22	0	2.02	.
1976	464	0	445	0	20	0	2.11	.
1977	520	0	501	0	19	0	2.34	.
1978	525	0	507	0	18	0	2.34	.
1979	542	15	511	0	17	0	2.40	.
1980	509	18	474	0	17	0	2.23	.
1981	481	33	431	0	17	0	2.08	.
1982	436	32	388	0	17	0	1.87	.
1983	423	45	362	0	16	0	1.79	.
1984	495	63	416	0	16	0	2.07	.
1985	446	69	361	0	16	0	1.85	.
1986	485	77	393	0	15	0	1.99	.
1987	497	64	415	0	18	0	2.01	.
1988	521	62	440	0	18	0	2.09	.
1989	530	65	450	0	16	0	2.10	.
1990	552	63	474	0	16	0	2.16	.
1991	491	64	413	0	14	0	1.91	.
1992	485	45	427	0	13	0	1.87	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for India



Per capita CO_2 emission rates for India

India

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	18356	16041	1955	0	361	0	0.05	157
1951	19222	16637	2143	0	442	0	0.05	214
1952	20263	17710	2064	0	489	0	0.05	272
1953	20645	18026	2096	0	522	0	0.05	249
1954	21703	18492	2604	0	608	0	0.06	328
1955	23544	19444	3480	0	620	0	0.06	293
1956	24372	19885	3806	0	681	0	0.06	296
1957	27341	22229	4338	0	774	0	0.07	460
1958	28577	23139	4597	0	841	0	0.07	384
1959	30230	24268	5018	0	943	0	0.07	370
1960	33193	26818	5307	0	1067	0	0.08	425
1961	35895	28956	5816	1	1121	0	0.08	408
1962	39486	31512	6792	3	1168	12	0.09	415
1963	42397	33687	7398	3	1272	37	0.09	418
1964	41437	32307	7675	6	1318	130	0.09	509
1965	45644	35513	8410	77	1439	205	0.09	465
1966	47224	35671	9737	85	1503	227	0.09	503
1967	47356	36311	8924	133	1590	397	0.09	601
1968	51475	37741	11531	205	1624	374	0.10	560
1969	52397	37600	12377	272	1803	344	0.10	476
1970	53261	37670	13109	252	1842	388	0.10	472
1971	56159	38712	14739	296	2026	387	0.10	490
1972	59396	40978	15614	329	2143	331	0.10	438
1973	61138	42024	16360	319	2041	395	0.10	522
1974	63578	44416	16377	371	1943	471	0.10	412
1975	69139	49209	16699	473	2208	549	0.11	491
1976	72232	51512	17055	626	2543	496	0.11	543
1977	86508	64243	18425	677	2592	571	0.13	600
1978	87046	62916	20182	748	2660	541	0.13	586
1979	90844	64760	22168	827	2484	605	0.13	614
1980	95547	69715	22427	679	2407	318	0.14	674
1981	102655	74050	24127	787	2823	867	0.15	463
1982	109186	78432	25463	1190	3060	1041	0.15	444
1983	118457	85689	26710	1431	3448	1179	0.16	501
1984	122502	86846	28605	1684	3948	1419	0.16	570
1985	134286	94822	31383	1965	4492	1625	0.18	540
1986	144167	102113	32935	2814	4950	1355	0.18	600
1987	152739	109121	33747	3156	5029	1687	0.19	730
1988	164699	118391	35275	3493	5535	2005	0.20	904
1989	179237	126679	39419	4240	6256	2644	0.22	774
1990	186187	131406	40183	5219	6664	2715	0.22	737
1991	199508	141774	42536	5885	6936	2377	0.23	723
1992	210000	150627	44032	6119	6800	2422	0.24	735

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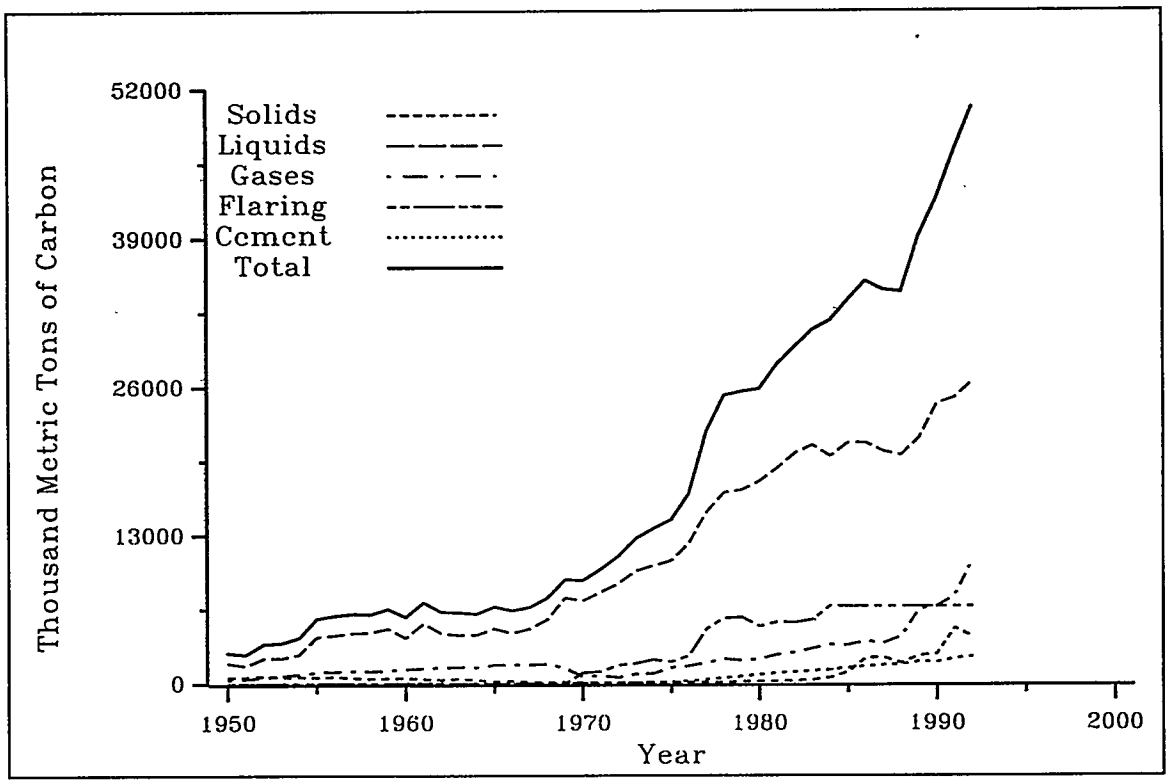
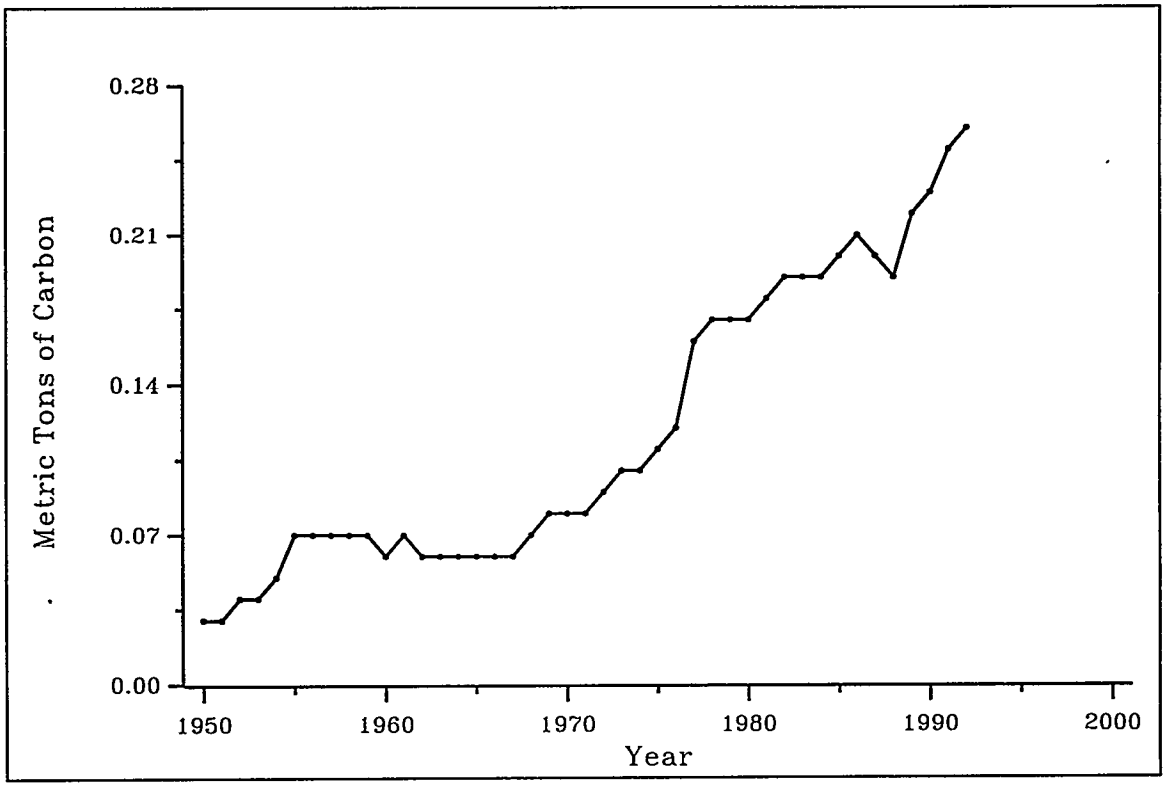


Total CO_2 emissions for Indonesia



Per capita CO_2 emission rates for Indonesia

Indonesia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2689	564	1800	325	0	0	0.03	.
1951	2570	584	1561	411	14	0	0.03	.
1952	3480	677	2224	560	19	0	0.04	.
1953	3577	600	2240	716	20	0	0.04	.
1954	4032	620	2563	829	20	0	0.05	.
1955	5696	586	4090	1000	20	0	0.07	.
1956	5960	630	4239	1071	20	0	0.07	.
1957	6123	529	4425	1136	34	0	0.07	.
1958	6066	443	4488	1093	41	0	0.07	.
1959	6518	491	4813	1168	47	0	0.07	.
1960	5843	503	4014	1274	53	0	0.06	.
1961	7102	422	5274	1345	61	0	0.07	.
1962	6275	359	4430	1417	69	0	0.06	.
1963	6218	440	4267	1466	45	0	0.06	.
1964	6110	333	4287	1431	60	0	0.06	.
1965	6735	210	4822	1653	50	0	0.06	.
1966	6383	248	4432	1657	46	0	0.06	.
1967	6700	171	4810	1671	48	0	0.06	.
1968	7524	130	5616	1722	56	0	0.07	.
1969	9107	155	7515	1364	73	0	0.08	.
1970	9047	119	7250	628	75	975	0.08	.
1971	10026	153	8010	740	66	1057	0.08	.
1972	11149	144	8761	545	81	1617	0.09	.
1973	12711	98	9877	858	99	1779	0.10	.
1974	13580	121	10342	893	113	2111	0.10	.
1975	14362	150	10767	1394	146	1904	0.11	.
1976	16637	123	12283	1540	245	2445	0.12	.
1977	22102	140	15003	1808	361	4790	0.16	.
1978	25253	150	16728	2148	502	5724	0.17	.
1979	25592	180	16964	2015	639	5795	0.17	.
1980	25825	195	17699	2124	792	5015	0.17	.
1981	27953	218	18865	2540	937	5393	0.18	.
1982	29474	238	20168	2720	1020	5328	0.19	.
1983	30981	331	20883	3080	1114	5574	0.19	.
1984	31816	520	19909	3401	1205	6781	0.19	.
1985	33555	1014	21079	3363	1371	6727	0.20	.
1986	35240	2225	21088	3713	1488	6727	0.21	.
1987	34482	2270	20338	3536	1611	6727	0.20	.
1988	34321	1791	20008	4131	1665	6727	0.19	.
1989	39109	2456	21504	6505	1917	6727	0.22	.
1990	42398	2593	24490	6717	1872	6727	0.23	.
1991	46525	4866	25035	7700	2197	6727	0.25	.
1992	50378	4062	26434	10804	2350	6727	0.26	.

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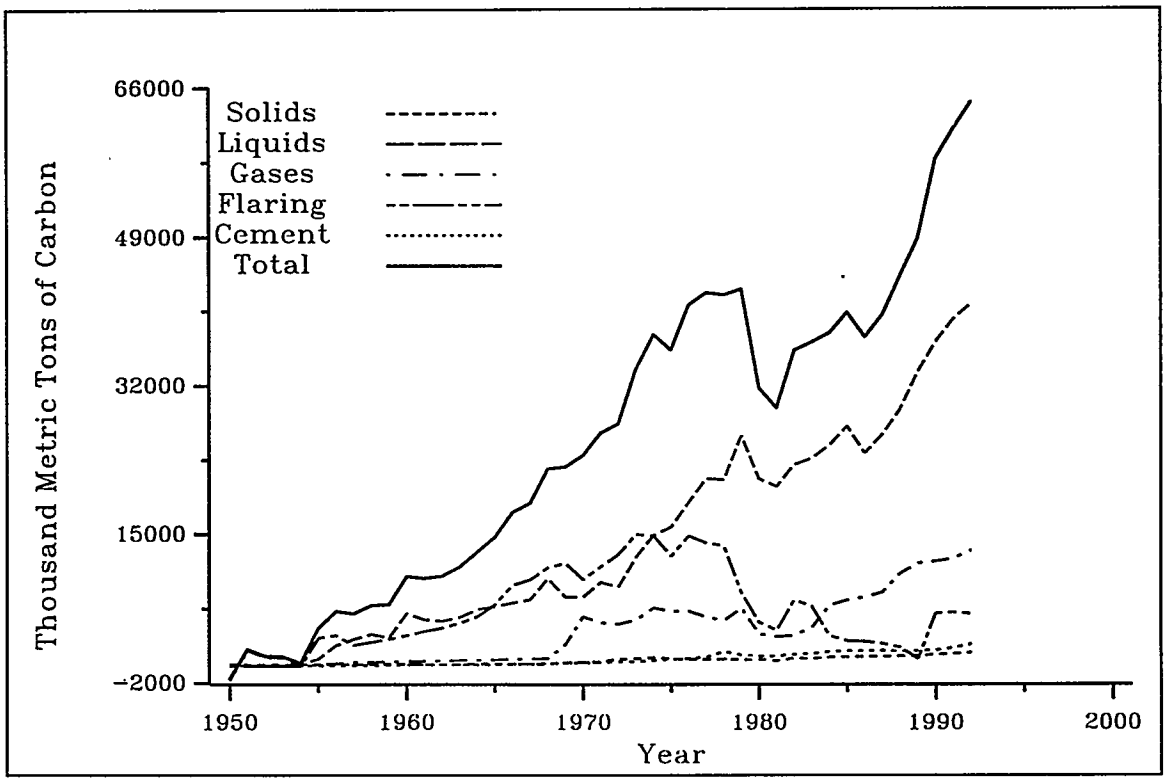
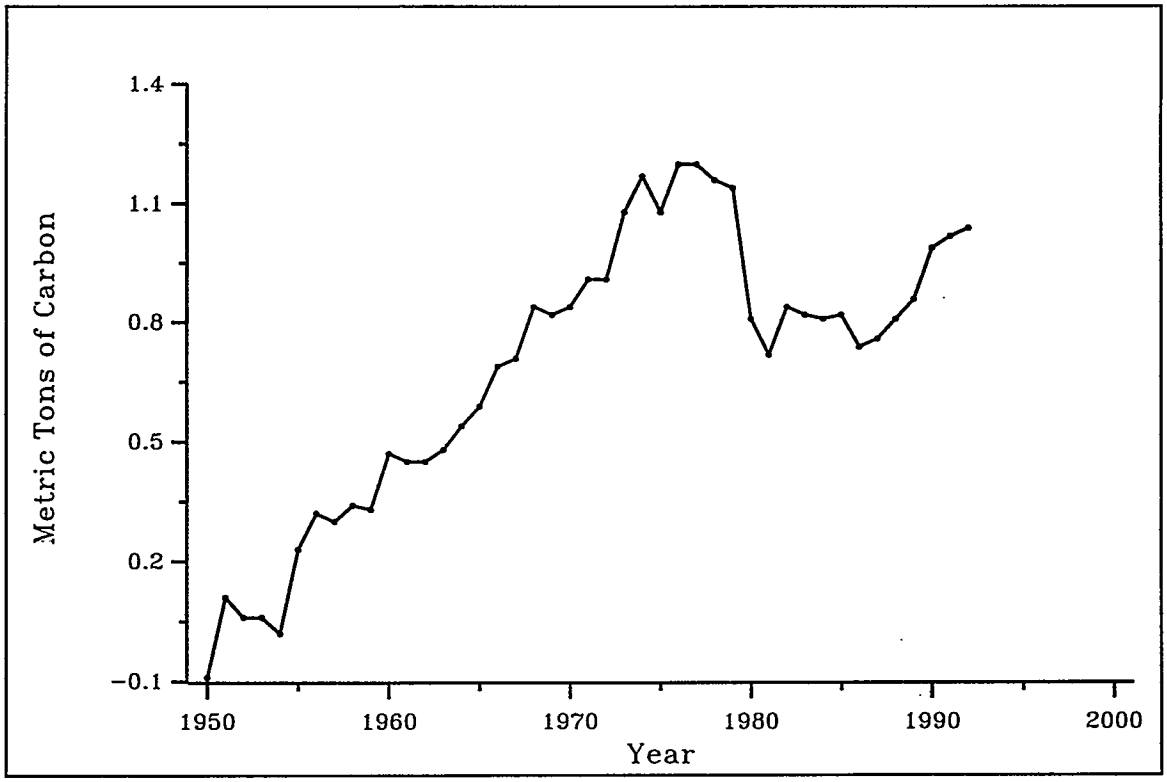


Total CO_2 emissions for Iran

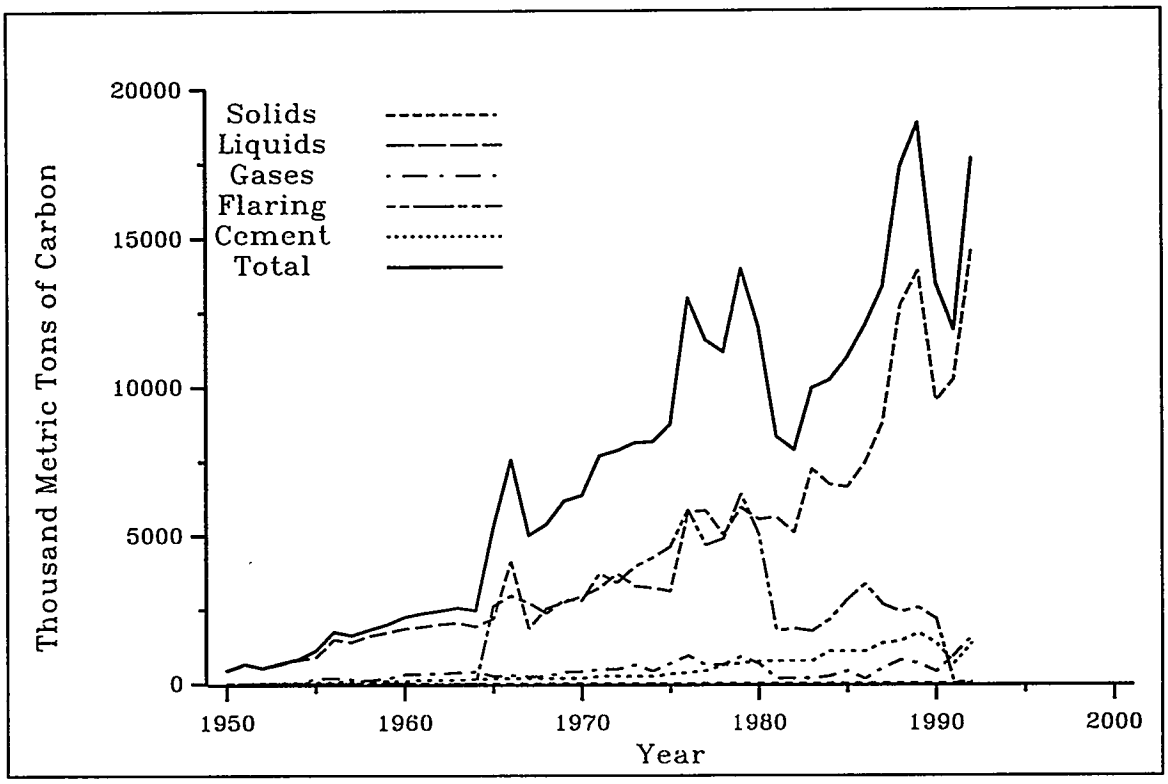


Per capita CO_2 emission rates for Iran

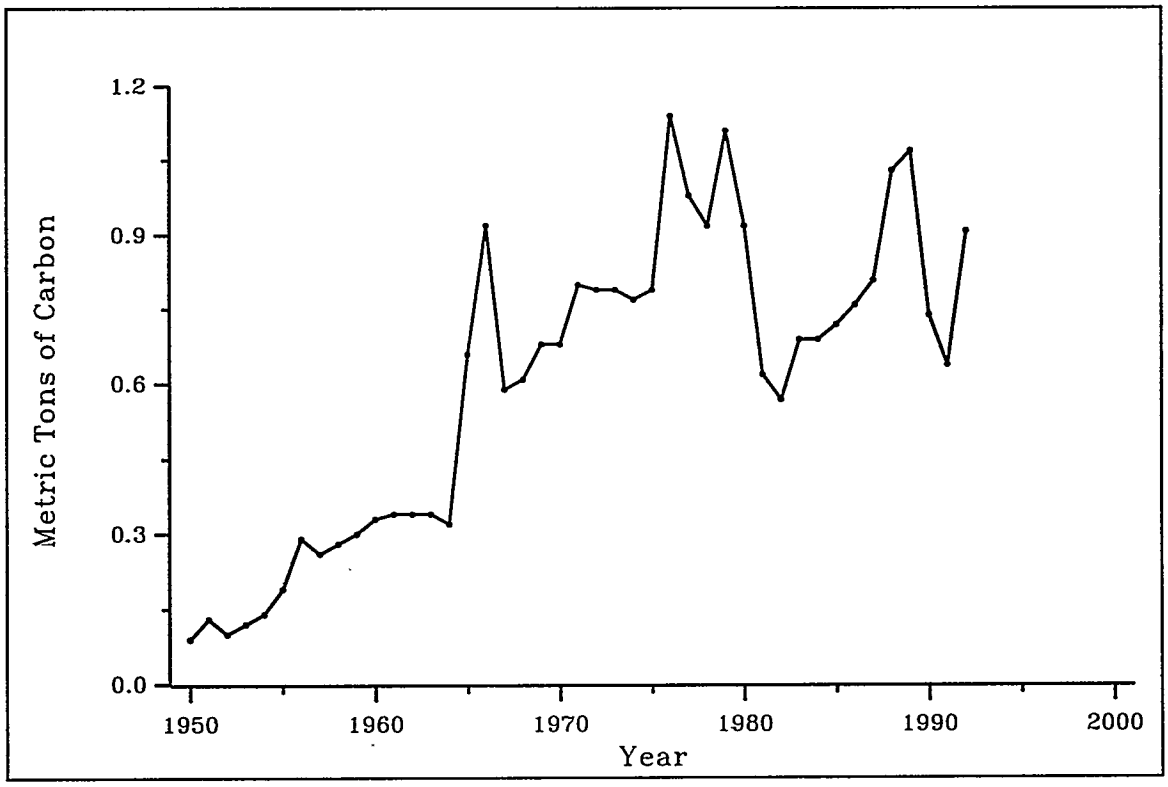
Iran

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	-1471	147	-1627	0	9	0	-0.09	.
1951	1888	125	1755	0	9	0	0.11	.
1952	1118	110	1001	0	7	0	0.06	.
1953	1046	114	923	0	9	0	0.06	.
1954	287	184	95	0	9	0	0.02	.
1955	4318	179	785	159	18	3177	0.23	.
1956	6227	139	2344	232	31	3481	0.32	.
1957	5951	128	3033	383	43	2365	0.30	.
1958	6888	142	3603	393	56	2694	0.34	.
1959	6981	174	3189	480	79	3059	0.33	.
1960	10199	168	5960	502	108	3461	0.47	.
1961	9967	145	5274	519	101	3927	0.45	.
1962	10218	149	5106	556	101	4305	0.45	.
1963	11277	167	5533	602	101	4874	0.48	.
1964	12973	201	6433	630	101	5608	0.54	.
1965	14664	209	6721	649	107	6978	0.59	.
1966	17499	209	7180	732	190	9188	0.69	.
1967	18530	212	7535	775	190	9818	0.71	.
1968	22474	218	9962	829	264	11202	0.84	.
1969	22669	359	7831	2462	319	11699	0.82	.
1970	23991	388	7822	5611	350	9819	0.84	.
1971	26574	440	9526	4920	388	11301	0.91	.
1972	27617	746	8975	4767	459	12670	0.91	.
1973	33824	820	12349	5237	475	14945	1.08	.
1974	37777	934	14845	6598	615	14785	1.17	.
1975	36044	804	15783	6247	730	12480	1.08	.
1976	41180	716	18629	6232	830	14774	1.20	.
1977	42581	718	21326	5580	987	13970	1.20	.
1978	42333	733	21205	5140	1632	13623	1.16	.
1979	43000	696	26229	6564	1224	8287	1.14	.
1980	31682	703	21294	3625	1088	4972	0.81	.
1981	29410	557	20411	3314	1088	4040	0.72	.
1982	35989	867	22904	3446	1292	7481	0.84	.
1983	36904	796	23629	4376	1357	6746	0.82	.
1984	37965	946	25143	6861	1605	3411	0.81	.
1985	40301	990	27307	7476	1695	2833	0.82	.
1986	37475	1034	24201	7790	1669	2781	0.74	.
1987	40009	1055	26352	8352	1731	2519	0.76	.
1988	44535	1070	29228	10479	1659	2099	0.81	.
1989	48784	1138	33532	11624	1703	787	0.86	.
1990	57808	1285	36925	11874	1768	5955	0.99	.
1991	61162	1358	39496	12182	2036	6090	1.02	.
1992	64268	1505	41266	13097	2468	5932	1.04	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Iraq

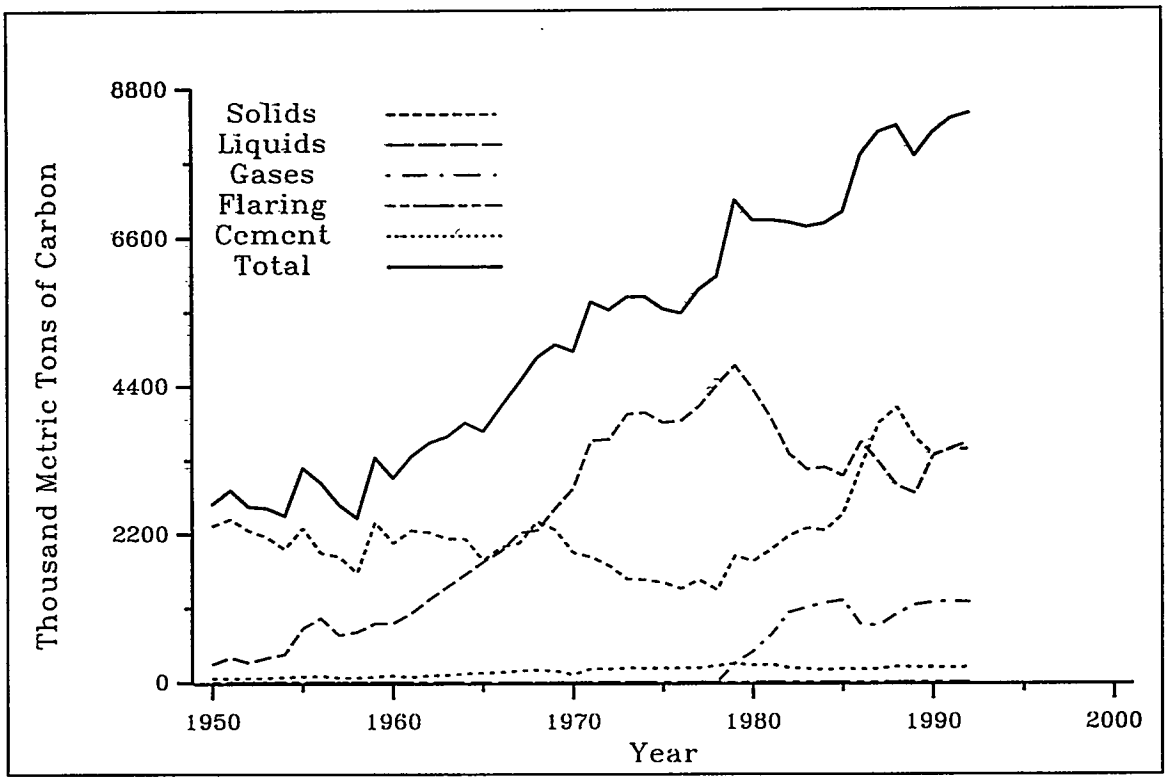


Per capita CO_2 emission rates for Iraq

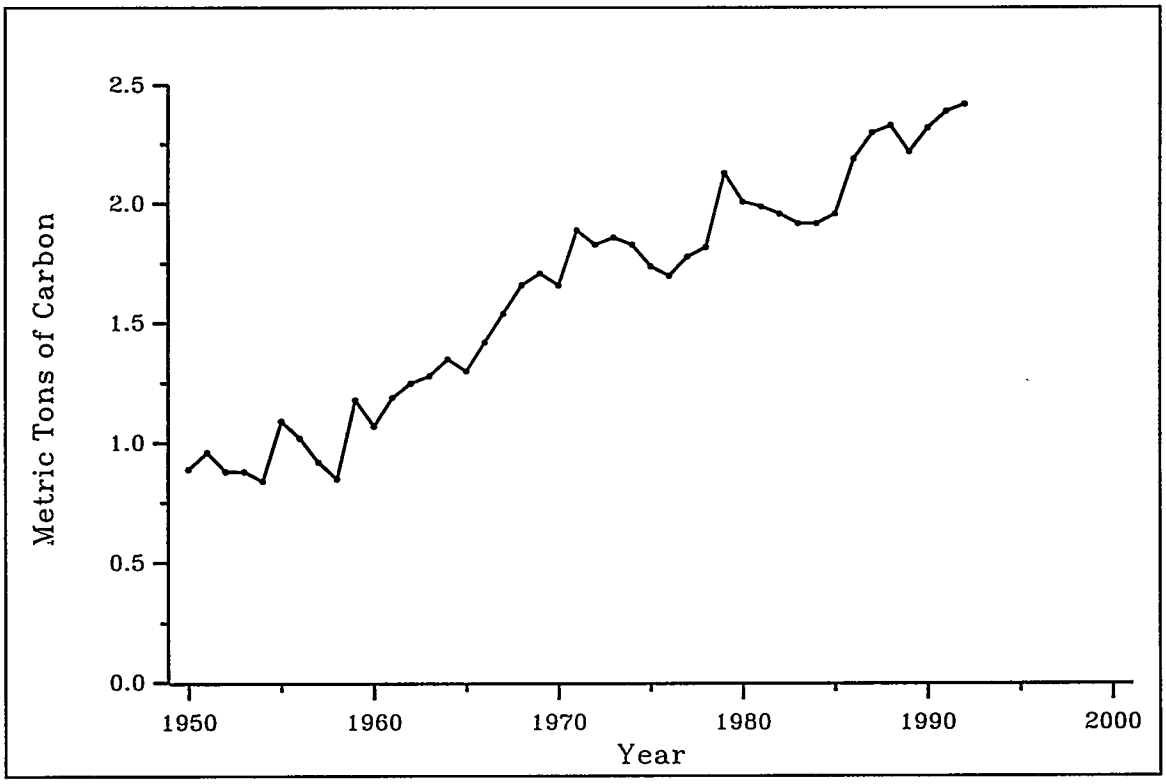
Iraq

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	450	1	440	0	9	0	0.09	.
1951	664	2	651	0	10	0	0.13	.
1952	536	1	520	0	14	0	0.10	.
1953	690	1	666	0	24	0	0.12	.
1954	832	1	805	0	27	0	0.14	.
1955	1119	2	900	173	43	0	0.19	.
1956	1746	1	1489	189	67	0	0.29	.
1957	1630	1	1406	141	82	0	0.26	.
1958	1820	1	1615	113	91	0	0.28	.
1959	1997	3	1729	175	90	0	0.30	.
1960	2254	2	1852	316	84	0	0.33	.
1961	2378	1	1916	334	127	0	0.34	.
1962	2463	1	2003	338	121	0	0.34	.
1963	2562	1	2053	380	128	0	0.34	.
1964	2475	1	1927	398	149	0	0.32	.
1965	5266	1	2196	260	175	2634	0.66	.
1966	7555	1	4121	284	183	2966	0.92	.
1967	5016	1	1851	243	190	2731	0.59	.
1968	5377	1	2548	254	190	2384	0.61	.
1969	6170	1	2748	399	188	2834	0.68	.
1970	6352	1	2948	411	185	2807	0.68	.
1971	7695	3	3236	485	252	3720	0.80	.
1972	7862	2	3707	490	259	3405	0.79	.
1973	8123	1	3295	634	247	3947	0.79	.
1974	8157	3	3236	424	247	4247	0.77	.
1975	8745	1	3123	681	324	4616	0.79	.
1976	12961	1	5785	945	371	5859	1.14	.
1977	11556	1	5834	618	431	4672	0.98	.
1978	11162	1	5013	640	626	4882	0.92	.
1979	13949	1	5942	918	694	6394	1.11	.
1980	11997	1	5532	672	748	5045	0.92	.
1981	8325	1	5610	179	762	1774	0.62	.
1982	7882	1	5090	182	761	1848	0.57	.
1983	9947	1	7242	179	761	1764	0.69	.
1984	10210	1	6715	252	1086	2157	0.69	.
1985	10959	1	6619	420	1086	2833	0.72	.
1986	12031	1	7440	157	1086	3348	0.76	.
1987	13335	1	8783	524	1357	2671	0.81	.
1988	17350	1	12709	790	1431	2419	1.03	.
1989	18804	1	13863	677	1703	2561	1.07	.
1990	13442	1	9503	403	1357	2178	0.74	.
1991	11894	1	10225	963	679	26	0.64	.
1992	17611	0	14624	1577	1357	53	0.91	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Ireland

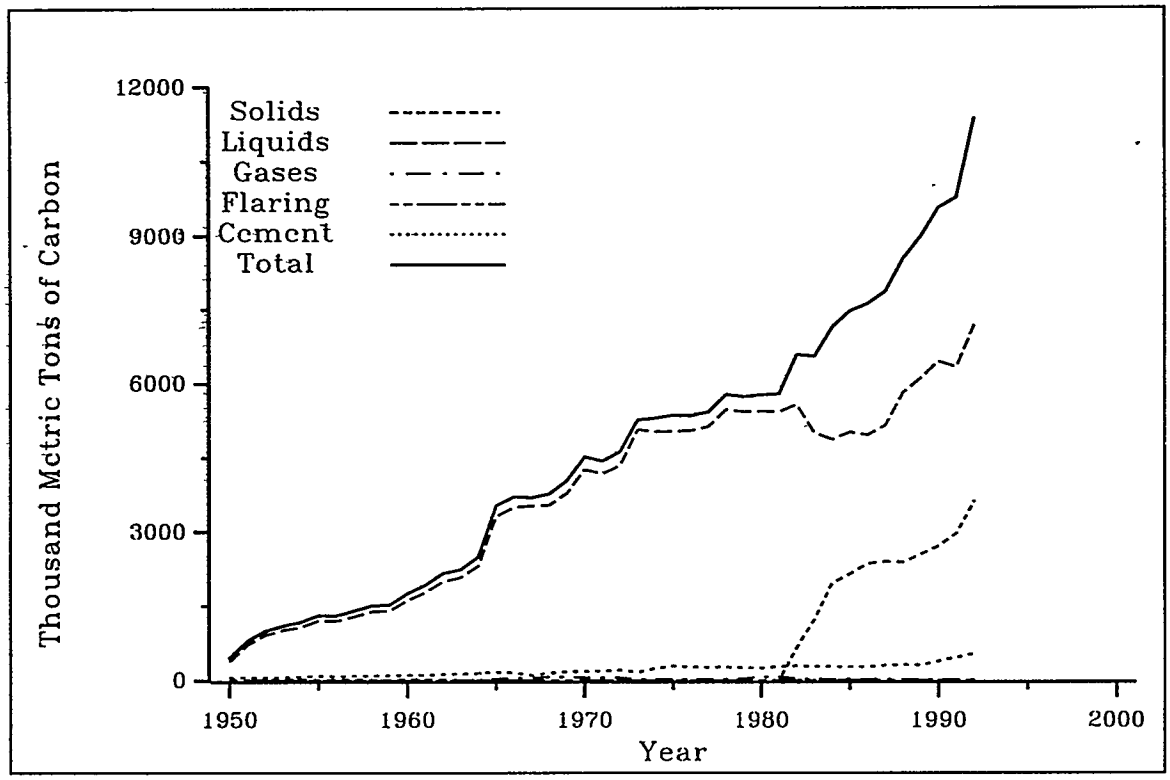


Per capita CO_2 emission rates for Ireland

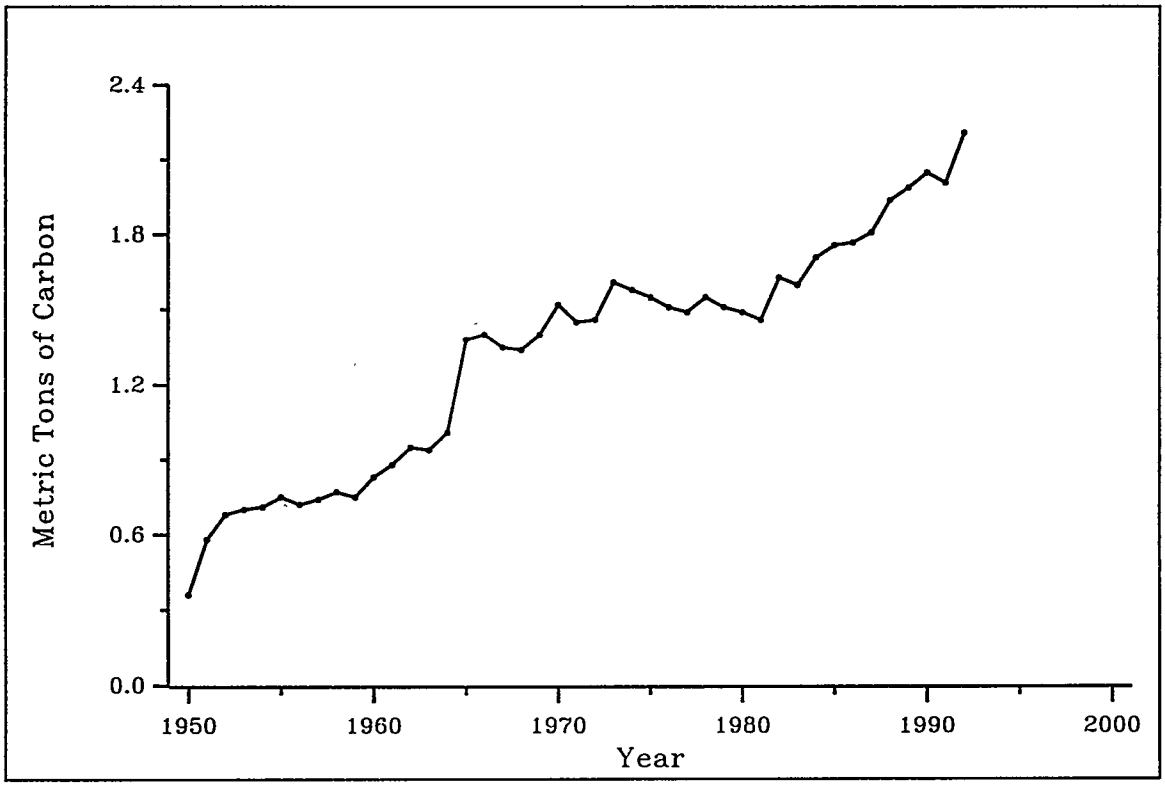
Ireland

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2651	2322	269	0	60	0	0.89	.
1951	2857	2425	373	0	58	0	0.96	.
1952	2612	2252	297	0	63	0	0.88	.
1953	2589	2157	368	0	64	0	0.88	.
1954	2476	1974	421	0	81	0	0.84	.
1955	3188	2291	805	0	91	0	1.09	.
1956	2967	1916	954	0	97	0	1.02	.
1957	2638	1865	702	0	71	0	0.92	.
1958	2441	1620	750	0	71	0	0.85	.
1959	3341	2379	876	0	85	0	1.18	.
1960	3039	2062	876	0	101	0	1.07	.
1961	3358	2253	1024	0	81	0	1.19	.
1962	3558	2225	1229	0	103	0	1.25	.
1963	3653	2130	1413	0	109	0	1.28	.
1964	3859	2129	1598	0	132	0	1.35	.
1965	3731	1804	1784	0	143	0	1.30	.
1966	4103	2006	1946	0	151	0	1.42	.
1967	4454	2064	2214	0	176	0	1.54	.
1968	4826	2386	2256	0	184	0	1.66	.
1969	5017	2262	2582	0	173	0	1.71	.
1970	4915	1921	2878	0	117	0	1.66	.
1971	5649	1856	3588	0	204	0	1.89	.
1972	5532	1724	3608	0	200	0	1.83	.
1973	5723	1528	3981	0	214	0	1.86	.
1974	5728	1516	4004	0	209	0	1.83	.
1975	5542	1475	3855	0	212	0	1.74	.
1976	5481	1385	3882	0	213	0	1.70	.
1977	5826	1517	4094	0	215	0	1.78	.
1978	6024	1367	4406	5	246	0	1.82	.
1979	7144	1873	4701	288	281	0	2.13	.
1980	6845	1787	4344	460	254	0	2.01	.
1981	6851	1964	3923	701	264	0	1.99	.
1982	6814	2170	3394	1035	215	0	1.96	.
1983	6754	2281	3161	1109	202	0	1.92	.
1984	6800	2248	3188	1176	187	0	1.92	.
1985	6969	2493	3063	1216	198	0	1.96	.
1986	7801	3196	3566	849	190	0	2.19	.
1987	8142	3847	3257	841	197	0	2.30	.
1988	8234	4076	2912	1016	229	0	2.33	.
1989	7790	3622	2801	1146	221	0	2.22	.
1990	8136	3373	3360	1183	221	0	2.32	.
1991	8343	3458	3470	1197	218	0	2.39	.
1992	8420	3453	3559	1186	222	0	2.42	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Israel

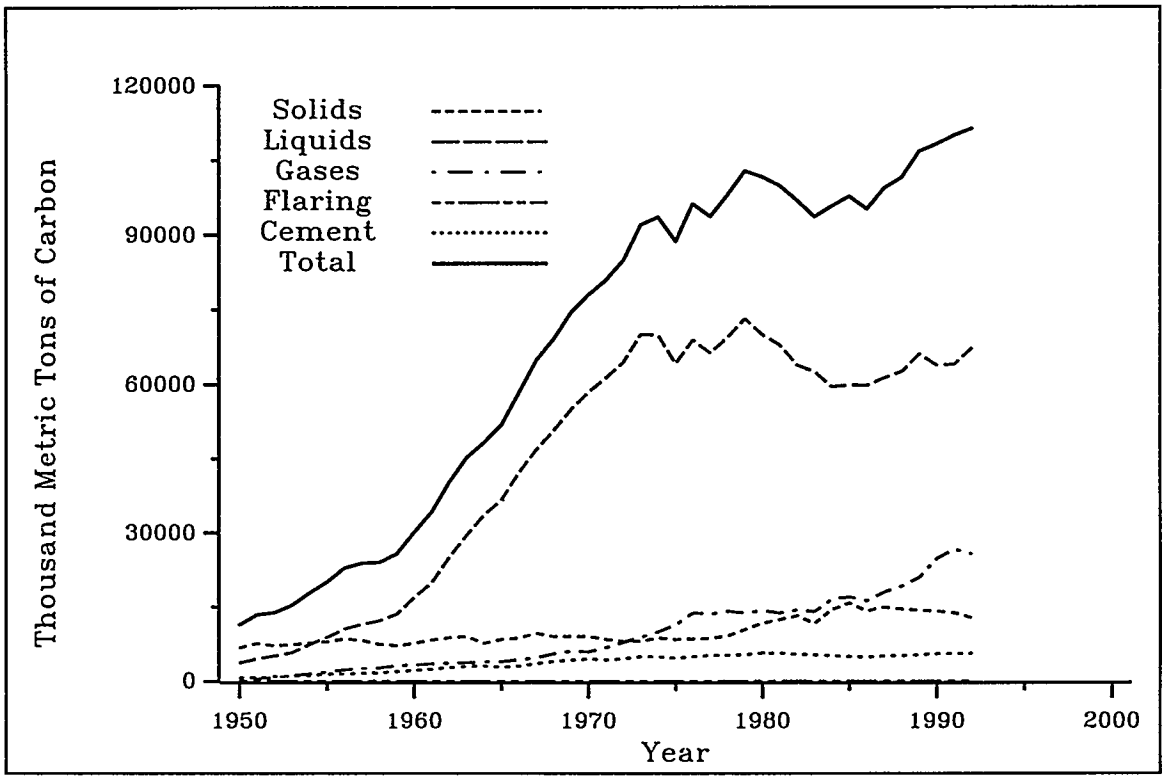


Per capita CO_2 emission rates for Israel

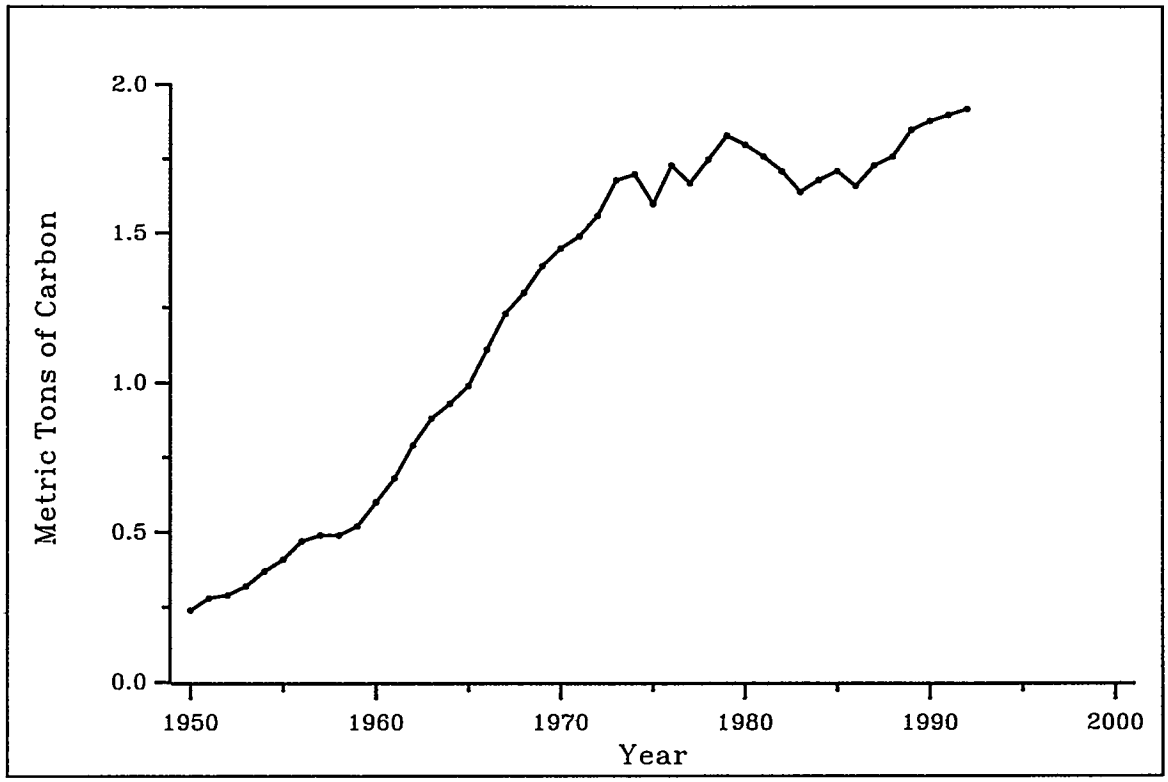
Israel

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	456	19	385	0	52	0	0.36	.
1951	797	12	726	0	60	0	0.58	.
1952	999	20	918	0	61	0	0.68	.
1953	1103	20	1020	0	63	0	0.70	.
1954	1181	25	1080	0	77	0	0.71	.
1955	1316	12	1213	0	90	0	0.75	.
1956	1310	20	1206	0	83	0	0.72	.
1957	1412	21	1294	0	98	0	0.74	.
1958	1512	18	1397	0	97	0	0.77	.
1959	1530	15	1409	0	106	0	0.75	.
1960	1764	34	1621	0	110	0	0.83	.
1961	1928	32	1780	2	115	0	0.88	.
1962	2166	33	1998	6	130	0	0.95	.
1963	2240	15	2081	5	139	0	0.94	.
1964	2496	20	2312	15	149	0	1.01	.
1965	3530	6	3316	37	171	0	1.38	.
1966	3708	5	3494	49	159	0	1.40	.
1967	3693	5	3522	57	109	0	1.35	.
1968	3767	7	3536	74	150	0	1.34	.
1969	4042	7	3783	74	178	0	1.40	.
1970	4521	5	4263	64	188	0	1.52	.
1971	4432	6	4175	59	191	0	1.45	.
1972	4618	5	4344	59	210	0	1.46	.
1973	5266	4	5065	26	171	0	1.61	.
1974	5303	3	5024	31	244	0	1.58	.
1975	5358	4	5028	29	298	0	1.55	.
1976	5348	4	5044	28	272	0	1.51	.
1977	5425	4	5126	28	267	0	1.49	.
1978	5776	4	5472	28	271	0	1.55	.
1979	5732	4	5430	36	261	0	1.51	.
1980	5768	4	5438	75	251	0	1.49	.
1981	5786	4	5425	76	280	0	1.46	.
1982	6574	665	5574	37	298	0	1.63	.
1983	6545	1234	5000	31	280	0	1.60	.
1984	7138	1966	4867	24	281	0	1.71	.
1985	7464	2149	5015	26	275	0	1.76	.
1986	7610	2357	4954	18	280	0	1.77	.
1987	7864	2393	5148	20	303	0	1.81	.
1988	8530	2385	5811	18	316	0	1.94	.
1989	8976	2543	6104	18	311	0	1.99	.
1990	9559	2713	6441	16	390	0	2.05	.
1991	9767	2967	6324	13	463	0	2.01	.
1992	11355	3623	7177	12	543	0	2.21	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Italy (includes San Marino)

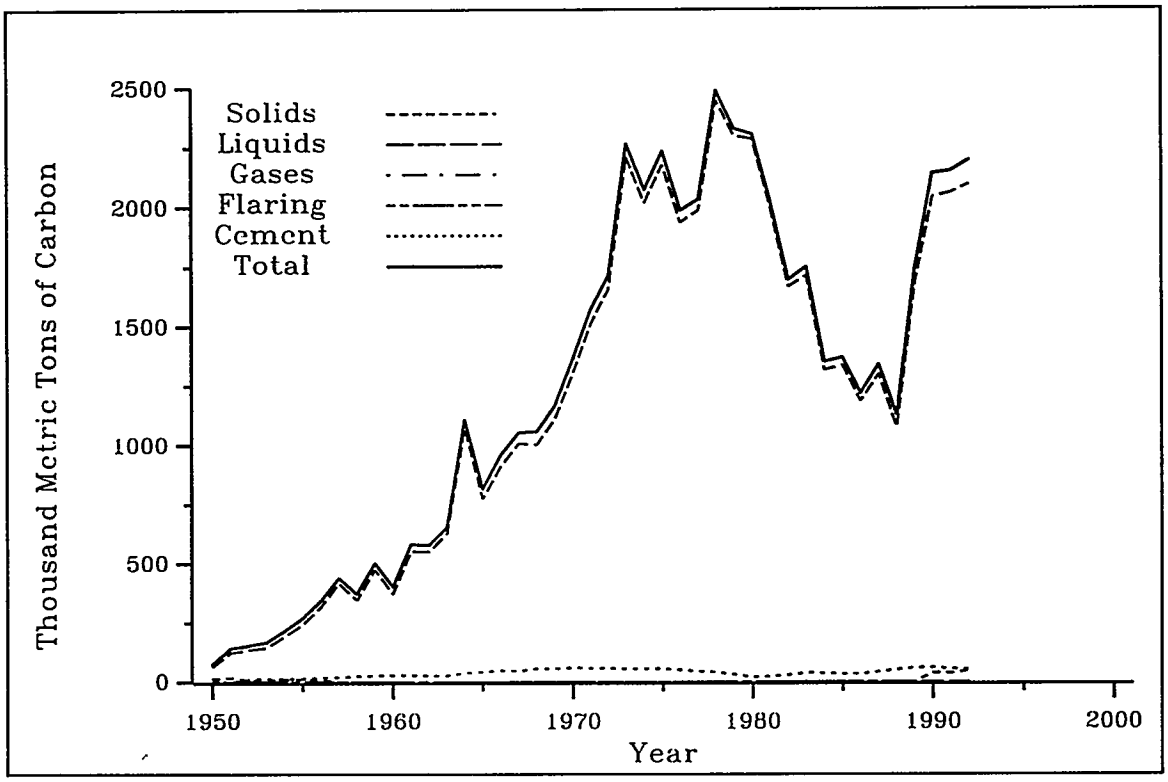


Per capita CO_2 emission rates for Italy (includes San Marino)

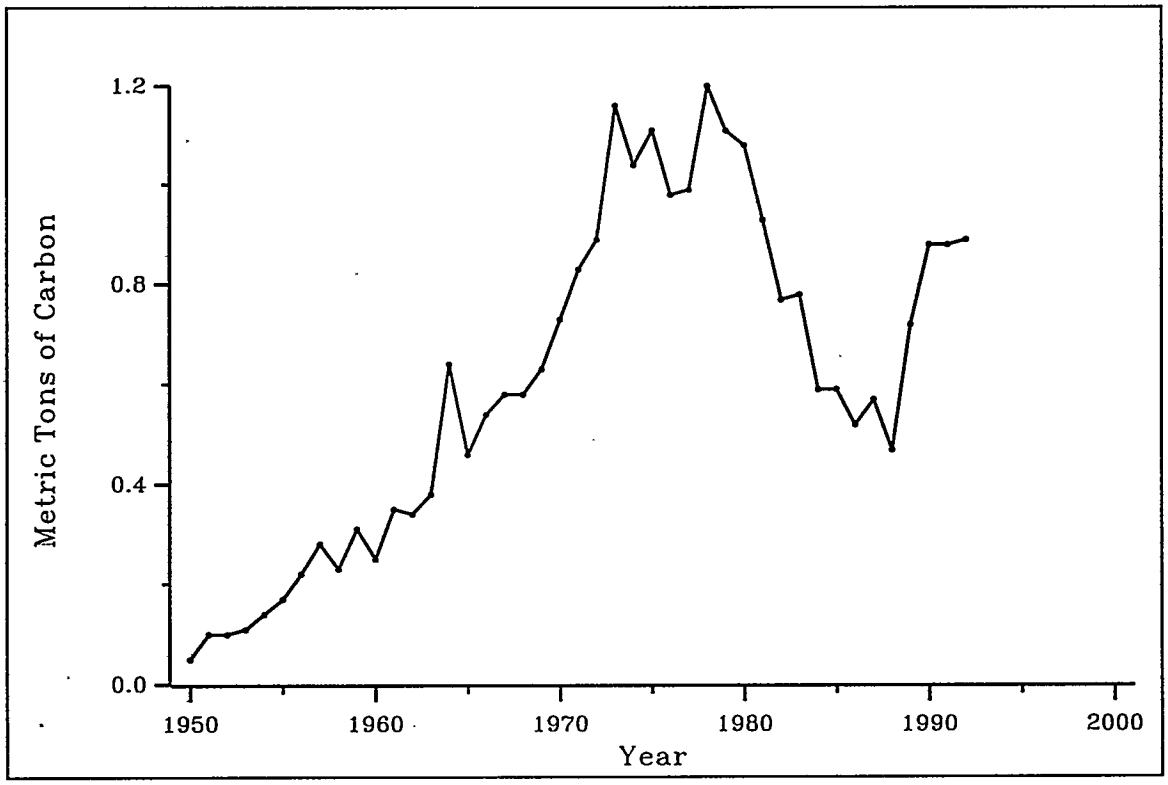
Italy (includes San Marino)

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	11386	6779	3666	261	681	0	0.24	.
1951	13415	7630	4532	494	759	0	0.28	.
1952	13920	7178	5105	733	905	0	0.29	.
1953	15412	7403	5779	1166	1065	0	0.32	.
1954	17865	7715	7441	1518	1191	0	0.37	.
1955	20142	8000	8838	1855	1450	0	0.41	.
1956	22943	8550	10562	2289	1542	0	0.47	.
1957	23927	8250	11501	2551	1625	0	0.49	.
1958	24054	7447	12215	2648	1744	0	0.49	.
1959	25813	7168	13558	3129	1959	0	0.52	.
1960	30143	7690	16979	3297	2178	0	0.60	.
1961	34226	8311	19968	3494	2452	0	0.68	.
1962	40240	8780	25060	3657	2743	0	0.79	.
1963	45217	9025	29471	3717	3004	0	0.88	.
1964	48279	7656	33612	3904	3106	0	0.93	.
1965	51819	8419	36627	3959	2815	0	0.99	.
1966	58267	8733	42163	4323	3049	0	1.11	.
1967	64814	9688	46833	4722	3571	0	1.23	.
1968	69218	9023	50670	5519	4007	0	1.30	.
1969	74398	9063	54974	6099	4263	0	1.39	.
1970	77955	9063	58433	5961	4498	0	1.45	.
1971	80930	8463	61344	6798	4325	0	1.49	.
1972	84876	8031	64431	7864	4551	0	1.56	.
1973	91976	8108	70043	8887	4938	0	1.68	.
1974	93542	8733	69900	9971	4938	0	1.70	.
1975	88630	8437	64134	11403	4656	0	1.60	.
1976	96172	8535	68901	13797	4941	0	1.73	.
1977	93647	8649	66252	13551	5196	0	1.67	.
1978	97996	9165	69473	14158	5200	0	1.75	.
1979	102771	10469	73140	13818	5343	0	1.83	.
1980	101627	11718	69970	14258	5681	0	1.80	.
1981	99788	12454	67914	13769	5651	0	1.76	.
1982	96856	13206	63835	14411	5403	0	1.71	.
1983	93598	11646	62559	14059	5334	0	1.64	.
1984	95770	14500	59503	16629	5138	0	1.68	.
1985	97686	15814	59826	17059	4988	0	1.71	.
1986	95118	14202	59754	16275	4888	0	1.66	.
1987	99343	14950	61283	18043	5067	0	1.73	.
1988	101499	14571	62558	19217	5152	0	1.76	.
1989	106717	14347	66031	20982	5356	0	1.85	.
1990	108223	14134	63793	24783	5514	0	1.88	.
1991	109970	13790	63995	26647	5538	0	1.90	.
1992	111272	12750	67220	25678	5623	0	1.92	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Jamaica

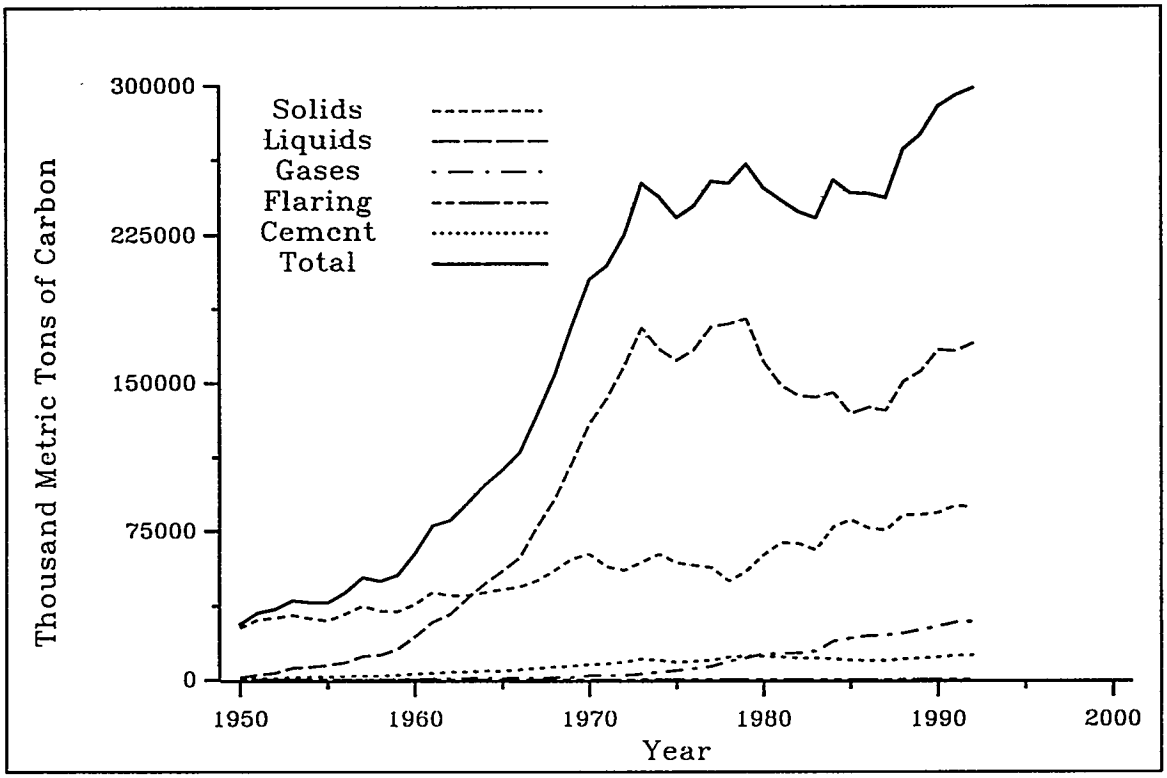


Per capita CO_2 emission rates for Jamaica

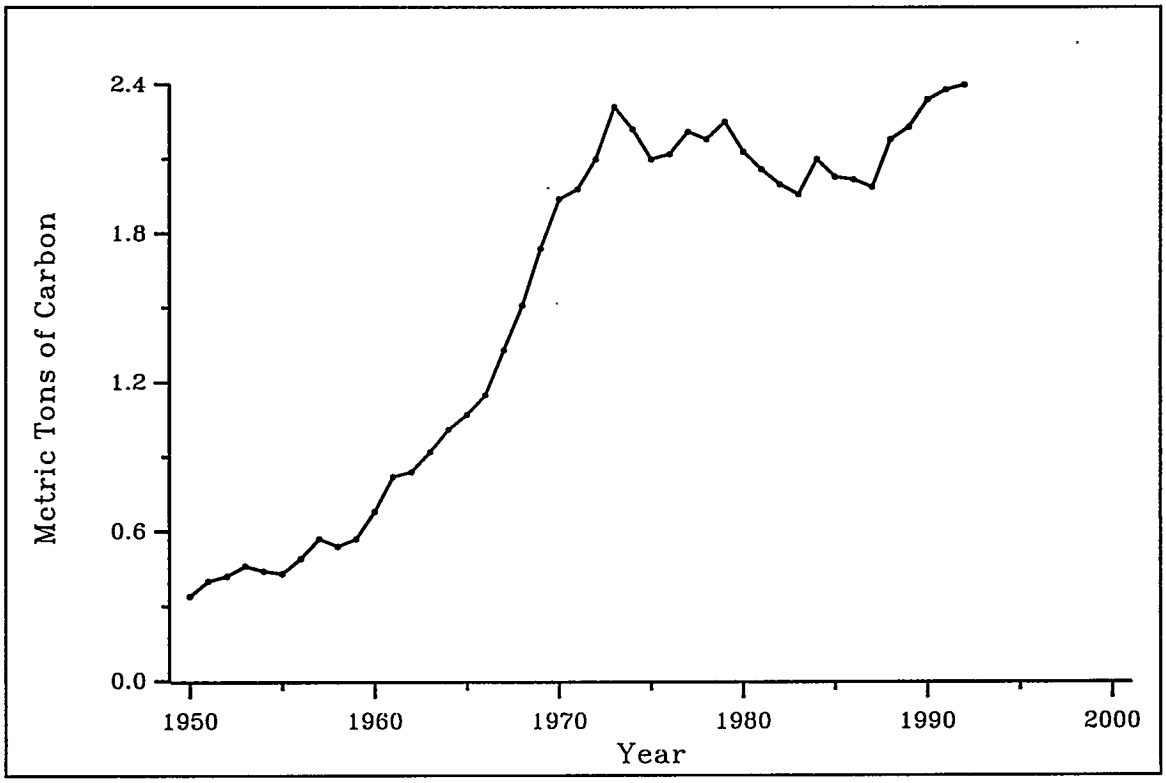
Jamaica

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	74	12	63	0	0	0	0.05	.
1951	142	18	124	0	0	0	0.10	.
1952	154	7	137	0	10	0	0.10	.
1953	167	8	146	0	14	0	0.11	.
1954	216	10	193	0	13	0	0.14	.
1955	269	11	243	0	15	0	0.17	.
1956	344	9	317	0	18	0	0.22	.
1957	438	1	417	0	20	0	0.28	.
1958	371	1	346	0	24	0	0.23	.
1959	501	1	474	0	27	0	0.31	.
1960	401	0	372	0	29	0	0.25	.
1961	581	1	551	0	29	0	0.35	.
1962	578	1	550	0	27	0	0.34	.
1963	654	1	626	0	27	0	0.38	.
1964	1109	1	1071	0	38	0	0.64	.
1965	817	1	774	0	42	0	0.46	.
1966	960	1	912	0	48	0	0.54	.
1967	1054	1	1008	0	46	0	0.58	.
1968	1058	1	1002	0	56	0	0.58	.
1969	1165	1	1109	0	56	0	0.63	.
1970	1362	1	1300	0	60	0	0.73	.
1971	1569	1	1510	0	58	0	0.83	.
1972	1714	1	1657	0	57	0	0.89	.
1973	2265	1	2210	0	55	0	1.16	.
1974	2073	1	2018	0	55	0	1.04	.
1975	2233	1	2177	0	55	0	1.11	.
1976	1986	1	1936	0	50	0	0.98	.
1977	2031	0	1986	0	45	0	0.99	.
1978	2487	0	2447	0	40	0	1.20	.
1979	2328	1	2297	0	31	0	1.11	.
1980	2304	1	2284	0	20	0	1.08	.
1981	2022	1	1999	0	23	0	0.93	.
1982	1696	0	1667	0	29	0	0.77	.
1983	1750	0	1712	0	38	0	0.78	.
1984	1351	0	1315	0	36	0	0.59	.
1985	1367	0	1335	0	33	0	0.59	.
1986	1217	0	1184	0	33	0	0.52	.
1987	1339	0	1298	0	42	0	0.57	.
1988	1125	0	1074	0	51	0	0.47	.
1989	1737	0	1678	0	59	0	0.72	.
1990	2139	38	2041	0	60	0	0.88	.
1991	2149	37	2058	0	54	0	0.88	.
1992	2195	48	2093	0	53	0	0.89	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Japan

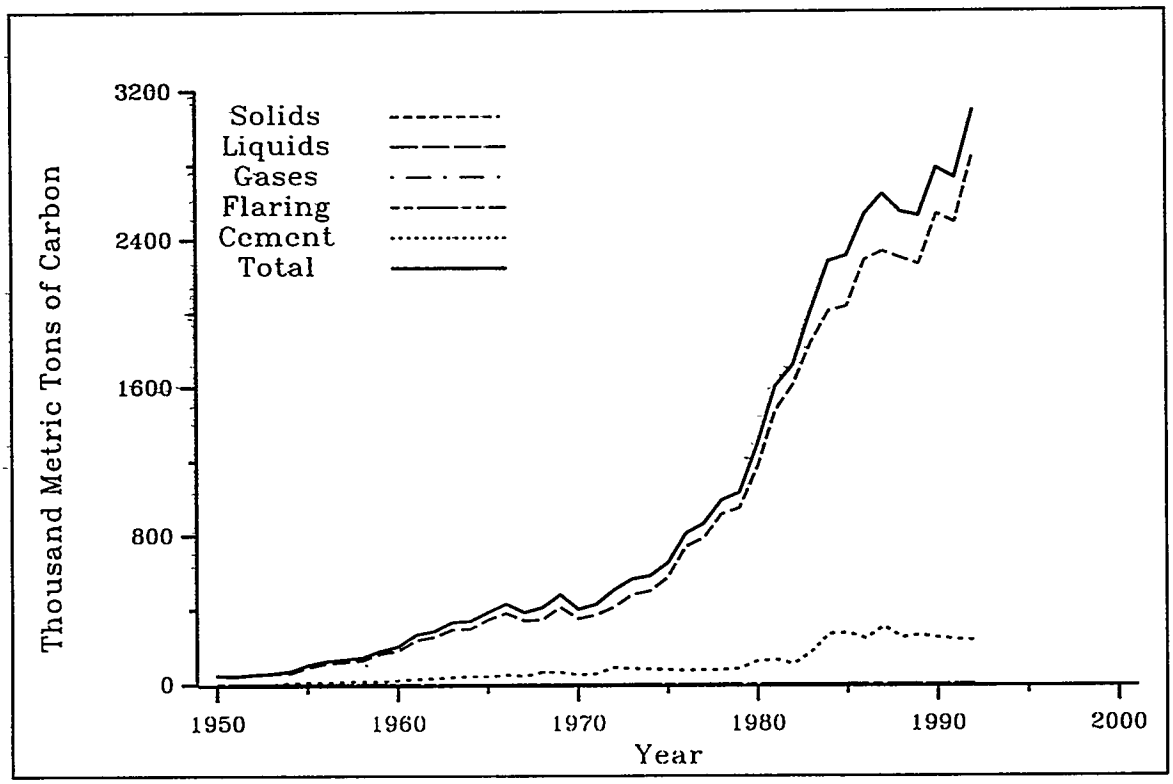


Per capita CO_2 emission rates for Japan

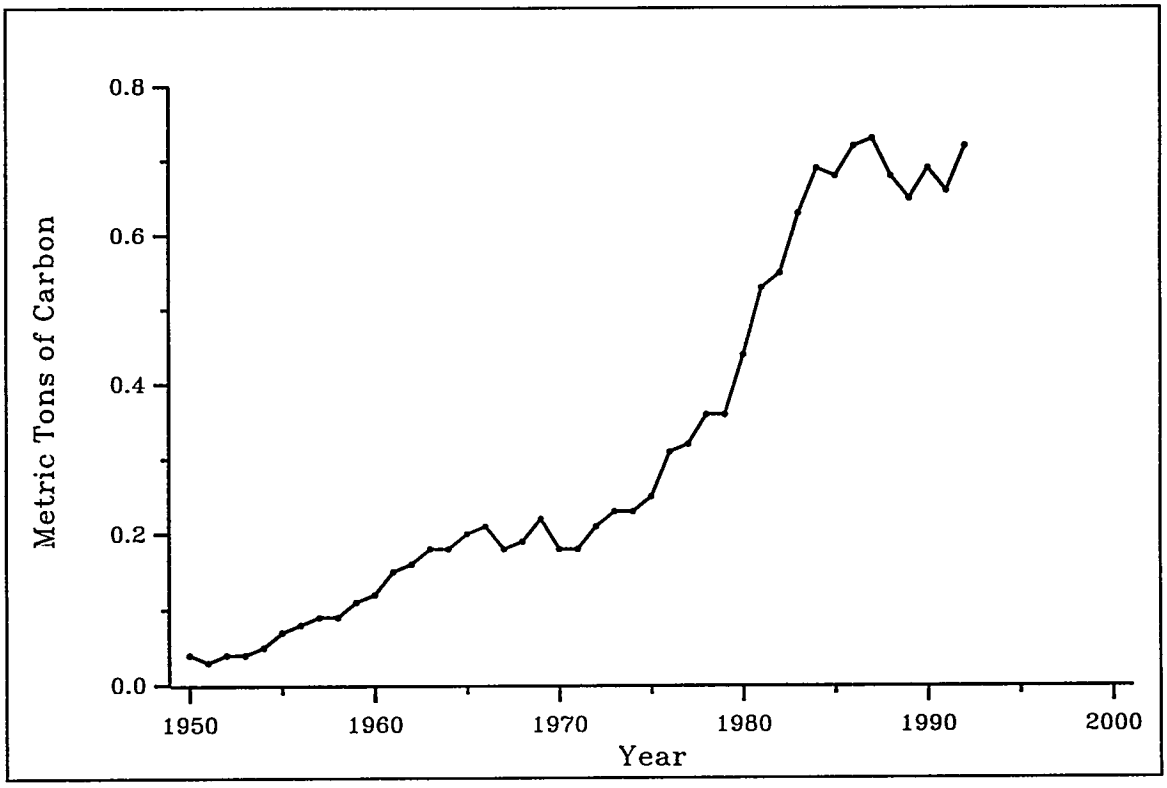
Japan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	28281	26417	1220	37	607	0	0.34	.
1951	34039	30633	2472	44	891	0	0.40	701
1952	35944	31443	3485	49	968	0	0.42	652
1953	40157	32889	6016	59	1192	0	0.46	504
1954	39257	31187	6543	75	1452	0	0.44	630
1955	39063	30050	7483	94	1437	0	0.43	1158
1956	44225	33497	8829	128	1771	0	0.49	1754
1957	51759	37543	11979	174	2064	0	0.57	1901
1958	49845	34906	12648	253	2038	0	0.54	1637
1959	52974	34731	15575	320	2348	0	0.57	2278
1960	63907	38403	22002	437	3065	0	0.68	3574
1961	77705	44402	29394	558	3350	0	0.82	5024
1962	80441	42568	33232	726	3915	0	0.84	5755
1963	89174	42881	41218	1002	4073	0	0.92	7039
1964	98491	44228	48685	1093	4485	0	1.01	8392
1965	106036	45759	54846	985	4446	0	1.07	7263
1966	115004	47060	61730	1010	5204	0	1.15	9429
1967	134167	50111	77146	1067	5844	0	1.33	9160
1968	154048	55253	91158	1154	6484	0	1.51	7903
1969	179039	61025	109737	1288	6989	0	1.74	9402
1970	202454	63301	129270	2095	7778	11	1.94	7150
1971	209490	56984	142204	2209	8083	11	1.98	9978
1972	224917	55282	158419	2179	9016	21	2.10	11439
1973	250664	59287	177843	2888	10624	22	2.31	14921
1974	244080	63317	166938	3865	9943	17	2.22	18013
1975	233698	58899	161176	4682	8910	30	2.10	15918
1976	239341	57627	166699	5645	9345	25	2.12	11640
1977	251596	56551	178334	6737	9947	28	2.21	9287
1978	250702	49901	179812	9417	11544	28	2.18	9375
1979	260189	54720	182341	11160	11941	27	2.25	9186
1980	248381	62821	160494	13082	11962	21	2.13	11253
1981	242285	68902	148564	13262	11537	20	2.06	10387
1982	236594	68529	143490	13577	10974	25	2.00	7638
1983	233413	65235	142592	14560	11001	25	1.96	7015
1984	252146	76931	144896	19568	10725	26	2.10	6815
1985	245751	80480	134327	21010	9907	27	2.03	7250
1986	245530	76342	137320	22176	9692	0	2.02	5711
1987	243312	75180	135828	22573	9731	0	1.99	5116
1988	267409	82953	150380	23528	10547	0	2.18	4514
1989	274791	82974	155669	25307	10842	0	2.23	4659
1990	289064	84113	166438	27028	11485	0	2.34	4980
1991	294749	87669	165842	29058	12180	0	2.38	8697
1992	298436	86733	169840	29528	12335	0	2.40	8835

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Jordan

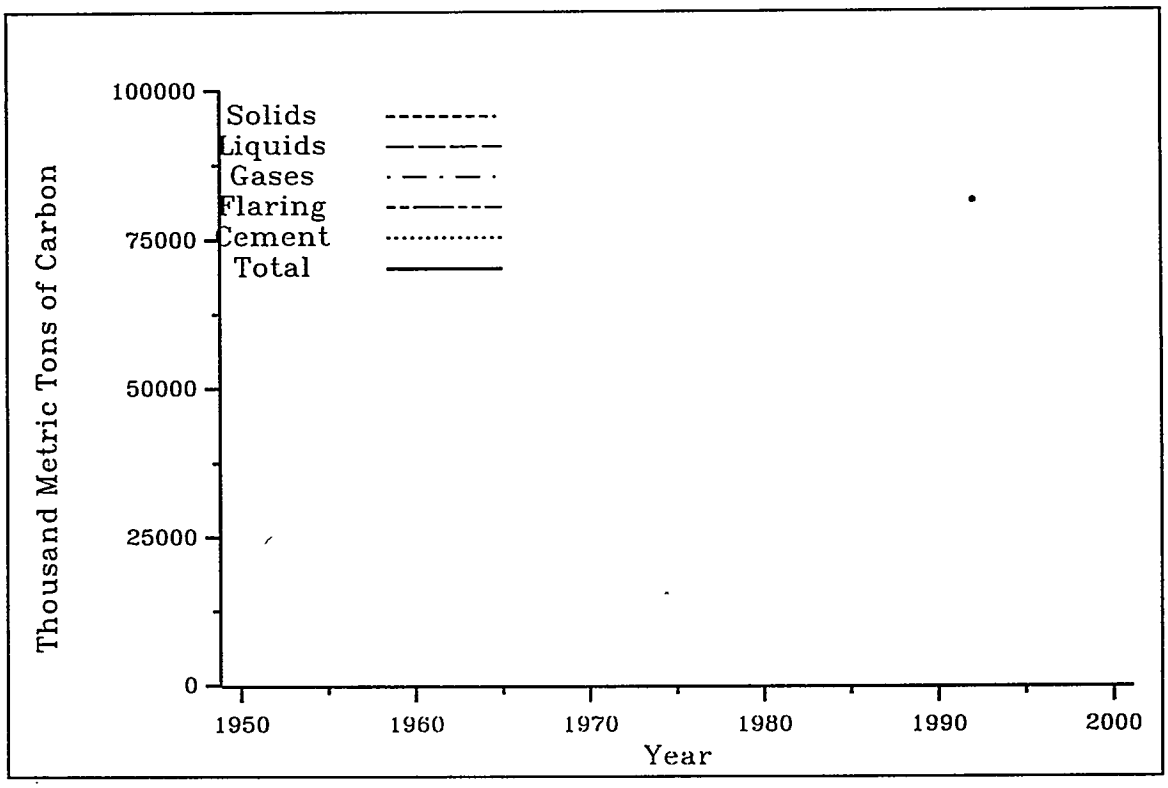


Per capita CO_2 emission rates for Jordan

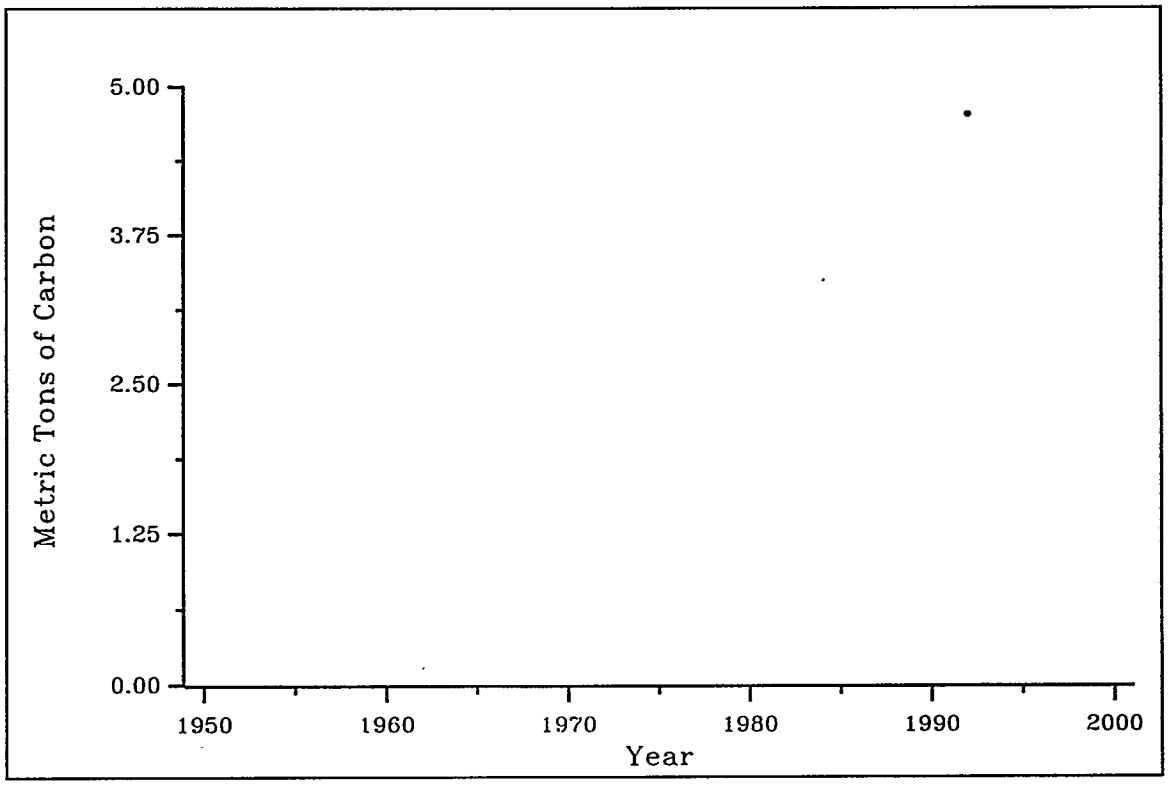
Jordan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	47	0	47	0	0	0	0.04	.
1951	44	0	44	0	0	0	0.03	.
1952	53	0	53	0	0	0	0.04	.
1953	58	0	58	0	0	0	0.04	.
1954	69	0	60	0	9	0	0.05	.
1955	104	0	92	0	12	0	0.07	.
1956	123	0	112	0	11	0	0.08	.
1957	134	0	120	0	15	0	0.09	.
1958	144	0	128	0	16	0	0.09	.
1959	179	0	164	0	15	0	0.11	.
1960	203	0	181	0	22	0	0.12	.
1961	267	0	237	0	30	0	0.15	.
1962	286	0	254	0	32	0	0.16	.
1963	333	0	294	0	39	0	0.18	.
1964	339	0	297	0	42	0	0.18	.
1965	388	0	347	0	42	0	0.20	.
1966	432	0	381	0	51	0	0.21	.
1967	386	0	342	0	44	0	0.18	.
1968	411	0	346	0	65	0	0.19	.
1969	481	0	415	0	65	0	0.22	.
1970	403	0	352	0	51	0	0.18	.
1971	429	0	372	0	57	0	0.18	.
1972	505	0	414	0	90	0	0.21	.
1973	564	0	480	0	84	0	0.23	.
1974	580	0	499	0	81	0	0.23	.
1975	650	0	572	0	78	0	0.25	.
1976	811	0	738	0	73	0	0.31	.
1977	862	0	785	0	77	0	0.32	.
1978	990	0	913	0	77	0	0.36	.
1979	1031	0	946	0	85	0	0.36	.
1980	1290	0	1165	0	124	0	0.44	.
1981	1599	0	1468	0	131	0	0.53	.
1982	1716	0	1608	0	108	0	0.55	.
1983	2008	0	1835	0	173	0	0.63	.
1984	2278	0	2008	0	270	0	0.69	.
1985	2309	0	2034	0	275	0	0.68	.
1986	2530	0	2286	0	244	0	0.72	.
1987	2639	0	2331	0	308	0	0.73	.
1988	2544	0	2296	0	249	0	0.68	.
1989	2524	0	2261	0	262	0	0.65	.
1990	2779	0	2532	0	248	0	0.69	.
1991	2726	0	2487	0	239	0	0.66	.
1992	3087	0	2853	0	234	0	0.72	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Kazakhstan

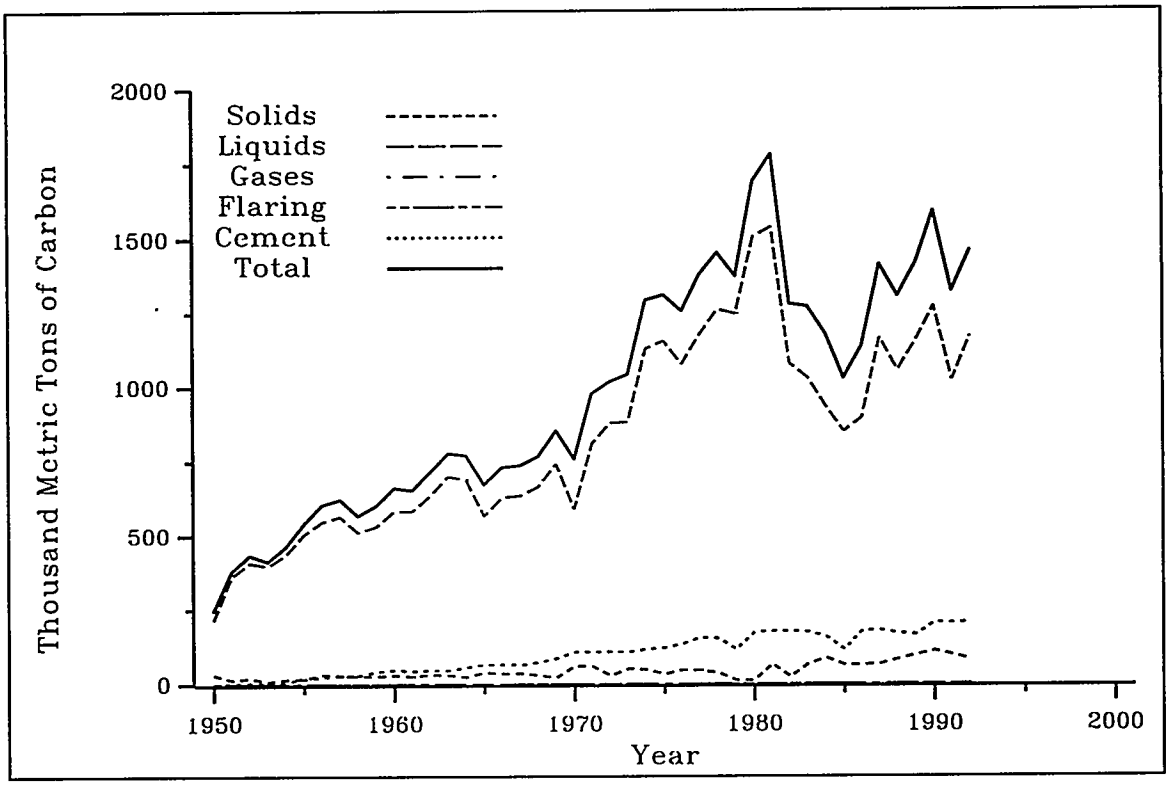


Per capita CO_2 emission rates for Kazakhastan

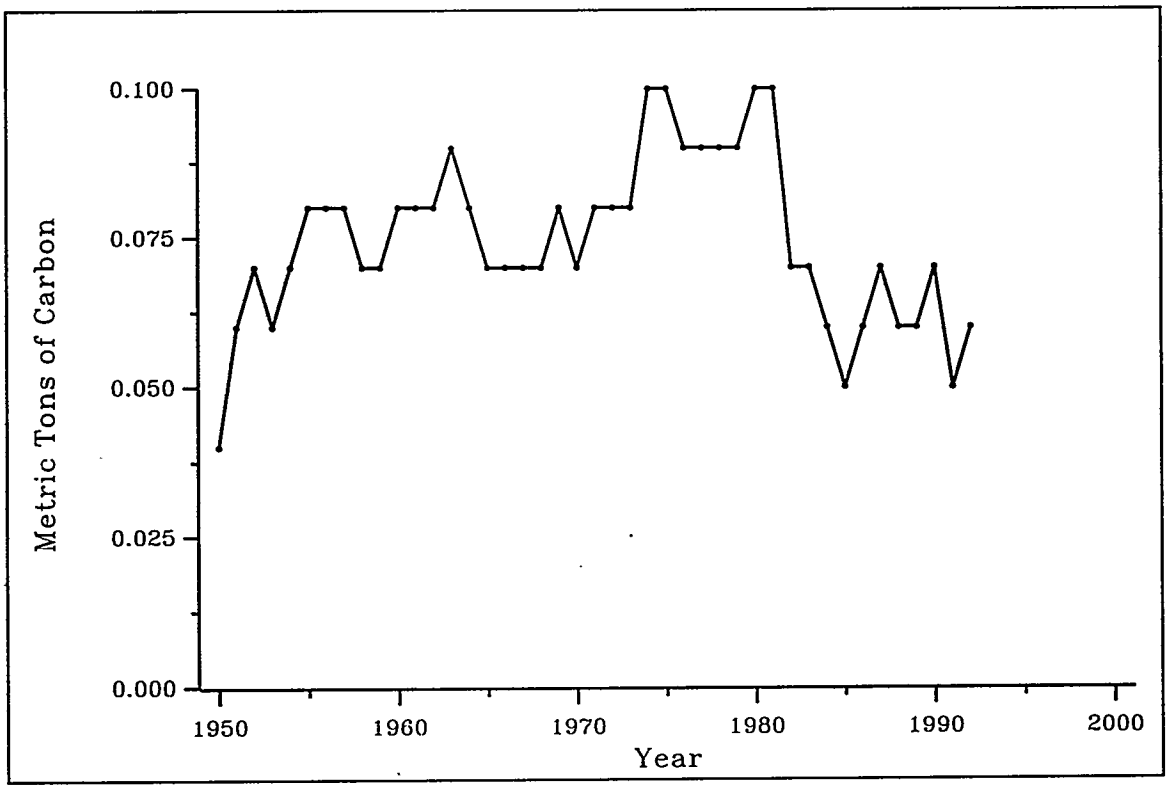
Kazakhstan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	81327	55080	15751	9682	814	0	4.77	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Kenya

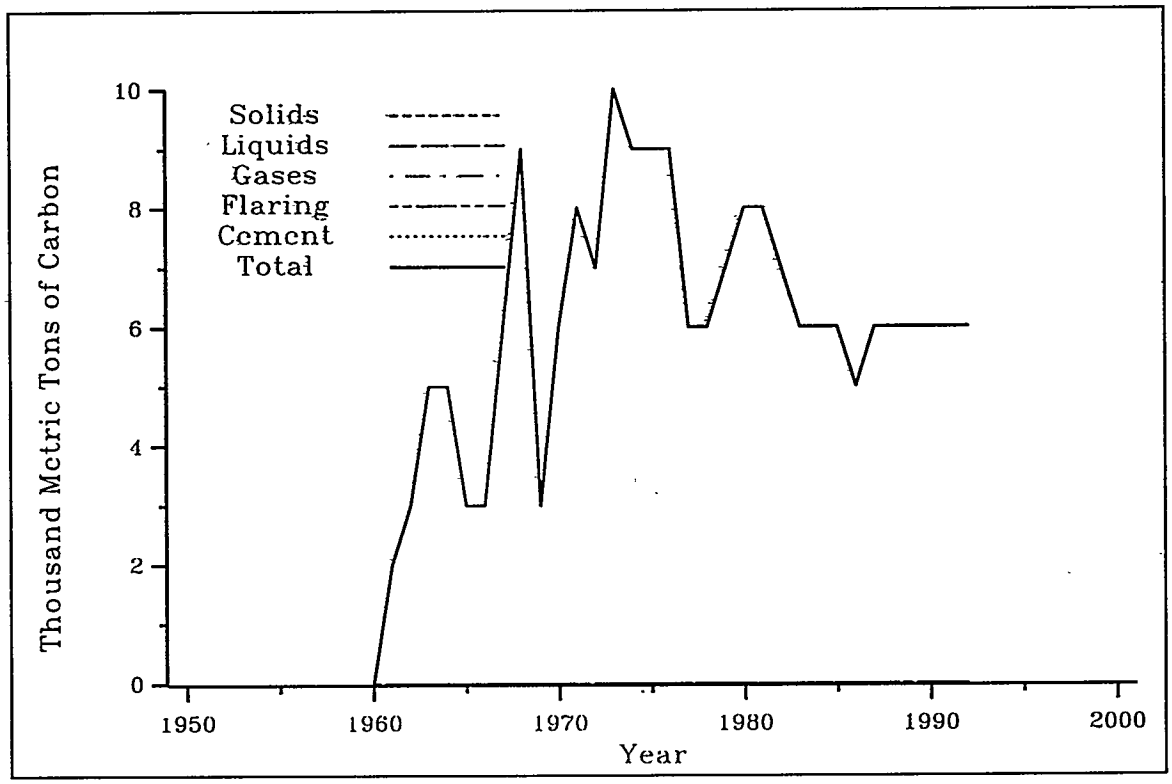


Per capita CO_2 emission rates for Kenya

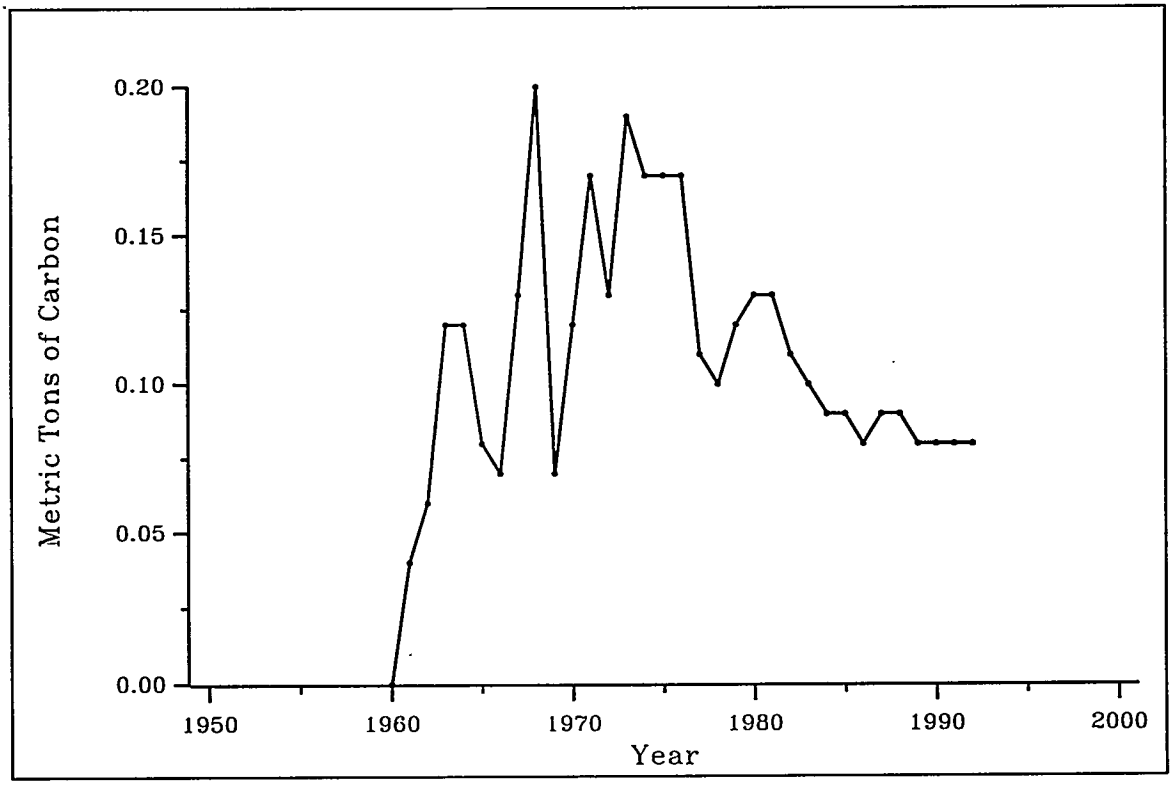
Kenya

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	248	32	216	0	0	0	0.04	.
1951	380	15	363	0	3	0	0.06	.
1952	435	21	409	0	5	0	0.07	.
1953	413	10	398	0	5	0	0.06	.
1954	464	17	437	0	10	0	0.07	.
1955	542	19	505	0	18	0	0.08	.
1956	606	33	548	0	25	0	0.08	.
1957	624	30	566	0	28	0	0.08	.
1958	569	28	512	0	30	0	0.07	.
1959	603	28	532	0	43	0	0.07	.
1960	663	31	584	0	48	0	0.08	.
1961	655	27	584	0	45	0	0.08	.
1962	716	33	636	0	47	0	0.08	.
1963	779	31	701	0	47	0	0.09	.
1964	772	25	689	0	57	0	0.08	.
1965	674	40	568	0	66	0	0.07	.
1966	732	36	630	0	66	0	0.07	.
1967	738	37	636	0	65	0	0.07	.
1968	769	30	666	0	74	0	0.07	.
1969	854	23	743	0	87	0	0.08	.
1970	760	61	591	0	108	0	0.07	.
1971	978	60	810	0	108	0	0.08	.
1972	1018	29	880	0	109	0	0.08	.
1973	1043	52	883	0	108	0	0.08	.
1974	1294	49	1129	0	117	0	0.10	.
1975	1311	34	1155	0	122	0	0.10	.
1976	1258	47	1077	0	134	0	0.09	.
1977	1379	46	1177	0	156	0	0.09	.
1978	1453	38	1262	0	153	0	0.09	.
1979	1374	12	1247	0	116	0	0.09	.
1980	1691	13	1505	0	173	0	0.10	.
1981	1781	66	1538	0	177	0	0.10	.
1982	1280	24	1079	0	177	0	0.07	.
1983	1272	67	1031	0	174	0	0.07	.
1984	1179	87	934	0	158	0	0.06	.
1985	1029	64	850	0	115	0	0.05	.
1986	1136	63	895	0	178	0	0.06	.
1987	1412	67	1165	0	180	0	0.07	.
1988	1307	83	1055	0	169	0	0.06	.
1989	1417	97	1155	0	165	0	0.06	.
1990	1590	111	1273	0	206	0	0.07	.
1991	1323	97	1022	0	204	0	0.05	.
1992	1458	81	1170	0	207	0	0.06	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Kiribati

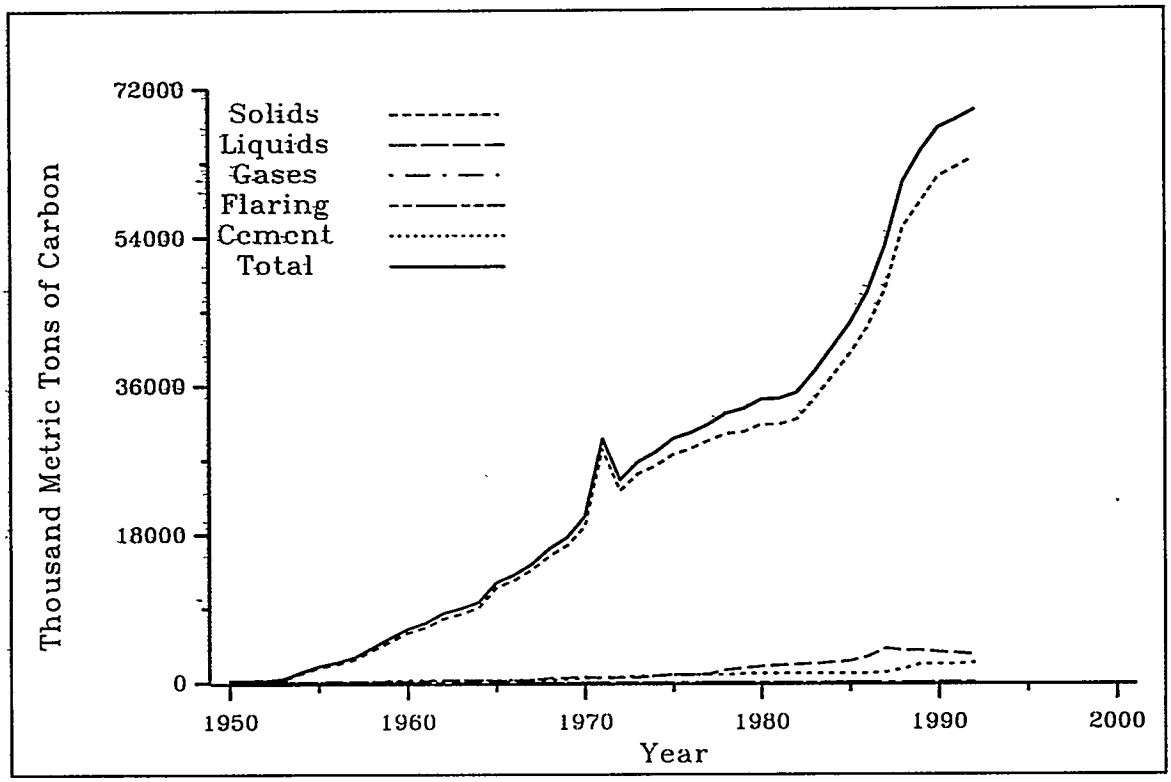


Per capita CO_2 emission rates for Kiribati

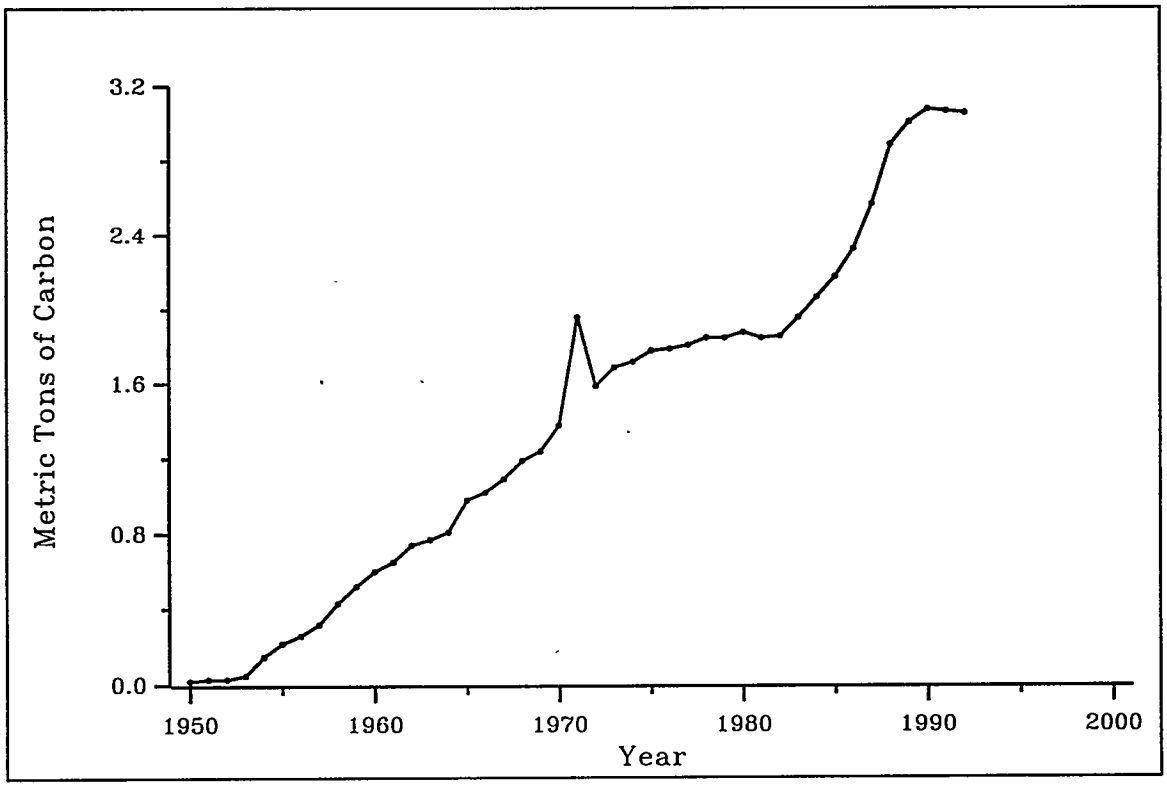
Kiribati

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1960	0	0	0	0	0	0	0.00	.
1961	2	0	2	0	0	0	0.04	.
1962	3	0	3	0	0	0	0.06	.
1963	5	0	5	0	0	0	0.12	.
1964	5	0	5	0	0	0	0.12	.
1965	3	0	3	0	0	0	0.08	.
1966	3	0	3	0	0	0	0.07	.
1967	6	0	6	0	0	0	0.13	.
1968	9	0	9	0	0	0	0.20	.
1969	3	0	3	0	0	0	0.07	.
1970	6	0	6	0	0	0	0.12	.
1971	8	0	8	0	0	0	0.17	.
1972	7	0	7	0	0	0	0.13	.
1973	10	0	10	0	0	0	0.19	.
1974	9	0	9	0	0	0	0.17	.
1975	9	0	9	0	0	0	0.17	.
1976	9	0	9	0	0	0	0.17	.
1977	6	0	6	0	0	0	0.11	.
1978	6	0	6	0	0	0	0.10	.
1979	7	0	7	0	0	0	0.12	.
1980	8	0	8	0	0	0	0.13	.
1981	8	0	8	0	0	0	0.13	.
1982	7	0	7	0	0	0	0.11	.
1983	6	0	6	0	0	0	0.10	.
1984	6	0	6	0	0	0	0.09	.
1985	6	0	6	0	0	0	0.09	.
1986	5	0	5	0	0	0	0.08	.
1987	6	0	6	0	0	0	0.09	.
1988	6	0	6	0	0	0	0.09	.
1989	6	0	6	0	0	0	0.08	.
1990	6	0	6	0	0	0	0.08	.
1991	6	0	6	0	0	0	0.08	.
1992	6	0	6	0	0	0	0.08	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Democratic People's Republic of Korea

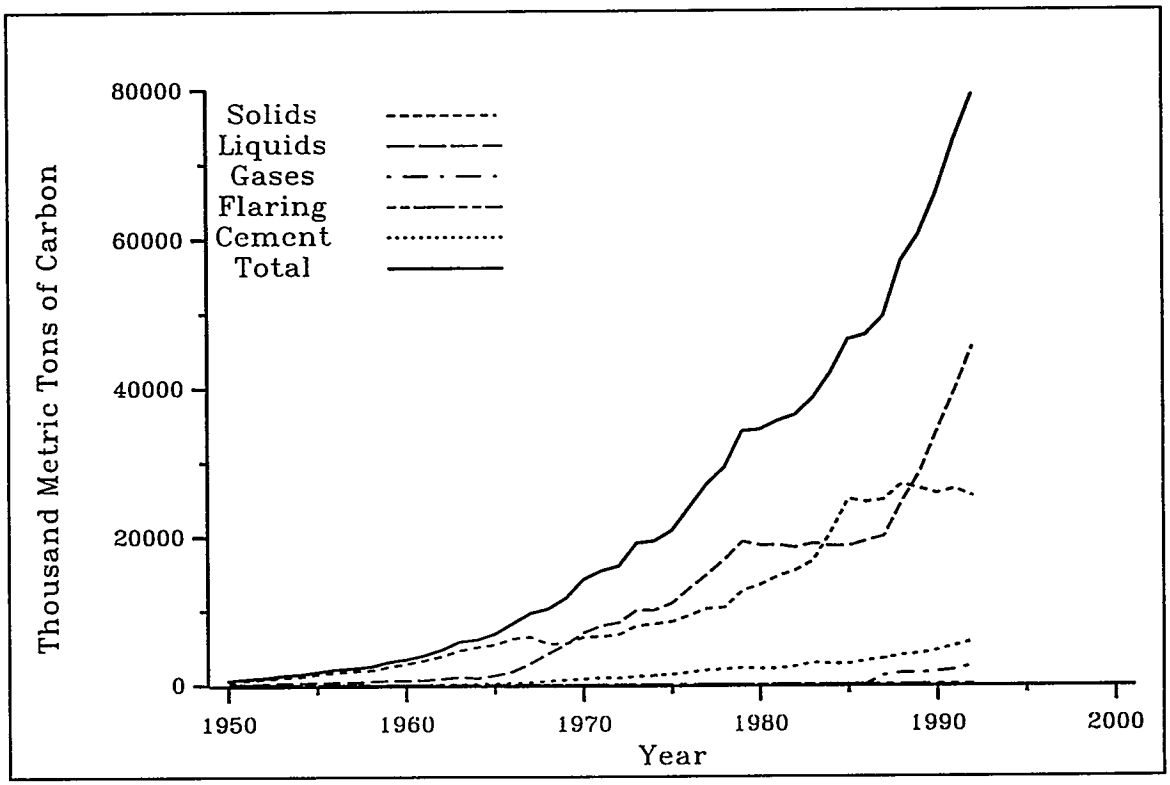


Per capita CO_2 emission rates for the Democratic People's Republic of Korea

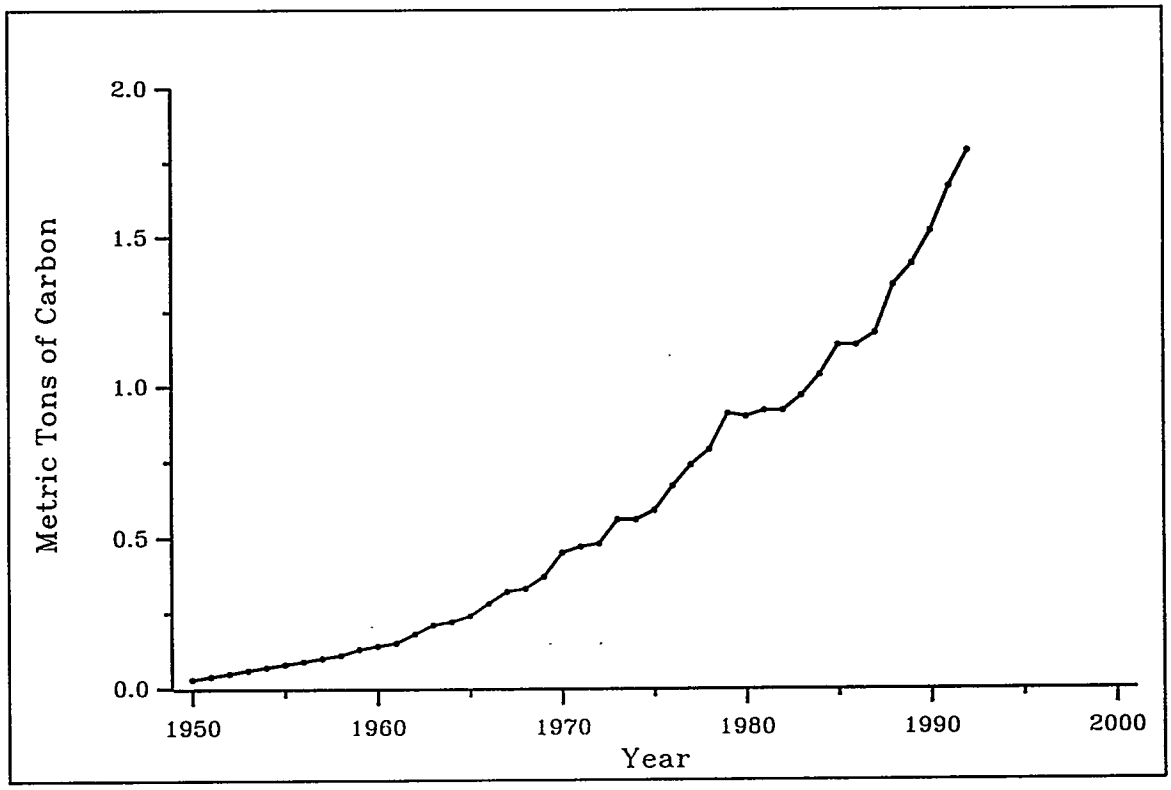
Democratic People's Republic of Korea

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	212	101	111	0	0	0	0.02	.
1951	271	134	116	0	21	0	0.03	.
1952	243	141	82	0	20	0	0.03	.
1953	473	338	95	0	41	0	0.05	.
1954	1309	1130	111	0	68	0	0.15	.
1955	2011	1850	112	0	49	0	0.22	.
1956	2455	2249	126	0	81	0	0.26	.
1957	3092	2830	140	0	122	0	0.32	.
1958	4286	3945	175	0	167	0	0.43	.
1959	5442	4992	188	0	262	0	0.52	.
1960	6520	6046	163	0	311	0	0.60	.
1961	7242	6700	234	0	308	0	0.65	.
1962	8419	7773	322	0	323	0	0.74	.
1963	9008	8320	343	0	344	0	0.77	.
1964	9790	9111	324	0	355	0	0.81	.
1965	12167	11543	298	0	326	0	0.98	.
1966	13091	12450	301	0	340	0	1.02	.
1967	14410	13707	349	0	353	0	1.09	.
1968	16304	15381	557	0	367	0	1.19	.
1969	17627	16643	603	0	381	0	1.24	.
1970	20173	18945	682	0	545	0	1.38	.
1971	29546	28320	572	0	654	0	1.96	.
1972	24580	23262	602	0	716	0	1.59	.
1973	26733	25303	640	0	790	0	1.69	.
1974	27898	26247	837	0	814	0	1.72	.
1975	29536	27615	971	0	950	0	1.78	.
1976	30212	28324	938	0	950	0	1.79	.
1977	31225	29268	1006	0	952	0	1.81	.
1978	32563	30079	1532	0	952	0	1.85	.
1979	33139	30301	1750	0	1088	0	1.85	.
1980	34269	31222	1959	0	1088	0	1.88	.
1981	34376	31203	2085	0	1088	0	1.85	.
1982	35099	31845	2168	0	1086	0	1.86	.
1983	37637	34299	2252	0	1086	0	1.96	.
1984	40515	37009	2420	0	1086	0	2.07	.
1985	43429	39757	2587	0	1086	0	2.18	.
1986	47197	42980	3131	0	1086	0	2.33	.
1987	52854	47522	4111	0	1221	0	2.57	.
1988	60535	55067	3864	0	1604	0	2.89	.
1989	64233	58144	3868	0	2221	0	3.01	.
1990	67117	61221	3676	0	2221	0	3.08	.
1991	68109	62338	3550	0	2221	0	3.07	.
1992	69255	63528	3382	0	2344	0	3.06	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Republic of Korea

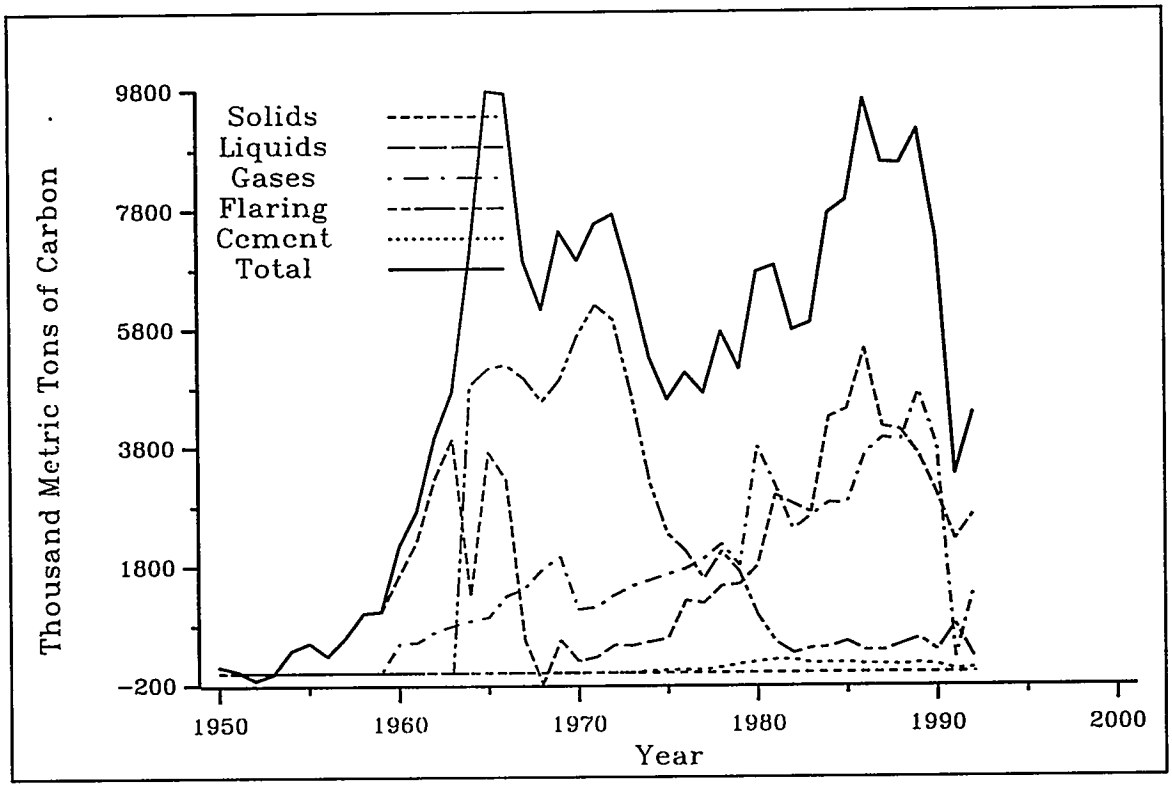


Per capita CO_2 emission rates for the Republic of Korea

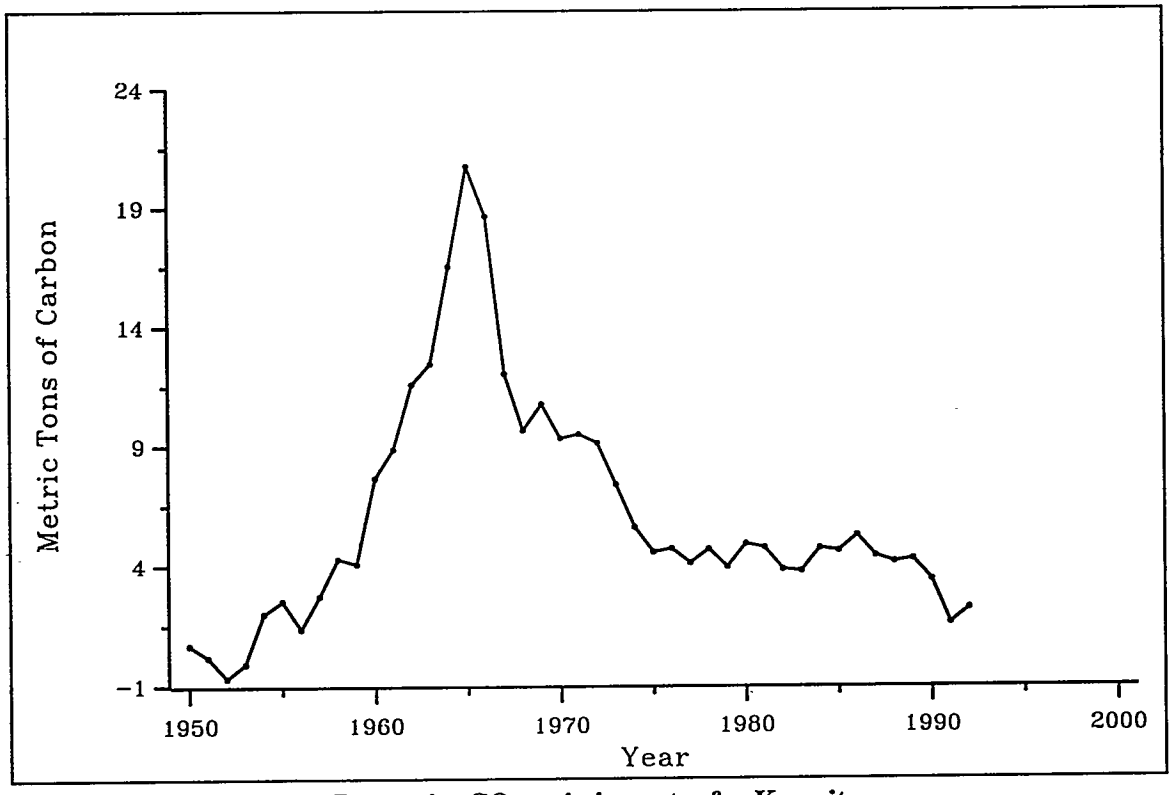
Republic of Korea

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	601	464	136	0	2	0	0.03	.
1951	806	653	152	0	1	0	0.04	.
1952	953	768	181	0	5	0	0.05	.
1953	1292	1011	275	0	6	0	0.06	.
1954	1421	1123	290	0	8	0	0.07	.
1955	1775	1462	306	0	8	0	0.08	.
1956	2082	1683	392	0	6	0	0.09	.
1957	2263	1850	401	0	13	0	0.10	.
1958	2482	1980	461	0	40	0	0.11	.
1959	3091	2456	587	0	49	0	0.13	.
1960	3455	2827	569	0	59	0	0.14	.
1961	3982	3286	625	0	71	0	0.15	.
1962	4757	3843	806	0	107	0	0.18	.
1963	5809	4631	1072	0	106	0	0.21	.
1964	6118	5062	887	0	169	0	0.22	.
1965	6882	5422	1241	0	220	0	0.24	.
1966	8256	6220	1781	0	256	0	0.28	.
1967	9660	6464	2864	0	332	0	0.32	.
1968	10220	5535	4199	0	486	0	0.33	.
1969	11660	5531	5472	0	657	0	0.37	.
1970	14230	6429	7009	0	792	0	0.45	.
1971	15382	6500	7947	0	935	0	0.47	.
1972	16010	6770	8358	0	882	0	0.48	.
1973	19085	7941	10032	0	1112	0	0.56	.
1974	19381	8156	10023	0	1203	0	0.56	.
1975	20809	8471	10960	0	1378	0	0.59	.
1976	23896	9332	12950	0	1615	0	0.67	.
1977	27014	10233	14850	0	1931	0	0.74	.
1978	29286	10371	16857	0	2058	0	0.79	.
1979	34118	12630	19256	0	2232	0	0.91	.
1980	34312	13414	18774	0	2123	0	0.90	.
1981	35433	14546	18764	0	2124	0	0.92	.
1982	36258	15359	18466	0	2433	0	0.92	.
1983	38517	16640	18982	0	2894	0	0.97	.
1984	41901	20449	18676	0	2776	0	1.04	.
1985	46371	24958	18635	0	2778	0	1.14	.
1986	47059	24532	19305	39	3183	0	1.14	.
1987	49488	24853	19963	1182	3490	0	1.18	.
1988	56897	26939	24485	1530	3943	0	1.34	.
1989	60409	26395	28391	1478	4145	0	1.41	.
1990	65995	25687	34039	1699	4570	0	1.52	.
1991	73015	26336	39496	1969	5214	0	1.67	.
1992	79103	25276	45453	2575	5799	0	1.79	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Kuwait



Per capita CO_2 emission rates for Kuwait

Kuwait

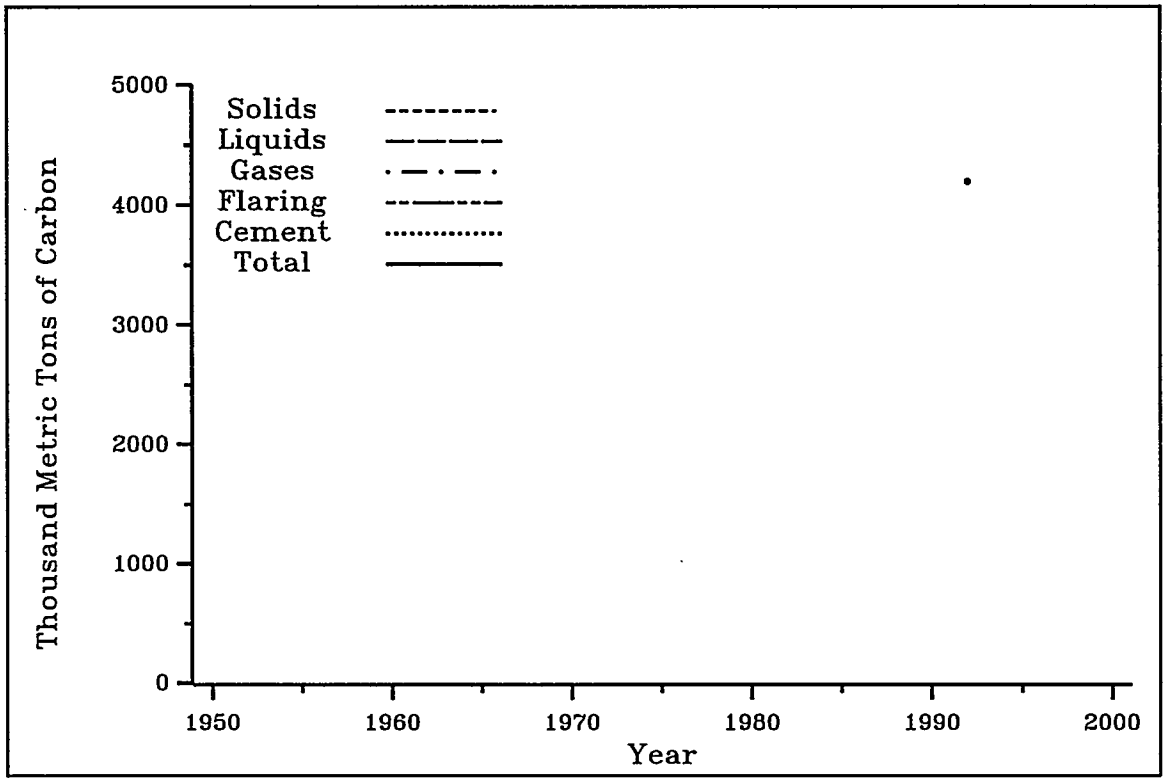
Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	105	0	105	0	0	0	0.69	.
1951	32	0	32	0	0	0	0.19	.
1952	-119	0	-119	0	0	0	-0.68	.
1953	-14	0	-14	0	0	0	-0.08	.
1954	383	0	383	0	0	0	2.00	.
1955	504	0	504	0	0	0	2.53	.
1956	284	0	284	0	0	0	1.36	.
1957	600	0	600	0	0	0	2.73	.
1958	1007	0	1007	0	0	0	4.29	.
1959	1037	0	1037	0	0	0	4.08	.
1960	2128	0	1635	493	0	0	7.66	.
1961	2722	0	2208	514	0	0	8.87	.
1962	3955	0	3261	694	0	0	11.60	.
1963	4738	0	3943	796	0	0	12.47	.
1964	7012	0	1287	878	0	4847	16.54	.
1965	9785	0	3717	940	0	5128	20.77	.
1966	9744	0	3247	1300	0	5197	18.67	.
1967	6938	0	553	1419	0	4967	12.05	.
1968	6130	0	-188	1749	0	4569	9.68	.
1969	7440	0	551	1953	0	4937	10.78	.
1970	6950	0	198	1069	0	5684	9.34	.
1971	7568	0	261	1105	0	6202	9.51	.
1972	7721	0	466	1306	0	5950	9.14	.
1973	6617	0	457	1462	0	4697	7.40	.
1974	5313	0	520	1558	31	3203	5.61	.
1975	4606	0	577	1660	39	2331	4.57	.
1976	5057	0	1216	1752	45	2043	4.71	.
1977	4715	0	1172	1917	45	1582	4.11	.
1978	5745	0	1459	2162	85	2039	4.69	.
1979	5124	0	1489	1799	141	1695	3.94	.
1980	6752	0	1797	3806	178	971	4.91	.
1981	6857	0	2987	3144	211	515	4.76	.
1982	5774	0	2835	2402	211	326	3.84	.
1983	5893	0	2693	2638	153	409	3.77	.
1984	7736	0	4294	2855	161	426	4.73	.
1985	7952	0	4429	2837	162	523	4.62	.
1986	9630	0	5453	3672	138	367	5.27	.
1987	8583	0	4134	3943	138	367	4.41	.
1988	8570	0	4076	3901	121	472	4.16	.
1989	9125	0	3660	4736	151	577	4.28	.
1990	7313	0	3011	3813	122	367	3.41	.
1991	3334	0	2232	248	41	813	1.60	.
1992	4359	0	2657	1373	68	263	2.21	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.

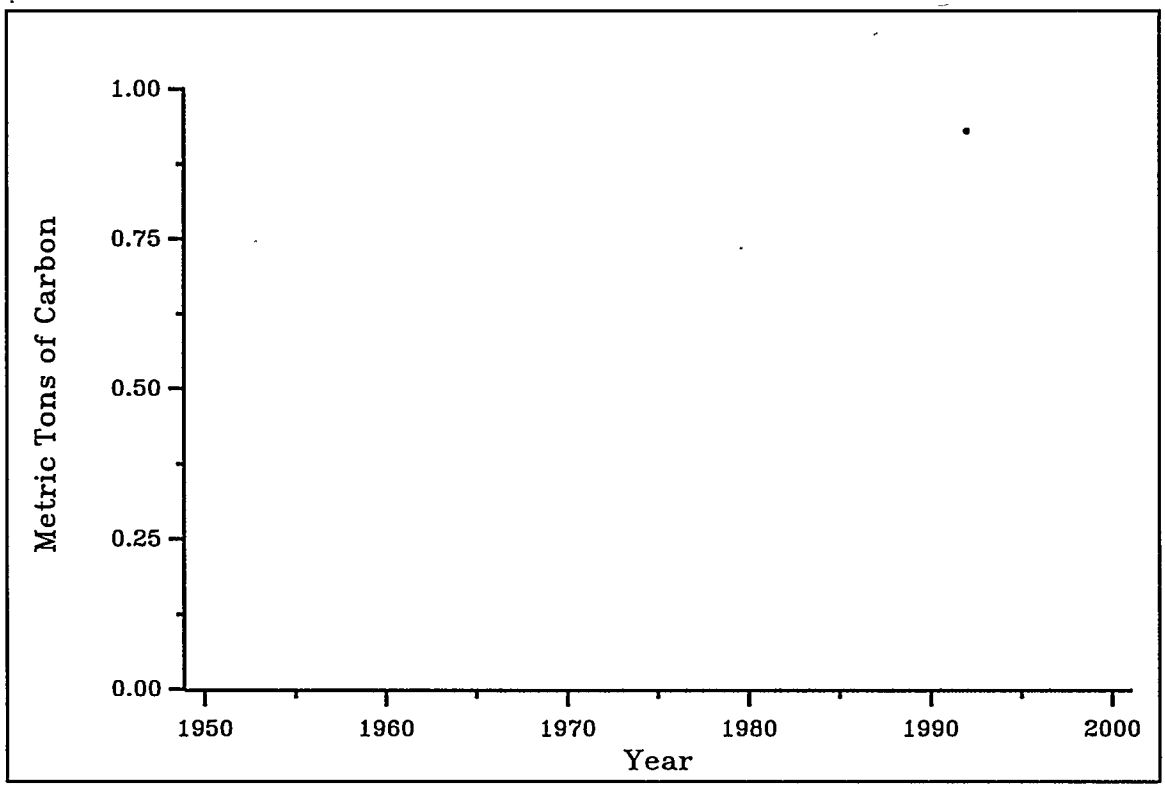
Kuwaiti Oil Fires of 1991

	Carbon dioxide emissions (thousand metric tons of carbon)						Per capita CO_2 emissions (metric tons of carbon)	
Year	Total	Solid	Liquid	Gas	Cement	Gas flaring		Bunkers[a]
1991	130438	0	123118	0	0	7320	.	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Kyrgyzstan

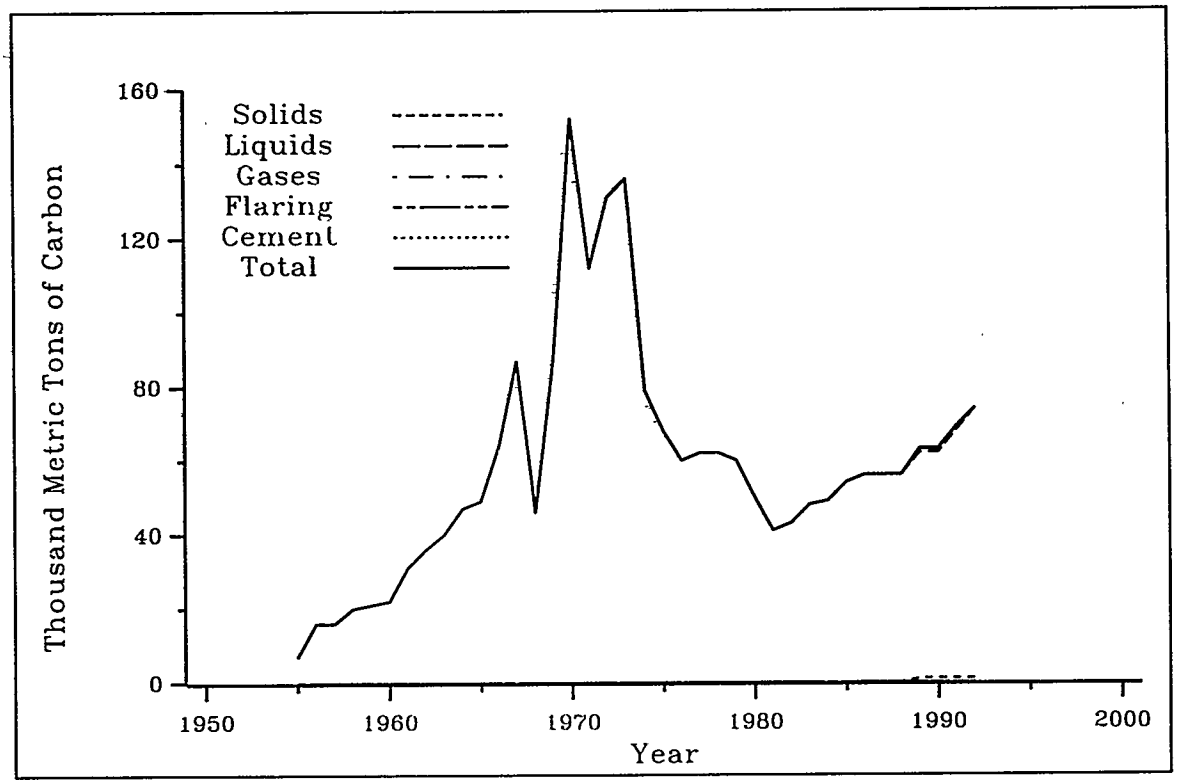


Per capita CO_2 emission rates for Kyrgyzstan

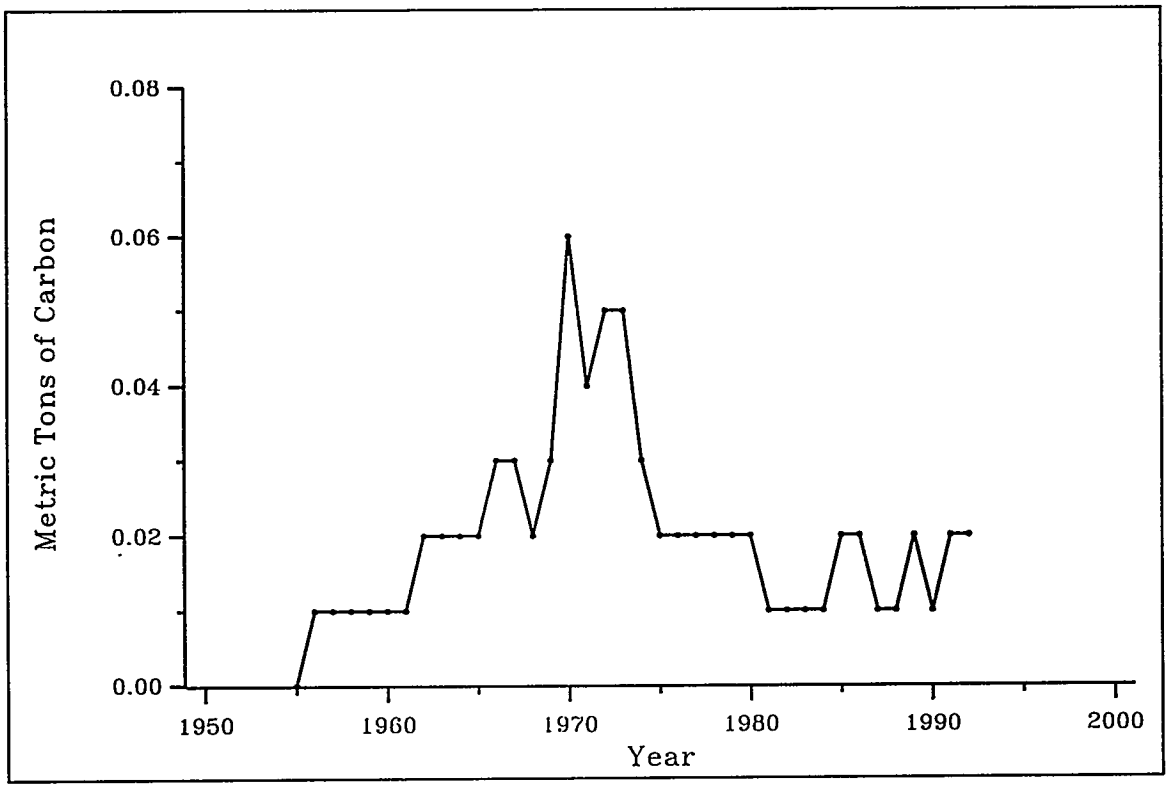
Kyrgyzstan

	Carbon dioxide emissions (thousand metric tons of carbon)						Per capita CO_2 emissions (metric tons of carbon)	
Year	Total	Solid	Liquid	Gas	Cement	Gas flaring		Bunkers[a]
1992	4196	1824	1254	983	136	0	0.93	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the People's Democratic Republic of Lao

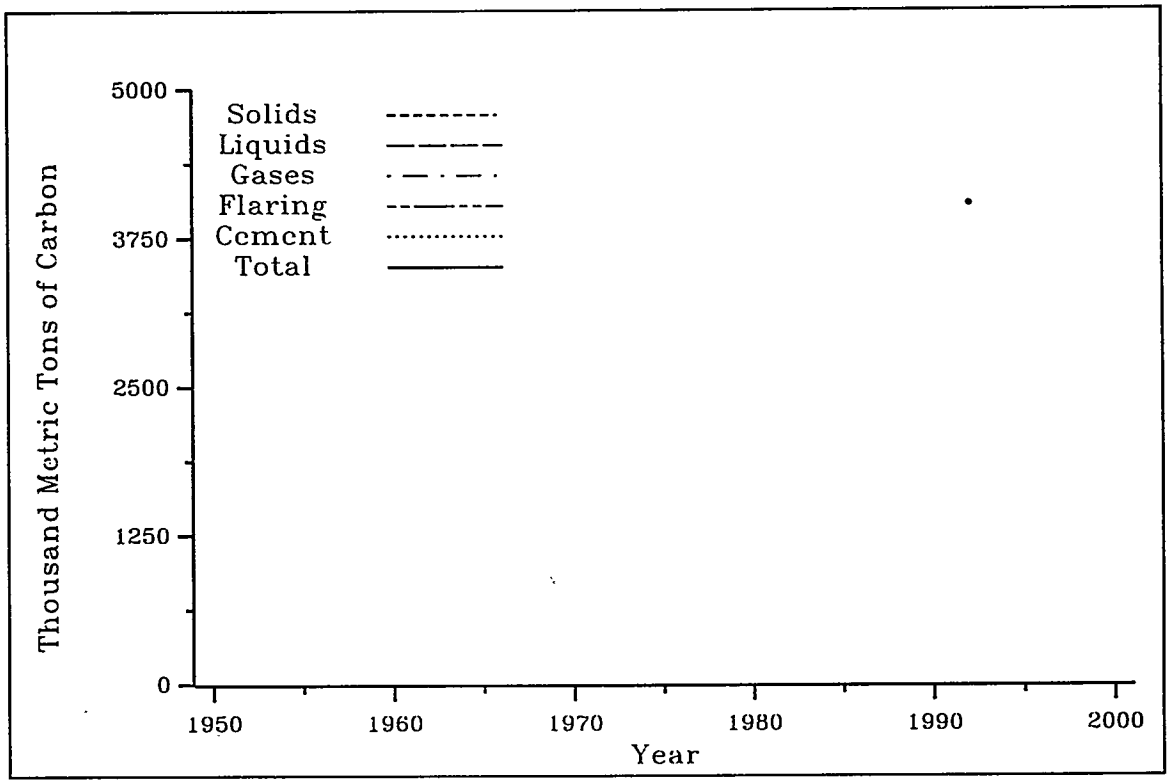


Per capita CO_2 emission rates for the People's Democratic Republic of Lao

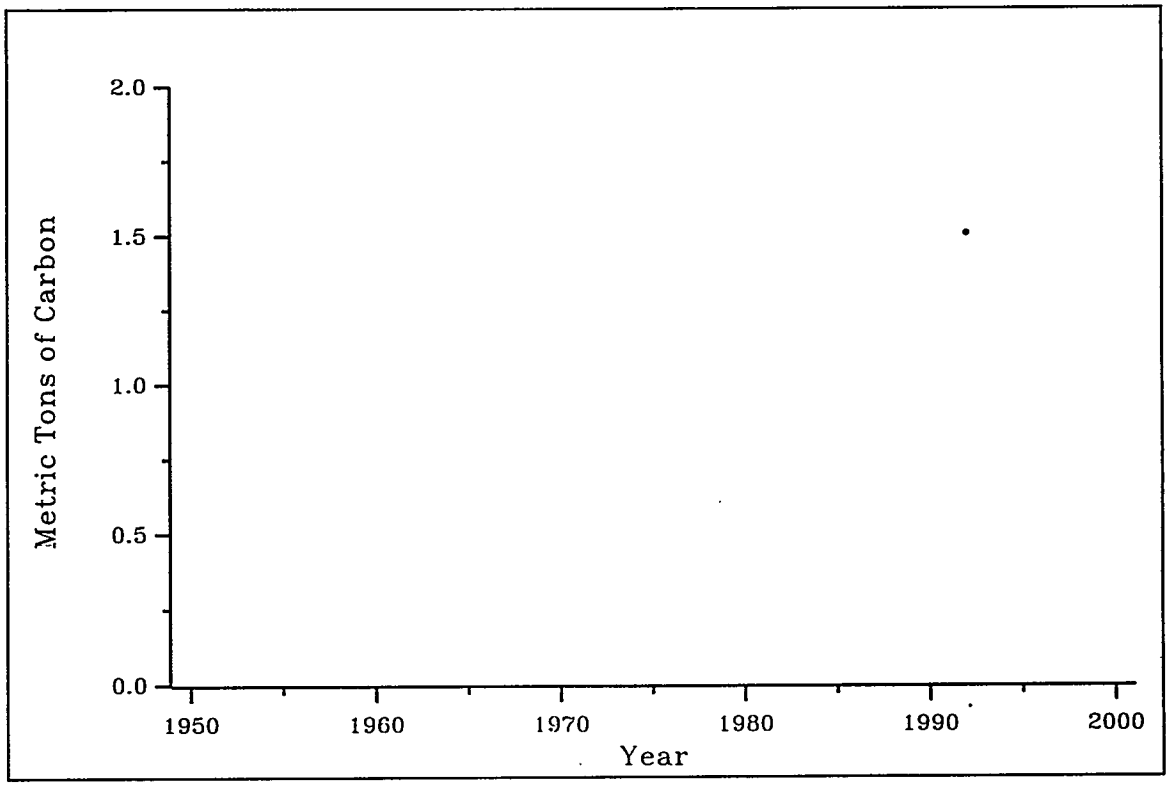
People's Democratic Republic of Lao

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1955	7	0	7	0	0	0	0.00	.
1956	16	0	16	0	0	0	0.01	.
1957	16	0	16	0	0	0	0.01	.
1958	20	0	20	0	0	0	0.01	.
1959	21	0	21	0	0	0	0.01	.
1960	22	0	22	0	0	0	0.01	.
1961	31	0	31	0	0	0	0.01	.
1962	36	0	36	0	0	0	0.02	.
1963	40	0	40	0	0	0	0.02	.
1964	47	0	47	0	0	0	0.02	.
1965	49	0	49	0	0	0	0.02	.
1966	64	0	64	0	0	0	0.03	.
1967	87	0	87	0	0	0	0.03	.
1968	46	0	46	0	0	0	0.02	.
1969	87	0	87	0	0	0	0.03	.
1970	152	0	152	0	0	0	0.06	.
1971	112	0	112	0	0	0	0.04	.
1972	131	0	131	0	0	0	0.05	.
1973	136	0	136	0	0	0	0.05	.
1974	79	0	79	0	0	0	0.03	.
1975	68	0	68	0	0	0	0.02	.
1976	60	0	60	0	0	0	0.02	.
1977	62	0	62	0	0	0	0.02	.
1978	62	0	62	0	0	0	0.02	.
1979	60	0	60	0	0	0	0.02	.
1980	50	0	50	0	0	0	0.02	.
1981	41	0	41	0	0	0	0.01	.
1982	43	0	43	0	0	0	0.01	.
1983	48	0	48	0	0	0	0.01	.
1984	49	0	49	0	0	0	0.01	.
1985	54	0	54	0	0	0	0.02	.
1986	56	0	56	0	0	0	0.02	.
1987	56	0	56	0	0	0	0.01	.
1988	56	0	56	0	0	0	0.01	.
1989	63	1	62	0	0	0	0.02	.
1990	63	1	62	0	0	0	0.01	.
1991	69	1	68	0	0	0	0.02	.
1992	74	1	74	0	0	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Latvia

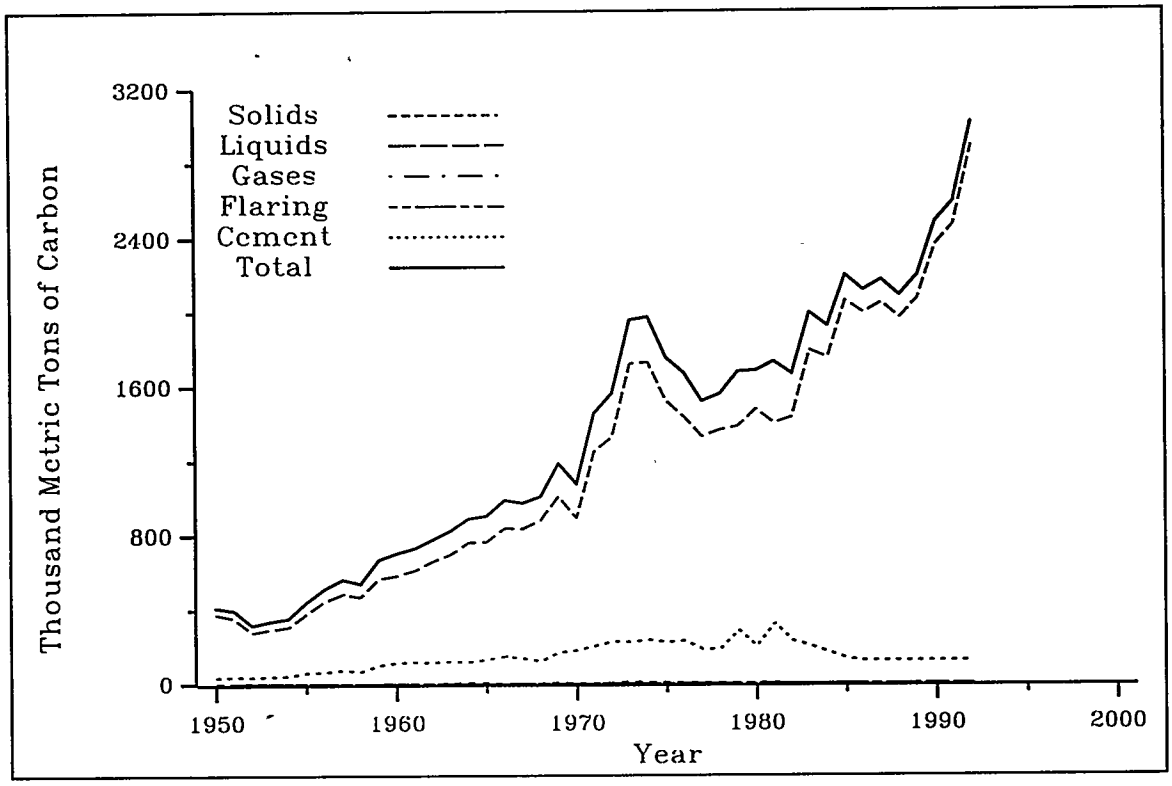


Per capita CO_2 emission rates for Latvia

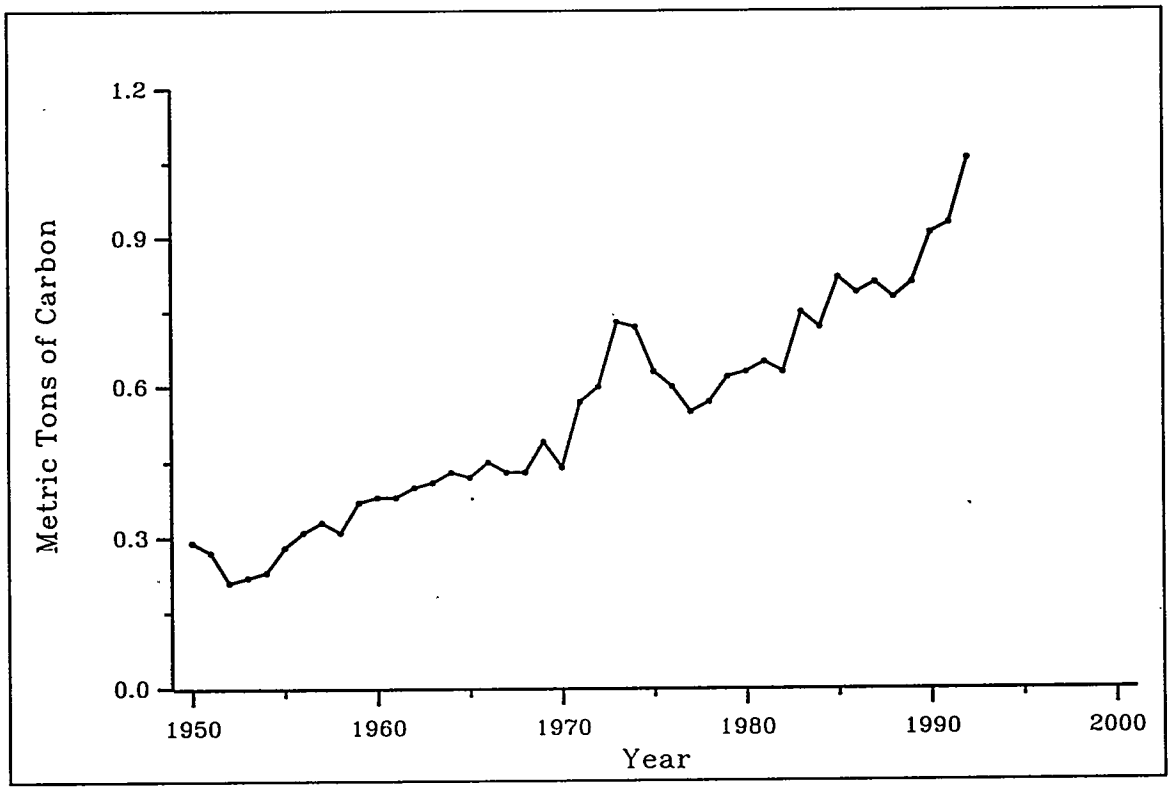
Latvia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	4034	467	2083	1430	54	0	1.51	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Lebanon

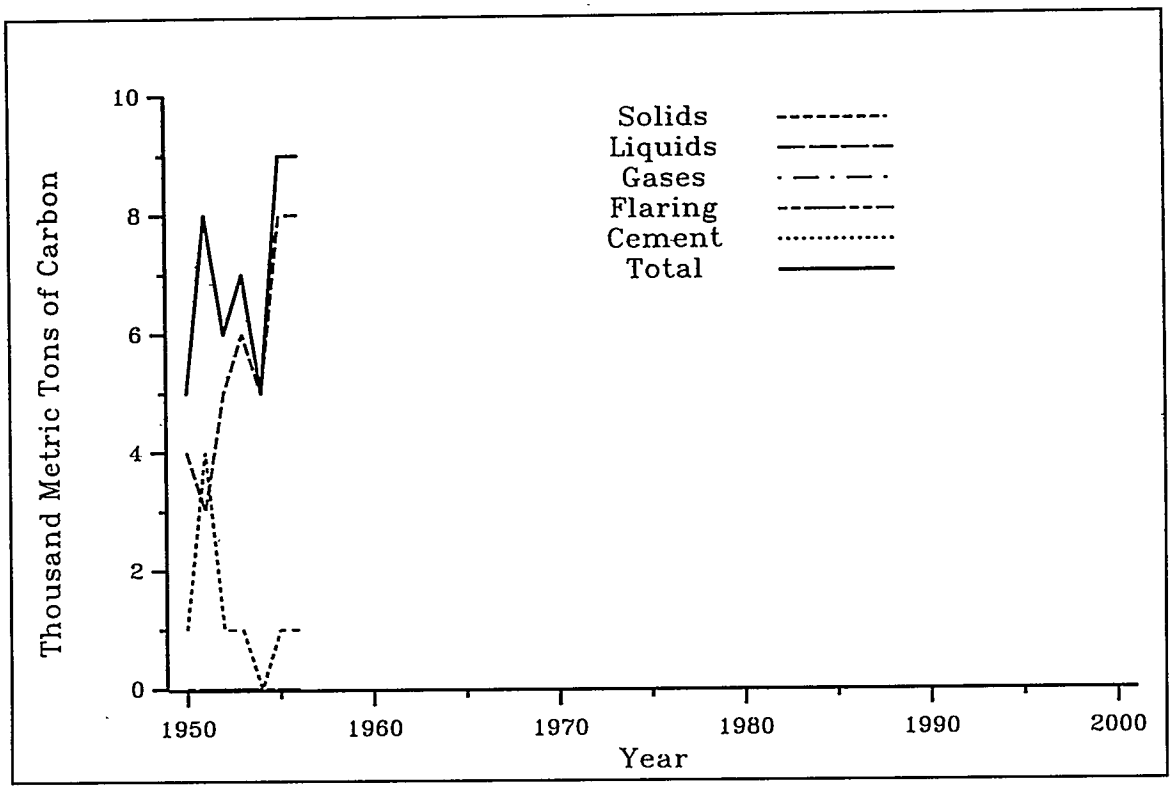


Per capita CO_2 emission rates for Lebanon

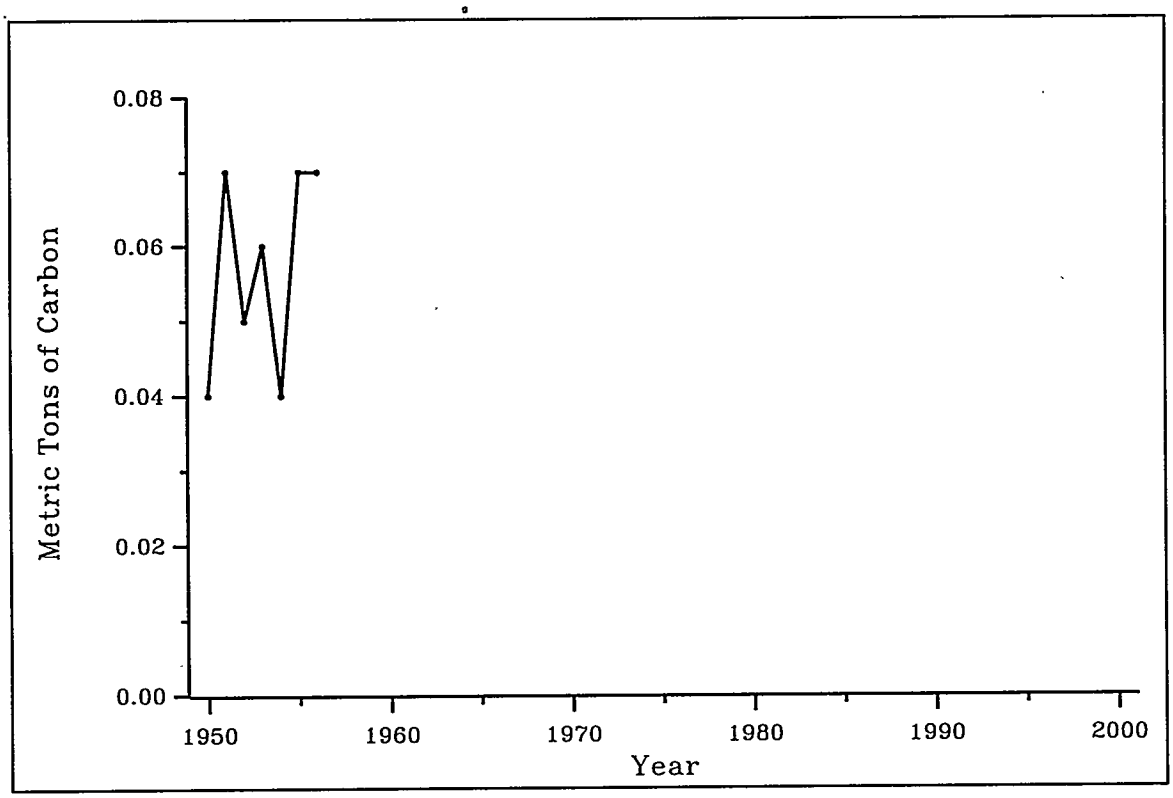
Lebanon

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	413	1	377	0	36	0	0.29	.
1951	399	1	357	0	41	0	0.27	.
1952	320	3	279	0	39	0	0.21	.
1953	341	3	297	0	42	0	0.22	.
1954	357	2	309	0	46	0	0.23	.
1955	444	1	381	0	62	0	0.28	.
1956	516	2	448	0	66	0	0.31	.
1957	565	2	486	0	76	0	0.33	.
1958	542	2	471	0	69	0	0.31	.
1959	670	2	567	0	101	0	0.37	.
1960	705	3	585	0	116	0	0.38	.
1961	733	1	613	0	119	0	0.38	.
1962	780	2	661	0	117	0	0.40	.
1963	827	6	699	0	122	0	0.41	.
1964	892	8	764	0	120	0	0.43	.
1965	905	7	767	0	132	0	0.42	.
1966	991	3	839	0	149	0	0.45	.
1967	975	1	836	0	138	0	0.43	.
1968	1010	3	883	0	123	0	0.43	.
1969	1188	7	1011	0	170	0	0.49	.
1970	1078	3	893	0	182	0	0.44	.
1971	1457	3	1250	0	204	0	0.57	.
1972	1563	5	1330	0	229	0	0.60	.
1973	1957	11	1721	0	226	0	0.73	.
1974	1973	7	1729	0	237	0	0.72	.
1975	1755	7	1522	0	225	0	0.63	.
1976	1671	4	1435	0	232	0	0.60	.
1977	1520	4	1331	0	185	0	0.55	.
1978	1558	4	1366	0	188	0	0.57	.
1979	1678	4	1386	0	289	0	0.62	.
1980	1684	4	1478	0	202	0	0.63	.
1981	1732	4	1402	0	325	0	0.65	.
1982	1667	2	1434	0	231	0	0.63	.
1983	1996	0	1792	0	204	0	0.75	.
1984	1923	0	1753	0	170	0	0.72	.
1985	2197	0	2061	0	136	0	0.82	.
1986	2116	0	1993	0	123	0	0.79	.
1987	2172	0	2049	0	123	0	0.81	.
1988	2088	0	1965	0	123	0	0.78	.
1989	2196	0	2072	0	123	0	0.81	.
1990	2483	0	2359	0	123	0	0.91	.
1991	2592	0	2468	0	123	0	0.93	.
1992	3016	0	2893	0	123	0	1.06	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Leeward Islands

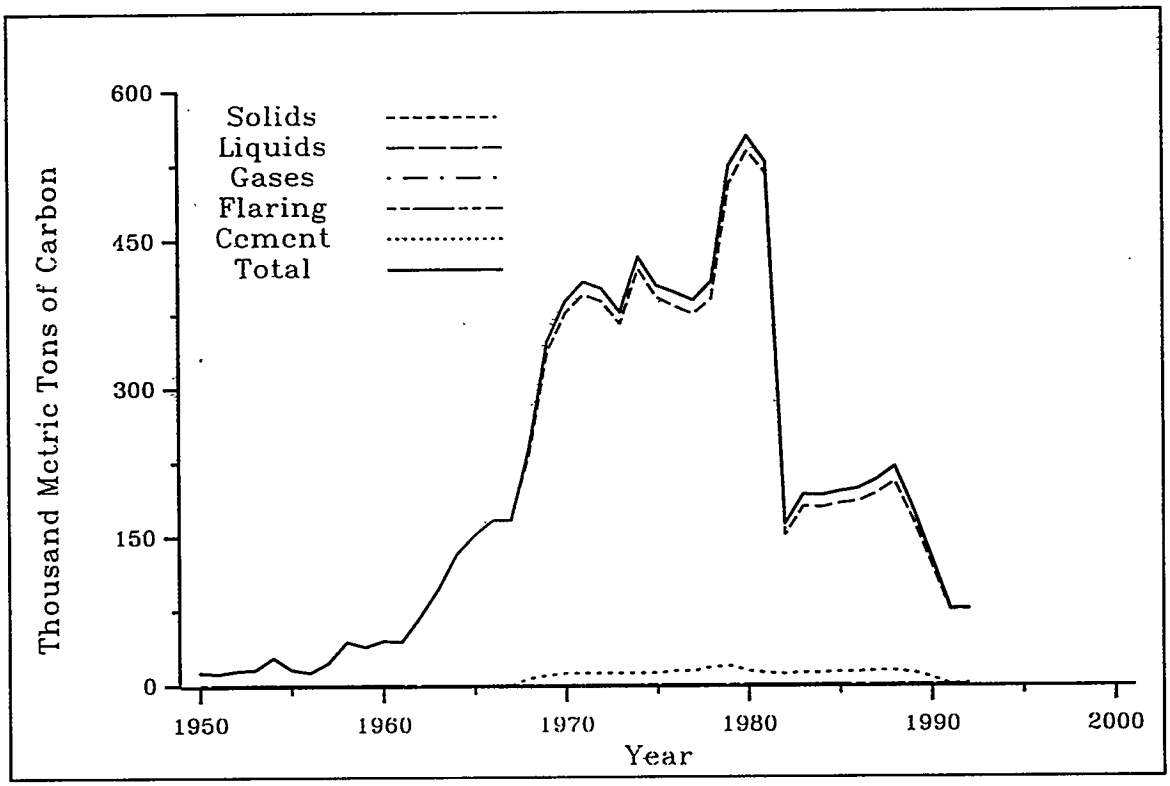


Per capita CO_2 emission rates for the Leeward Islands

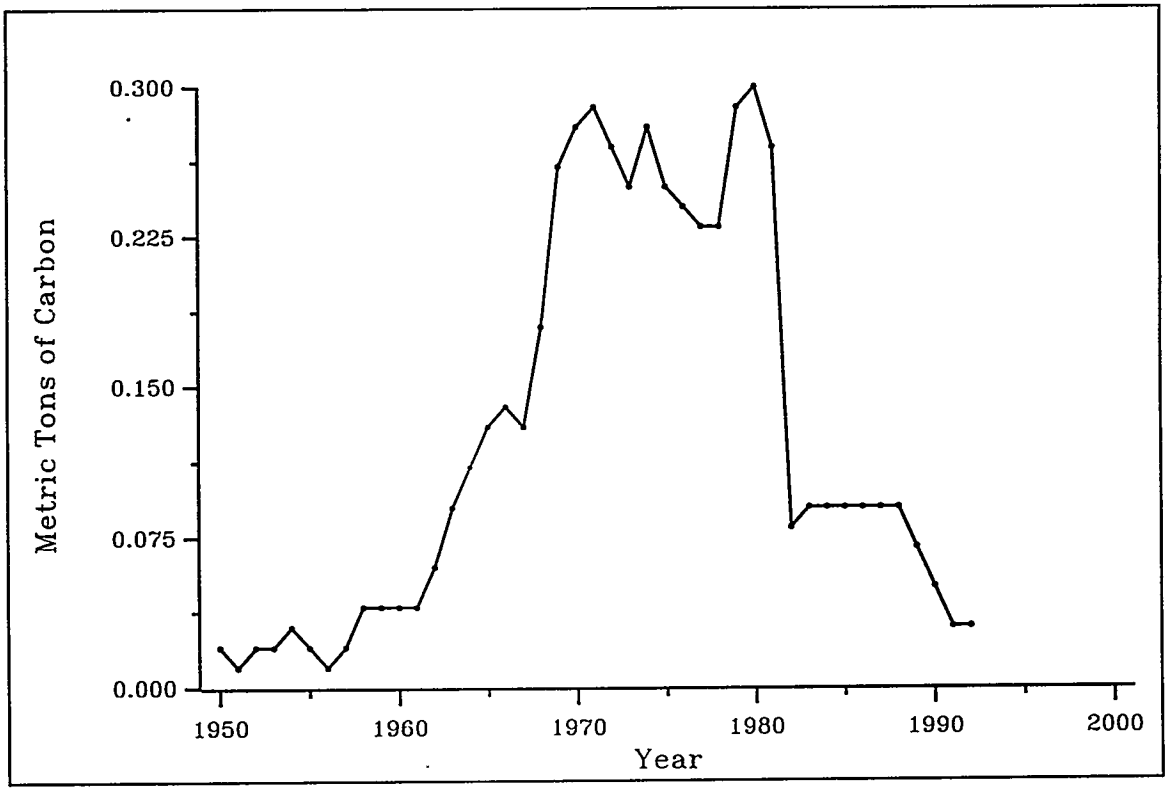
Leeward Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	5	1	4	0	0	0	0.04	.
1951	8	4	3	0	0	0	0.07	.
1952	6	1	5	0	0	0	0.05	.
1953	7	1	6	0	0	0	0.06	.
1954	5	0	5	0	0	0	0.04	.
1955	9	1	8	0	0	0	0.07	.
1956	9	1	8	0	0	0	0.07	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Liberia

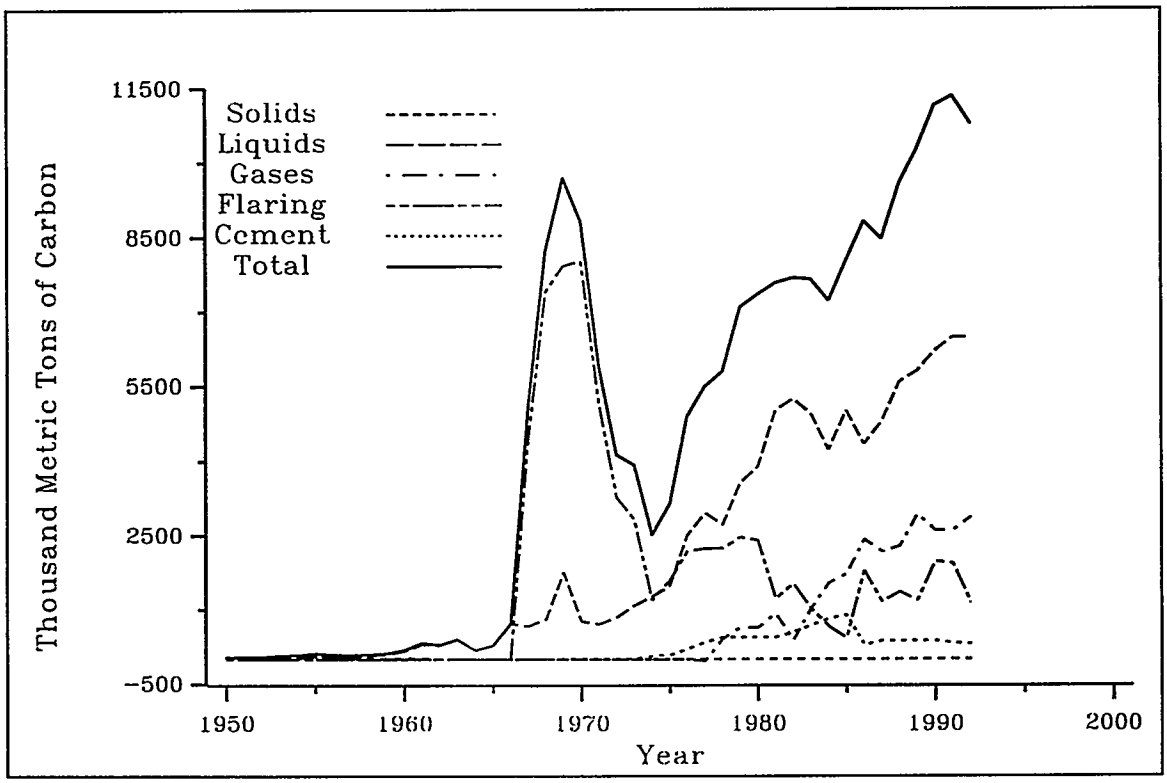


Per capita CO_2 emission rates for Liberia

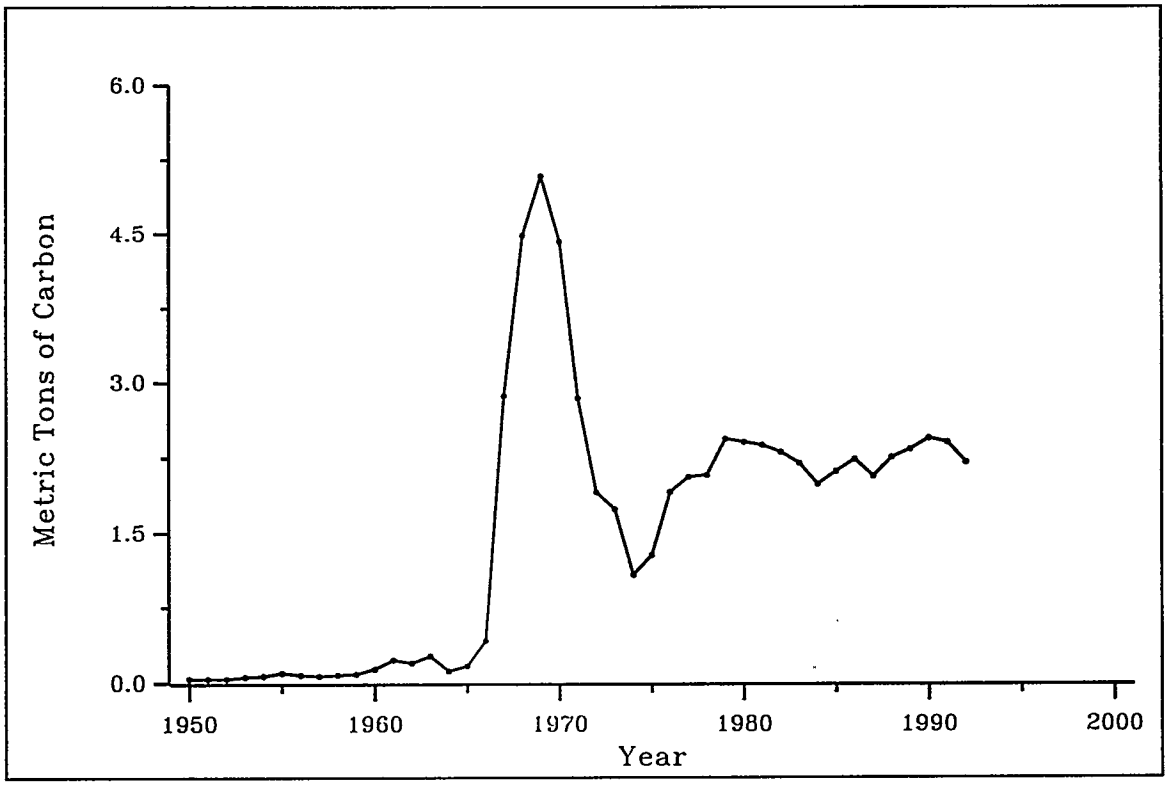
Liberia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	13	0	13	0	0	0	0.02	.
1951	12	0	12	0	0	0	0.01	.
1952	15	0	15	0	0	0	0.02	.
1953	16	0	16	0	0	0	0.02	.
1954	28	0	28	0	0	0	0.03	.
1955	16	0	16	0	0	0	0.02	.
1956	13	0	13	0	0	0	0.01	.
1957	23	0	23	0	0	0	0.02	.
1958	44	0	44	0	0	0	0.04	.
1959	39	0	39	0	0	0	0.04	.
1960	45	0	45	0	0	0	0.04	.
1961	44	0	44	0	0	0	0.04	.
1962	69	0	69	0	0	0	0.06	.
1963	97	0	97	0	0	0	0.09	.
1964	132	0	132	0	0	0	0.11	.
1965	152	0	152	0	0	0	0.13	.
1966	167	0	167	0	0	0	0.14	.
1967	167	0	167	0	0	0	0.13	.
1968	240	0	234	0	7	0	0.18	.
1969	347	0	337	0	10	0	0.26	.
1970	388	0	376	0	12	0	0.28	.
1971	408	0	395	0	12	0	0.29	.
1972	401	0	388	0	12	0	0.27	.
1973	377	0	365	0	12	0	0.25	.
1974	433	0	421	0	12	0	0.28	.
1975	404	0	392	0	12	0	0.25	.
1976	397	0	383	0	14	0	0.24	.
1977	389	0	375	0	14	0	0.23	.
1978	408	0	390	0	18	0	0.23	.
1979	524	0	506	0	19	0	0.29	.
1980	554	0	539	0	14	0	0.30	.
1981	528	0	517	0	12	0	0.27	.
1982	162	0	151	0	11	0	0.08	.
1983	192	0	180	0	12	0	0.09	.
1984	191	0	179	0	12	0	0.09	.
1985	195	0	183	0	13	0	0.09	.
1986	198	0	185	0	13	0	0.09	.
1987	207	0	193	0	14	0	0.09	.
1988	220	0	205	0	14	0	0.09	.
1989	177	0	166	0	12	0	0.07	.
1990	127	0	121	0	7	0	0.05	.
1991	76	0	75	0	0	0	0.03	.
1992	76	0	75	0	1	0	0.03	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Libyan Arab Jamahiriyah

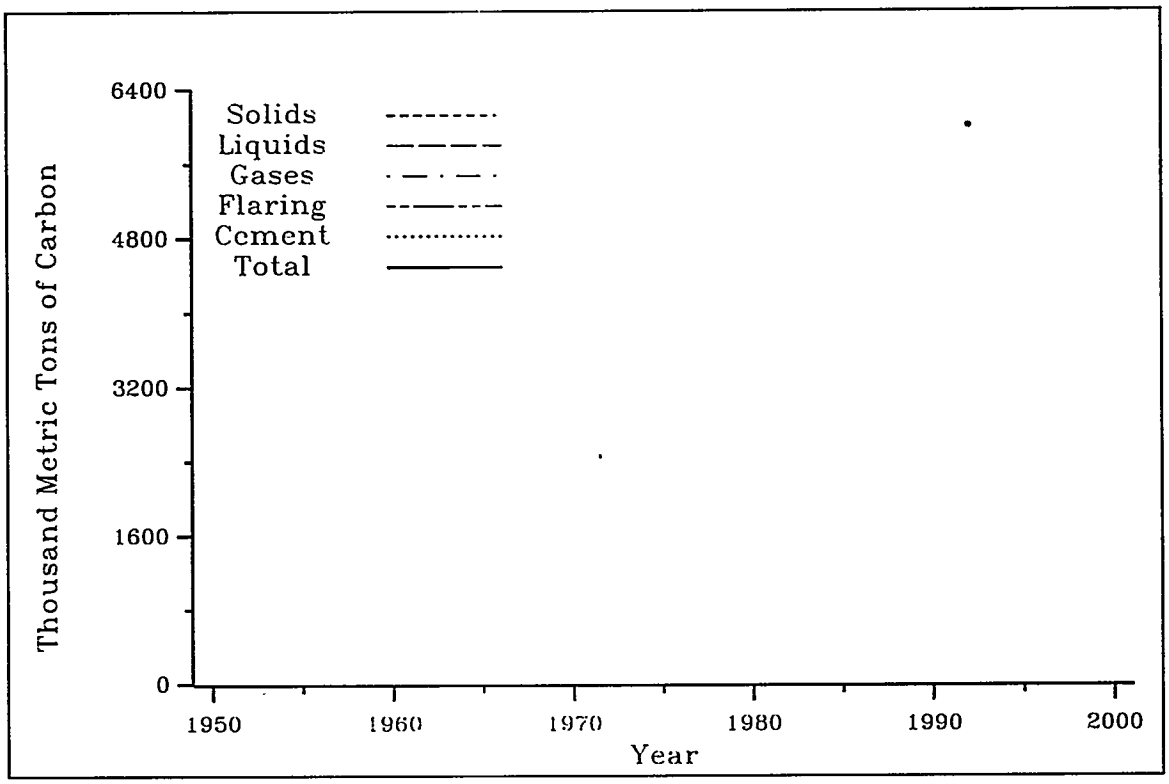


Per capita CO_2 emission rates for Libyan Arab Jamahiriyah

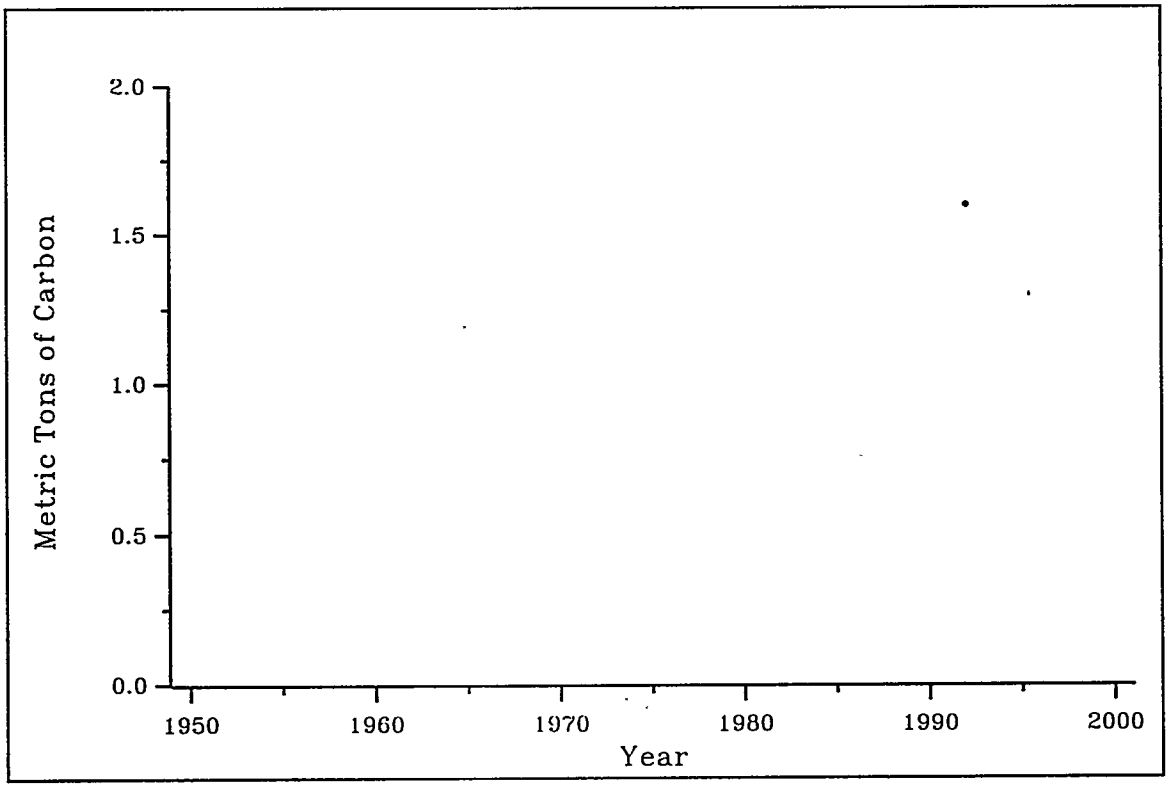
Libyan Arab Jamahiriyah

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	39	4	35	0	0	0	0.04	.
1951	46	4	42	0	0	0	0.04	.
1952	45	4	40	0	0	0	0.04	.
1953	68	7	61	0	0	0	0.06	.
1954	82	19	63	0	0	0	0.07	.
1955	118	55	63	0	0	0	0.10	.
1956	90	25	65	0	0	0	0.08	.
1957	85	22	63	0	0	0	0.07	.
1958	96	26	69	0	0	0	0.08	.
1959	118	23	95	0	0	0	0.09	.
1960	189	24	165	0	0	0	0.14	.
1961	327	28	299	0	0	0	0.23	.
1962	286	4	281	0	0	0	0.20	.
1963	399	7	393	0	0	0	0.27	.
1964	181	1	179	0	0	0	0.12	.
1965	277	5	272	0	0	0	0.17	.
1966	717	0	717	0	0	0	0.42	.
1967	5047	1	667	0	0	4378	2.87	.
1968	8219	3	809	0	0	7408	4.49	.
1969	9695	1	1758	0	9	7927	5.09	.
1970	8807	0	767	0	13	8027	4.43	.
1971	5891	1	707	0	10	5173	2.85	.
1972	4128	1	846	0	8	3273	1.91	.
1973	3916	0	1084	0	11	2821	1.74	.
1974	2520	0	1263	0	66	1192	1.08	.
1975	3136	0	1470	0	84	1582	1.28	.
1976	4886	0	2498	0	204	2183	1.91	.
1977	5483	0	2953	-40	340	2230	2.06	.
1978	5792	0	2714	408	435	2235	2.08	.
1979	7089	0	3557	638	435	2460	2.44	.
1980	7347	1	3884	633	435	2394	2.41	.
1981	7578	1	5008	916	435	1217	2.38	.
1982	7681	1	5236	379	543	1523	2.31	.
1983	7653	1	4942	1018	679	1013	2.20	.
1984	7222	1	4215	1533	814	659	1.99	.
1985	8028	1	5000	1719	888	420	2.12	.
1986	8817	1	4333	2415	282	1785	2.24	.
1987	8466	1	4776	2167	367	1155	2.07	.
1988	9578	1	5574	2277	370	1354	2.26	.
1989	10268	3	5796	2918	370	1181	2.34	.
1990	11145	4	6204	2599	370	1969	2.45	.
1991	11335	4	6479	2599	322	1932	2.41	.
1992	10786	4	6474	2866	308	1134	2.21	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Lithuania

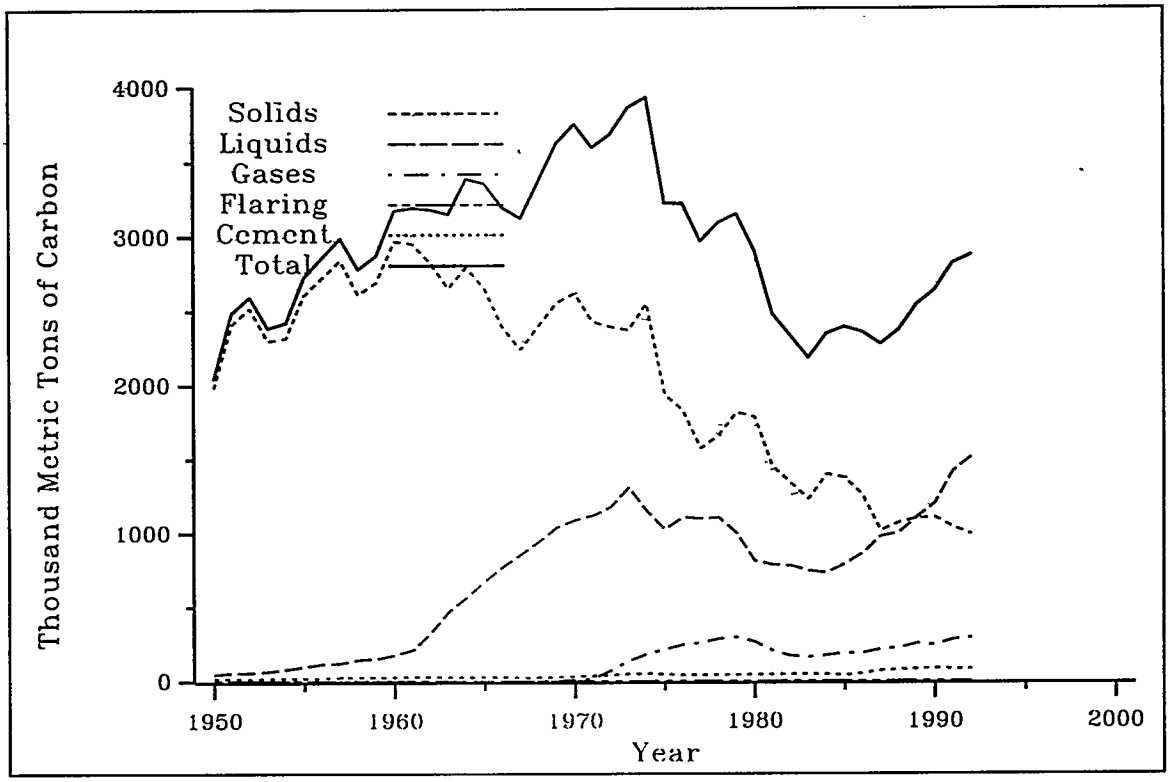


Per capita CO_2 emission rates for Lithuania

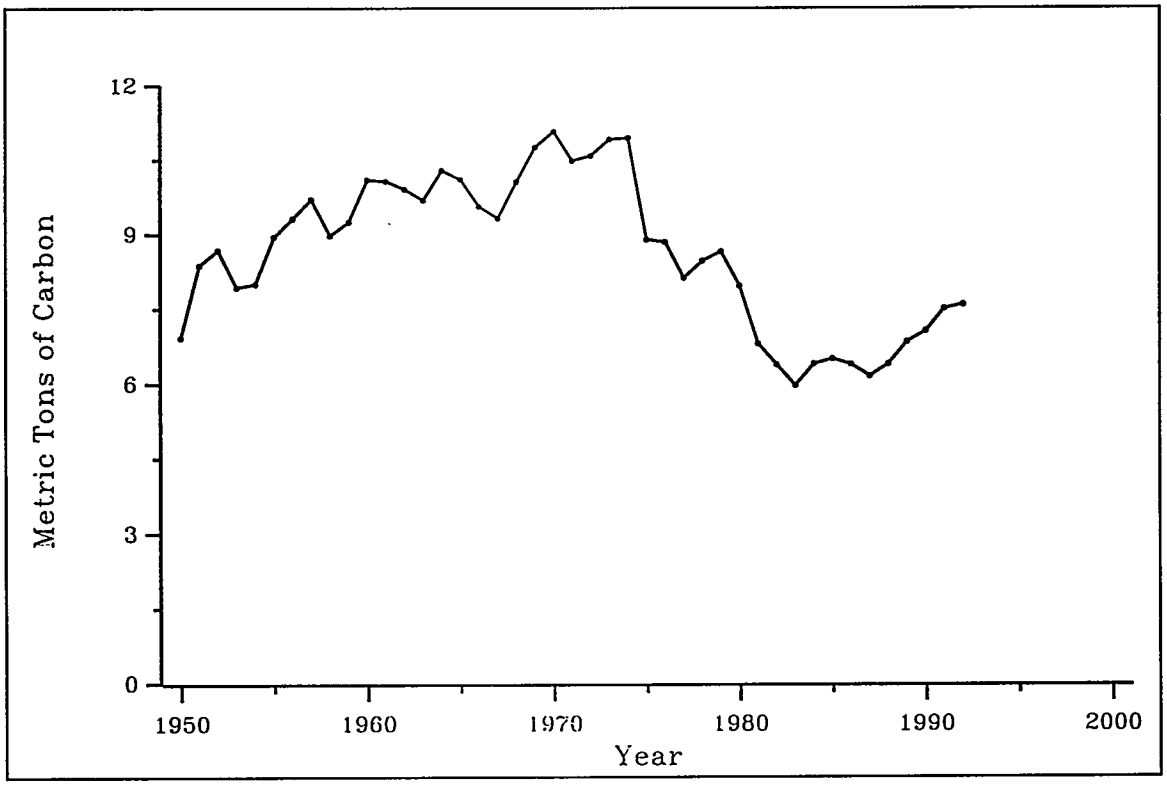
Lithuania

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	6006	505	3429	1801	271	0	1.60	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Luxembourg

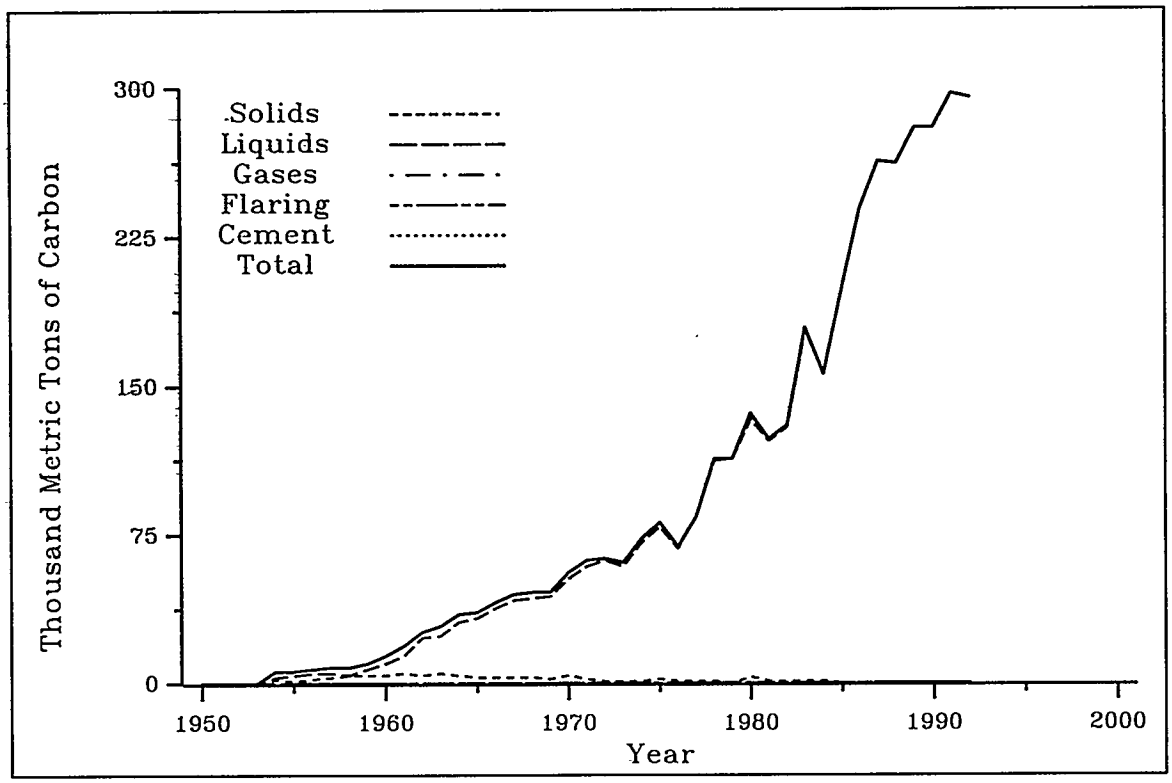


Per capita CO_2 emission rates for Luxembourg

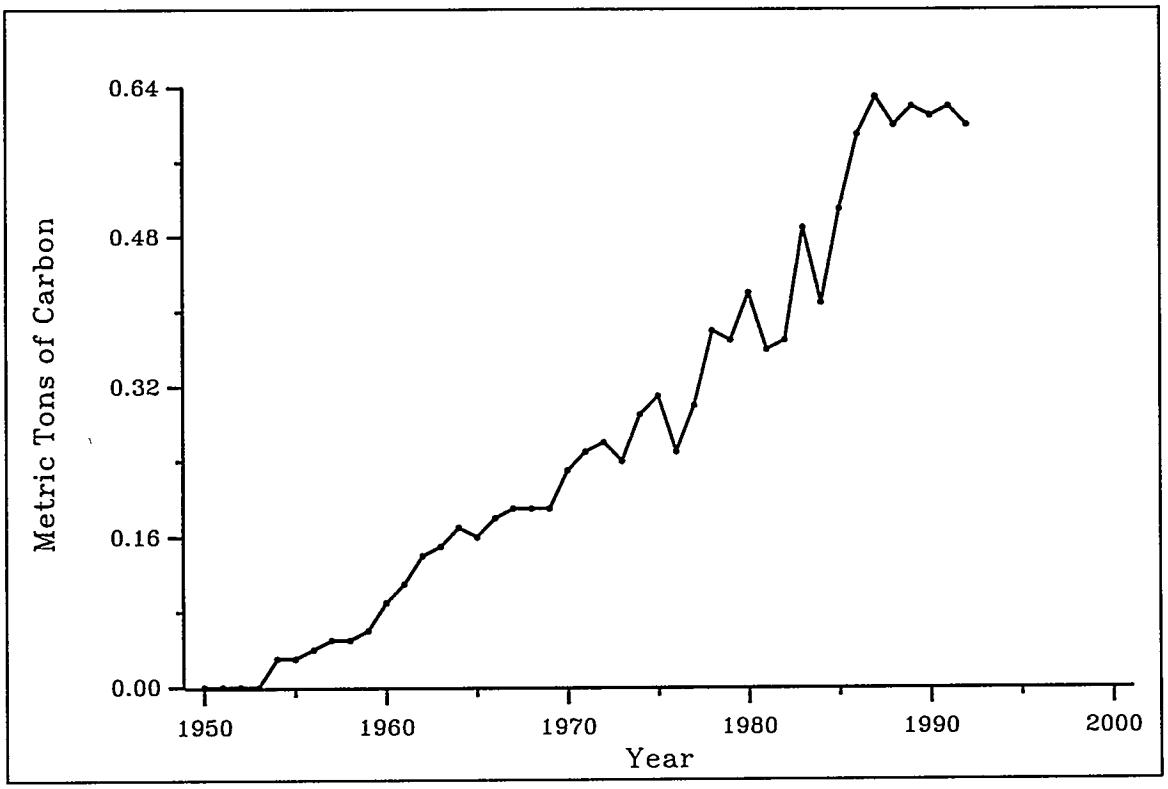
Luxembourg

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2048	1983	47	0	18	0	6.92	.
1951	2487	2412	57	0	18	0	8.37	.
1952	2595	2520	59	0	16	0	8.68	.
1953	2388	2301	67	0	20	0	7.93	.
1954	2423	2320	82	0	21	0	8.00	.
1955	2728	2607	100	0	21	0	8.95	.
1956	2862	2723	117	0	22	0	9.32	.
1957	2990	2842	122	0	26	0	9.71	.
1958	2782	2611	145	0	27	0	8.98	.
1959	2875	2695	154	0	26	0	9.25	.
1960	3175	2969	177	0	29	0	10.11	.
1961	3195	2953	211	0	31	0	10.08	.
1962	3183	2825	327	0	31	0	9.92	.
1963	3152	2654	471	0	28	0	9.70	.
1964	3389	2794	567	0	28	0	10.30	.
1965	3359	2652	676	0	30	0	10.12	.
1966	3197	2392	773	3	29	0	9.57	.
1967	3124	2241	856	2	25	0	9.33	.
1968	3374	2401	944	3	26	0	10.07	.
1969	3628	2553	1041	5	28	0	10.76	.
1970	3755	2619	1089	13	33	0	11.08	.
1971	3599	2428	1119	17	36	0	10.49	.
1972	3686	2394	1176	73	42	0	10.59	.
1973	3865	2372	1308	137	49	0	10.92	.
1974	3931	2548	1150	183	51	0	10.95	.
1975	3223	1935	1026	214	47	0	8.90	.
1976	3221	1828	1107	245	41	0	8.85	.
1977	2967	1571	1098	258	40	0	8.13	.
1978	3090	1658	1106	284	42	0	8.47	.
1979	3151	1814	999	295	43	0	8.66	.
1980	2902	1783	810	265	44	0	7.97	.
1981	2479	1447	784	203	47	0	6.81	.
1982	2331	1337	778	170	47	0	6.39	.
1983	2183	1228	745	162	48	0	5.98	.
1984	2345	1396	729	174	46	0	6.41	.
1985	2391	1372	789	189	40	0	6.51	.
1986	2357	1252	863	189	53	0	6.40	.
1987	2277	1016	978	214	69	0	6.17	.
1988	2371	1071	1002	222	77	0	6.41	.
1989	2541	1100	1108	253	80	0	6.85	.
1990	2636	1106	1201	242	87	0	7.07	.
1991	2820	1043	1417	279	81	0	7.52	.
1992	2874	990	1512	291	81	0	7.60	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Macau

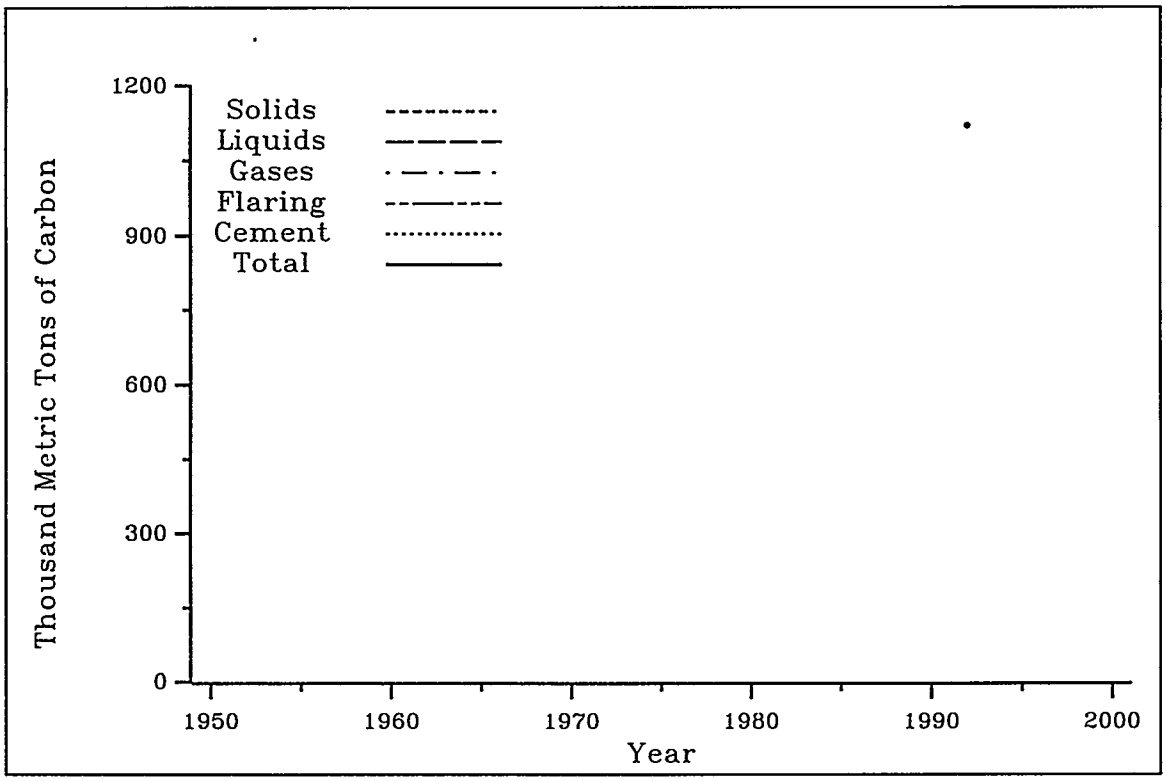


Per capita CO_2 emission rates for Macau

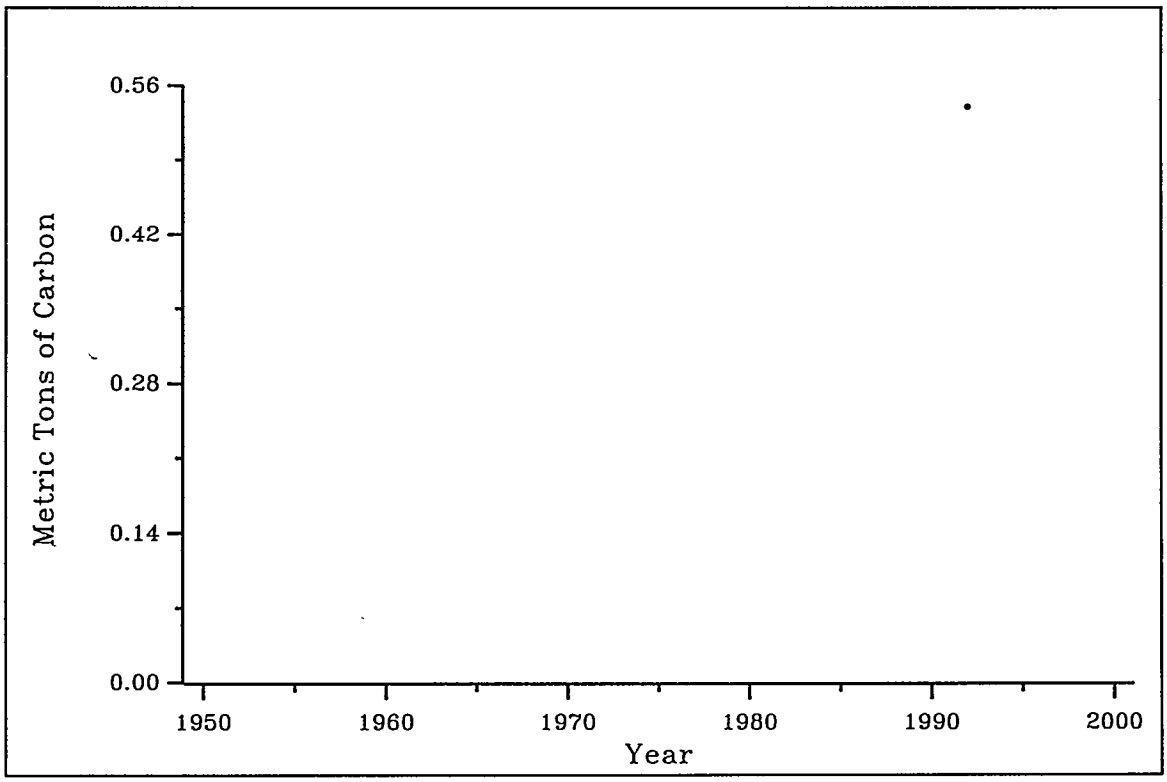
Macau

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	0	0	0	0	0	0	0.00	.
1953	0	0	0	0	0	0	0.00	.
1954	6	2	3	0	0	0	0.03	.
1955	6	1	4	0	0	0	0.03	.
1956	7	2	5	0	0	0	0.04	.
1957	8	3	5	0	0	0	0.05	.
1958	8	4	4	0	0	0	0.05	.
1959	10	4	7	0	0	0	0.06	.
1960	14	4	10	0	0	0	0.09	.
1961	19	5	14	0	0	0	0.11	.
1962	26	4	23	0	0	0	0.14	.
1963	29	5	24	0	0	0	0.15	.
1964	35	4	31	0	0	0	0.17	.
1965	36	3	33	0	0	0	0.16	.
1966	41	3	38	0	0	0	0.18	.
1967	45	3	42	0	0	0	0.19	.
1968	46	3	43	0	0	0	0.19	.
1969	46	2	44	0	0	0	0.19	.
1970	56	4	53	0	0	0	0.23	.
1971	62	2	59	0	0	0	0.25	.
1972	63	1	62	0	0	0	0.26	.
1973	61	1	59	0	0	0	0.24	.
1974	73	1	71	0	0	0	0.29	.
1975	81	2	79	0	0	0	0.31	.
1976	69	1	68	0	0	0	0.25	.
1977	84	1	84	0	0	0	0.30	.
1978	113	1	112	0	0	0	0.38	.
1979	113	0	113	0	0	0	0.37	.
1980	136	3	133	0	0	0	0.42	.
1981	123	1	122	0	0	0	0.36	.
1982	130	1	129	0	0	0	0.37	.
1983	179	1	178	0	0	0	0.49	.
1984	156	1	156	0	0	0	0.41	.
1985	198	0	198	0	0	0	0.51	.
1986	239	0	239	0	0	0	0.59	.
1987	263	0	263	0	0	0	0.63	.
1988	262	0	262	0	0	0	0.60	.
1989	280	0	280	0	0	0	0.62	.
1990	280	0	280	0	0	0	0.61	.
1991	297	0	297	0	0	0	0.62	.
1992	295	0	295	0	0	0	0.60	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Macedonia

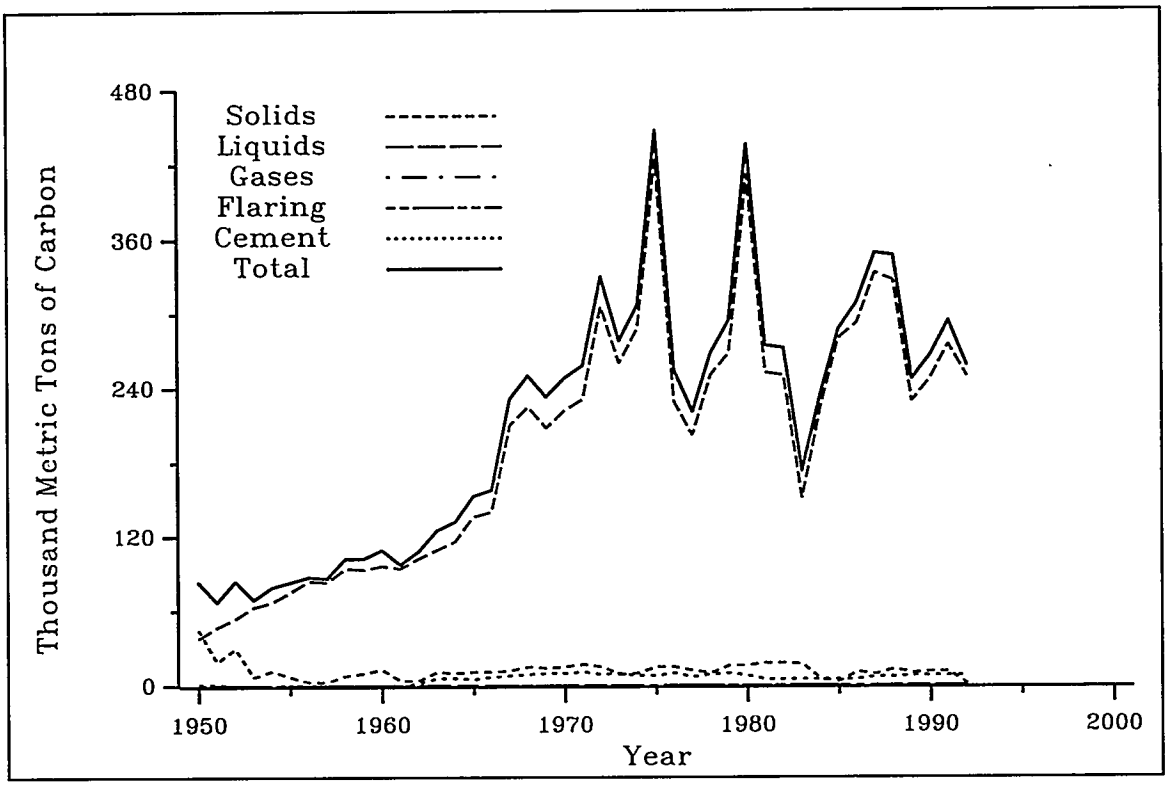


Per capita CO_2 emission rates for Macedonia

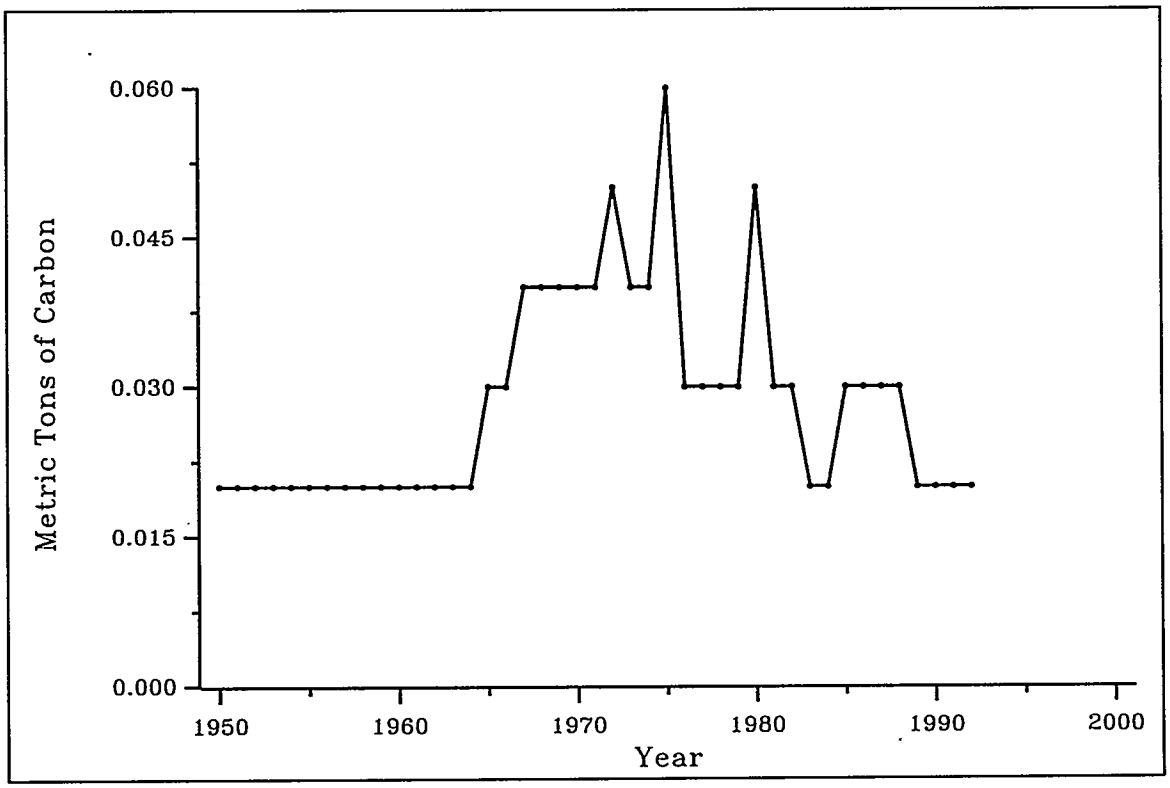
Macedonia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	1119	0	917	134	68	0	0.54	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Madagascar

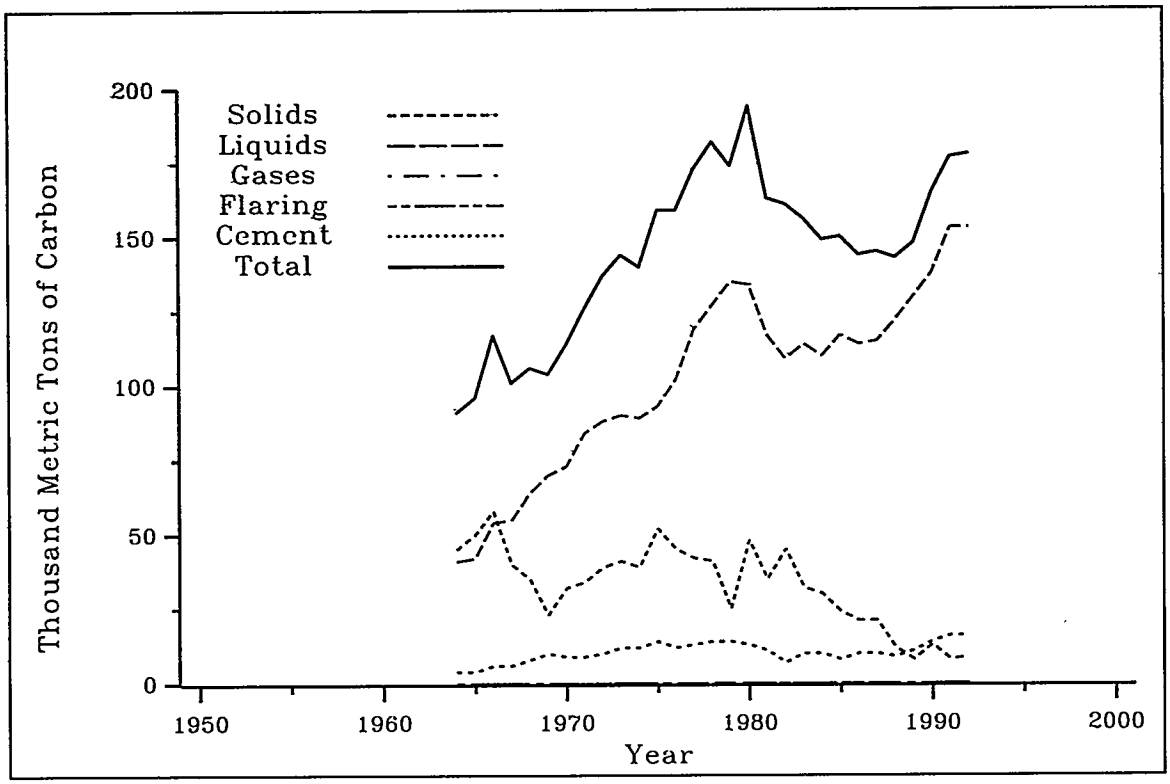


Per capita CO_2 emission rates for Madagascar

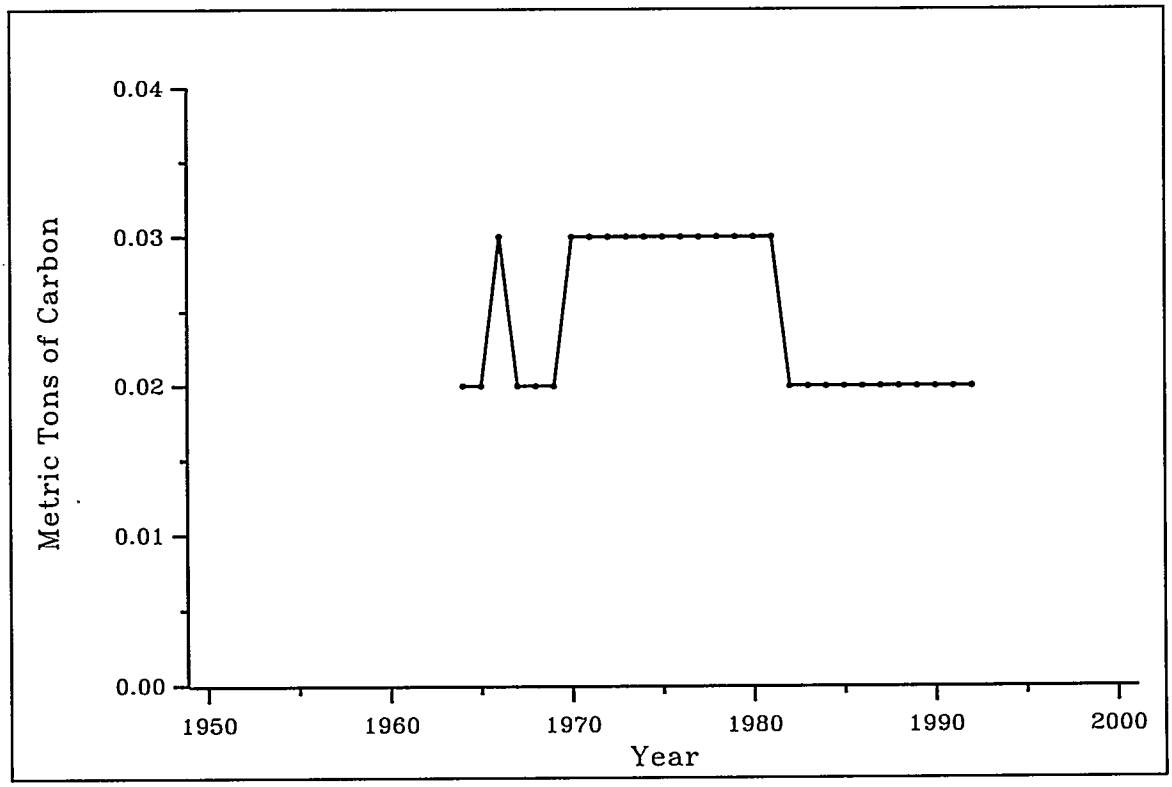
Madagascar

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	83	45	38	0	1	0	0.02	.
1951	67	19	47	0	1	0	0.02	.
1952	84	30	54	0	0	0	0.02	.
1953	69	7	63	0	0	0	0.02	.
1954	79	12	67	0	0	0	0.02	.
1955	83	7	75	0	0	0	0.02	.
1956	87	3	84	0	0	0	0.02	.
1957	86	3	83	0	0	0	0.02	.
1958	102	8	94	0	0	0	0.02	.
1959	102	10	93	0	0	0	0.02	.
1960	109	13	96	0	0	0	0.02	.
1961	97	4	94	0	0	0	0.02	.
1962	108	4	102	0	2	0	0.02	.
1963	125	11	109	0	6	0	0.02	.
1964	132	10	116	0	6	0	0.02	.
1965	153	11	136	0	5	0	0.03	.
1966	158	11	140	0	7	0	0.03	.
1967	231	12	210	0	8	0	0.04	.
1968	250	15	225	0	9	0	0.04	.
1969	233	14	208	0	10	0	0.04	.
1970	248	15	222	0	10	0	0.04	.
1971	258	17	231	0	11	0	0.04	.
1972	330	15	306	0	9	0	0.05	.
1973	278	9	260	0	10	0	0.04	.
1974	307	10	288	0	8	0	0.04	.
1975	447	15	424	0	8	0	0.06	.
1976	254	15	229	0	10	0	0.03	.
1977	221	12	202	0	7	0	0.03	.
1978	268	10	250	0	9	0	0.03	.
1979	294	16	268	0	10	0	0.03	.
1980	436	16	412	0	8	0	0.05	.
1981	274	18	252	0	5	0	0.03	.
1982	272	18	250	0	5	0	0.03	.
1983	173	17	151	0	5	0	0.02	.
1984	234	5	224	0	5	0	0.02	.
1985	287	3	280	0	5	0	0.03	.
1986	309	11	292	0	5	0	0.03	.
1987	349	9	333	0	7	0	0.03	.
1988	347	13	327	0	7	0	0.03	.
1989	247	10	229	0	8	0	0.02	.
1990	266	11	247	0	8	0	0.02	.
1991	294	11	275	0	8	0	0.02	.
1992	258	1	249	0	8	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Malawi

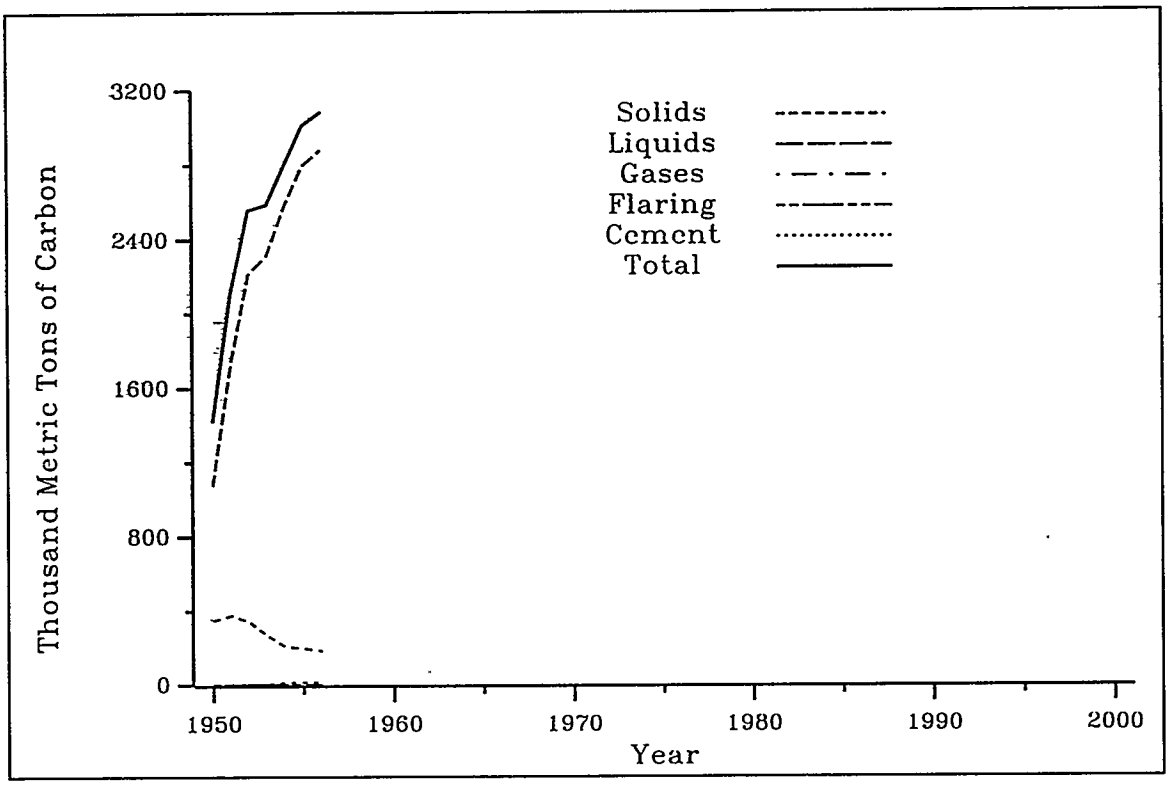


Per capita CO_2 emission rates for Malawi

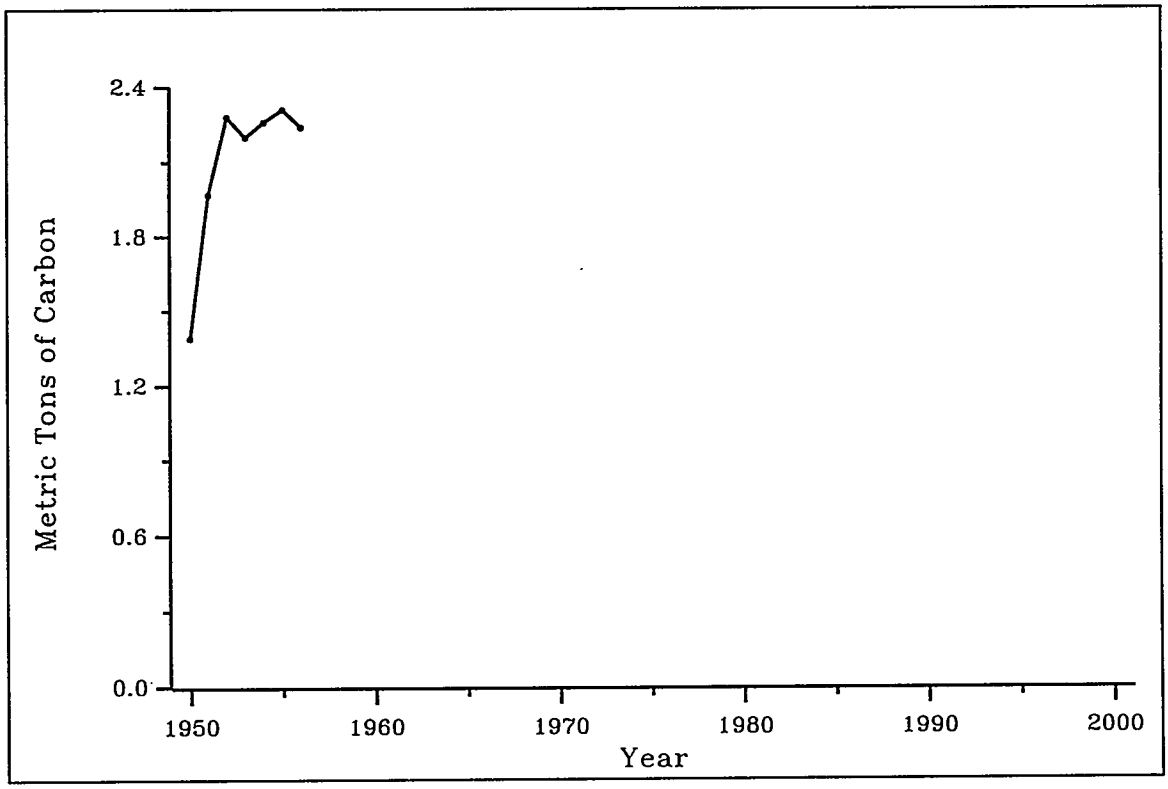
Malawi

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1964	91	45	41	0	4	0	0.02	.
1965	96	50	42	0	4	0	0.02	.
1966	117	58	54	0	6	0	0.03	.
1967	101	40	55	0	6	0	0.02	.
1968	106	35	64	0	8	0	0.02	.
1969	104	23	70	0	10	0	0.02	.
1970	114	32	73	0	9	0	0.03	.
1971	126	34	84	0	9	0	0.03	.
1972	137	39	88	0	10	0	0.03	.
1973	144	41	90	0	12	0	0.03	.
1974	140	39	89	0	12	0	0.03	.
1975	159	52	93	0	14	0	0.03	.
1976	159	45	102	0	12	0	0.03	.
1977	173	42	119	0	13	0	0.03	.
1978	182	41	127	0	14	0	0.03	.
1979	174	25	135	0	14	0	0.03	.
1980	194	48	134	0	13	0	0.03	.
1981	163	35	117	0	11	0	0.03	.
1982	161	45	109	0	7	0	0.02	.
1983	156	32	114	0	10	0	0.02	.
1984	149	30	110	0	10	0	0.02	.
1985	150	24	117	0	8	0	0.02	.
1986	144	21	114	0	10	0	0.02	.
1987	145	21	115	0	10	0	0.02	.
1988	143	12	122	0	9	0	0.02	.
1989	148	8	130	0	11	0	0.02	.
1990	165	13	138	0	14	0	0.02	.
1991	177	8	153	0	16	0	0.02	.
1992	178	9	153	0	16	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Federation of Malaya–Singapore

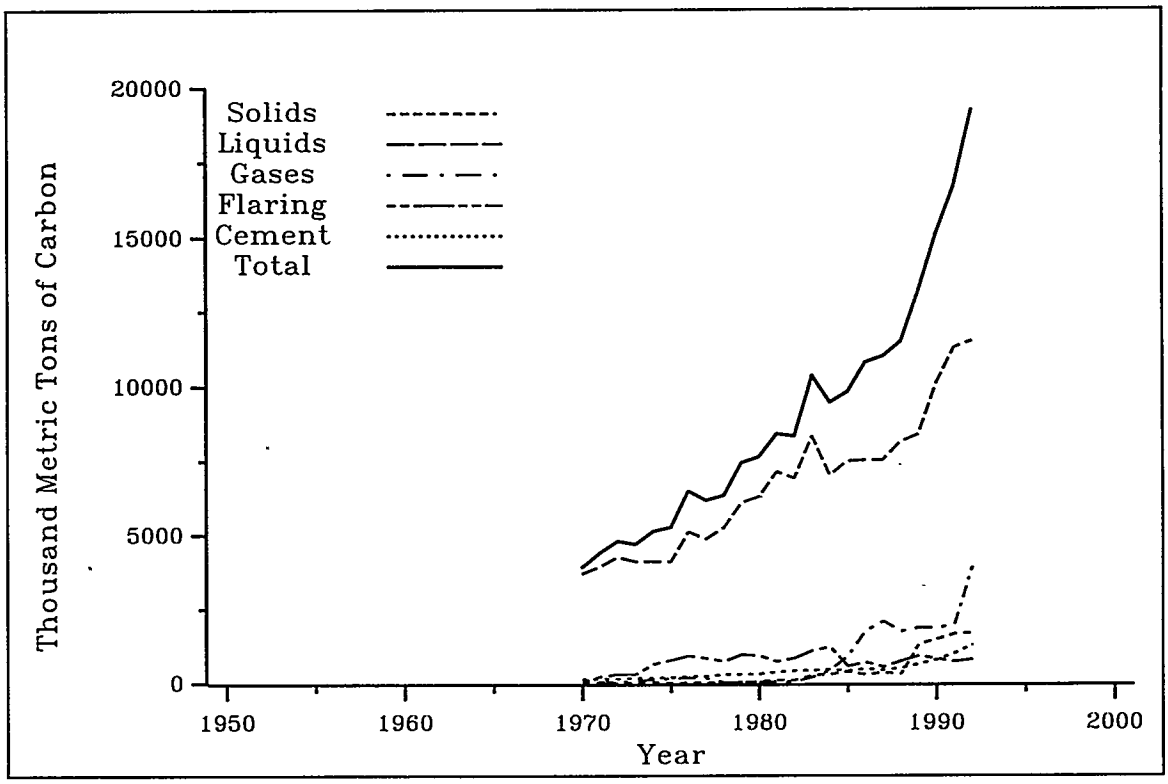


Per capita CO_2 emission rates for the Federation of Malaya–Singapore

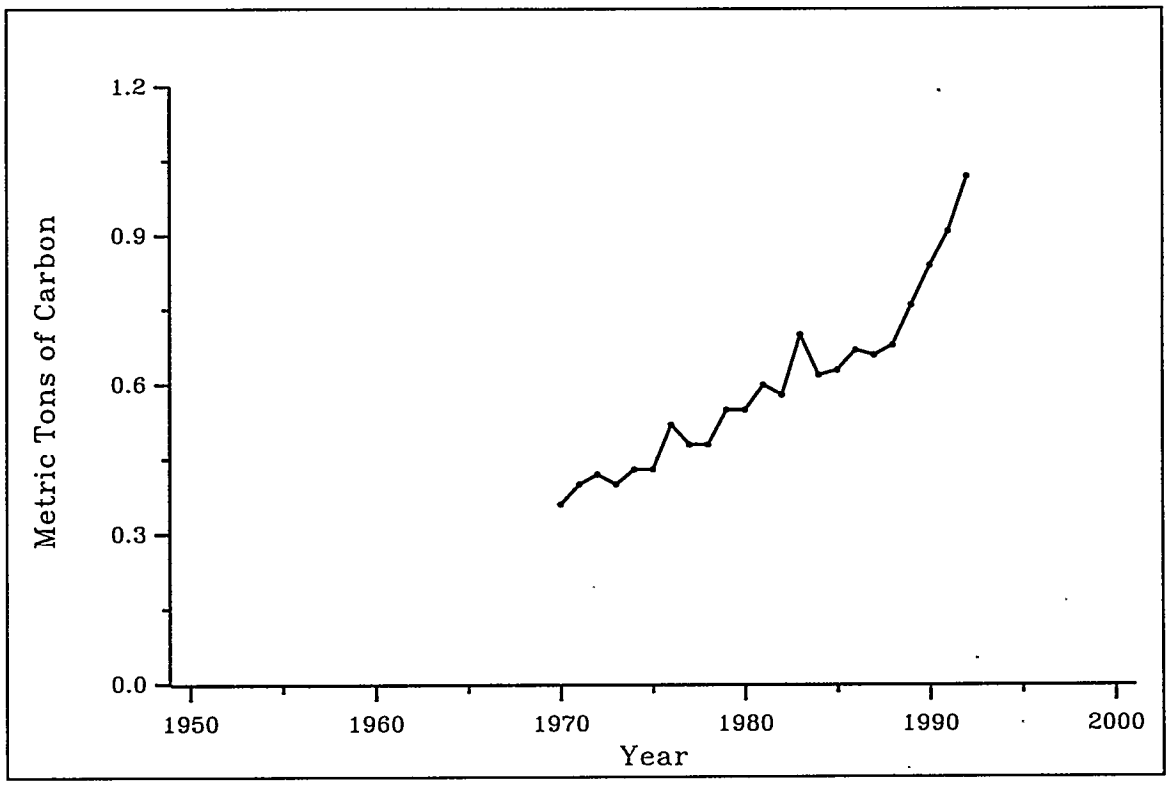
Federation of Malaya - Singapore

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1425	350	1075	0	0	0	1.39	42
1951	2103	378	1725	0	0	0	1.97	39
1952	2559	344	2215	0	0	0	2.28	34
1953	2589	269	2316	0	4	0	2.20	21
1954	2802	208	2583	0	12	0	2.26	18
1955	3012	200	2797	0	15	0	2.31	15
1956	3082	186	2882	0	14	0	2.24	23

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Malaysia

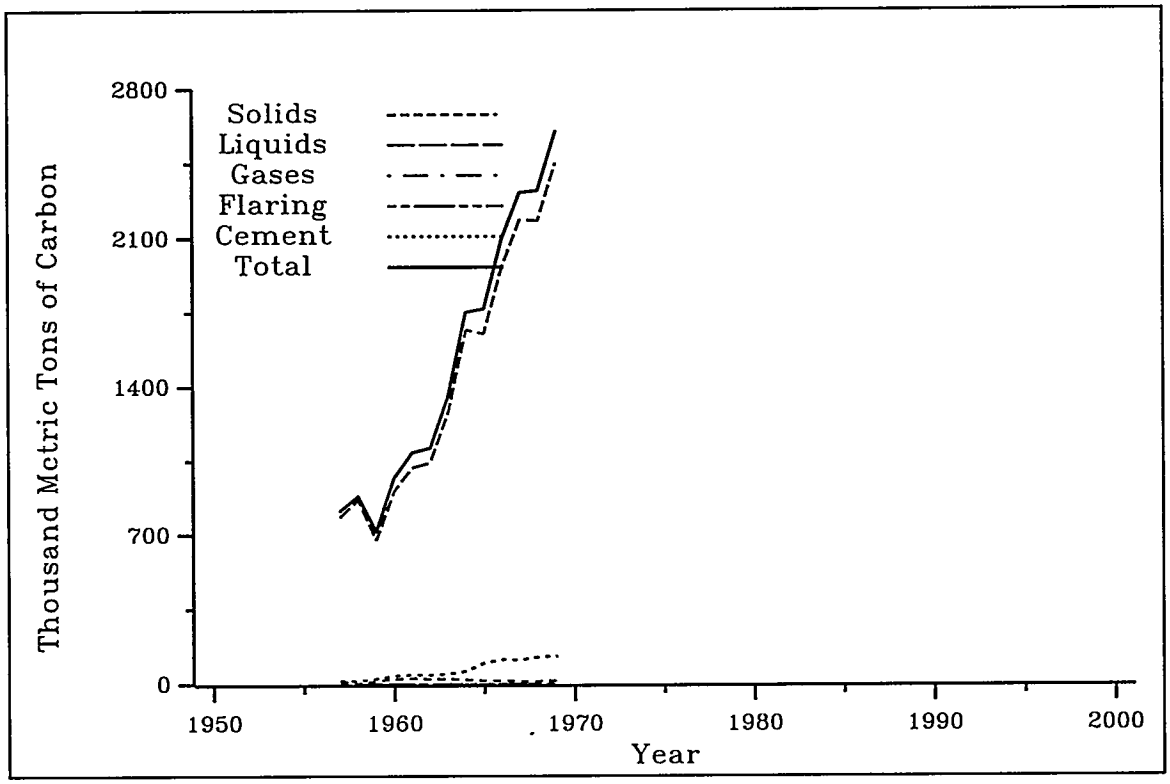


Per capita CO_2 emission rates for Malaysia

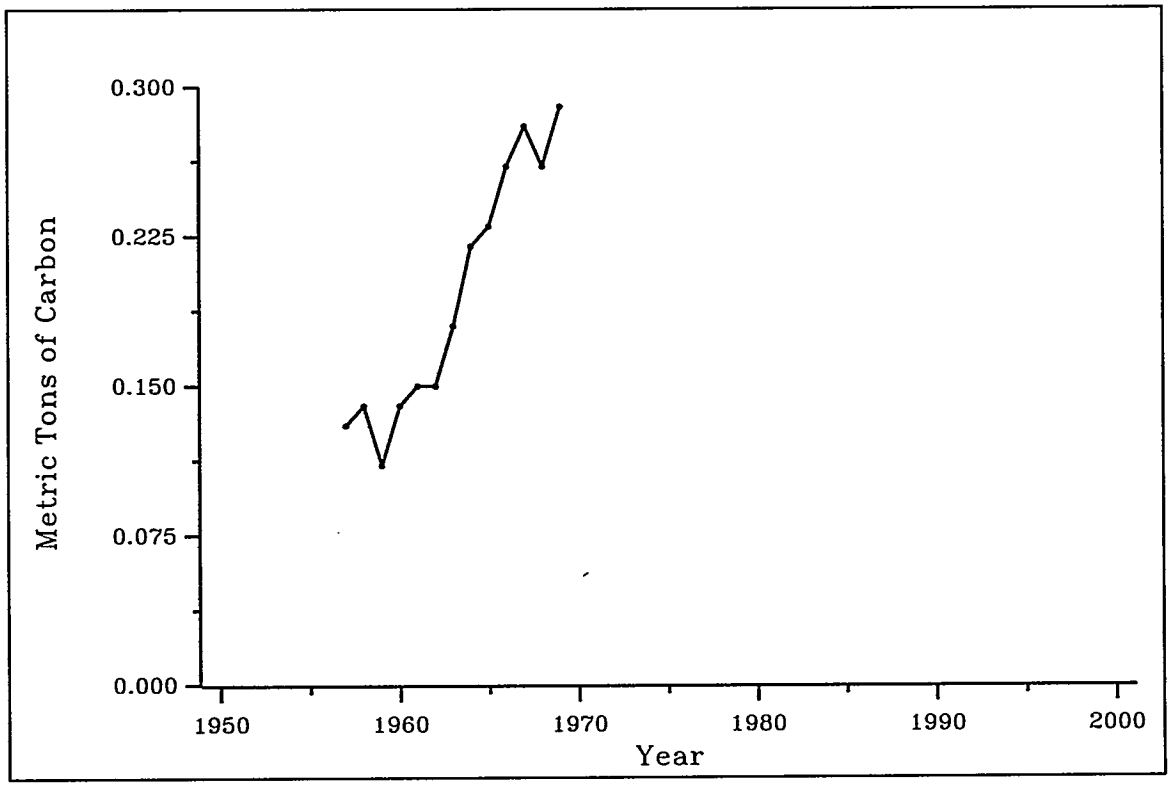
Malaysia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	3934	17	3708	12	140	58	0.36	.
1971	4408	43	3949	45	149	223	0.40	.
1972	4797	10	4255	62	158	312	0.42	.
1973	4697	35	4113	62	174	312	0.40	.
1974	5124	44	4113	130	186	651	0.43	.
1975	5261	19	4103	157	197	785	0.43	.
1976	6487	26	5104	186	237	934	0.52	.
1977	6166	32	4866	171	242	855	0.48	.
1978	6337	25	5239	29	299	745	0.48	.
1979	7440	38	6085	32	308	977	0.55	.
1980	7636	57	6285	38	319	937	0.55	.
1981	8407	106	7131	42	385	743	0.60	.
1982	8338	98	6912	46	425	857	0.58	.
1983	10359	274	8334	202	440	1109	0.70	.
1984	9465	302	7012	449	472	1231	0.62	.
1985	9820	397	7493	924	425	580	0.63	.
1986	10798	294	7524	1783	485	712	0.67	.
1987	10997	359	7535	2095	451	557	0.66	.
1988	11491	319	8146	1759	513	753	0.68	.
1989	13180	1324	8392	1881	652	931	0.76	.
1990	15104	1494	10109	1866	800	836	0.84	.
1991	16695	1676	11284	1987	1013	734	0.91	.
1992	19239	1695	11508	3933	1296	807	1.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Peninsular Malaysia

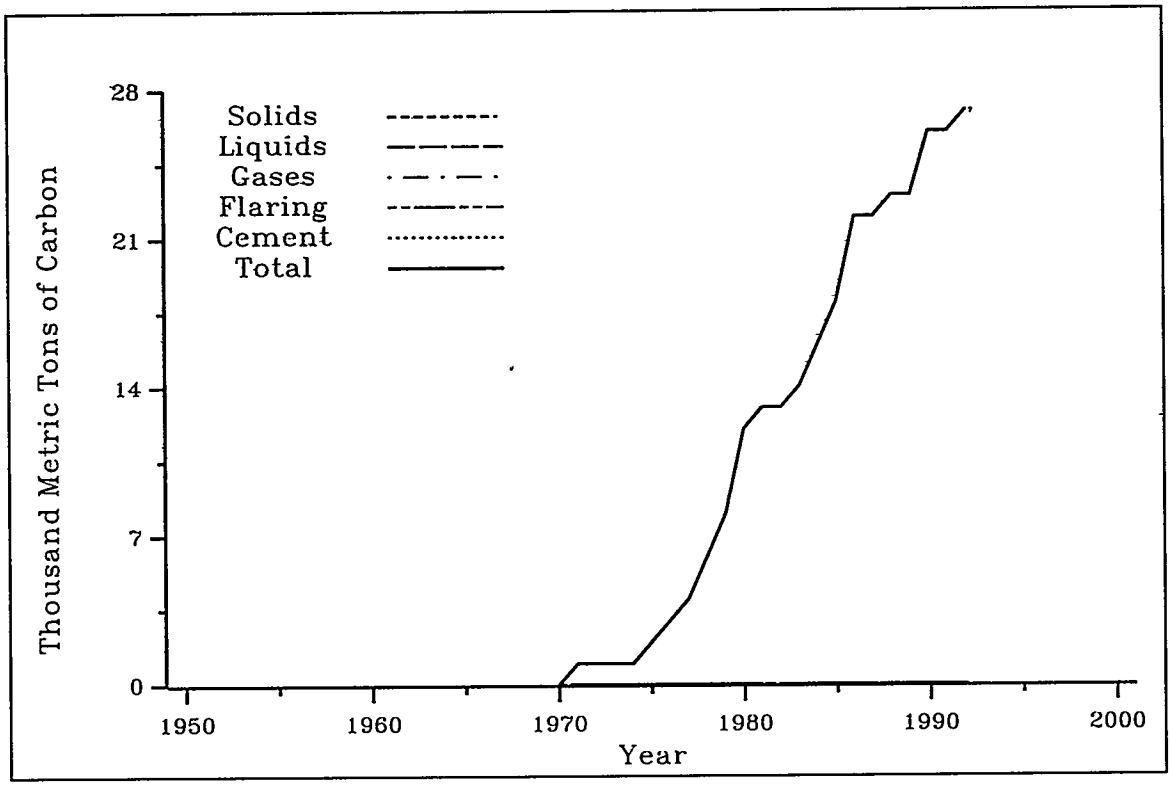


Per capita CO_2 emission rates for Peninsular Malaysia

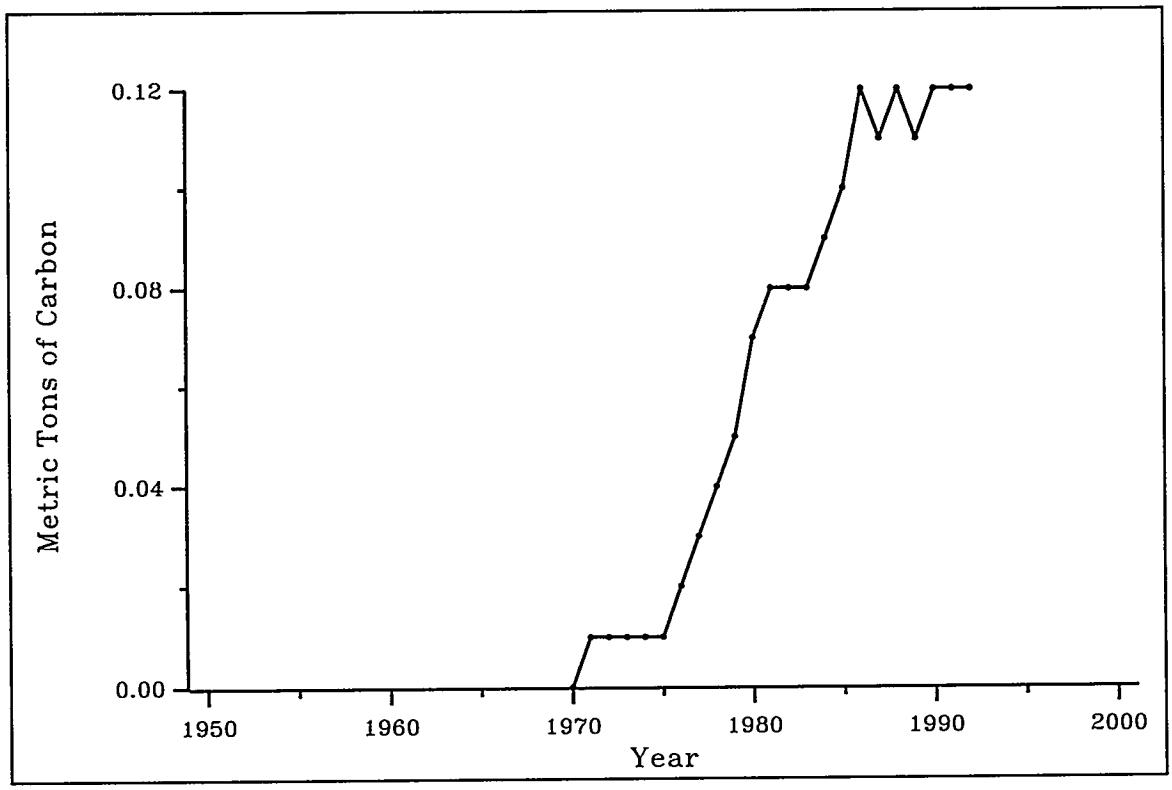
Peninsular Malaysia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1957	813	13	785	0	16	0	0.13	.
1958	884	3	867	0	15	0	0.14	.
1959	716	14	676	0	26	0	0.11	.
1960	973	25	909	0	39	0	0.14	.
1961	1091	28	1019	0	45	0	0.15	.
1962	1111	24	1043	0	44	0	0.15	.
1963	1356	25	1281	0	49	0	0.18	.
1964	1753	21	1669	0	63	0	0.22	.
1965	1769	16	1652	0	101	0	0.23	.
1966	2098	17	1965	0	116	0	0.26	.
1967	2312	13	2186	0	114	0	0.28	.
1968	2322	13	2182	0	127	0	0.26	.
1969	2599	16	2450	0	132	0	0.29	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Maldives

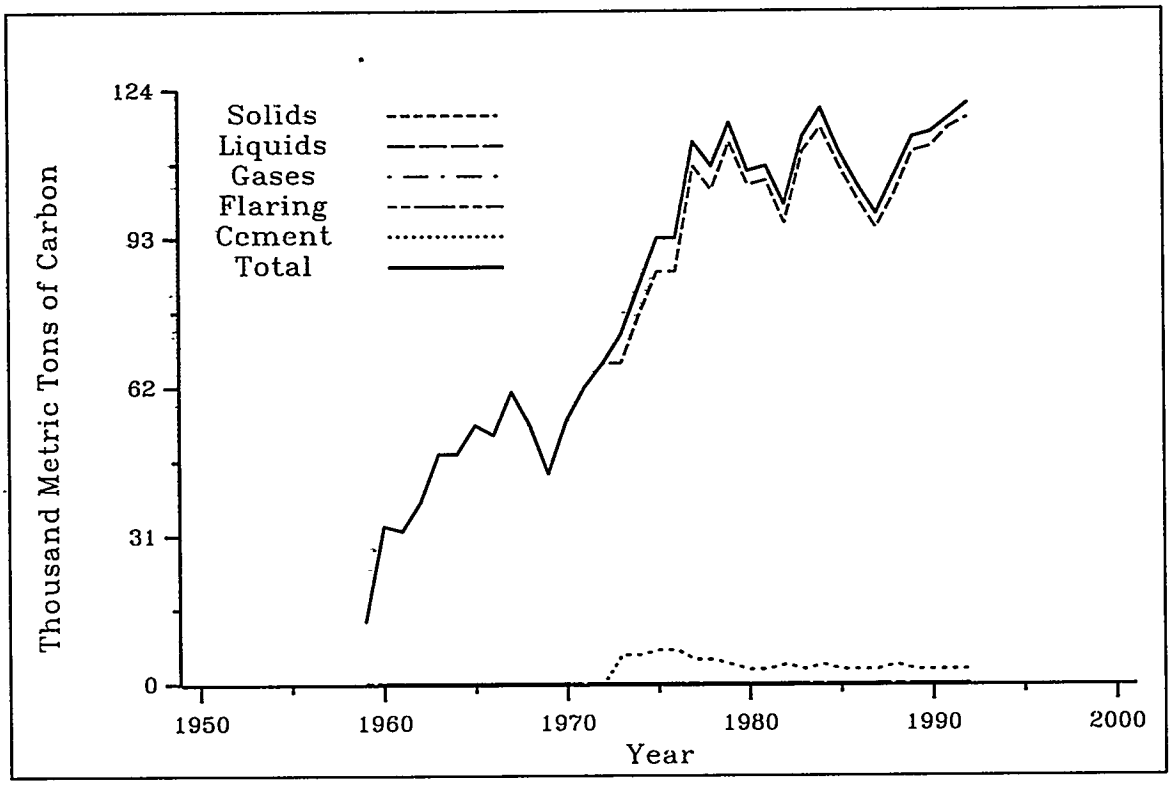


Per capita CO_2 emission rates for the Maldives

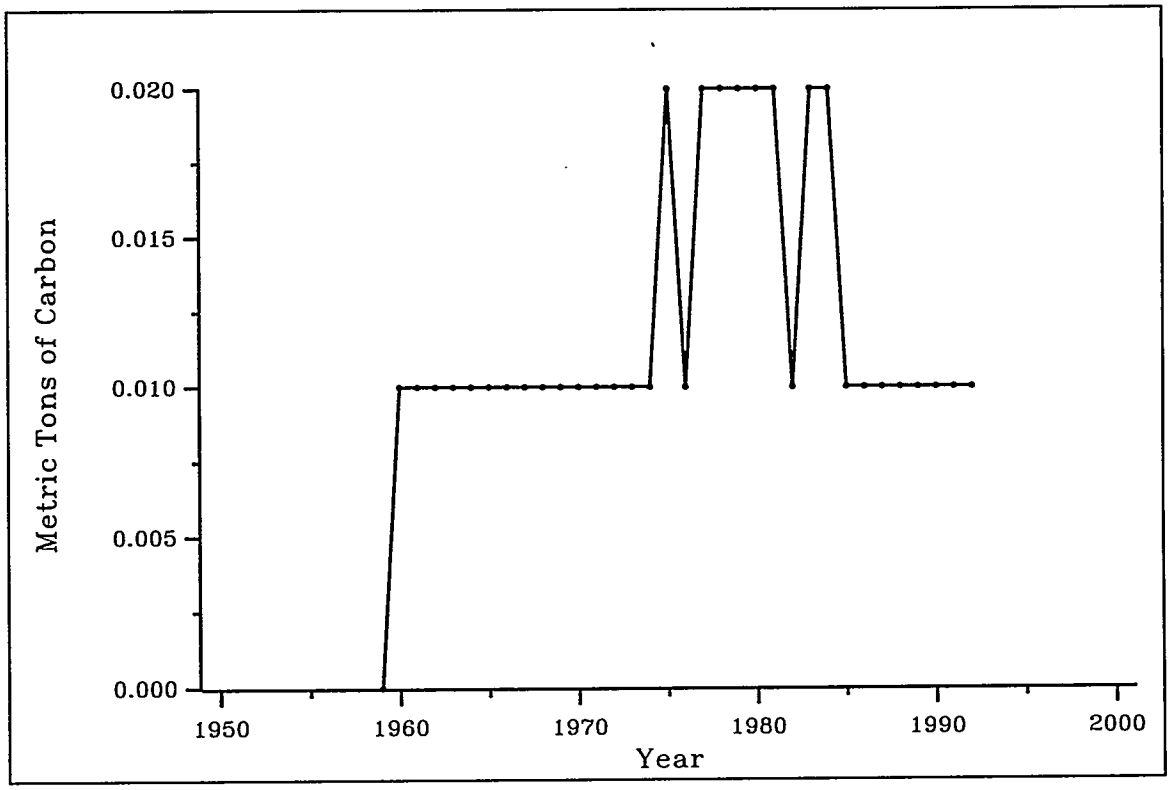
Maldives

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	0	0	0	0	0	0	0.00	.
1971	1	0	1	0	0	0	0.01	.
1972	1	0	1	0	0	0	0.01	.
1973	1	0	1	0	0	0	0.01	.
1974	1	0	1	0	0	0	0.01	.
1975	2	0	2	0	0	0	0.01	.
1976	3	0	3	0	0	0	0.02	.
1977	4	0	4	0	0	0	0.03	.
1978	6	0	6	0	0	0	0.04	.
1979	8	0	8	0	0	0	0.05	.
1980	12	0	12	0	0	0	0.07	.
1981	13	0	13	0	0	0	0.08	.
1982	13	0	13	0	0	0	0.08	.
1983	14	0	14	0	0	0	0.08	.
1984	16	0	16	0	0	0	0.09	.
1985	18	0	18	0	0	0	0.10	.
1986	22	0	22	0	0	0	0.12	.
1987	22	0	22	0	0	0	0.11	.
1988	23	0	23	0	0	0	0.12	.
1989	23	0	23	0	0	0	0.11	.
1990	26	0	26	0	0	0	0.12	.
1991	26	0	26	0	0	0	0.12	.
1992	27	0	27	0	0	0	0.12	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Mali

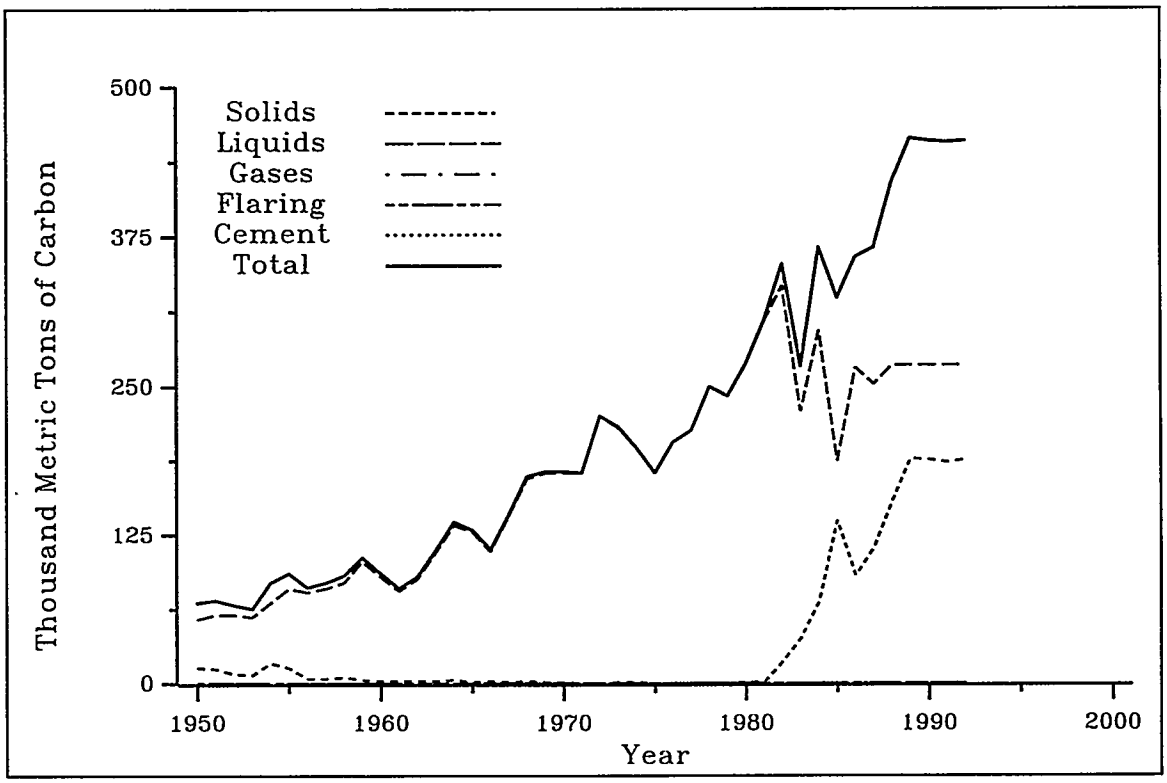


Per capita CO_2 emission rates for Mali

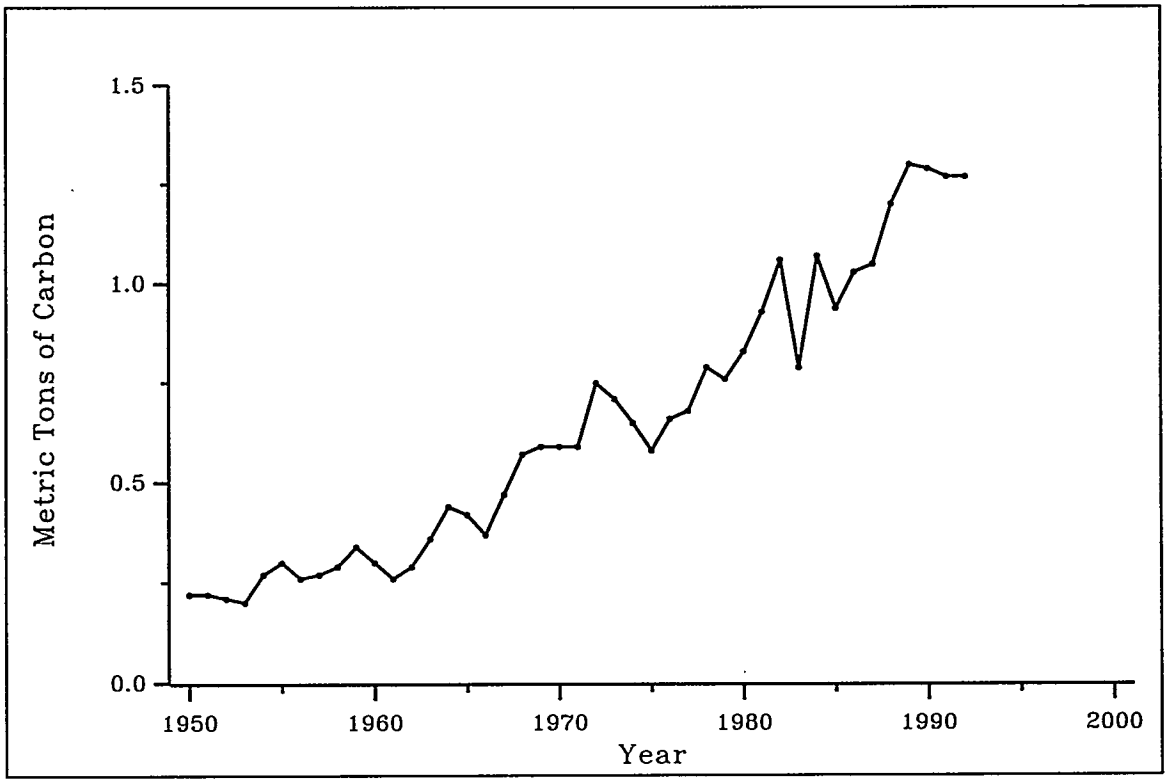
Mali

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1959	13	0	13	0	0	0	0.00	.
1960	33	0	33	0	0	0	0.01	.
1961	32	0	32	0	0	0	0.01	.
1962	38	0	38	0	0	0	0.01	.
1963	48	0	48	0	0	0	0.01	.
1964	48	0	48	0	0	0	0.01	.
1965	54	0	54	0	0	0	0.01	.
1966	52	0	52	0	0	0	0.01	.
1967	61	0	61	0	0	0	0.01	.
1968	54	0	54	0	0	0	0.01	.
1969	44	0	44	0	0	0	0.01	.
1970	55	0	55	0	0	0	0.01	.
1971	62	0	62	0	0	0	0.01	.
1972	67	0	67	0	0	0	0.01	.
1973	73	0	67	0	6	0	0.01	.
1974	83	0	77	0	6	0	0.01	.
1975	93	0	86	0	7	0	0.02	.
1976	93	0	86	0	7	0	0.01	.
1977	113	0	108	0	5	0	0.02	.
1978	108	0	103	0	5	0	0.02	.
1979	117	0	113	0	4	0	0.02	.
1980	107	0	104	0	3	0	0.02	.
1981	108	0	105	0	3	0	0.02	.
1982	100	0	96	0	4	0	0.01	.
1983	114	0	111	0	3	0	0.02	.
1984	120	0	116	0	4	0	0.02	.
1985	111	0	108	0	3	0	0.01	.
1986	104	0	101	0	3	0	0.01	.
1987	98	0	95	0	3	0	0.01	.
1988	106	0	102	0	4	0	0.01	.
1989	114	0	111	0	3	0	0.01	.
1990	115	0	112	0	3	0	0.01	.
1991	118	0	116	0	3	0	0.01	.
1992	121	0	118	0	3	0	0.01	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Malta

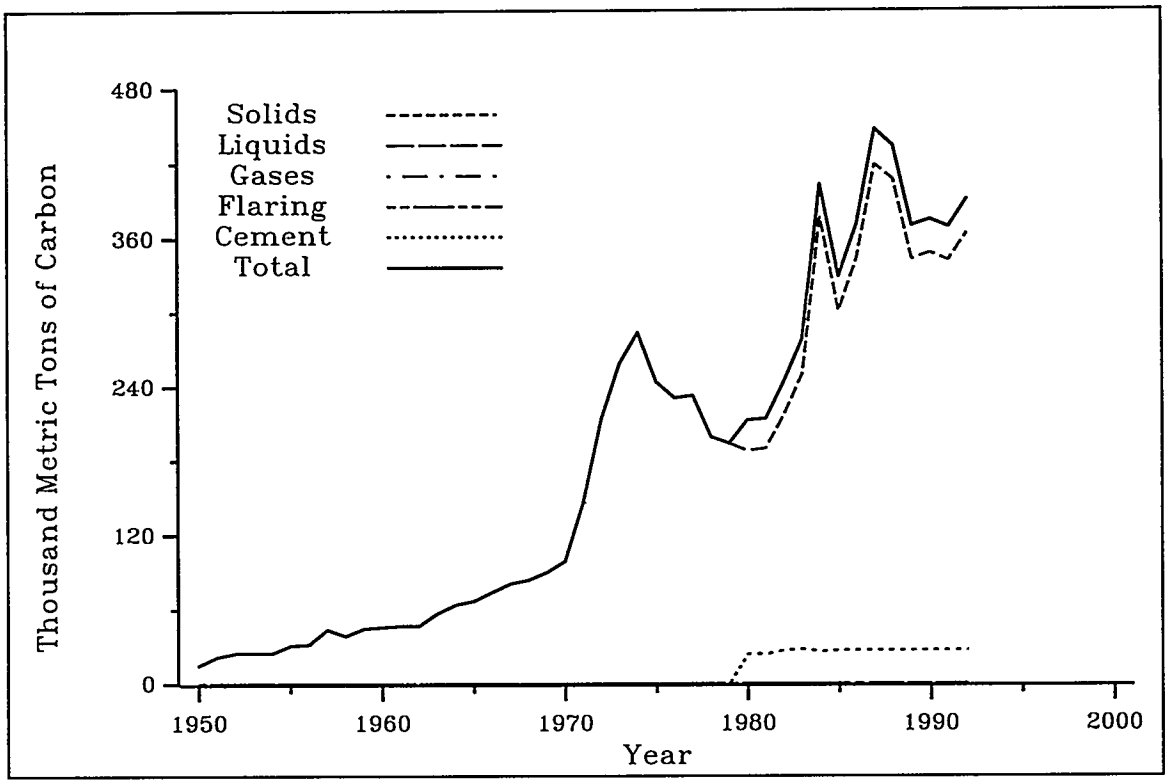


Per capita CO_2 emission rates for Malta

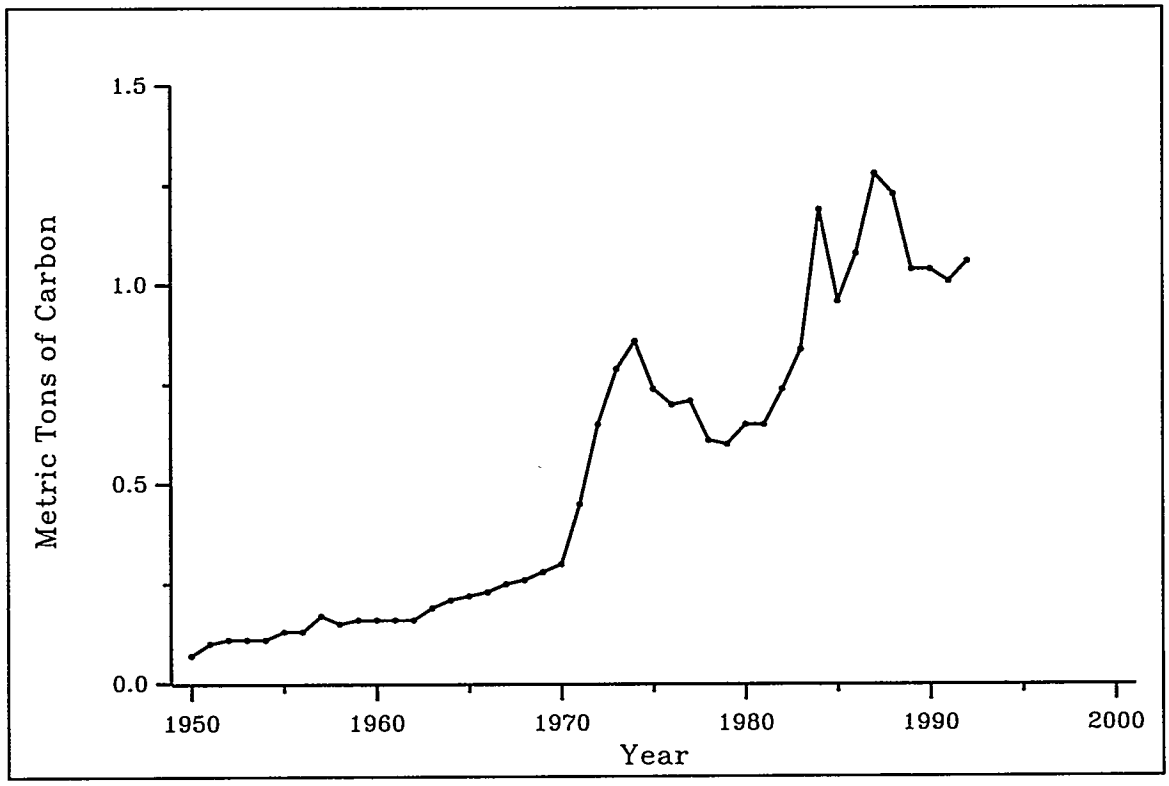
Malta

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	68	13	54	0	0	0	0.22	30
1951	70	12	58	0	0	0	0.22	28
1952	66	8	58	0	0	0	0.21	44
1953	63	7	56	0	0	0	0.20	54
1954	85	17	68	0	0	0	0.27	49
1955	93	13	80	0	0	0	0.30	43
1956	81	4	77	0	0	0	0.26	69
1957	85	4	80	0	0	0	0.27	63
1958	91	5	85	0	0	0	0.29	55
1959	106	3	103	0	0	0	0.34	55
1960	93	2	90	0	0	0	0.30	44
1961	80	2	78	0	0	0	0.26	42
1962	90	2	88	0	0	0	0.29	47
1963	112	2	110	0	0	0	0.36	52
1964	136	3	133	0	0	0	0.44	60
1965	129	1	128	0	0	0	0.42	62
1966	113	2	111	0	0	0	0.37	97
1967	142	1	141	0	0	0	0.47	109
1968	174	2	172	0	0	0	0.57	113
1969	178	1	177	0	0	0	0.59	97
1970	178	1	177	0	0	0	0.59	91
1971	177	0	177	0	0	0	0.59	103
1972	225	0	225	0	0	0	0.75	69
1973	216	1	215	0	0	0	0.71	80
1974	198	1	198	0	0	0	0.65	73
1975	177	0	177	0	0	0	0.58	68
1976	203	0	203	0	0	0	0.66	79
1977	213	0	213	0	0	0	0.68	82
1978	250	0	250	0	0	0	0.79	78
1979	242	0	242	0	0	0	0.76	81
1980	269	1	269	0	0	0	0.83	89
1981	305	1	305	0	0	0	0.93	86
1982	352	18	334	0	0	0	1.06	73
1983	267	38	229	0	0	0	0.79	51
1984	366	69	297	0	0	0	1.07	87
1985	324	137	187	0	0	0	0.94	57
1986	358	91	266	0	0	0	1.03	68
1987	366	114	252	0	0	0	1.05	62
1988	421	153	268	0	0	0	1.20	68
1989	457	189	268	0	0	0	1.30	68
1990	455	188	268	0	0	0	1.29	68
1991	454	186	268	0	0	0	1.27	68
1992	455	188	268	0	0	0	1.27	68

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Martinique

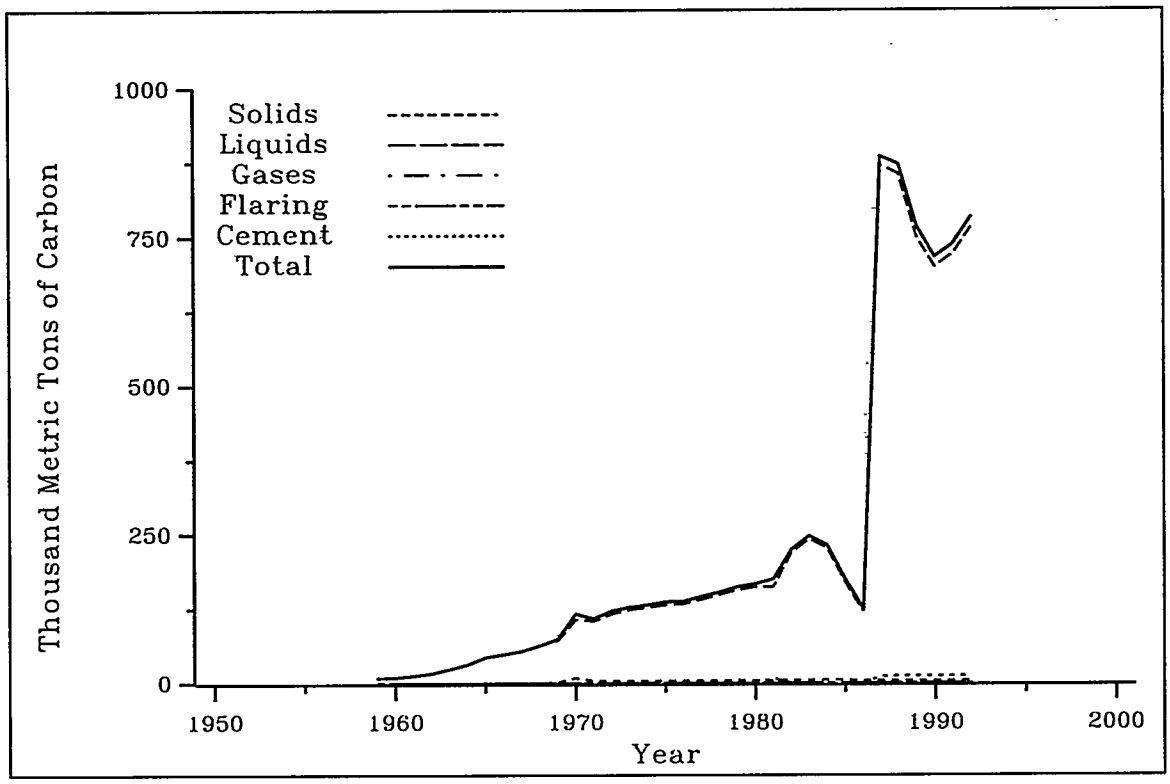


Per capita CO_2 emission rates for Martinique

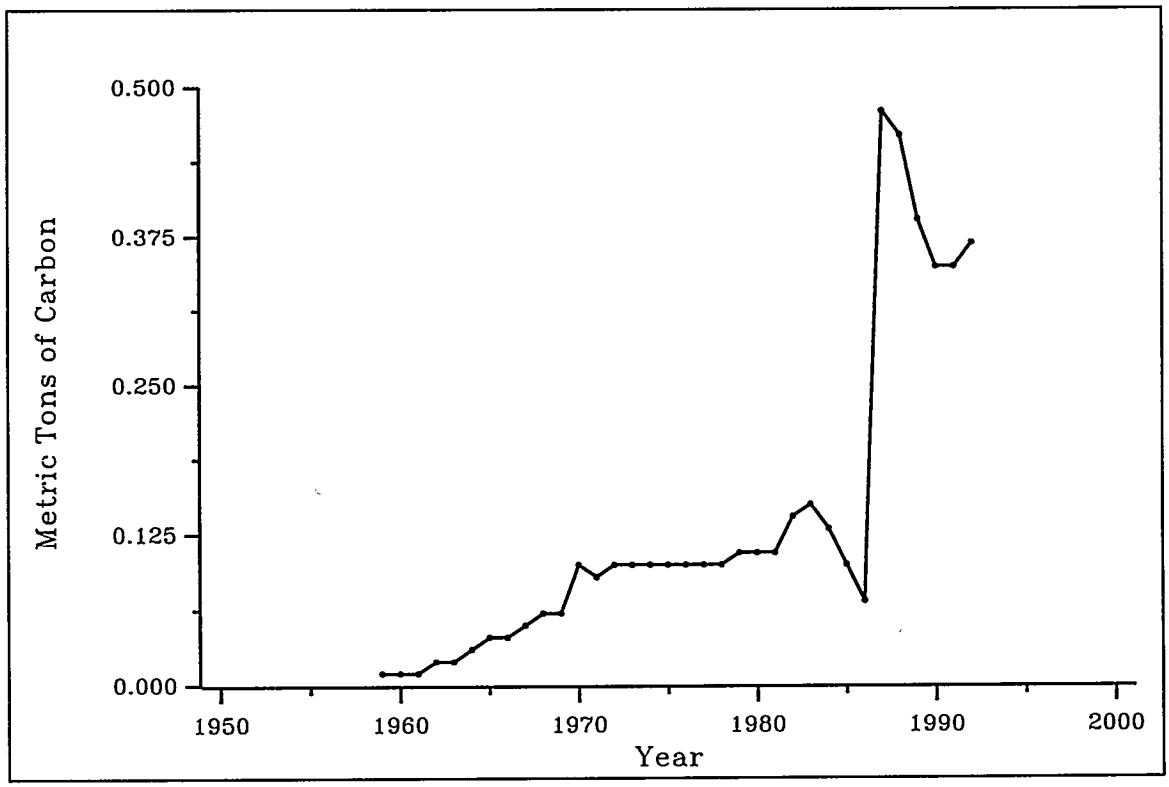
Martinique

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	15	0	15	0	0	0	0.07	.
1951	22	0	22	0	0	0	0.10	.
1952	25	0	25	0	0	0	0.11	.
1953	25	0	25	0	0	0	0.11	.
1954	25	0	25	0	0	0	0.11	.
1955	31	0	31	0	0	0	0.13	.
1956	32	0	32	0	0	0	0.13	.
1957	44	0	44	0	0	0	0.17	.
1958	39	0	39	0	0	0	0.15	.
1959	45	0	45	0	0	0	0.16	.
1960	46	0	46	0	0	0	0.16	.
1961	47	0	47	0	0	0	0.16	.
1962	47	0	47	0	0	0	0.16	.
1963	57	0	57	0	0	0	0.19	.
1964	64	0	64	0	0	0	0.21	.
1965	67	0	67	0	0	0	0.22	.
1966	74	0	74	0	0	0	0.23	.
1967	81	0	81	0	0	0	0.25	.
1968	84	0	84	0	0	0	0.26	.
1969	90	0	90	0	0	0	0.28	.
1970	99	0	99	0	0	0	0.30	.
1971	146	0	146	0	0	0	0.45	.
1972	214	0	214	0	0	0	0.65	.
1973	259	0	259	0	0	0	0.79	.
1974	284	0	284	0	0	0	0.86	.
1975	244	0	244	0	0	0	0.74	.
1976	231	0	231	0	0	0	0.70	.
1977	233	0	233	0	0	0	0.71	.
1978	199	0	199	0	0	0	0.61	.
1979	194	0	194	0	0	0	0.60	.
1980	213	0	188	0	24	0	0.65	.
1981	214	0	190	0	24	0	0.65	.
1982	244	0	217	0	27	0	0.74	.
1983	278	0	250	0	28	0	0.84	.
1984	403	0	377	0	26	0	1.19	.
1985	329	0	301	0	27	0	0.96	.
1986	371	0	344	0	27	0	1.08	.
1987	447	0	419	0	27	0	1.28	.
1988	434	0	407	0	27	0	1.23	.
1989	370	0	343	0	27	0	1.04	.
1990	375	0	348	0	27	0	1.04	.
1991	369	0	342	0	27	0	1.01	.
1992	391	0	364	0	27	0	1.06	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Mauritania

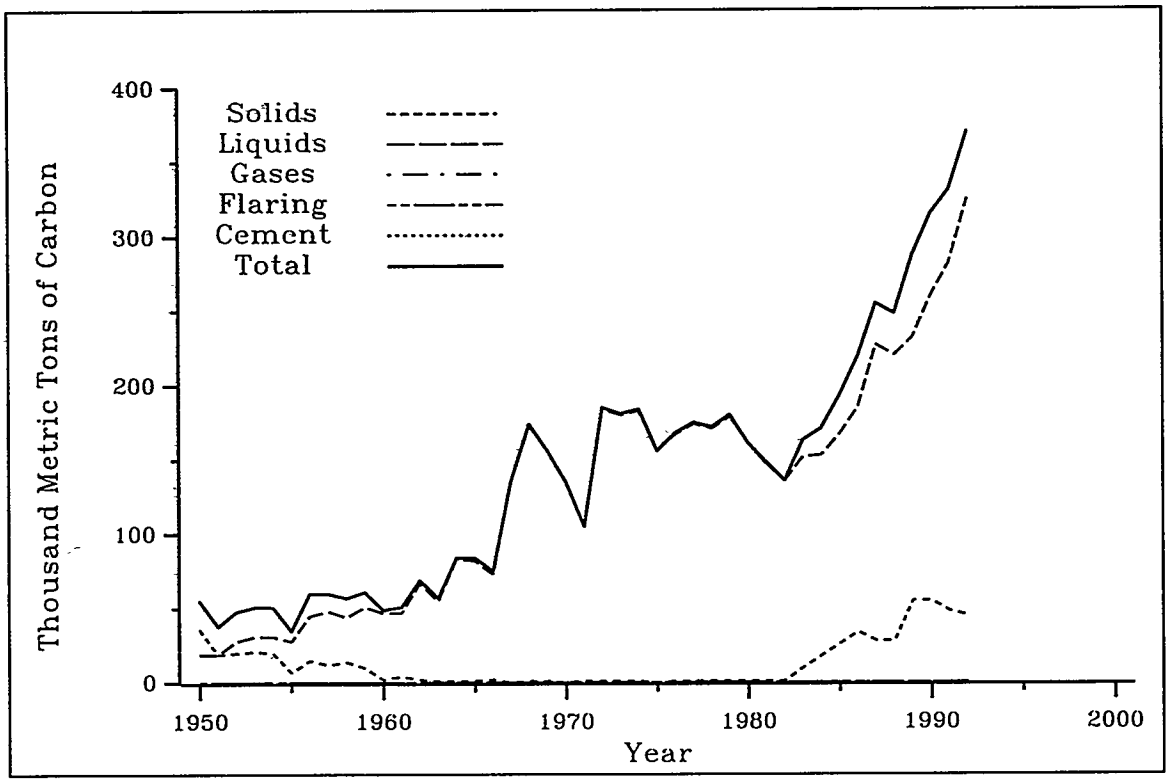


Per capita CO_2 emission rates for Mauritania

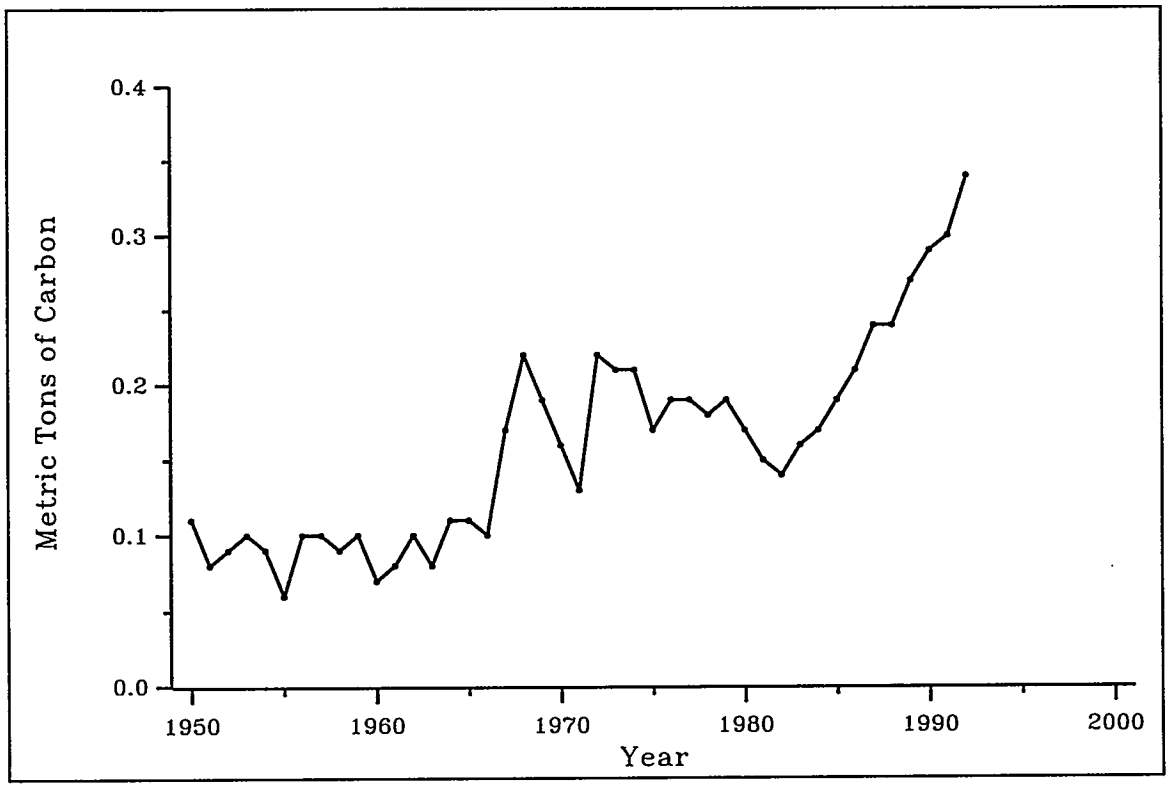
Mauritania

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1959	9	0	9	0	0	0	0.01	.
1960	10	0	10	0	0	0	0.01	.
1961	13	0	13	0	0	0	0.01	.
1962	17	0	17	0	0	0	0.02	.
1963	24	0	24	0	0	0	0.02	.
1964	32	0	32	0	0	0	0.03	.
1965	44	0	44	0	0	0	0.04	.
1966	49	0	49	0	0	0	0.04	.
1967	54	0	54	0	0	0	0.05	.
1968	64	0	64	0	0	0	0.06	.
1969	75	2	73	0	0	0	0.06	.
1970	117	9	108	0	0	0	0.10	.
1971	109	4	105	0	0	0	0.09	.
1972	122	4	117	0	0	0	0.10	.
1973	128	4	124	0	0	0	0.10	.
1974	132	4	128	0	0	0	0.10	.
1975	137	4	132	0	0	0	0.10	.
1976	138	4	134	0	0	0	0.10	.
1977	146	4	141	0	0	0	0.10	.
1978	153	4	149	0	0	0	0.10	.
1979	162	5	157	0	0	0	0.11	.
1980	167	4	162	0	0	0	0.11	.
1981	175	4	162	0	8	0	0.11	.
1982	224	5	219	0	0	0	0.14	.
1983	247	5	242	0	0	0	0.15	.
1984	231	5	226	0	0	0	0.13	.
1985	174	5	169	0	0	0	0.10	.
1986	125	4	121	0	0	0	0.07	.
1987	885	4	870	0	11	0	0.48	.
1988	872	4	856	0	12	0	0.46	.
1989	768	4	751	0	12	0	0.39	.
1990	717	4	700	0	12	0	0.35	.
1991	738	4	722	0	12	0	0.35	.
1992	783	4	766	0	12	0	0.37	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Mauritius

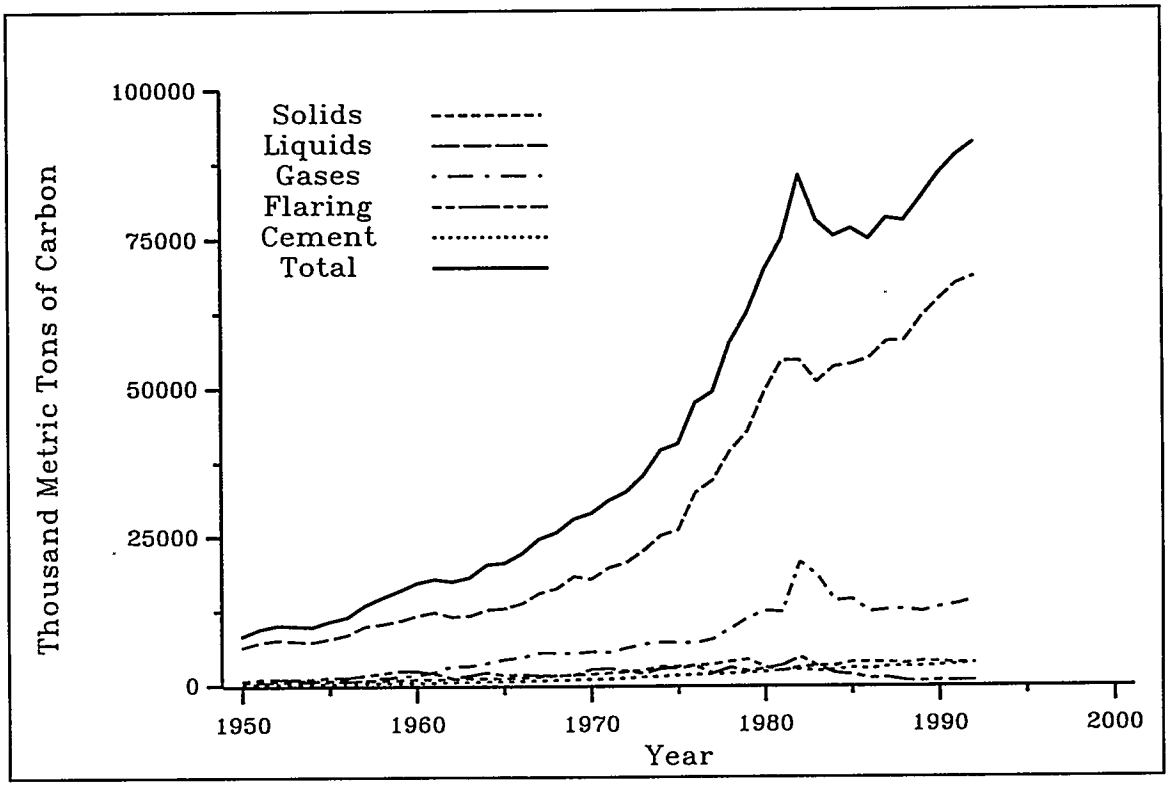


Per capita CO_2 emission rates for Mauritius

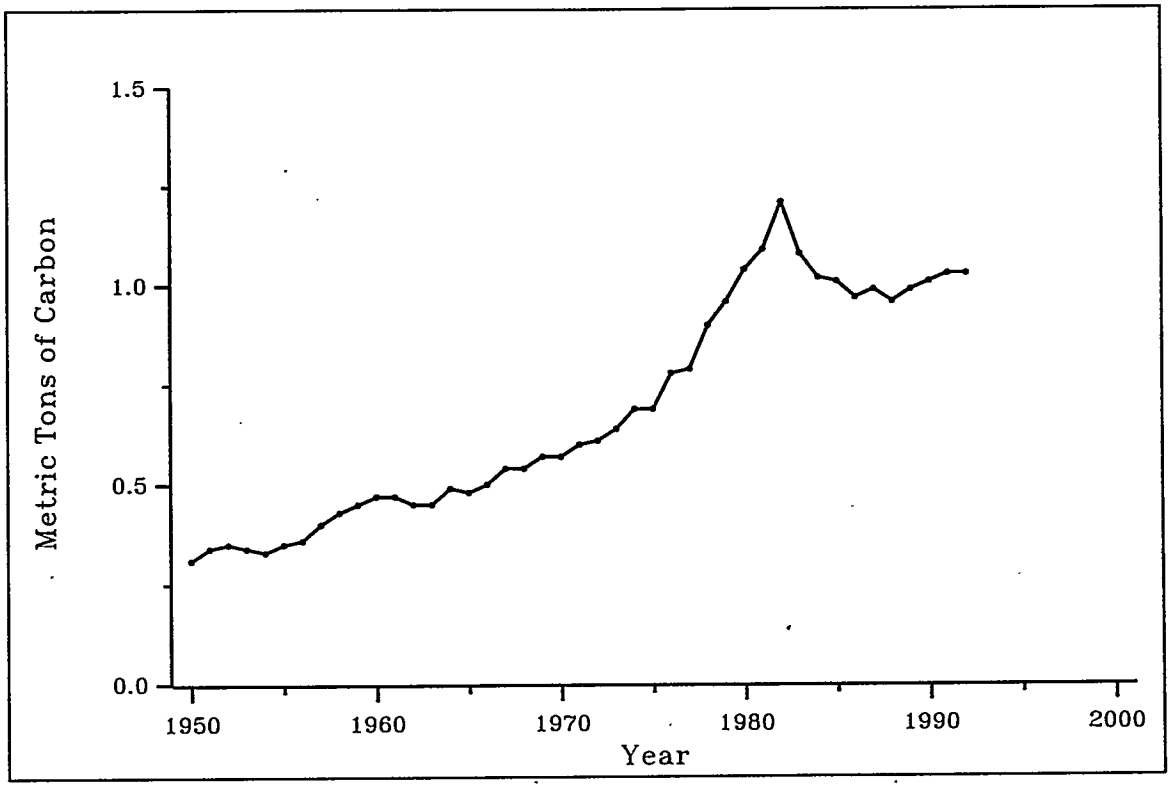
Mauritius

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	55	36	19	0	0	0	0.11	.
1951	38	19	19	0	0	0	0.08	.
1952	48	20	28	0	0	0	0.09	.
1953	51	21	31	0	0	0	0.10	.
1954	51	20	31	0	0	0	0.09	.
1955	35	7	28	0	0	0	0.06	.
1956	60	15	45	0	0	0	0.10	.
1957	60	12	48	0	0	0	0.10	.
1958	57	14	44	0	0	0	0.09	.
1959	61	10	51	0	0	0	0.10	.
1960	49	2	47	0	0	0	0.07	.
1961	51	4	47	0	0	0	0.08	.
1962	69	2	67	0	0	0	0.10	.
1963	57	1	55	0	0	0	0.08	.
1964	84	1	83	0	0	0	0.11	.
1965	84	1	82	0	0	0	0.11	.
1966	75	2	73	0	0	0	0.10	.
1967	136	0	136	0	0	0	0.17	.
1968	174	1	173	0	0	0	0.22	.
1969	156	1	156	0	0	0	0.19	.
1970	135	0	135	0	0	0	0.16	.
1971	105	1	105	0	0	0	0.13	.
1972	185	1	184	0	0	0	0.22	.
1973	181	1	180	0	0	0	0.21	.
1974	184	1	183	0	0	0	0.21	.
1975	156	0	156	0	0	0	0.17	.
1976	168	1	167	0	0	0	0.19	.
1977	175	1	174	0	0	0	0.19	.
1978	172	1	171	0	0	0	0.18	.
1979	180	1	179	0	0	0	0.19	.
1980	161	1	161	0	0	0	0.17	.
1981	148	1	147	0	0	0	0.15	.
1982	136	1	136	0	0	0	0.14	.
1983	163	10	152	0	0	0	0.16	.
1984	171	18	153	0	0	0	0.17	.
1985	193	26	167	0	0	0	0.19	.
1986	219	34	185	0	0	0	0.21	.
1987	255	28	227	0	0	0	0.24	.
1988	248	28	220	0	0	0	0.24	.
1989	287	55	232	0	0	0	0.27	.
1990	315	55	260	0	0	0	0.29	.
1991	331	48	282	0	0	0	0.30	.
1992	370	45	325	0	0	0	0.34	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Mexico

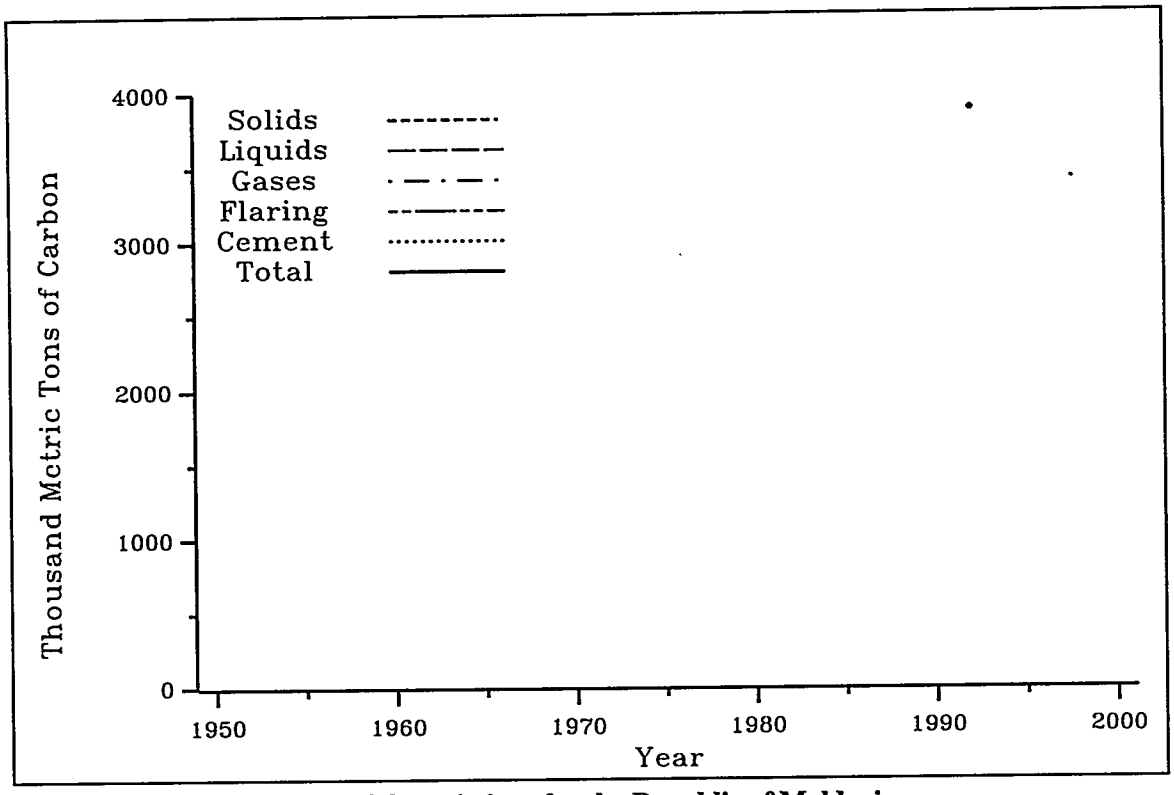


Per capita CO_2 emission rates for Mexico

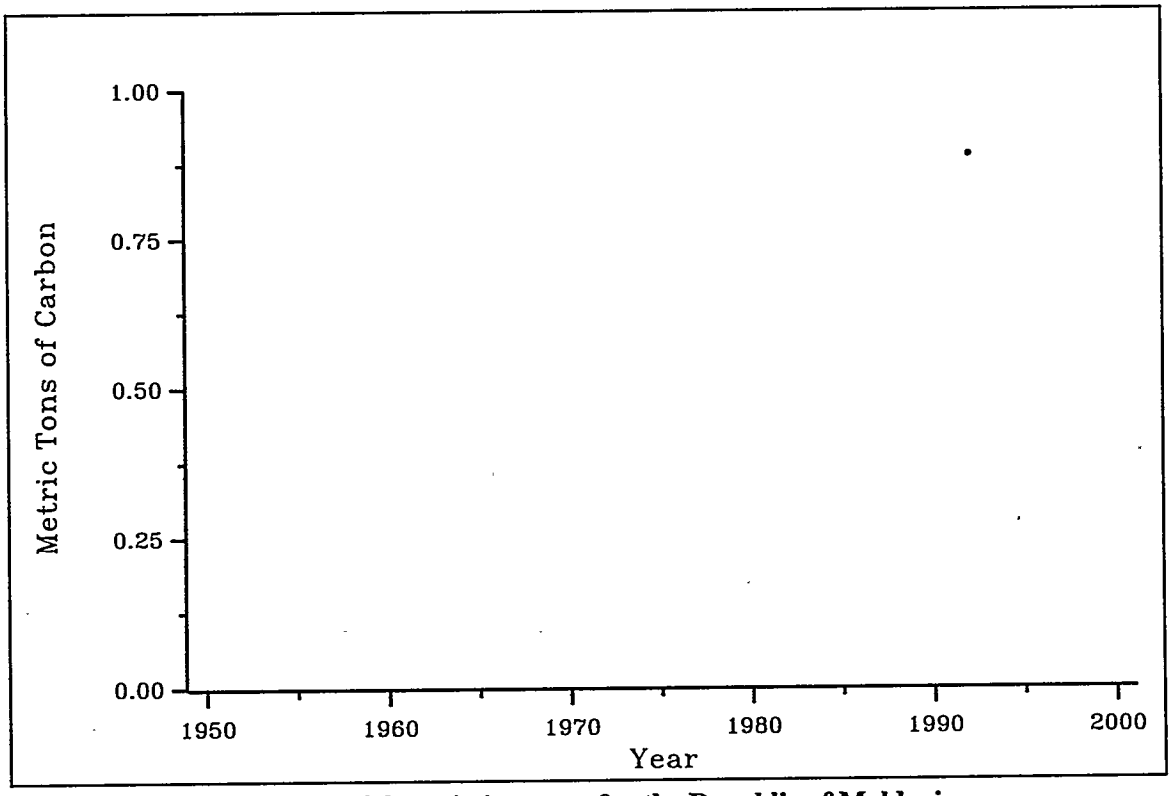
Mexico

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	8333	513	6463	419	208	731	0.31	.
1951	9531	588	7266	453	220	1004	0.34	.
1952	10167	719	7658	530	226	1033	0.35	.
1953	10028	779	7459	564	227	1000	0.34	.
1954	9910	728	7318	602	238	1024	0.33	.
1955	10835	741	7873	636	274	1312	0.35	.
1956	11511	778	8509	676	310	1238	0.36	.
1957	13461	787	9953	719	348	1653	0.40	.
1958	14753	797	10345	1251	345	2014	0.43	.
1959	15921	865	10873	1405	368	2410	0.45	.
1960	17223	964	11727	1741	420	2372	0.47	.
1961	17820	987	12274	2193	413	1953	0.47	.
1962	17413	1027	11525	3234	456	1172	0.45	.
1963	18110	1126	11675	3182	512	1616	0.45	.
1964	20269	1169	12678	3672	601	2150	0.49	.
1965	20534	1124	12909	4303	585	1613	0.48	.
1966	22084	1224	13729	4643	670	1818	0.50	.
1967	24587	1385	15450	5408	761	1584	0.54	.
1968	25650	1605	16215	5411	833	1585	0.54	.
1969	27933	1714	18278	5348	923	1670	0.57	.
1970	28914	1869	17819	5625	977	2624	0.57	.
1971	31065	2051	19731	5521	1001	2762	0.60	.
1972	32534	2225	20588	6241	1170	2310	0.61	.
1973	35265	2469	22600	6900	1331	1964	0.64	.
1974	39513	3049	25094	7188	1441	2741	0.69	.
1975	40650	3072	26030	7115	1579	2854	0.69	.
1976	47480	3199	32373	7073	1711	3124	0.78	.
1977	49341	3433	34451	7716	1799	1941	0.79	.
1978	57562	3899	39385	9476	1912	2890	0.90	.
1979	62511	4251	42645	11238	2064	2312	0.96	.
1980	69641	2909	49384	12441	2209	2698	1.04	.
1981	74917	2397	54534	12302	2445	3239	1.09	.
1982	85404	2945	54531	20605	2625	4699	1.21	.
1983	77917	3159	50906	18399	2321	3132	1.08	.
1984	75354	3211	53463	14183	2507	1990	1.02	.
1985	76601	3830	53888	14361	2813	1709	1.01	.
1986	74824	3830	54876	12323	2686	1109	0.97	.
1987	78283	3768	57670	12602	3039	1204	0.99	.
1988	77867	3573	57795	12736	3062	701	0.96	.
1989	81606	3920	61694	12330	3096	566	0.99	.
1990	85551	3841	64703	13068	3240	698	1.01	.
1991	88705	3632	67410	13588	3414	662	1.03	.
1992	90844	3661	68532	14326	3652	673	1.03	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Republic of Moldavia

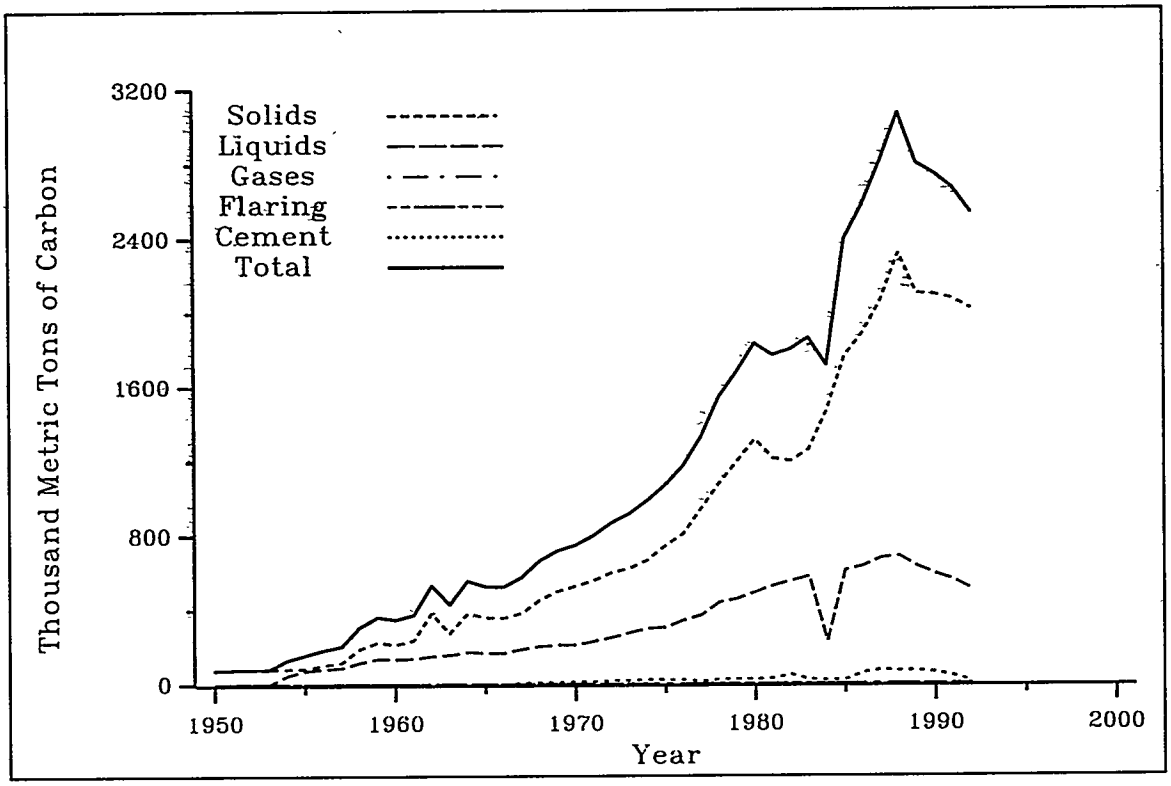


Per capita CO_2 emission rates for the Republic of Moldavia

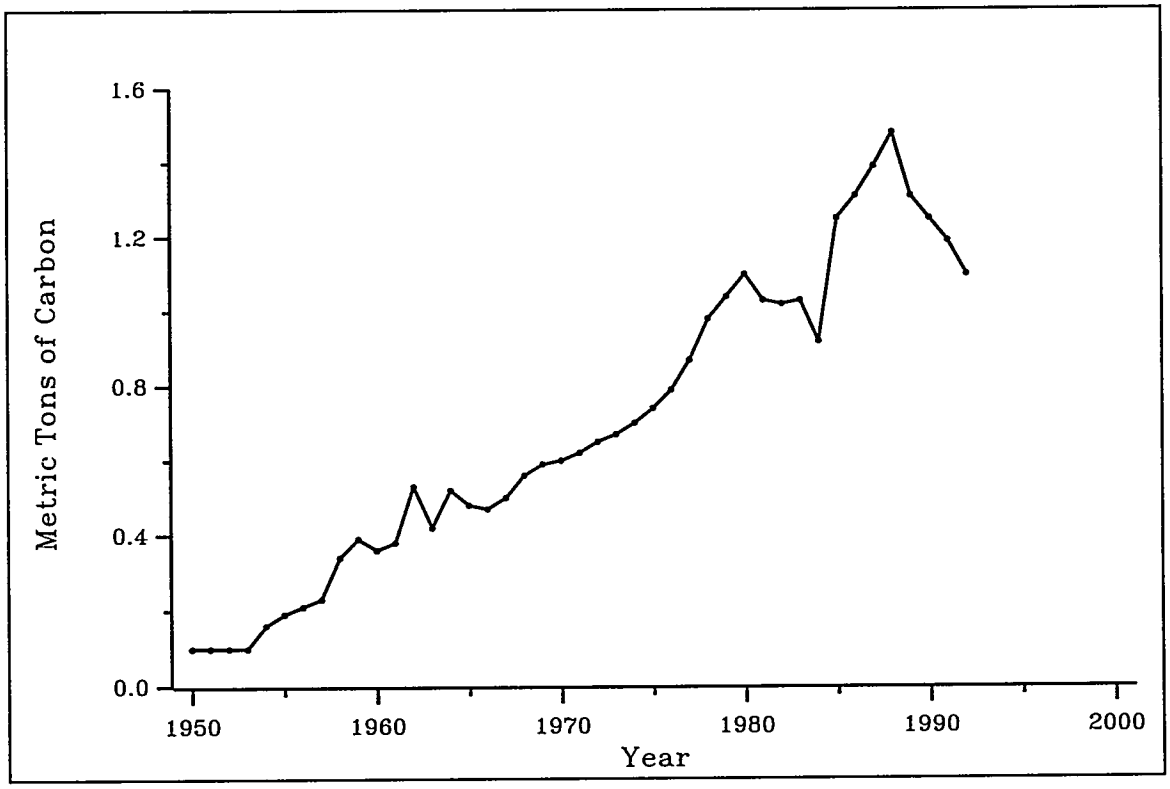
Republic of Moldavia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	3878	1410	329	1909	231	0	0.89	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Mongolia

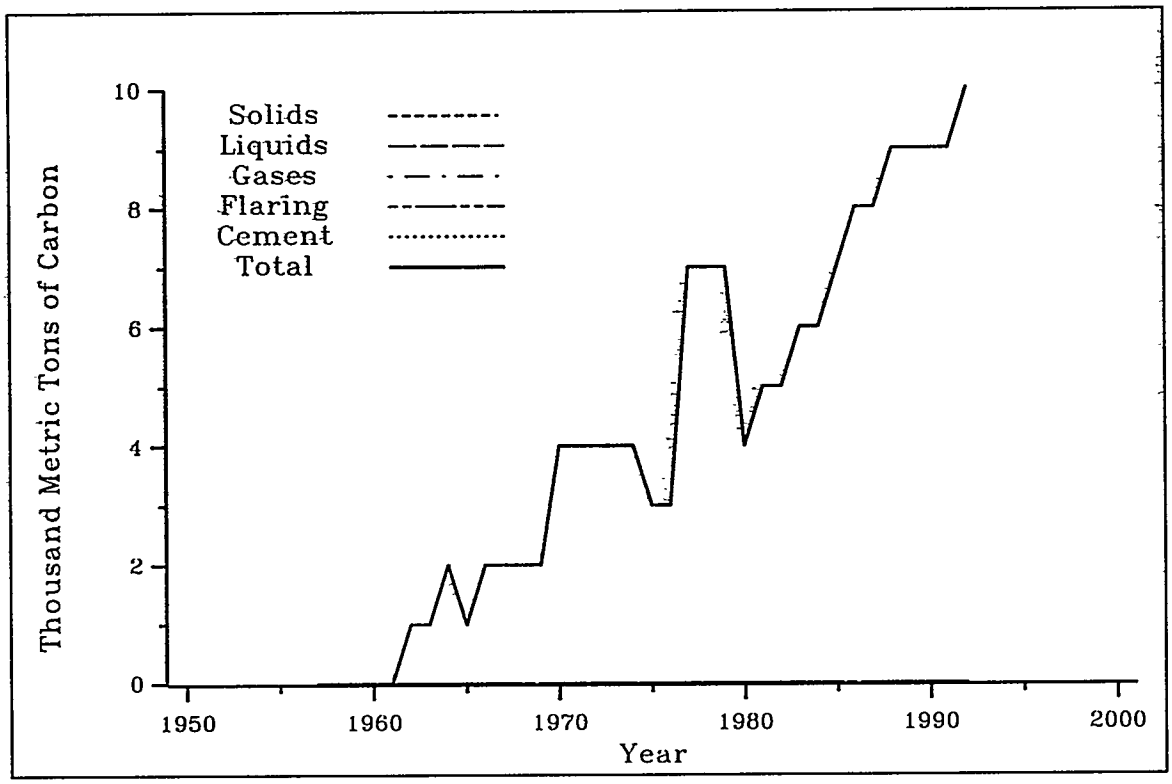


Per capita CO_2 emission rates for Mongolia

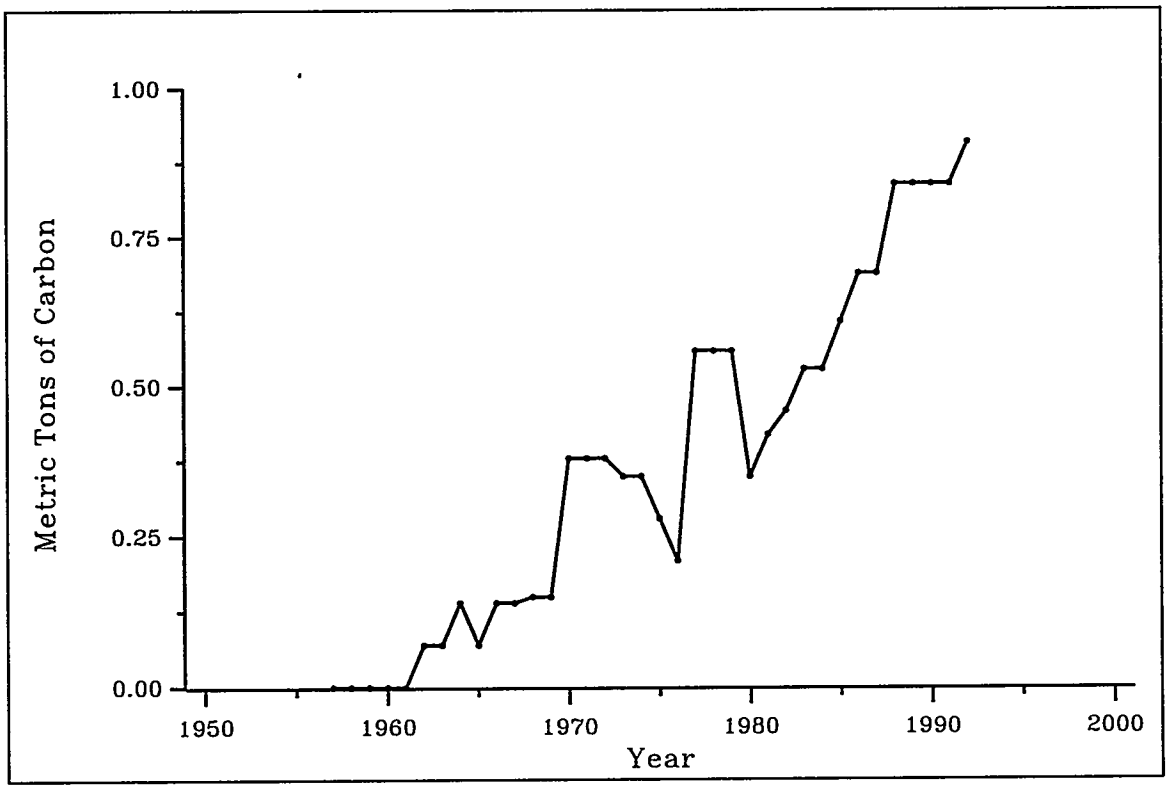
Mongolia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	76	76	0	0	0	0	0.10	.
1951	78	78	0	0	0	0	0.10	.
1952	79	79	0	0	0	0	0.10	.
1953	81	81	0	0	0	0	0.10	.
1954	131	83	48	0	0	0	0.16	.
1955	158	85	73	0	0	0	0.19	.
1956	185	103	82	0	0	0	0.21	.
1957	204	115	89	0	0	0	0.23	.
1958	306	190	116	0	0	0	0.34	.
1959	362	225	137	0	0	0	0.39	.
1960	348	213	135	0	0	0	0.36	.
1961	374	236	138	0	0	0	0.38	.
1962	533	383	150	0	0	0	0.53	.
1963	430	274	157	0	0	0	0.42	.
1964	556	382	173	0	0	0	0.52	.
1965	527	359	168	0	0	0	0.48	.
1966	524	357	167	0	0	0	0.47	.
1967	577	382	188	0	7	0	0.50	.
1968	666	453	203	0	10	0	0.56	.
1969	720	500	210	0	10	0	0.59	.
1970	750	527	210	0	13	0	0.60	.
1971	799	557	229	0	13	0	0.62	.
1972	868	599	250	0	19	0	0.65	.
1973	917	622	275	0	20	0	0.67	.
1974	988	667	298	0	23	0	0.70	.
1975	1070	744	304	0	22	0	0.74	.
1976	1172	807	342	0	22	0	0.79	.
1977	1325	943	369	0	14	0	0.87	.
1978	1538	1077	439	0	23	0	0.98	.
1979	1676	1194	457	0	25	0	1.04	.
1980	1829	1312	492	0	24	0	1.10	.
1981	1767	1211	527	0	29	0	1.03	.
1982	1798	1197	553	0	48	0	1.02	.
1983	1859	1257	579	0	23	0	1.03	.
1984	1713	1467	228	0	19	0	0.92	.
1985	2389	1759	610	0	21	0	1.25	.
1986	2573	1883	632	0	58	0	1.31	.
1987	2808	2058	676	0	74	0	1.39	.
1988	3068	2313	687	0	68	0	1.48	.
1989	2801	2100	630	0	70	0	1.31	.
1990	2744	2093	591	0	60	0	1.25	.
1991	2667	2069	558	0	41	0	1.19	.
1992	2533	2016	507	0	11	0	1.10	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Montserrat

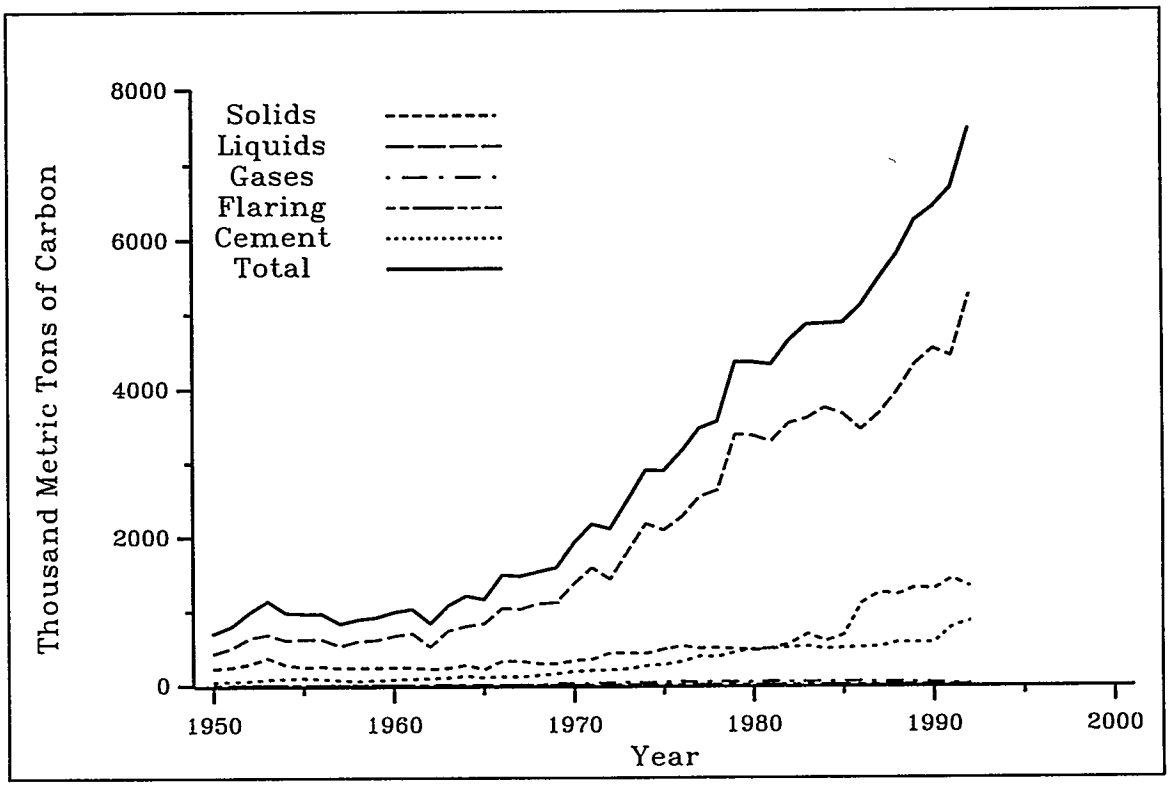


Per capita CO_2 emission rates for Montserrat

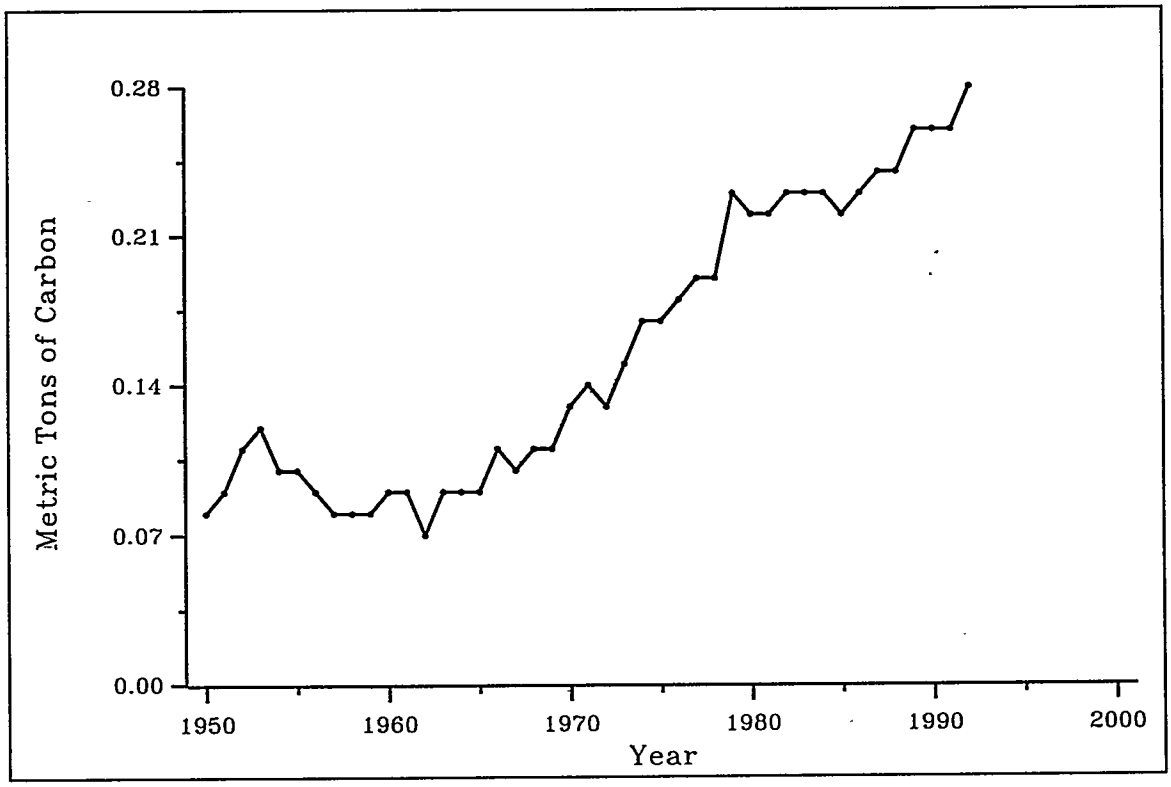
Montserrat

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1957	0	0	0	0	0	0	0.00	.
1958	0	0	0	0	0	0	0.00	.
1959	0	0	0	0	0	0	0.00	.
1960	0	0	0	0	0	0	0.00	.
1961	0	0	0	0	0	0	0.00	.
1962	1	0	1	0	0	0	0.07	.
1963	1	0	1	0	0	0	0.07	.
1964	2	0	2	0	0	0	0.14	.
1965	1	0	1	0	0	0	0.07	.
1966	2	0	2	0	0	0	0.14	.
1967	2	0	2	0	0	0	0.14	.
1968	2	0	2	0	0	0	0.15	.
1969	2	0	2	0	0	0	0.15	.
1970	4	0	4	0	0	0	0.38	.
1971	4	0	4	0	0	0	0.38	.
1972	4	0	4	0	0	0	0.38	.
1973	4	0	4	0	0	0	0.35	.
1974	4	0	4	0	0	0	0.35	.
1975	3	0	3	0	0	0	0.28	.
1976	3	0	3	0	0	0	0.21	.
1977	7	0	7	0	0	0	0.56	.
1978	7	0	7	0	0	0	0.56	.
1979	7	0	7	0	0	0	0.56	.
1980	4	0	4	0	0	0	0.35	.
1981	5	0	5	0	0	0	0.42	.
1982	5	0	5	0	0	0	0.46	.
1983	6	0	6	0	0	0	0.53	.
1984	6	0	6	0	0	0	0.53	.
1985	7	0	7	0	0	0	0.61	.
1986	8	0	8	0	0	0	0.69	.
1987	8	0	8	0	0	0	0.69	.
1988	9	0	9	0	0	0	0.84	.
1989	9	0	9	0	0	0	0.84	.
1990	9	0	9	0	0	0	0.84	.
1991	9	0	9	0	0	0	0.84	.
1992	10	0	10	0	0	0	0.91	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Morocco

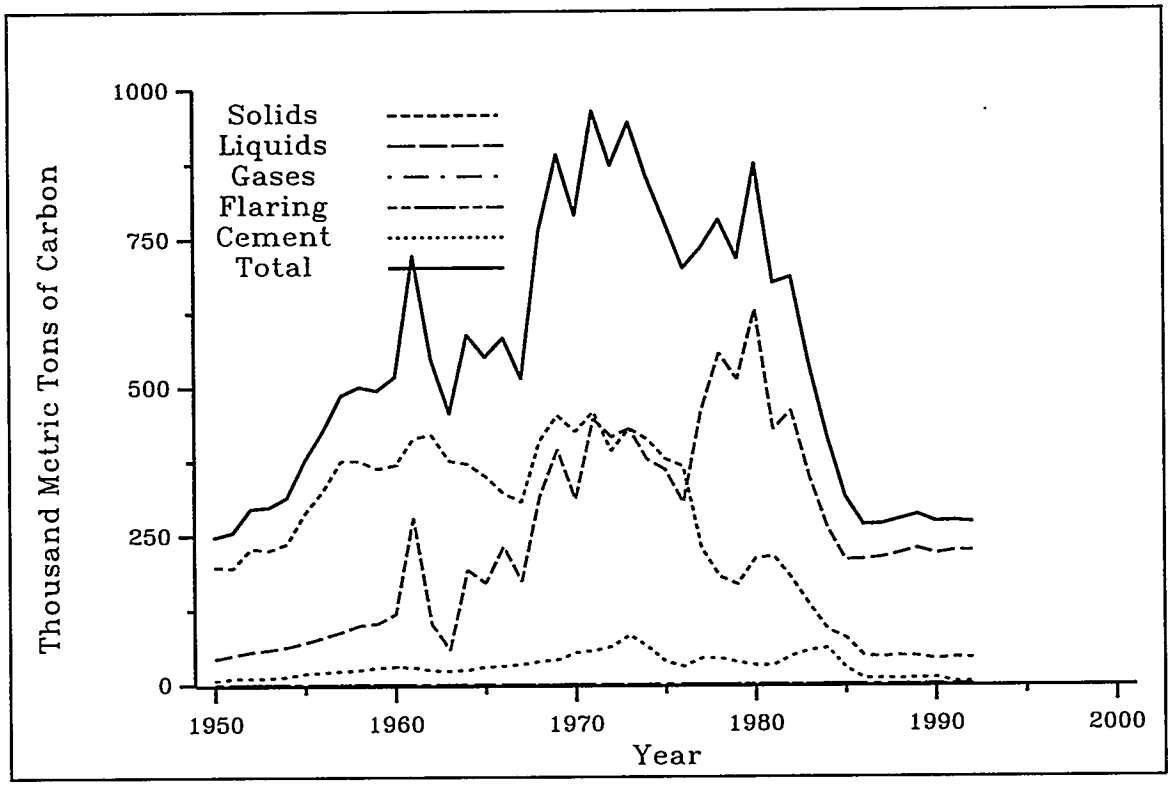


Per capita CO_2 emission rates for Morocco

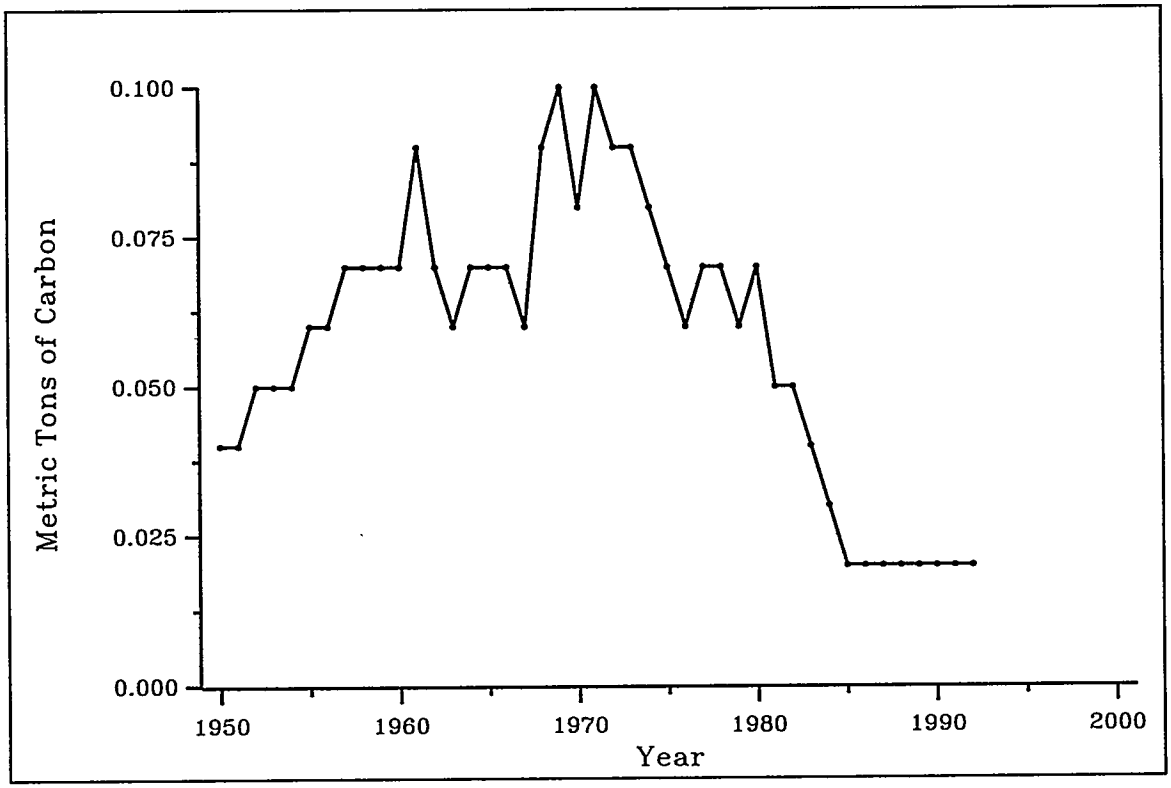
Morocco

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	702	228	430	0	44	0	0.08	.
1951	802	244	507	0	51	0	0.09	.
1952	990	289	642	0	59	0	0.11	.
1953	1143	369	689	2	83	0	0.12	.
1954	983	277	612	4	90	0	0.10	.
1955	974	246	625	4	99	0	0.10	.
1956	969	255	624	4	87	0	0.09	.
1957	836	235	532	2	69	0	0.08	.
1958	895	239	599	1	56	0	0.08	.
1959	923	237	615	2	68	0	0.08	.
1960	995	242	670	5	79	0	0.09	.
1961	1034	240	704	5	86	0	0.09	.
1962	842	219	523	5	95	0	0.07	.
1963	1083	234	740	6	103	0	0.09	.
1964	1210	274	803	6	126	0	0.09	.
1965	1165	214	838	6	107	0	0.09	.
1966	1494	329	1042	7	117	0	0.11	.
1967	1480	327	1031	6	117	0	0.10	.
1968	1539	293	1104	6	136	0	0.11	.
1969	1593	292	1120	22	158	0	0.11	.
1970	1928	333	1379	25	191	0	0.13	.
1971	2171	351	1592	27	201	0	0.14	.
1972	2112	438	1435	29	210	0	0.13	.
1973	2500	432	1811	37	220	0	0.15	.
1974	2899	429	2177	33	260	0	0.17	.
1975	2893	487	2091	40	276	0	0.17	.
1976	3155	528	2266	45	316	0	0.18	.
1977	3463	499	2538	36	390	0	0.19	.
1978	3559	503	2628	44	383	0	0.19	.
1979	4357	489	3382	39	446	0	0.23	.
1980	4354	470	3365	35	483	0	0.22	.
1981	4326	498	3288	50	490	0	0.22	.
1982	4640	556	3534	41	509	0	0.23	.
1983	4854	689	3598	44	523	0	0.23	.
1984	4865	592	3741	44	488	0	0.23	.
1985	4880	677	3655	45	502	0	0.22	.
1986	5111	1109	3445	48	509	0	0.23	.
1987	5463	1249	3657	39	518	0	0.24	.
1988	5793	1223	3953	44	574	0	0.24	.
1989	6248	1320	4325	32	571	0	0.26	.
1990	6425	1293	4531	30	571	0	0.26	.
1991	6680	1439	4436	20	785	0	0.26	.
1992	7463	1329	5258	13	864	0	0.28	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Mozambique

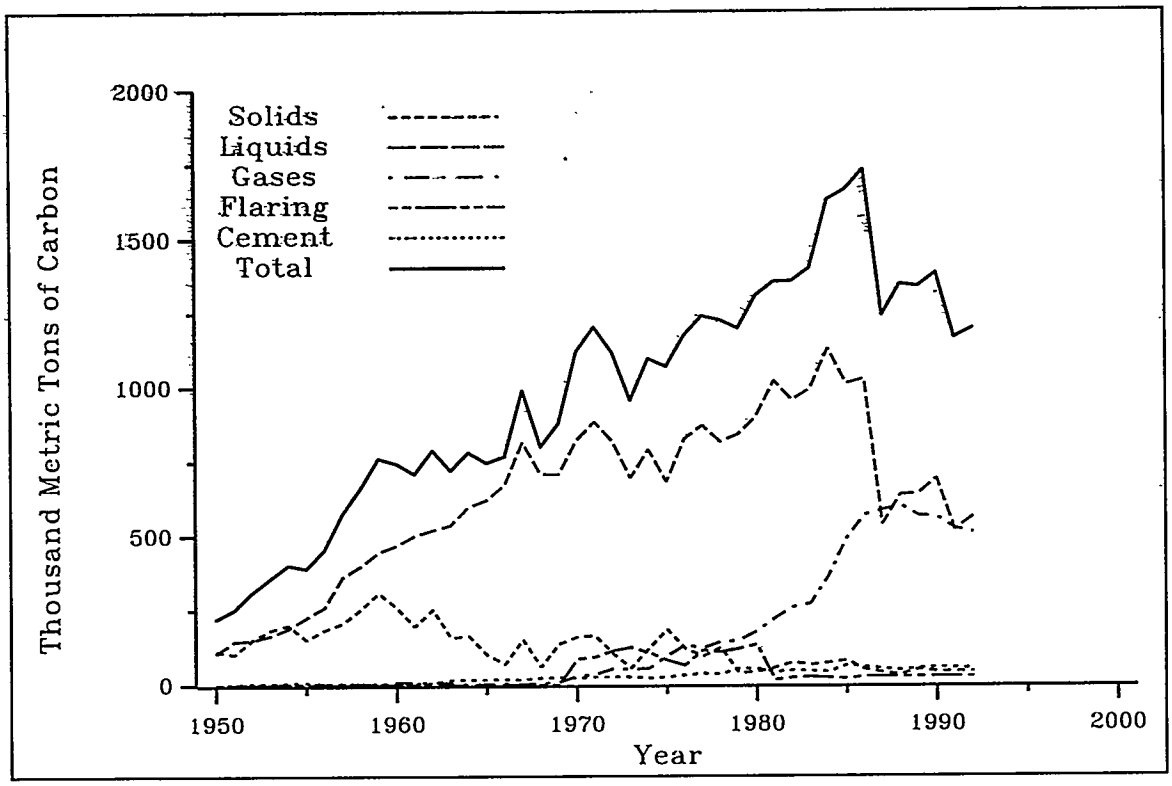


Per capita CO_2 emission rates for Mozambique

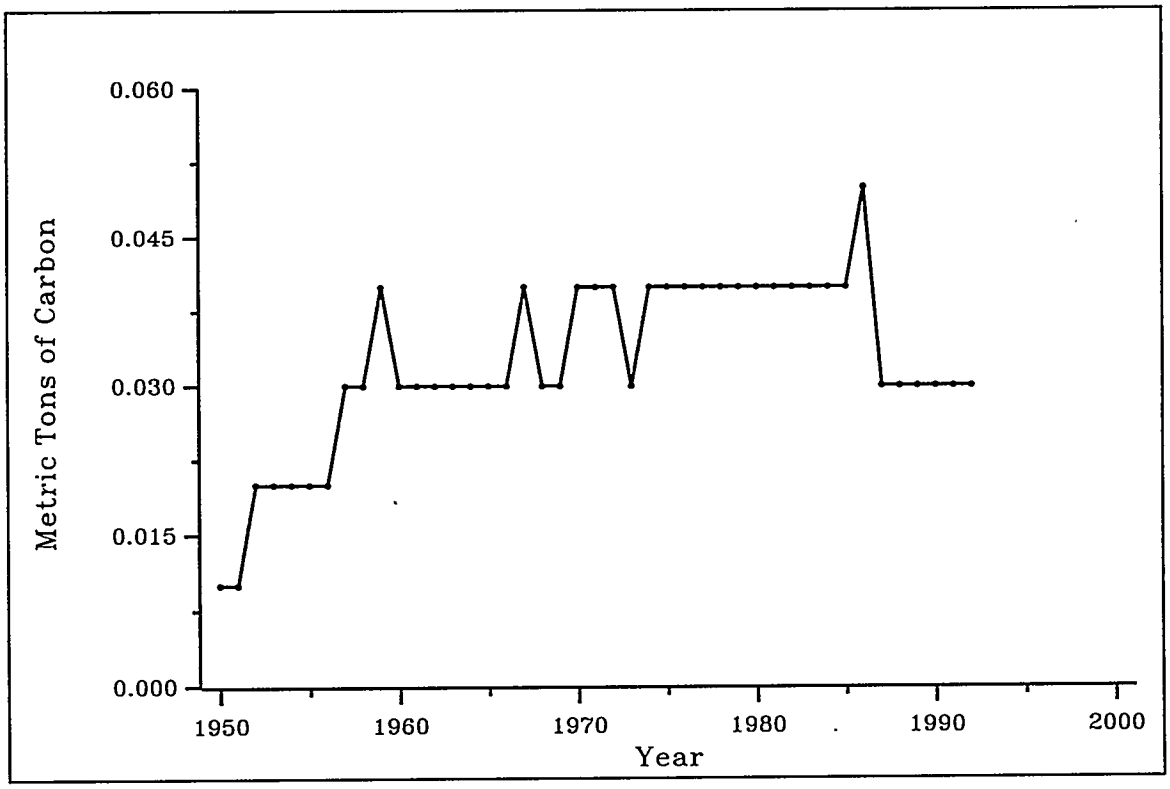
Mozambique

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	248	198	44	0	7	0	0.04	.
1951	256	196	50	0	11	0	0.04	.
1952	296	229	56	0	11	0	0.05	.
1953	298	226	59	0	12	0	0.05	.
1954	315	237	64	0	14	0	0.05	.
1955	378	288	71	0	19	0	0.06	.
1956	427	326	80	0	21	0	0.06	.
1957	487	376	89	0	23	0	0.07	.
1958	501	376	100	0	25	0	0.07	.
1959	495	363	103	0	29	0	0.07	.
1960	518	369	119	0	30	0	0.07	.
1961	722	414	280	0	29	0	0.09	.
1962	547	420	102	0	24	0	0.07	.
1963	457	376	59	0	23	0	0.06	.
1964	588	371	193	0	25	0	0.07	.
1965	551	350	171	0	30	0	0.07	.
1966	583	321	232	0	31	0	0.07	.
1967	515	307	174	0	34	0	0.06	.
1968	763	409	315	0	39	0	0.09	.
1969	890	453	395	0	42	0	0.10	.
1970	790	425	311	0	54	0	0.08	.
1971	963	459	447	0	57	0	0.10	.
1972	873	393	416	0	64	0	0.09	.
1973	944	430	430	0	83	0	0.09	.
1974	853	412	378	0	63	0	0.08	.
1975	778	379	361	0	38	0	0.07	.
1976	700	366	305	0	30	0	0.06	.
1977	734	229	460	0	44	0	0.07	.
1978	781	181	556	0	44	0	0.07	.
1979	717	168	512	0	37	0	0.06	.
1980	874	211	630	0	32	0	0.07	.
1981	675	215	428	0	32	0	0.05	.
1982	685	178	460	0	48	0	0.05	.
1983	539	133	349	0	57	0	0.04	.
1984	416	92	263	0	61	0	0.03	.
1985	314	78	209	0	27	0	0.02	.
1986	268	48	210	0	10	0	0.02	.
1987	269	46	213	0	10	0	0.02	.
1988	277	48	220	0	9	0	0.02	.
1989	285	47	228	0	10	0	0.02	.
1990	273	42	219	0	11	0	0.02	.
1991	274	45	224	0	4	0	0.02	.
1992	272	44	224	0	4	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Myanmar

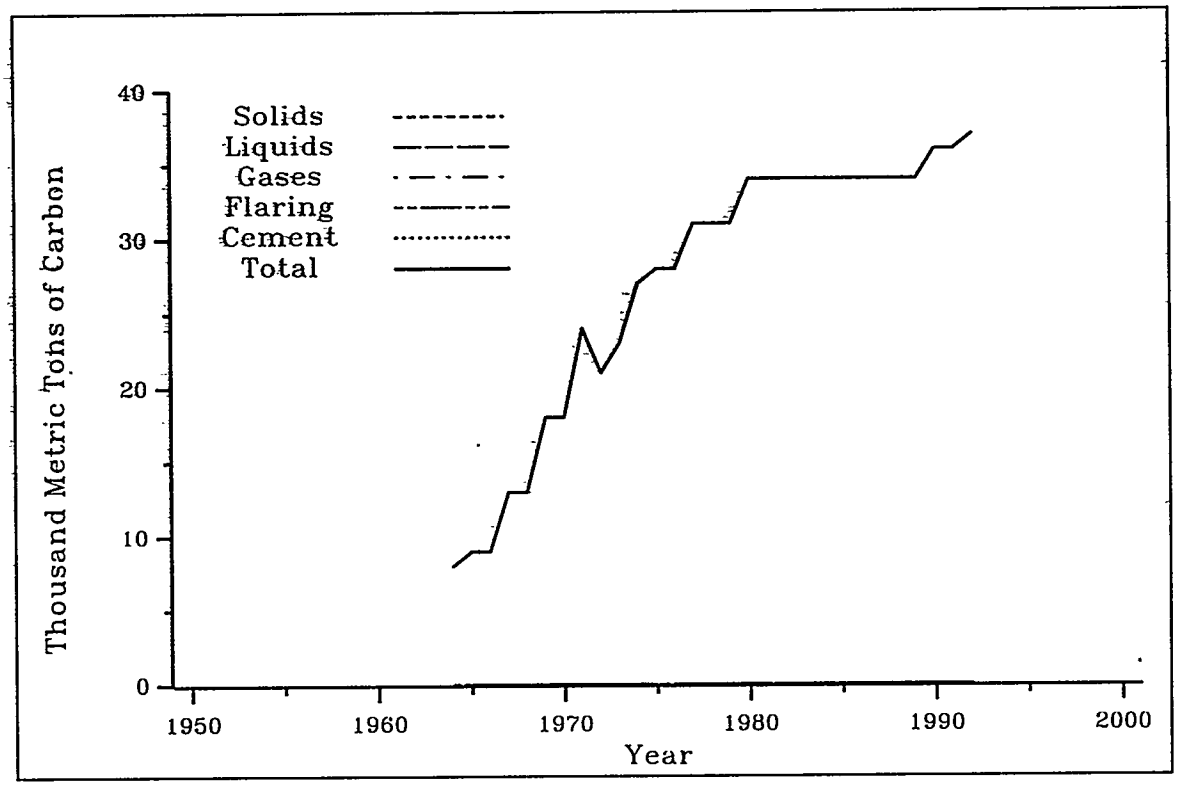


Per capita CO_2 emission rates for Myanmar

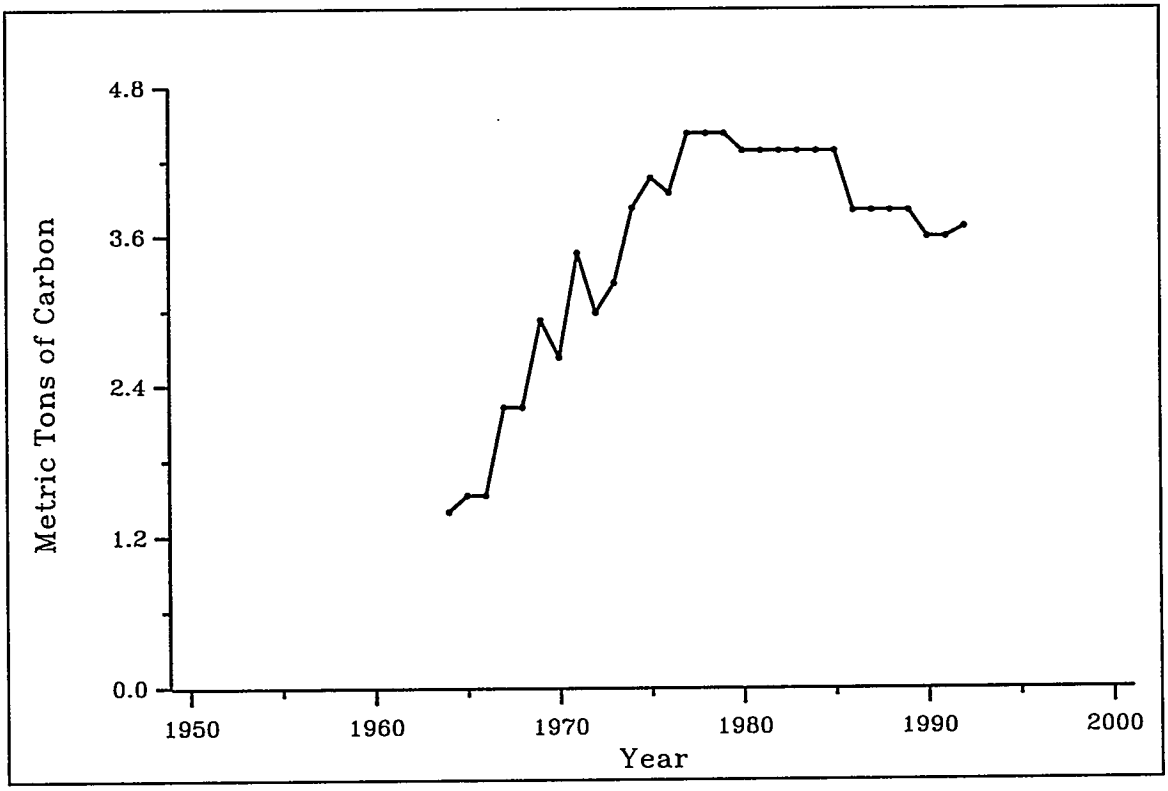
Myanmar

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	221	113	106	1	0	0	0.01	.
1951	252	103	146	1	2	0	0.01	.
1952	310	152	151	2	6	0	0.02	.
1953	357	184	166	3	6	0	0.02	.
1954	402	201	190	3	8	0	0.02	.
1955	390	152	226	3	8	0	0.02	.
1956	454	185	260	4	5	0	0.02	.
1957	576	207	361	3	5	0	0.03	.
1958	660	253	398	5	5	0	0.03	.
1959	761	308	445	3	5	0	0.04	.
1960	744	259	468	11	6	0	0.03	.
1961	710	196	501	8	6	0	0.03	.
1962	789	253	520	9	7	0	0.03	.
1963	721	159	537	8	17	0	0.03	.
1964	782	164	598	2	18	0	0.03	.
1965	746	102	621	4	18	0	0.03	.
1966	767	70	672	6	19	0	0.03	.
1967	989	152	815	4	18	0	0.04	.
1968	800	61	709	6	24	0	0.03	.
1969	878	137	707	9	25	0	0.03	.
1970	1120	160	821	30	23	86	0.04	.
1971	1203	165	883	35	27	93	0.04	.
1972	1118	105	818	54	27	114	0.04	.
1973	955	56	695	53	26	125	0.03	.
1974	1096	121	790	55	23	108	0.04	.
1975	1069	185	682	96	25	82	0.04	.
1976	1174	121	825	132	32	65	0.04	.
1977	1239	95	870	122	37	115	0.04	.
1978	1226	124	815	143	35	109	0.04	.
1979	1198	39	840	147	53	120	0.04	.
1980	1308	43	900	178	53	134	0.04	.
1981	1355	56	1020	221	43	16	0.04	.
1982	1356	74	954	258	47	23	0.04	.
1983	1400	66	992	270	46	26	0.04	.
1984	1629	73	1129	362	42	23	0.04	.
1985	1663	80	1010	489	65	20	0.04	.
1986	1731	51	1026	568	59	27	0.05	.
1987	1241	40	537	585	53	27	0.03	.
1988	1346	33	637	601	48	27	0.03	.
1989	1339	51	641	566	54	27	0.03	.
1990	1383	43	692	563	57	27	0.03	.
1991	1166	43	518	523	55	27	0.03	.
1992	1197	43	563	510	54	27	0.03	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Nauru

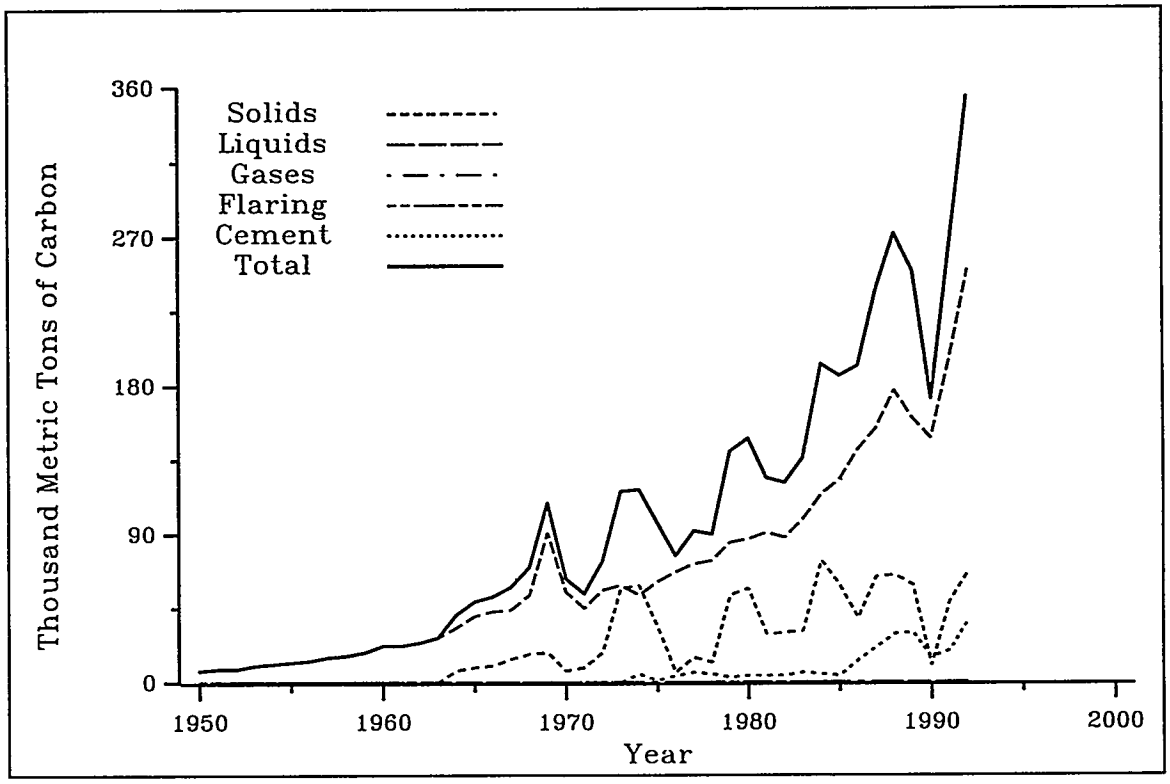


Per capita CO_2 emission rates for Nauru

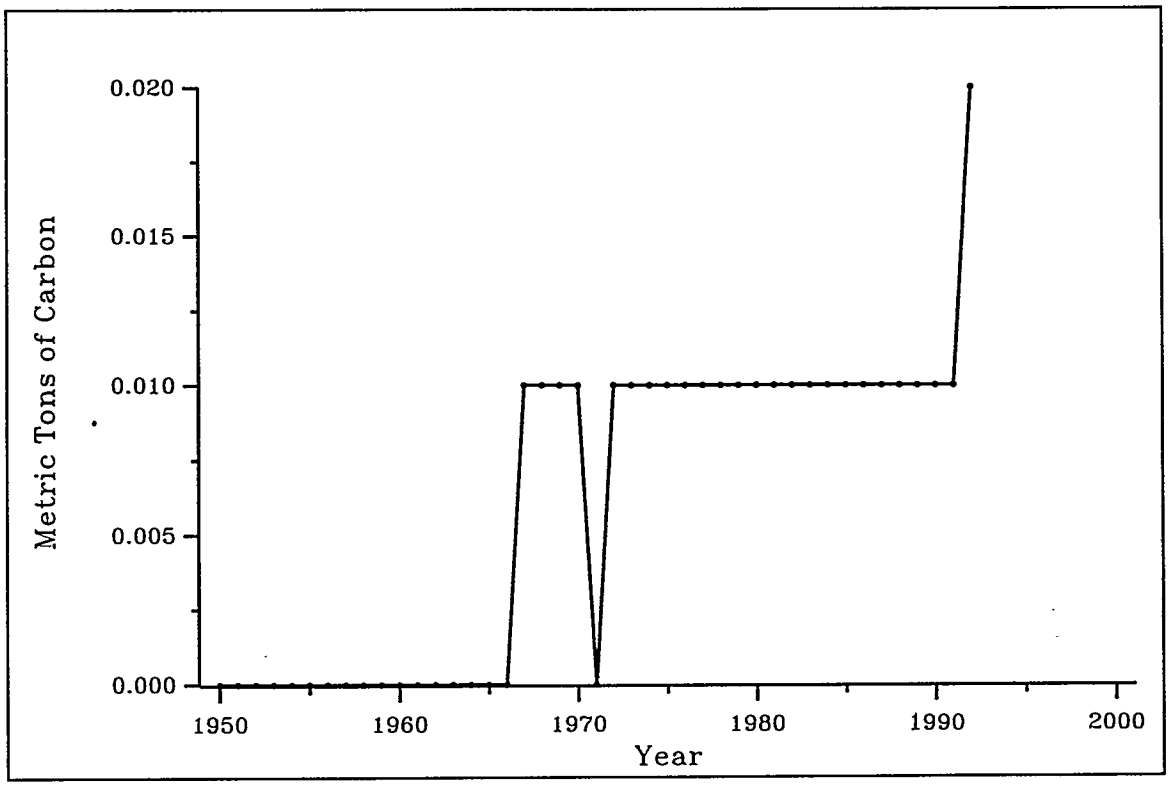
Nauru

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1964	8	0	8	0	0	0	1.40	.
1965	9	0	9	0	0	0	1.53	.
1966	9	0	9	0	0	0	1.53	.
1967	13	0	13	0	0	0	2.23	.
1968	13	0	13	0	0	0	2.23	.
1969	18	0	18	0	0	0	2.93	.
1970	18	0	18	0	0	0	2.63	.
1971	24	0	24	0	0	0	3.47	.
1972	21	0	21	0	0	0	2.99	.
1973	23	0	23	0	0	0	3.23	.
1974	27	0	27	0	0	0	3.83	.
1975	28	0	28	0	0	0	4.07	.
1976	28	0	28	0	0	0	3.95	.
1977	31	0	31	0	0	0	4.43	.
1978	31	0	31	0	0	0	4.43	.
1979	31	0	31	0	0	0	4.43	.
1980	34	0	34	0	0	0	4.29	.
1981	34	0	34	0	0	0	4.29	.
1982	34	0	34	0	0	0	4.29	.
1983	34	0	34	0	0	0	4.29	.
1984	34	0	34	0	0	0	4.29	.
1985	34	0	34	0	0	0	4.29	.
1986	34	0	34	0	0	0	3.81	.
1987	34	0	34	0	0	0	3.81	.
1988	34	0	34	0	0	0	3.81	.
1989	34	0	34	0	0	0	3.81	.
1990	36	0	36	0	0	0	3.60	.
1991	36	0	36	0	0	0	3.60	.
1992	37	0	37	0	0	0	3.68	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Nepal

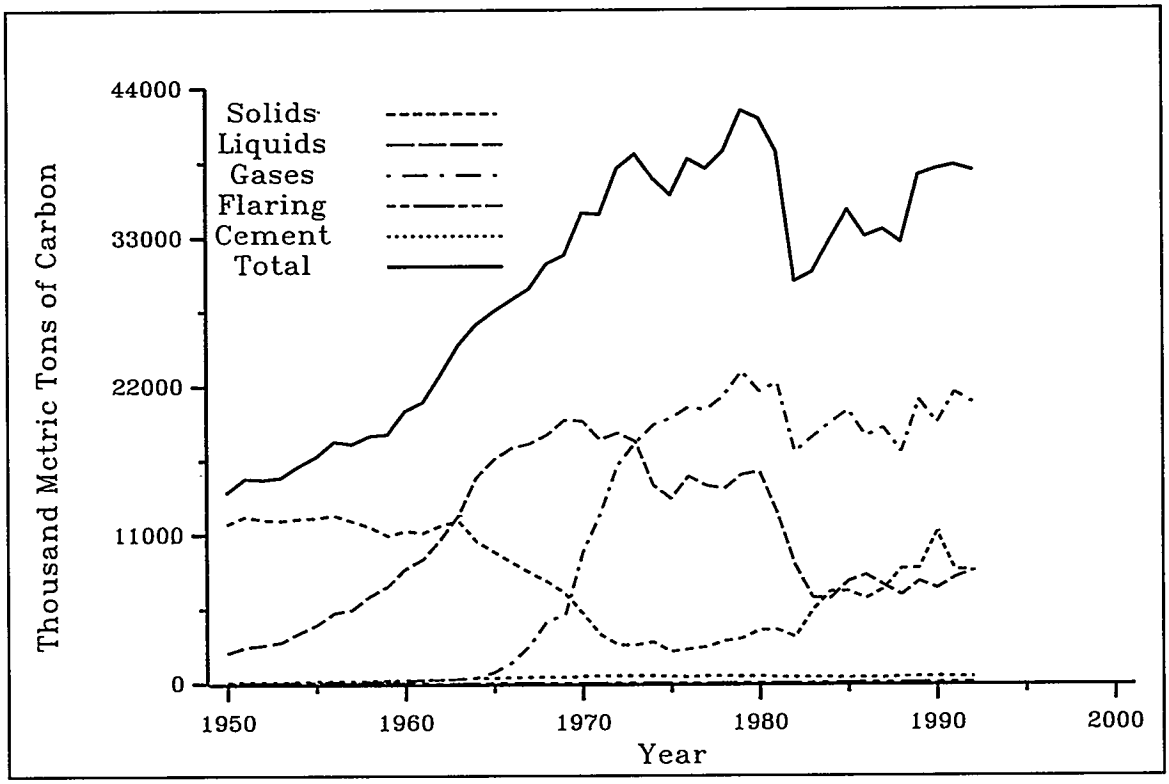


Per capita CO_2 emission rates for Nepal

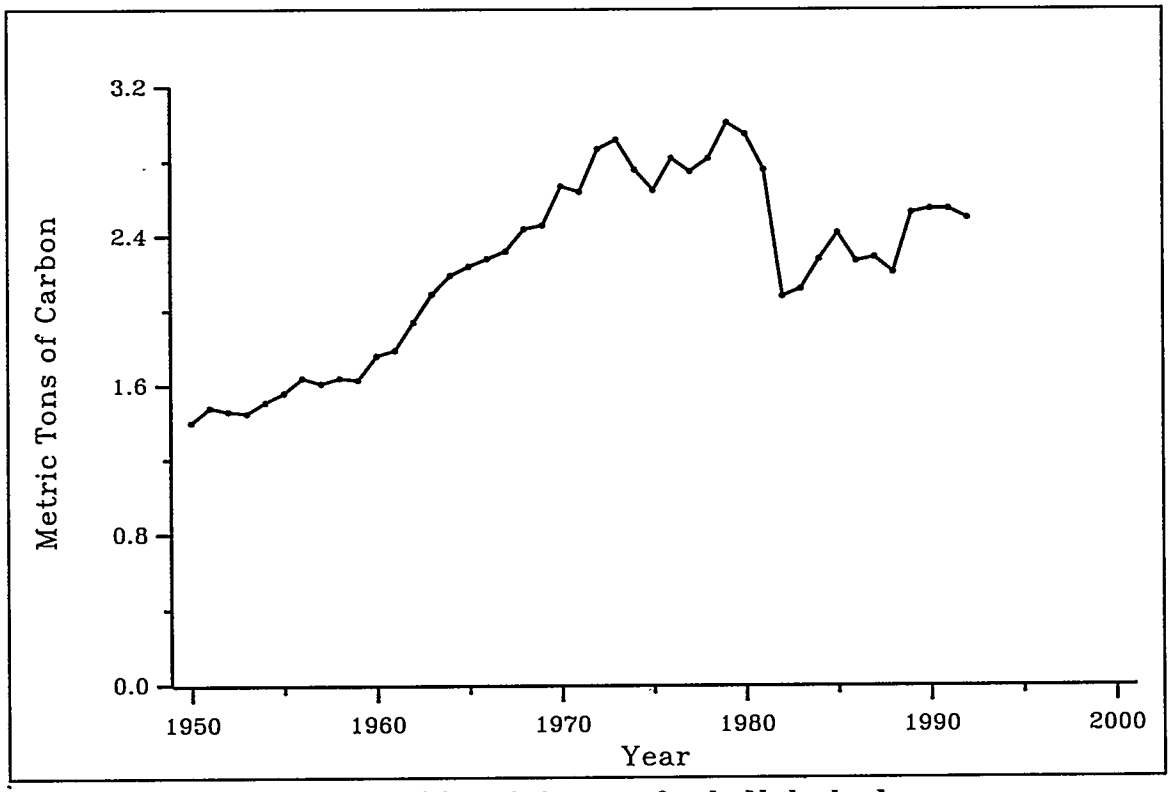
Nepal

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	7	0	7	0	0	0	0.00	.
1951	8	0	8	0	0	0	0.00	.
1952	8	0	8	0	0	0	0.00	.
1953	10	0	10	0	0	0	0.00	.
1954	11	0	11	0	0	0	0.00	.
1955	12	0	12	0	0	0	0.00	.
1956	13	0	13	0	0	0	0.00	.
1957	15	0	15	0	0	0	0.00	.
1958	16	0	16	0	0	0	0.00	.
1959	18	0	18	0	0	0	0.00	.
1960	22	0	22	0	0	0	0.00	.
1961	22	0	22	0	0	0	0.00	.
1962	24	0	24	0	0	0	0.00	.
1963	27	0	27	0	0	0	0.00	.
1964	41	7	33	0	0	0	0.00	.
1965	49	9	40	0	0	0	0.00	.
1966	52	10	43	0	0	0	0.00	.
1967	58	14	44	0	0	0	0.01	.
1968	70	17	53	0	0	0	0.01	.
1969	109	18	91	0	0	0	0.01	.
1970	63	7	55	0	0	0	0.01	.
1971	54	9	45	0	0	0	0.00	.
1972	74	18	56	0	0	0	0.01	.
1973	116	57	59	0	0	0	0.01	.
1974	117	59	53	0	5	0	0.01	.
1975	97	34	61	0	1	0	0.01	.
1976	77	6	67	0	4	0	0.01	.
1977	92	15	72	0	6	0	0.01	.
1978	90	12	74	0	5	0	0.01	.
1979	140	53	85	0	3	0	0.01	.
1980	148	57	87	0	4	0	0.01	.
1981	124	29	91	0	4	0	0.01	.
1982	121	30	88	0	4	0	0.01	.
1983	136	31	99	0	6	0	0.01	.
1984	193	74	114	0	5	0	0.01	.
1985	186	59	123	0	4	0	0.01	.
1986	192	39	141	0	13	0	0.01	.
1987	238	64	154	0	21	0	0.01	.
1988	272	65	177	0	29	0	0.01	.
1989	249	59	160	0	30	0	0.01	.
1990	172	10	148	0	15	0	0.01	.
1991	264	49	196	0	19	0	0.01	.
1992	354	67	250	0	37	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Netherlands

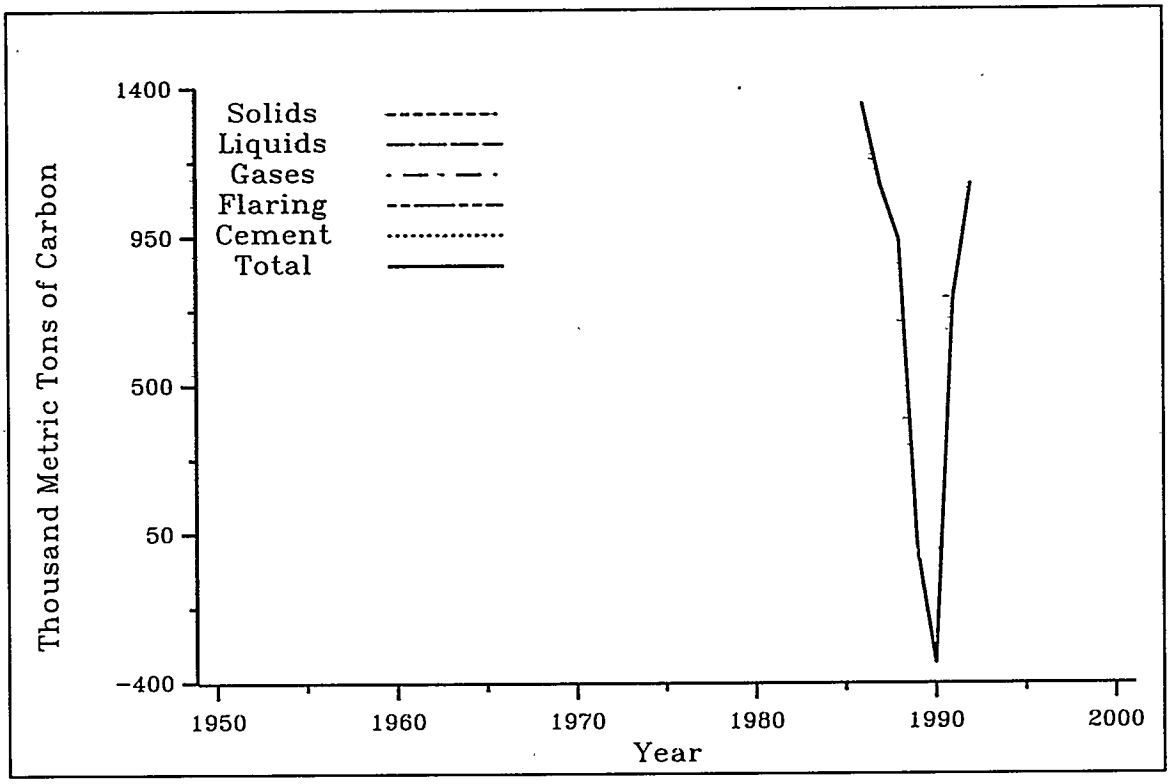


Per capita CO_2 emission rates for the Netherlands

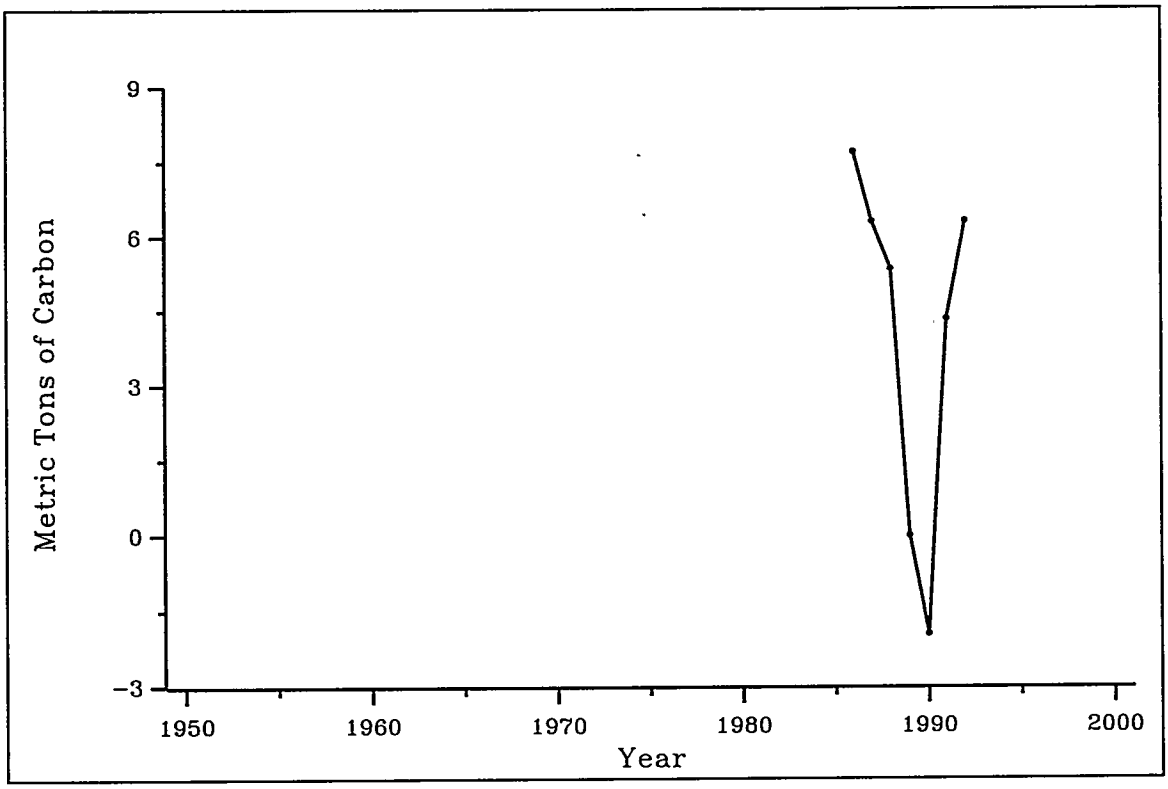
Netherlands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	14131	11779	2268	4	81	0	1.40	1150
1951	15143	12336	2708	4	96	0	1.48	1248
1952	15071	12094	2859	8	111	0	1.46	1201
1953	15220	12028	3063	12	117	0	1.45	1210
1954	16076	12166	3729	48	132	0	1.51	1399
1955	16784	12227	4338	70	150	0	1.56	1957
1956	17904	12414	5238	81	171	0	1.64	2205
1957	17715	11993	5464	78	180	0	1.61	1916
1958	18334	11569	6479	100	186	0	1.64	1805
1959	18444	10914	7190	122	218	0	1.63	1585
1960	20173	11263	8488	177	245	0	1.76	2185
1961	20821	11125	9197	240	259	0	1.79	3060
1962	22865	11667	10661	263	274	0	1.94	3298
1963	25014	12015	12411	305	283	0	2.09	3355
1964	26535	10525	15199	420	391	0	2.19	3886
1965	27518	9730	16560	823	404	0	2.24	4508
1966	28369	8962	17416	1561	430	0	2.28	4547
1967	29214	8209	17731	2819	455	0	2.32	4720
1968	31053	7540	18396	4649	467	0	2.44	5963
1969	31686	6673	19493	5050	448	22	2.46	7374
1970	34813	5192	19428	9647	521	25	2.67	7943
1971	34715	3608	18040	12490	550	26	2.64	8385
1972	38102	2856	18538	16144	547	16	2.87	10243
1973	39129	2853	17901	17811	555	9	2.92	10821
1974	37382	3057	14640	19119	556	10	2.76	8762
1975	36140	2351	13651	19623	504	12	2.65	9710
1976	38787	2548	15296	20458	473	12	2.82	10164
1977	38074	2703	14607	20224	530	11	2.75	9971
1978	39341	3130	14370	21300	533	9	2.82	10355
1979	42314	3325	15416	23063	503	6	3.01	9278
1980	41704	3944	15648	21594	509	8	2.95	8912
1981	39258	3959	12594	22241	451	13	2.76	8541
1982	29738	3414	8781	17108	422	14	2.08	8399
1983	30410	5419	6351	18203	423	14	2.12	7901
1984	32802	6793	6306	19249	432	21	2.28	7437
1985	35014	6826	7553	20214	396	25	2.42	8489
1986	33072	6279	8032	18280	422	60	2.27	9485
1987	33593	6993	7264	18893	398	45	2.29	9350
1988	32649	8484	6547	17122	465	32	2.21	10377
1989	37591	8525	7551	20965	482	68	2.53	10154
1990	38035	11187	7043	19248	507	50	2.55	10703
1991	38309	8431	7825	21518	482	53	2.55	11066
1992	37944	8324	8315	20793	457	56	2.50	11417

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Netherlands Antilles

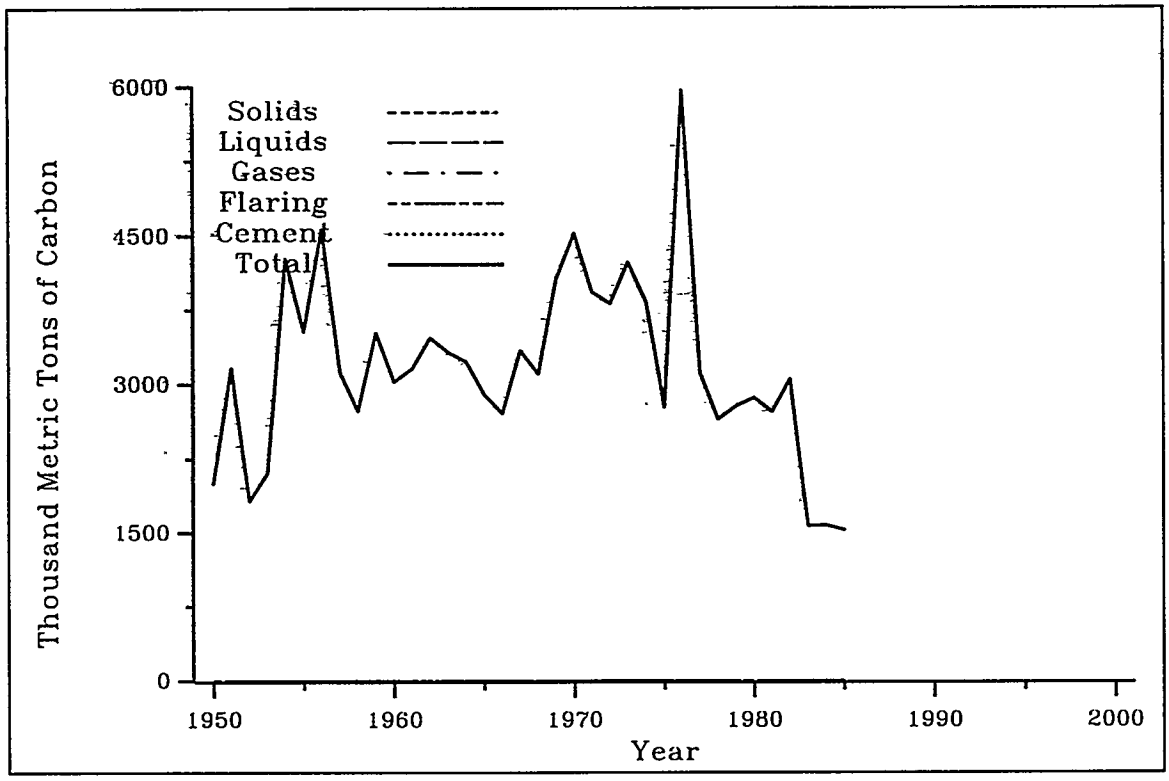


Per capita CO_2 emission rates for the Netherlands Antilles

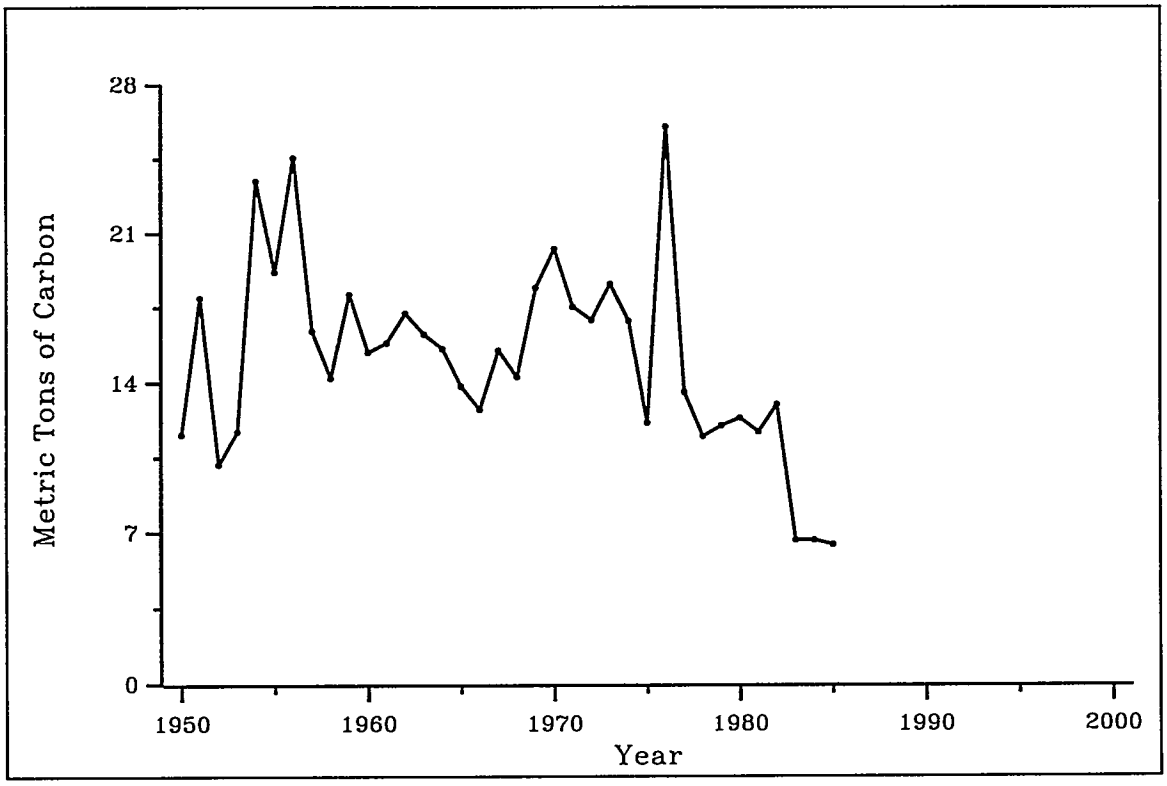
Netherlands Antilles

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1986	1349	0	1349	0	0	0	7.71	.
1987	1104	0	1104	0	0	0	6.31	.
1988	938	0	938	0	0	0	5.36	.
1989	-1	0	-1	0	0	0	0.00	.
1990	-342	0	-342	0	0	0	-1.95	.
1991	761	0	761	0	0	0	4.35	.
1992	1107	0	1107	0	0	0	6.32	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Netherlands Antilles and Aruba

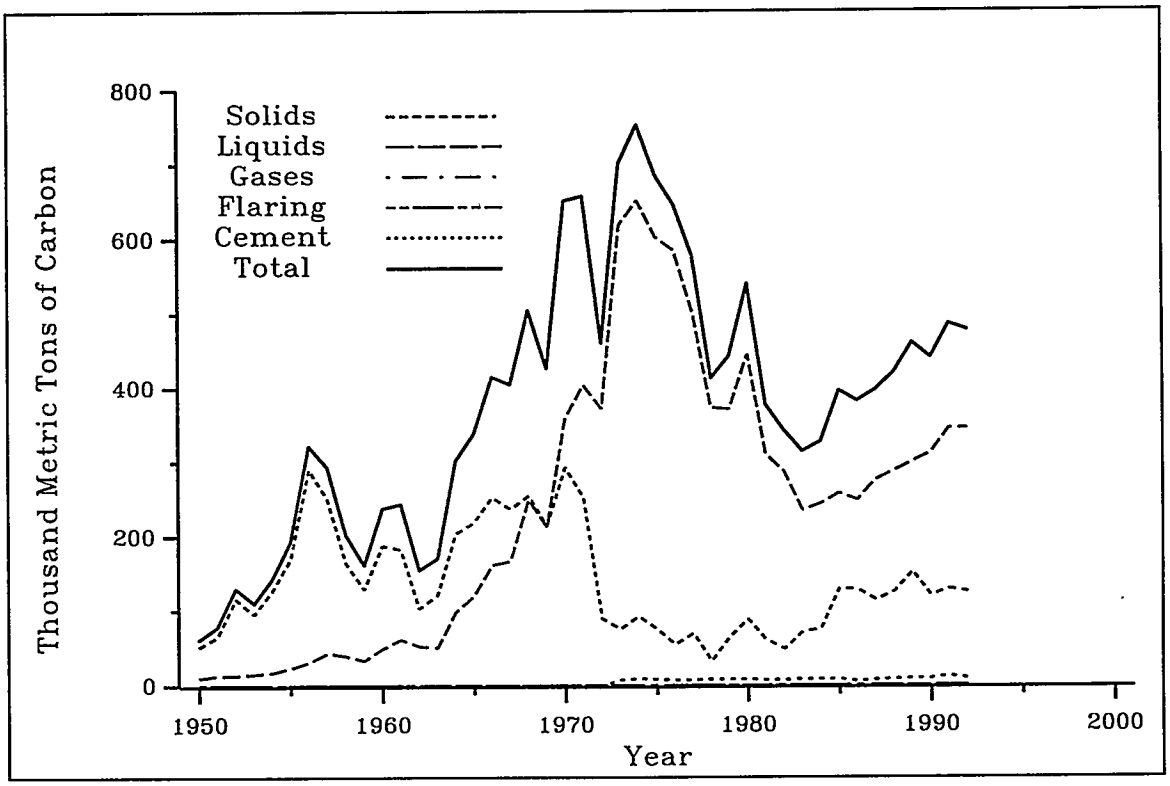


Per capita CO_2 emission rates for the Netherlands Antilles and Aruba

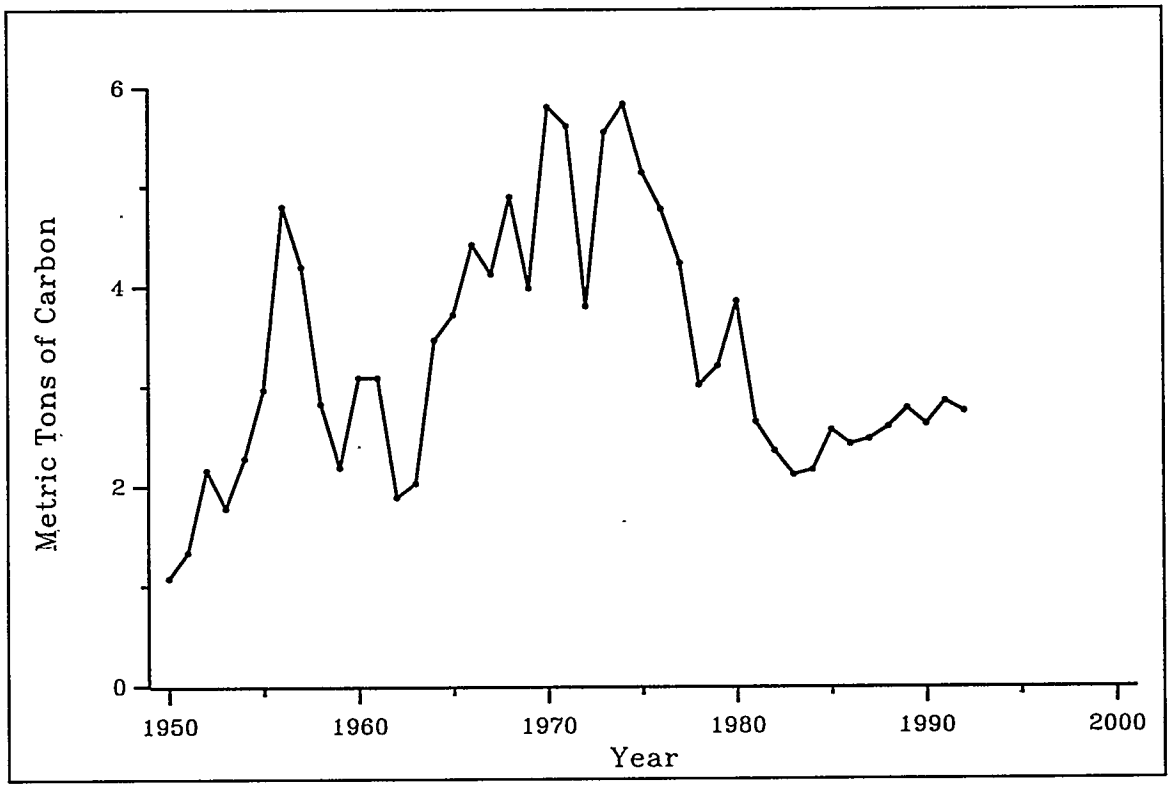
Netherlands Antilles & Aruba

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2003	0	2003	0	0	0	11.58	.
1951	3159	0	3159	0	0	0	17.95	.
1952	1824	0	1824	0	0	0	10.19	.
1953	2111	0	2111	0	0	0	11.73	.
1954	4270	0	4270	0	0	0	23.46	.
1955	3532	0	3532	0	0	0	19.19	.
1956	4568	0	4568	0	0	0	24.56	.
1957	3120	0	3120	0	0	0	16.42	.
1958	2733	0	2733	0	0	0	14.23	.
1959	3518	0	3518	0	0	0	18.13	.
1960	3025	0	3025	0	0	0	15.43	.
1961	3157	0	3157	0	0	0	15.87	.
1962	3467	0	3467	0	0	0	17.25	.
1963	3321	0	3321	0	0	0	16.28	.
1964	3229	0	3229	0	0	0	15.60	.
1965	2897	0	2897	0	0	0	13.86	.
1966	2709	0	2709	0	0	0	12.78	.
1967	3337	0	3337	0	0	0	15.52	.
1968	3103	0	3103	0	0	0	14.30	.
1969	4061	0	4061	0	0	0	18.46	.
1970	4524	0	4524	0	0	0	20.29	.
1971	3933	0	3933	0	0	0	17.56	.
1972	3814	0	3814	0	0	0	16.95	.
1973	4232	0	4232	0	0	0	18.64	.
1974	3835	0	3835	0	0	0	16.90	.
1975	2774	0	2774	0	0	0	12.17	.
1976	5962	0	5962	0	0	0	26.04	.
1977	3114	0	3114	0	0	0	13.60	.
1978	2652	0	2652	0	0	0	11.53	.
1979	2782	0	2782	0	0	0	12.04	.
1980	2863	0	2863	0	0	0	12.40	.
1981	2726	0	2726	0	0	0	11.75	.
1982	3048	0	3048	0	0	0	13.03	.
1983	1567	0	1567	0	0	0	6.67	.
1984	1573	0	1573	0	0	0	6.67	.
1985	1525	0	1525	0	0	0	6.46	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for New Caledonia

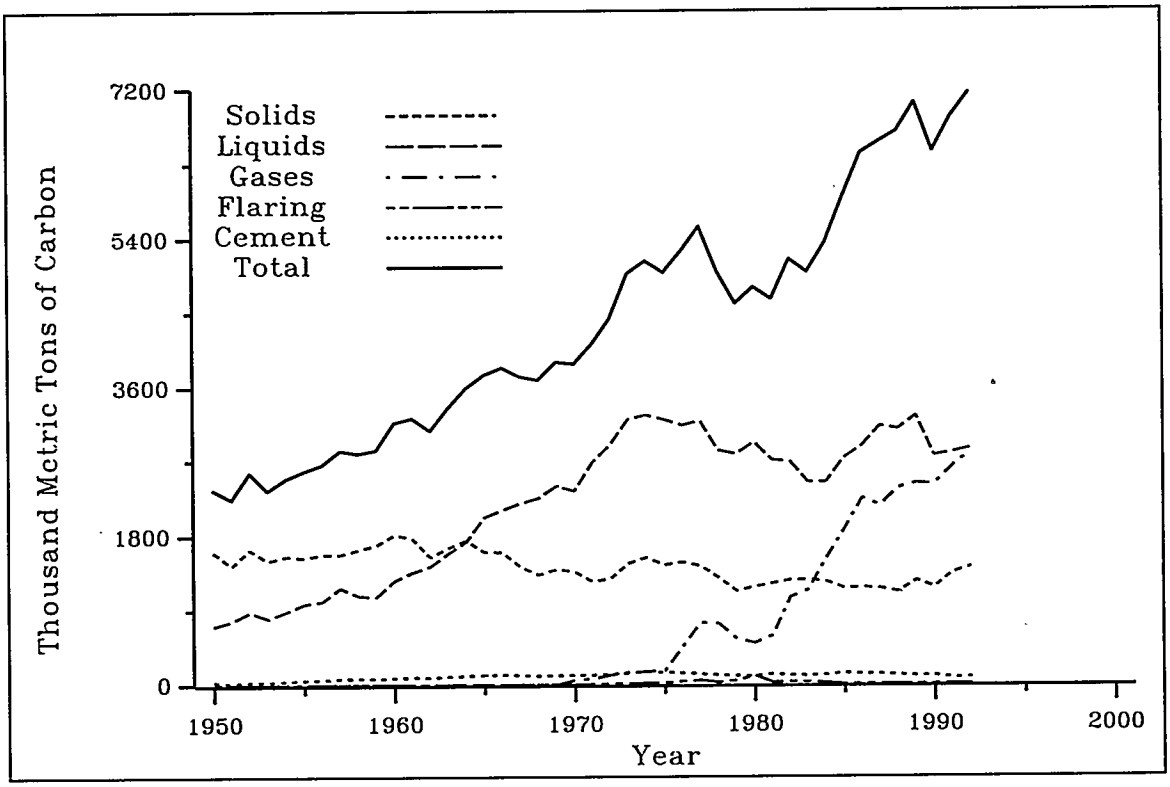


Per capita CO_2 emission rates for New Caledonia

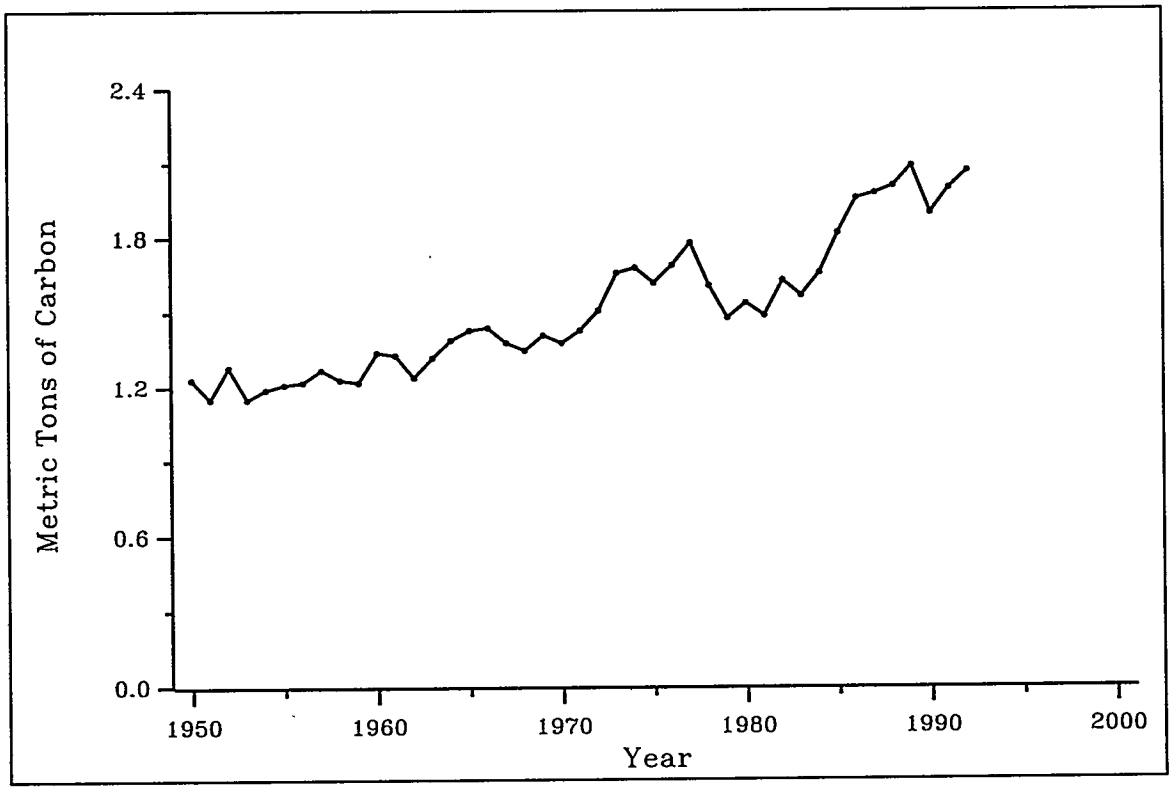
New Caledonia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	61	51	10	0	0	0	1.08	.
1951	78	65	13	0	0	0	1.34	.
1952	130	116	13	0	0	0	2.16	.
1953	110	95	15	0	0	0	1.78	.
1954	143	127	17	0	0	0	2.28	.
1955	193	170	23	0	0	0	2.97	.
1956	322	291	31	0	0	0	4.80	.
1957	294	251	43	0	0	0	4.20	.
1958	203	165	39	0	0	0	2.83	.
1959	162	129	33	0	0	0	2.19	.
1960	238	188	49	0	0	0	3.09	.
1961	244	183	61	0	0	0	3.09	.
1962	155	103	52	0	0	0	1.89	.
1963	171	121	50	0	0	0	2.03	.
1964	302	204	98	0	0	0	3.47	.
1965	338	219	120	0	0	0	3.72	.
1966	415	253	162	0	0	0	4.42	.
1967	405	237	167	0	0	0	4.13	.
1968	505	255	250	0	0	0	4.90	.
1969	427	215	213	0	0	0	3.99	.
1970	651	293	358	0	0	0	5.81	.
1971	657	253	404	0	0	0	5.62	.
1972	461	89	372	0	0	0	3.81	.
1973	701	75	618	0	7	0	5.56	.
1974	753	92	651	0	9	0	5.84	.
1975	685	75	602	0	8	0	5.15	.
1976	645	54	584	0	7	0	4.78	.
1977	577	69	502	0	7	0	4.24	.
1978	413	32	373	0	8	0	3.02	.
1979	443	64	371	0	8	0	3.21	.
1980	540	88	445	0	8	0	3.86	.
1981	377	60	310	0	7	0	2.65	.
1982	342	48	287	0	7	0	2.36	.
1983	314	71	235	0	8	0	2.12	.
1984	327	75	244	0	8	0	2.17	.
1985	396	130	258	0	8	0	2.57	.
1986	382	128	249	0	5	0	2.43	.
1987	397	114	276	0	7	0	2.48	.
1988	421	125	288	0	8	0	2.60	.
1989	461	152	300	0	9	0	2.79	.
1990	441	120	312	0	9	0	2.63	.
1991	486	129	345	0	12	0	2.86	.
1992	478	125	345	0	9	0	2.76	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for New Zealand

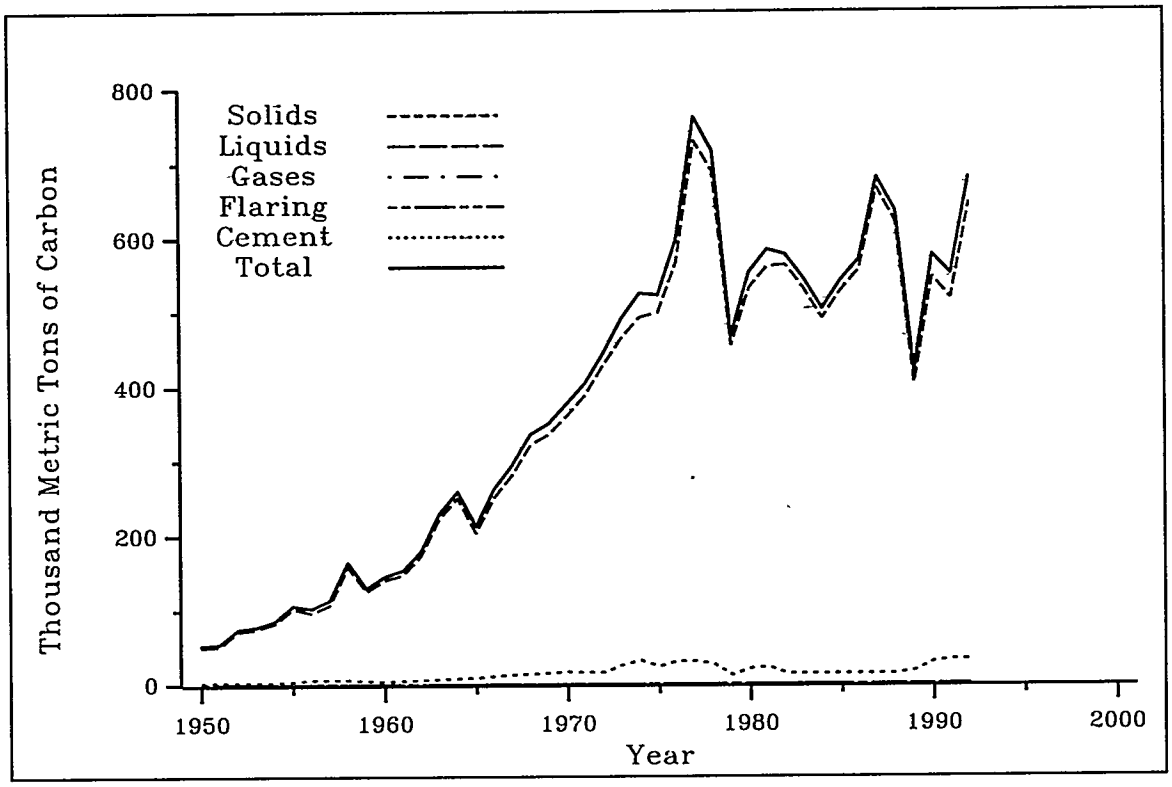


Per capita CO_2 emission rates for New Zealand

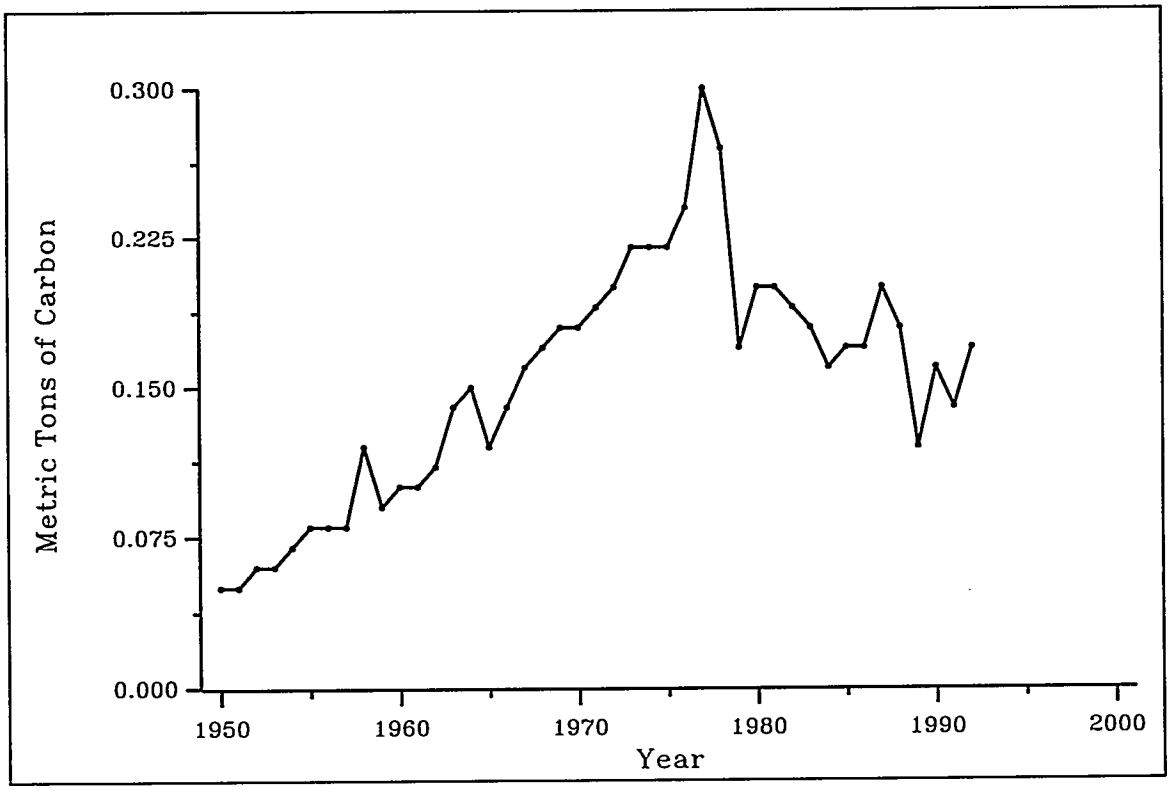
New Zealand

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2354	1608	712	0	35	0	1.23	.
1951	2243	1446	775	0	22	0	1.15	.
1952	2560	1640	884	0	36	0	1.28	.
1953	2349	1507	805	0	38	0	1.15	.
1954	2491	1558	889	0	44	0	1.19	.
1955	2580	1542	982	0	56	0	1.21	.
1956	2657	1582	1013	0	61	0	1.22	.
1957	2829	1581	1175	0	73	0	1.27	.
1958	2796	1639	1081	0	76	0	1.23	.
1959	2835	1692	1066	0	76	0	1.22	.
1960	3167	1819	1264	0	84	0	1.34	.
1961	3227	1775	1364	0	89	0	1.33	.
1962	3073	1550	1437	0	86	0	1.24	.
1963	3353	1660	1594	0	98	0	1.32	.
1964	3593	1748	1737	0	107	0	1.39	.
1965	3752	1611	2026	0	115	0	1.43	.
1966	3839	1606	2113	0	119	0	1.44	.
1967	3734	1430	2194	0	111	0	1.38	.
1968	3692	1334	2254	0	104	0	1.35	.
1969	3906	1398	2399	0	109	0	1.41	.
1970	3884	1371	2339	56	113	5	1.38	.
1971	4119	1251	2678	72	112	7	1.43	.
1972	4430	1284	2897	115	122	11	1.51	.
1973	4970	1468	3207	138	144	13	1.66	.
1974	5121	1540	3259	157	151	15	1.68	.
1975	4981	1448	3204	165	146	18	1.62	.
1976	5247	1482	3134	460	136	35	1.69	.
1977	5538	1437	3185	746	124	47	1.78	.
1978	4989	1295	2827	734	109	24	1.61	.
1979	4608	1131	2781	548	102	47	1.48	.
1980	4802	1179	2924	497	98	104	1.54	.
1981	4663	1224	2707	590	121	21	1.49	.
1982	5141	1264	2688	1054	106	28	1.63	.
1983	4985	1269	2442	1144	103	27	1.57	.
1984	5344	1246	2443	1527	112	17	1.66	.
1985	5901	1162	2732	1875	132	0	1.82	.
1986	6425	1173	2881	2248	123	0	1.96	.
1987	6560	1160	3120	2160	120	0	1.98	.
1988	6686	1120	3086	2369	110	0	2.01	.
1989	7031	1258	3246	2428	99	0	2.09	.
1990	6451	1174	2761	2413	102	0	1.90	.
1991	6857	1352	2799	2628	78	0	2.00	.
1992	7145	1420	2850	2797	79	0	2.07	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Nicaragua

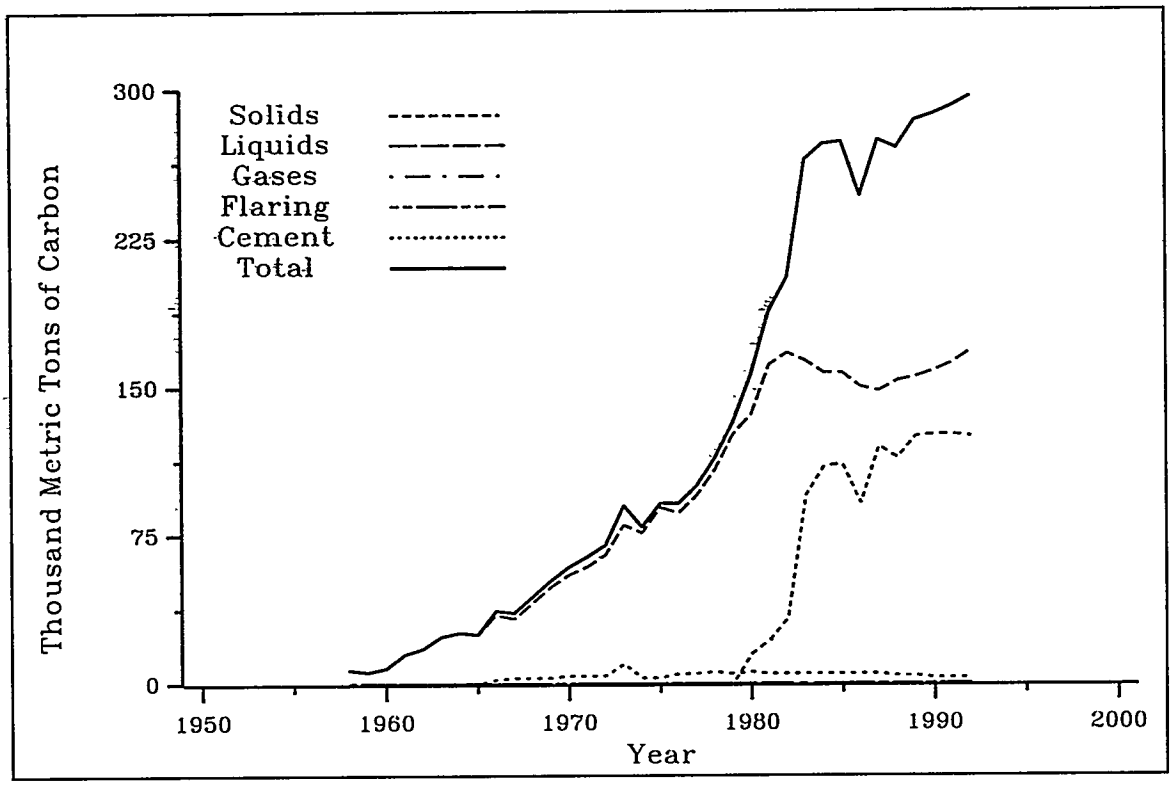


Per capita CO_2 emission rates for Nicaragua

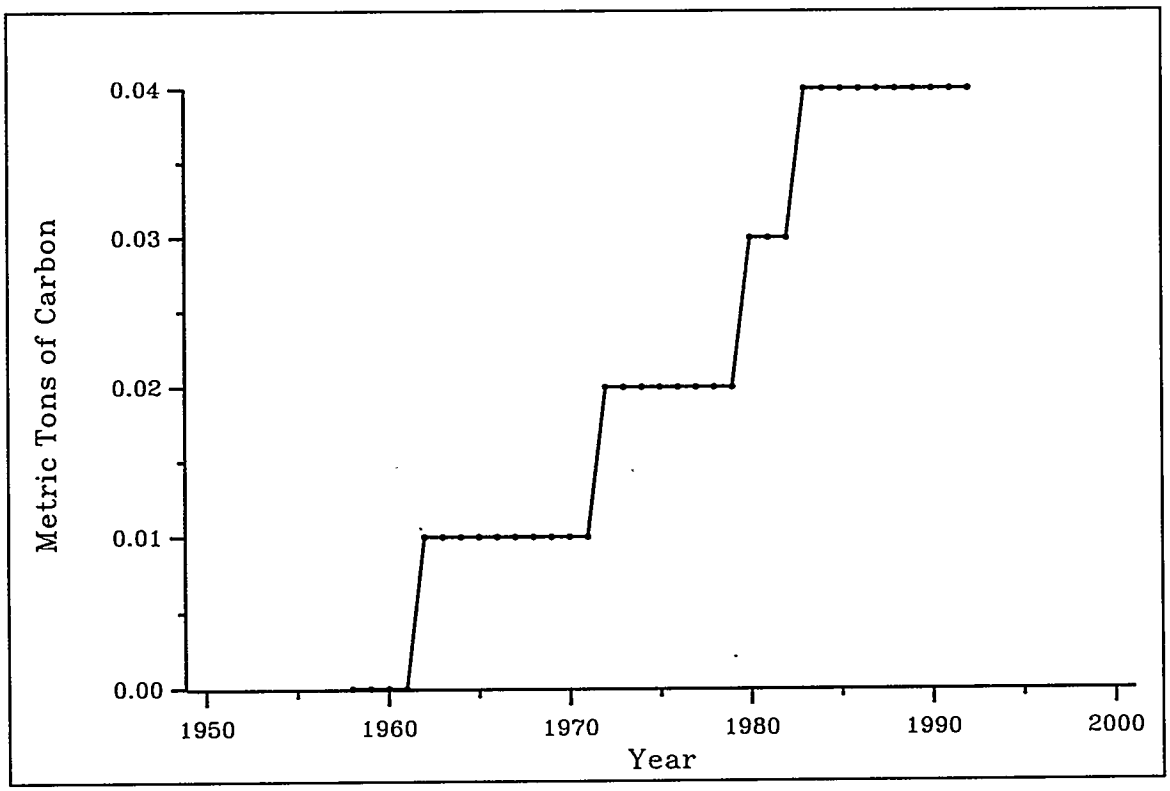
Nicaragua

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	53	0	50	0	2	0	0.05	.
1951	55	0	52	0	3	0	0.05	.
1952	75	0	72	0	3	0	0.06	.
1953	78	0	75	0	3	0	0.06	.
1954	86	0	83	0	3	0	0.07	.
1955	107	0	103	0	4	0	0.08	.
1956	103	0	97	0	6	0	0.08	.
1957	114	0	108	0	6	0	0.08	.
1958	165	0	159	0	6	0	0.12	.
1959	130	0	126	0	5	0	0.09	.
1960	146	0	141	0	4	0	0.10	.
1961	154	0	148	0	5	0	0.10	.
1962	180	0	174	0	6	0	0.11	.
1963	230	0	223	0	7	0	0.14	.
1964	259	0	251	0	8	0	0.15	.
1965	213	0	204	0	9	0	0.12	.
1966	263	0	251	0	11	0	0.14	.
1967	295	0	282	0	13	0	0.16	.
1968	336	0	322	0	14	0	0.17	.
1969	351	0	336	0	15	0	0.18	.
1970	378	0	361	0	17	0	0.18	.
1971	405	0	389	0	16	0	0.19	.
1972	445	0	429	0	16	0	0.20	.
1973	491	0	465	0	26	0	0.22	.
1974	525	0	493	0	32	0	0.22	.
1975	523	0	499	0	24	0	0.22	.
1976	597	0	566	0	31	0	0.24	.
1977	762	0	731	0	31	0	0.30	.
1978	717	0	690	0	27	0	0.27	.
1979	467	0	455	0	12	0	0.17	.
1980	553	0	532	0	21	0	0.20	.
1981	584	0	561	0	23	0	0.20	.
1982	577	0	563	0	14	0	0.19	.
1983	544	0	531	0	14	0	0.18	.
1984	504	0	491	0	14	0	0.16	.
1985	542	0	528	0	14	0	0.17	.
1986	570	0	556	0	14	0	0.17	.
1987	681	0	667	0	14	0	0.20	.
1988	636	0	622	0	14	0	0.18	.
1989	421	0	404	0	18	0	0.12	.
1990	577	0	547	0	30	0	0.16	.
1991	551	0	518	0	33	0	0.14	.
1992	681	0	647	0	33	0	0.17	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Niger

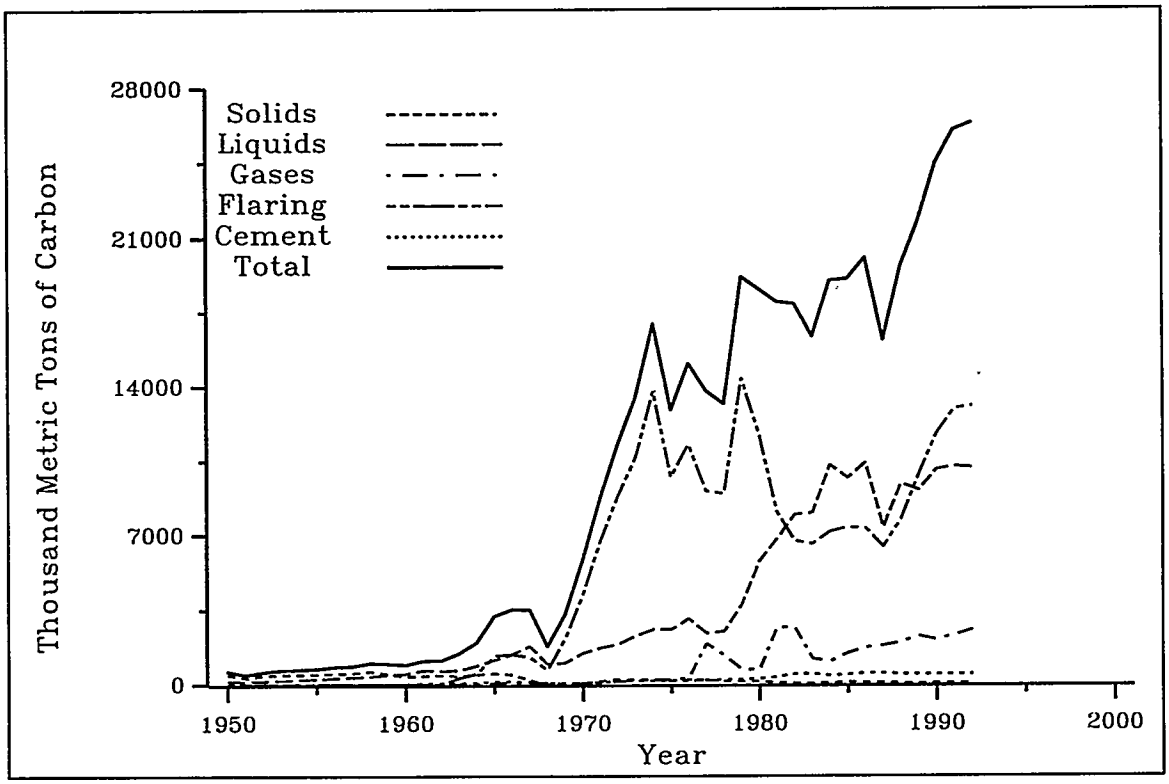


Per capita CO_2 emission rates for Niger

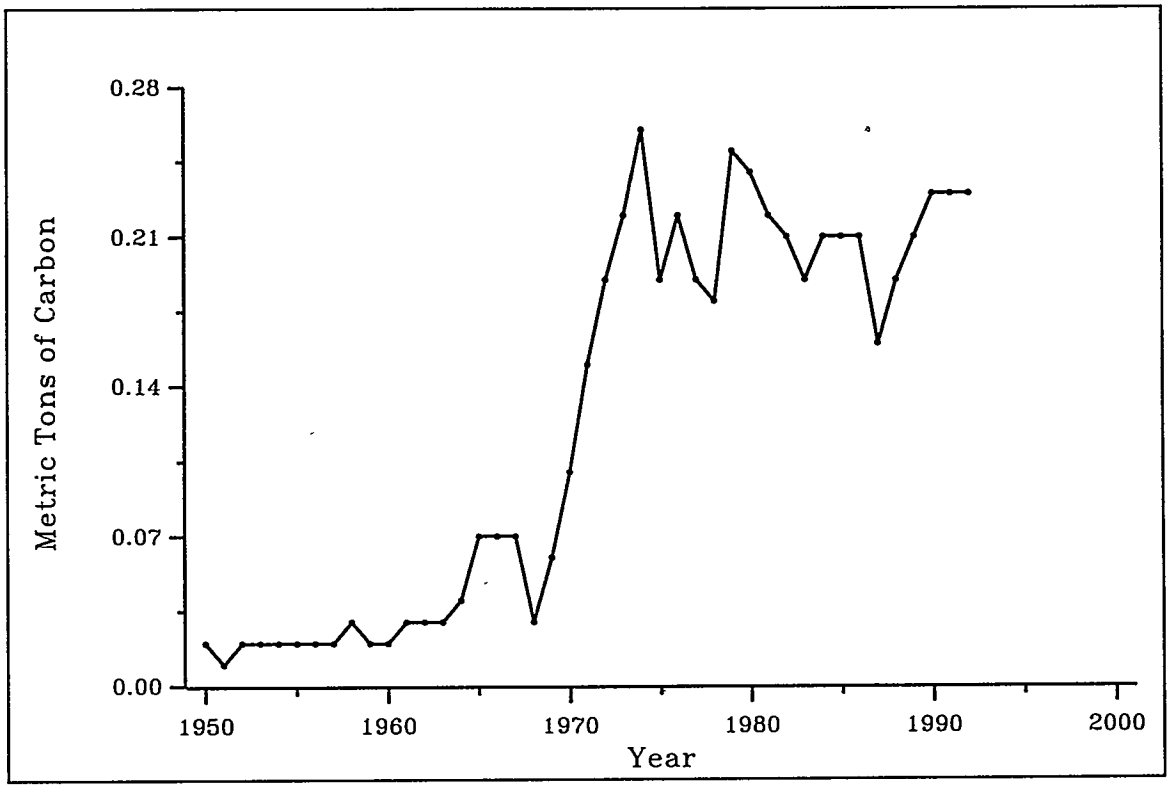
Niger

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1958	7	0	7	0	0	0	0.00	.
1959	6	0	6	0	0	0	0.00	.
1960	8	0	8	0	0	0	0.00	.
1961	15	0	15	0	0	0	0.00	.
1962	18	0	18	0	0	0	0.01	.
1963	24	0	24	0	0	0	0.01	.
1964	26	0	26	0	0	0	0.01	.
1965	25	0	25	0	0	0	0.01	.
1966	37	0	35	0	2	0	0.01	.
1967	36	0	33	0	3	0	0.01	.
1968	44	0	41	0	3	0	0.01	.
1969	52	0	49	0	3	0	0.01	.
1970	59	0	55	0	4	0	0.01	.
1971	64	0	59	0	4	0	0.01	.
1972	70	0	65	0	4	0	0.02	.
1973	90	0	80	0	10	0	0.02	.
1974	79	0	76	0	3	0	0.02	.
1975	91	0	89	0	3	0	0.02	.
1976	91	0	86	0	5	0	0.02	.
1977	100	0	95	0	5	0	0.02	.
1978	114	0	108	0	6	0	0.02	.
1979	132	0	126	0	5	0	0.02	.
1980	156	15	136	0	6	0	0.03	.
1981	188	22	161	0	5	0	0.03	.
1982	205	33	167	0	5	0	0.03	.
1983	264	95	163	0	5	0	0.04	.
1984	272	110	157	0	5	0	0.04	.
1985	273	111	157	0	5	0	0.04	.
1986	246	91	150	0	5	0	0.04	.
1987	274	120	148	0	5	0	0.04	.
1988	270	114	153	0	4	0	0.04	.
1989	284	125	155	0	4	0	0.04	.
1990	287	126	158	0	3	0	0.04	.
1991	291	126	162	0	3	0	0.04	.
1992	296	125	168	0	3	0	0.04	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Nigeria

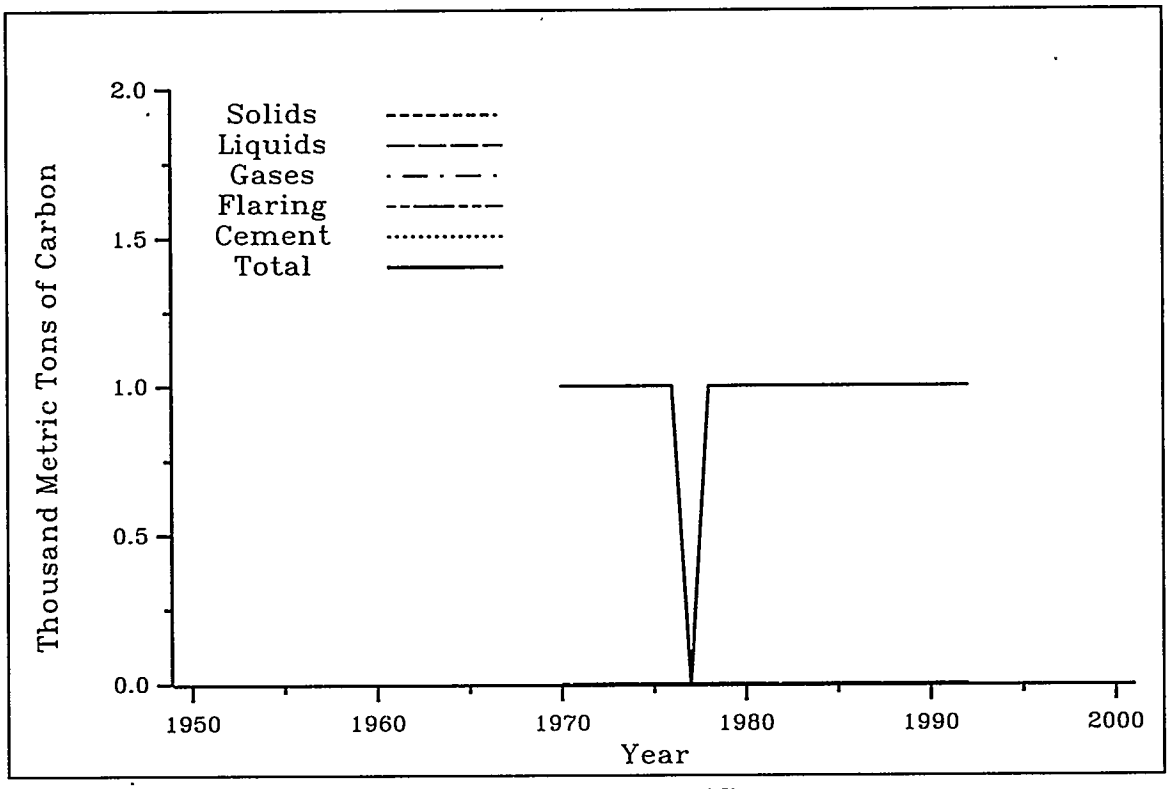


Per capita CO_2 emission rates for Nigeria

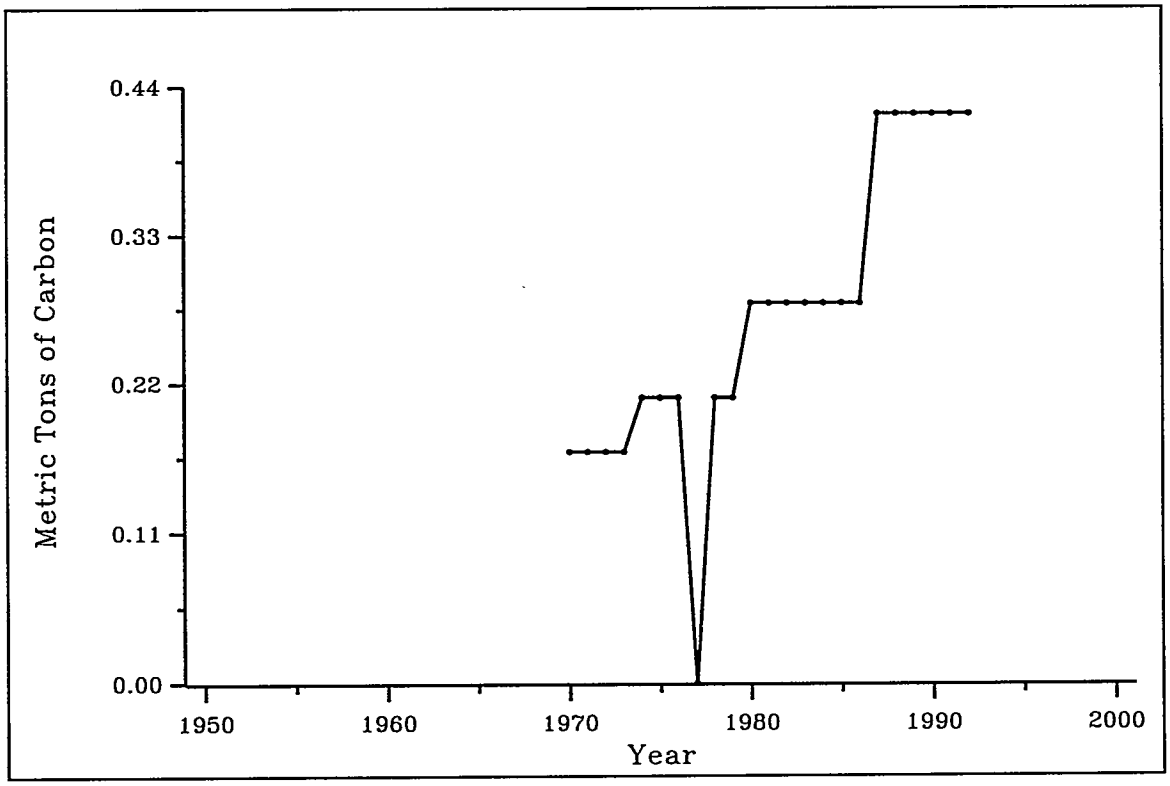
Nigeria

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	622	478	144	0	0	0	0.02	.
1951	464	312	152	0	0	0	0.01	.
1952	600	434	167	0	0	0	0.02	.
1953	671	478	193	0	0	0	0.02	.
1954	707	476	231	0	0	0	0.02	.
1955	741	483	258	0	0	0	0.02	.
1956	828	514	315	0	0	0	0.02	.
1957	875	532	343	0	0	0	0.02	.
1958	1023	616	392	0	15	0	0.03	.
1959	979	497	465	0	17	0	0.02	.
1960	934	399	512	0	23	0	0.02	.
1961	1127	408	670	0	50	0	0.03	.
1962	1145	441	638	0	66	0	0.03	.
1963	1463	393	670	16	72	313	0.03	.
1964	1990	477	882	28	90	512	0.04	.
1965	3214	517	1161	51	134	1350	0.07	.
1966	3526	467	1412	92	136	1418	0.07	.
1967	3503	204	1809	95	107	1288	0.07	.
1968	1810	2	962	77	78	690	0.03	.
1969	3303	16	1023	33	77	2154	0.06	.
1970	5855	48	1479	58	80	4190	0.10	.
1971	8781	152	1724	96	90	6718	0.15	.
1972	11279	237	1899	143	156	8846	0.19	.
1973	13479	221	2297	159	166	10635	0.22	.
1974	16945	214	2591	212	164	13765	0.26	.
1975	12892	164	2591	211	186	9740	0.19	.
1976	15069	212	3082	331	173	11271	0.22	.
1977	13792	194	2410	1930	196	9064	0.19	.
1978	13172	150	2494	1358	209	8961	0.18	.
1979	19169	127	3743	688	237	14375	0.25	.
1980	18588	132	5753	694	272	11737	0.24	.
1981	17987	79	6811	2685	340	8072	0.22	.
1982	17890	44	7944	2685	490	6727	0.21	.
1983	16343	42	8037	1204	490	6570	0.19	.
1984	18988	55	10298	1075	407	7152	0.21	.
1985	19062	102	9689	1467	454	7350	0.21	.
1986	20046	81	10405	1728	525	7306	0.21	.
1987	16178	57	7340	1830	517	6435	0.16	.
1988	19660	44	9427	1975	476	7738	0.19	.
1989	21760	40	9118	2264	476	9861	0.21	.
1990	24479	46	10091	2101	476	11765	0.23	.
1991	26008	46	10235	2305	476	12946	0.23	.
1992	26341	49	10176	2567	476	13072	0.23	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Niue

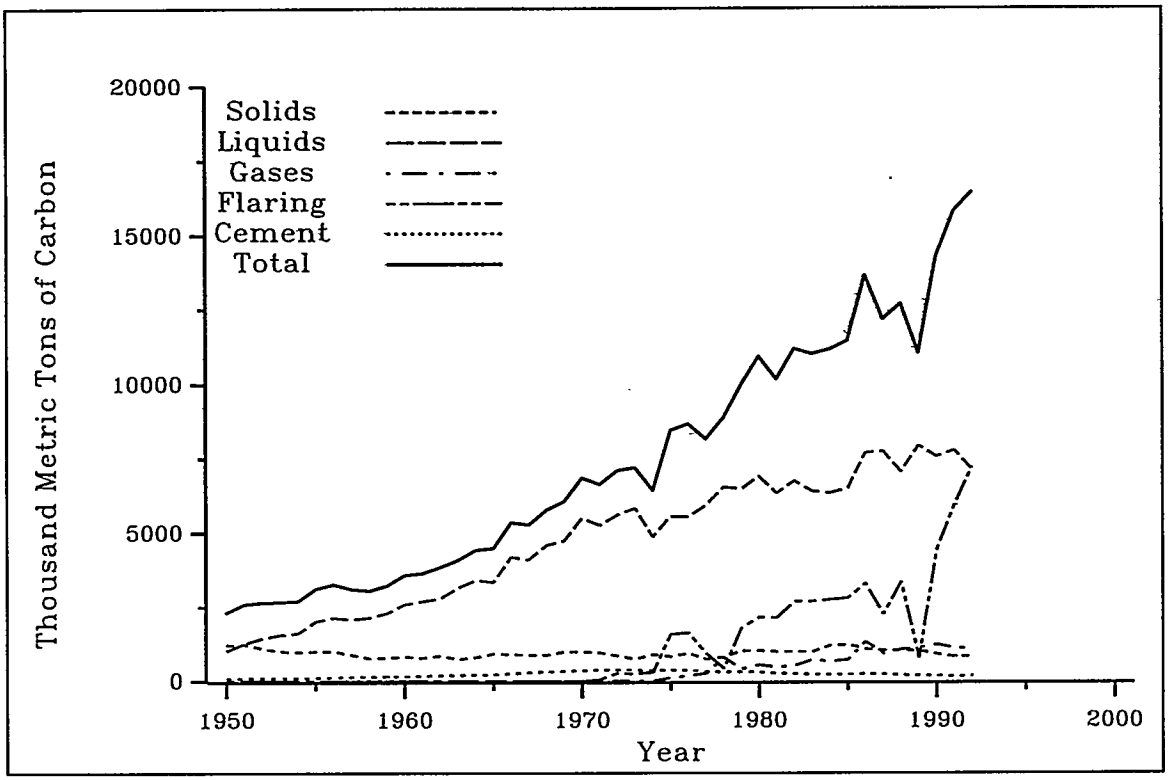


Per capita CO_2 emission rates for Niue

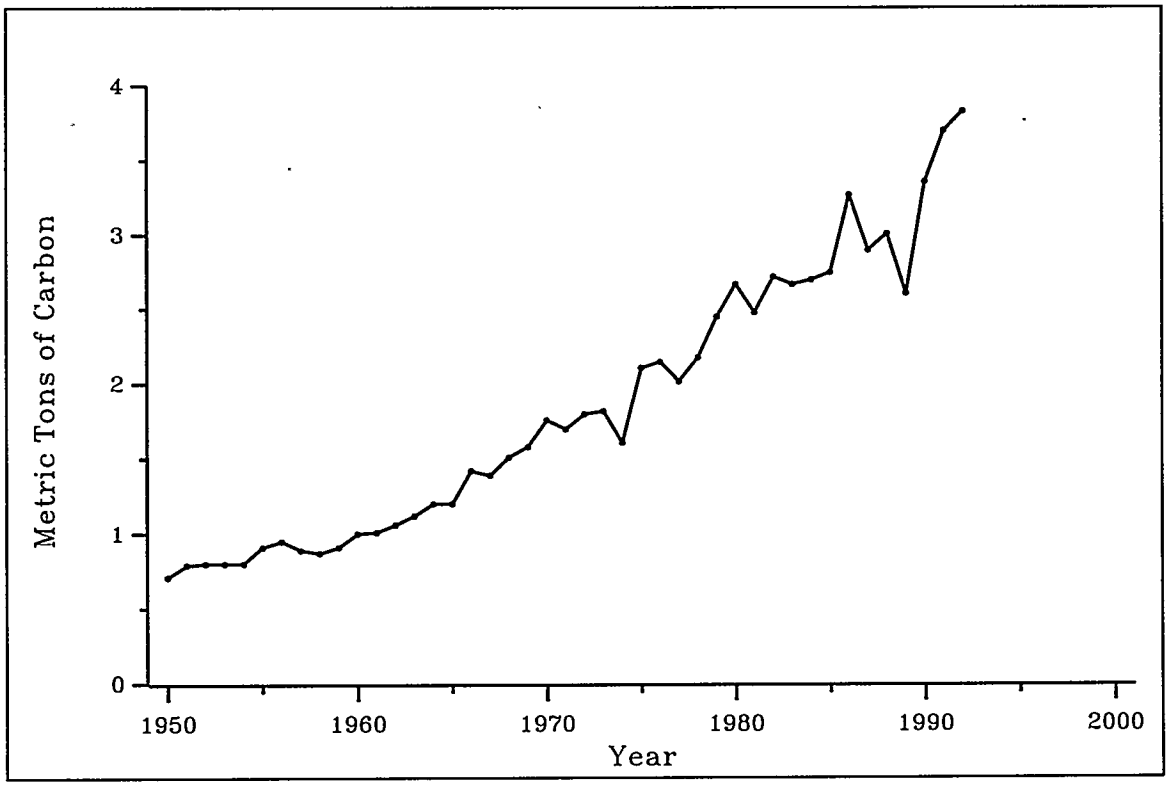
Niue

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	1	0	1	0	0	0	0.17	.
1971	1	0	1	0	0	0	0.17	.
1972	1	0	1	0	0	0	0.17	.
1973	1	0	1	0	0	0	0.17	.
1974	1	0	1	0	0	0	0.21	.
1975	1	0	1	0	0	0	0.21	.
1976	1	0	1	0	0	0	0.21	.
1977	0	0	0	0	0	0	0.00	.
1978	1	0	1	0	0	0	0.21	.
1979	1	0	1	0	0	0	0.21	.
1980	1	0	1	0	0	0	0.28	.
1981	1	0	1	0	0	0	0.28	.
1982	1	0	1	0	0	0	0.28	.
1983	1	0	1	0	0	0	0.28	.
1984	1	0	1	0	0	0	0.28	.
1985	1	0	1	0	0	0	0.28	.
1986	1	0	1	0	0	0	0.28	.
1987	1	0	1	0	0	0	0.42	.
1988	1	0	1	0	0	0	0.42	.
1989	1	0	1	0	0	0	0.42	.
1990	1	0	1	0	0	0	0.42	.
1991	1	0	1	0	0	0	0.42	.
1992	1	0	1	0	0	0	0.42	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Norway

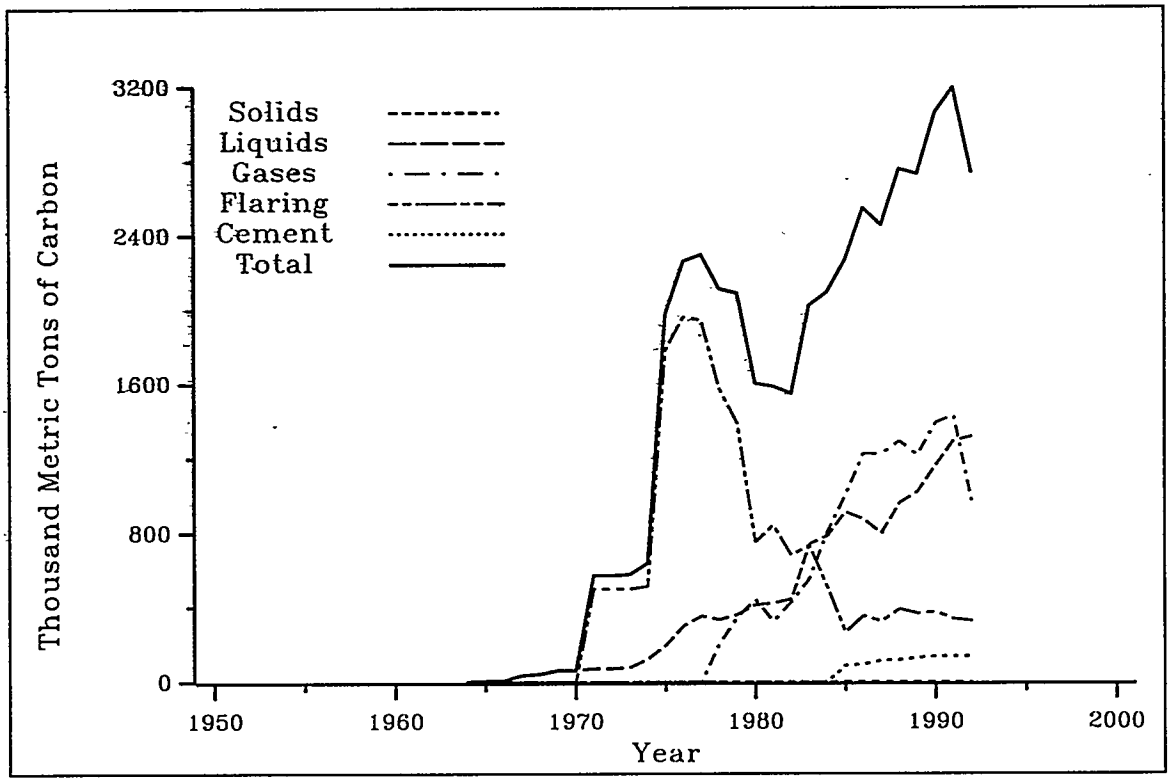


Per capita CO_2 emission rates for Norway

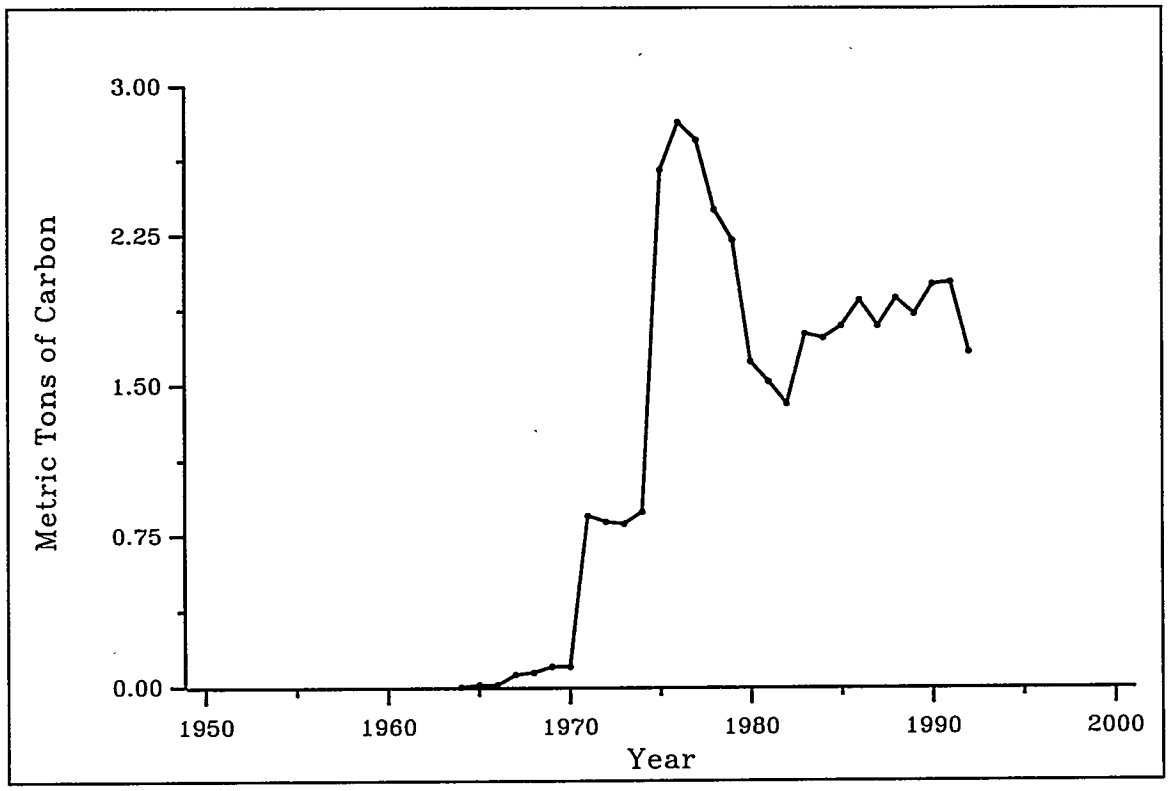
Norway

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2316	1215	1022	0	79	0	0.71	.
1951	2602	1239	1268	0	96	0	0.79	.
1952	2657	1104	1457	0	96	0	0.80	.
1953	2682	1012	1567	0	103	0	0.80	.
1954	2709	981	1623	0	105	0	0.80	.
1955	3127	999	2019	0	109	0	0.91	.
1956	3274	1009	2143	0	122	0	0.95	.
1957	3112	891	2082	0	138	0	0.89	.
1958	3063	773	2150	0	140	0	0.87	.
1959	3232	785	2294	0	154	0	0.91	.
1960	3582	830	2595	0	157	0	1.00	.
1961	3650	779	2698	0	173	0	1.01	.
1962	3849	857	2800	0	192	0	1.06	.
1963	4094	742	3156	0	196	0	1.12	.
1964	4424	806	3408	0	210	0	1.20	.
1965	4486	920	3347	0	218	0	1.20	.
1966	5346	905	4192	0	249	0	1.42	.
1967	5280	881	4107	0	293	0	1.39	.
1968	5776	876	4587	0	312	0	1.51	.
1969	6071	994	4738	0	339	0	1.58	.
1970	6845	991	5500	0	355	0	1.76	.
1971	6635	956	5260	0	373	46	1.70	.
1972	7100	852	5606	0	371	270	1.80	.
1973	7198	745	5833	0	371	249	1.82	.
1974	6430	900	4870	8	359	293	1.61	.
1975	8448	829	5554	109	369	1588	2.11	.
1976	8659	939	5538	182	365	1635	2.15	.
1977	8164	734	5929	256	315	931	2.02	.
1978	8868	809	6539	793	304	424	2.18	.
1979	9985	1013	6473	405	299	1796	2.45	.
1980	10919	1027	6901	543	300	2149	2.67	.
1981	10168	985	6334	464	250	2135	2.48	.
1982	11182	987	6746	516	243	2691	2.72	.
1983	11012	983	6397	715	227	2691	2.67	.
1984	11164	1196	6344	660	210	2754	2.70	.
1985	11441	1222	6485	715	218	2801	2.75	.
1986	13639	1087	7687	1329	238	3298	3.27	.
1987	12170	1033	7737	926	223	2251	2.90	.
1988	12688	1033	7053	1064	194	3345	3.01	.
1989	11043	1021	7931	1123	187	780	2.61	.
1990	14282	906	7561	1234	172	4409	3.36	.
1991	15807	824	7771	1109	156	5948	3.70	.
1992	16443	842	7117	1099	172	7212	3.83	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Oman

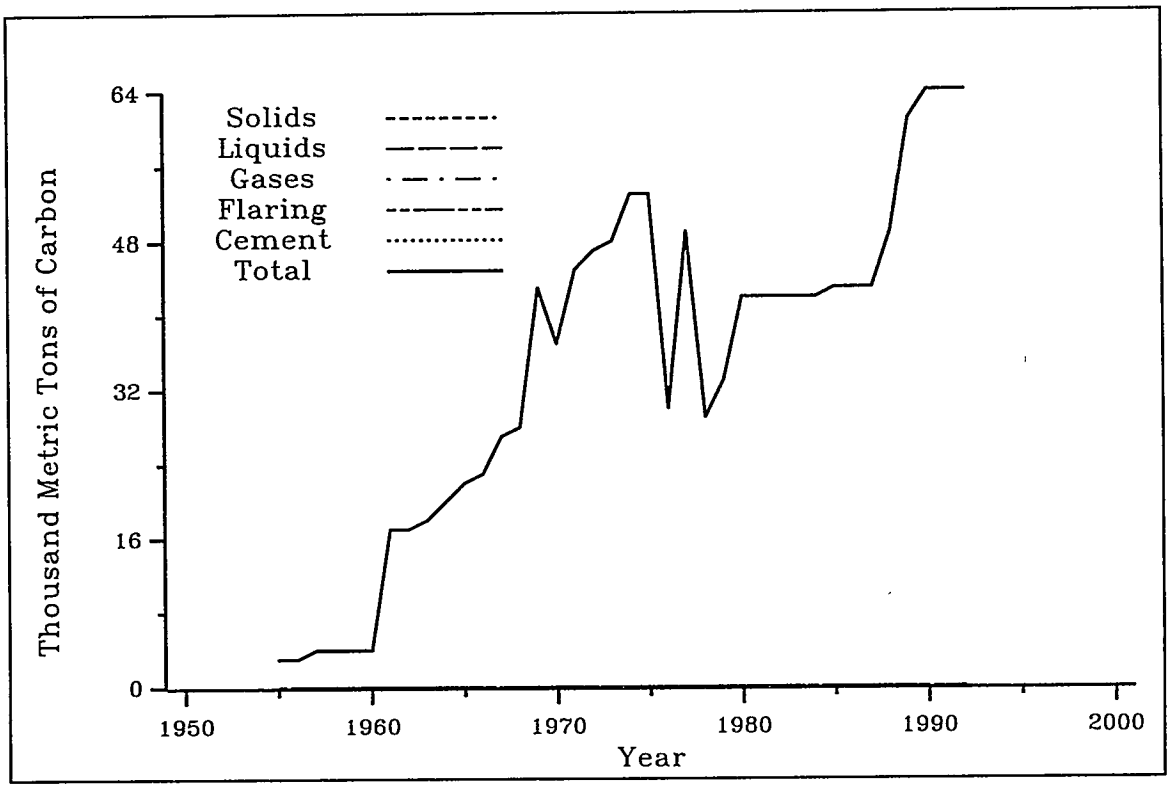


Per capita CO_2 emission rates for Oman

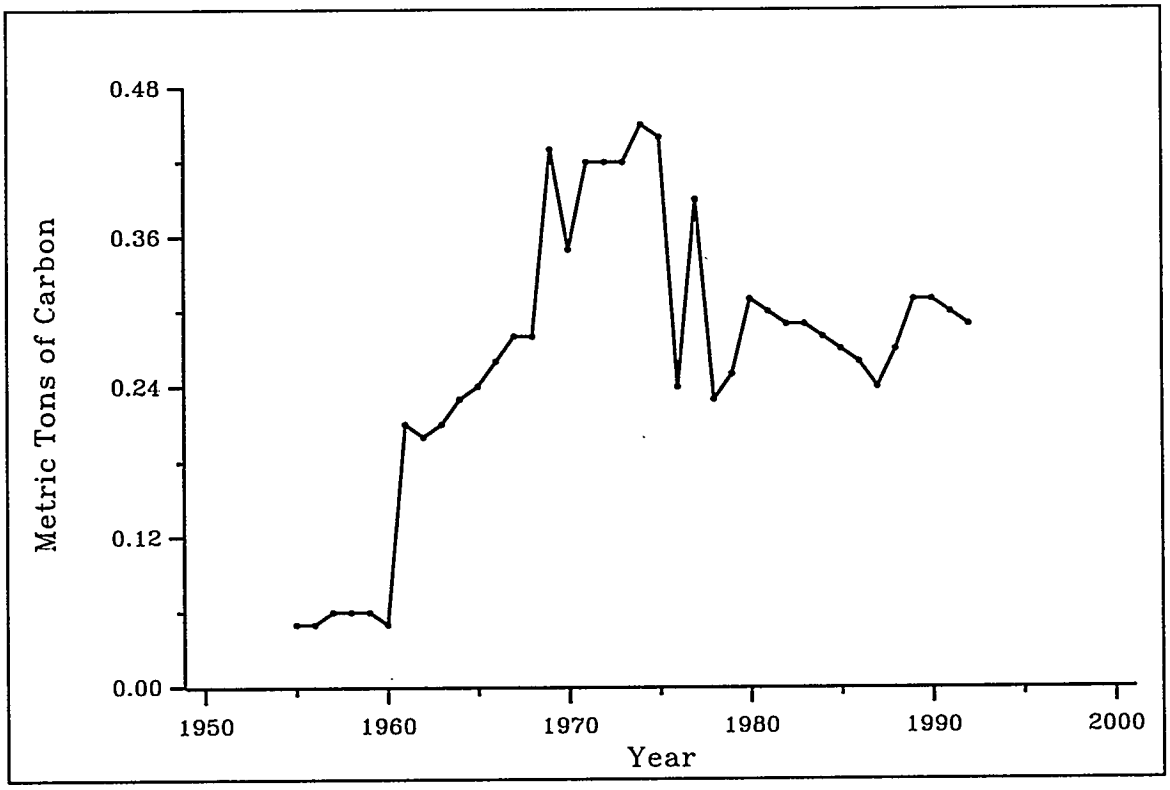
Oman

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1964	3	0	3	0	0	0	0.00	.
1965	7	0	7	0	0	0	0.01	.
1966	8	0	8	0	0	0	0.01	.
1967	37	0	37	0	0	0	0.06	.
1968	44	0	44	0	0	0	0.07	.
1969	64	0	64	0	0	0	0.10	.
1970	64	0	64	0	0	0	0.10	.
1971	571	0	73	0	0	498	0.85	.
1972	570	0	72	0	0	498	0.82	.
1973	576	0	79	0	0	498	0.81	.
1974	637	0	124	0	0	513	0.87	.
1975	1979	0	197	0	0	1782	2.58	.
1976	2262	0	300	0	0	1962	2.82	.
1977	2298	0	353	0	0	1945	2.73	.
1978	2113	0	334	206	0	1574	2.38	.
1979	2090	0	360	347	0	1384	2.23	.
1980	1603	0	412	440	0	751	1.62	.
1981	1586	0	421	324	0	841	1.52	.
1982	1547	0	441	428	0	678	1.41	.
1983	2024	0	739	552	0	733	1.76	.
1984	2096	0	785	806	0	506	1.74	.
1985	2269	0	912	1003	88	266	1.80	.
1986	2546	0	874	1224	95	353	1.93	.
1987	2456	0	797	1222	114	323	1.80	.
1988	2757	0	960	1290	118	389	1.94	.
1989	2731	0	1020	1216	129	366	1.86	.
1990	3059	0	1160	1388	136	374	2.01	.
1991	3193	0	1293	1428	136	336	2.02	.
1992	2739	0	1314	964	136	326	1.67	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Pacific Islands

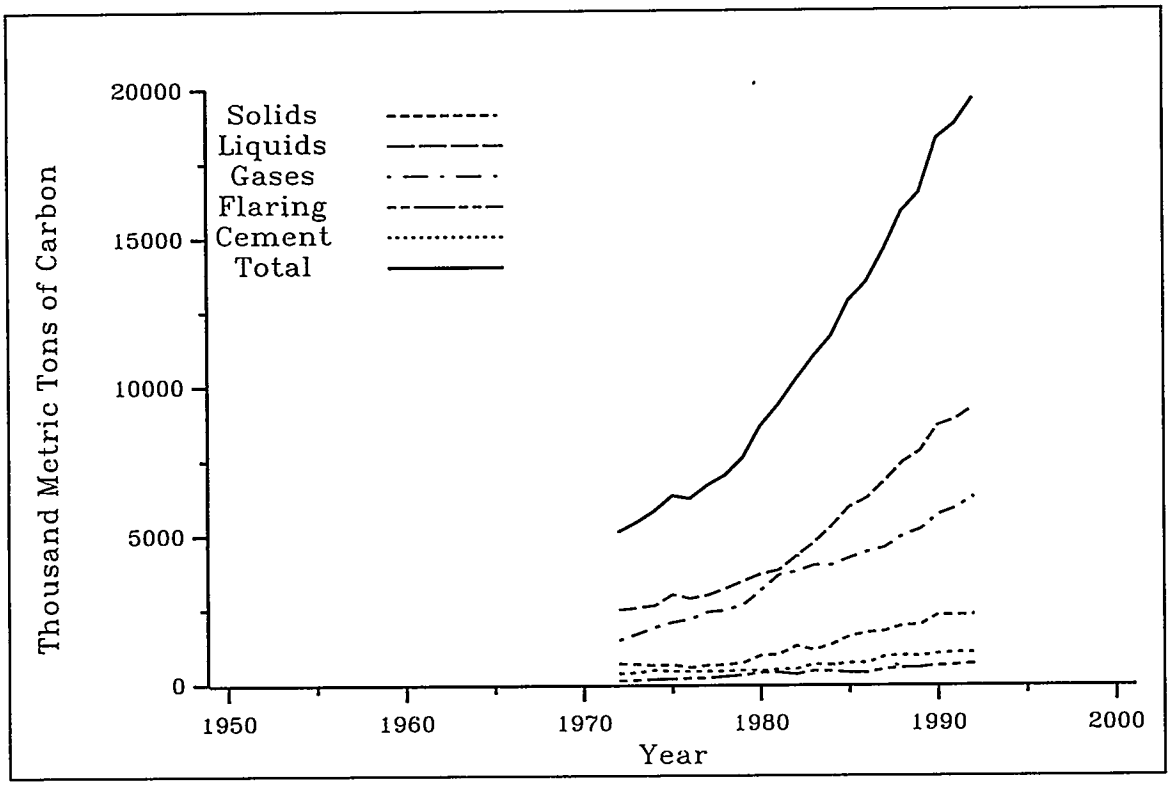


Per capita CO_2 emission rates for the Pacific Islands

Pacific Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1955	3	0	3	0	0	0	0.05	.
1956	3	0	3	0	0	0	0.05	.
1957	4	0	4	0	0	0	0.06	.
1958	4	0	4	0	0	0	0.06	.
1959	4	0	4	0	0	0	0.06	.
1960	4	0	4	0	0	0	0.05	.
1961	17	0	17	0	0	0	0.21	.
1962	17	0	17	0	0	0	0.20	.
1963	18	0	18	0	0	0	0.21	.
1964	20	0	20	0	0	0	0.23	.
1965	22	0	22	0	0	0	0.24	.
1966	23	0	23	0	0	0	0.26	.
1967	27	0	27	0	0	0	0.28	.
1968	28	0	28	0	0	0	0.28	.
1969	43	0	43	0	0	0	0.43	.
1970	37	0	37	0	0	0	0.35	.
1971	45	0	45	0	0	0	0.42	.
1972	47	0	47	0	0	0	0.42	.
1973	48	0	48	0	0	0	0.42	.
1974	53	0	53	0	0	0	0.45	.
1975	53	0	53	0	0	0	0.44	.
1976	30	0	30	0	0	0	0.24	.
1977	49	0	49	0	0	0	0.39	.
1978	29	0	29	0	0	0	0.23	.
1979	33	0	33	0	0	0	0.25	.
1980	42	0	42	0	0	0	0.31	.
1981	42	0	42	0	0	0	0.30	.
1982	42	0	42	0	0	0	0.29	.
1983	42	0	42	0	0	0	0.29	.
1984	42	0	42	0	0	0	0.28	.
1985	43	0	43	0	0	0	0.27	.
1986	43	0	43	0	0	0	0.26	.
1987	43	0	43	0	0	0	0.24	.
1988	49	0	49	0	0	0	0.27	.
1989	61	0	61	0	0	0	0.31	.
1990	64	0	64	0	0	0	0.31	.
1991	64	0	64	0	0	0	0.30	.
1992	64	0	64	0	0	0	0.29	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



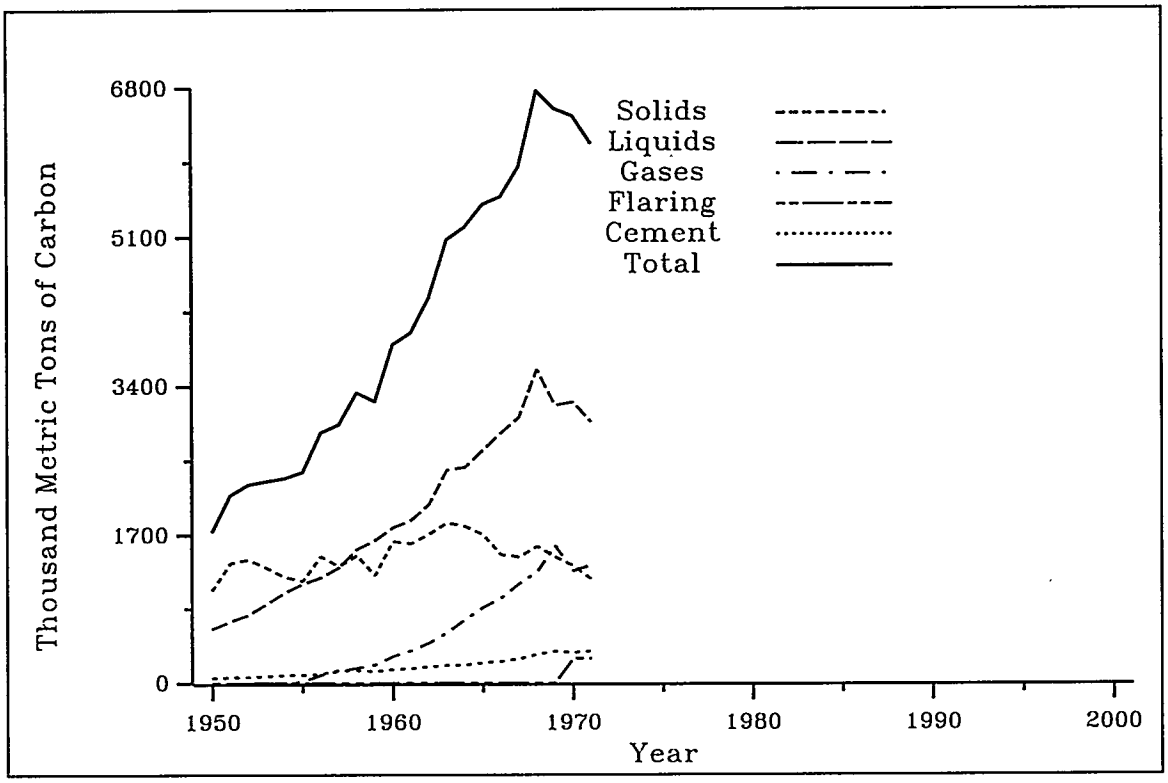
Total CO_2 emissions for Pakistan

Per capita CO_2 emission rates for Pakistan

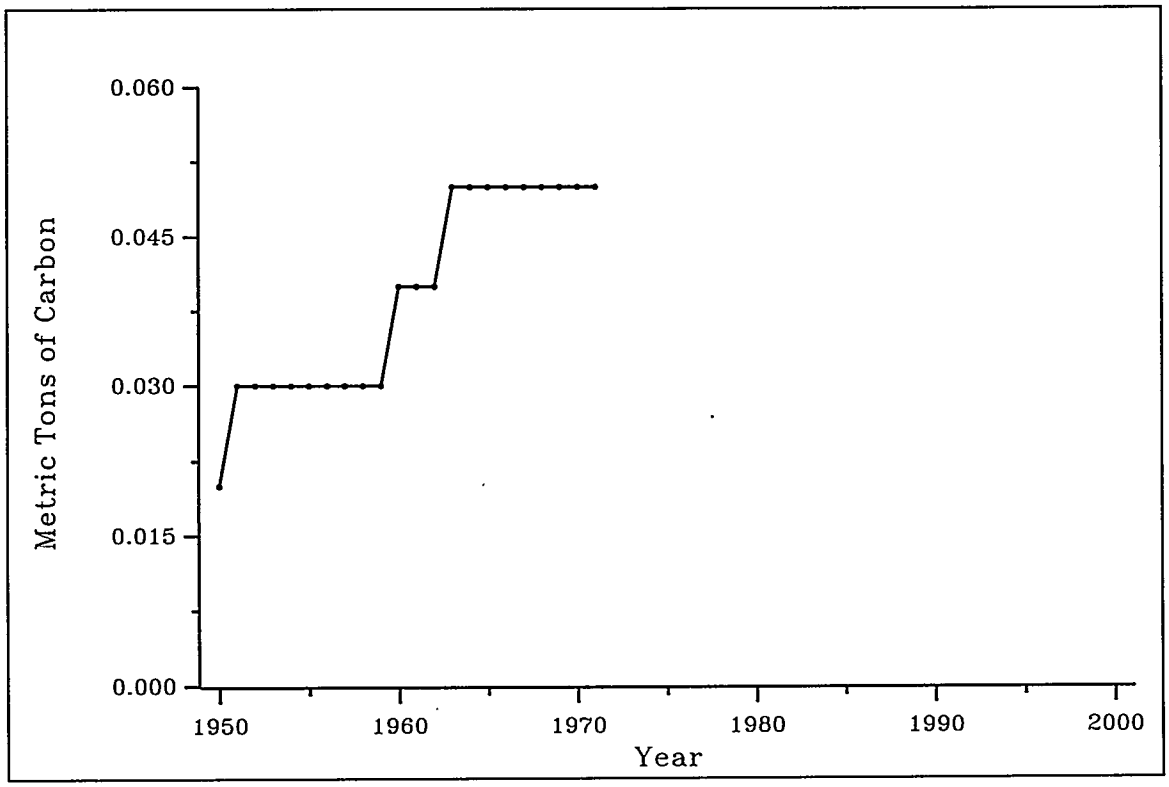
Pakistan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1972	5140	694	2504	1476	354	112	0.07	.
1973	5446	672	2563	1685	391	136	0.08	.
1974	5826	634	2641	1912	472	168	0.08	.
1975	6330	653	3011	2074	424	168	0.08	.
1976	6240	557	2880	2179	427	197	0.08	.
1977	6676	637	2991	2420	431	198	0.08	.
1978	7015	651	3207	2479	422	257	0.09	.
1979	7603	724	3455	2659	465	299	0.09	.
1980	8648	962	3693	3148	454	391	0.10	.
1981	9351	998	3816	3656	488	393	0.11	.
1982	10182	1281	4288	3778	503	332	0.11	.
1983	10974	1147	4738	3978	672	440	0.12	.
1984	11674	1327	5296	3985	639	427	0.12	.
1985	12859	1600	5939	4223	711	386	0.13	.
1986	13489	1731	6239	4430	711	379	0.13	.
1987	14586	1778	6802	4581	929	497	0.14	.
1988	15865	1962	7426	4980	958	539	0.14	.
1989	16486	1990	7802	5188	943	562	0.14	.
1990	18304	2328	8661	5683	1018	614	0.15	.
1991	18768	2299	8868	5906	1056	639	0.15	.
1992	19624	2333	9278	6274	1060	679	0.16	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for East and West Pakistan

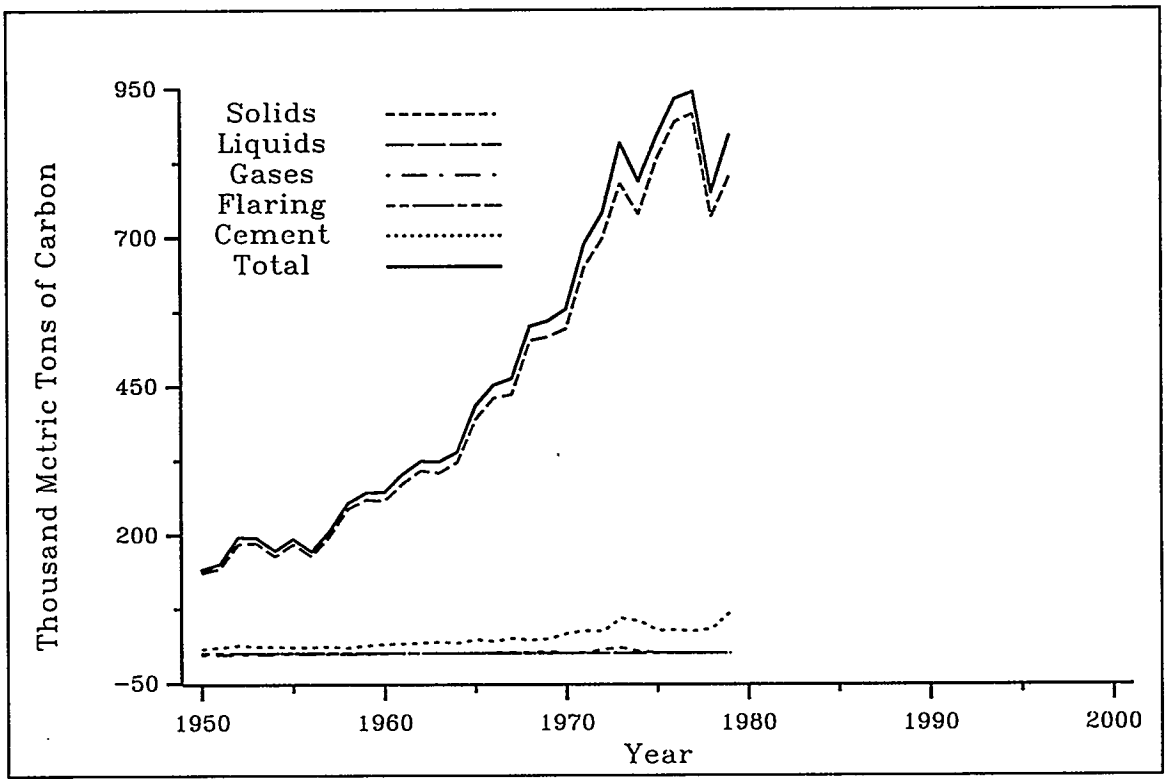


Per capita CO_2 emission rates for East and West Pakistan

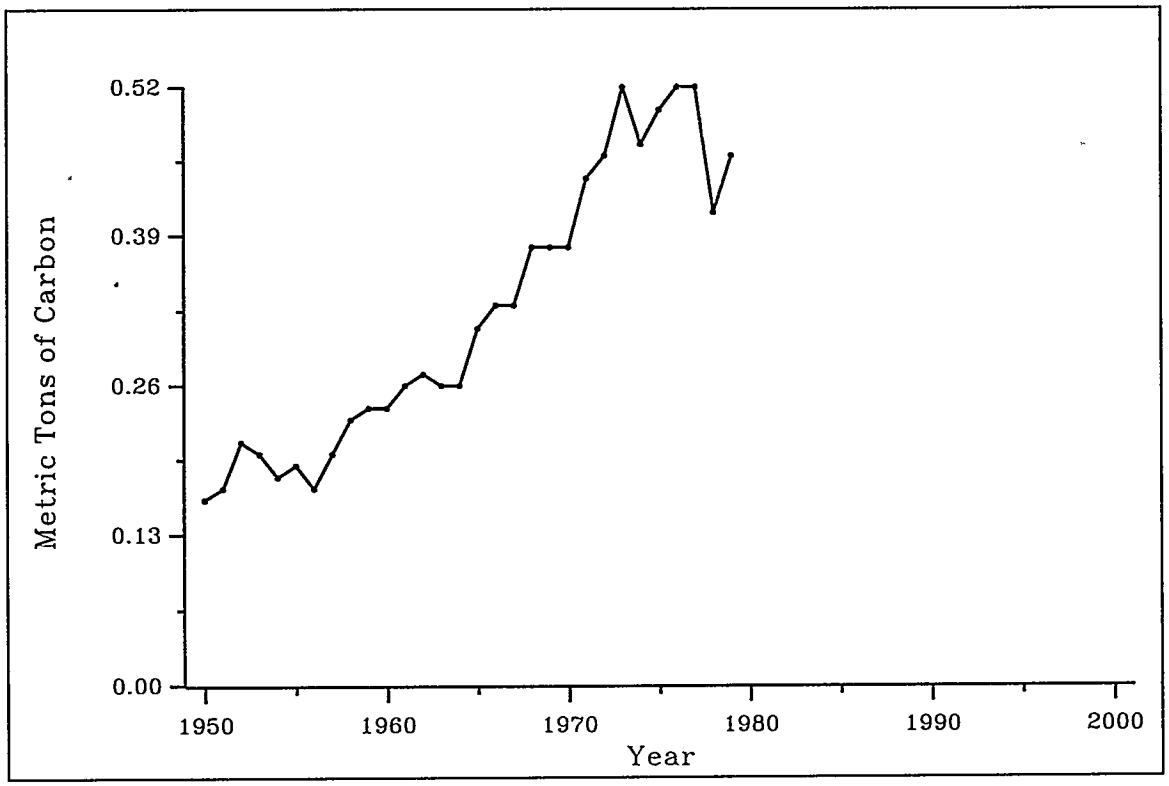
East and West Pakistan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1746	1065	623	0	57	0	0.02	.
1951	2156	1378	709	0	69	0	0.03	.
1952	2277	1421	782	0	73	0	0.03	.
1953	2316	1325	908	0	82	0	0.03	.
1954	2351	1219	1038	0	93	0	0.03	.
1955	2421	1170	1138	19	94	0	0.03	.
1956	2869	1455	1212	95	107	0	0.03	.
1957	2962	1343	1329	141	149	0	0.03	.
1958	3326	1466	1537	175	148	0	0.03	.
1959	3225	1238	1639	212	136	0	0.03	.
1960	3879	1626	1787	309	158	0	0.04	.
1961	4016	1602	1870	375	169	0	0.04	.
1962	4411	1708	2051	463	190	0	0.04	.
1963	5070	1843	2443	580	204	0	0.05	.
1964	5212	1800	2473	729	210	0	0.05	.
1965	5467	1703	2669	863	232	0	0.05	.
1966	5560	1471	2863	975	251	0	0.05	.
1967	5900	1445	3041	1137	277	0	0.05	.
1968	6764	1567	3590	1276	331	0	0.05	.
1969	6560	1446	3178	1572	364	0	0.05	.
1970	6478	1347	3213	1286	350	284	0.05	.
1971	6174	1190	2986	1349	365	284	0.05	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Panama

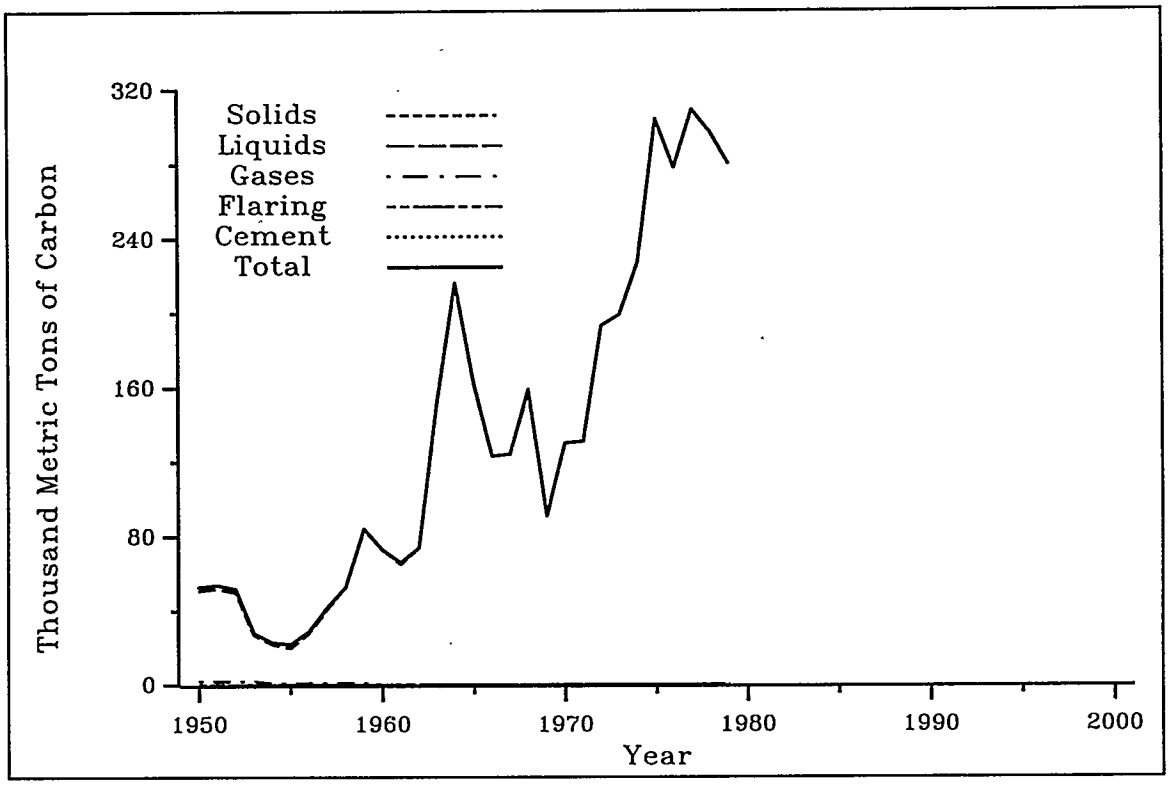


Per capita CO_2 emission rates for Panama

Panama

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	141	0	136	-2	7	0	0.16	.
1951	151	0	143	-2	10	0	0.17	.
1952	196	0	185	-2	13	0	0.21	.
1953	195	0	186	-2	11	0	0.20	.
1954	173	0	164	-1	11	0	0.18	.
1955	193	0	185	-1	10	0	0.19	.
1956	172	0	164	-1	10	0	0.17	.
1957	207	0	198	-1	11	0	0.20	.
1958	253	0	244	-1	9	0	0.23	.
1959	271	0	259	-1	13	0	0.24	.
1960	272	0	257	0	15	0	0.24	.
1961	302	0	286	0	16	0	0.26	.
1962	324	0	308	0	17	0	0.27	.
1963	323	0	304	0	19	0	0.26	.
1964	339	0	322	0	17	0	0.26	.
1965	417	0	394	0	23	0	0.31	.
1966	452	1	430	0	20	0	0.33	.
1967	463	2	436	0	25	0	0.33	.
1968	551	1	527	0	22	0	0.38	.
1969	560	3	533	0	24	0	0.38	.
1970	580	0	547	0	33	0	0.38	.
1971	688	1	649	0	38	0	0.44	.
1972	740	6	697	0	37	0	0.46	.
1973	858	9	790	0	59	0	0.52	.
1974	794	3	738	0	54	0	0.47	.
1975	868	1	830	0	38	0	0.50	.
1976	932	0	893	0	39	0	0.52	.
1977	944	0	907	0	37	0	0.52	.
1978	775	0	734	0	41	0	0.41	.
1979	871	0	802	0	69	0	0.46	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.

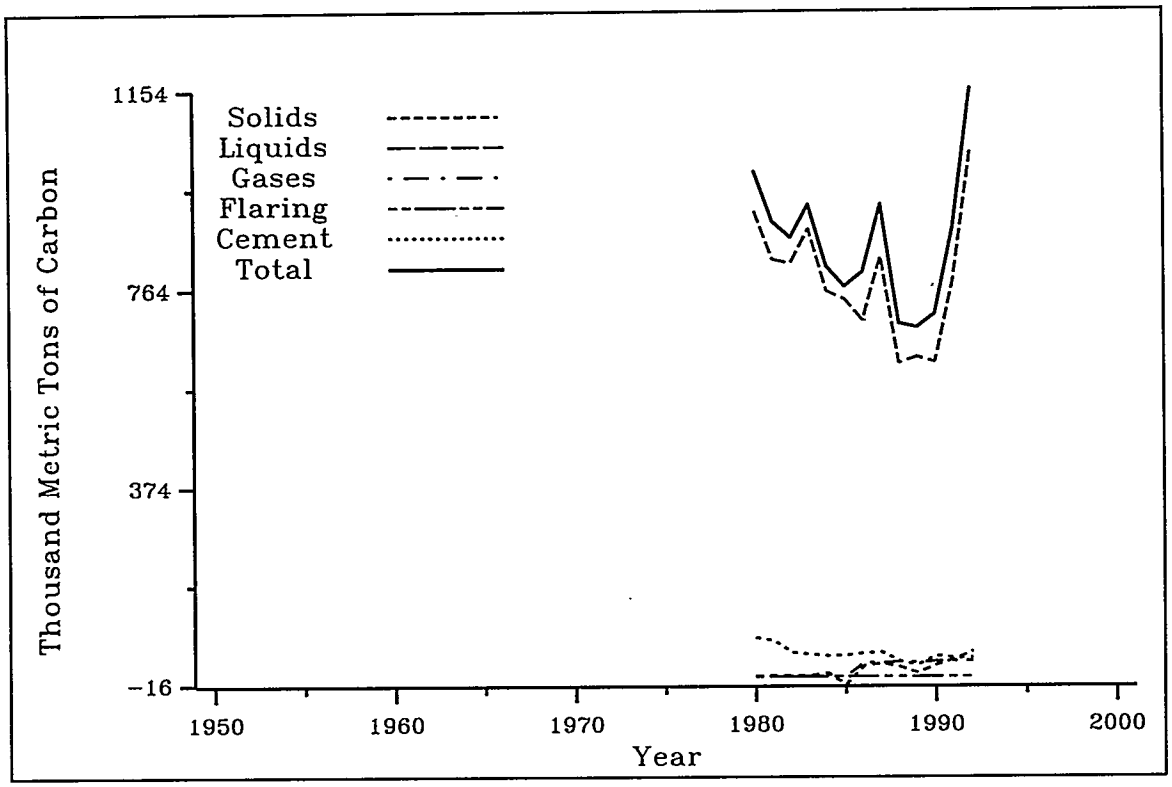


Total CO_2 emissions for the former Panama Canal Zone (1950-79)

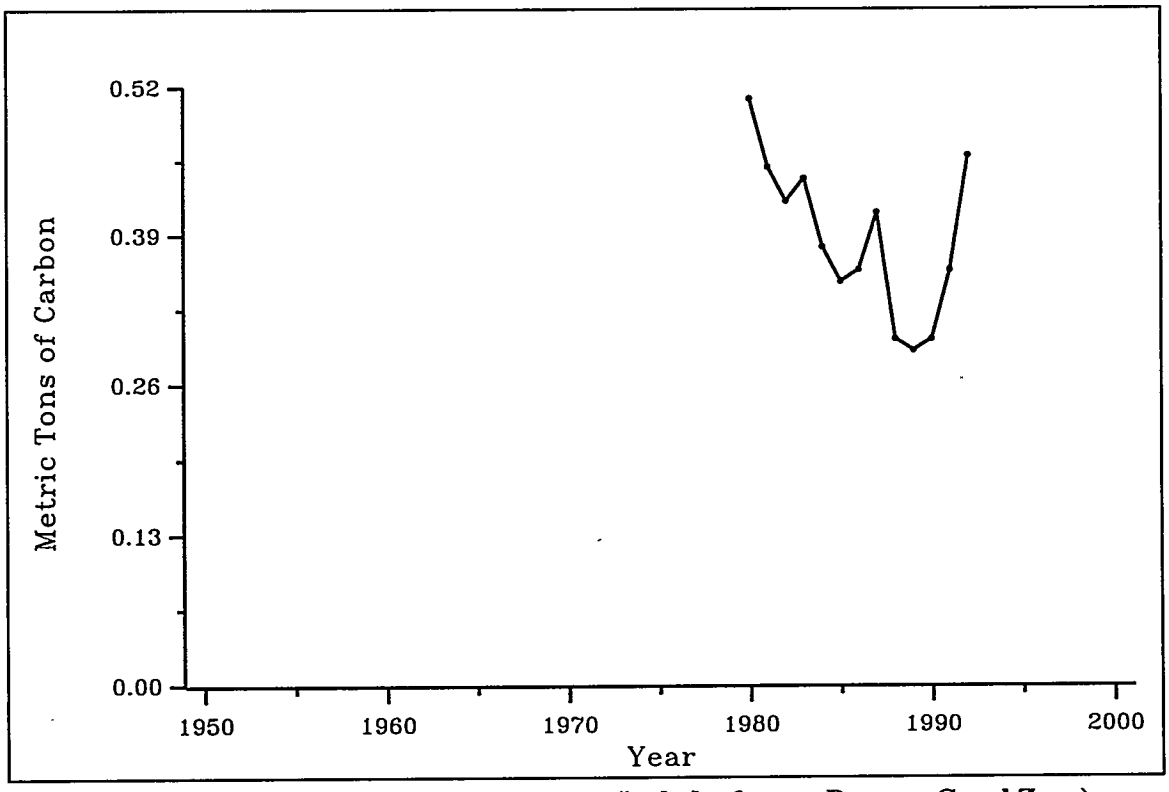
Panama Canal Zone (former)

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	53	0	51	2	0	0	.	.
1951	54	0	52	2	0	0	.	.
1952	52	0	50	2	0	0	.	.
1953	28	0	27	2	0	0	.	.
1954	23	0	22	1	0	0	.	.
1955	22	0	20	1	0	0	.	.
1956	29	0	28	1	0	0	.	.
1957	42	0	41	1	0	0	.	.
1958	53	0	53	1	0	0	.	.
1959	84	0	84	1	0	0	.	.
1960	73	0	73	0	0	0	.	.
1961	66	0	65	0	0	0	.	.
1962	74	0	74	0	0	0	.	.
1963	152	0	152	0	0	0	.	.
1964	216	0	216	0	0	0	.	.
1965	163	0	162	0	0	0	.	.
1966	123	0	123	0	0	0	.	.
1967	124	0	124	0	0	0	.	.
1968	159	0	158	0	0	0	.	.
1969	91	0	90	0	0	0	.	.
1970	130	0	130	0	0	0	.	.
1971	131	0	131	0	0	0	.	.
1972	193	0	193	0	0	0	.	.
1973	199	0	199	0	0	0	.	.
1974	227	0	227	0	0	0	.	.
1975	304	0	304	0	0	0	.	.
1976	278	0	278	0	0	0	.	.
1977	309	0	309	0	0	0	.	.
1978	297	0	297	0	0	0	.	.
1979	280	0	280	0	0	0	.	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Panama (includes former Panama Canal Zone)

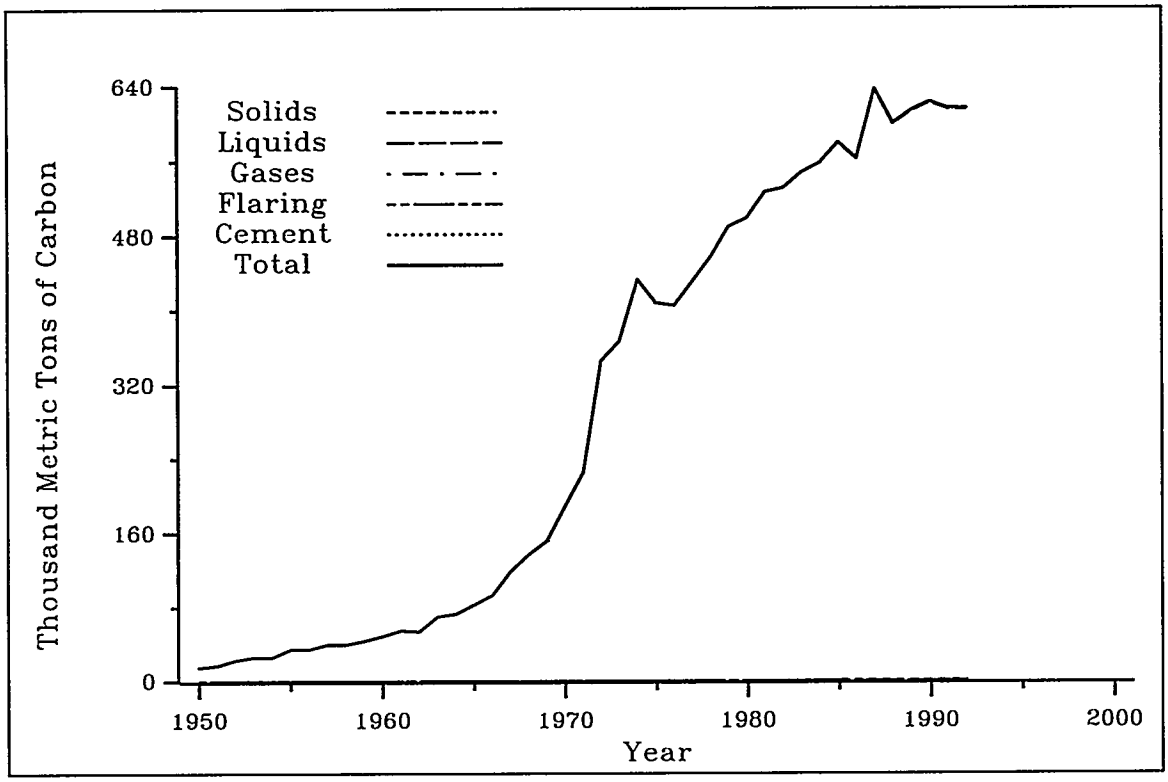


Per capita CO_2 emission rates for Panama (includes former Panama Canal Zone)

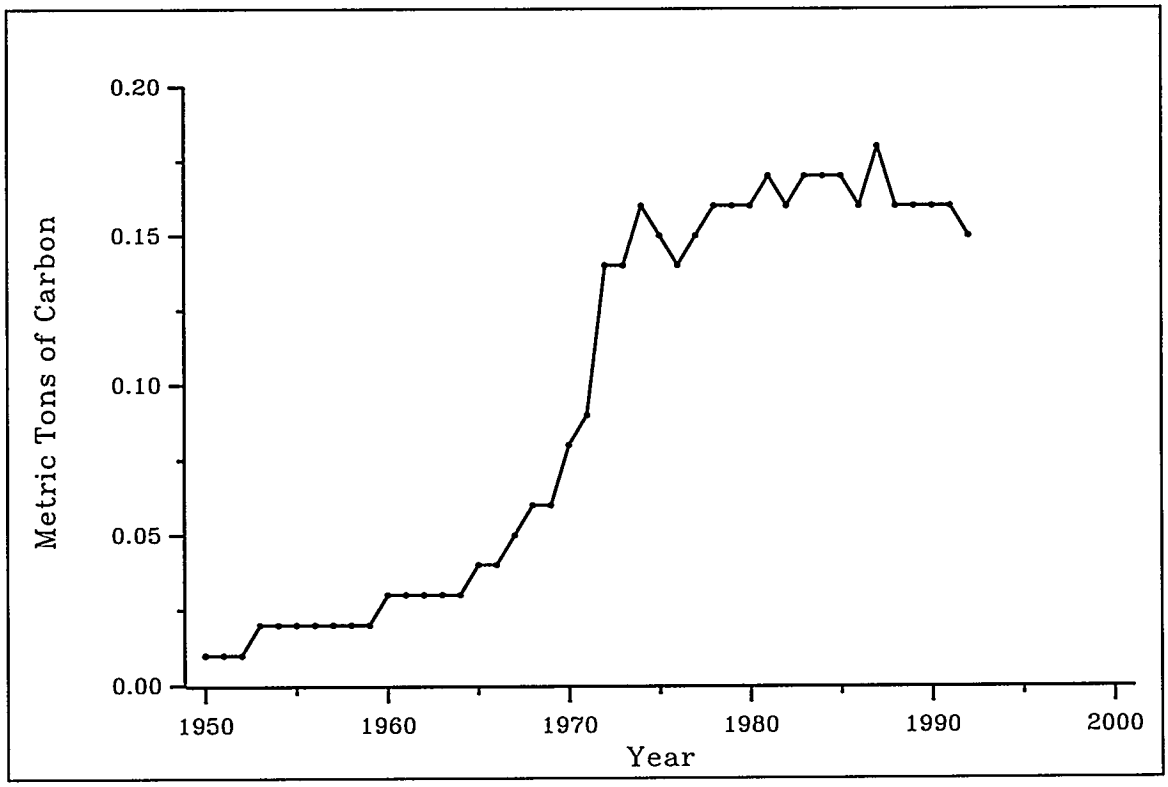
Panama (includes former Panama Canal Zone)

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1980	993	1	914	0	77	0	0.51	.
1981	894	2	821	0	71	0	0.45	.
1982	863	2	813	0	48	0	0.42	.
1983	927	2	880	0	44	0	0.44	.
1984	807	7	759	0	41	0	0.38	.
1985	768	-16	743	0	42	0	0.35	.
1986	796	21	702	27	46	0	0.36	.
1987	927	26	826	27	48	0	0.41	.
1988	696	19	618	29	30	0	0.30	.
1989	688	7	630	28	23	0	0.29	.
1990	714	23	620	30	41	0	0.30	.
1991	881	34	779	31	37	0	0.36	.
1992	1154	49	1037	31	37	0	0.46	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Papua New Guinea

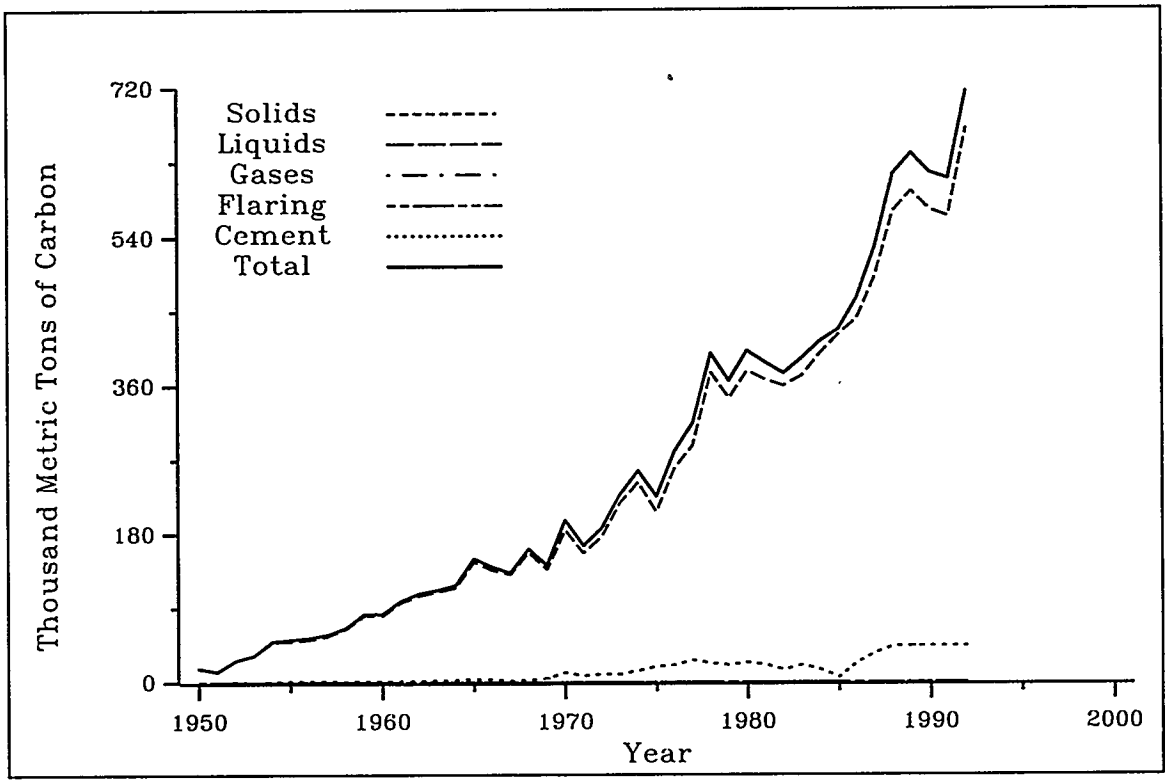


Per capita CO_2 emission rates for Papua New Guinea

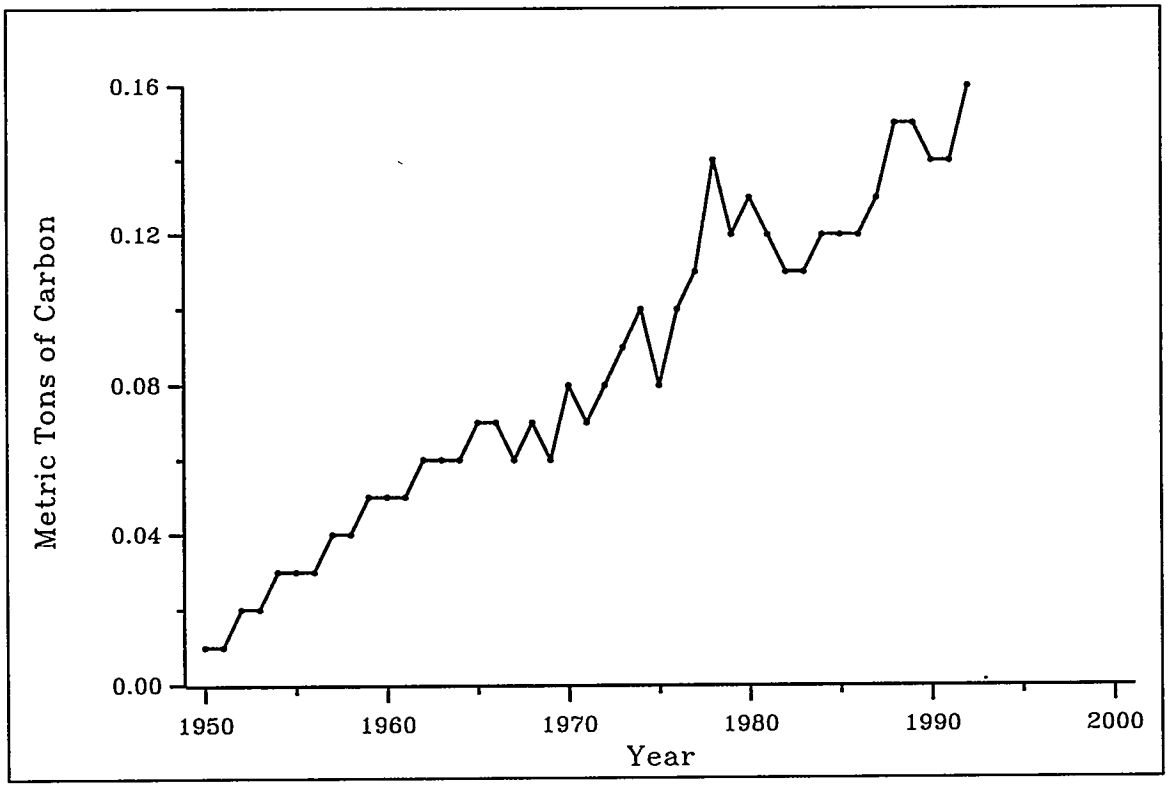
Papua New Guinea

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	15	0	15	0	0	0	0.01	.
1951	17	0	17	0	0	0	0.01	.
1952	23	0	23	0	0	0	0.01	.
1953	26	0	26	0	0	0	0.02	.
1954	26	0	26	0	0	0	0.02	.
1955	35	0	35	0	0	0	0.02	.
1956	35	0	35	0	0	0	0.02	.
1957	40	0	40	0	0	0	0.02	.
1958	40	0	40	0	0	0	0.02	.
1959	44	0	44	0	0	0	0.02	.
1960	49	0	49	0	0	0	0.03	.
1961	55	0	55	0	0	0	0.03	.
1962	54	0	54	0	0	0	0.03	.
1963	70	0	70	0	0	0	0.03	.
1964	73	0	73	0	0	0	0.03	.
1965	83	0	83	0	0	0	0.04	.
1966	93	0	93	0	0	0	0.04	.
1967	119	0	119	0	0	0	0.05	.
1968	137	0	137	0	0	0	0.06	.
1969	152	0	152	0	0	0	0.06	.
1970	189	0	189	0	0	0	0.08	.
1971	225	0	225	0	0	0	0.09	.
1972	346	0	346	0	0	0	0.14	.
1973	367	0	367	0	0	0	0.14	.
1974	433	0	433	0	0	0	0.16	.
1975	408	0	408	0	0	0	0.15	.
1976	405	0	405	0	0	0	0.14	.
1977	431	0	431	0	0	0	0.15	.
1978	457	0	457	0	0	0	0.16	.
1979	490	0	490	0	0	0	0.16	.
1980	499	0	499	0	0	0	0.16	.
1981	527	0	527	0	0	0	0.17	.
1982	531	0	531	0	0	0	0.16	.
1983	548	0	548	0	0	0	0.17	.
1984	558	0	558	0	0	0	0.17	.
1985	580	1	579	0	0	0	0.17	.
1986	563	1	562	0	0	0	0.16	.
1987	637	1	636	0	0	0	0.18	.
1988	600	1	599	0	0	0	0.16	.
1989	614	1	613	0	0	0	0.16	.
1990	623	1	622	0	0	0	0.16	.
1991	616	1	615	0	0	0	0.16	.
1992	616	1	615	0	0	0	0.15	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Paraguay

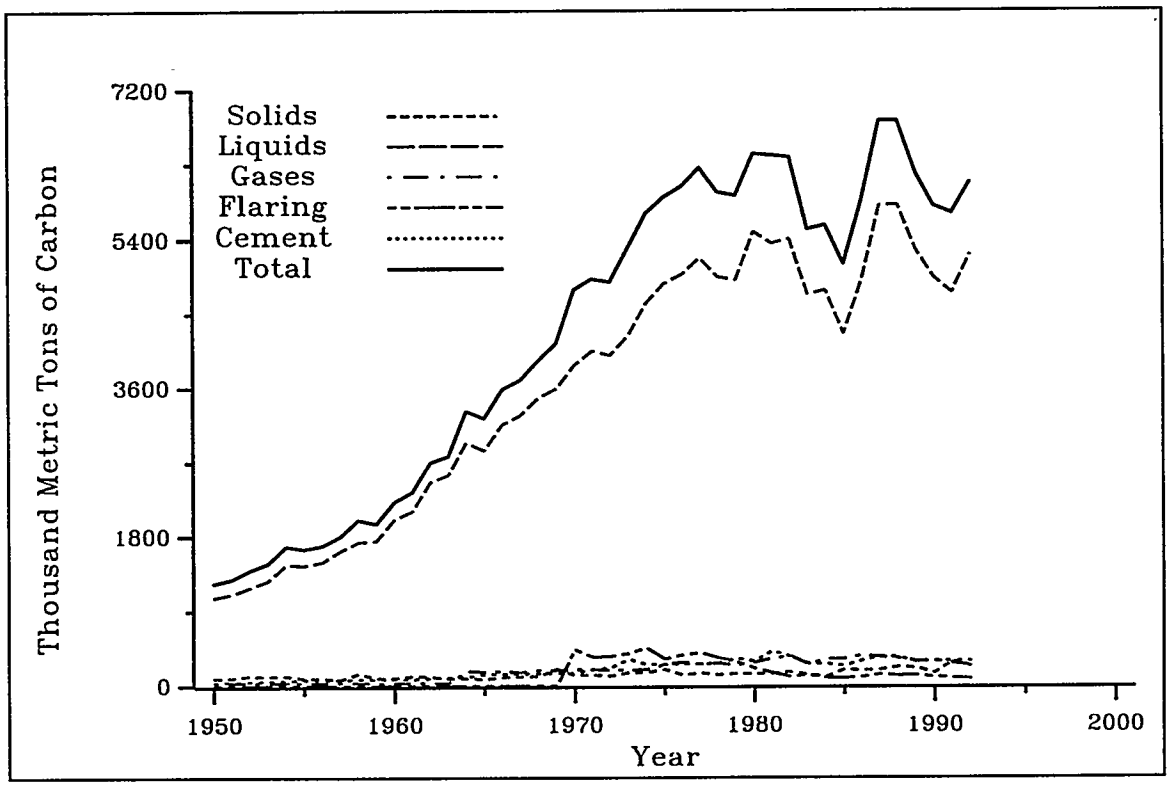


Per capita CO_2 emission rates for Paraguay

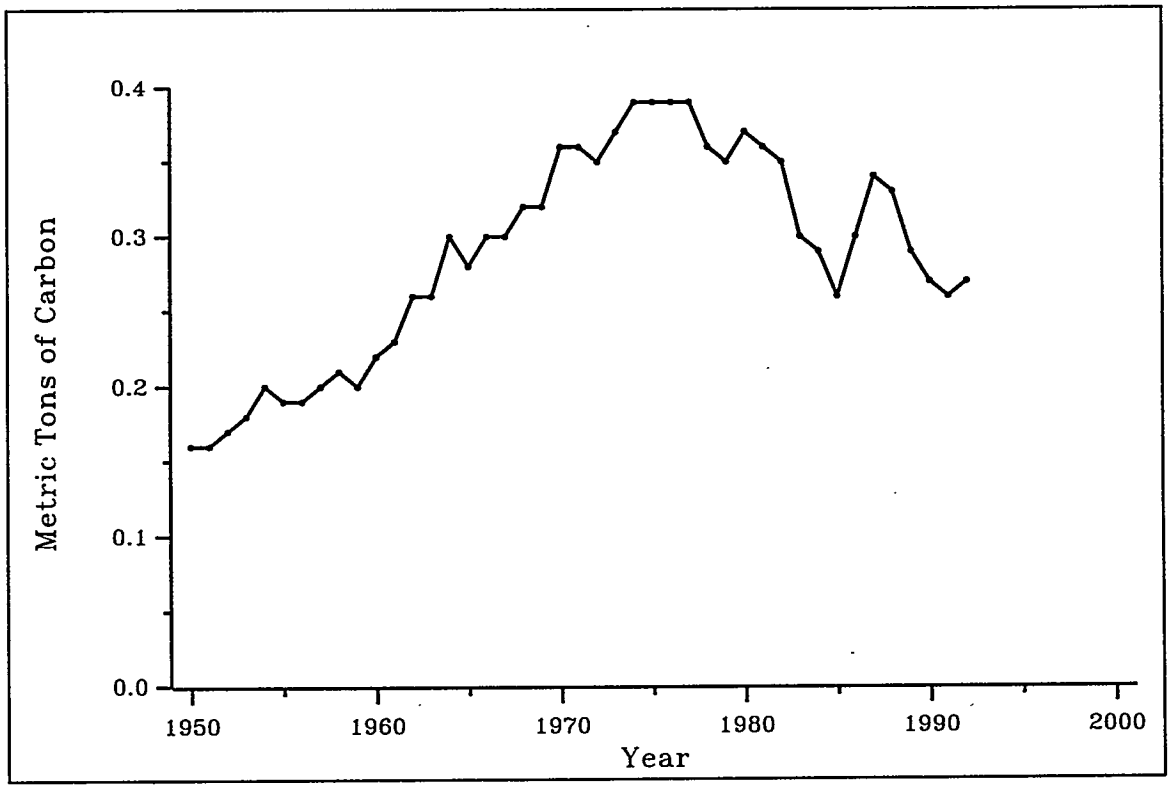
Paraguay

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	17	0	17	0	0	0	0.01	.
1951	13	0	13	0	0	0	0.01	.
1952	27	0	27	0	1	0	0.02	.
1953	33	0	33	0	0	0	0.02	.
1954	50	0	49	0	1	0	0.03	.
1955	52	0	50	0	2	0	0.03	.
1956	54	0	52	0	2	0	0.03	.
1957	58	0	56	0	2	0	0.04	.
1958	66	0	65	0	1	0	0.04	.
1959	83	0	81	0	2	0	0.05	.
1960	83	0	81	0	2	0	0.05	.
1961	99	0	97	0	2	0	0.05	.
1962	108	0	105	0	2	0	0.06	.
1963	112	0	110	0	3	0	0.06	.
1964	118	0	115	0	3	0	0.06	.
1965	150	0	146	0	4	0	0.07	.
1966	140	0	136	0	4	0	0.07	.
1967	133	0	131	0	2	0	0.06	.
1968	162	0	158	0	3	0	0.07	.
1969	142	0	137	0	5	0	0.06	.
1970	197	0	185	0	12	0	0.08	.
1971	166	0	157	0	8	0	0.07	.
1972	187	0	177	0	10	0	0.08	.
1973	228	0	218	0	10	0	0.09	.
1974	257	0	243	0	14	0	0.10	.
1975	226	0	207	0	19	0	0.08	.
1976	281	0	260	0	21	0	0.10	.
1977	315	0	288	0	27	0	0.11	.
1978	399	0	376	0	23	0	0.14	.
1979	366	0	345	0	21	0	0.12	.
1980	402	0	378	0	24	0	0.13	.
1981	388	0	367	0	21	0	0.12	.
1982	375	0	360	0	15	0	0.11	.
1983	393	0	372	0	21	0	0.11	.
1984	414	0	399	0	15	0	0.12	.
1985	428	0	422	0	6	0	0.12	.
1986	466	0	441	0	24	0	0.12	.
1987	528	0	492	0	36	0	0.13	.
1988	615	0	571	0	44	0	0.15	.
1989	640	0	595	0	44	0	0.15	.
1990	617	0	573	0	44	0	0.14	.
1991	610	0	565	0	44	0	0.14	.
1992	715	0	671	0	44	0	0.16	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Peru

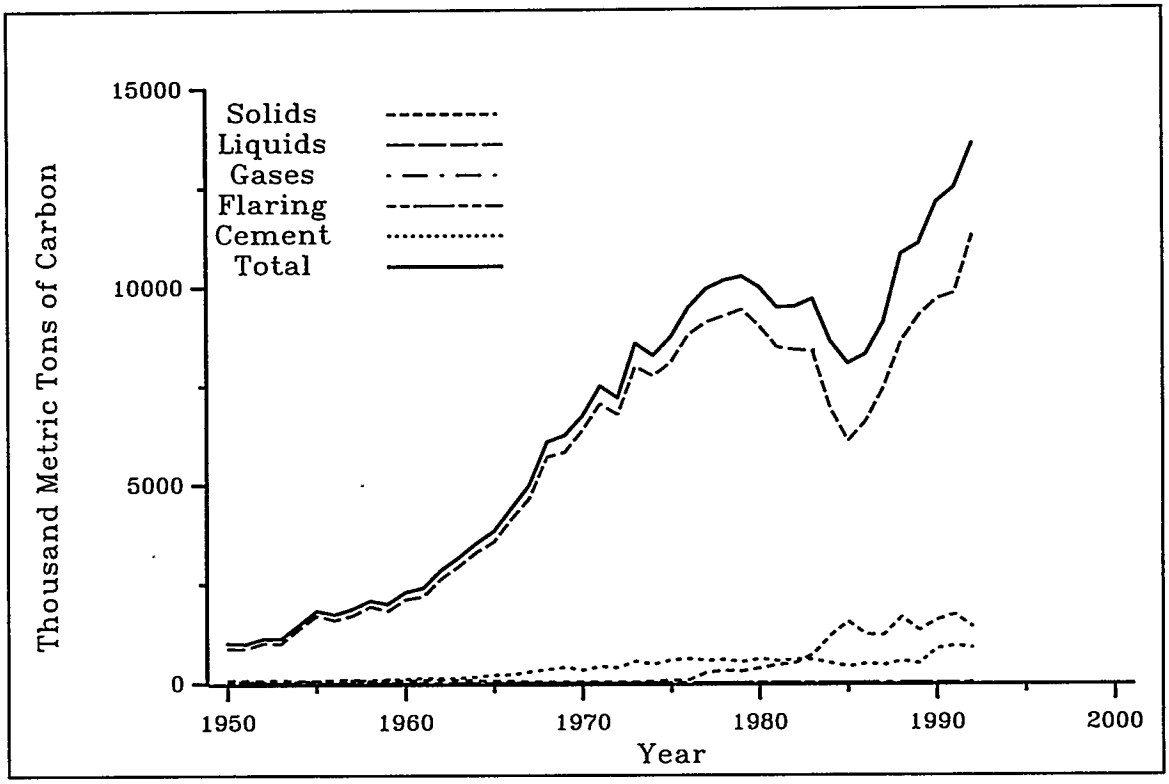


Per capita CO_2 emission rates for Peru

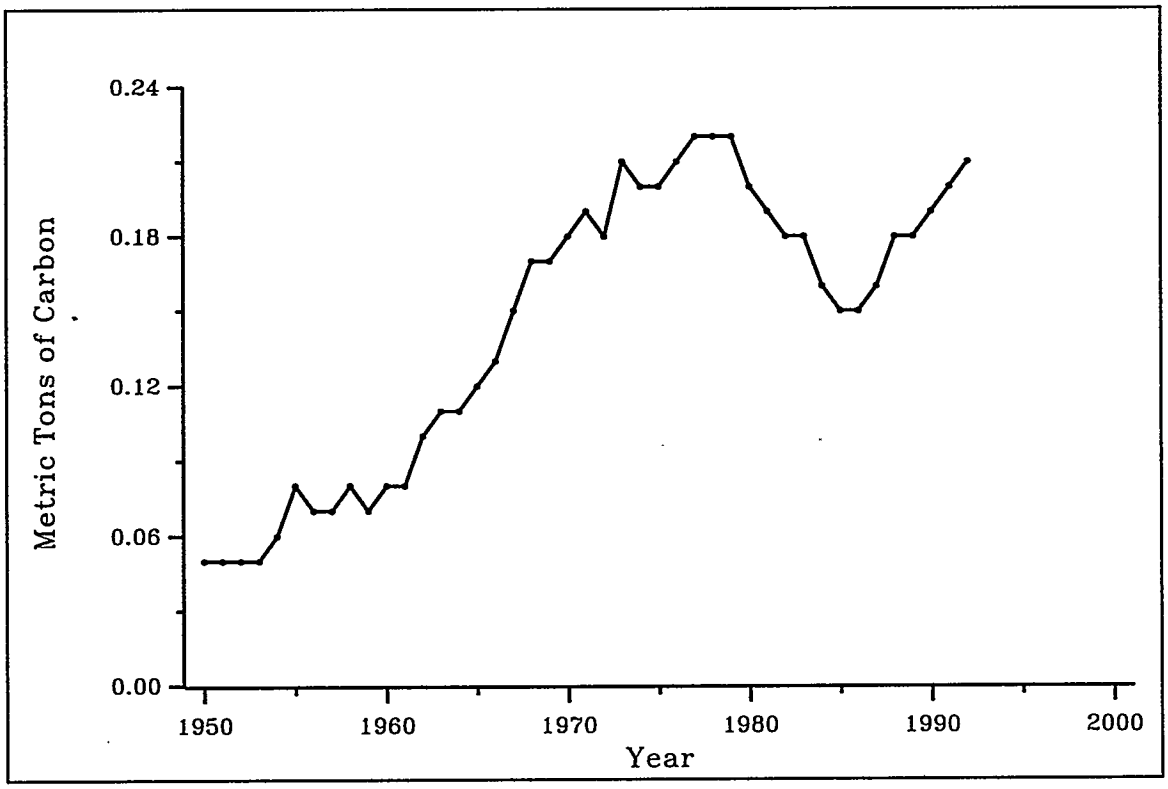
Peru

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1232	90	1063	34	45	0	0.16	.
1951	1285	97	1106	34	49	0	0.16	.
1952	1393	122	1186	34	50	0	0.17	.
1953	1475	114	1267	34	61	0	0.18	.
1954	1680	121	1459	34	66	0	0.20	.
1955	1648	89	1451	34	74	0	0.19	.
1956	1691	92	1491	34	75	0	0.19	.
1957	1805	75	1623	34	74	0	0.20	.
1958	2002	152	1734	34	82	0	0.21	.
1959	1957	94	1750	34	79	0	0.20	.
1960	2223	97	2010	34	82	0	0.22	.
1961	2347	120	2112	34	81	0	0.23	.
1962	2703	112	2462	34	95	0	0.26	.
1963	2779	88	2551	38	103	0	0.26	.
1964	3323	93	2940	180	111	0	0.30	.
1965	3236	82	2846	170	138	0	0.28	.
1966	3584	104	3157	178	145	0	0.30	.
1967	3697	116	3269	164	148	0	0.30	.
1968	3934	117	3478	188	151	0	0.32	.
1969	4145	206	3592	193	155	0	0.32	.
1970	4798	129	3876	198	154	440	0.36	.
1971	4926	132	4051	197	197	349	0.36	.
1972	4889	120	3998	192	221	358	0.35	.
1973	5297	161	4233	190	321	392	0.37	.
1974	5708	162	4628	198	259	461	0.39	.
1975	5902	198	4865	256	259	324	0.39	.
1976	6032	131	4976	284	267	374	0.39	.
1977	6255	155	5178	261	262	399	0.39	.
1978	5962	132	4947	272	275	336	0.36	.
1979	5922	144	4910	252	326	289	0.35	.
1980	6423	145	5492	280	295	211	0.37	.
1981	6406	148	5353	329	419	157	0.36	.
1982	6384	164	5404	354	352	109	0.35	.
1983	5522	133	4737	258	267	127	0.30	.
1984	5570	106	4786	317	265	97	0.29	.
1985	5107	194	4260	324	239	91	0.26	.
1986	5856	183	4905	366	300	103	0.30	.
1987	6824	190	5805	344	352	135	0.34	.
1988	6824	225	5810	328	342	120	0.33	.
1989	6195	212	5279	294	286	124	0.29	.
1990	5799	153	4942	302	297	104	0.27	.
1991	5713	292	4759	272	296	94	0.26	.
1992	6080	235	5222	244	296	83	0.27	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Philippines

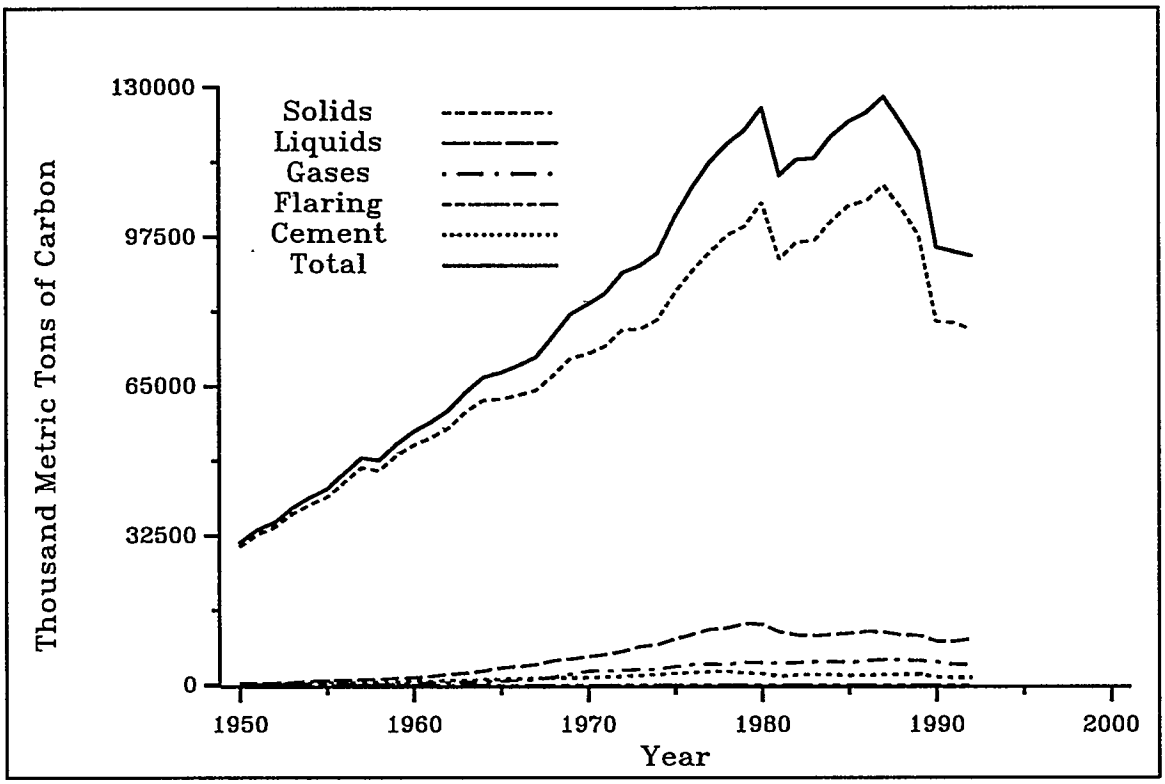


Per capita CO_2 emission rates for the Philippines

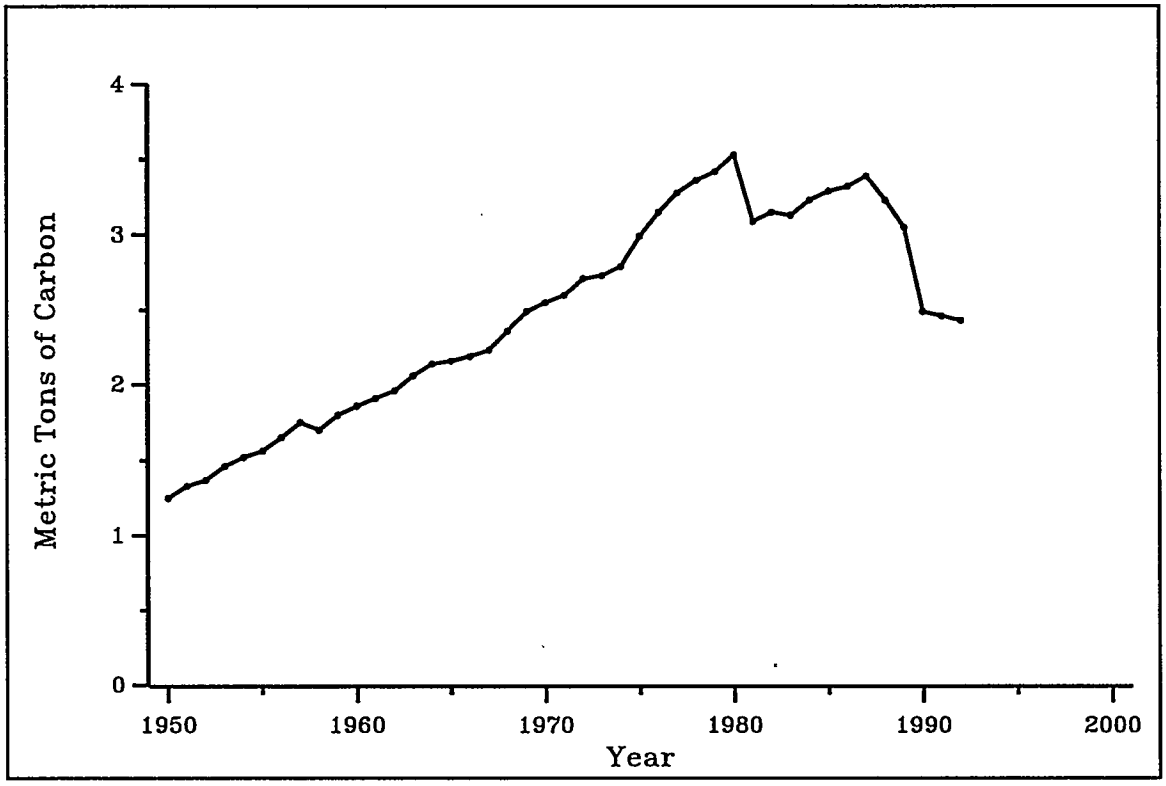
Philippines

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1017	83	894	0	40	0	0.05	.
1951	1001	78	881	0	42	0	0.05	.
1952	1132	66	1024	0	42	0	0.05	.
1953	1133	80	1013	0	40	0	0.05	.
1954	1480	62	1376	0	42	0	0.06	.
1955	1833	68	1711	0	54	0	0.08	.
1956	1738	80	1598	0	59	0	0.07	.
1957	1877	98	1709	0	70	0	0.07	.
1958	2086	58	1941	0	87	0	0.08	.
1959	2001	74	1828	0	99	0	0.07	.
1960	2303	79	2116	0	108	0	0.08	.
1961	2409	80	2190	0	139	0	0.08	.
1962	2855	91	2633	0	131	0	0.10	.
1963	3165	87	2948	0	129	0	0.11	.
1964	3525	65	3297	0	163	0	0.11	.
1965	3832	61	3563	0	208	0	0.12	.
1966	4415	55	4141	0	219	0	0.13	.
1967	4987	44	4656	0	287	0	0.15	.
1968	6075	31	5695	0	349	0	0.17	.
1969	6243	29	5812	0	401	0	0.17	.
1970	6733	32	6368	0	333	0	0.18	.
1971	7489	30	7035	0	424	0	0.19	.
1972	7191	29	6767	0	395	0	0.18	.
1973	8562	26	7984	0	552	0	0.21	.
1974	8257	43	7737	0	476	0	0.20	.
1975	8725	63	8083	0	580	0	0.20	.
1976	9464	74	8779	0	612	0	0.21	.
1977	9931	267	9093	0	571	0	0.22	.
1978	10147	313	9244	0	590	0	0.22	.
1979	10247	299	9411	0	537	0	0.22	.
1980	9971	371	8991	0	609	0	0.20	.
1981	9471	456	8459	0	556	0	0.19	.
1982	9482	503	8388	0	592	0	0.18	.
1983	9676	716	8363	0	596	0	0.18	.
1984	8601	1193	6911	0	497	0	0.16	.
1985	8043	1542	6083	0	419	0	0.15	.
1986	8277	1218	6577	0	482	0	0.15	.
1987	9084	1205	7427	0	452	0	0.16	.
1988	10806	1650	8599	0	557	0	0.18	.
1989	11067	1329	9245	0	493	0	0.18	.
1990	12110	1581	9664	0	865	0	0.19	.
1991	12473	1719	9817	0	938	0	0.20	.
1992	13564	1407	11273	0	884	0	0.21	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Poland

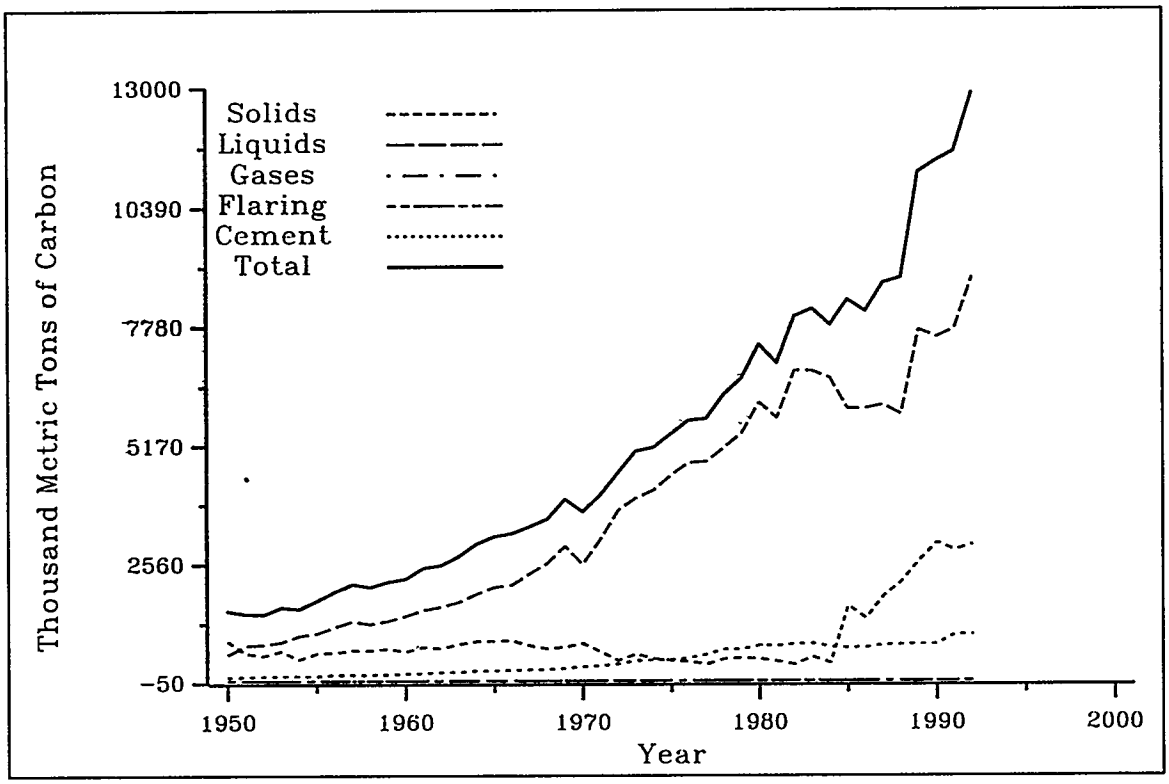


Per capita CO_2 emission rates for Poland

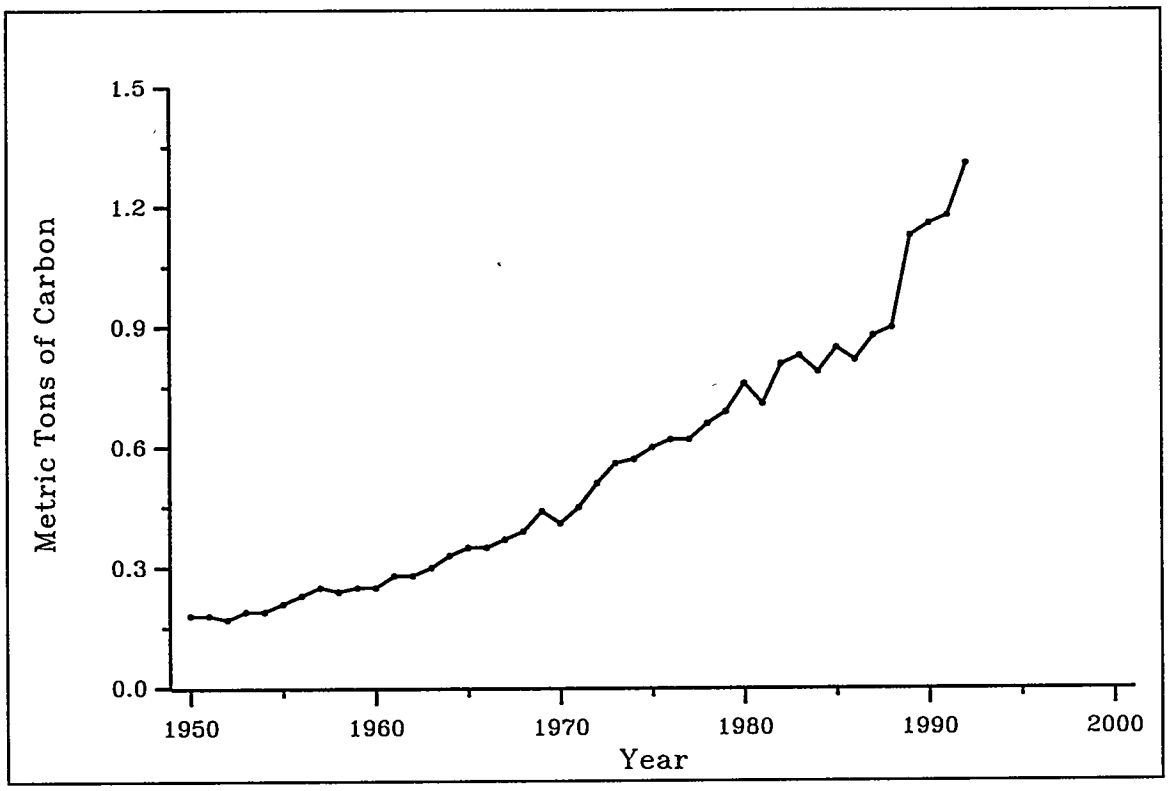
Poland

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	30950	30133	363	112	342	0	1.25	.
1951	33714	32750	428	170	366	0	1.33	.
1952	35346	34298	486	199	363	0	1.37	.
1953	38420	37205	556	212	448	0	1.46	.
1954	40730	39155	871	242	463	0	1.52	157
1955	42555	40781	986	269	519	0	1.56	144
1956	45930	44029	1067	284	549	0	1.65	131
1957	49312	47199	1213	289	611	0	1.75	128
1958	48767	46526	1261	292	688	0	1.70	113
1959	52319	49775	1505	315	723	0	1.80	94
1960	55049	52104	1648	401	897	0	1.86	82
1961	57154	53730	1916	506	1002	0	1.91	95
1962	59724	55783	2348	567	1026	0	1.96	80
1963	63645	59382	2580	639	1044	0	2.06	76
1964	66856	61851	3081	732	1192	0	2.14	102
1965	67951	62083	3707	860	1302	0	2.16	99
1966	69428	62982	4054	1027	1366	0	2.19	87
1967	71230	64003	4422	1291	1514	0	2.23	72
1968	75814	67194	5329	1713	1578	0	2.36	58
1969	80611	70970	5663	2369	1609	0	2.49	64
1970	82783	71934	6213	2979	1657	0	2.55	55
1971	85185	73666	6649	3090	1779	0	2.60	62
1972	89683	77258	7321	3202	1902	0	2.71	62
1973	91142	77321	8347	3360	2115	0	2.73	58
1974	93946	79459	8753	3454	2280	0	2.79	58
1975	101756	85267	10004	3968	2516	0	2.99	61
1976	108168	90006	11036	4433	2693	0	3.15	55
1977	113579	94052	12098	4532	2897	0	3.28	96
1978	117567	97730	12412	4474	2951	0	3.36	54
1979	120503	99689	13321	4885	2608	0	3.42	49
1980	125436	104888	13166	4874	2508	0	3.53	48
1981	110845	92620	11525	4766	1935	0	3.09	48
1982	114184	96337	10825	4833	2190	0	3.15	35
1983	114445	96504	10741	4997	2203	0	3.13	26
1984	119298	100882	11024	5121	2271	0	3.23	18
1985	122428	104244	11265	4879	2040	0	3.29	17
1986	124377	105259	11649	5320	2149	0	3.32	8
1987	127773	108602	11490	5492	2188	0	3.39	0
1988	122212	103620	10853	5429	2310	0	3.23	1265
1989	116090	97653	10779	5330	2329	0	3.05	1209
1990	95184	79006	9460	5004	1714	0	2.49	370
1991	94207	78685	9443	4443	1636	0	2.46	156
1992	93311	77296	9999	4387	1629	0	2.43	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Portugal

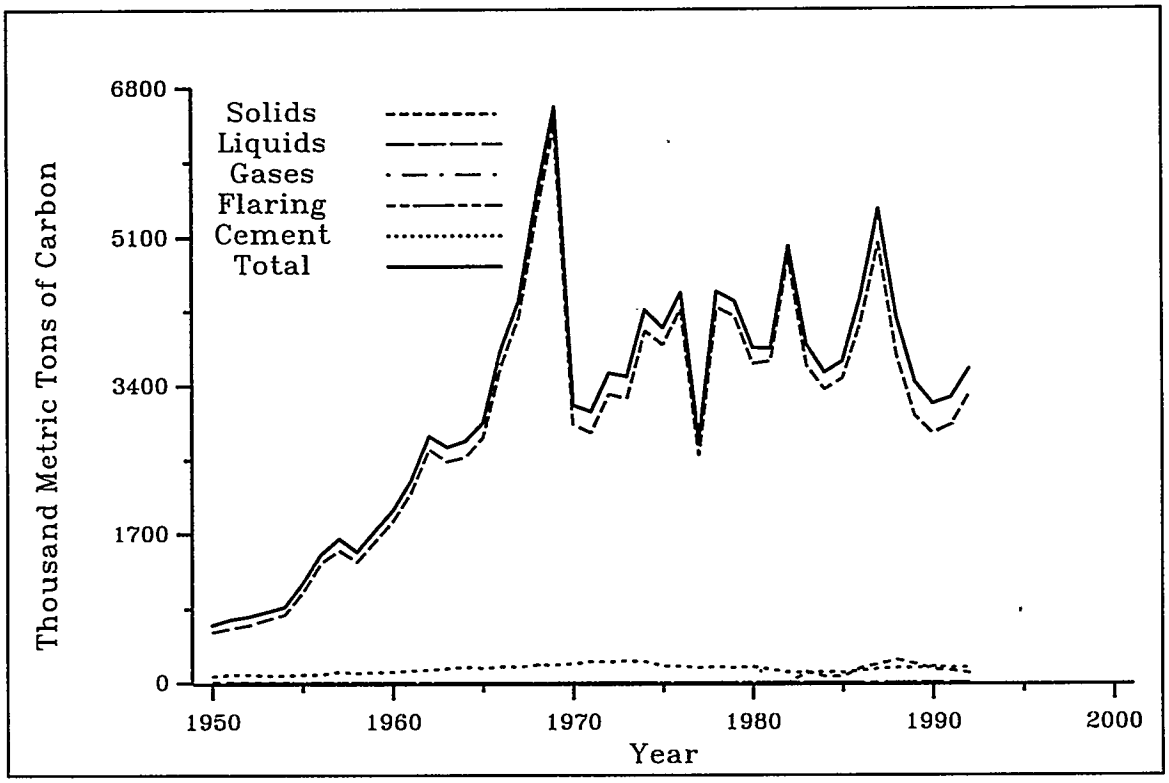


Per capita CO_2 emission rates for Portugal

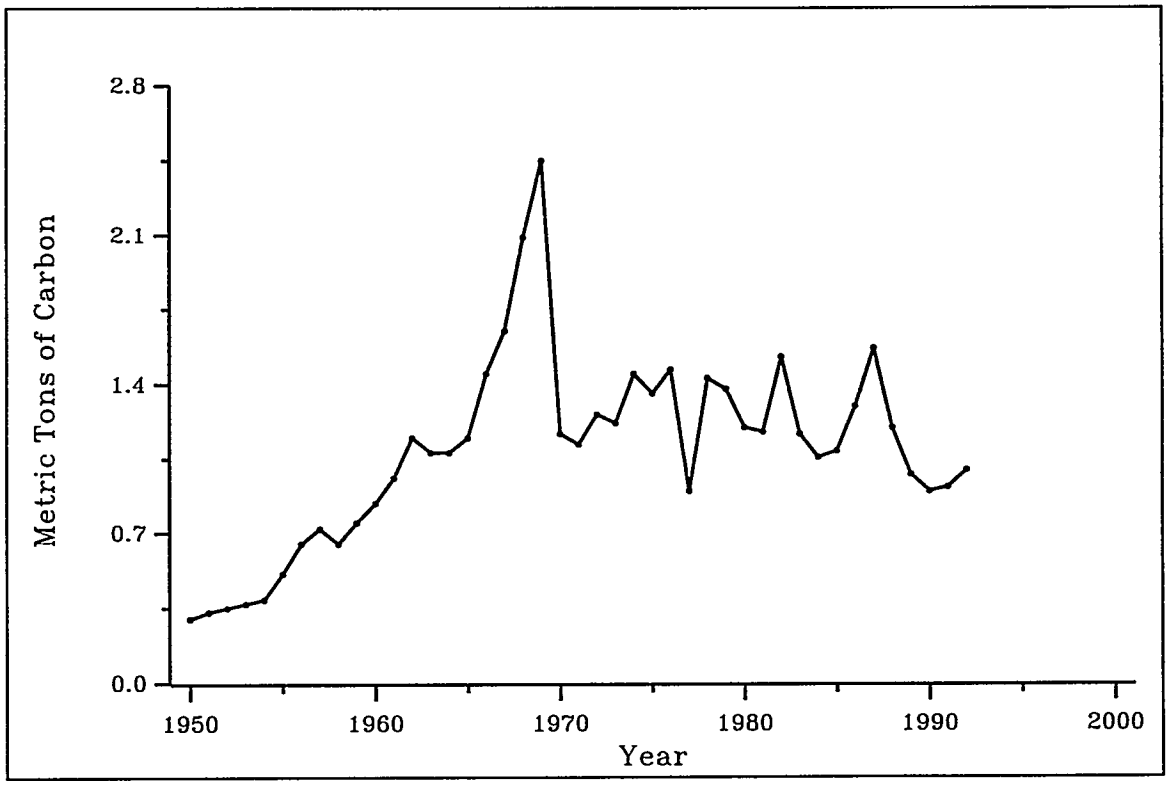
Portugal

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1543	880	585	0	78	0	0.18	94
1951	1479	612	779	0	87	0	0.18	94
1952	1467	561	807	0	99	0	0.17	103
1953	1625	661	860	0	105	0	0.19	101
1954	1586	481	998	0	107	0	0.19	80
1955	1770	613	1052	0	106	0	0.21	67
1956	1962	629	1193	0	139	0	0.23	66
1957	2131	680	1317	0	133	0	0.25	63
1958	2069	672	1258	0	139	0	0.24	73
1959	2185	721	1325	0	140	0	0.25	72
1960	2248	650	1435	0	163	0	0.25	54
1961	2486	755	1562	0	169	0	0.28	43
1962	2543	718	1634	0	191	0	0.28	42
1963	2741	811	1736	0	195	0	0.30	44
1964	3015	879	1916	0	221	0	0.33	53
1965	3172	880	2064	0	229	0	0.35	52
1966	3242	895	2113	0	234	0	0.35	58
1967	3392	783	2361	0	248	0	0.37	61
1968	3556	714	2589	0	253	0	0.39	55
1969	3993	754	2962	0	277	0	0.44	51
1970	3716	831	2568	0	317	0	0.41	783
1971	4089	646	3109	0	334	0	0.45	858
1972	4574	453	3743	0	378	0	0.51	843
1973	5055	593	4013	0	449	0	0.56	835
1974	5137	493	4183	0	461	0	0.57	782
1975	5440	452	4520	-2	469	0	0.60	803
1976	5731	431	4795	0	505	0	0.62	704
1977	5772	367	4821	0	584	0	0.62	782
1978	6307	485	5126	0	696	0	0.66	790
1979	6657	506	5449	4	699	0	0.69	707
1980	7396	486	6128	0	782	0	0.76	616
1981	6990	433	5783	0	775	0	0.71	649
1982	8001	367	6823	0	811	0	0.81	575
1983	8172	531	6816	0	825	0	0.83	653
1984	7821	400	6668	0	753	0	0.79	629
1985	8372	1652	5991	0	730	0	0.85	617
1986	8115	1379	5996	0	740	0	0.82	811
1987	8735	1865	6073	0	796	0	0.88	816
1988	8852	2180	5871	0	802	0	0.90	793
1989	11164	2635	7714	0	814	0	1.13	899
1990	11411	3037	7560	0	814	0	1.16	770
1991	11612	2870	7721	0	1020	0	1.18	954
1992	12877	2995	8861	0	1020	0	1.31	977

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Puerto Rico

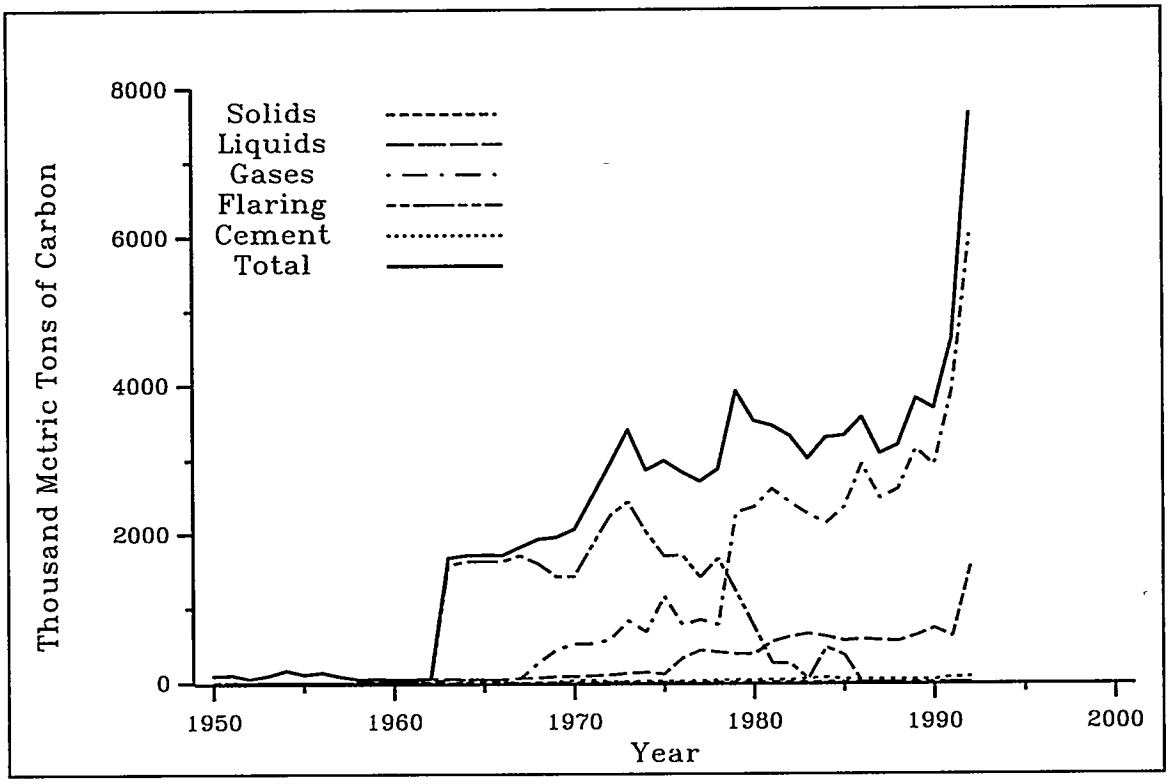


Per capita CO_2 emission rates for Puerto Rico

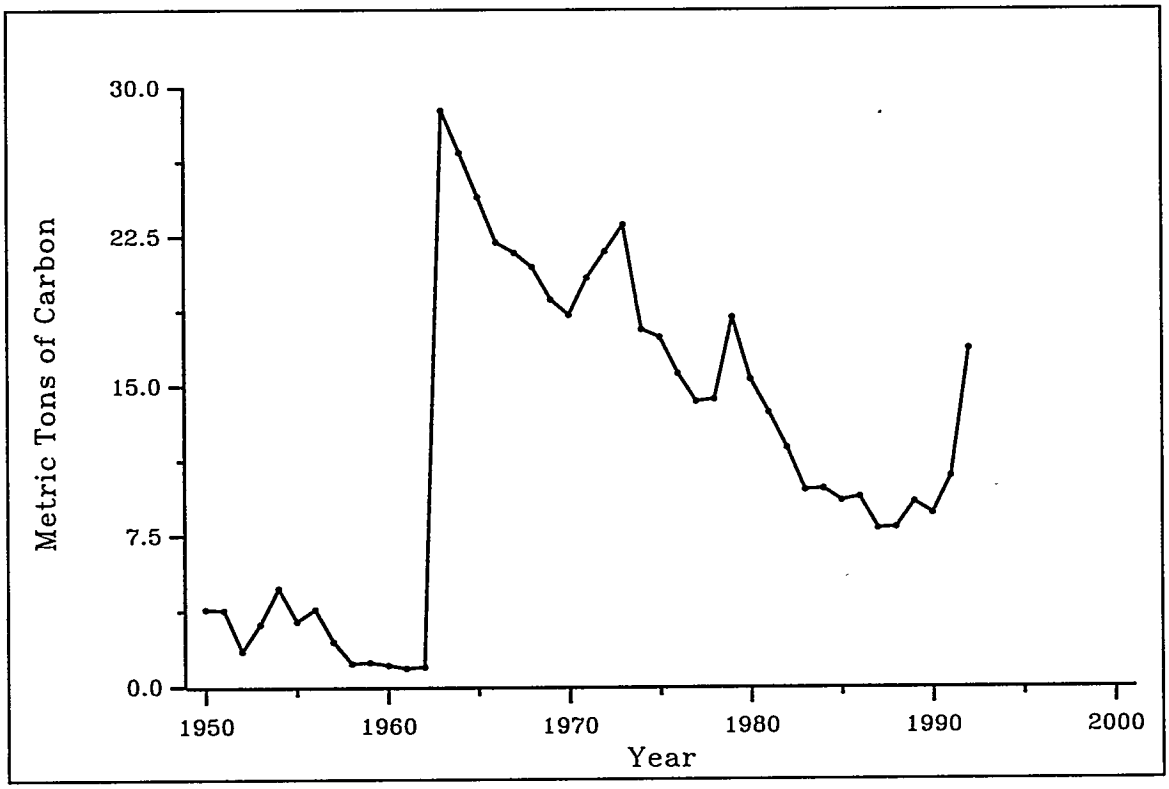
Puerto Rico

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	668	9	584	0	75	0	0.30	.
1951	731	7	625	0	98	0	0.33	.
1952	764	5	664	0	95	0	0.35	.
1953	817	5	728	0	85	0	0.37	.
1954	875	6	786	0	84	0	0.39	.
1955	1142	2	1042	0	97	0	0.51	.
1956	1470	6	1366	0	98	0	0.65	.
1957	1644	4	1513	0	128	0	0.72	.
1958	1496	1	1381	0	113	0	0.65	.
1959	1737	1	1613	0	124	0	0.75	.
1960	1972	1	1846	0	126	0	0.84	.
1961	2315	1	2174	0	141	0	0.96	.
1962	2823	1	2675	0	148	0	1.15	.
1963	2701	1	2534	0	166	0	1.08	.
1964	2765	1	2580	0	184	0	1.08	.
1965	2973	0	2805	0	169	0	1.15	.
1966	3813	0	3626	0	187	0	1.45	.
1967	4368	0	4183	0	185	0	1.65	.
1968	5565	0	5358	0	207	0	2.09	.
1969	6585	0	6377	0	208	0	2.45	.
1970	3179	0	2958	0	221	0	1.17	.
1971	3107	0	2862	0	246	0	1.12	.
1972	3544	0	3302	0	242	0	1.26	.
1973	3506	0	3252	0	254	0	1.22	.
1974	4269	0	4025	0	243	0	1.45	.
1975	4060	0	3865	0	195	0	1.36	.
1976	4466	0	4276	0	191	0	1.47	.
1977	2772	0	2598	0	174	0	0.90	.
1978	4480	0	4296	0	184	0	1.43	.
1979	4367	0	4193	0	174	0	1.38	.
1980	3832	0	3649	0	183	0	1.20	.
1981	3825	0	3675	0	151	0	1.18	.
1982	5002	0	4880	0	122	0	1.53	.
1983	3867	125	3628	0	114	0	1.17	.
1984	3551	73	3355	0	123	0	1.06	.
1985	3675	73	3483	0	119	0	1.09	.
1986	4416	170	4107	0	139	0	1.30	.
1987	5416	215	5040	0	161	0	1.57	.
1988	4172	262	3739	0	171	0	1.20	.
1989	3442	218	3055	0	169	0	0.98	.
1990	3193	156	2853	0	184	0	0.90	.
1991	3264	141	2950	0	173	0	0.92	.
1992	3589	113	3300	0	177	0	1.00	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Qatar

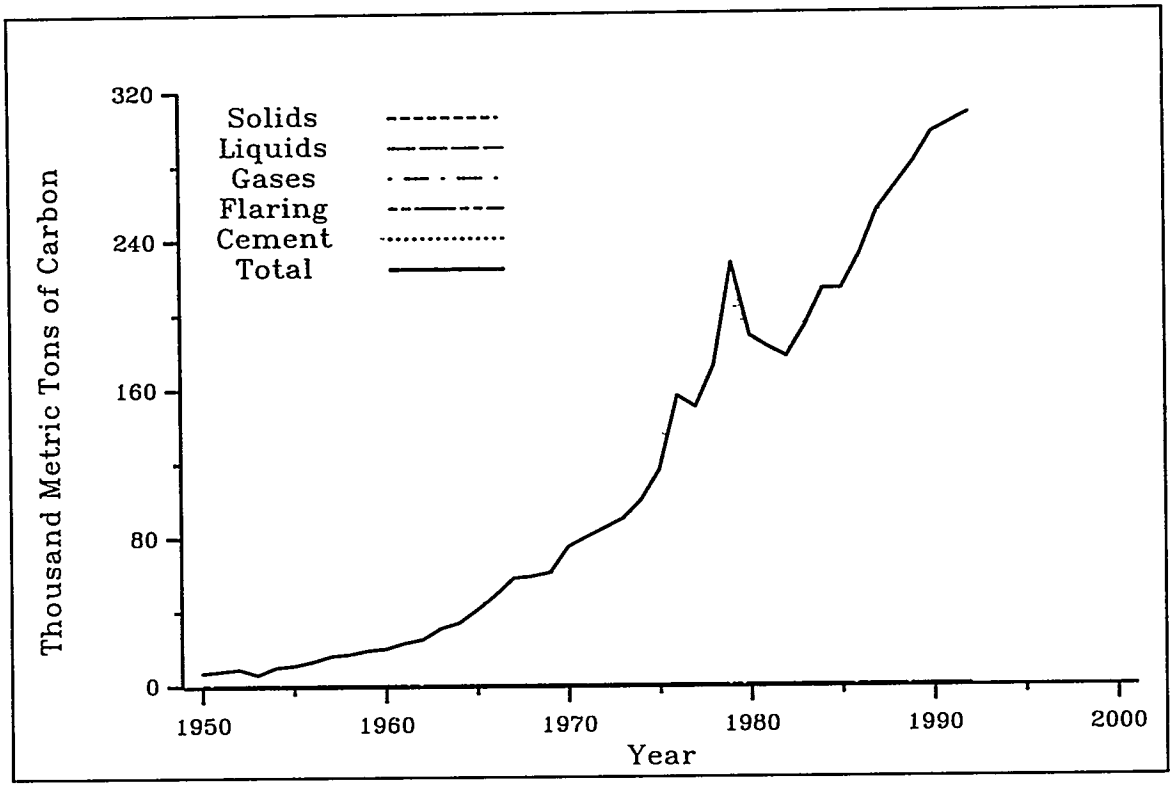


Per capita CO_2 emission rates for Qatar

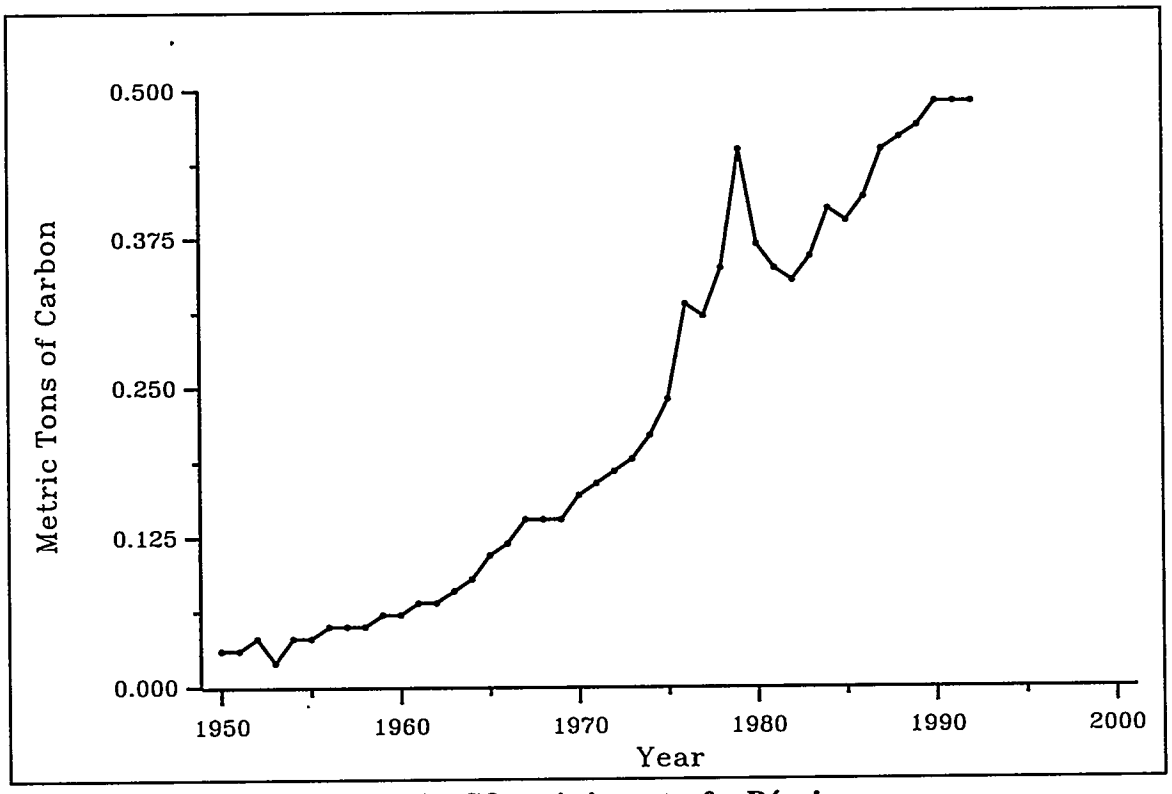
Qatar

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	96	0	96	0	0	0	3.85	.
1951	106	0	106	0	0	0	3.80	.
1952	53	0	53	0	0	0	1.76	.
1953	100	0	100	0	0	0	3.11	.
1954	166	0	166	0	0	0	4.88	.
1955	114	0	114	0	0	0	3.25	.
1956	138	0	138	0	0	0	3.84	.
1957	85	0	85	0	0	0	2.23	.
1958	46	0	46	0	0	0	1.15	.
1959	50	0	50	0	0	0	1.20	.
1960	48	0	48	0	0	0	1.06	.
1961	44	0	44	0	0	0	0.91	.
1962	52	0	52	0	0	0	0.98	.
1963	1674	0	53	46	0	1575	28.86	.
1964	1711	0	42	41	0	1628	26.73	.
1965	1716	0	46	42	0	1628	24.51	.
1966	1712	0	42	43	0	1628	22.24	.
1967	1824	0	59	59	0	1706	21.71	.
1968	1931	0	66	269	0	1597	20.99	.
1969	1956	0	83	445	7	1421	19.37	.
1970	2063	0	82	525	35	1422	18.59	.
1971	2495	0	92	527	35	1842	20.45	.
1972	2941	0	104	578	14	2245	21.78	.
1973	3399	0	126	828	14	2432	23.12	.
1974	2859	0	140	681	17	2022	17.87	.
1975	2988	0	114	1157	22	1695	17.47	.
1976	2832	0	327	773	23	1708	15.65	.
1977	2707	0	434	842	23	1409	14.25	.
1978	2872	0	409	773	28	1661	14.36	.
1979	3916	0	383	2285	32	1215	18.47	.
1980	3518	0	383	2357	28	748	15.36	.
1981	3451	0	551	2605	35	260	13.70	.
1982	3313	0	614	2416	31	253	11.92	.
1983	3011	0	652	2262	51	46	9.81	.
1984	3293	0	616	2139	65	473	9.86	.
1985	3319	0	561	2350	43	365	9.27	.
1986	3563	0	580	2941	42	0	9.45	.
1987	3081	0	564	2476	41	0	7.86	.
1988	3194	0	555	2598	41	0	7.91	.
1989	3815	0	630	3145	41	0	9.19	.
1990	3683	0	726	2921	36	0	8.62	.
1991	4615	0	620	3924	72	0	10.49	.
1992	7652	0	1559	6019	74	0	16.89	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Réunion

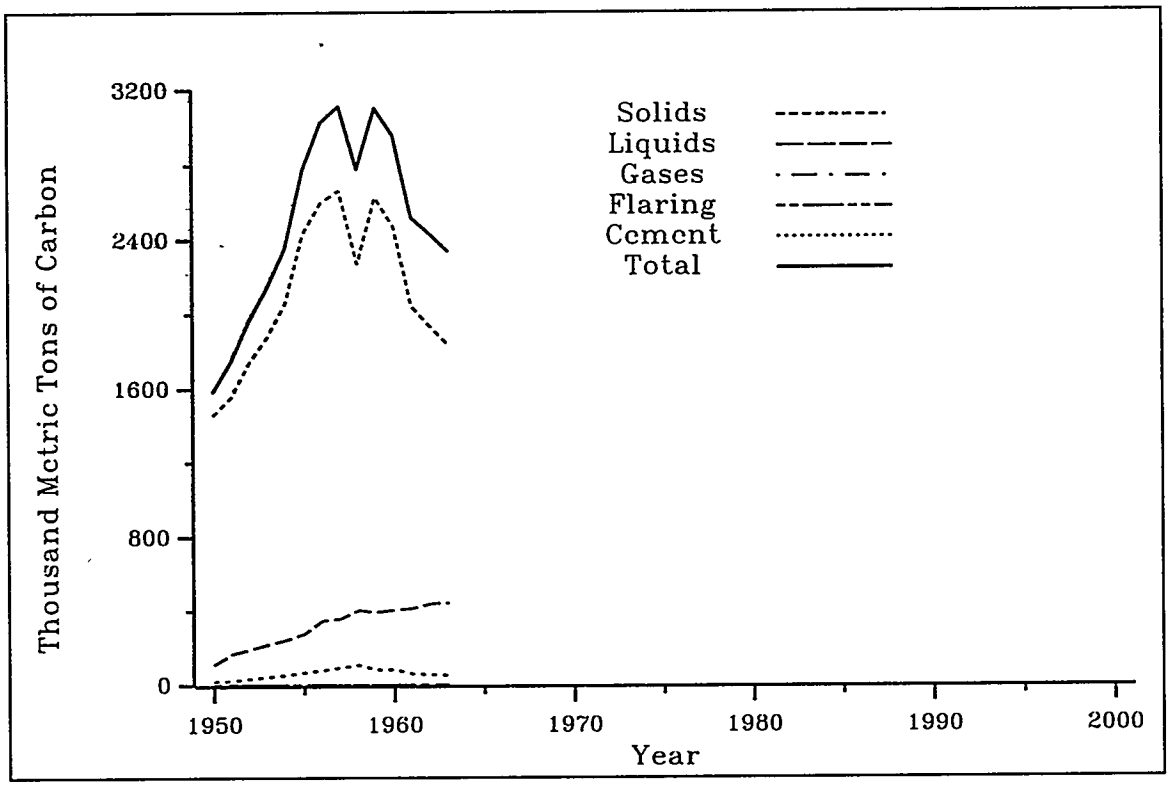


Per capita CO_2 emission rates for Réunion

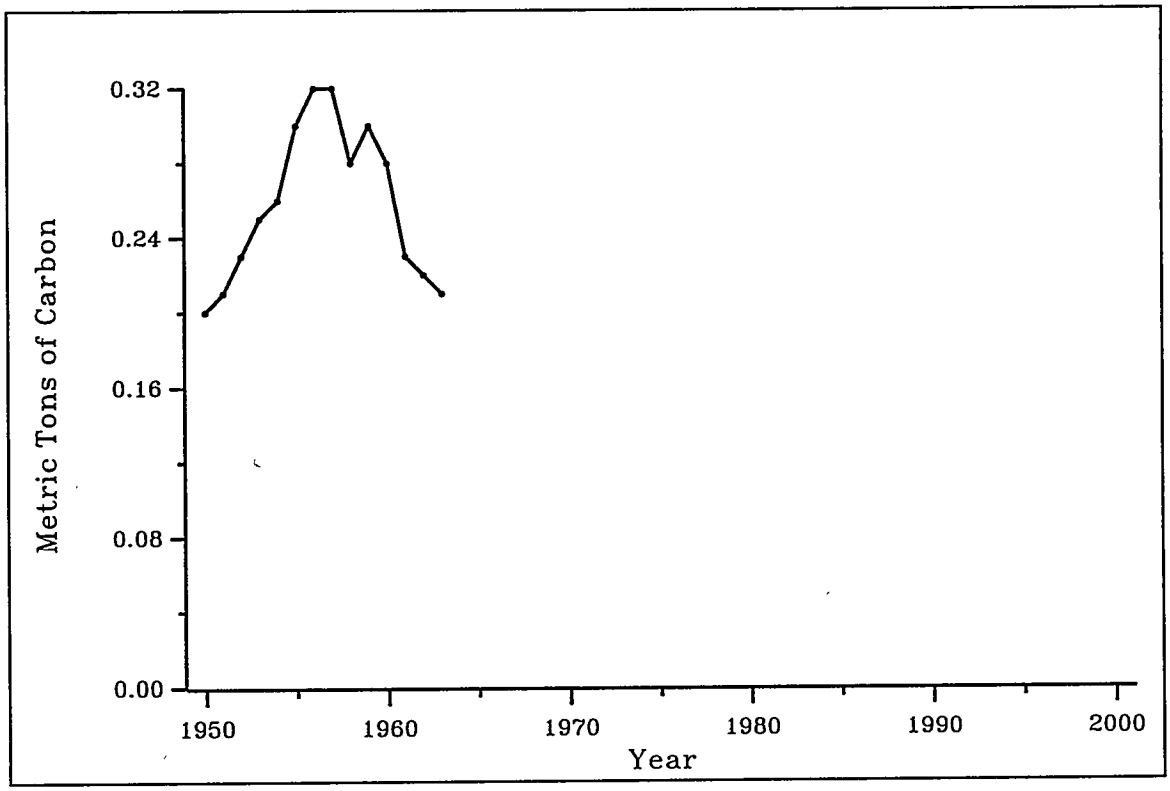
Réunion

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	7	0	7	0	0	0	0.03	.
1951	8	0	8	0	0	0	0.03	.
1952	9	0	9	0	0	0	0.04	.
1953	6	0	6	0	0	0	0.02	.
1954	10	0	10	0	0	0	0.04	.
1955	11	0	11	0	0	0	0.04	.
1956	13	0	13	0	0	0	0.05	.
1957	16	0	16	0	0	0	0.05	.
1958	17	0	17	0	0	0	0.05	.
1959	19	0	19	0	0	0	0.06	.
1960	20	0	20	0	0	0	0.06	.
1961	23	0	23	0	0	0	0.07	.
1962	25	0	25	0	0	0	0.07	.
1963	31	0	31	0	0	0	0.08	.
1964	34	0	34	0	0	0	0.09	.
1965	41	0	41	0	0	0	0.11	.
1966	49	0	49	0	0	0	0.12	.
1967	58	0	58	0	0	0	0.14	.
1968	59	0	59	0	0	0	0.14	.
1969	61	0	61	0	0	0	0.14	.
1970	75	0	75	0	0	0	0.16	.
1971	80	0	80	0	0	0	0.17	.
1972	85	0	85	0	0	0	0.18	.
1973	90	0	90	0	0	0	0.19	.
1974	100	0	100	0	0	0	0.21	.
1975	116	0	116	0	0	0	0.24	.
1976	156	0	156	0	0	0	0.32	.
1977	150	0	150	0	0	0	0.31	.
1978	172	0	172	0	0	0	0.35	.
1979	227	0	227	0	0	0	0.45	.
1980	188	0	188	0	0	0	0.37	.
1981	182	0	182	0	0	0	0.35	.
1982	177	0	177	0	0	0	0.34	.
1983	193	0	193	0	0	0	0.36	.
1984	213	0	213	0	0	0	0.40	.
1985	213	0	213	0	0	0	0.39	.
1986	231	0	231	0	0	0	0.41	.
1987	255	0	255	0	0	0	0.45	.
1988	268	0	268	0	0	0	0.46	.
1989	281	0	281	0	0	0	0.47	.
1990	297	0	297	0	0	0	0.49	.
1991	302	0	302	0	0	0	0.49	.
1992	307	0	307	0	0	0	0.49	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Rhodesia-Nyasaland

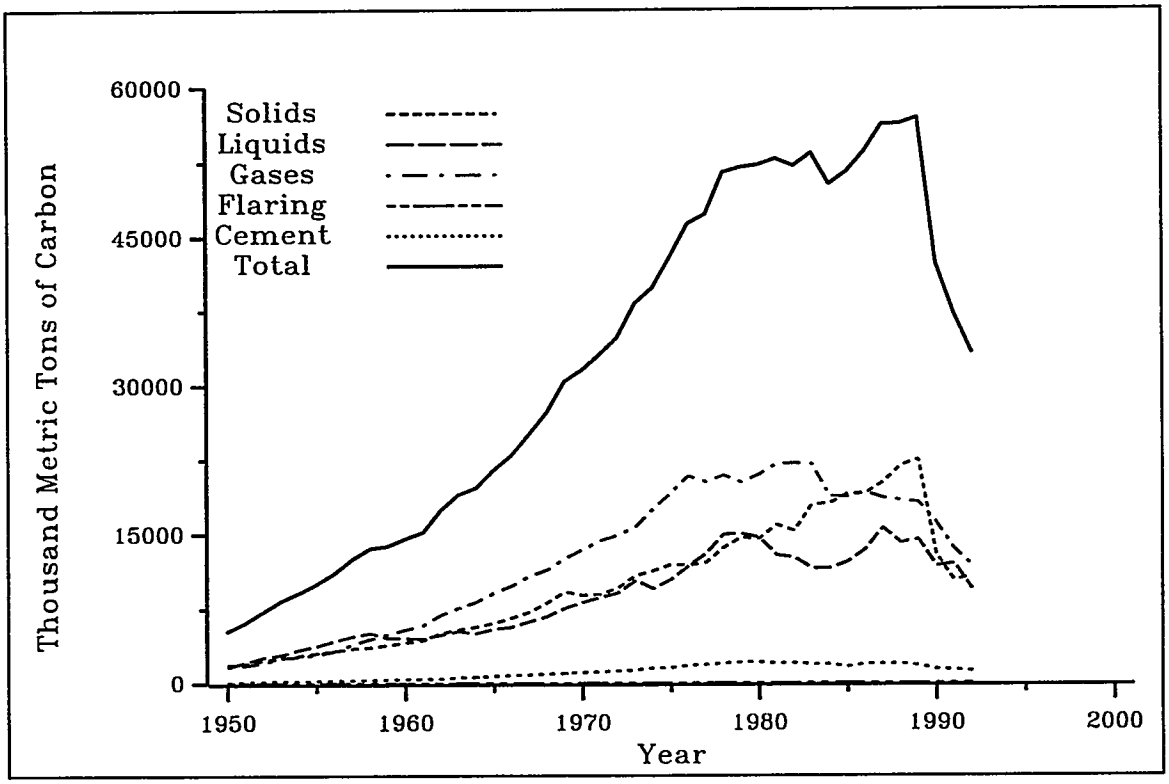


Per capita CO_2 emission rates for Rhodesia-Nyasaland

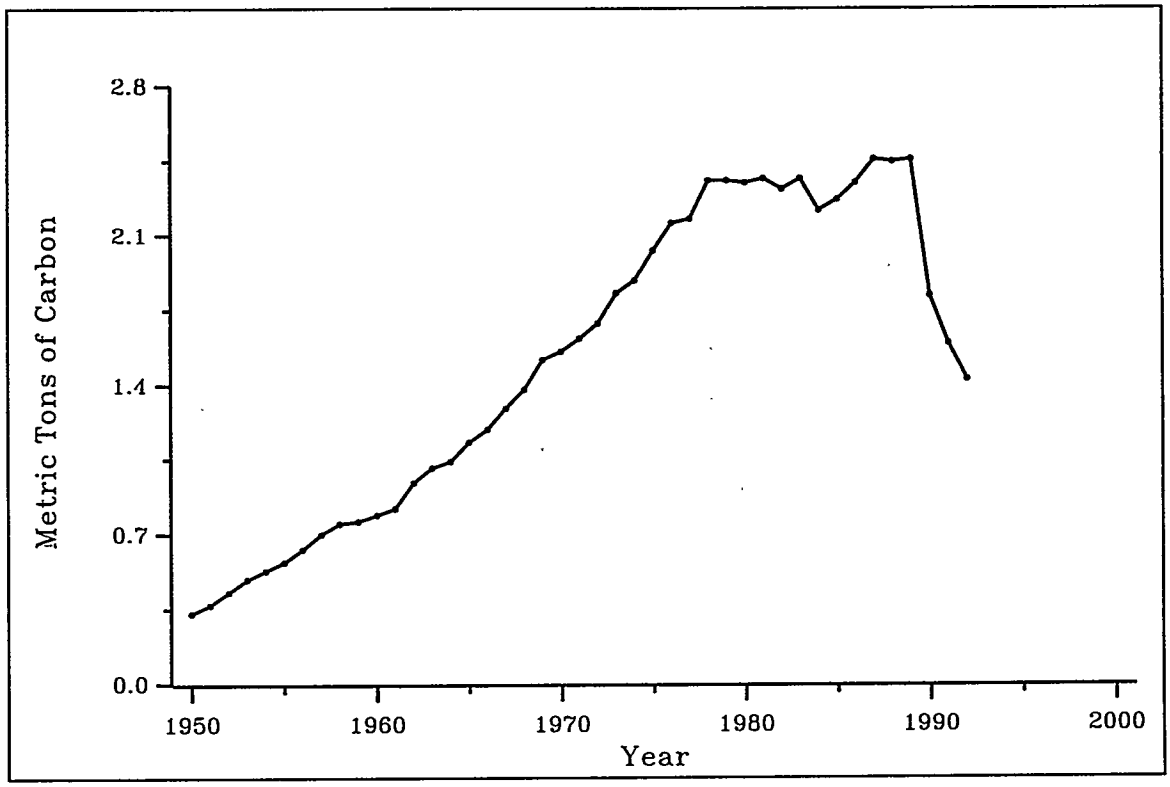
Rhodesia-Nyasaland

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1585	1456	110	0	20	0	0.20	.
1951	1747	1555	169	0	23	0	0.21	.
1952	1965	1739	193	0	34	0	0.23	.
1953	2142	1878	220	0	44	0	0.25	.
1954	2355	2057	244	0	54	0	0.26	.
1955	2777	2433	277	0	67	0	0.30	.
1956	3027	2600	348	0	79	0	0.32	.
1957	3116	2666	358	0	93	0	0.32	.
1958	2782	2270	404	0	108	0	0.28	.
1959	3104	2629	394	0	81	0	0.30	.
1960	2960	2472	406	0	82	0	0.28	.
1961	2519	2043	416	0	60	0	0.23	.
1962	2433	1938	440	0	55	0	0.22	.
1963	2339	1840	445	0	53	0	0.21	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Romania

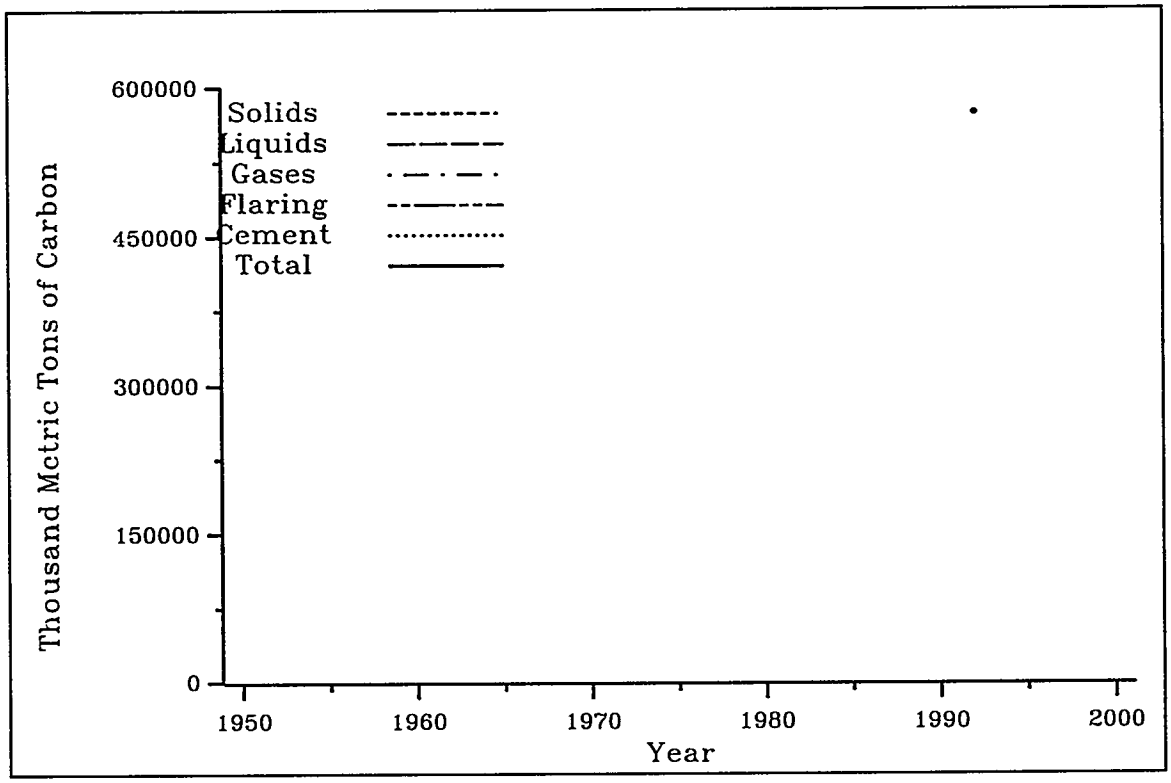


Per capita CO_2 emission rates for Romania

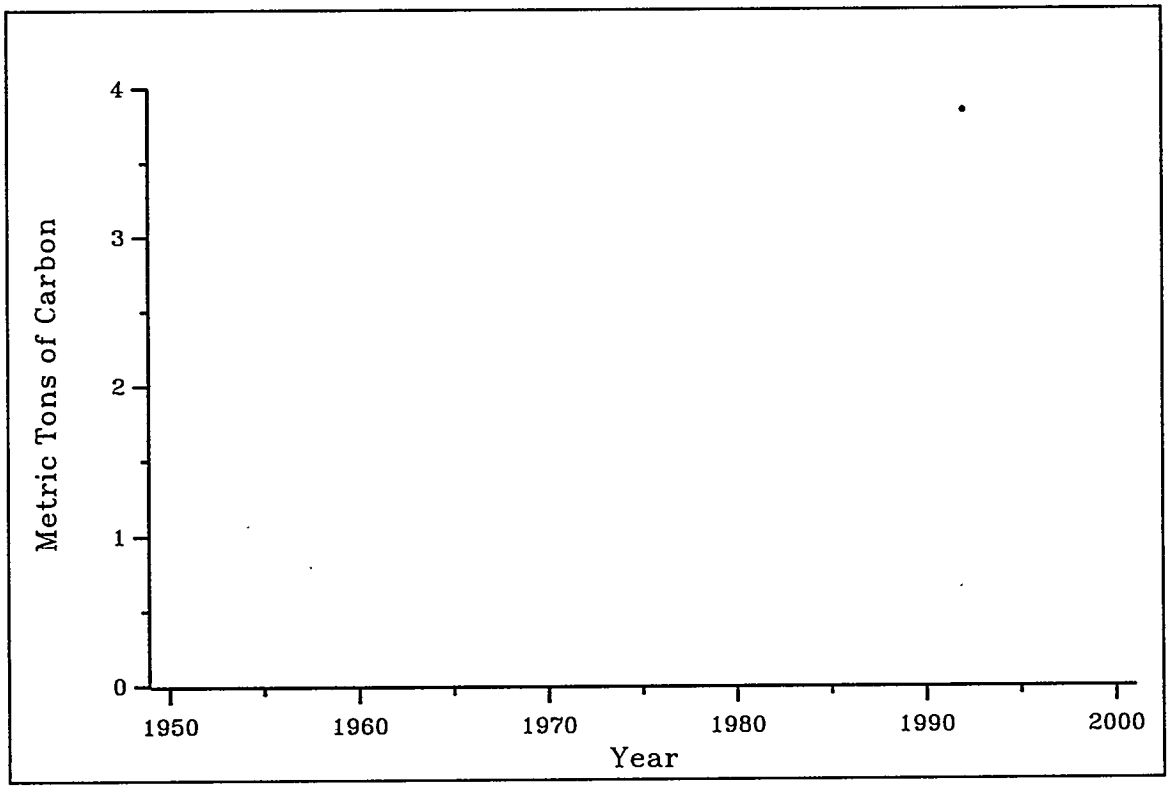
Romania

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	5309	1842	1684	1695	88	0	0.33	.
1951	6150	2032	2133	1829	155	0	0.37	.
1952	7275	2351	2630	2091	204	0	0.43	.
1953	8365	2589	2905	2613	258	0	0.49	.
1954	9151	2830	3400	2703	218	0	0.53	.
1955	10046	3063	3785	2935	263	0	0.57	.
1956	11135	3277	4302	3270	285	0	0.63	.
1957	12539	3532	4749	3938	320	0	0.70	.
1958	13594	3658	5082	4504	350	0	0.75	.
1959	13828	3876	4607	4958	388	0	0.76	.
1960	14585	4154	4556	5459	415	0	0.79	.
1961	15219	4364	4527	5878	450	0	0.82	.
1962	17432	5093	4931	6934	475	0	0.94	.
1963	18974	5458	5285	7638	594	0	1.01	.
1964	19675	5728	5070	8231	646	0	1.04	.
1965	21472	6087	5510	9140	735	0	1.13	.
1966	22955	6619	5707	9830	801	0	1.19	.
1967	25117	7209	6243	10804	862	0	1.29	.
1968	27305	8142	6768	11439	956	0	1.38	.
1969	30422	9235	7606	12560	1022	0	1.52	.
1970	31614	8886	8182	13440	1105	0	1.56	.
1971	33160	8966	8681	14353	1159	0	1.62	.
1972	34868	9613	9116	14886	1253	0	1.69	.
1973	38271	10847	10377	15708	1339	0	1.83	.
1974	39877	11333	9541	17481	1523	0	1.89	.
1975	43042	11946	10437	19092	1567	0	2.03	.
1976	46321	11910	11801	20830	1780	0	2.16	.
1977	47302	12146	13044	20225	1887	0	2.18	.
1978	51498	13637	14962	20901	1998	0	2.36	.
1979	52001	14659	15029	20192	2121	0	2.36	.
1980	52241	14497	14653	20968	2123	0	2.35	.
1981	52844	15911	12891	22036	2006	0	2.37	.
1982	52127	15305	12653	22129	2039	0	2.32	.
1983	53402	17934	11549	22019	1900	0	2.37	.
1984	50294	18048	11580	18759	1906	0	2.22	.
1985	51537	18978	12187	18707	1664	0	2.27	.
1986	53578	19027	13430	19187	1933	0	2.35	.
1987	56294	20145	15606	18599	1944	0	2.46	.
1988	56333	21880	14121	18367	1965	0	2.45	.
1989	56929	22508	14444	18172	1804	0	2.46	.
1990	42320	12934	11819	16154	1412	0	1.82	.
1991	37257	10353	12049	13498	1357	0	1.60	.
1992	33325	10765	9481	11846	1234	0	1.43	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Russia

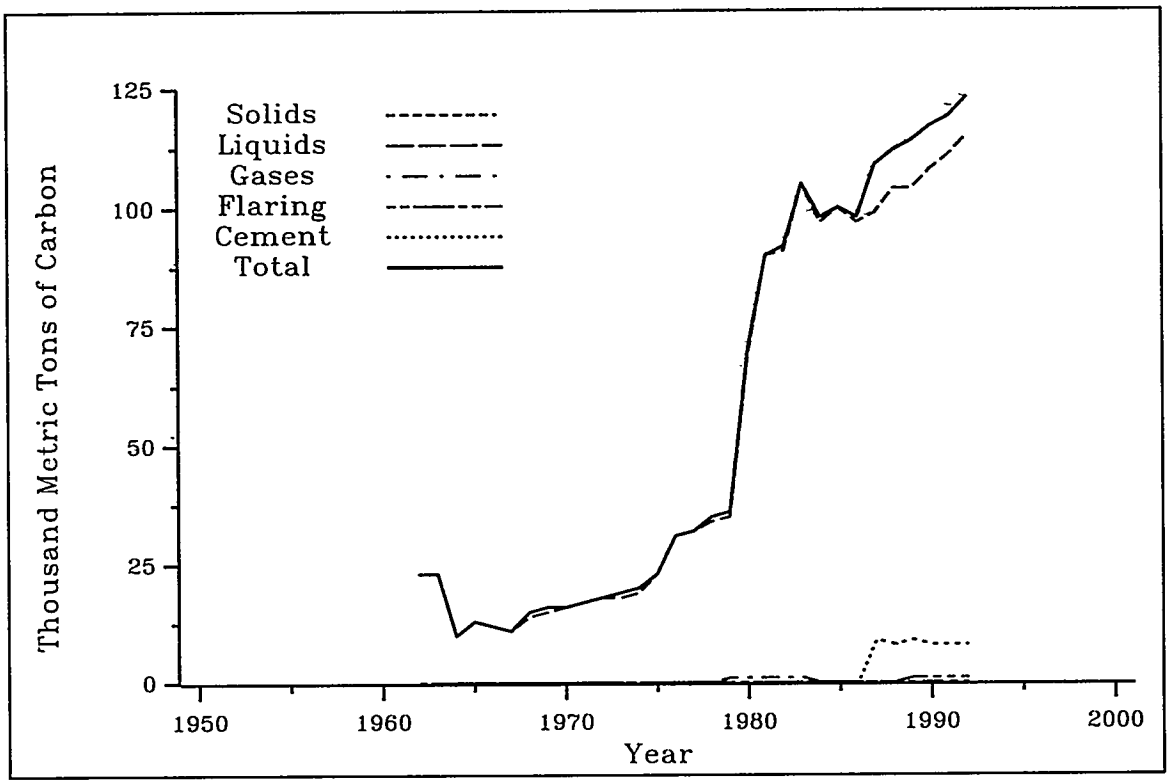


Per capita CO_2 emission rates for Russia

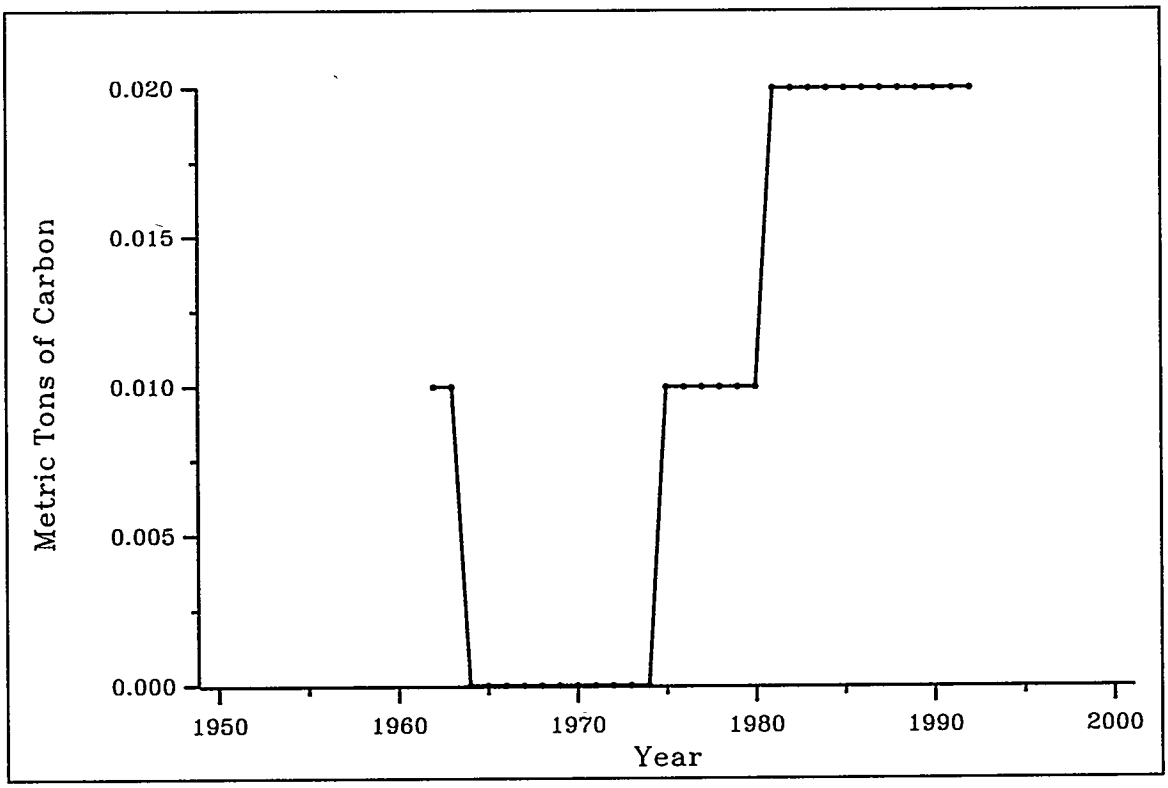
Russia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	573999	165694	186463	206791	9253	5798	3.85	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country.where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Rwanda

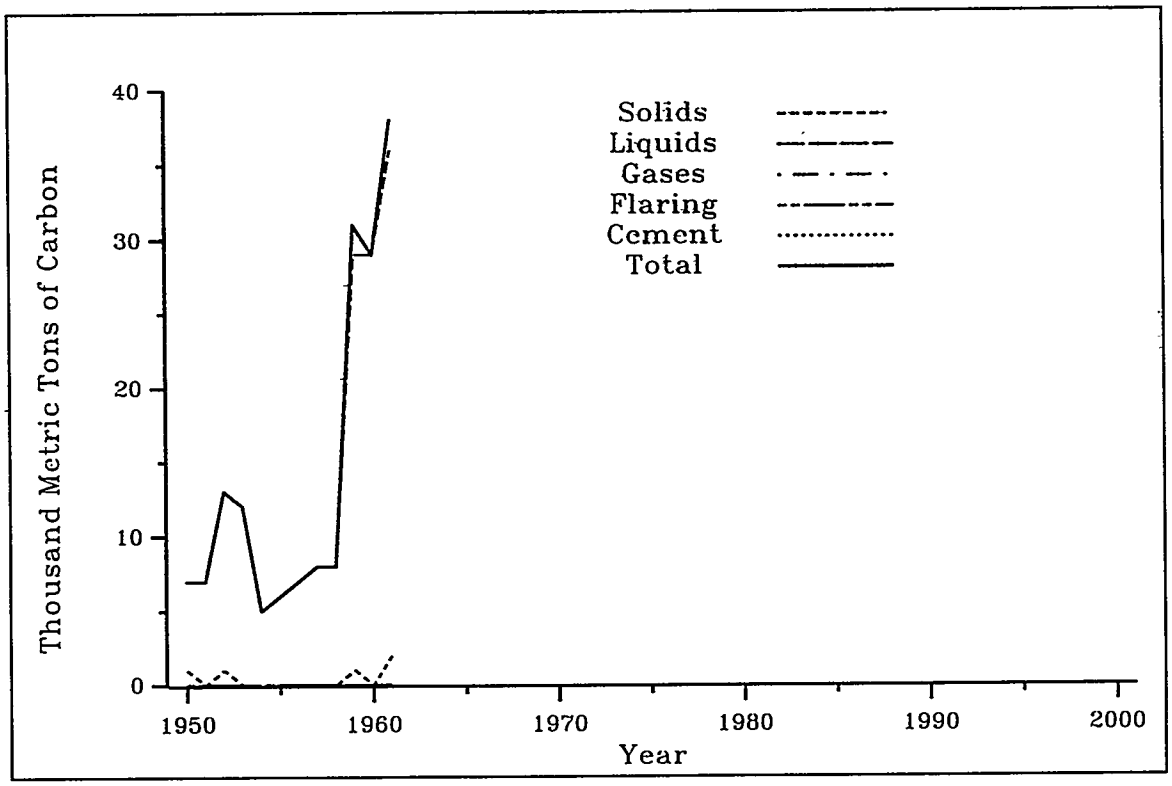


Per capita CO_2 emission rates for Rwanda

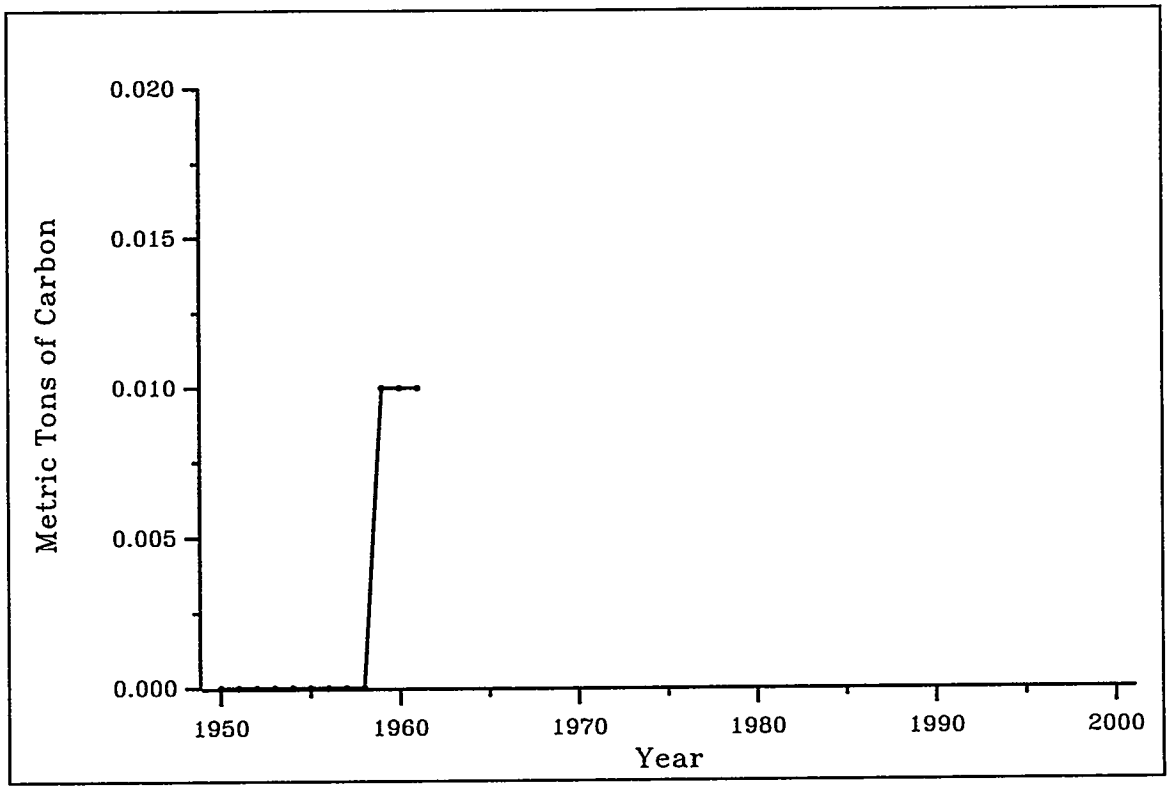
Rwanda

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1962	23	0	23	0	0	0	0.01	.
1963	23	0	23	0	0	0	0.01	.
1964	10	0	10	0	0	0	0.00	.
1965	13	0	13	0	0	0	0.00	.
1966	12	0	12	0	0	0	0.00	.
1967	11	0	11	0	0	0	0.00	.
1968	15	0	14	0	0	0	0.00	.
1969	16	0	15	0	0	0	0.00	.
1970	16	0	16	0	0	0	0.00	.
1971	17	0	17	0	0	0	0.00	.
1972	18	0	18	0	0	0	0.00	.
1973	19	0	18	0	0	0	0.00	.
1974	20	0	19	0	0	0	0.00	.
1975	23	0	23	0	0	0	0.01	.
1976	31	0	31	0	0	0	0.01	.
1977	32	0	32	0	0	0	0.01	.
1978	35	0	34	0	0	0	0.01	.
1979	36	0	35	1	0	0	0.01	.
1980	70	0	69	1	0	0	0.01	.
1981	90	0	90	1	0	0	0.02	.
1982	92	0	91	1	0	0	0.02	.
1983	105	0	105	1	0	0	0.02	.
1984	98	0	97	0	0	0	0.02	.
1985	100	0	100	0	0	0	0.02	.
1986	98	0	97	0	0	0	0.02	.
1987	109	0	99	0	9	0	0.02	.
1988	112	0	104	0	8	0	0.02	.
1989	114	0	104	0	9	1	0.02	.
1990	117	0	108	0	8	1	0.02	.
1991	119	0	111	0	8	1	0.02	.
1992	123	0	115	0	8	1	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Rwanda-Urundi

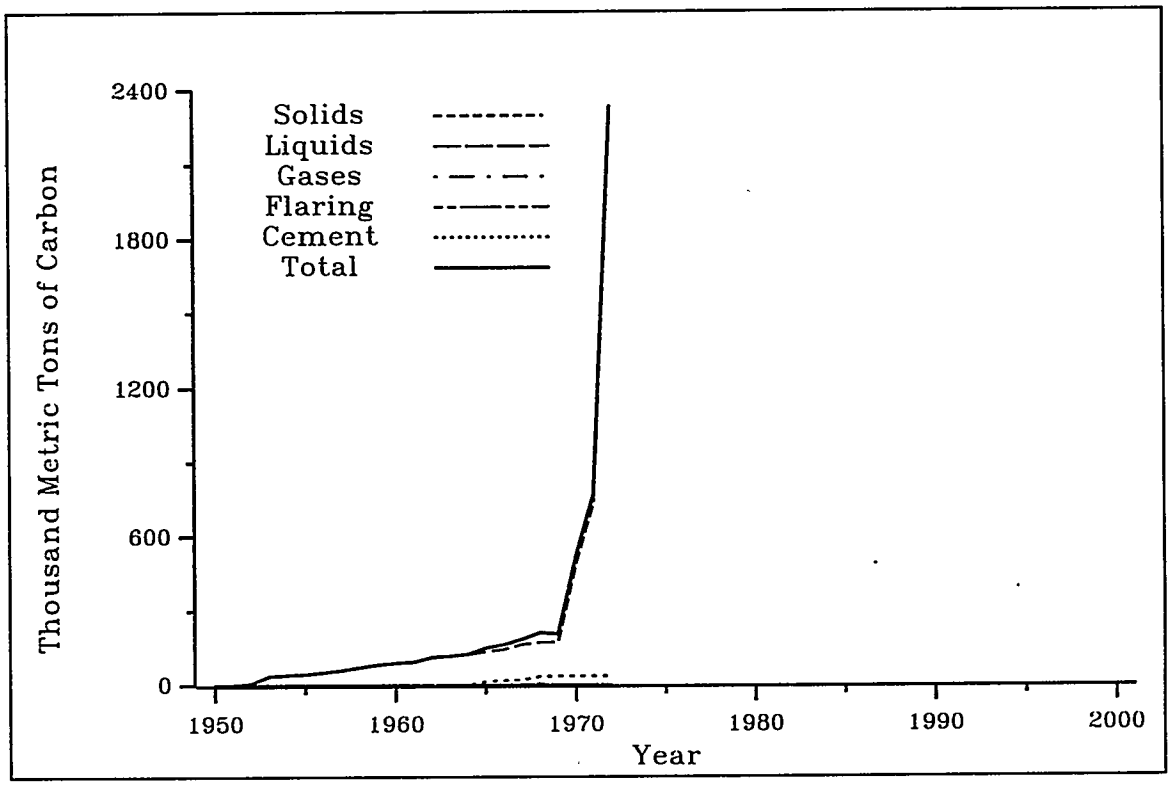


Per capita CO_2 emission rates for Rwanda-Urundi

Rwanda-Urundi

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	7	1	7	0	0	0	0.00	.
1951	7	0	7	0	0	0	0.00	.
1952	13	1	13	0	0	0	0.00	.
1953	12	0	12	0	0	0	0.00	.
1954	5	0	5	0	0	0	0.00	.
1955	6	0	6	0	0	0	0.00	.
1956	7	0	7	0	0	0	0.00	.
1957	8	0	8	0	0	0	0.00	.
1958	8	0	8	0	0	0	0.00	.
1959	31	1	29	0	0	0	0.01	.
1960	29	0	29	0	0	0	0.01	.
1961	38	2	36	0	0	0	0.01	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.

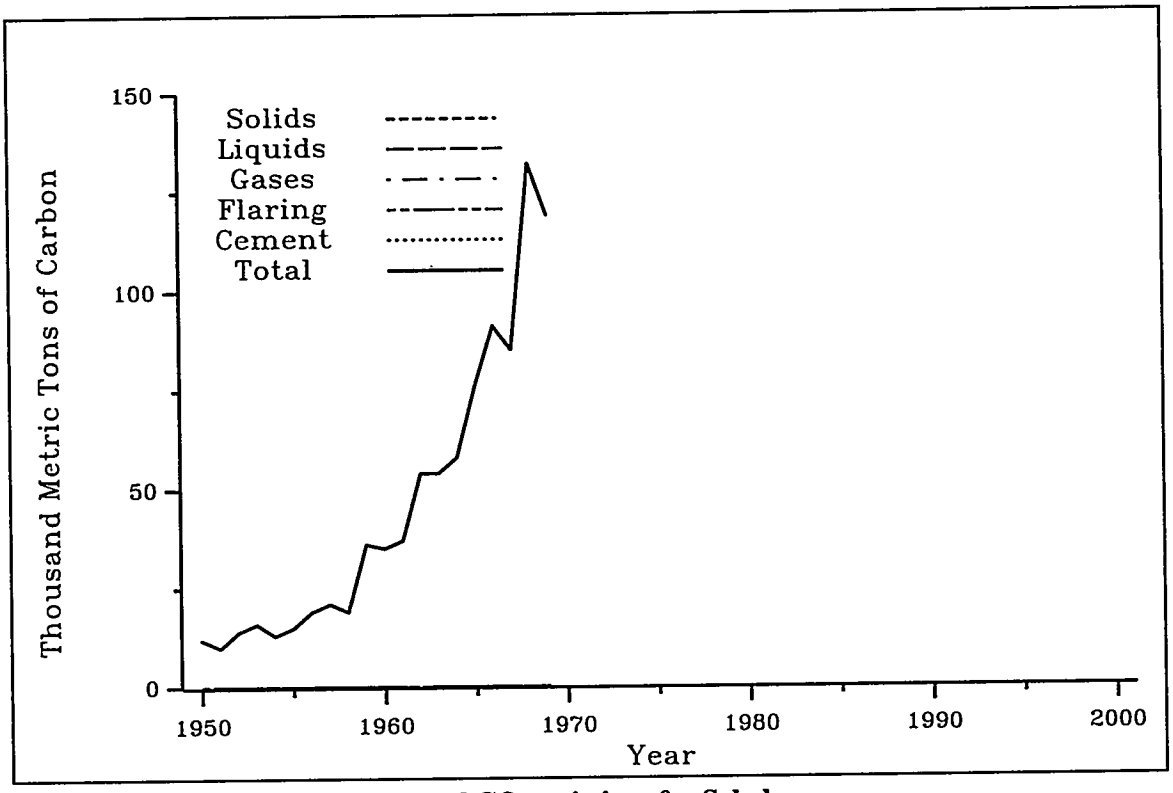


Total CO_2 emissions for the Ryukyu Islands

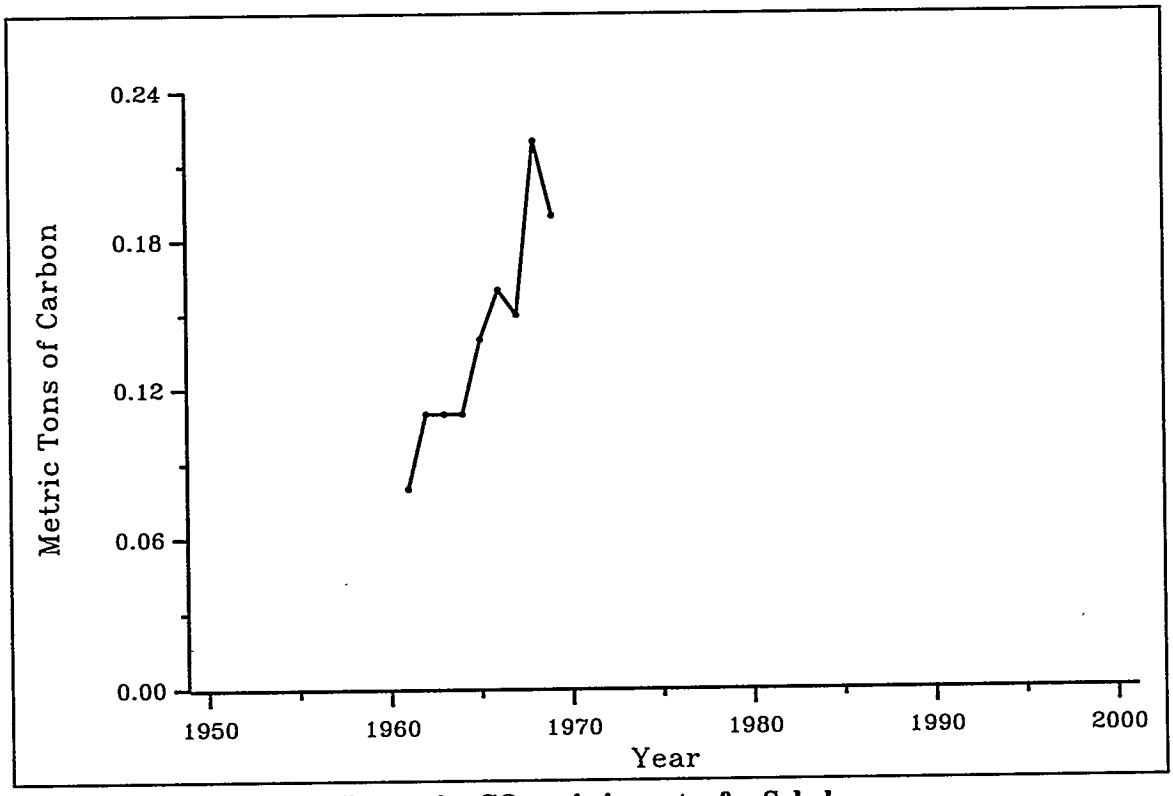
Ryukyu Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	.	.
1951	0	0	0	0	0	0	.	.
1952	6	0	6	0	0	0	.	.
1953	36	0	36	0	0	0	.	.
1954	40	0	40	0	0	0	.	.
1955	44	0	44	0	0	0	.	.
1956	51	0	51	0	0	0	.	.
1957	60	1	59	0	0	0	.	.
1958	71	1	70	0	0	0	.	.
1959	82	1	81	0	0	0	.	.
1960	90	1	90	0	0	0	.	.
1961	94	0	94	0	0	0	.	.
1962	113	1	111	0	0	0	.	.
1963	117	1	116	0	0	0	.	.
1964	125	1	124	0	0	0	.	.
1965	150	0	136	0	14	0	.	.
1966	163	1	145	0	17	0	.	.
1967	185	1	164	0	20	0	.	.
1968	212	5	172	0	34	0	.	.
1969	207	0	172	0	35	0	.	.
1970	519	1	484	0	35	0	.	.
1971	766	1	731	0	35	0	.	.
1972	2332	0	2297	0	35	0	.	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Sabah

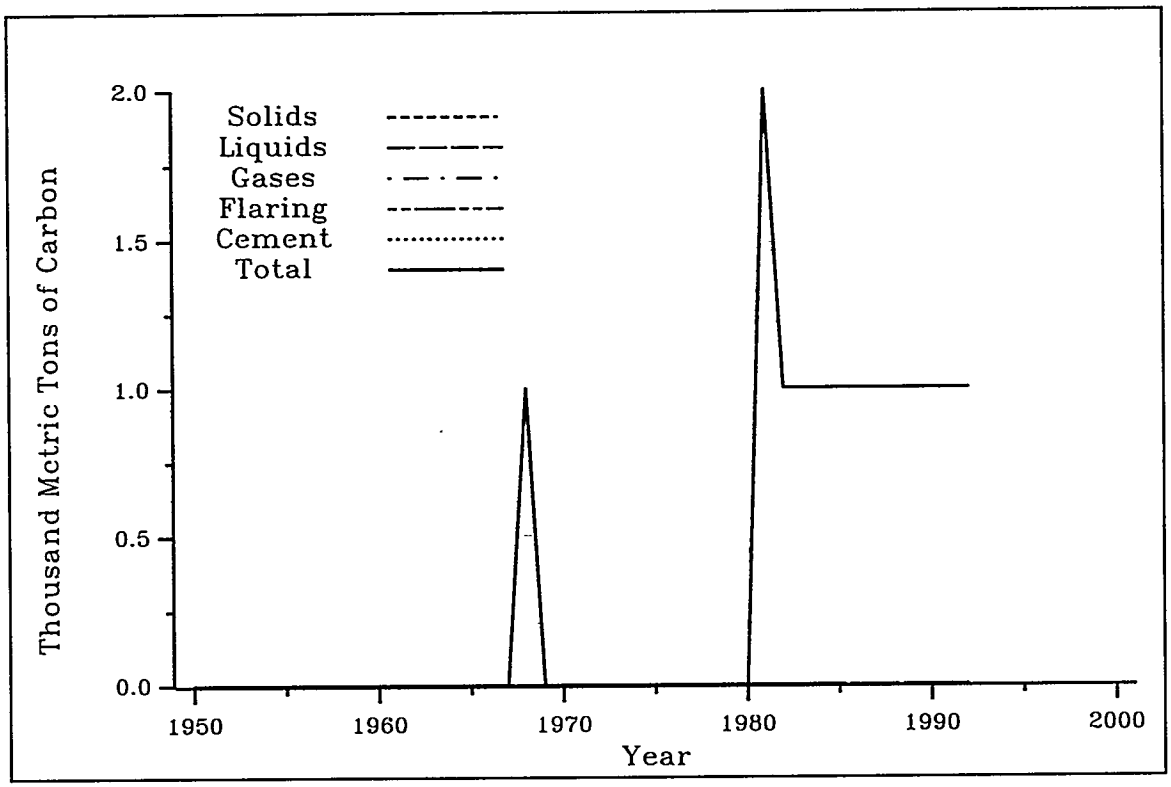


Per capita CO_2 emission rates for Sabah

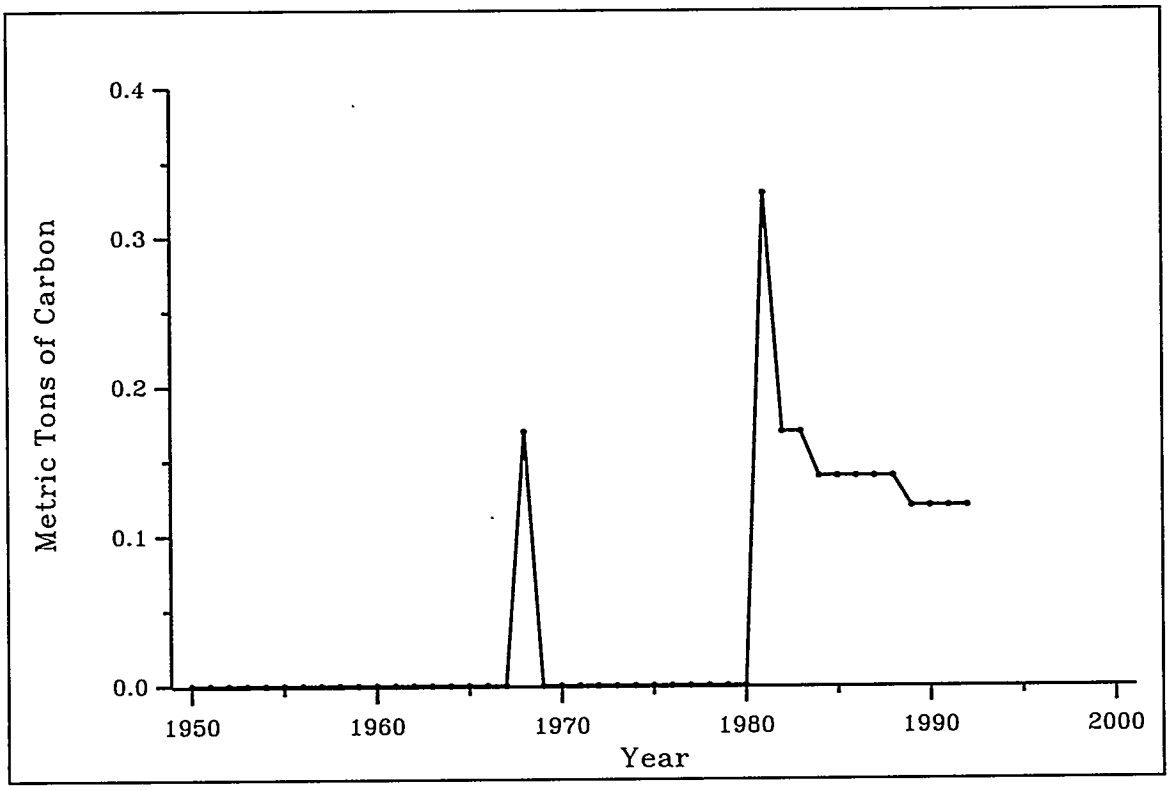
Sabah

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	12	0	12	0	0	0	.	.
1951	10	0	10	0	0	0	.	.
1952	14	0	14	0	0	0	.	.
1953	16	0	16	0	0	0	.	.
1954	13	0	13	0	0	0	.	.
1955	15	0	15	0	0	0	.	.
1956	19	0	19	0	0	0	.	.
1957	21	0	21	0	0	0	.	.
1958	19	0	19	0	0	0	.	.
1959	36	0	36	0	0	0	.	.
1960	35	0	35	0	0	0	.	.
1961	37	0	37	0	0	0	0.08	.
1962	54	0	54	0	0	0	0.11	.
1963	54	0	54	0	0	0	0.11	.
1964	58	0	58	0	0	0	0.11	.
1965	76	0	76	0	0	0	0.14	.
1966	91	0	91	0	0	0	0.16	.
1967	85	0	85	0	0	0	0.15	.
1968	132	0	132	0	0	0	0.22	.
1969	119	0	119	0	0	0	0.19	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Saint Helena

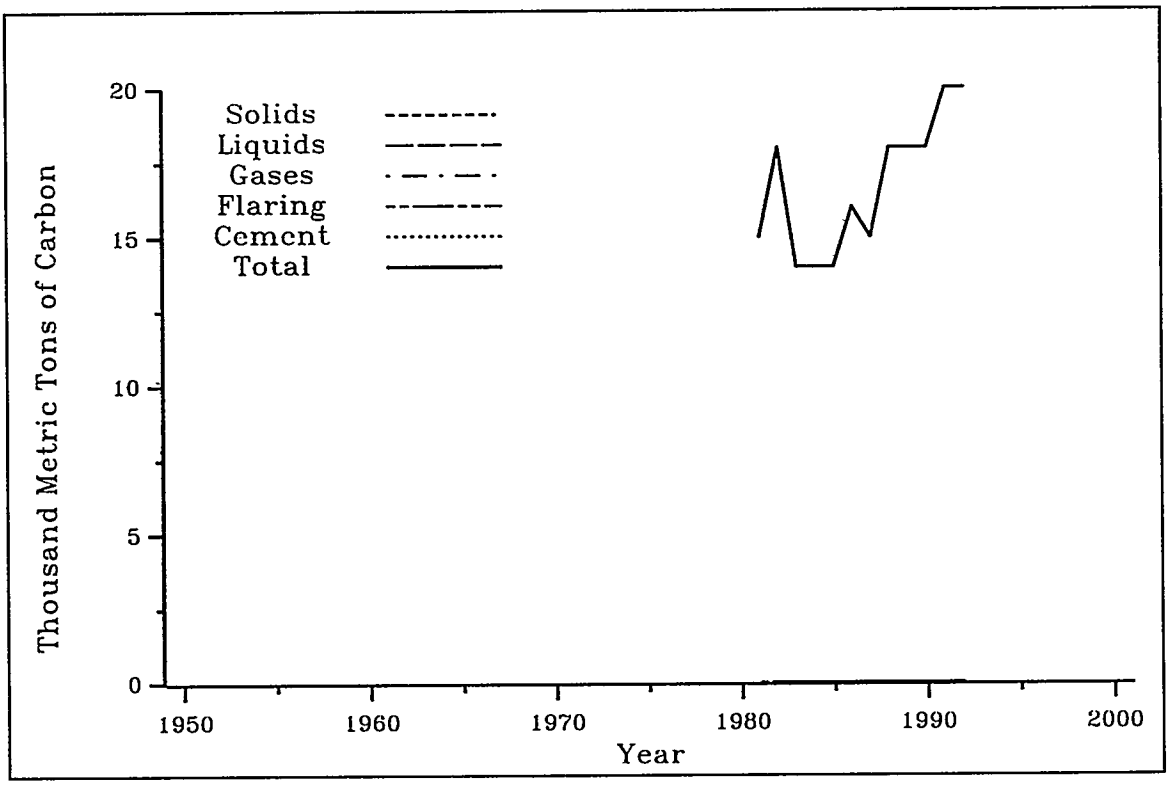


Per capita CO_2 emission rates for Saint Helena

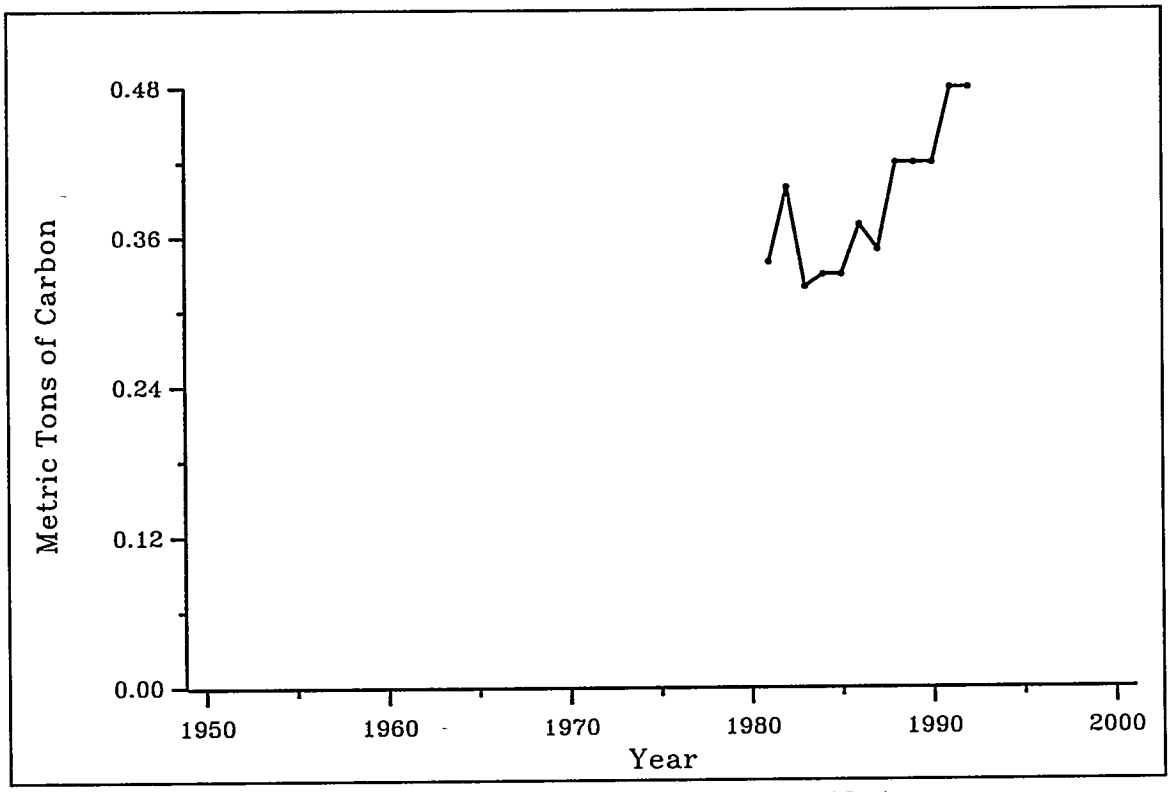
Saint Helena

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	0	0	0	0	0	0	0.00	.
1953	0	0	0	0	0	0	0.00	.
1954	0	0	0	0	0	0	0.00	.
1955	0	0	0	0	0	0	0.00	.
1956	0	0	0	0	0	0	0.00	.
1957	0	0	0	0	0	0	0.00	.
1958	0	0	0	0	0	0	0.00	.
1959	0	0	0	0	0	0	0.00	.
1960	0	0	0	0	0	0	0.00	.
1961	0	0	0	0	0	0	0.00	.
1962	0	0	0	0	0	0	0.00	.
1963	0	0	0	0	0	0	0.00	.
1964	0	0	0	0	0	0	0.00	.
1965	0	0	0	0	0	0	0.00	.
1966	0	0	0	0	0	0	0.00	.
1967	0	0	0	0	0	0	0.00	.
1968	1	0	1	0	0	0	0.17	.
1969	0	0	0	0	0	0	0.00	.
1970	0	0	0	0	0	0	0.00	.
1971	0	0	0	0	0	0	0.00	.
1972	0	0	0	0	0	0	0.00	.
1973	0	0	0	0	0	0	0.00	.
1974	0	0	0	0	0	0	0.00	.
1975	0	0	0	0	0	0	0.00	.
1976	0	0	0	0	0	0	0.00	.
1977	0	0	0	0	0	0	0.00	.
1978	0	0	0	0	0	0	0.00	.
1979	0	0	0	0	0	0	0.00	.
1980	0	0	0	0	0	0	0.00	.
1981	2	0	2	0	0	0	0.33	.
1982	1	0	1	0	0	0	0.17	.
1983	1	0	1	0	0	0	0.17	.
1984	1	0	1	0	0	0	0.14	.
1985	1	0	1	0	0	0	0.14	.
1986	1	0	1	0	0	0	0.14	.
1987	1	0	1	0	0	0	0.14	.
1988	1	0	1	0	0	0	0.14	.
1989	1	0	1	0	0	0	0.12	.
1990	1	0	1	0	0	0	0.12	.
1991	1	0	1	0	0	0	0.12	.
1992	1	0	1	0	0	0	0.12	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Saint Kitts-Nevis

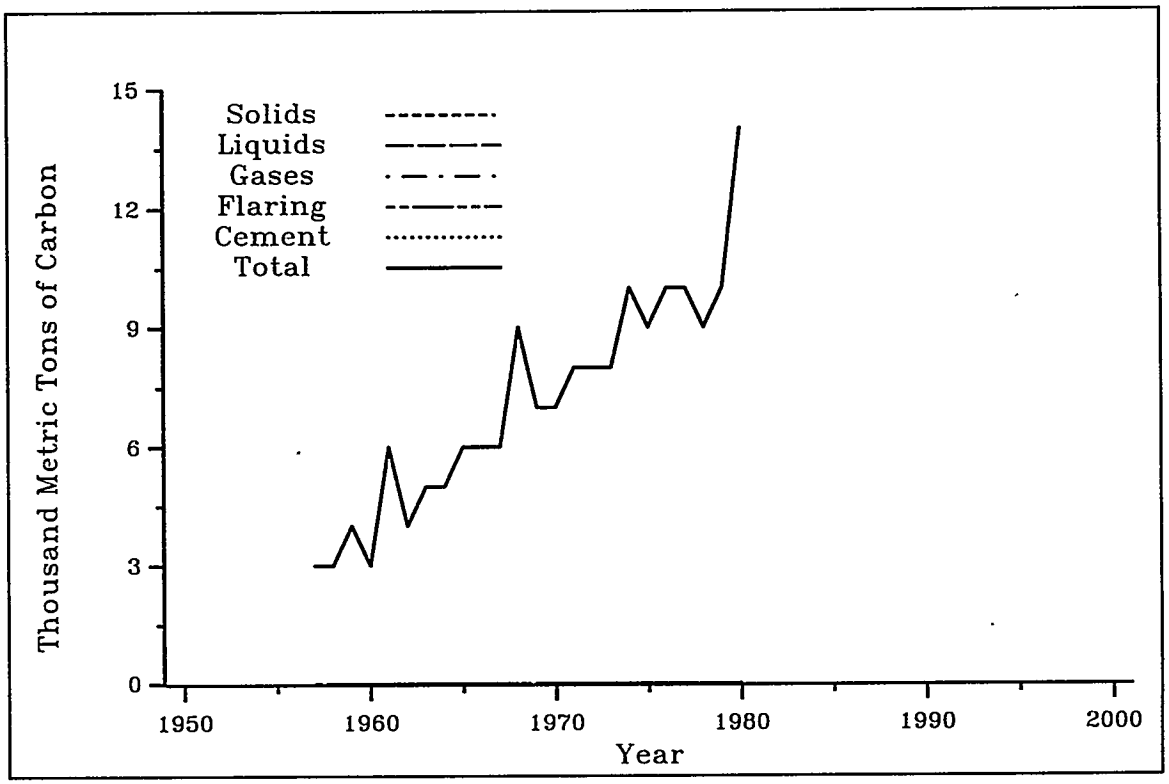


Per capita CO_2 emission rates for Saint Kitts-Nevis

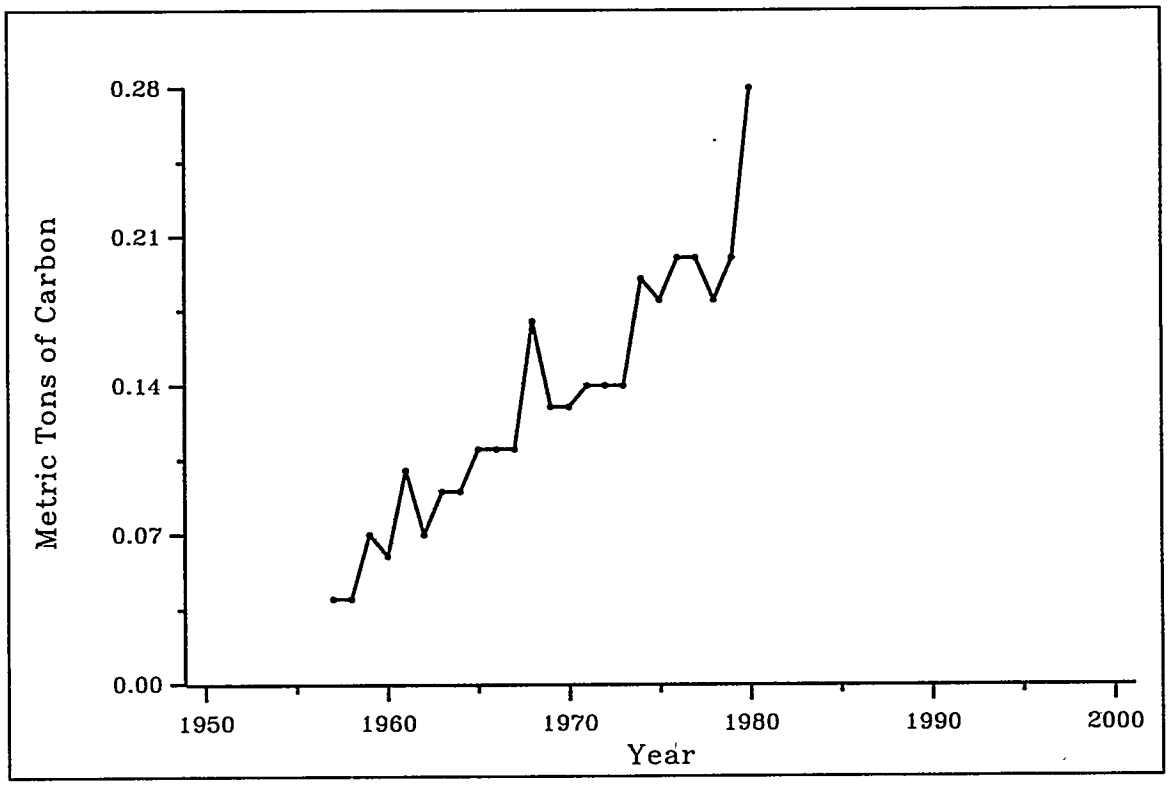
Saint Kitts-Nevis

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1981	15	0	15	0	0	0	0.34	.
1982	18	0	18	0	0	0	0.40	.
1983	14	0	14	0	0	0	0.32	.
1984	14	0	14	0	0	0	0.33	.
1985	14	0	14	0	0	0	0.33	.
1986	16	0	16	0	0	0	0.37	.
1987	15	0	15	0	0	0	0.35	.
1988	18	0	18	0	0	0	0.42	.
1989	18	0	18	0	0	0	0.42	.
1990	18	0	18	0	0	0	0.42	.
1991	20	0	20	0	0	0	0.48	.
1992	20	0	20	0	0	0	0.48	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Saint Kitts-Nevis-Anguilla

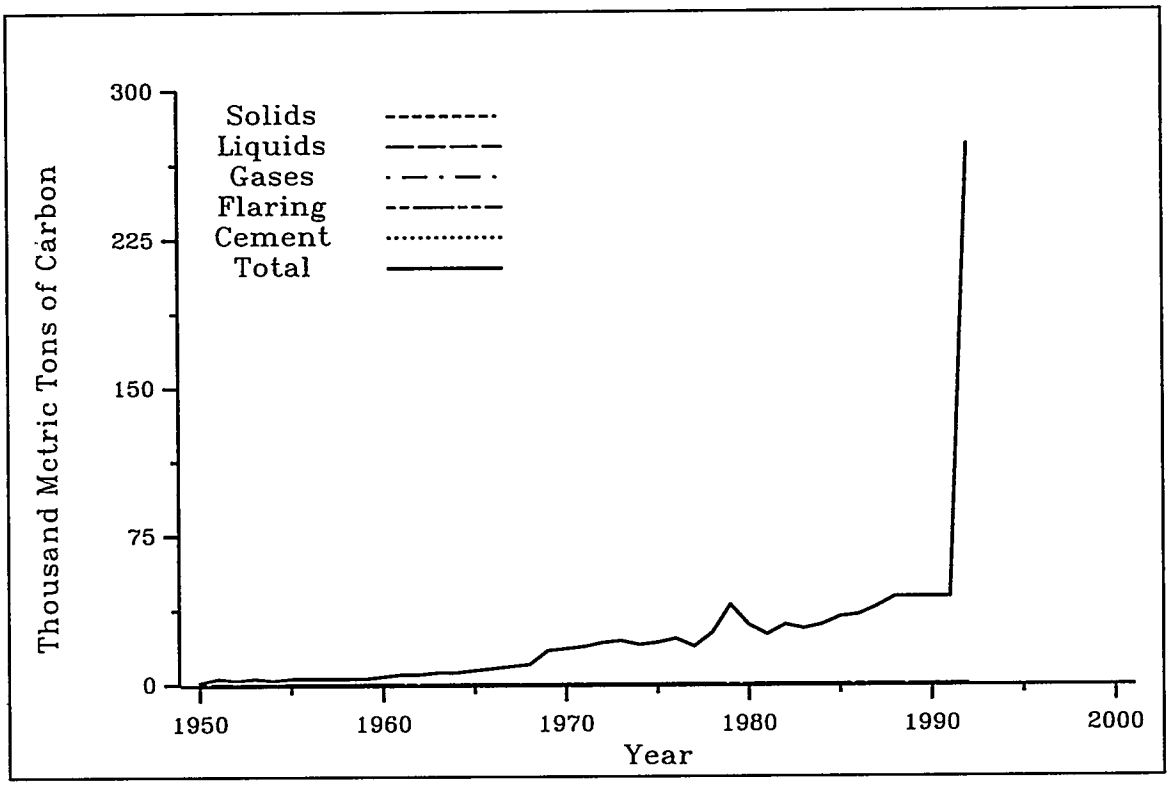


Per capita CO_2 emission rates for Saint Kitts-Nevis-Anguilla

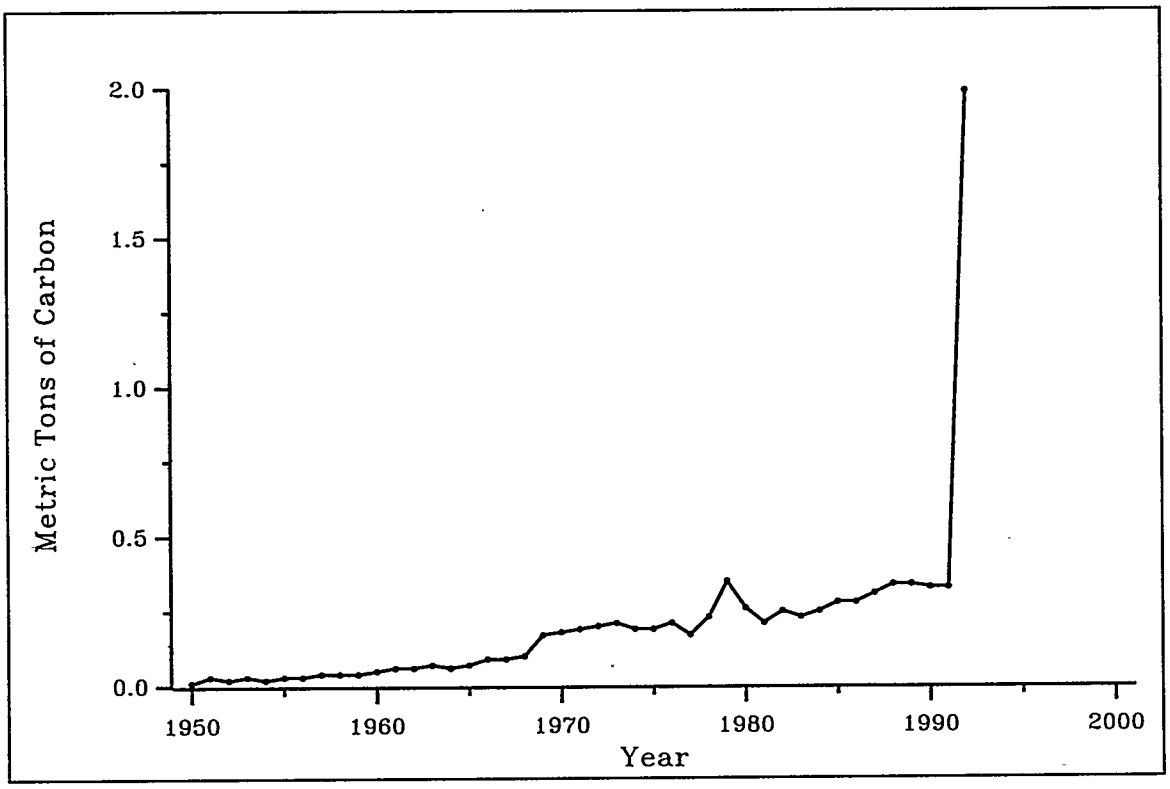
Saint Kitts-Nevis-Anguilla

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1957	3	0	3	0	0	0	0.04	.
1958	3	0	3	0	0	0	0.04	.
1959	4	0	4	0	0	0	0.07	.
1960	3	0	3	0	0	0	0.06	.
1961	6	0	6	0	0	0	0.10	.
1962	4	0	4	0	0	0	0.07	.
1963	5	0	5	0	0	0	0.09	.
1964	5	0	5	0	0	0	0.09	.
1965	6	0	6	0	0	0	0.11	.
1966	6	0	6	0	0	0	0.11	.
1967	6	0	6	0	0	0	0.11	.
1968	9	0	9	0	0	0	0.17	.
1969	7	0	7	0	0	0	0.13	.
1970	7	0	7	0	0	0	0.13	.
1971	8	0	8	0	0	0	0.14	.
1972	8	0	8	0	0	0	0.14	.
1973	8	0	8	0	0	0	0.14	.
1974	10	0	10	0	0	0	0.19	.
1975	9	0	9	0	0	0	0.18	.
1976	10	0	10	0	0	0	0.20	.
1977	10	0	10	0	0	0	0.20	.
1978	9	0	9	0	0	0	0.18	.
1979	10	0	10	0	0	0	0.20	.
1980	14	0	14	0	0	0	0.28	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Saint Lucia

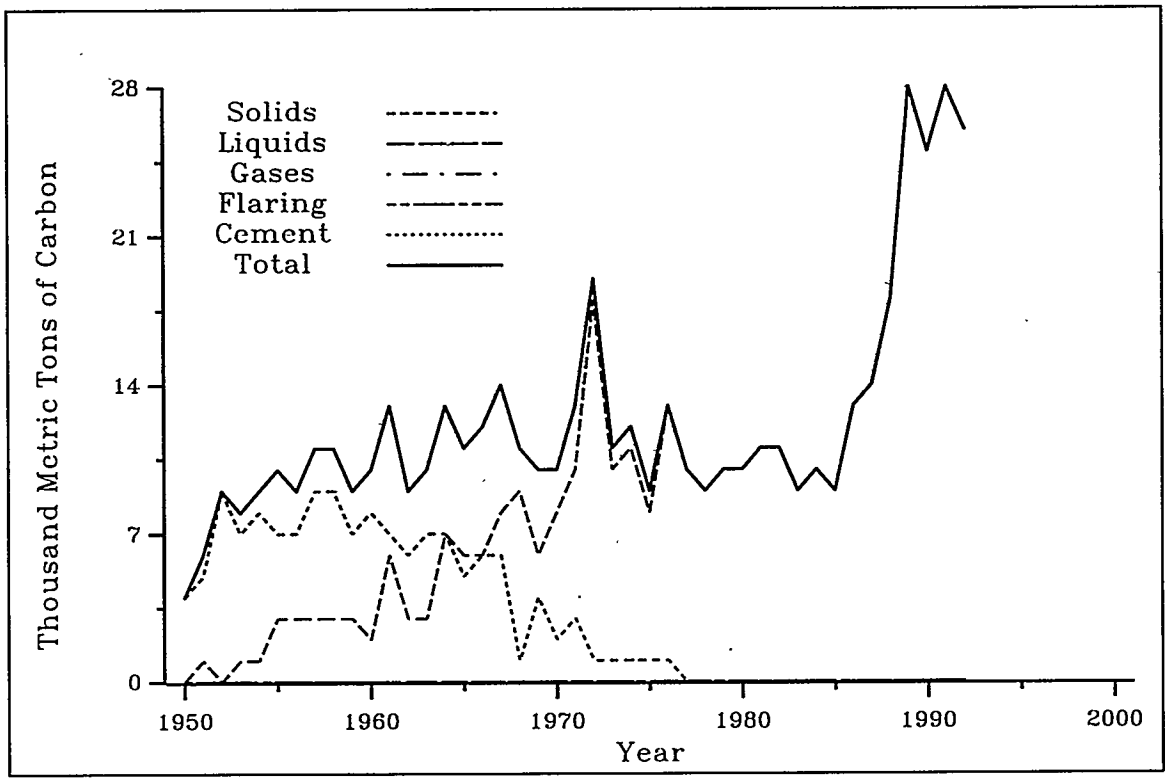


Per capita CO_2 emission rates for Saint Lucia

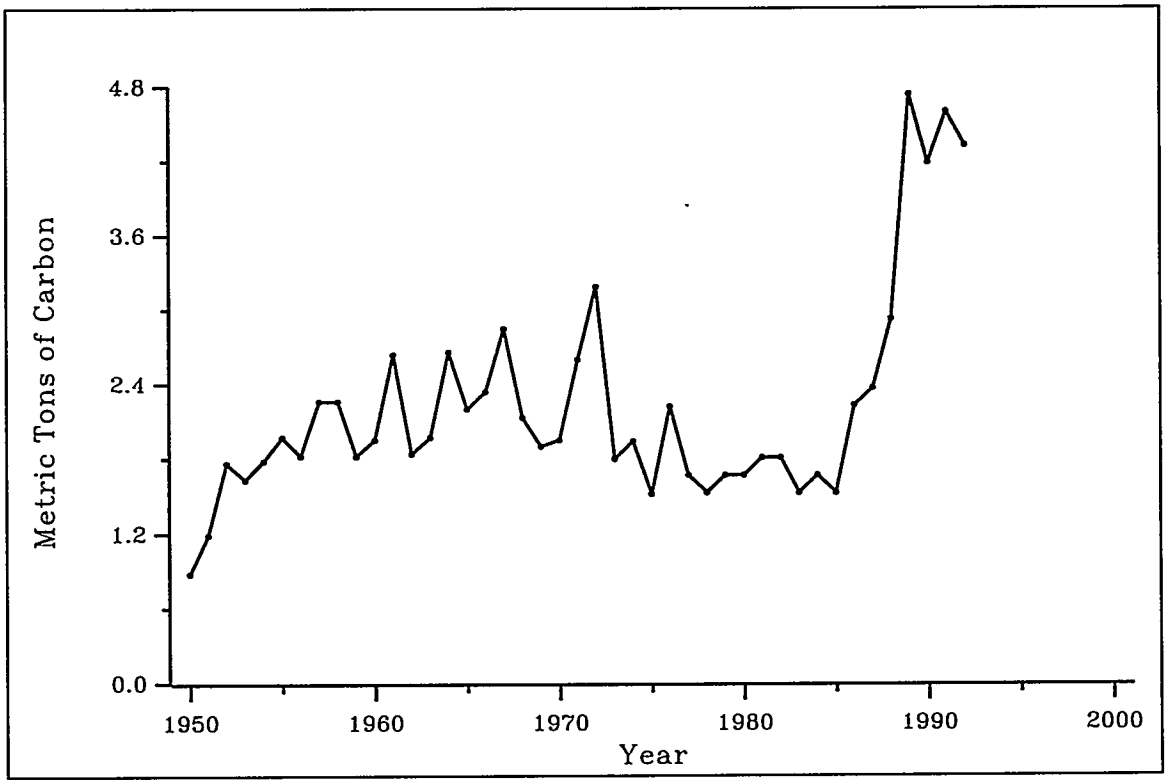
Saint Lucia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1	0	1	0	0	0	0.01	.
1951	3	0	3	0	0	0	0.03	.
1952	2	0	2	0	0	0	0.02	.
1953	3	0	3	0	0	0	0.03	.
1954	2	0	2	0	0	0	0.02	.
1955	3	0	3	0	0	0	0.03	.
1956	3	0	3	0	0	0	0.03	.
1957	3	0	3	0	0	0	0.04	.
1958	3	0	3	0	0	0	0.04	.
1959	3	0	3	0	0	0	0.04	.
1960	4	0	4	0	0	0	0.05	.
1961	5	0	5	0	0	0	0.06	.
1962	5	0	5	0	0	0	0.06	.
1963	6	0	6	0	0	0	0.07	.
1964	6	0	6	0	0	0	0.06	.
1965	7	0	7	0	0	0	0.07	.
1966	8	0	8	0	0	0	0.09	.
1967	9	0	9	0	0	0	0.09	.
1968	10	0	10	0	0	0	0.10	.
1969	17	0	17	0	0	0	0.17	.
1970	18	0	18	0	0	0	0.18	.
1971	19	0	19	0	0	0	0.19	.
1972	21	0	21	0	0	0	0.20	.
1973	22	0	22	0	0	0	0.21	.
1974	20	0	20	0	0	0	0.19	.
1975	21	0	21	0	0	0	0.19	.
1976	23	0	23	0	0	0	0.21	.
1977	19	0	19	0	0	0	0.17	.
1978	26	0	26	0	0	0	0.23	.
1979	40	0	40	0	0	0	0.35	.
1980	30	0	30	0	0	0	0.26	.
1981	25	0	25	0	0	0	0.21	.
1982	30	0	30	0	0	0	0.25	.
1983	28	0	28	0	0	0	0.23	.
1984	30	0	30	0	0	0	0.25	.
1985	34	0	34	0	0	0	0.28	.
1986	35	0	35	0	0	0	0.28	.
1987	39	0	39	0	0	0	0.31	.
1988	44	0	44	0	0	0	0.34	.
1989	44	0	44	0	0	0	0.34	.
1990	44	0	44	0	0	0	0.33	.
1991	44	0	44	0	0	0	0.33	.
1992	272	0	272	0	0	0	1.99	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Saint Pierre and Miquelon

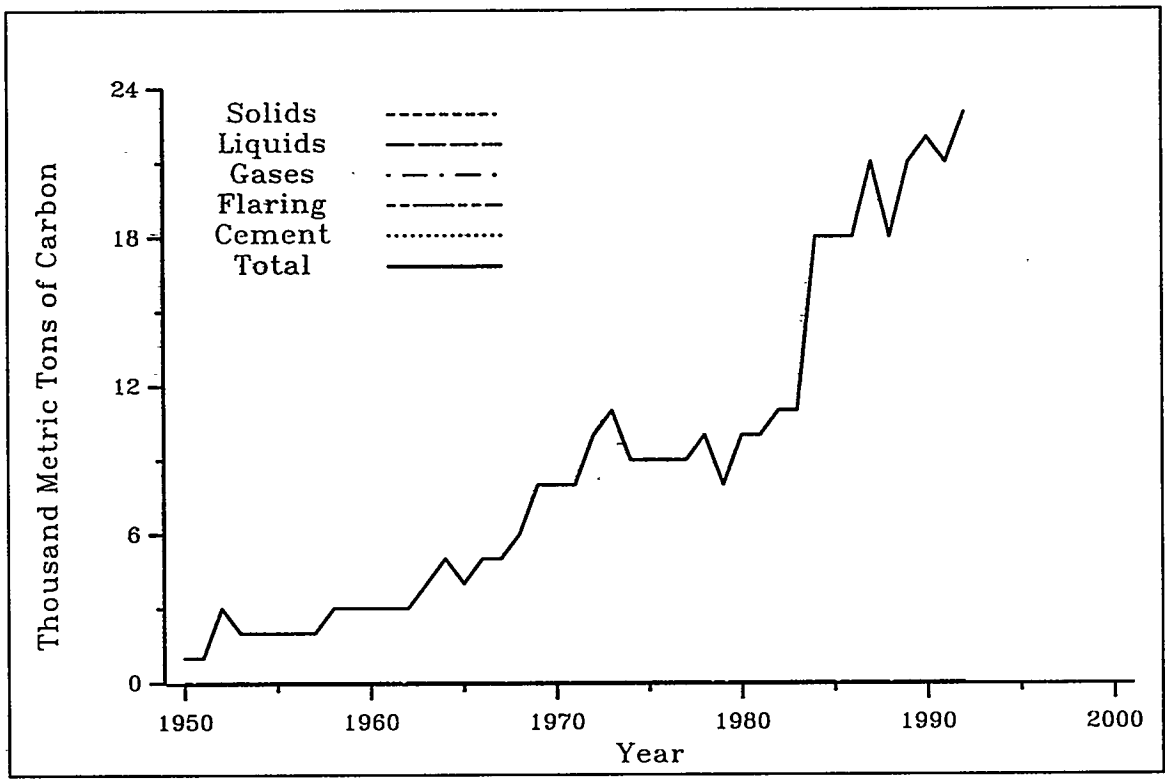


Per capita CO_2 emission rates for Saint Pierre and Miquelon

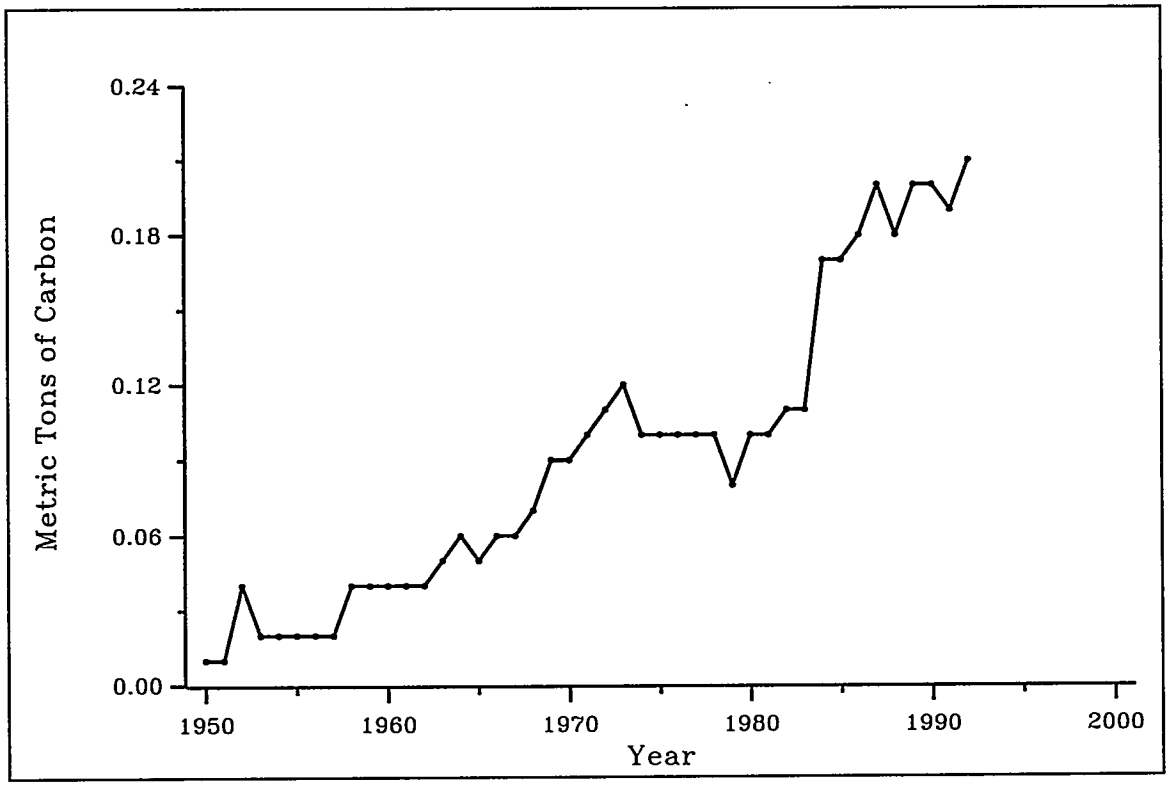
Saint Pierre and Miquelon

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	4	4	0	0	0	0	0.88	.
1951	6	5	1	0	0	0	1.19	.
1952	9	9	0	0	0	0	1.76	.
1953	8	7	1	0	0	0	1.63	.
1954	9	8	1	0	0	0	1.78	.
1955	10	7	3	0	0	0	1.97	.
1956	9	7	3	0	0	0	1.82	.
1957	11	9	3	0	0	0	2.26	.
1958	11	9	3	0	0	0	2.26	.
1959	9	7	3	0	0	0	1.82	.
1960	10	8	2	0	0	0	1.95	.
1961	13	7	6	0	0	0	2.64	.
1962	9	6	3	0	0	0	1.84	.
1963	10	7	3	0	0	0	1.97	.
1964	13	7	7	0	0	0	2.66	.
1965	11	5	6	0	0	0	2.20	.
1966	12	6	6	0	0	0	2.34	.
1967	14	6	8	0	0	0	2.85	.
1968	11	1	9	0	0	0	2.13	.
1969	10	4	6	0	0	0	1.90	.
1970	10	2	8	0	0	0	1.95	.
1971	13	3	10	0	0	0	2.60	.
1972	19	1	18	0	0	0	3.19	.
1973	11	1	10	0	0	0	1.80	.
1974	12	1	11	0	0	0	1.94	.
1975	9	1	8	0	0	0	1.52	.
1976	13	1	13	0	0	0	2.22	.
1977	10	0	10	0	0	0	1.67	.
1978	9	0	9	0	0	0	1.53	.
1979	10	0	10	0	0	0	1.67	.
1980	10	0	10	0	0	0	1.67	.
1981	11	0	11	0	0	0	1.81	.
1982	11	0	11	0	0	0	1.81	.
1983	9	0	9	0	0	0	1.53	.
1984	10	0	10	0	0	0	1.67	.
1985	9	0	9	0	0	0	1.53	.
1986	13	0	13	0	0	0	2.23	.
1987	14	0	14	0	0	0	2.37	.
1988	18	0	18	0	0	0	2.93	.
1989	28	0	28	0	0	0	4.74	.
1990	25	0	25	0	0	0	4.19	.
1991	28	0	28	0	0	0	4.60	.
1992	26	0	26	0	0	0	4.33	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Saint Vincent and the Grenadines

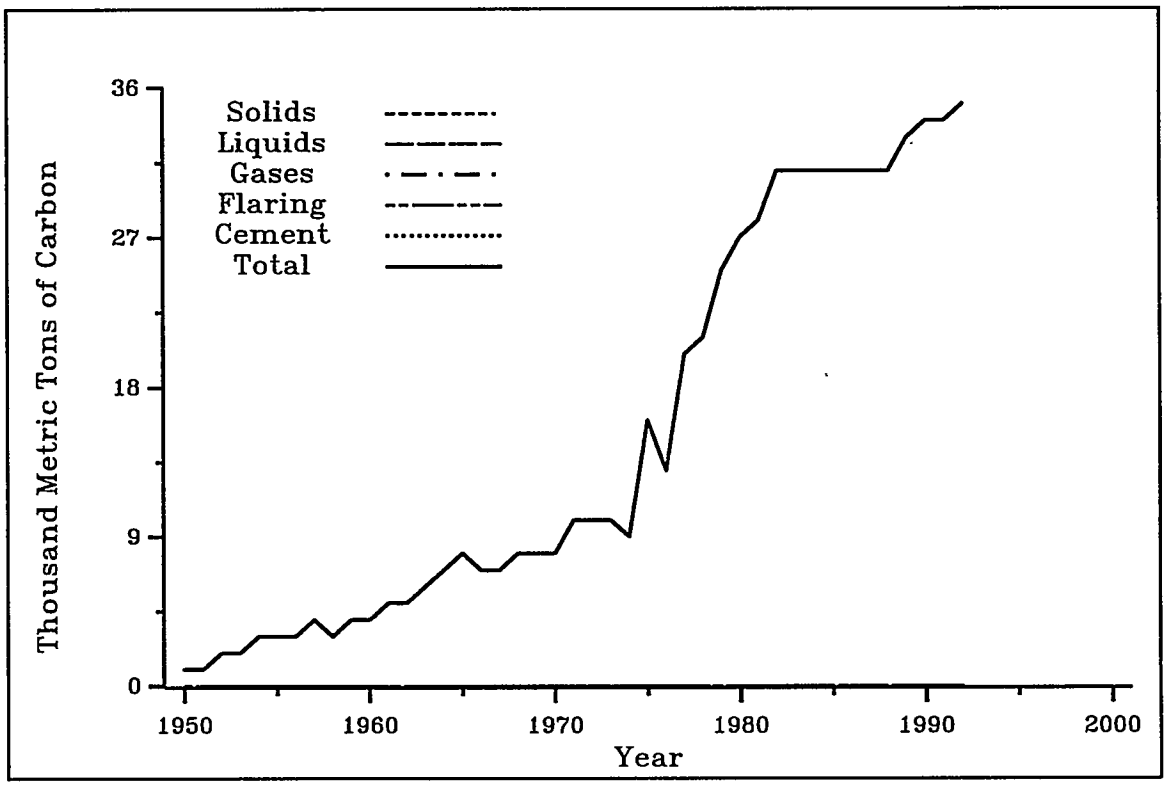


Per capita CO_2 emission rates for Saint Vincent and the Grenadines

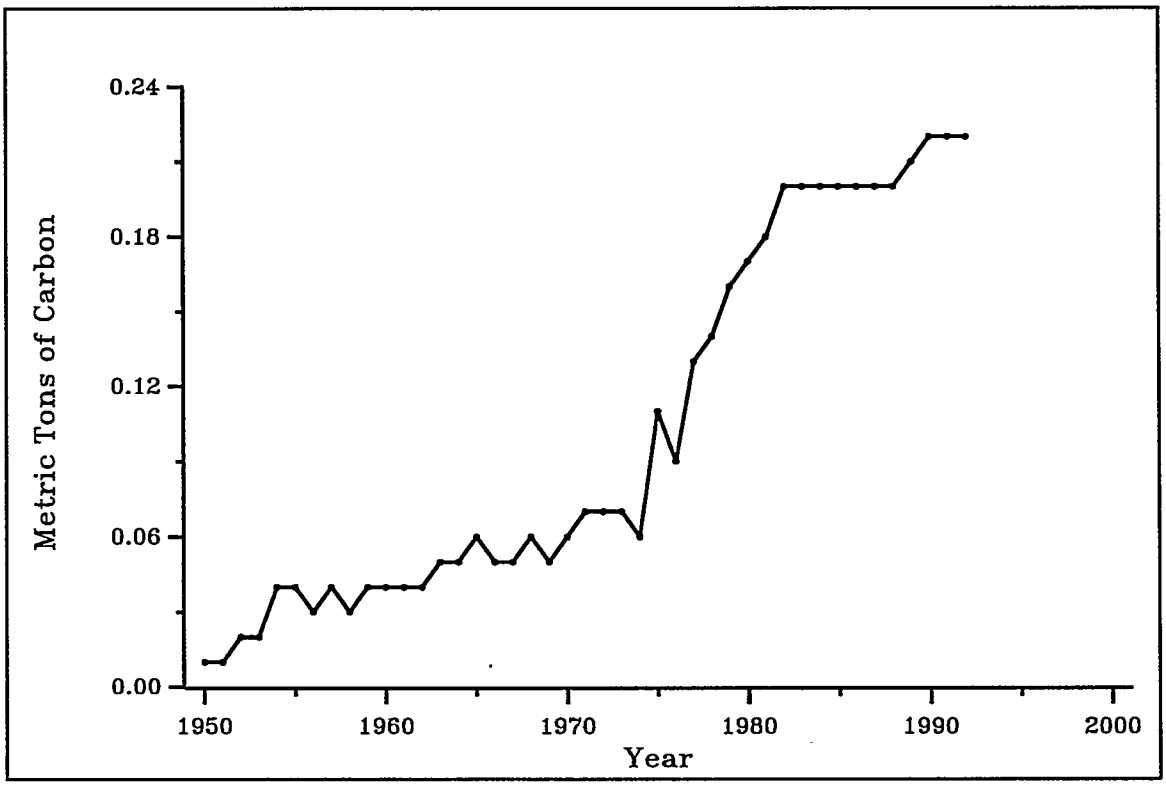
Saint Vincent and the Grenadines

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1	0	1	0	0	0	0.01	.
1951	1	0	1	0	0	0	0.01	.
1952	3	0	3	0	0	0	0.04	.
1953	2	0	2	0	0	0	0.02	.
1954	2	0	2	0	0	0	0.02	.
1955	2	0	2	0	0	0	0.02	.
1956	2	0	2	0	0	0	0.02	.
1957	2	0	2	0	0	0	0.02	.
1958	3	0	3	0	0	0	0.04	.
1959	3	0	3	0	0	0	0.04	.
1960	3	0	3	0	0	0	0.04	.
1961	3	0	3	0	0	0	0.04	.
1962	3	0	3	0	0	0	0.04	.
1963	4	0	4	0	0	0	0.05	.
1964	5	0	5	0	0	0	0.06	.
1965	4	0	4	0	0	0	0.05	.
1966	5	0	5	0	0	0	0.06	.
1967	5	0	5	0	0	0	0.06	.
1968	6	0	6	0	0	0	0.07	.
1969	8	0	8	0	0	0	0.09	.
1970	8	0	8	0	0	0	0.09	.
1971	8	0	8	0	0	0	0.10	.
1972	10	0	10	0	0	0	0.11	.
1973	11	0	11	0	0	0	0.12	.
1974	9	0	9	0	0	0	0.10	.
1975	9	0	9	0	0	0	0.10	.
1976	9	0	9	0	0	0	0.10	.
1977	9	0	9	0	0	0	0.10	.
1978	10	0	10	0	0	0	0.10	.
1979	8	0	8	0	0	0	0.08	.
1980	10	0	10	0	0	0	0.10	.
1981	10	0	10	0	0	0	0.10	.
1982	11	0	11	0	0	0	0.11	.
1983	11	0	11	0	0	0	0.11	.
1984	18	0	18	0	0	0	0.17	.
1985	18	0	18	0	0	0	0.17	.
1986	18	0	18	0	0	0	0.18	.
1987	21	0	21	0	0	0	0.20	.
1988	18	0	18	0	0	0	0.18	.
1989	21	0	21	0	0	0	0.20	.
1990	22	0	22	0	0	0	0.20	.
1991	21	0	21	0	0	0	0.19	.
1992	23	0	23	0	0	0	0.21	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Samoa

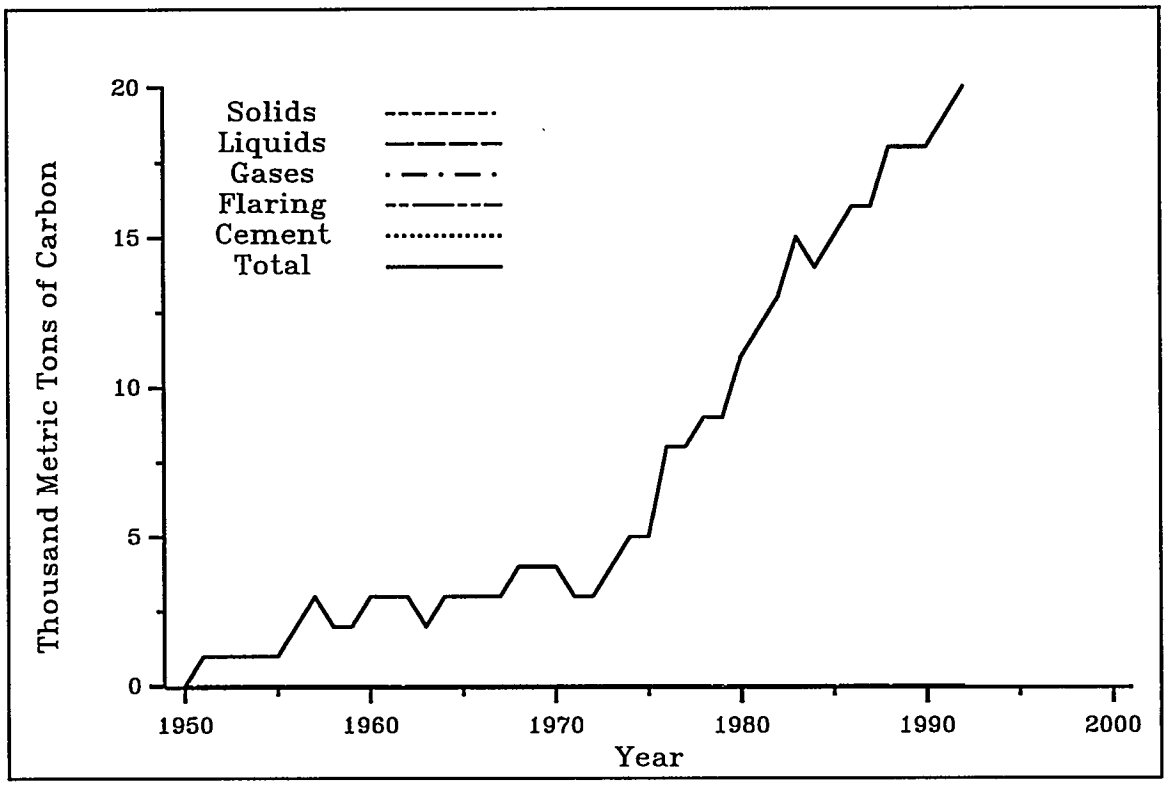


Per capita CO_2 emission rates for Samoa

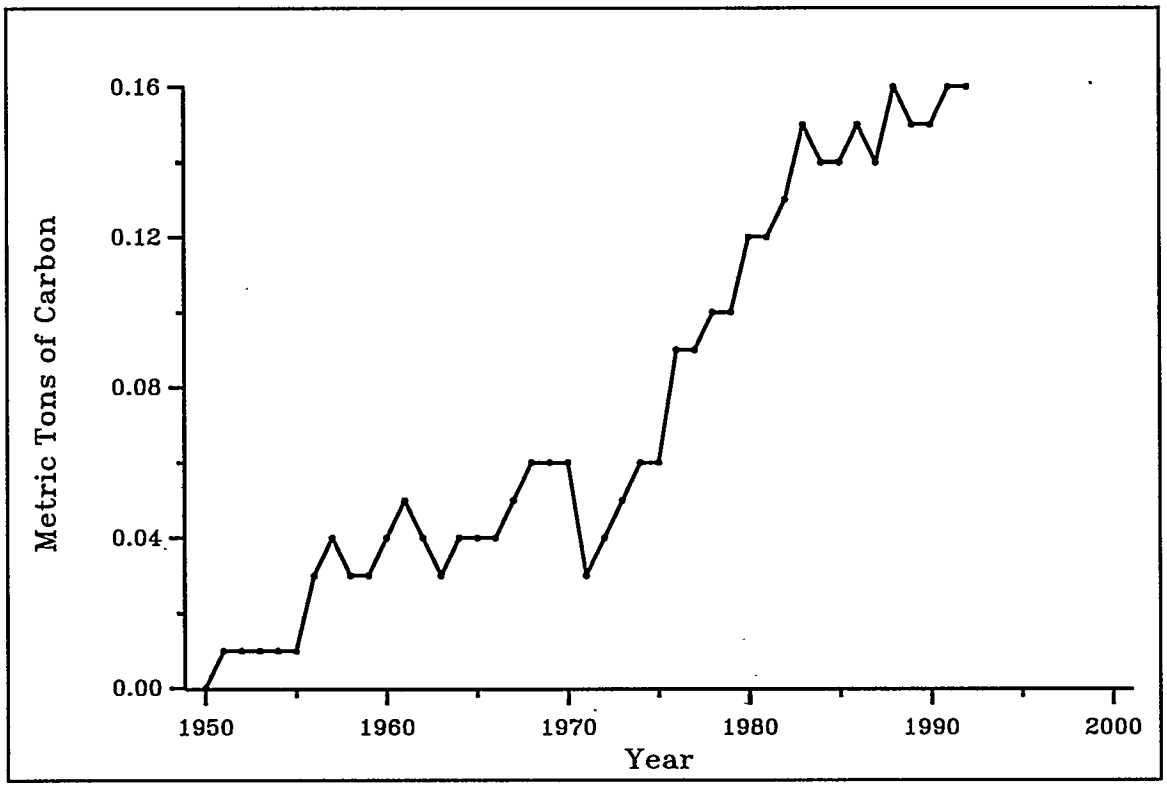
Samoa

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1	0	1	0	0	0	0.01	.
1951	1	0	1	0	0	0	0.01	.
1952	2	0	2	0	0	0	0.02	.
1953	2	0	2	0	0	0	0.02	.
1954	3	0	3	0	0	0	0.04	.
1955	3	0	3	0	0	0	0.04	.
1956	3	0	3	0	0	0	0.03	.
1957	4	0	4	0	0	0	0.04	.
1958	3	0	3	0	0	0	0.03	.
1959	4	0	4	0	0	0	0.04	.
1960	4	0	4	0	0	0	0.04	.
1961	5	0	5	0	0	0	0.04	.
1962	5	0	5	0	0	0	0.04	.
1963	6	0	6	0	0	0	0.05	.
1964	7	0	7	0	0	0	0.05	.
1965	8	0	8	0	0	0	0.06	.
1966	7	0	7	0	0	0	0.05	.
1967	7	0	7	0	0	0	0.05	.
1968	8	0	8	0	0	0	0.06	.
1969	8	0	8	0	0	0	0.05	.
1970	8	0	8	0	0	0	0.06	.
1971	10	0	10	0	0	0	0.07	.
1972	10	0	10	0	0	0	0.07	.
1973	10	0	10	0	0	0	0.07	.
1974	9	0	9	0	0	0	0.06	.
1975	16	0	16	0	0	0	0.11	.
1976	13	0	13	0	0	0	0.09	.
1977	20	0	20	0	0	0	0.13	.
1978	21	0	21	0	0	0	0.14	.
1979	25	0	25	0	0	0	0.16	.
1980	27	0	27	0	0	0	0.17	.
1981	28	0	28	0	0	0	0.18	.
1982	31	0	31	0	0	0	0.20	.
1983	31	0	31	0	0	0	0.20	.
1984	31	0	31	0	0	0	0.20	.
1985	31	0	31	0	0	0	0.20	.
1986	31	0	31	0	0	0	0.20	.
1987	31	0	31	0	0	0	0.20	.
1988	31	0	31	0	0	0	0.20	.
1989	33	0	33	0	0	0	0.21	.
1990	34	0	34	0	0	0	0.22	.
1991	34	0	34	0	0	0	0.22	.
1992	35	0	35	0	0	0	0.22	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Sao Tome and Principe

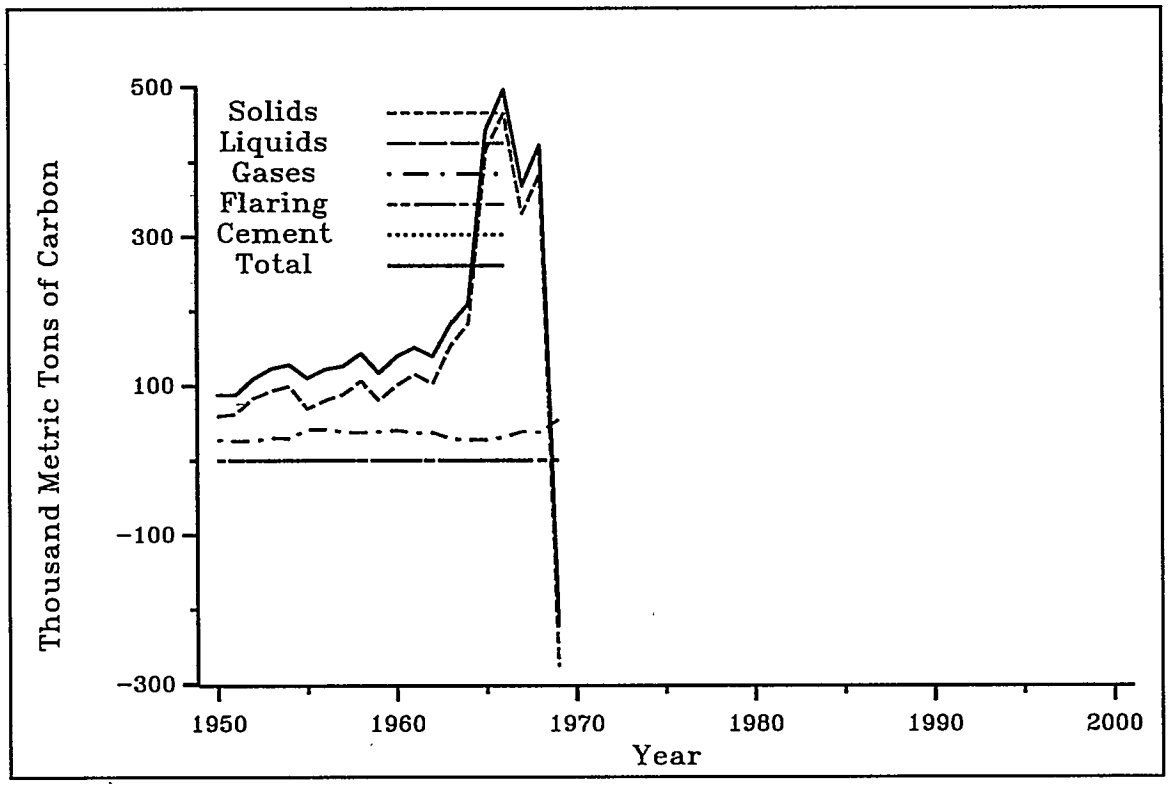


Per capita CO_2 emission rates for Sao Tome and Principe

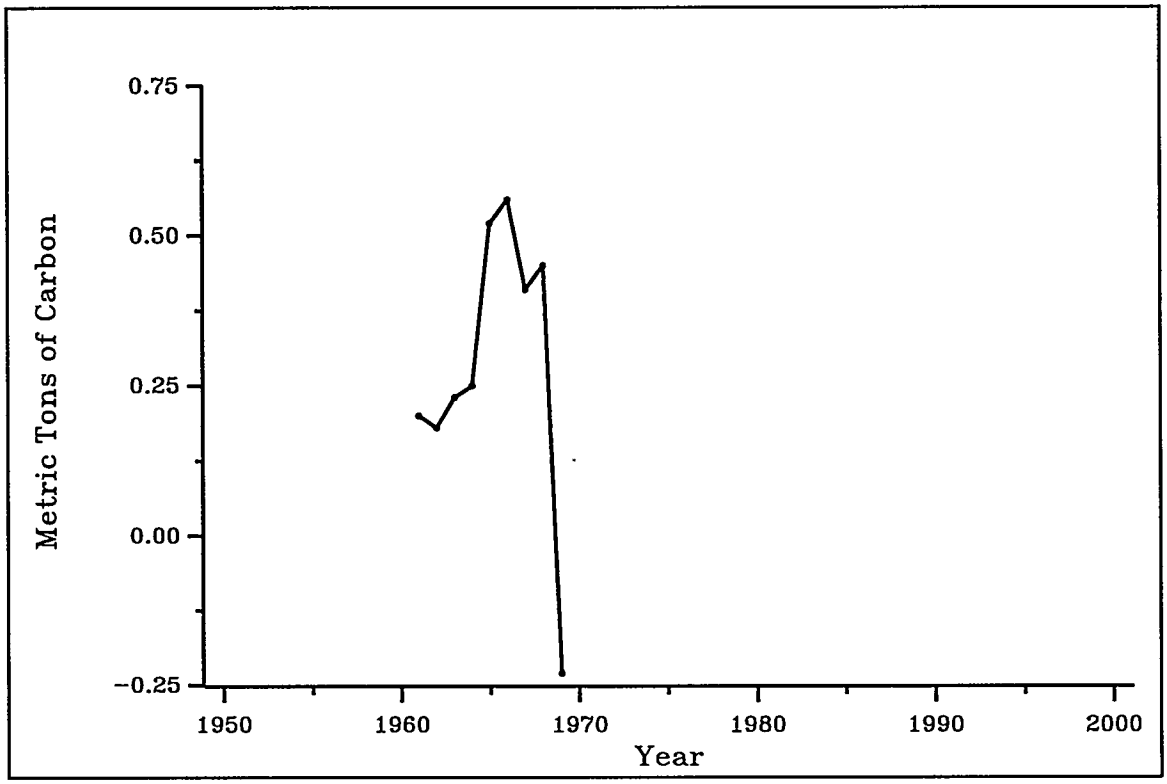
Sao Tome and Principe

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	1	0	1	0	0	0	0.01	.
1952	1	0	1	0	0	0	0.01	.
1953	1	0	1	0	0	0	0.01	.
1954	1	0	1	0	0	0	0.01	.
1955	1	0	1	0	0	0	0.01	.
1956	2	0	2	0	0	0	0.03	.
1957	3	0	3	0	0	0	0.04	.
1958	2	0	2	0	0	0	0.03	.
1959	2	0	2	0	0	0	0.03	.
1960	3	0	3	0	0	0	0.04	.
1961	3	0	3	0	0	0	0.05	.
1962	3	0	3	0	0	0	0.04	.
1963	2	0	2	0	0	0	0.03	.
1964	3	0	3	0	0	0	0.04	.
1965	3	0	3	0	0	0	0.04	.
1966	3	0	3	0	0	0	0.04	.
1967	3	0	3	0	0	0	0.05	.
1968	4	0	4	0	0	0	0.06	.
1969	4	0	4	0	0	0	0.06	.
1970	4	0	4	0	0	0	0.06	.
1971	3	0	3	0	0	0	0.03	.
1972	3	0	3	0	0	0	0.04	.
1973	4	0	4	0	0	0	0.05	.
1974	5	0	5	0	0	0	0.06	.
1975	5	0	5	0	0	0	0.06	.
1976	8	0	8	0	0	0	0.09	.
1977	8	0	8	0	0	0	0.09	.
1978	9	0	9	0	0	0	0.10	.
1979	9	0	9	0	0	0	0.10	.
1980	11	0	11	0	0	0	0.12	.
1981	12	0	12	0	0	0	0.12	.
1982	13	0	13	0	0	0	0.13	.
1983	15	0	15	0	0	0	0.15	.
1984	14	0	14	0	0	0	0.14	.
1985	15	0	15	0	0	0	0.14	.
1986	16	0	16	0	0	0	0.15	.
1987	16	0	16	0	0	0	0.14	.
1988	18	0	18	0	0	0	0.16	.
1989	18	0	18	0	0	0	0.15	.
1990	18	0	18	0	0	0	0.15	.
1991	19	0	19	0	0	0	0.16	.
1992	20	0	20	0	0	0	0.16	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Sarawak

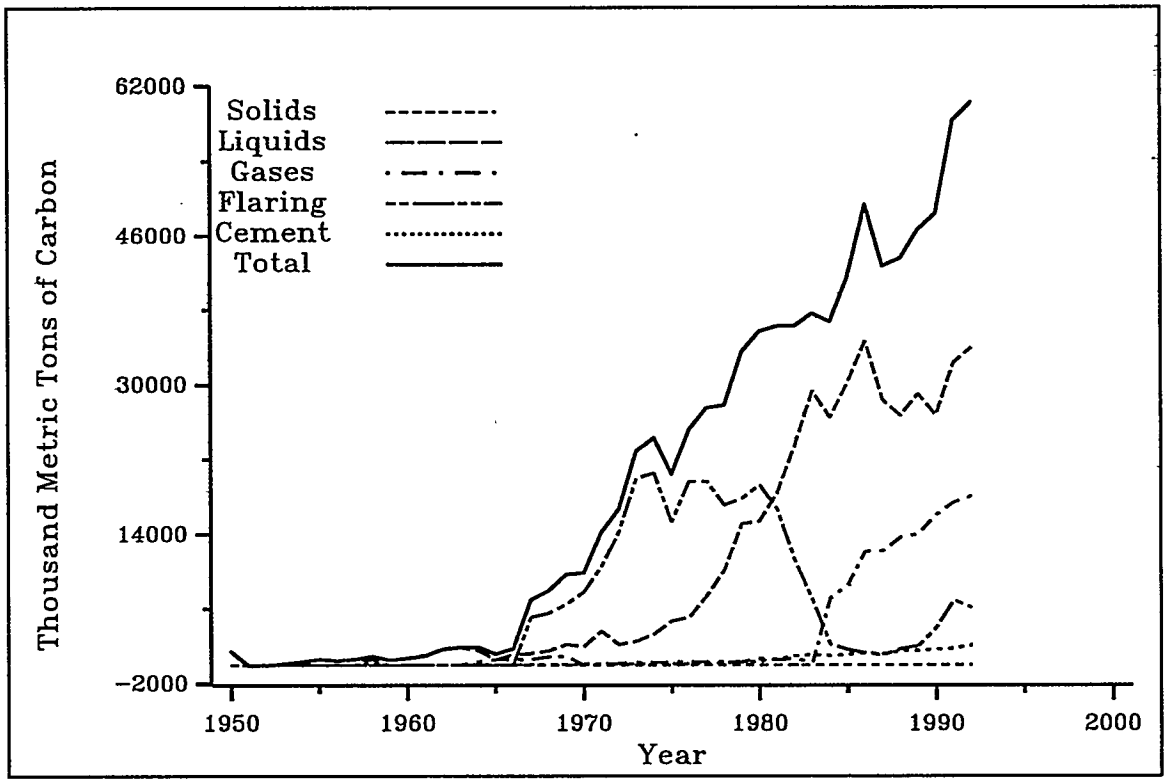


Per capita CO_2 emission rates for Sarawak

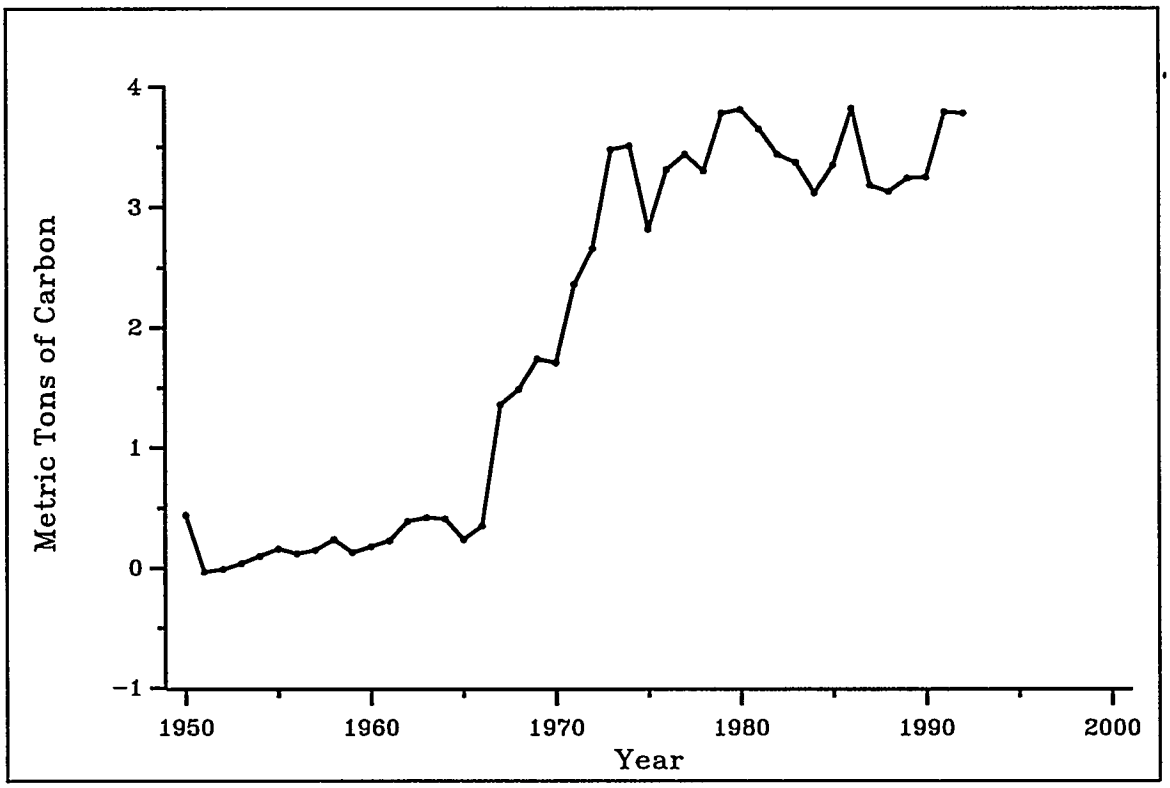
Sarawak

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	87	0	59	27	0	0	.	.
1951	88	0	62	26	0	0	.	.
1952	109	0	83	26	0	0	.	.
1953	123	0	93	30	0	0	.	.
1954	128	0	99	29	0	0	.	.
1955	110	0	69	41	0	0	.	.
1956	122	0	80	41	0	0	.	.
1957	126	0	88	38	0	0	.	.
1958	143	0	106	37	0	0	.	.
1959	117	0	80	38	0	0	.	.
1960	139	0	100	40	0	0	.	.
1961	151	0	115	36	0	0	0.20	.
1962	139	0	102	37	0	0	0.18	.
1963	182	0	153	29	0	0	0.23	.
1964	210	0	183	27	0	0	0.25	.
1965	443	0	415	27	0	0	0.52	.
1966	496	0	465	31	0	0	0.56	.
1967	368	0	330	38	0	0	0.41	.
1968	422	0	384	37	0	0	0.45	.
1969	-222	0	-276	54	0	0	-0.23	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Saudia Arabia

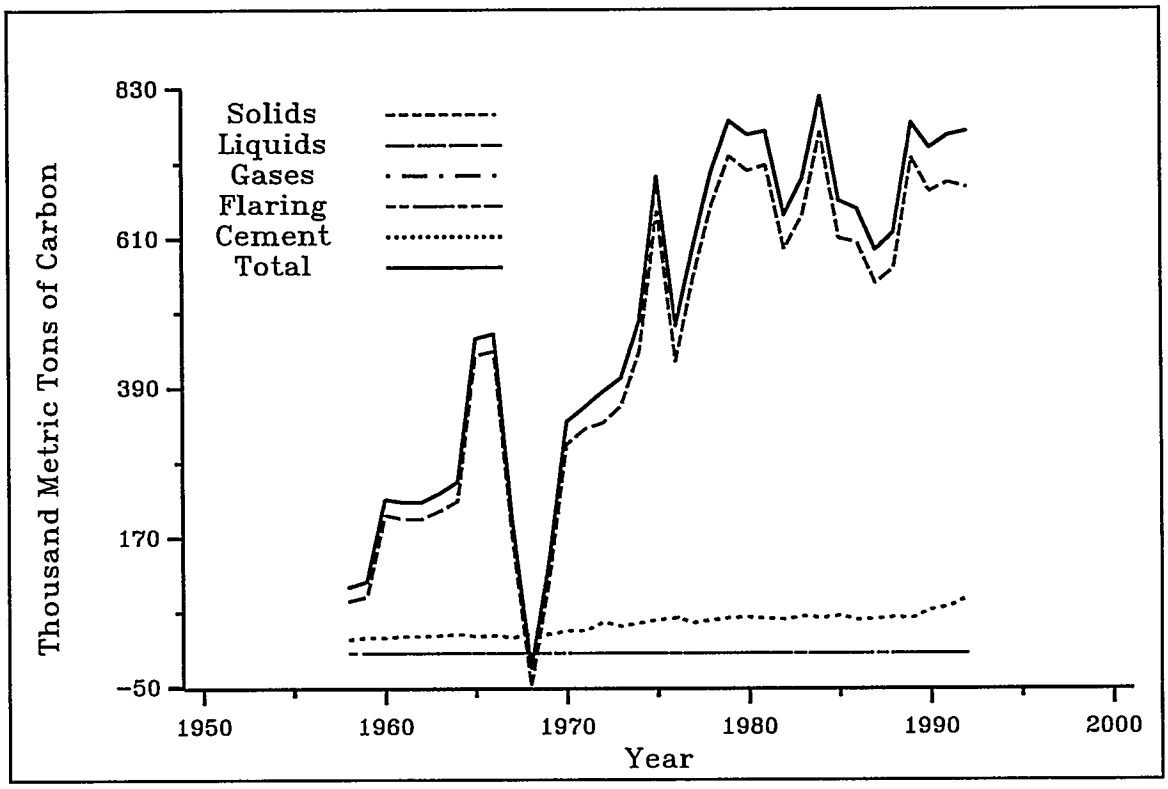


Per capita CO_2 emission rates for Saudia Arabia

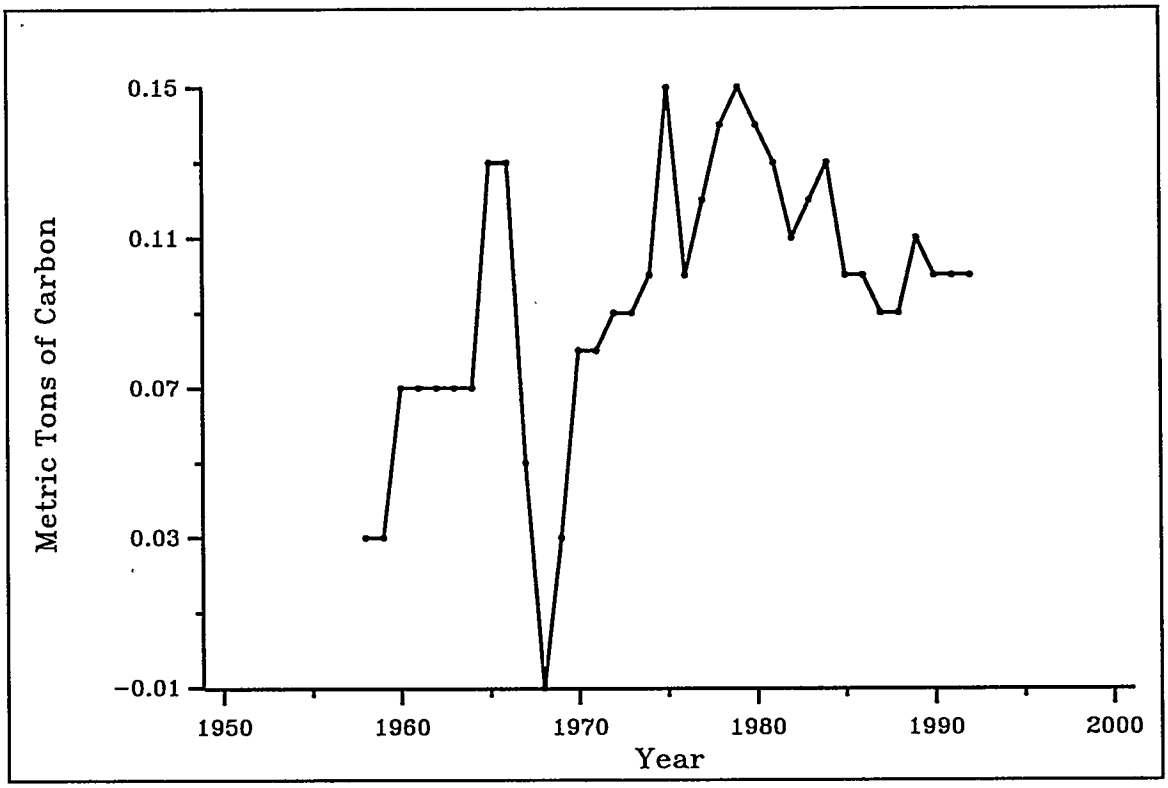
Saudia Arabia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1403	0	1403	0	0	0	0.44	.
1951	-95	0	-95	0	0	0	-0.03	.
1952	-47	0	-47	0	0	0	-0.01	.
1953	130	0	130	0	0	0	0.04	.
1954	338	0	338	0	0	0	0.10	.
1955	577	0	577	0	0	0	0.16	.
1956	445	0	445	0	0	0	0.12	.
1957	573	0	573	0	0	0	0.15	.
1958	917	0	545	0	372	0	0.24	.
1959	506	0	496	0	10	0	0.13	.
1960	731	0	718	0	12	0	0.18	.
1961	974	0	959	0	14	0	0.23	.
1962	1706	0	1675	6	25	0	0.39	.
1963	1894	0	1860	8	27	0	0.42	.
1964	1923	0	1549	338	35	0	0.41	.
1965	1151	0	578	539	34	0	0.24	.
1966	1749	0	1121	594	34	0	0.35	.
1967	6956	0	1218	595	44	5099	1.36	.
1968	7937	0	1483	859	70	5527	1.49	.
1969	9627	0	2194	914	80	6439	1.74	.
1970	9831	0	1952	0	92	7787	1.71	.
1971	14166	0	3624	1	96	10445	2.36	.
1972	16672	0	2187	148	131	14206	2.66	.
1973	22871	0	2536	258	131	19946	3.48	.
1974	24260	0	3314	283	144	20520	3.51	.
1975	20432	0	4678	288	153	15313	2.82	.
1976	25173	0	5077	304	150	19641	3.31	.
1977	27505	0	7381	317	172	19635	3.44	.
1978	27772	0	10119	317	245	17091	3.30	.
1979	33516	0	15106	336	299	17776	3.78	.
1980	35685	0	15368	653	396	19268	3.81	.
1981	36274	0	18394	537	644	16698	3.65	.
1982	36285	0	23434	671	973	11207	3.44	.
1983	37630	0	29305	269	1105	6951	3.37	.
1984	36744	0	26460	7097	973	2214	3.12	.
1985	41518	0	30221	8553	1118	1627	3.35	.
1986	49303	0	34656	12118	1269	1259	3.82	.
1987	42708	0	28315	12175	1169	1049	3.18	.
1988	43544	0	26668	13656	1489	1732	3.13	.
1989	46601	0	29006	13993	1556	2046	3.24	.
1990	48334	0	26709	16037	1632	3956	3.25	.
1991	58333	0	32330	17360	1768	6875	3.79	.
1992	60213	0	33948	18026	2097	6142	3.78	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Senegal

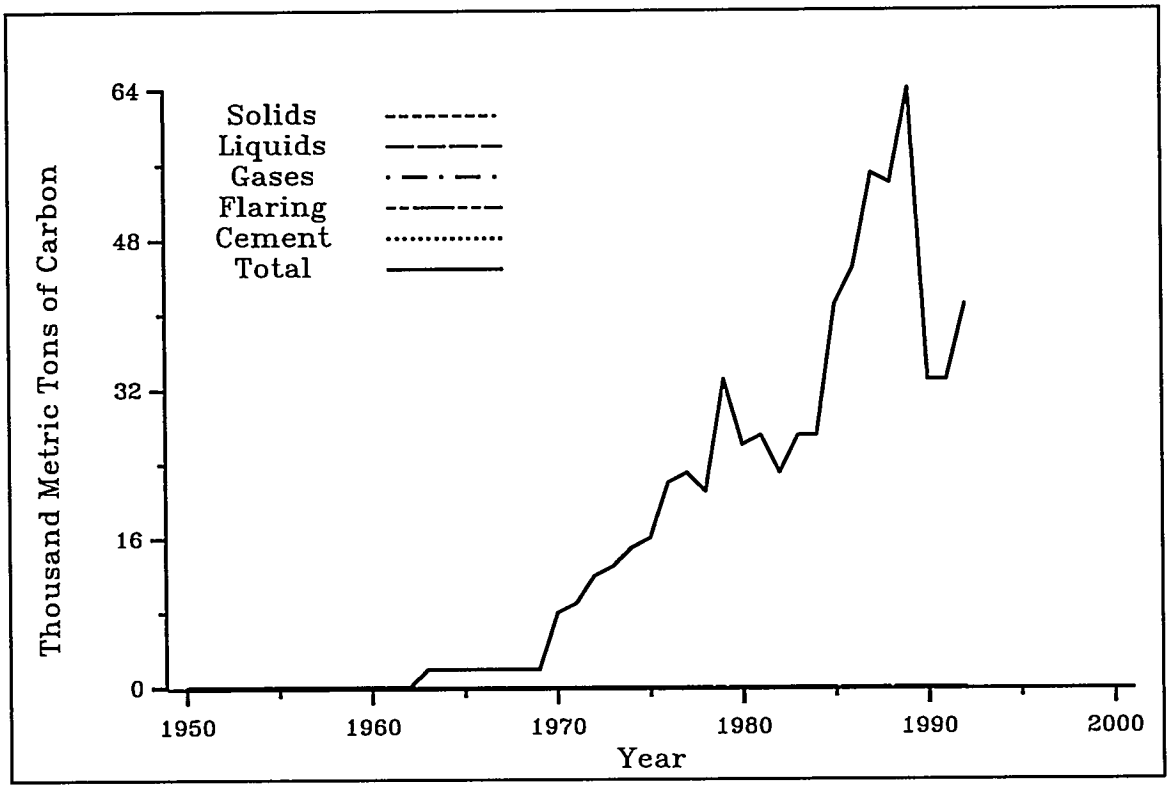


Per capita CO_2 emission rates for Senegal

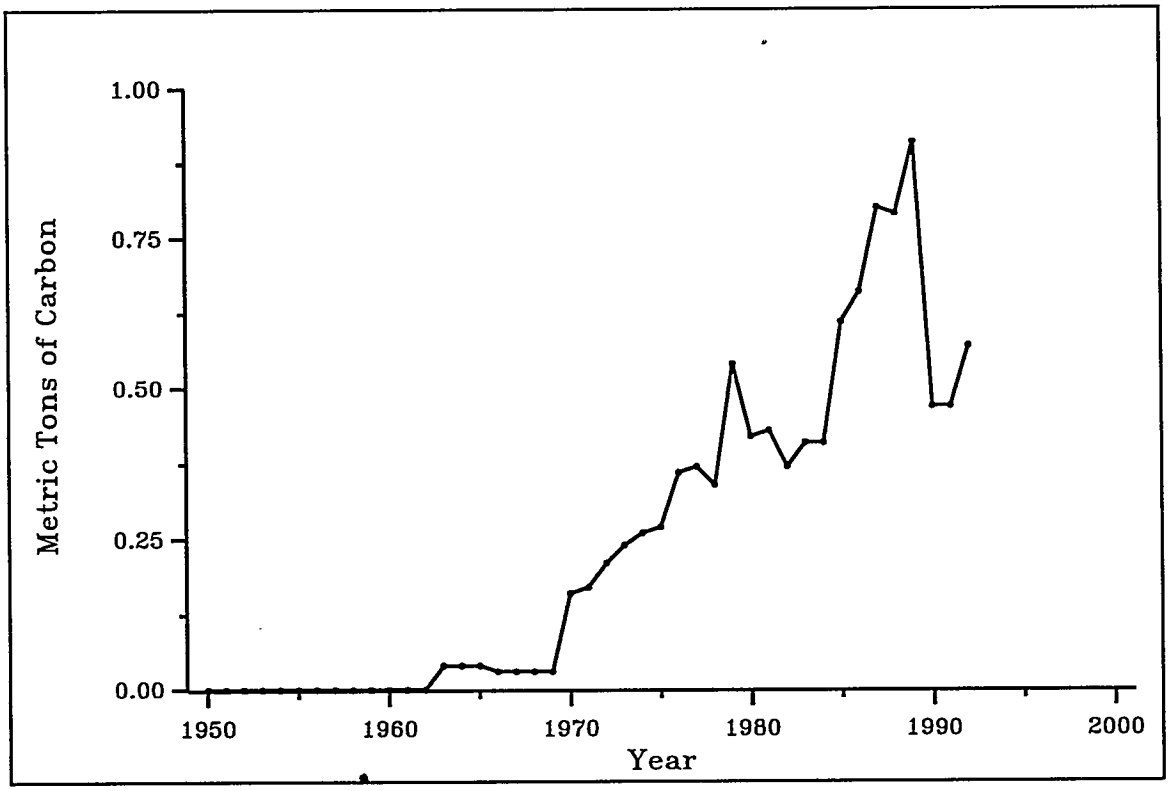
Senegal

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1958	97	0	77	0	20	0	0.03	.
1959	106	0	83	0	23	0	0.03	.
1960	226	0	203	0	23	0	0.07	.
1961	222	0	197	0	25	0	0.07	.
1962	222	0	197	0	25	0	0.07	.
1963	235	0	209	0	26	0	0.07	.
1964	252	0	224	0	28	0	0.07	.
1965	462	0	437	0	25	0	0.13	.
1966	469	0	443	0	26	0	0.13	.
1967	192	0	168	0	23	0	0.05	.
1968	-22	0	-49	0	28	0	-0.01	.
1969	134	0	106	0	28	0	0.03	.
1970	340	0	307	0	33	0	0.08	.
1971	362	0	329	0	33	0	0.08	.
1972	384	0	338	0	46	0	0.09	.
1973	404	0	363	0	40	0	0.09	.
1974	487	0	442	0	45	0	0.10	.
1975	700	0	651	0	49	0	0.15	.
1976	480	0	428	0	52	0	0.10	.
1977	599	0	554	0	45	0	0.12	.
1978	707	0	658	0	49	0	0.14	.
1979	782	0	730	0	52	0	0.15	.
1980	762	0	709	0	53	0	0.14	.
1981	767	0	717	0	51	0	0.13	.
1982	644	0	594	0	50	0	0.11	.
1983	697	0	643	0	54	0	0.12	.
1984	818	0	766	0	52	0	0.13	.
1985	665	0	610	0	55	0	0.10	.
1986	653	0	604	0	49	0	0.10	.
1987	593	0	543	0	51	0	0.09	.
1988	618	0	565	0	53	0	0.09	.
1989	779	0	728	0	52	0	0.11	.
1990	743	0	679	0	64	0	0.10	.
1991	761	0	692	0	69	0	0.10	.
1992	767	0	685	0	82	0	0.10	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Seychelles

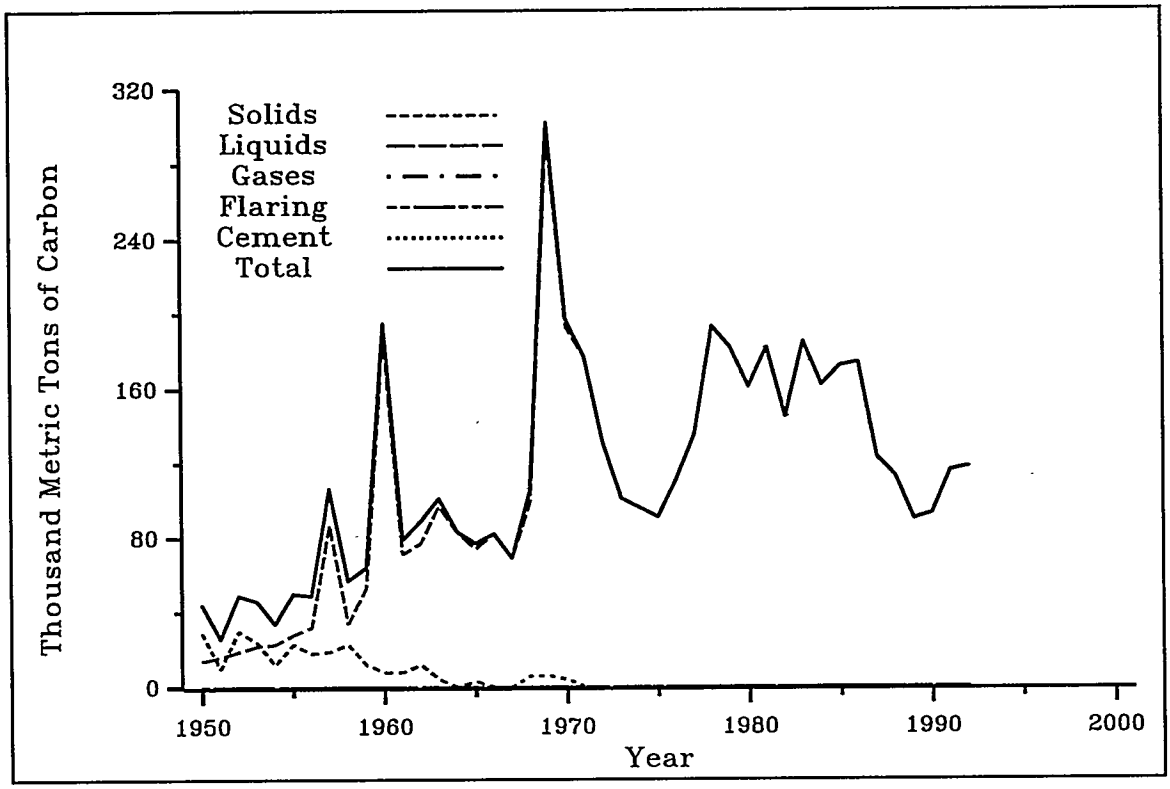


Per capita CO_2 emission rates for the Seychelles

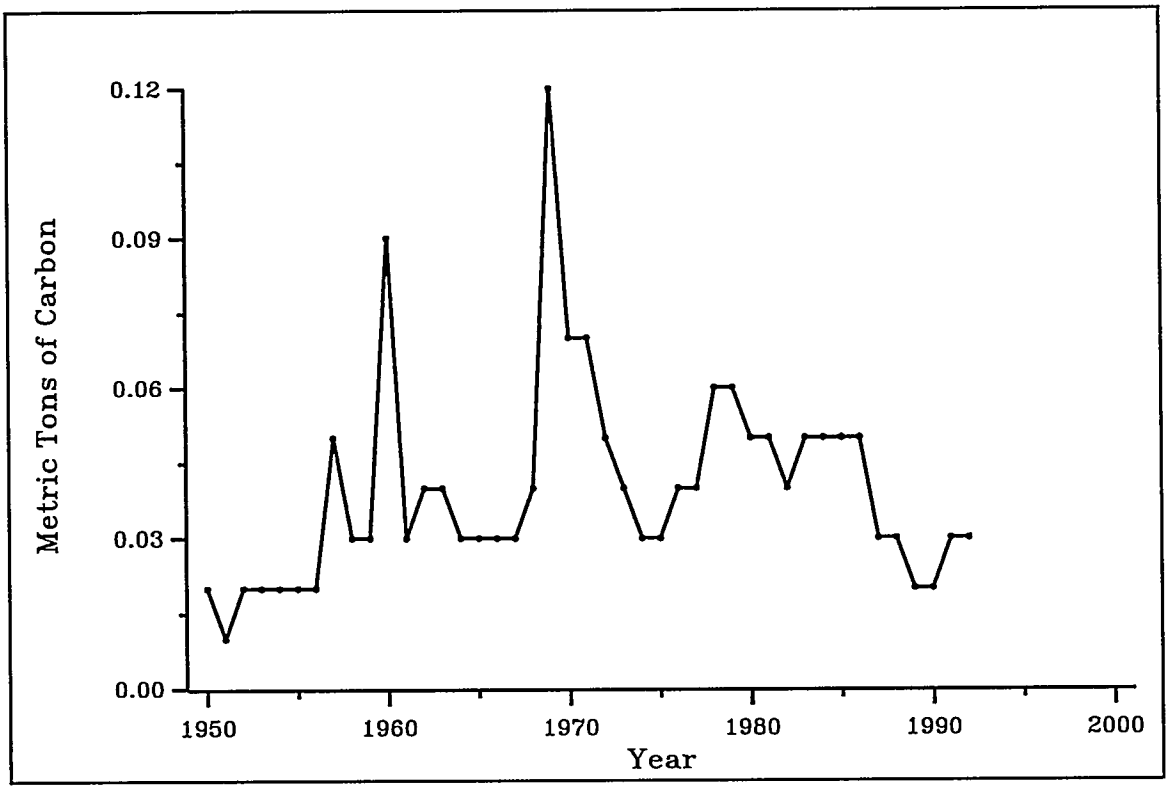
Seychelles

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	0	0	0	0	0	0	0.00	.
1953	0	0	0	0	0	0	0.00	.
1954	0	0	0	0	0	0	0.00	.
1955	0	0	0	0	0	0	0.00	.
1956	0	0	0	0	0	0	0.00	.
1957	0	0	0	0	0	0	0.00	.
1958	0	0	0	0	0	0	0.00	.
1959	0	0	0	0	0	0	0.00	.
1960	0	0	0	0	0	0	0.00	.
1961	0	0	0	0	0	0	0.00	.
1962	0	0	0	0	0	0	0.00	.
1963	2	0	2	0	0	0	0.04	.
1964	2	0	2	0	0	0	0.04	.
1965	2	0	2	0	0	0	0.04	.
1966	2	0	2	0	0	0	0.03	.
1967	2	0	2	0	0	0	0.03	.
1968	2	0	2	0	0	0	0.03	.
1969	2	0	2	0	0	0	0.03	.
1970	8	0	8	0	0	0	0.16	.
1971	9	0	9	0	0	0	0.17	.
1972	12	0	12	0	0	0	0.21	.
1973	13	0	13	0	0	0	0.24	.
1974	15	0	15	0	0	0	0.26	.
1975	16	0	16	0	0	0	0.27	.
1976	22	0	22	0	0	0	0.36	.
1977	23	0	23	0	0	0	0.37	.
1978	21	0	21	0	0	0	0.34	.
1979	33	0	33	0	0	0	0.54	.
1980	26	0	26	0	0	0	0.42	.
1981	27	0	27	0	0	0	0.43	.
1982	23	0	23	0	0	0	0.37	.
1983	27	0	27	0	0	0	0.41	.
1984	27	0	27	0	0	0	0.41	.
1985	41	0	41	0	0	0	0.61	.
1986	45	0	45	0	0	0	0.66	.
1987	55	0	55	0	0	0	0.80	.
1988	54	0	54	0	0	0	0.79	.
1989	64	0	64	0	0	0	0.91	.
1990	33	0	33	0	0	0	0.47	.
1991	33	0	33	0	0	0	0.47	.
1992	41	0	41	0	0	0	0.57	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Sierra Leone

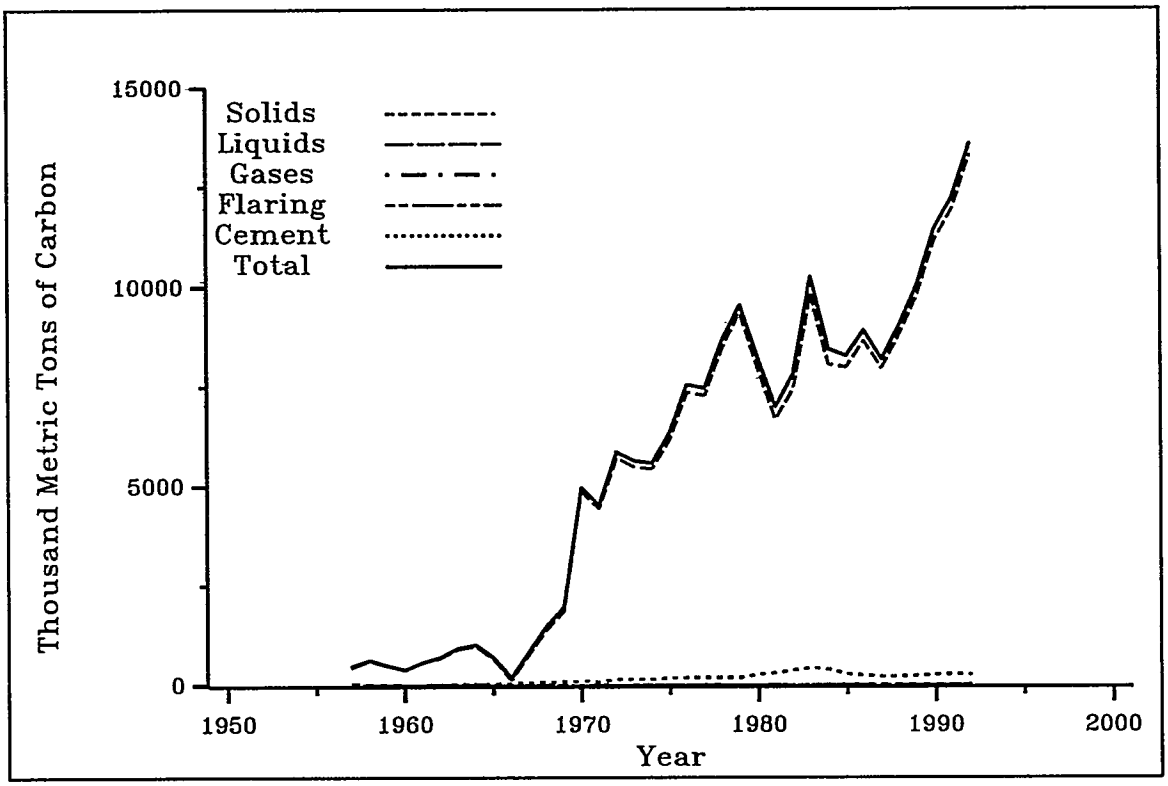


Per capita CO_2 emission rates for Sierra Leone

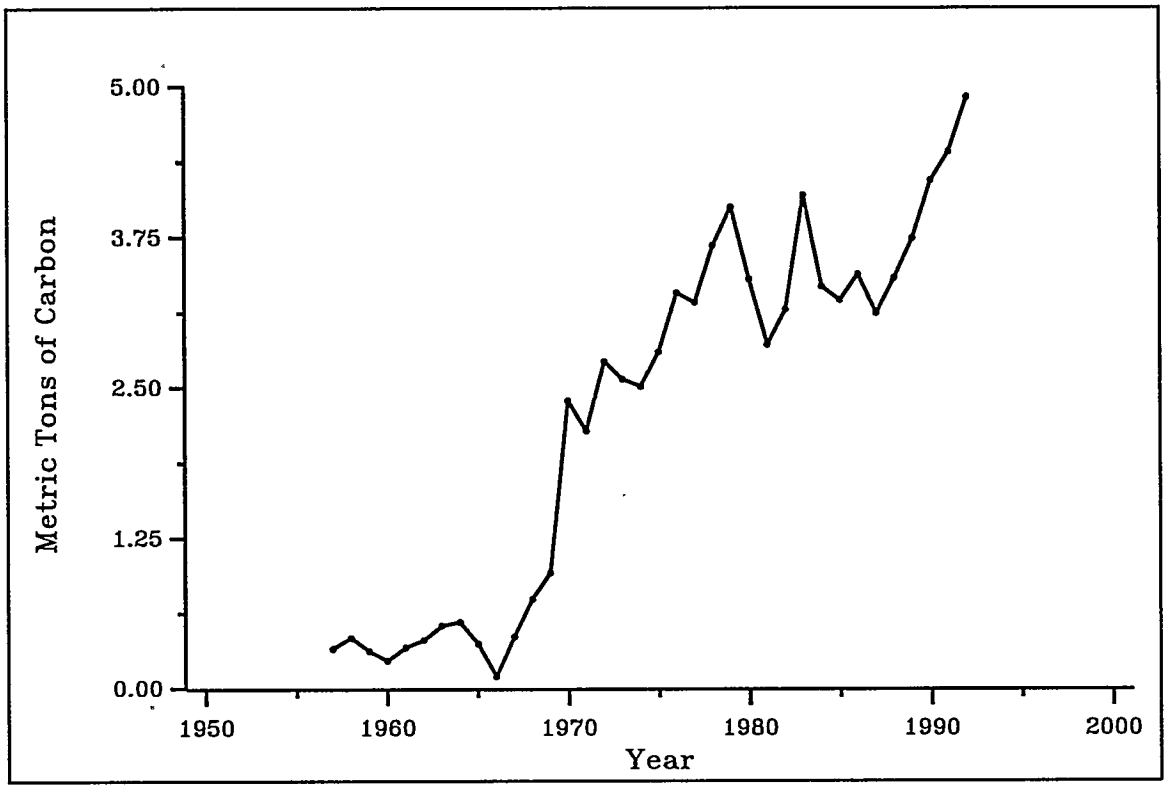
Sierra Leone

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	44	29	14	0	0	0	0.02	.
1951	26	10	16	0	0	0	0.01	.
1952	49	30	19	0	0	0	0.02	.
1953	46	24	22	0	0	0	0.02	.
1954	34	12	23	0	0	0	0.02	.
1955	50	23	28	0	0	0	0.02	.
1956	49	18	32	0	0	0	0.02	.
1957	106	19	87	0	0	0	0.05	.
1958	57	23	34	0	0	0	0.03	.
1959	64	12	53	0	0	0	0.03	.
1960	195	8	187	0	0	0	0.09	.
1961	79	8	71	0	0	0	0.03	.
1962	89	12	77	0	0	0	0.04	.
1963	101	4	97	0	0	0	0.04	.
1964	83	0	83	0	0	0	0.03	.
1965	77	3	74	0	0	0	0.03	.
1966	82	0	82	0	0	0	0.03	.
1967	69	0	69	0	0	0	0.03	.
1968	105	0	99	0	6	0	0.04	.
1969	302	0	296	0	6	0	0.12	.
1970	197	0	193	0	4	0	0.07	.
1971	177	0	177	0	0	0	0.07	.
1972	131	0	131	0	0	0	0.05	.
1973	101	0	101	0	0	0	0.04	.
1974	96	0	96	0	0	0	0.03	.
1975	91	0	91	0	0	0	0.03	.
1976	111	0	111	0	0	0	0.04	.
1977	135	0	135	0	0	0	0.04	.
1978	193	0	193	0	0	0	0.06	.
1979	182	0	182	0	0	0	0.06	.
1980	161	0	161	0	0	0	0.05	.
1981	182	0	182	0	0	0	0.05	.
1982	145	0	145	0	0	0	0.04	.
1983	185	0	185	0	0	0	0.05	.
1984	162	0	162	0	0	0	0.05	.
1985	172	0	172	0	0	0	0.05	.
1986	174	0	174	0	0	0	0.05	.
1987	123	0	123	0	0	0	0.03	.
1988	113	0	113	0	0	0	0.03	.
1989	90	0	90	0	0	0	0.02	.
1990	93	0	93	0	0	0	0.02	.
1991	116	0	116	0	0	0	0.03	.
1992	118	0	118	0	0	0	0.03	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Singapore

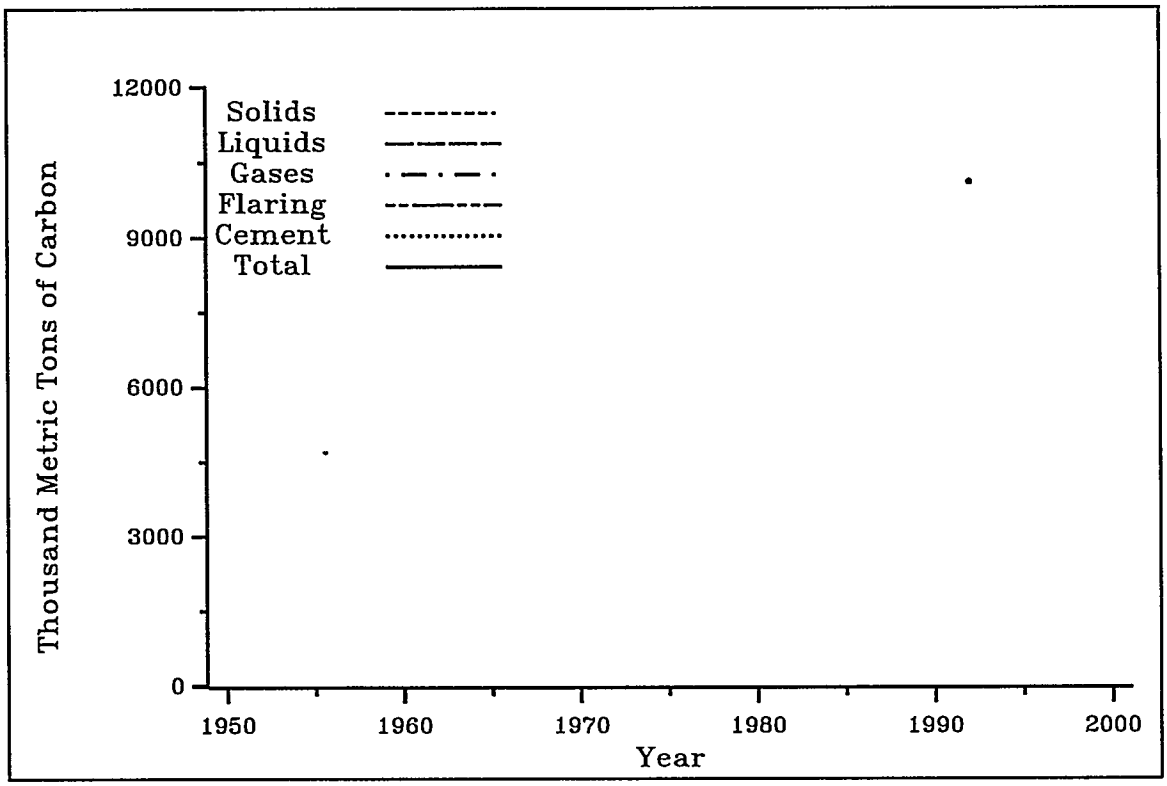


Per capita CO_2 emission rates for Singapore

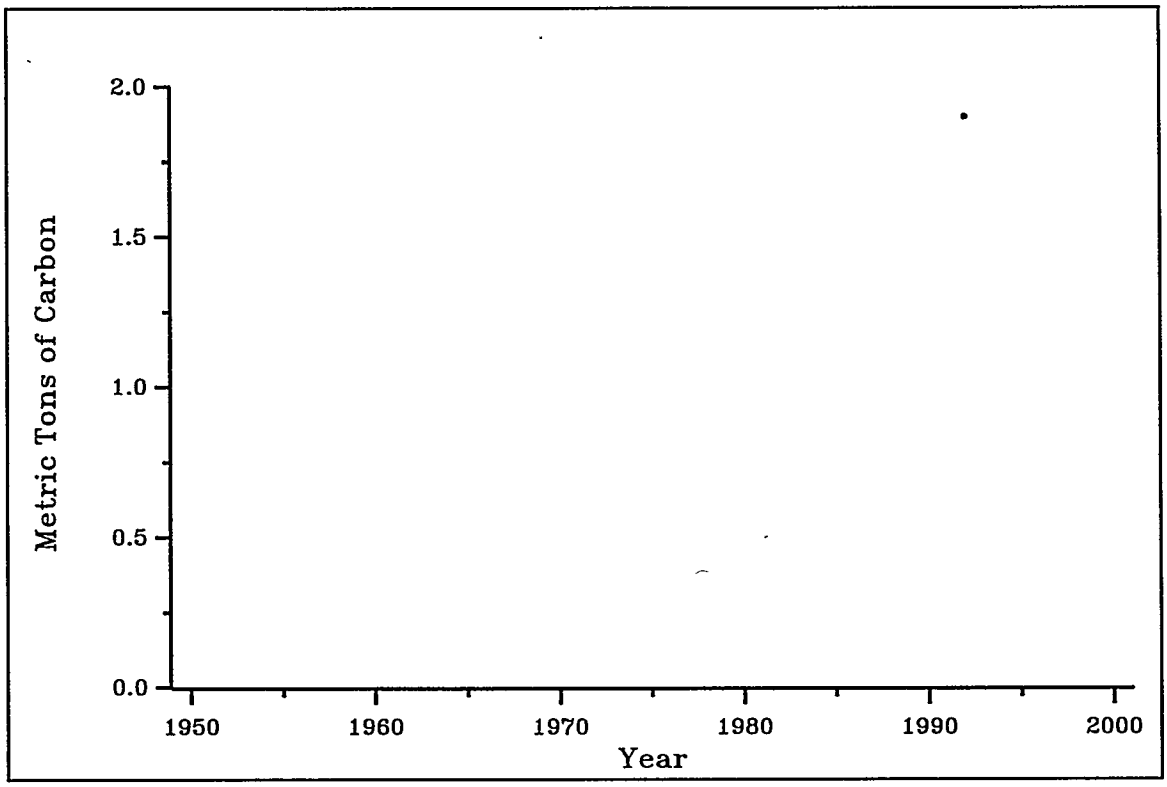
Singapore

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1957	473	35	438	0	0	0	0.33	1946
1958	627	15	613	0	0	0	0.42	1748
1959	491	10	481	0	0	0	0.31	1616
1960	380	3	378	0	0	0	0.23	1684
1961	571	2	569	0	0	0	0.34	2085
1962	702	9	677	0	17	0	0.40	2311
1963	928	6	896	0	26	0	0.52	2307
1964	1010	6	977	0	27	0	0.55	2193
1965	690	3	659	0	28	0	0.37	2544
1966	183	4	126	0	53	0	0.10	2684
1967	834	2	768	0	64	0	0.43	3114
1968	1478	6	1396	0	77	0	0.74	3595
1969	1965	2	1878	0	85	0	0.96	3537
1970	4964	3	4863	0	99	0	2.39	3652
1971	4525	5	4437	0	83	0	2.14	2806
1972	5856	3	5716	0	137	0	2.72	4418
1973	5637	4	5493	0	140	0	2.57	4135
1974	5584	5	5436	0	143	0	2.51	3709
1975	6343	1	6162	0	180	0	2.80	3199
1976	7545	3	7358	0	184	0	3.29	3838
1977	7458	4	7271	0	184	0	3.21	3783
1978	8669	4	8481	0	184	0	3.68	3847
1979	9540	1	9355	0	184	0	4.00	3950
1980	8217	3	7949	0	266	0	3.40	3975
1981	6985	5	6674	0	307	0	2.86	4331
1982	7798	2	7430	0	367	0	3.15	5345
1983	10252	3	9820	0	429	0	4.10	4925
1984	8439	6	8050	0	384	0	3.34	4929
1985	8267	12	7984	0	271	0	3.23	5100
1986	8900	7	8648	0	245	0	3.44	5115
1987	8179	11	7960	0	208	0	3.12	7740
1988	9042	13	8811	0	217	0	3.41	5344
1989	10021	12	9777	0	232	0	3.74	6092
1990	11442	22	11168	0	252	0	4.22	6750
1991	12227	12	11943	0	271	0	4.46	7695
1992	13589	18	13312	0	259	0	4.91	8208

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Slovakia

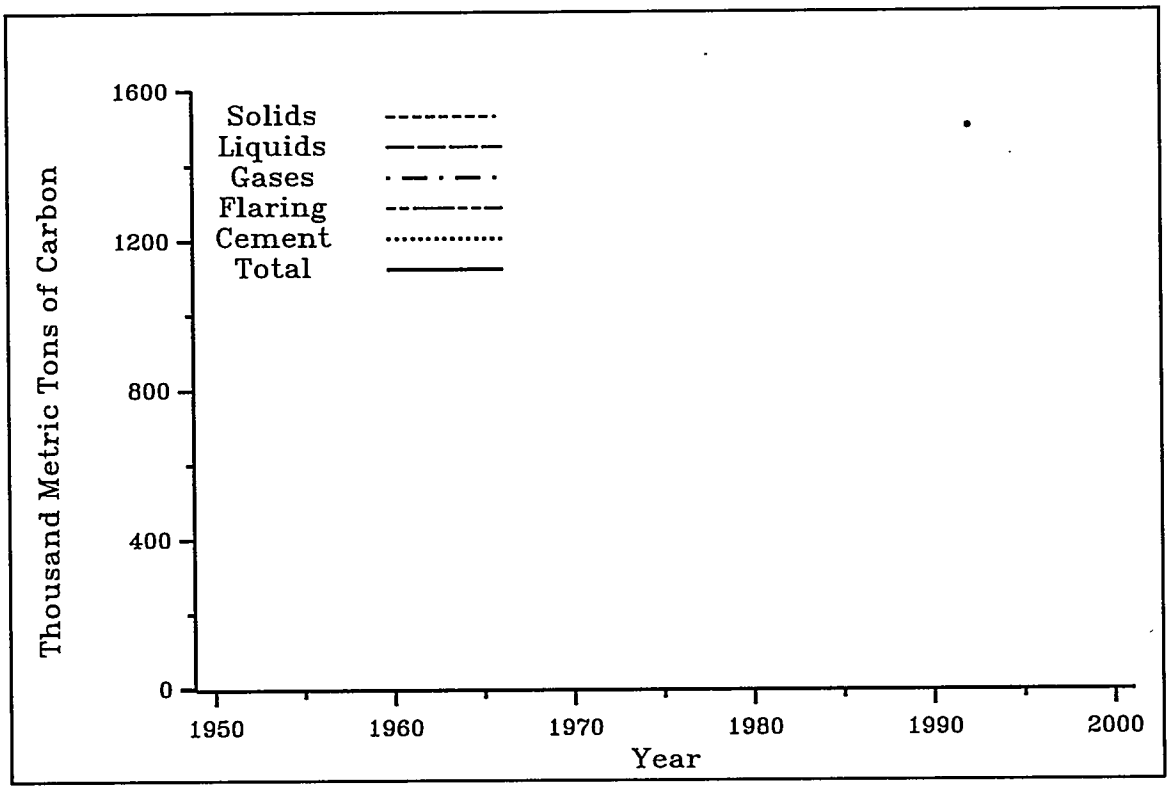


Per capita CO_2 emission rates for Slovakia

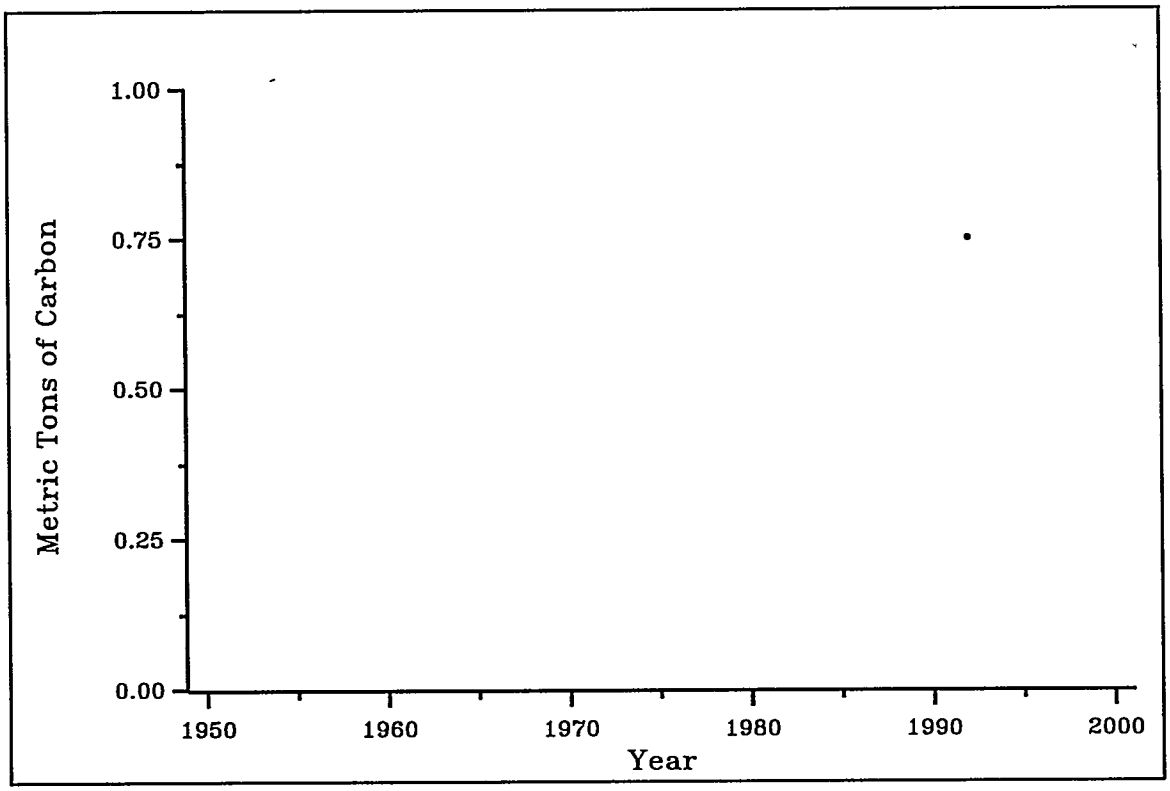
Slovakia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	10098	4187	2859	3052	0	0	1.90	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Slovenia

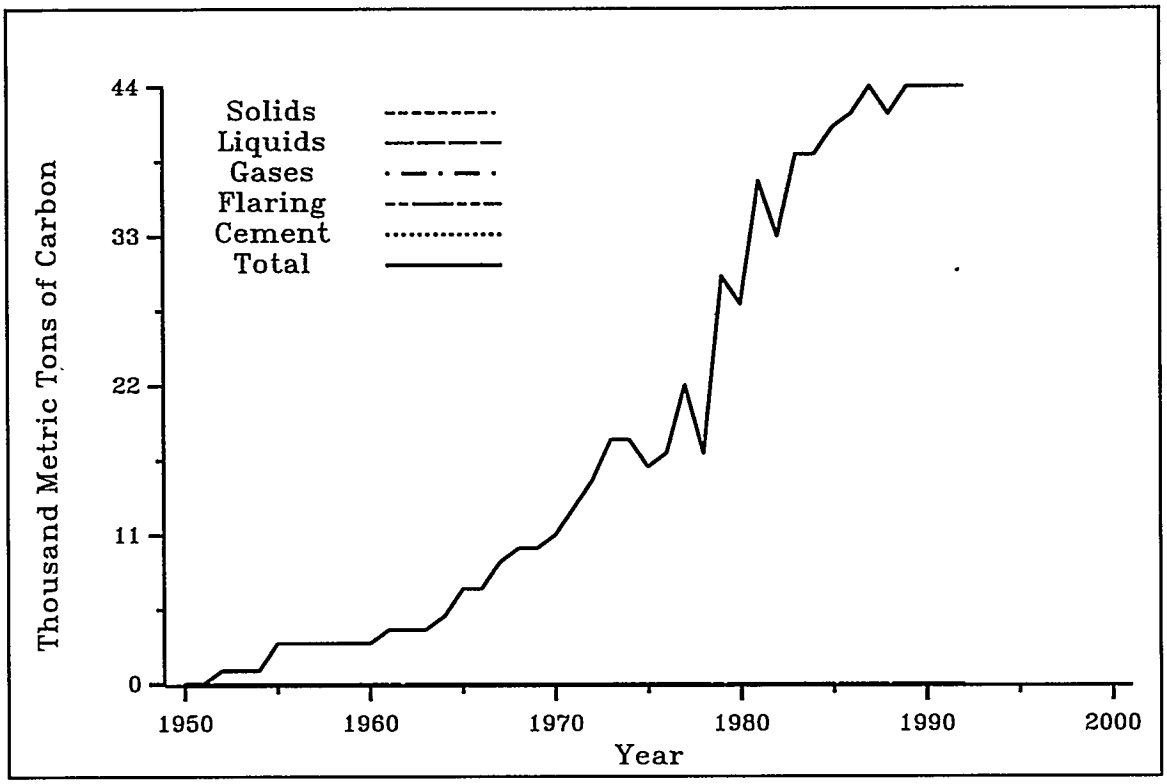


Per capita CO_2 emission rates for Slovenia

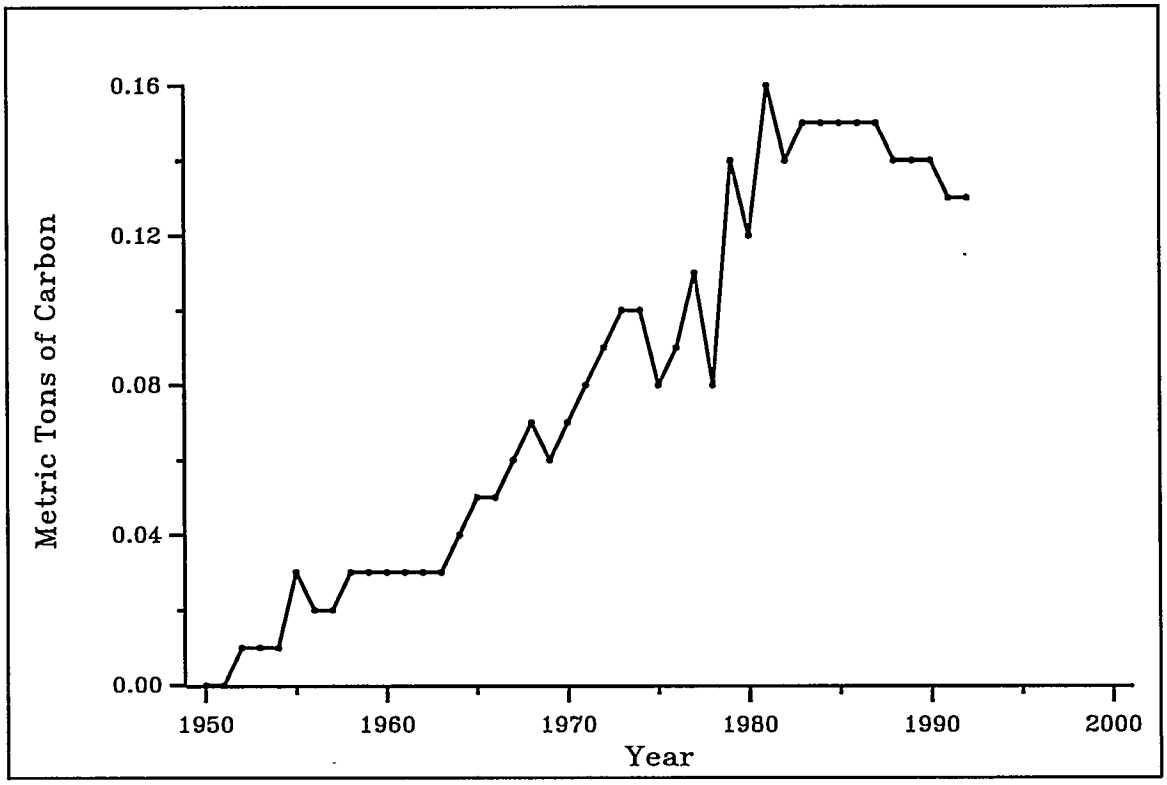
Slovenia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	1502	847	370	175	111	0	0.75	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Solomon Islands

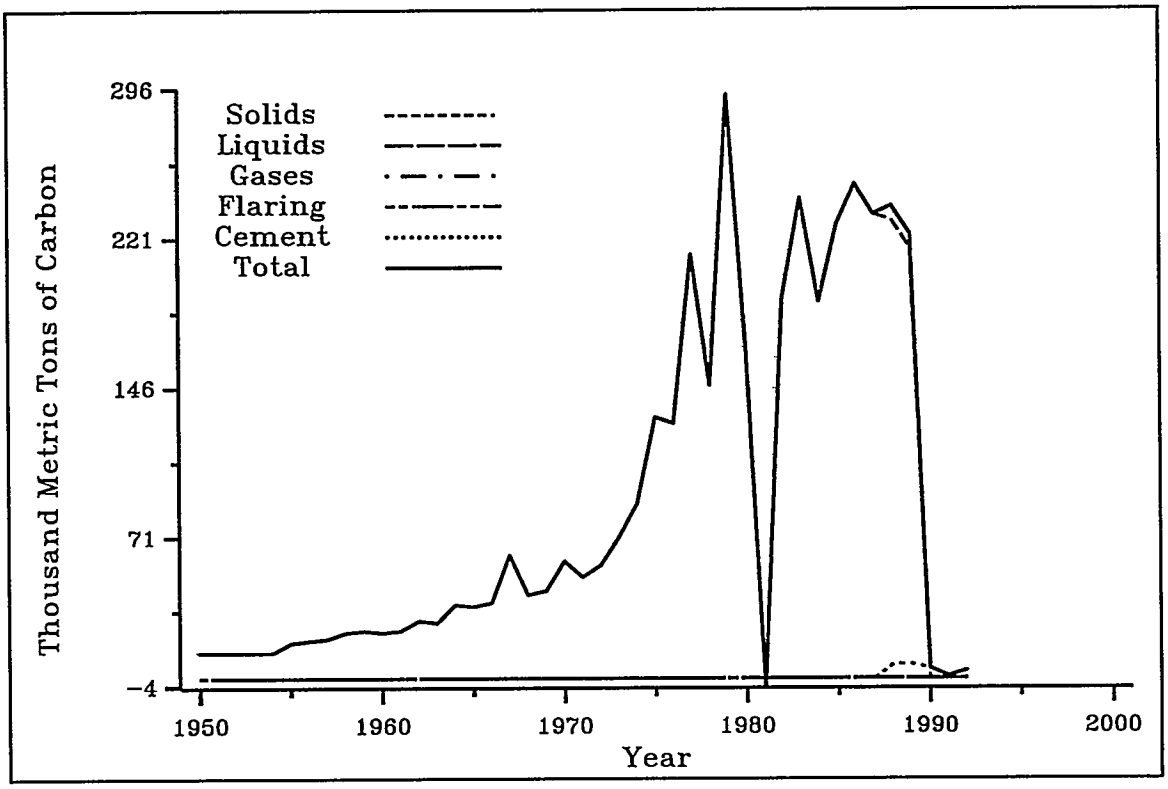


Per capita CO_2 emission rates for the Solomon Islands

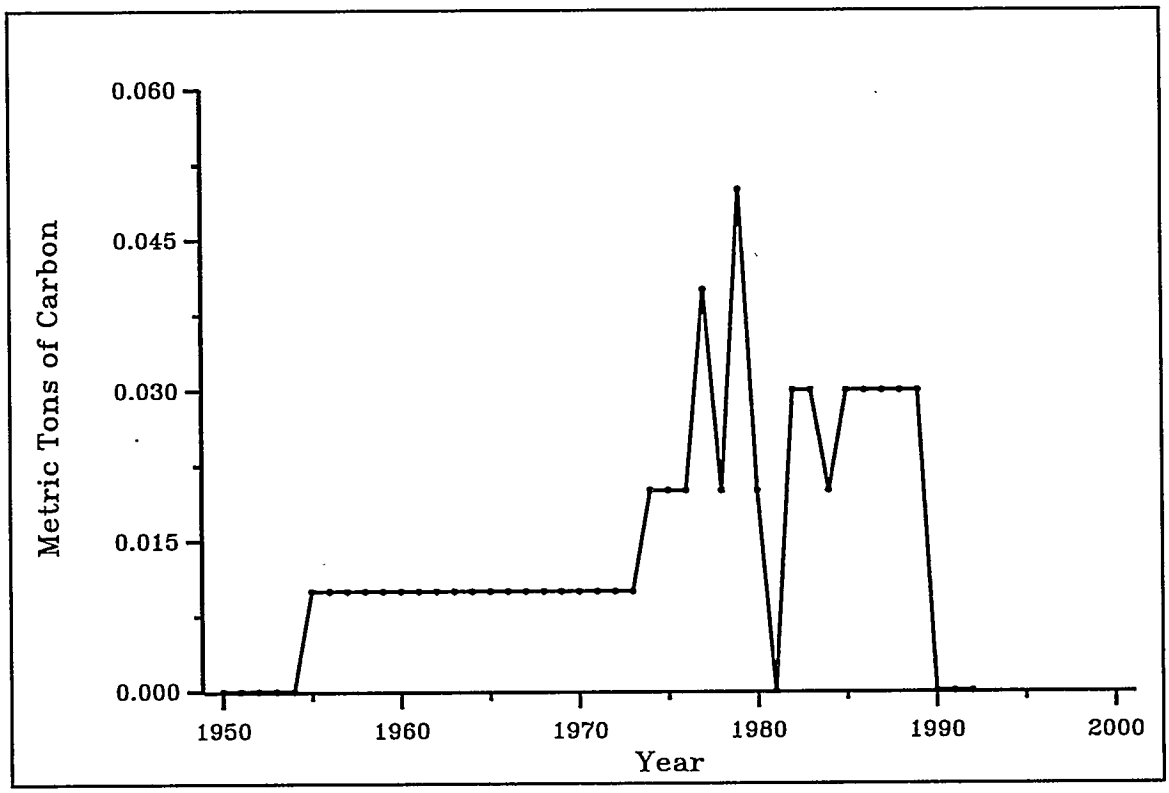
Solomon Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	1	0	1	0	0	0	0.01	.
1953	1	0	1	0	0	0	0.01	.
1954	1	0	1	0	0	0	0.01	.
1955	3	0	3	0	0	0	0.03	.
1956	3	0	3	0	0	0	0.02	.
1957	3	0	3	0	0	0	0.02	.
1958	3	0	3	0	0	0	0.03	.
1959	3	0	3	0	0	0	0.03	.
1960	3	0	3	0	0	0	0.03	.
1961	4	0	4	0	0	0	0.03	.
1962	4	0	4	0	0	0	0.03	.
1963	4	0	4	0	0	0	0.03	.
1964	5	0	5	0	0	0	0.04	.
1965	7	0	7	0	0	0	0.05	.
1966	7	0	7	0	0	0	0.05	.
1967	9	0	9	0	0	0	0.06	.
1968	10	0	10	0	0	0	0.07	.
1969	10	0	10	0	0	0	0.06	.
1970	11	0	11	0	0	0	0.07	.
1971	13	0	13	0	0	0	0.08	.
1972	15	0	15	0	0	0	0.09	.
1973	18	0	18	0	0	0	0.10	.
1974	18	0	18	0	0	0	0.10	.
1975	16	0	16	0	0	0	0.08	.
1976	17	0	17	0	0	0	0.09	.
1977	22	0	22	0	0	0	0.11	.
1978	17	0	17	0	0	0	0.08	.
1979	30	0	30	0	0	0	0.14	.
1980	28	0	28	0	0	0	0.12	.
1981	37	0	37	0	0	0	0.16	.
1982	33	0	33	0	0	0	0.14	.
1983	39	0	39	0	0	0	0.15	.
1984	39	0	39	0	0	0	0.15	.
1985	41	0	41	0	0	0	0.15	.
1986	42	0	42	0	0	0	0.15	.
1987	44	0	44	0	0	0	0.15	.
1988	42	0	42	0	0	0	0.14	.
1989	44	0	44	0	0	0	0.14	.
1990	44	0	44	0	0	0	0.14	.
1991	44	0	44	0	0	0	0.13	.
1992	44	0	44	0	0	0	0.13	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Somalia

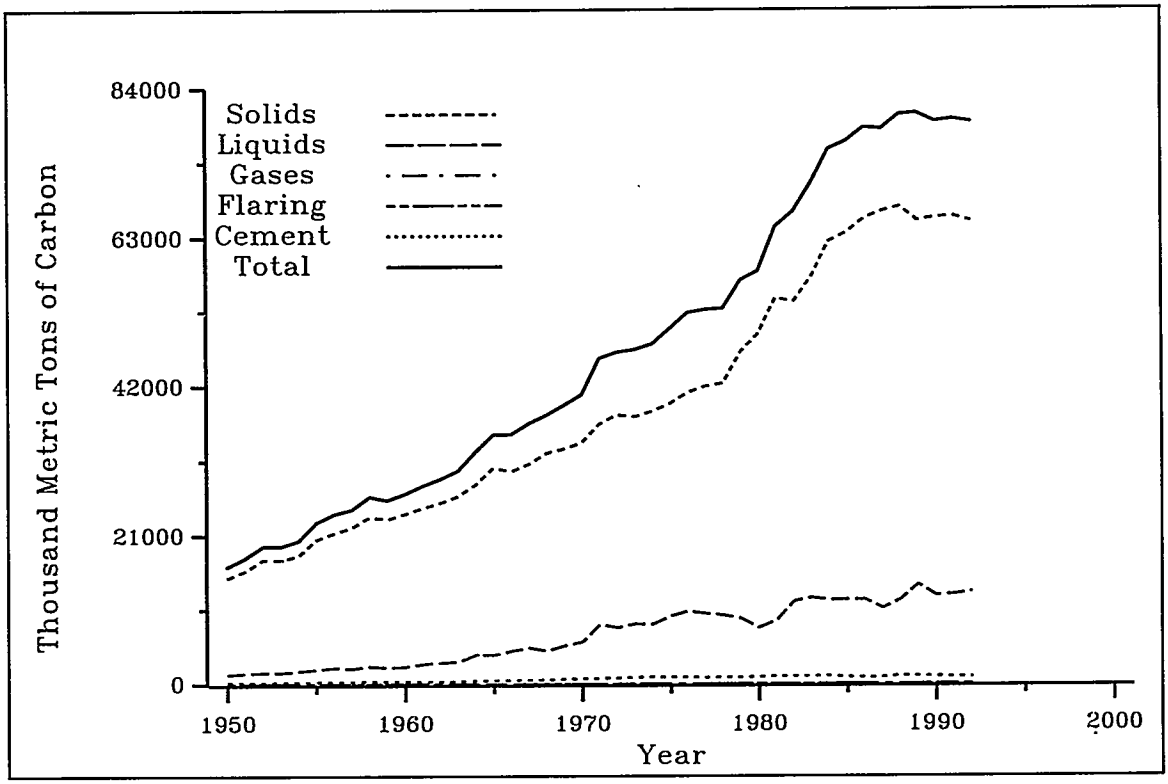


Per capita CO_2 emission rates for Somalia

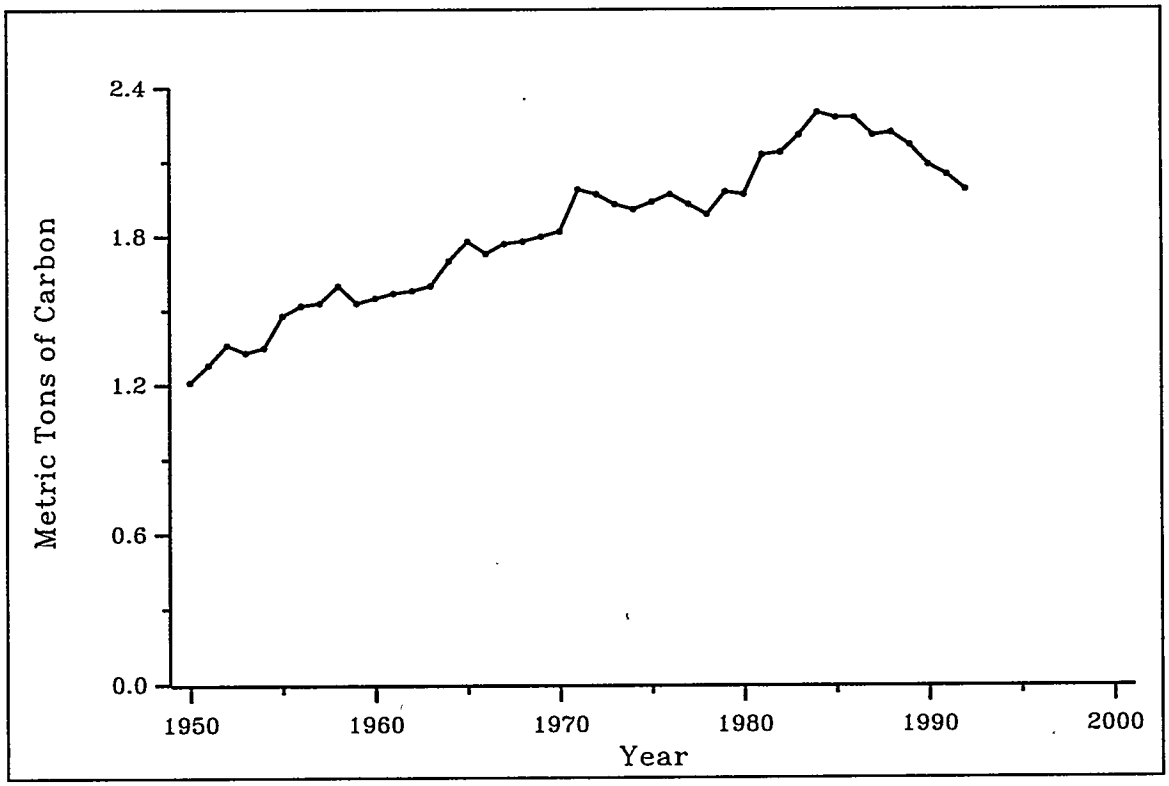
Somalia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	13	0	13	0	0	0	0.00	.
1951	13	0	13	0	0	0	0.00	.
1952	13	0	13	0	0	0	0.00	.
1953	13	0	13	0	0	0	0.00	.
1954	13	0	13	0	0	0	0.00	.
1955	18	0	18	0	0	0	0.01	.
1956	19	0	19	0	0	0	0.01	.
1957	20	0	20	0	0	0	0.01	.
1958	23	0	23	0	0	0	0.01	.
1959	24	0	24	0	0	0	0.01	.
1960	23	0	23	0	0	0	0.01	.
1961	24	0	24	0	0	0	0.01	.
1962	29	0	29	0	0	0	0.01	.
1963	28	0	28	0	0	0	0.01	.
1964	37	0	37	0	0	0	0.01	.
1965	36	0	36	0	0	0	0.01	.
1966	38	0	38	0	0	0	0.01	.
1967	62	0	62	0	0	0	0.01	.
1968	42	0	42	0	0	0	0.01	.
1969	44	0	44	0	0	0	0.01	.
1970	59	0	59	0	0	0	0.01	.
1971	51	0	51	0	0	0	0.01	.
1972	57	0	57	0	0	0	0.01	.
1973	71	0	71	0	0	0	0.01	.
1974	88	0	88	0	0	0	0.02	.
1975	131	0	131	0	0	0	0.02	.
1976	128	0	128	0	0	0	0.02	.
1977	213	0	213	0	0	0	0.04	.
1978	147	0	147	0	0	0	0.02	.
1979	293	0	293	0	0	0	0.05	.
1980	166	0	166	0	0	0	0.02	.
1981	-4	0	-4	0	0	0	0.00	.
1982	191	0	191	0	0	0	0.03	.
1983	241	0	241	0	0	0	0.03	.
1984	189	0	189	0	0	0	0.02	.
1985	228	0	228	0	0	0	0.03	.
1986	248	0	248	0	0	0	0.03	.
1987	233	0	233	0	0	0	0.03	.
1988	237	0	230	0	7	0	0.03	.
1989	223	0	216	0	7	0	0.03	.
1990	5	0	0	0	5	0	0.00	.
1991	1	0	0	0	1	0	0.00	.
1992	4	0	0	0	4	0	0.00	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for South Africa

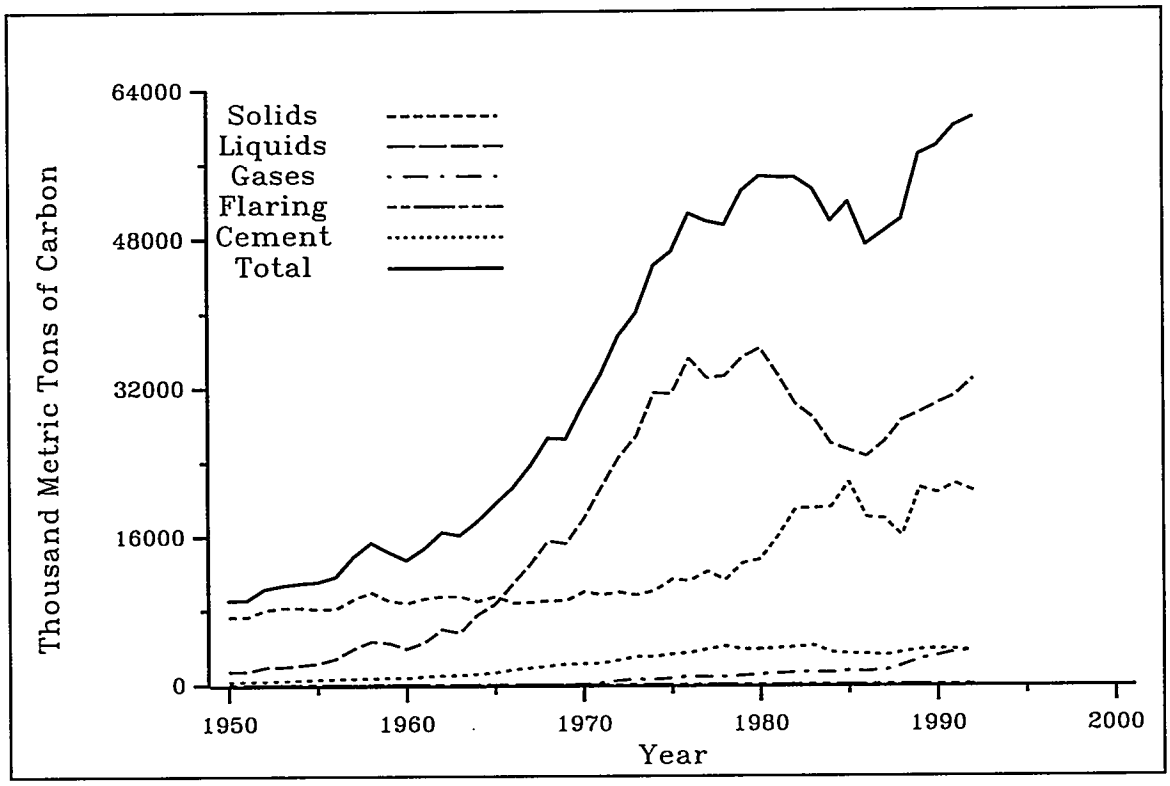


Per capita CO_2 emission rates for South Africa

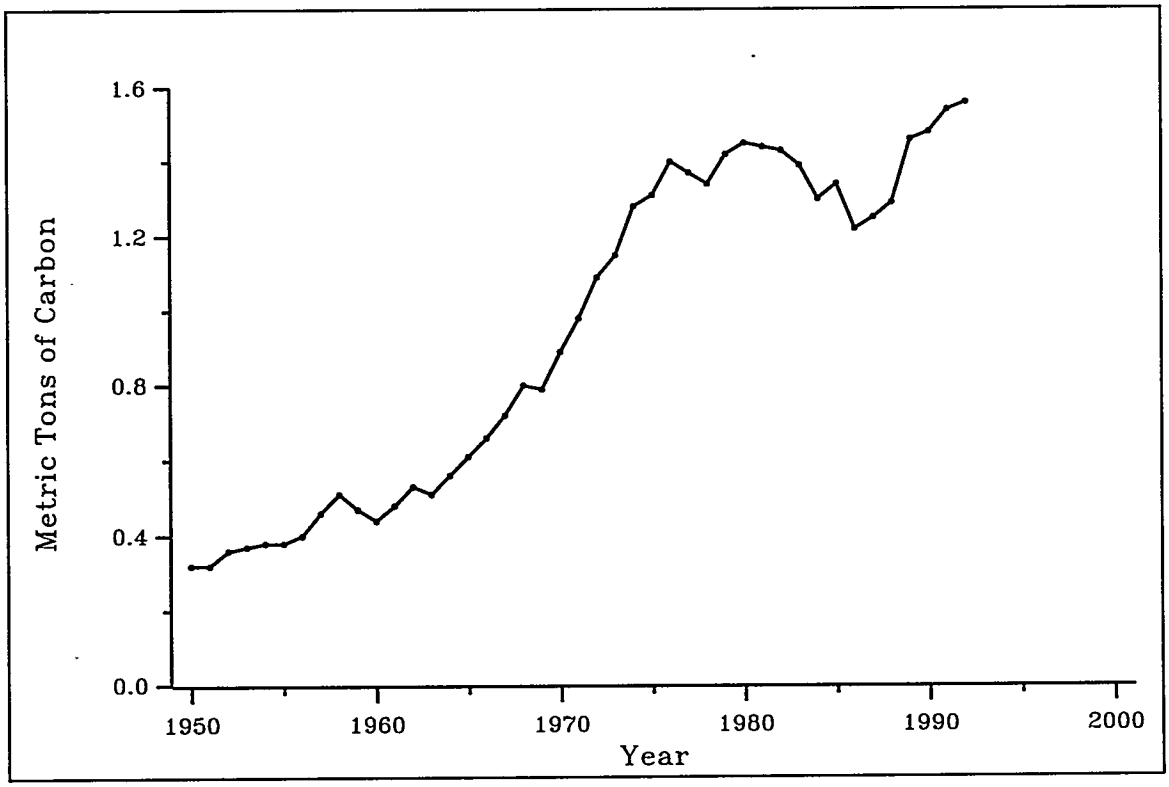
South Africa

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	16620	15018	1350	0	251	0	1.21	721
1951	17842	16035	1541	0	266	0	1.28	627
1952	19489	17582	1632	0	275	0	1.36	430
1953	19481	17538	1654	0	289	0	1.33	368
1954	20288	18145	1849	0	294	0	1.35	401
1955	22819	20419	2082	0	318	0	1.48	436
1956	24015	21355	2323	0	337	0	1.52	679
1957	24677	22135	2199	0	344	0	1.53	1122
1958	26492	23612	2510	0	370	0	1.60	485
1959	26014	23295	2359	0	360	0	1.53	391
1960	26907	24064	2475	0	368	0	1.55	359
1961	28075	24892	2829	0	353	0	1.57	456
1962	29002	25613	3027	0	362	0	1.58	438
1963	30141	26557	3192	0	392	0	1.60	500
1964	32842	28200	4172	0	470	0	1.70	729
1965	35219	30564	4127	0	528	0	1.78	734
1966	35257	30016	4699	0	542	0	1.73	967
1967	36766	31070	5151	0	545	0	1.77	2006
1968	37930	32609	4721	0	600	0	1.78	2864
1969	39341	33213	5434	0	694	0	1.80	2556
1970	40795	34057	5955	0	782	0	1.82	2870
1971	45888	36681	8410	0	796	0	1.99	3028
1972	46768	37971	7966	0	831	0	1.97	2916
1973	47128	37693	8501	0	934	0	1.93	2798
1974	47911	38470	8448	0	993	0	1.91	2665
1975	50099	39527	9596	0	976	0	1.94	2518
1976	52305	41062	10285	0	959	0	1.97	1828
1977	52754	41916	9944	0	894	0	1.93	2070
1978	52955	42331	9695	0	928	0	1.89	2262
1979	56949	46774	9237	0	938	0	1.98	2360
1980	58230	49312	7939	0	979	0	1.97	2753
1981	64510	54449	8960	0	1101	0	2.13	3057
1982	66599	53853	11656	0	1089	0	2.14	.
1983	70545	57312	12159	0	1074	0	2.21	.
1984	75379	62404	11862	0	1114	0	2.30	.
1985	76446	63606	11883	0	957	0	2.28	.
1986	78402	65598	11891	0	913	0	2.28	.
1987	78189	66606	10667	0	916	0	2.21	.
1988	80265	67252	11859	0	1154	0	2.22	.
1989	80449	65328	14028	0	1092	0	2.17	.
1990	79292	65738	12492	0	1062	0	2.09	.
1991	79597	65961	12627	0	1010	0	2.05	.
1992	79228	65267	12976	0	986	0	1.99	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Spain

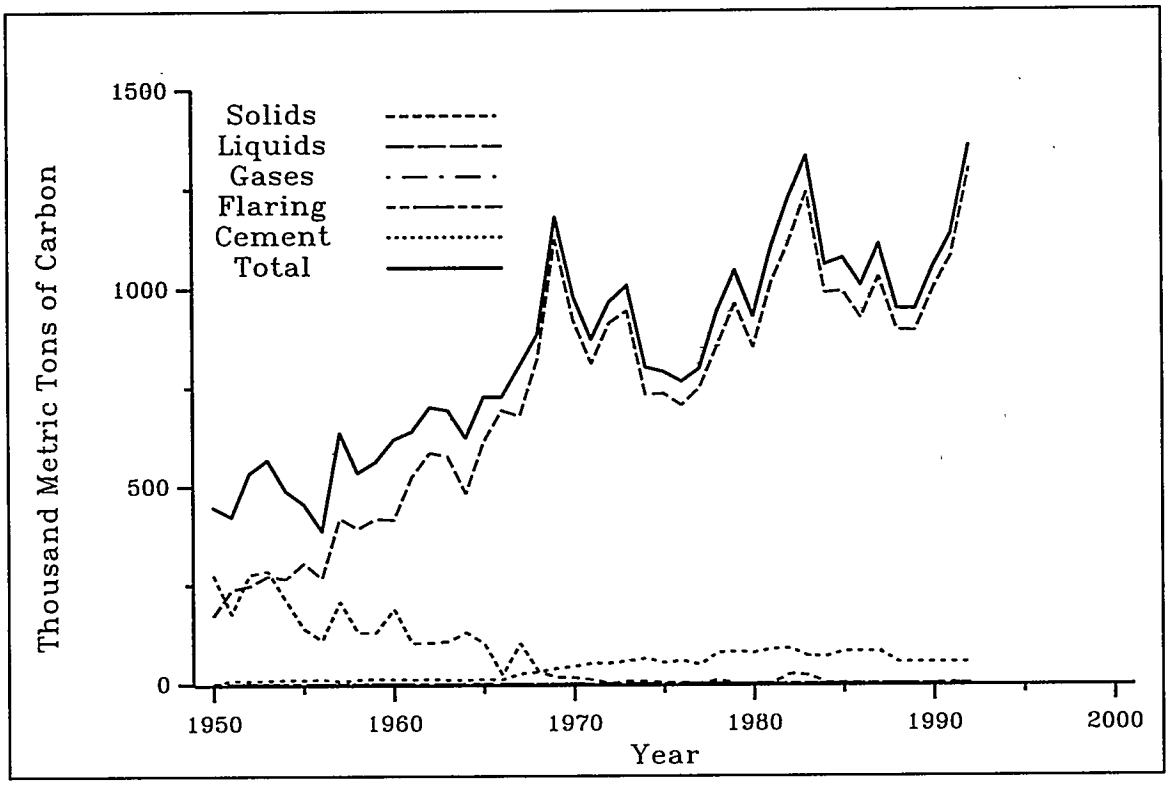


Per capita CO_2 emission rates for Spain

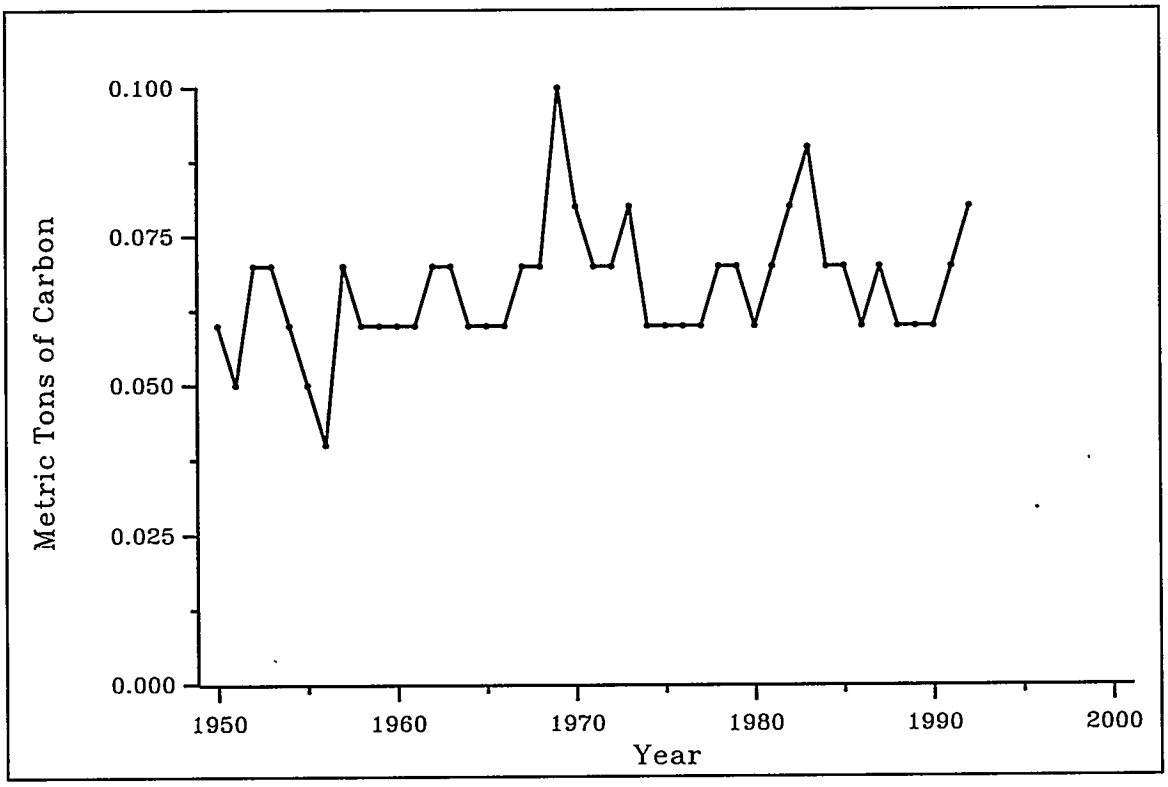
Spain

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	9087	7304	1440	0	343	0	0.32	1527
1951	9107	7284	1450	0	373	0	0.32	1648
1952	10340	8032	1905	0	403	0	0.36	1771
1953	10703	8291	1969	0	443	0	0.37	1921
1954	10921	8284	2119	0	518	0	0.38	2006
1955	11069	8153	2327	0	589	0	0.38	2162
1956	11630	8148	2840	0	643	0	0.40	2417
1957	13787	9204	3907	0	676	0	0.46	3362
1958	15339	9950	4664	0	724	0	0.51	2698
1959	14300	9022	4499	0	779	0	0.47	2601
1960	13423	8759	3885	0	780	0	0.44	2750
1961	14719	9245	4572	0	901	0	0.48	2968
1962	16458	9500	5965	0	992	0	0.53	2886
1963	16120	9489	5576	1	1054	0	0.51	3107
1964	17639	8955	7526	1	1156	0	0.56	3166
1965	19471	9485	8666	2	1318	0	0.61	3311
1966	21267	8783	10839	4	1642	0	0.66	3459
1967	23664	8843	12988	2	1832	0	0.72	4147
1968	26564	9004	15525	1	2034	0	0.80	4725
1969	26493	9023	15216	34	2219	0	0.79	4740
1970	30194	9991	17886	45	2272	0	0.89	2318
1971	33430	9642	21231	223	2334	0	0.98	2337
1972	37561	9934	24521	444	2662	0	1.09	2586
1973	40040	9640	26769	589	3042	0	1.15	2521
1974	45121	10095	31435	565	3025	0	1.28	2542
1975	46602	11304	31328	693	3277	0	1.31	1747
1976	50603	11147	35124	904	3427	0	1.40	1821
1977	49795	12156	32995	837	3807	0	1.37	1818
1978	49391	11227	33210	843	4112	0	1.34	1705
1979	53015	13067	35195	957	3796	0	1.42	2382
1980	54596	13475	36223	1088	3809	0	1.45	2132
1981	54462	15986	33363	1203	3910	0	1.44	1979
1982	54481	18945	30209	1307	4021	0	1.43	2281
1983	53200	18986	28712	1336	4167	0	1.39	2544
1984	49781	19126	25922	1273	3459	0	1.30	2752
1985	51783	21799	25225	1469	3291	0	1.34	3038
1986	47295	18016	24584	1384	3270	42	1.22	3406
1987	48628	17874	26089	1497	3130	38	1.25	4091
1988	49993	16029	28421	2049	3455	39	1.29	3627
1989	56944	21183	29266	2732	3723	40	1.46	3722
1990	57842	20642	30241	3104	3821	34	1.48	4281
1991	60011	21644	31085	3497	3751	34	1.54	4608
1992	60916	20833	32849	3623	3578	34	1.56	4379

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Sri Lanka

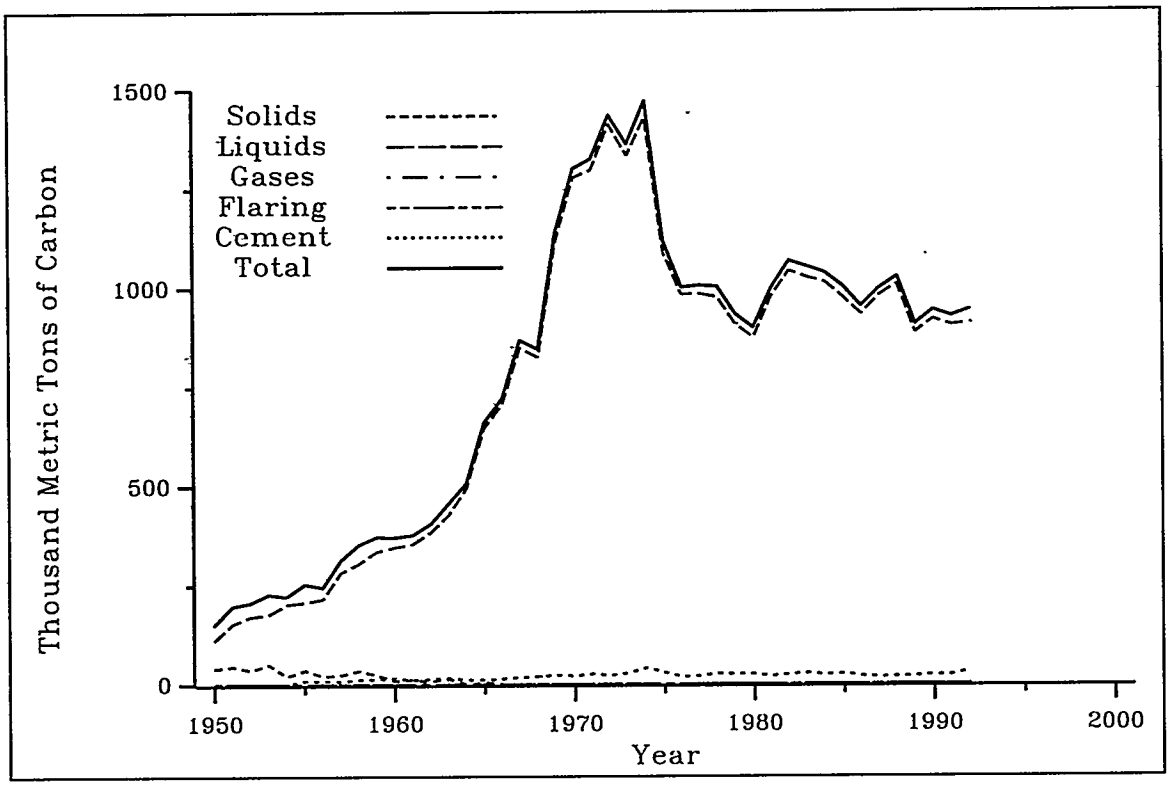


Per capita CO_2 emission rates for Sri Lanka

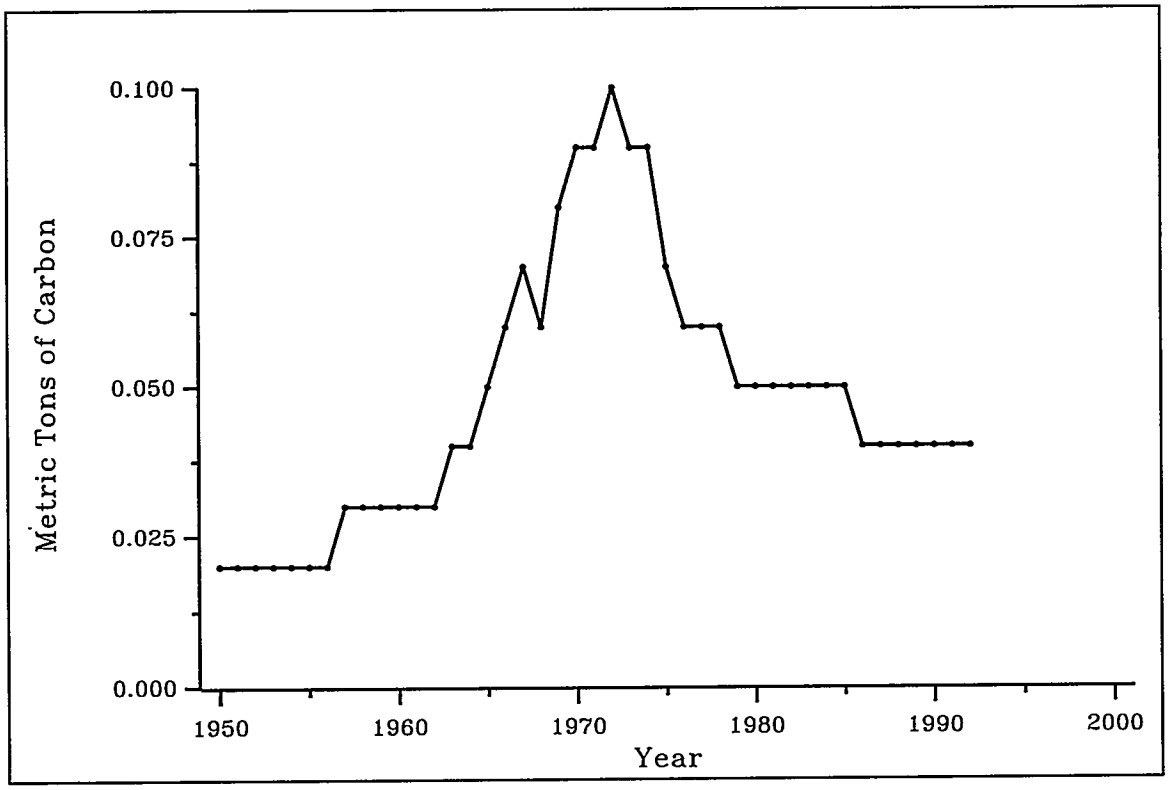
Sri Lanka

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	447	275	172	0	0	0	0.06	.
1951	424	177	238	0	9	0	0.05	.
1952	533	277	248	0	8	0	0.07	.
1953	567	286	273	0	9	0	0.07	.
1954	490	212	266	0	11	0	0.06	.
1955	456	140	306	0	10	0	0.05	.
1956	388	110	267	0	12	0	0.04	.
1957	635	208	420	0	7	0	0.07	.
1958	534	130	393	0	11	0	0.06	.
1959	562	130	419	0	13	0	0.06	.
1960	618	190	416	0	12	0	0.06	.
1961	638	103	524	0	11	0	0.06	.
1962	700	104	584	0	12	0	0.07	.
1963	692	107	575	0	10	0	0.07	.
1964	622	130	482	0	10	0	0.06	.
1965	726	102	612	0	12	0	0.06	.
1966	726	23	692	0	11	0	0.06	.
1967	805	102	677	0	26	0	0.07	.
1968	885	31	823	0	30	0	0.07	.
1969	1179	17	1123	0	39	0	0.10	.
1970	981	16	921	0	44	0	0.08	.
1971	872	10	810	0	52	0	0.07	.
1972	966	1	913	0	52	0	0.07	.
1973	1007	6	944	0	57	0	0.08	.
1974	801	6	731	0	64	0	0.06	.
1975	790	3	734	0	53	0	0.06	.
1976	765	3	704	0	58	0	0.06	.
1977	797	1	748	0	48	0	0.06	.
1978	942	9	855	0	78	0	0.07	.
1979	1044	1	962	0	81	0	0.07	.
1980	930	1	851	0	78	0	0.06	.
1981	1100	1	1011	0	87	0	0.07	.
1982	1228	24	1115	0	89	0	0.08	.
1983	1332	21	1242	0	69	0	0.09	.
1984	1059	2	989	0	68	0	0.07	.
1985	1076	2	993	0	81	0	0.07	.
1986	1008	1	925	0	81	0	0.06	.
1987	1110	0	1028	0	81	0	0.07	.
1988	949	0	895	0	54	0	0.06	.
1989	948	1	893	0	54	0	0.06	.
1990	1052	1	997	0	54	0	0.06	.
1991	1136	2	1080	0	54	0	0.07	.
1992	1357	1	1301	0	54	0	0.08	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Sudan

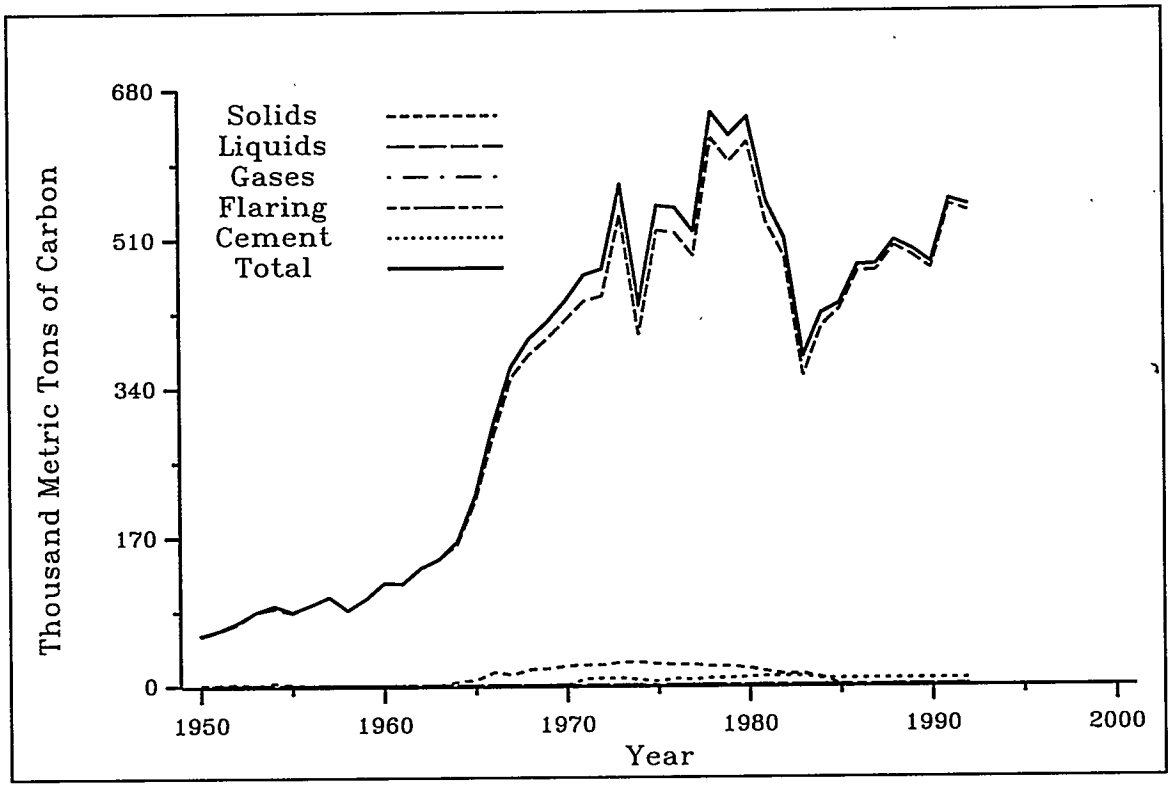


Per capita CO_2 emission rates for Sudan

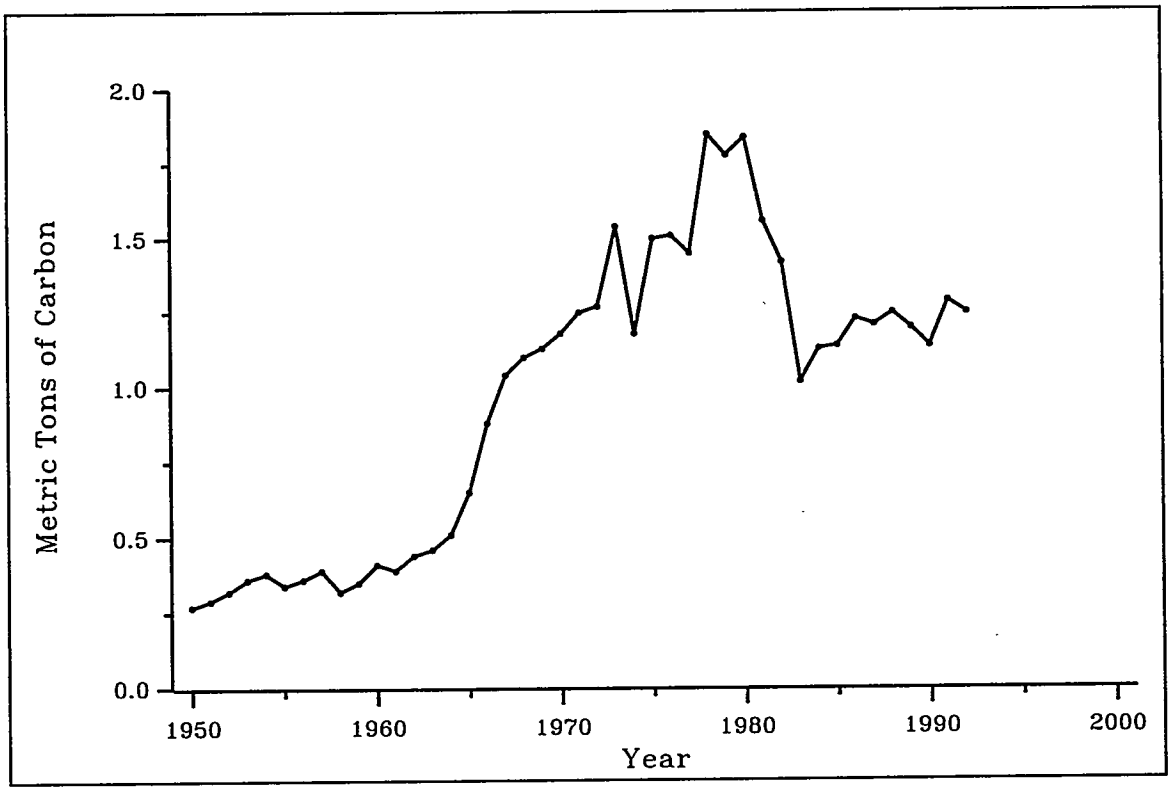
Sudan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	151	40	111	0	0	0	0.02	.
1951	198	45	153	0	0	0	0.02	.
1952	207	36	172	0	0	0	0.02	.
1953	228	50	177	0	0	0	0.02	.
1954	223	21	203	0	0	0	0.02	.
1955	254	36	208	0	9	0	0.02	.
1956	246	21	216	0	9	0	0.02	.
1957	315	24	283	0	8	0	0.03	.
1958	353	35	306	0	12	0	0.03	.
1959	373	23	336	0	14	0	0.03	.
1960	372	9	347	0	16	0	0.03	.
1961	378	12	355	0	11	0	0.03	.
1962	406	7	384	0	14	0	0.03	.
1963	457	14	428	0	16	0	0.04	.
1964	507	0	495	0	12	0	0.04	.
1965	661	5	646	0	11	0	0.05	.
1966	721	1	707	0	14	0	0.06	.
1967	869	1	850	0	18	0	0.07	.
1968	847	1	826	0	20	0	0.06	.
1969	1141	1	1117	0	23	0	0.08	.
1970	1302	1	1279	0	21	0	0.09	.
1971	1326	1	1299	0	26	0	0.09	.
1972	1436	0	1414	0	22	0	0.10	.
1973	1364	1	1335	0	28	0	0.09	.
1974	1471	0	1430	0	41	0	0.09	.
1975	1119	0	1090	0	29	0	0.07	.
1976	1001	0	984	0	18	0	0.06	.
1977	1006	0	985	0	21	0	0.06	.
1978	1003	0	977	0	26	0	0.06	.
1979	934	0	909	0	25	0	0.05	.
1980	900	0	875	0	25	0	0.05	.
1981	998	0	978	0	20	0	0.05	.
1982	1068	0	1043	0	25	0	0.05	.
1983	1054	0	1026	0	27	0	0.05	.
1984	1038	0	1014	0	24	0	0.05	.
1985	1003	0	976	0	26	0	0.05	.
1986	954	0	934	0	20	0	0.04	.
1987	998	0	981	0	17	0	0.04	.
1988	1028	0	1009	0	19	0	0.04	.
1989	909	0	888	0	20	0	0.04	.
1990	944	0	921	0	23	0	0.04	.
1991	929	0	906	0	23	0	0.04	.
1992	945	0	911	0	34	0	0.04	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Suriname

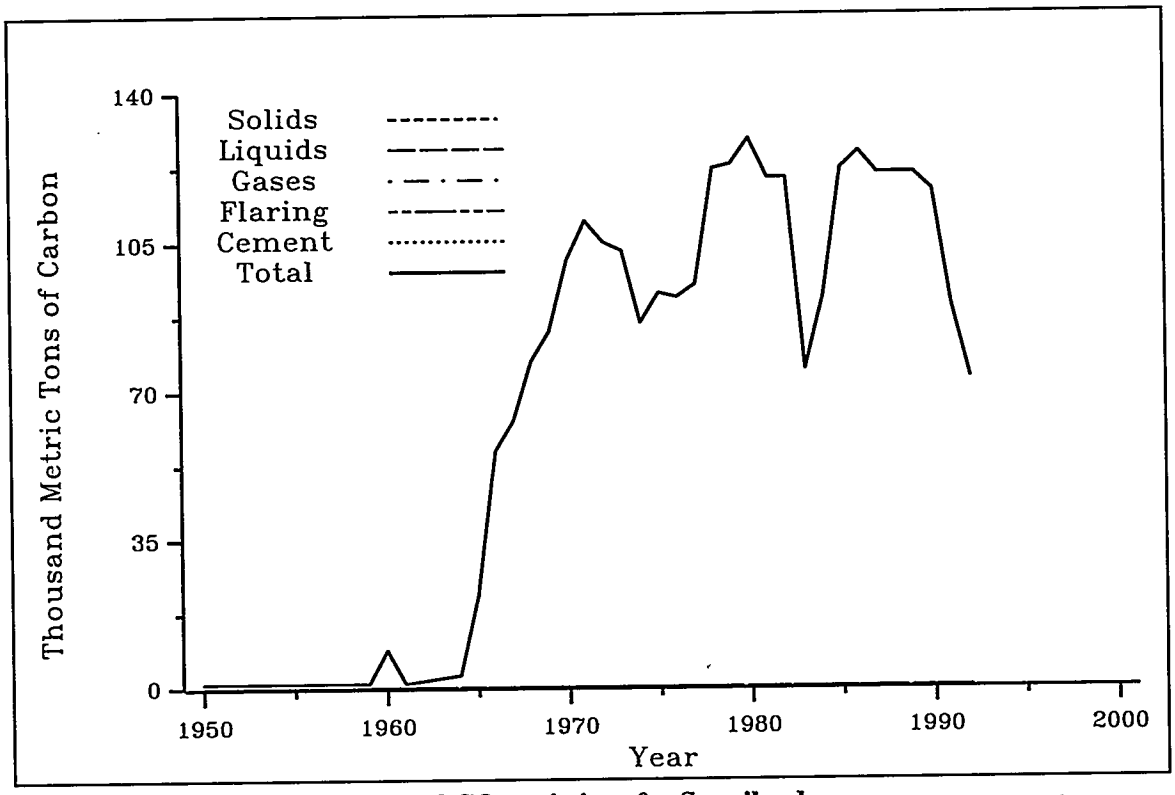


Per capita CO_2 emission rates for Suriname

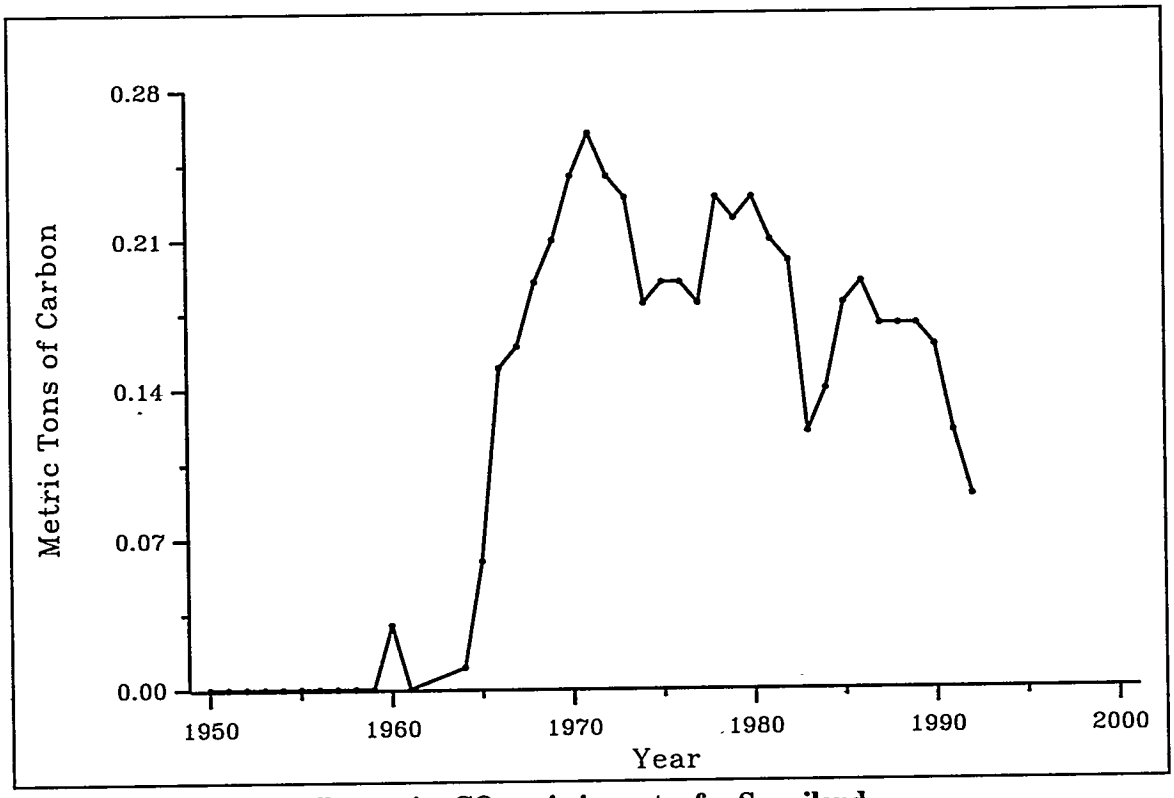
Suriname

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	58	1	57	0	0	0	0.27	.
1951	64	1	63	0	0	0	0.29	.
1952	73	2	71	0	0	0	0.32	.
1953	85	0	85	0	0	0	0.36	.
1954	92	3	89	0	0	0	0.38	.
1955	85	1	84	0	0	0	0.34	.
1956	93	0	93	0	0	0	0.36	.
1957	102	0	102	0	0	0	0.39	.
1958	87	0	87	0	0	0	0.32	.
1959	100	0	100	0	0	0	0.35	.
1960	118	0	118	0	0	0	0.41	.
1961	117	0	117	0	0	0	0.39	.
1962	135	0	135	0	0	0	0.44	.
1963	145	0	145	0	0	0	0.46	.
1964	165	4	162	0	0	0	0.51	.
1965	217	6	211	0	0	0	0.65	.
1966	299	15	285	0	0	0	0.88	.
1967	364	12	352	0	0	0	1.04	.
1968	396	18	378	0	0	0	1.10	.
1969	415	19	396	0	0	0	1.13	.
1970	439	22	417	0	0	0	1.18	.
1971	468	23	438	0	7	0	1.25	.
1972	475	23	444	0	8	0	1.27	.
1973	572	26	538	0	8	0	1.54	.
1974	433	26	400	0	6	0	1.18	.
1975	547	24	519	0	4	0	1.50	.
1976	545	23	516	0	7	0	1.51	.
1977	518	23	490	0	6	0	1.45	.
1978	653	21	624	0	8	0	1.85	.
1979	627	21	597	0	8	0	1.78	.
1980	648	19	620	0	9	0	1.84	.
1981	553	15	528	0	10	0	1.56	.
1982	510	12	489	0	10	0	1.42	.
1983	375	12	353	0	10	0	1.02	.
1984	424	8	409	0	7	0	1.13	.
1985	435	0	429	0	7	0	1.14	.
1986	479	0	472	0	7	0	1.23	.
1987	480	0	473	0	7	0	1.21	.
1988	507	0	501	0	7	0	1.25	.
1989	497	0	490	0	7	0	1.20	.
1990	482	0	475	0	7	0	1.14	.
1991	554	0	548	0	7	0	1.29	.
1992	548	0	541	0	7	0	1.25	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Swaziland

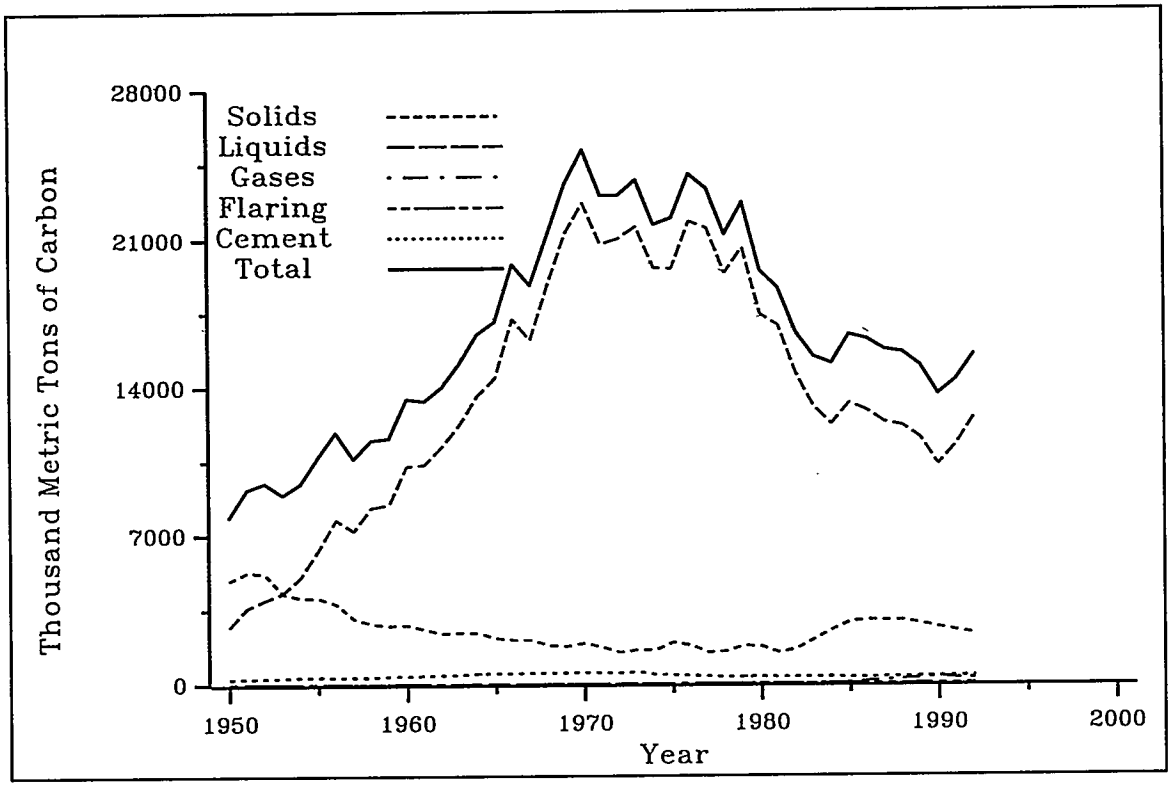


Per capita CO_2 emission rates for Swaziland

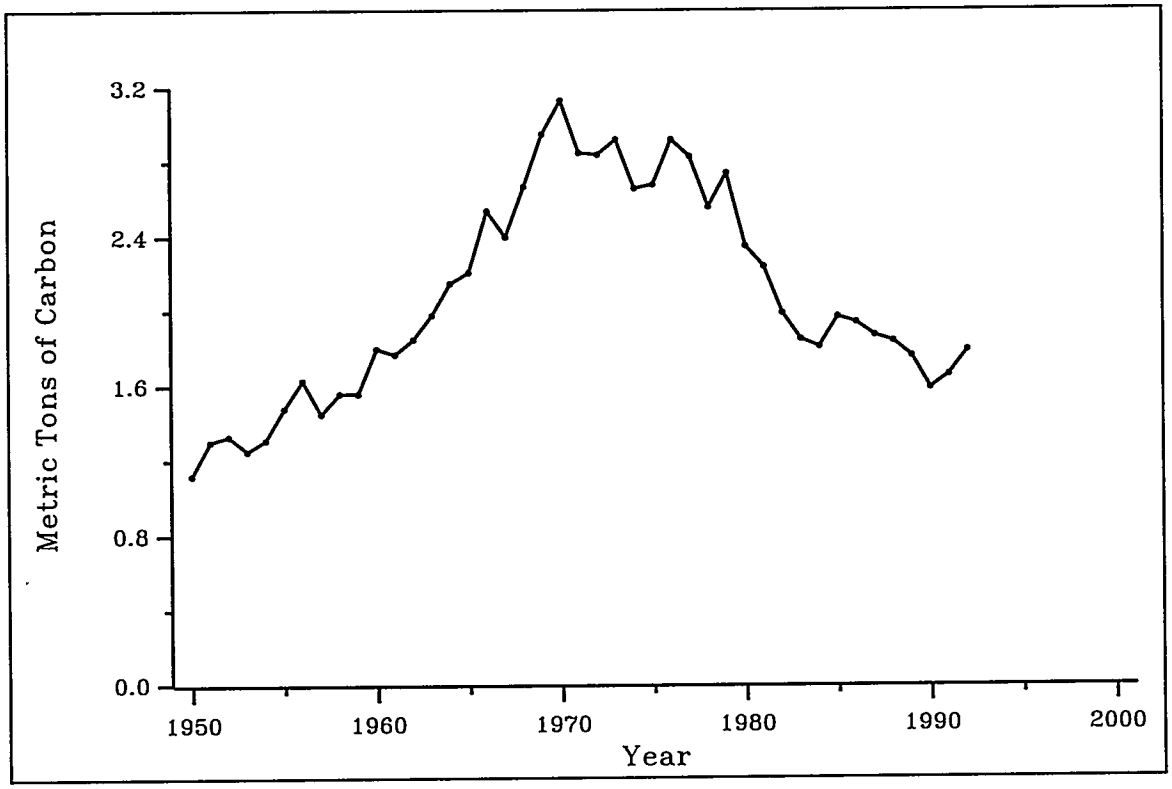
Swaziland

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1	1	0	0	0	0	0.00	.
1951	1	1	0	0	0	0	0.00	.
1952	1	1	0	0	0	0	0.00	.
1953	1	1	0	0	0	0	0.00	.
1954	1	1	0	0	0	0	0.00	.
1955	1	1	0	0	0	0	0.00	.
1956	1	1	0	0	0	0	0.00	.
1957	1	1	0	0	0	0	0.00	.
1958	1	1	0	0	0	0	0.00	.
1959	1	1	0	0	0	0	0.00	.
1960	9	9	0	0	0	0	0.03	.
1961	1	1	0	0	0	0	0.00	.
1964	3	3	0	0	0	0	0.01	.
1965	22	22	0	0	0	0	0.06	.
1966	56	56	0	0	0	0	0.15	.
1967	63	63	0	0	0	0	0.16	.
1968	77	77	0	0	0	0	0.19	.
1969	84	84	0	0	0	0	0.21	.
1970	101	101	0	0	0	0	0.24	.
1971	110	110	0	0	0	0	0.26	.
1972	105	105	0	0	0	0	0.24	.
1973	103	103	0	0	0	0	0.23	.
1974	86	86	0	0	0	0	0.18	.
1975	93	93	0	0	0	0	0.19	.
1976	92	92	0	0	0	0	0.19	.
1977	95	95	0	0	0	0	0.18	.
1978	122	122	0	0	0	0	0.23	.
1979	123	123	0	0	0	0	0.22	.
1980	129	129	0	0	0	0	0.23	.
1981	120	120	0	0	0	0	0.21	.
1982	120	120	0	0	0	0	0.20	.
1983	75	75	0	0	0	0	0.12	.
1984	92	92	0	0	0	0	0.14	.
1985	122	122	0	0	0	0	0.18	.
1986	126	126	0	0	0	0	0.19	.
1987	121	121	0	0	0	0	0.17	.
1988	121	121	0	0	0	0	0.17	.
1989	121	121	0	0	0	0	0.17	.
1990	117	117	0	0	0	0	0.16	.
1991	90	90	0	0	0	0	0.12	.
1992	73	73	0	0	0	0	0.09	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Sweden

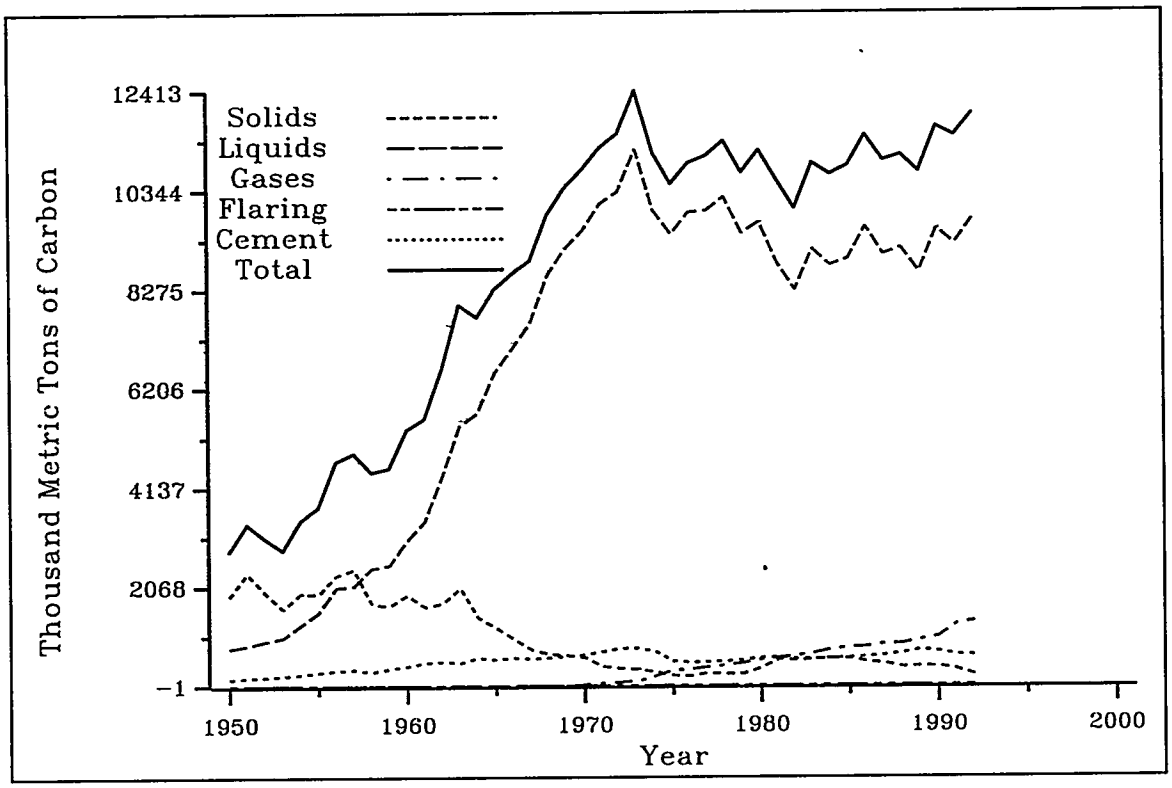


Per capita CO_2 emission rates for Sweden

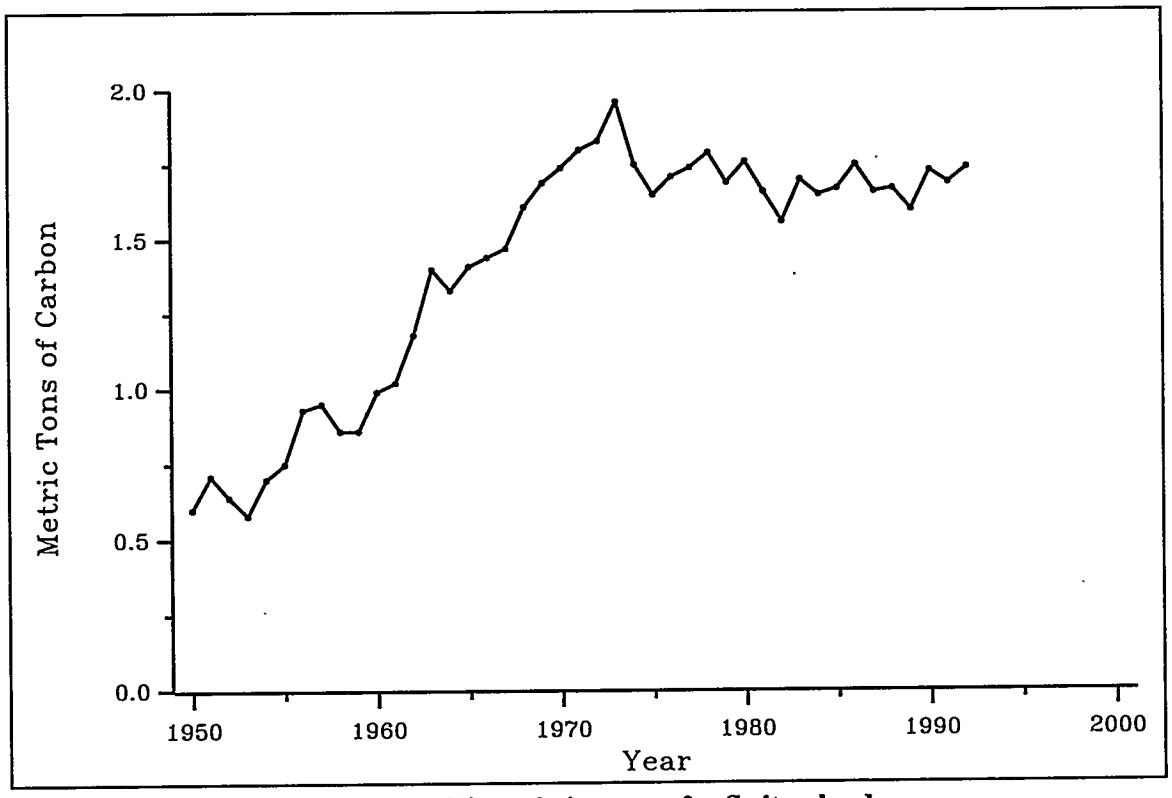
Sweden

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	7880	4886	2729	0	265	0	1.12	.
1951	9189	5287	3625	0	277	0	1.30	.
1952	9484	5202	3994	0	288	0	1.33	.
1953	8935	4294	4322	0	320	0	1.25	.
1954	9465	4084	5045	0	335	0	1.31	.
1955	10720	4078	6294	0	347	0	1.48	.
1956	11885	3804	7742	0	339	0	1.63	.
1957	10640	3096	7211	0	333	0	1.45	.
1958	11518	2865	8311	0	341	0	1.56	.
1959	11604	2771	8449	0	384	0	1.56	.
1960	13454	2793	10280	0	382	0	1.80	.
1961	13352	2592	10347	0	414	0	1.77	.
1962	14025	2396	11211	0	418	0	1.85	.
1963	15127	2431	12248	0	449	0	1.98	.
1964	16508	2417	13598	0	493	0	2.15	.
1965	17105	2172	14420	0	513	0	2.21	.
1966	19820	2089	17221	0	511	0	2.54	.
1967	18841	2082	16229	0	530	0	2.40	.
1968	21207	1827	18847	0	532	0	2.67	.
1969	23601	1787	21276	0	538	0	2.95	.
1970	25179	1929	22695	0	554	0	3.13	.
1971	23037	1744	20756	0	537	0	2.85	.
1972	23044	1497	21020	0	527	0	2.84	.
1973	23761	1602	21586	0	573	0	2.92	.
1974	21686	1597	19639	0	450	0	2.66	.
1975	21983	1955	19604	0	424	0	2.68	.
1976	24024	1812	21822	0	390	0	2.92	.
1977	23340	1478	21506	0	356	0	2.83	.
1978	21214	1530	19365	0	320	0	2.56	.
1979	22689	1790	20574	0	325	0	2.74	.
1980	19494	1751	17411	0	333	0	2.35	.
1981	18669	1462	16892	0	315	0	2.24	.
1982	16557	1639	14604	0	313	0	1.99	.
1983	15416	2084	13027	0	305	0	1.85	.
1984	15091	2532	12234	0	326	0	1.81	.
1985	16449	2904	13213	43	289	0	1.97	.
1986	16248	2988	12868	113	279	0	1.94	.
1987	15732	2965	12310	151	307	0	1.87	.
1988	15617	2970	12148	194	306	0	1.84	.
1989	14990	2823	11577	259	331	0	1.76	.
1990	13637	2650	10319	331	337	0	1.59	.
1991	14310	2486	11235	244	346	0	1.66	.
1992	15501	2348	12552	255	346	0	1.79	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Switzerland

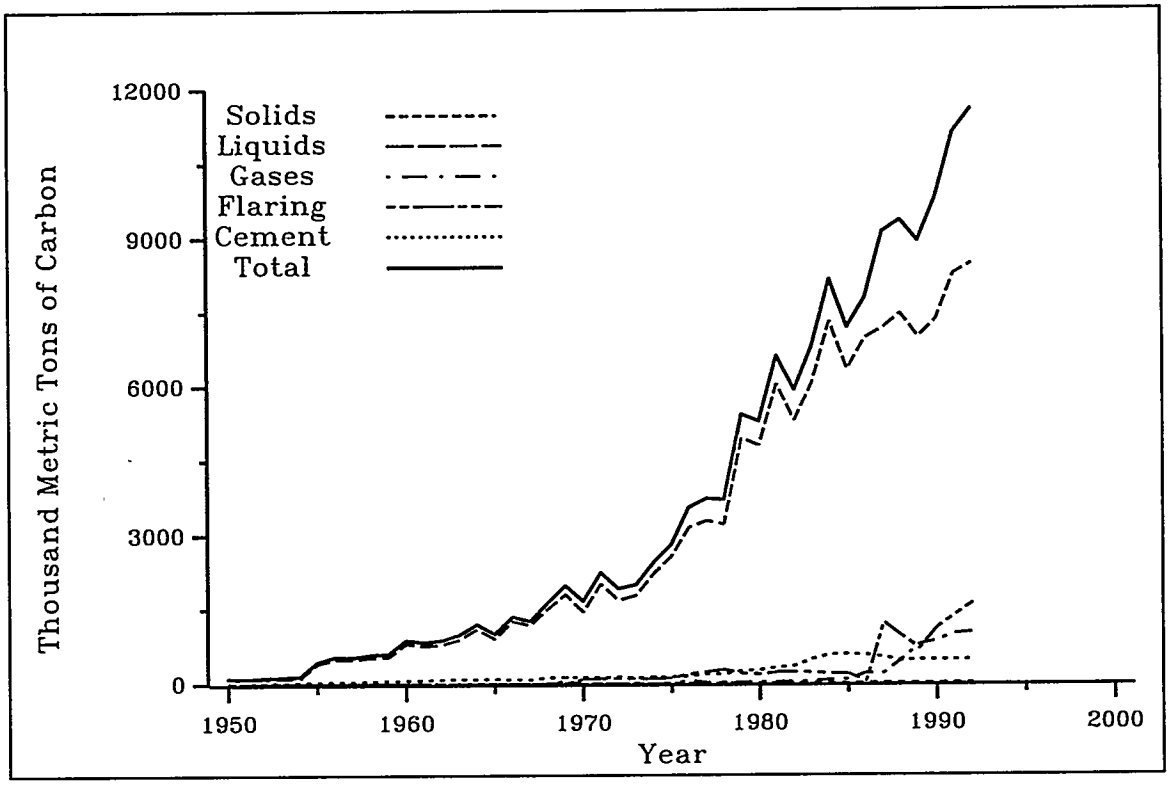


Per capita CO_2 emission rates for Switzerland

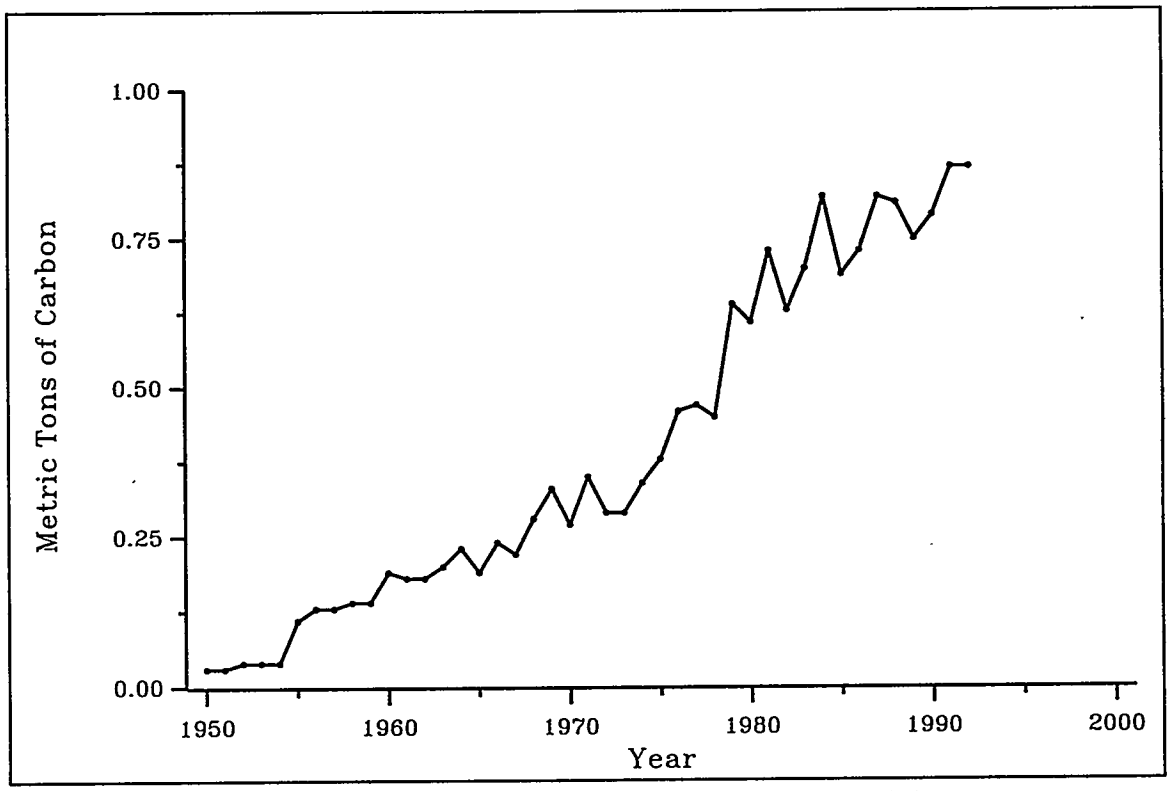
Switzerland

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2815	1878	790	0	147	0	0.60	.
1951	3385	2354	852	0	179	0	0.71	.
1952	3088	1957	943	0	188	0	0.64	.
1953	2840	1613	1013	0	215	0	0.58	.
1954	3462	1938	1277	0	247	0	0.70	.
1955	3740	1916	1536	0	288	0	0.75	.
1956	4685	2309	2053	-1	324	0	0.93	.
1957	4860	2433	2086	-1	342	0	0.95	.
1958	4466	1714	2456	-1	297	0	0.86	.
1959	4552	1669	2519	-1	365	0	0.86	.
1960	5346	1899	3035	-1	413	0	0.99	.
1961	5579	1651	3439	-1	490	0	1.02	.
1962	6606	1725	4375	-1	507	0	1.18	.
1963	7959	2044	5429	-1	487	0	1.40	.
1964	7697	1427	5682	-1	588	0	1.33	.
1965	8296	1221	6526	0	549	0	1.41	.
1966	8609	984	7037	-1	588	0	1.44	.
1967	8888	759	7560	1	568	0	1.47	.
1968	9832	666	8573	6	588	0	1.61	.
1969	10396	639	9134	7	617	0	1.69	.
1970	10780	595	9509	23	652	0	1.74	.
1971	11231	404	10062	55	710	0	1.80	.
1972	11517	359	10311	70	777	0	1.83	.
1973	12413	341	11194	95	783	0	1.96	.
1974	11124	288	9921	201	714	0	1.75	.
1975	10479	214	9430	323	512	0	1.65	.
1976	10907	202	9885	338	482	0	1.71	.
1977	11058	260	9916	386	496	0	1.74	.
1978	11365	240	10199	424	503	0	1.79	.
1979	10706	247	9450	474	535	0	1.69	.
1980	11169	365	9684	541	578	0	1.76	.
1981	10548	550	8823	584	591	0	1.66	.
1982	9962	526	8262	617	558	0	1.56	.
1983	10901	550	9115	678	557	0	1.70	.
1984	10668	564	8779	756	569	0	1.65	.
1985	10845	562	8913	792	579	0	1.67	.
1986	11477	490	9579	811	597	0	1.75	.
1987	10959	456	9005	869	628	0	1.66	.
1988	11069	380	9139	875	675	0	1.67	.
1989	10723	395	8633	952	743	0	1.60	.
1990	11654	391	9536	1019	708	0	1.73	.
1991	11470	333	9223	1275	639	0	1.69	.
1992	11927	221	9738	1339	628	0	1.74	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Syrian Arab Republic

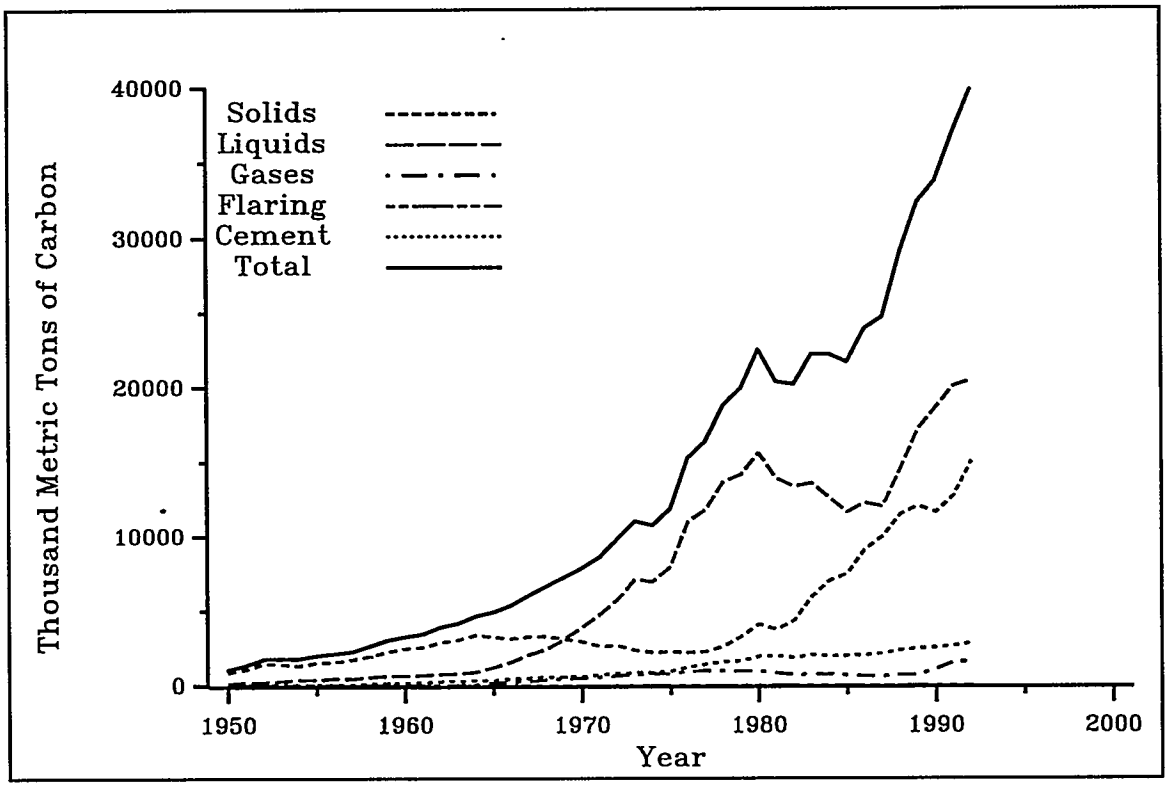


Per capita CO_2 emission rates for Syrian Arab Republic

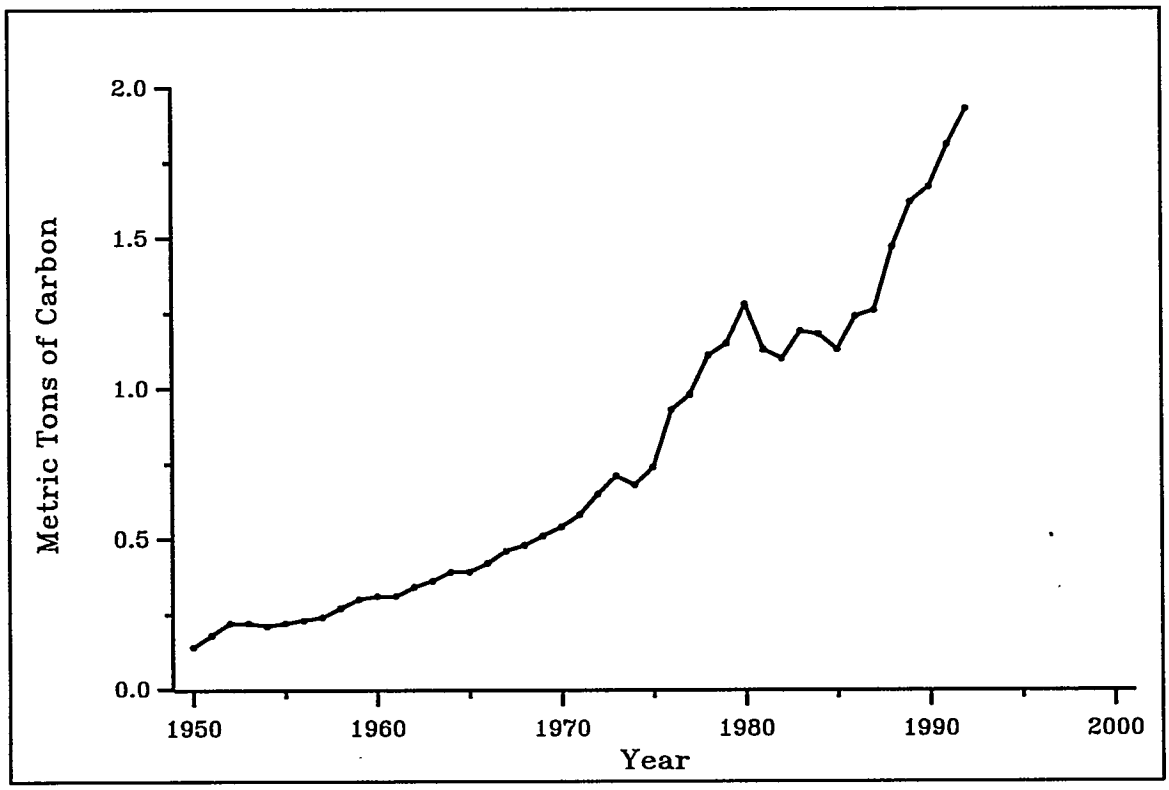
Syrian Arab Republic

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	113	1	102	0	9	0	0.03	.
1951	104	2	93	0	9	0	0.03	.
1952	130	2	107	0	21	0	0.04	.
1953	141	2	108	0	31	0	0.04	.
1954	157	1	122	0	34	0	0.04	.
1955	449	4	409	0	36	0	0.11	.
1956	547	4	499	0	44	0	0.13	.
1957	540	4	494	0	43	0	0.13	.
1958	591	3	536	0	53	0	0.14	.
1959	608	4	543	0	61	0	0.14	.
1960	880	3	810	0	67	0	0.19	.
1961	836	3	760	0	73	0	0.18	.
1962	874	3	789	0	83	0	0.18	.
1963	985	2	890	0	93	0	0.20	.
1964	1191	3	1102	0	86	0	0.23	.
1965	1003	3	908	0	92	0	0.19	.
1966	1341	3	1254	0	84	0	0.24	.
1967	1257	1	1174	0	82	0	0.22	.
1968	1625	1	1500	0	125	0	0.28	.
1969	1975	3	1793	52	127	0	0.33	.
1970	1663	1	1441	0	131	89	0.27	.
1971	2236	5	2004	0	124	104	0.35	.
1972	1913	1	1676	0	137	99	0.29	.
1973	1990	3	1773	0	115	99	0.29	.
1974	2442	1	2215	0	131	95	0.34	.
1975	2804	2	2557	0	135	110	0.38	.
1976	3546	3	3142	61	151	190	0.46	.
1977	3725	3	3279	19	190	235	0.47	.
1978	3704	5	3212	18	195	275	0.45	.
1979	5411	3	4936	19	251	203	0.64	.
1980	5274	3	4787	25	271	187	0.61	.
1981	6598	6	6023	25	315	228	0.73	.
1982	5906	7	5291	26	353	228	0.63	.
1983	6798	5	6045	40	493	215	0.70	.
1984	8155	3	7302	68	582	200	0.82	.
1985	7179	1	6325	81	584	188	0.69	.
1986	7777	1	6960	204	571	42	0.73	.
1987	9105	1	7162	201	526	1216	0.82	.
1988	9340	1	7462	474	453	951	0.81	.
1989	8925	0	6982	777	476	691	0.75	.
1990	9784	0	7342	855	476	1111	0.79	.
1991	11103	1	8266	998	476	1361	0.87	.
1992	11574	1	8475	1017	476	1605	0.87	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Taiwan

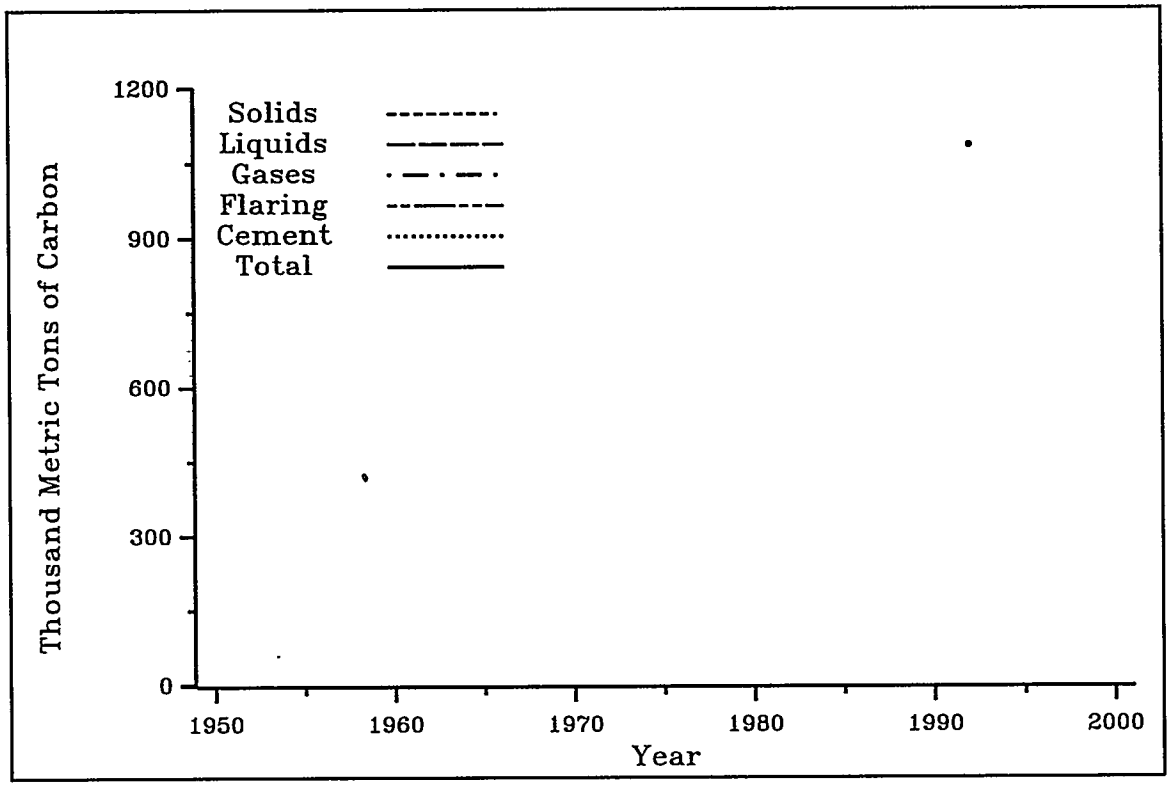


Per capita CO_2 emission rates for Taiwan

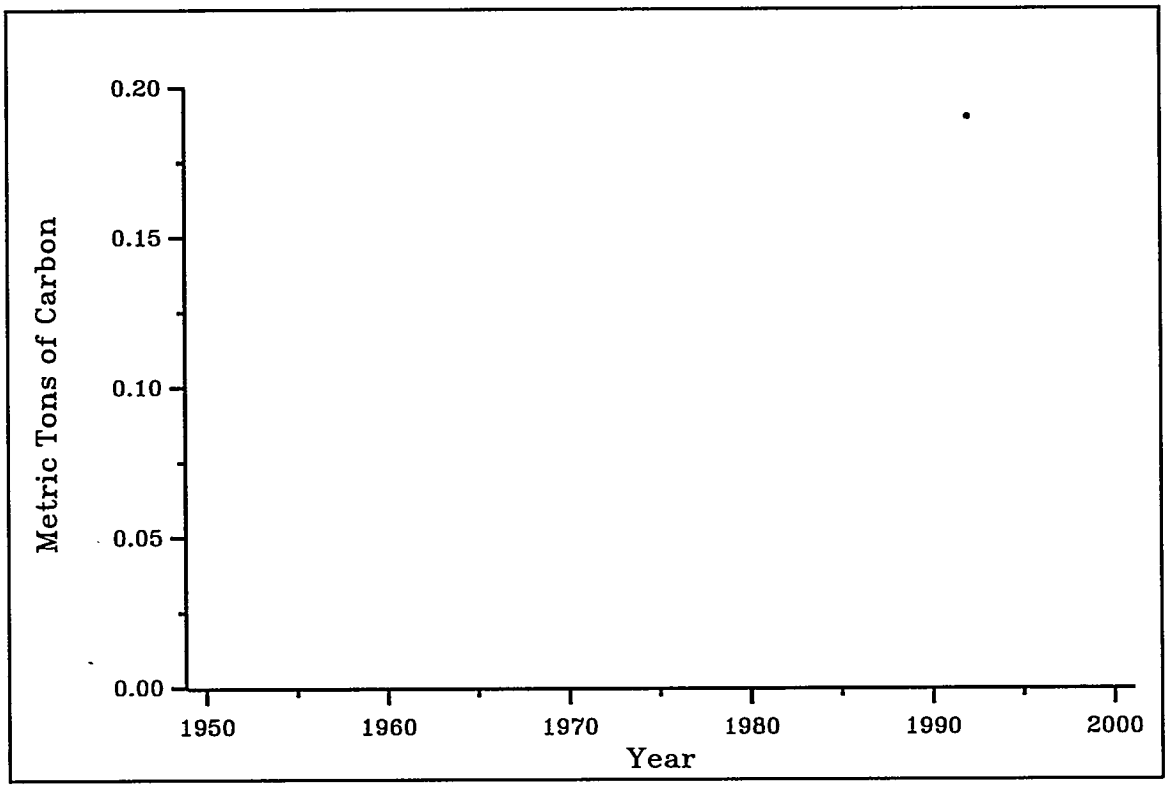
Taiwan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	1043	870	108	19	45	0	0.14	.
1951	1352	1064	221	14	53	0	0.18	.
1952	1761	1475	212	13	61	0	0.22	.
1953	1784	1424	280	9	71	0	0.22	.
1954	1786	1313	388	13	73	0	0.21	.
1955	1983	1522	367	14	80	0	0.22	.
1956	2117	1557	464	15	80	0	0.23	.
1957	2254	1720	436	16	82	0	0.24	.
1958	2636	1936	548	14	138	0	0.27	.
1959	3027	2239	630	13	145	0	0.30	.
1960	3270	2458	639	13	161	0	0.31	.
1961	3451	2552	675	19	205	0	0.31	.
1962	3902	2889	739	19	254	0	0.34	.
1963	4161	3046	784	26	306	0	0.36	.
1964	4657	3369	884	83	320	0	0.39	.
1965	4911	3223	1201	154	332	0	0.39	.
1966	5351	3139	1566	222	423	0	0.42	.
1967	6037	3255	2044	264	474	0	0.46	.
1968	6631	3289	2431	367	543	0	0.48	.
1969	7215	3099	3099	461	556	0	0.51	.
1970	7856	2935	3866	470	585	0	0.54	.
1971	8592	2616	4736	554	686	0	0.58	.
1972	9816	2660	5718	639	798	0	0.65	.
1973	11000	2349	7084	738	829	0	0.71	.
1974	10738	2195	6928	775	839	0	0.68	.
1975	11855	2221	7940	769	924	0	0.74	.
1976	15250	2183	10952	923	1191	0	0.93	.
1977	16369	2236	11765	962	1406	0	0.98	.
1978	18757	2610	13634	955	1559	0	1.11	.
1979	19929	3265	14121	925	1618	0	1.15	.
1980	22506	4075	15572	947	1913	0	1.28	.
1981	20352	3722	13872	808	1951	0	1.13	.
1982	20185	4341	13327	690	1827	0	1.10	.
1983	22201	5917	13554	716	2014	0	1.19	.
1984	22200	6988	12553	723	1936	0	1.18	.
1985	21669	7455	11603	651	1961	0	1.13	.
1986	23916	9091	12218	593	2014	0	1.24	.
1987	24674	9972	11976	601	2125	0	1.26	.
1988	28996	11461	14498	687	2350	0	1.47	.
1989	32342	12019	17172	697	2454	0	1.62	.
1990	33784	11604	18601	1069	2511	0	1.67	.
1991	36976	12714	20072	1553	2637	0	1.81	.
1992	39833	15009	20453	1557	2813	0	1.93	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Tajikistan

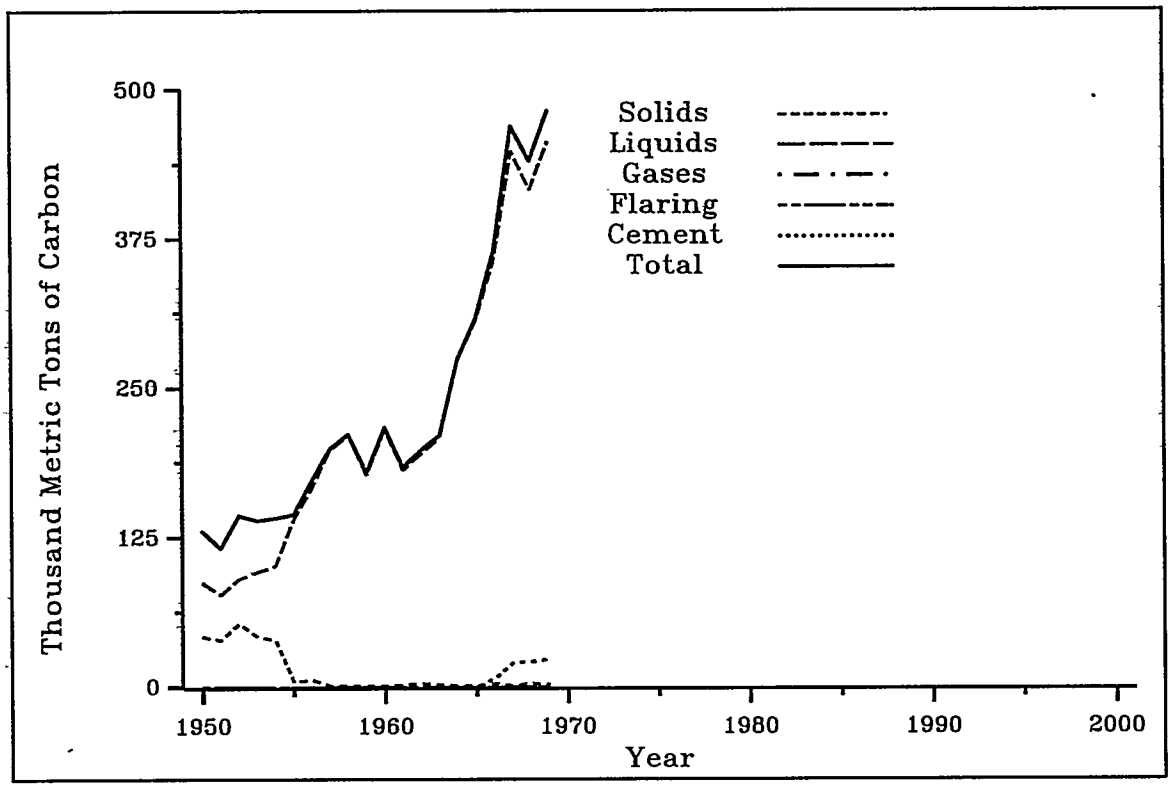


Per capita CO_2 emission rates for Tajikistan

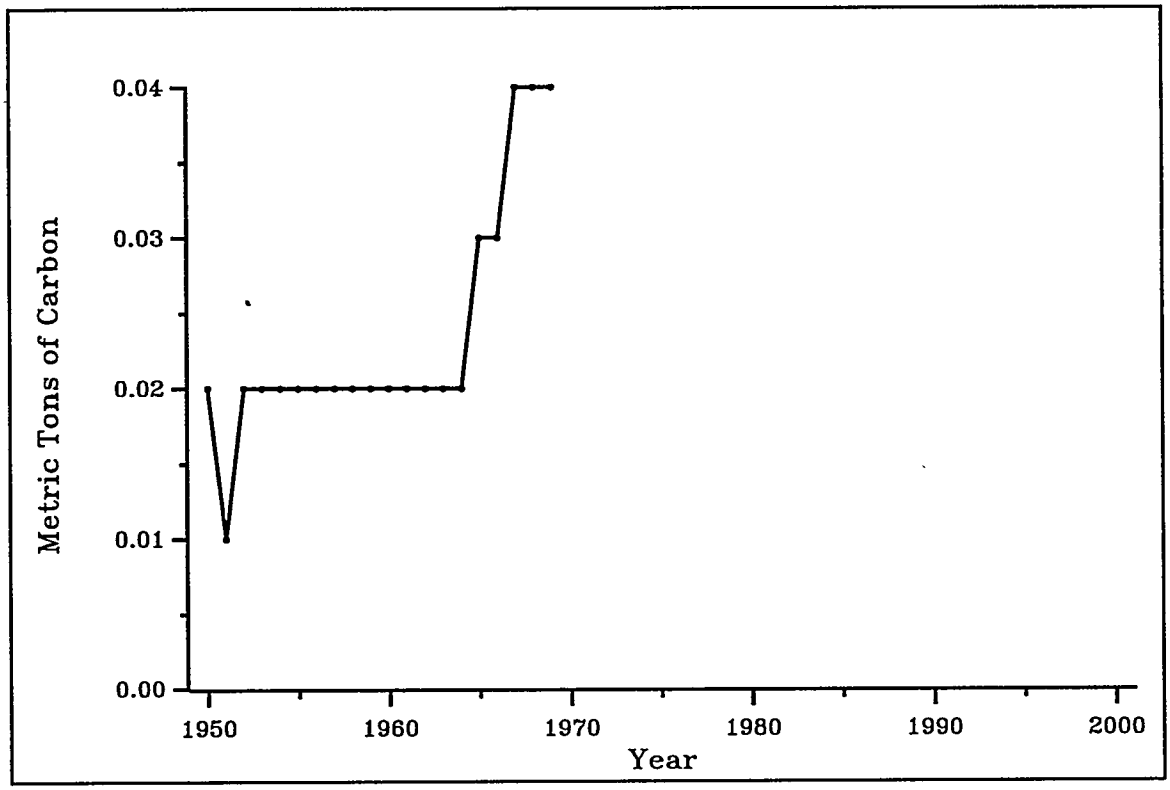
Tajikistan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	1084	83	32	928	41	0	0.19	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Tanganyika

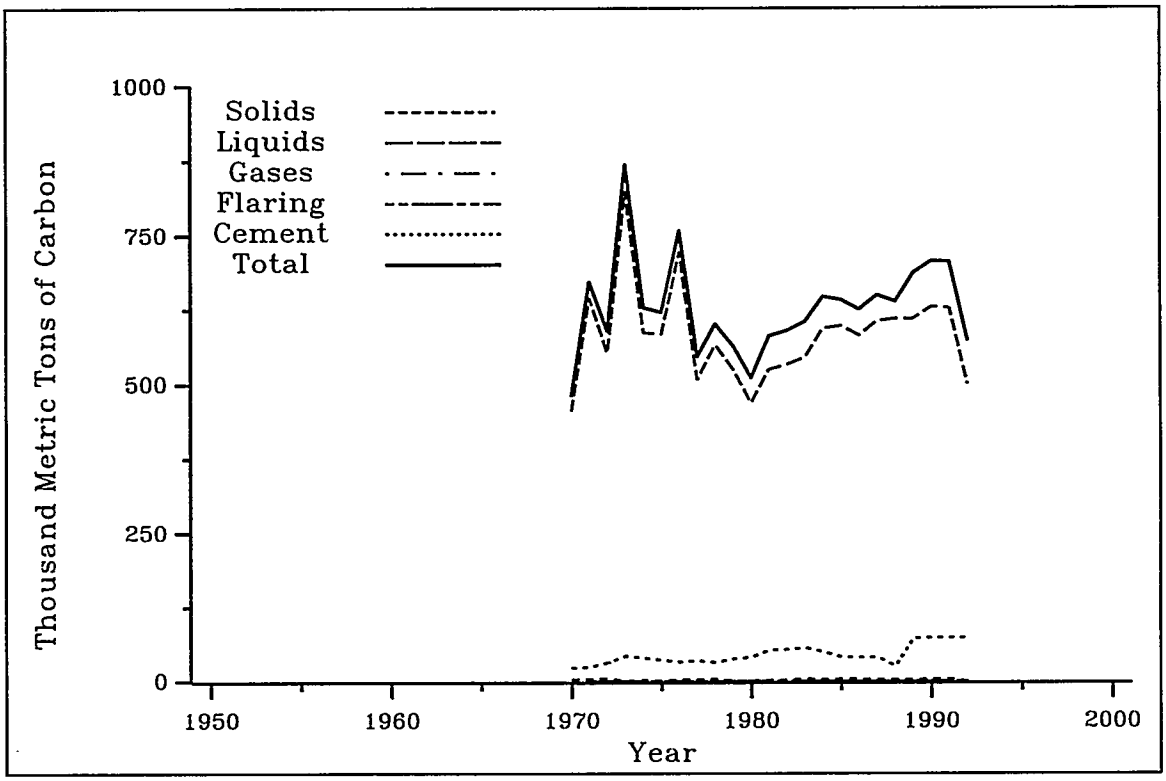


Per capita CO_2 emission rates for Tanganyika

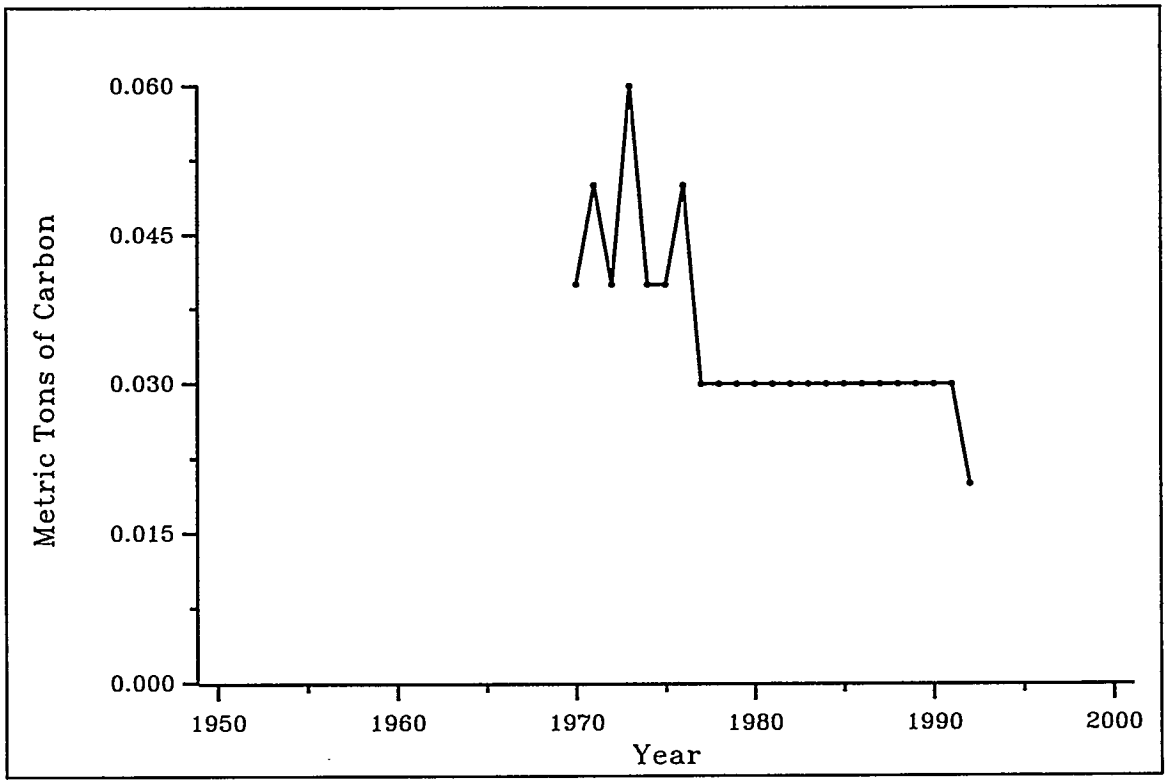
Tanganyika

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	130	42	87	0	0	0	0.02	.
1951	116	39	77	0	0	0	0.01	.
1952	143	53	90	0	0	0	0.02	.
1953	139	42	96	0	0	0	0.02	.
1954	141	39	101	0	0	0	0.02	.
1955	144	4	140	0	0	0	0.02	.
1956	172	6	166	0	0	0	0.02	.
1957	199	1	198	0	0	0	0.02	1
1958	211	1	210	0	0	0	0.02	0
1959	179	1	177	0	0	0	0.02	2
1960	217	1	215	0	0	0	0.02	1
1961	183	2	181	0	0	0	0.02	1
1962	198	3	195	0	0	0	0.02	3
1963	210	2	208	0	0	0	0.02	5
1964	274	1	273	0	0	0	0.02	3
1965	308	1	306	0	0	0	0.03	3
1966	365	3	356	0	7	0	0.03	6
1967	469	1	448	0	20	0	0.04	18
1968	440	3	416	0	21	0	0.04	30
1969	482	2	456	0	23	0	0.04	9

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the United Republic of Tanzania

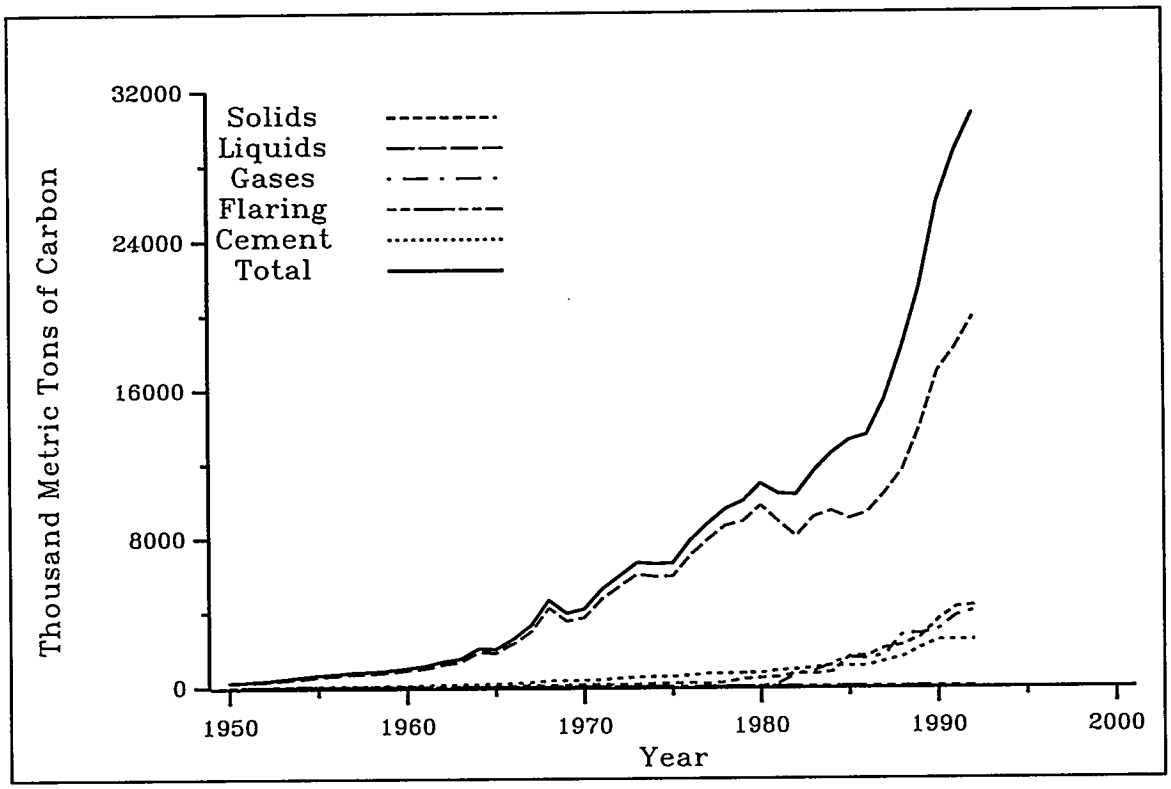


Per capita CO_2 emission rates for the United Republic of Tanzania

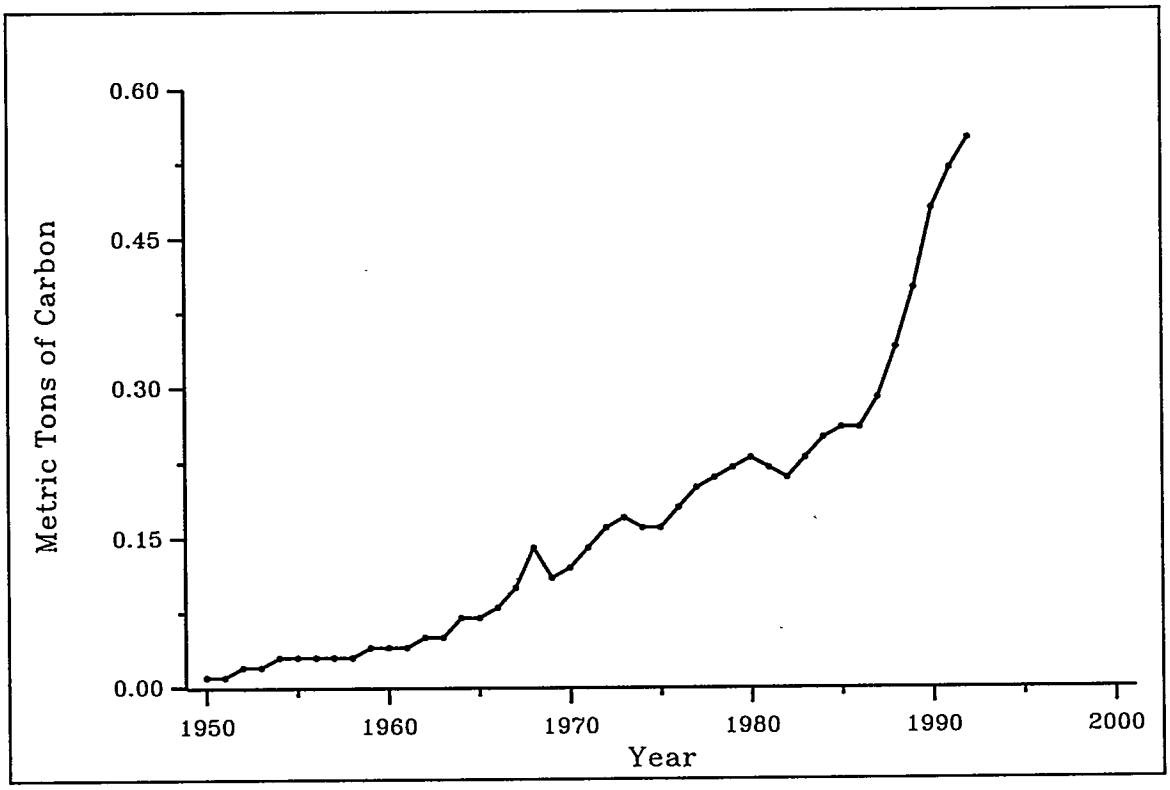
United Republic of Tanzania

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	482	3	456	0	23	0	0.04	.
1971	672	4	645	0	24	0	0.05	.
1972	590	5	553	0	32	0	0.04	.
1973	869	1	825	0	43	0	0.06	.
1974	629	2	587	0	40	0	0.04	.
1975	621	1	584	0	36	0	0.04	.
1976	758	3	723	0	33	0	0.05	.
1977	546	3	508	0	35	0	0.03	.
1978	601	4	566	0	32	0	0.03	.
1979	564	1	525	0	38	0	0.03	.
1980	511	1	469	0	41	0	0.03	.
1981	581	2	525	0	53	0	0.03	.
1982	590	2	533	0	54	0	0.03	.
1983	605	4	545	0	57	0	0.03	.
1984	647	3	594	0	50	0	0.03	.
1985	642	4	598	0	41	0	0.03	.
1986	626	4	582	0	41	0	0.03	.
1987	650	3	606	0	41	0	0.03	.
1988	639	3	610	0	26	0	0.03	.
1989	687	3	610	0	73	0	0.03	.
1990	707	4	630	0	74	0	0.03	.
1991	706	4	628	0	74	0	0.03	.
1992	574	0	500	0	74	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Thailand

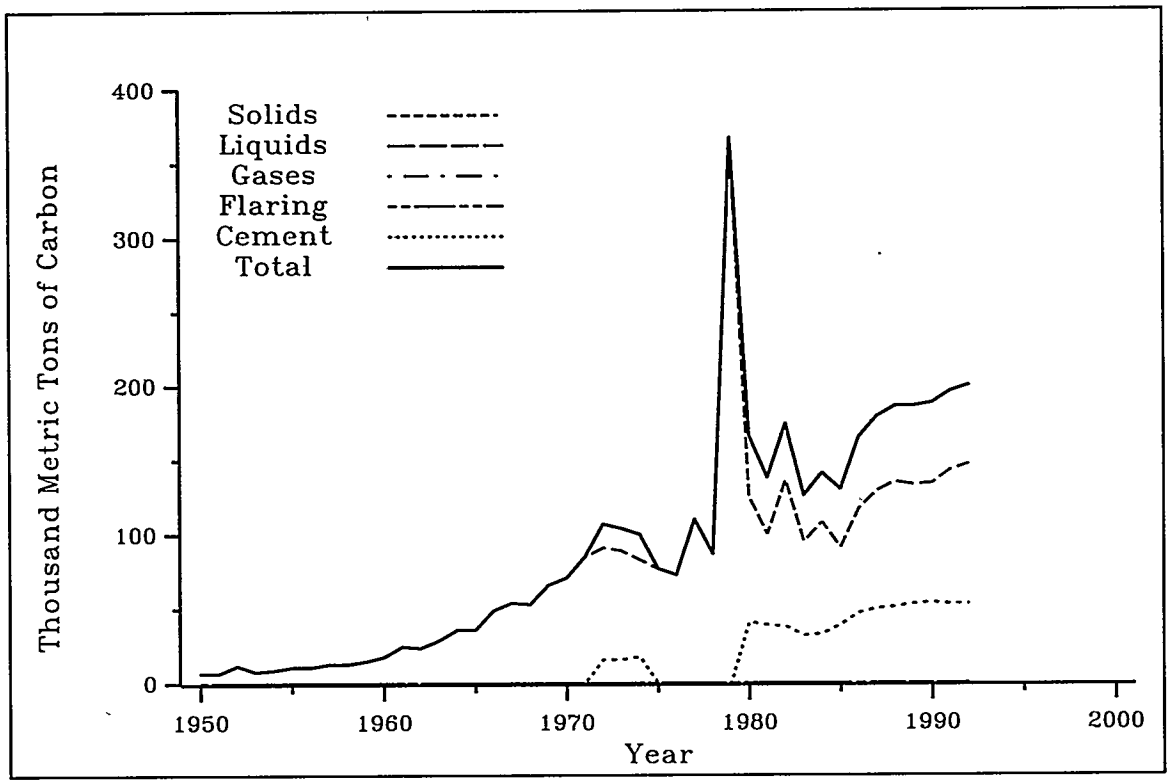


Per capita CO_2 emission rates for Thailand

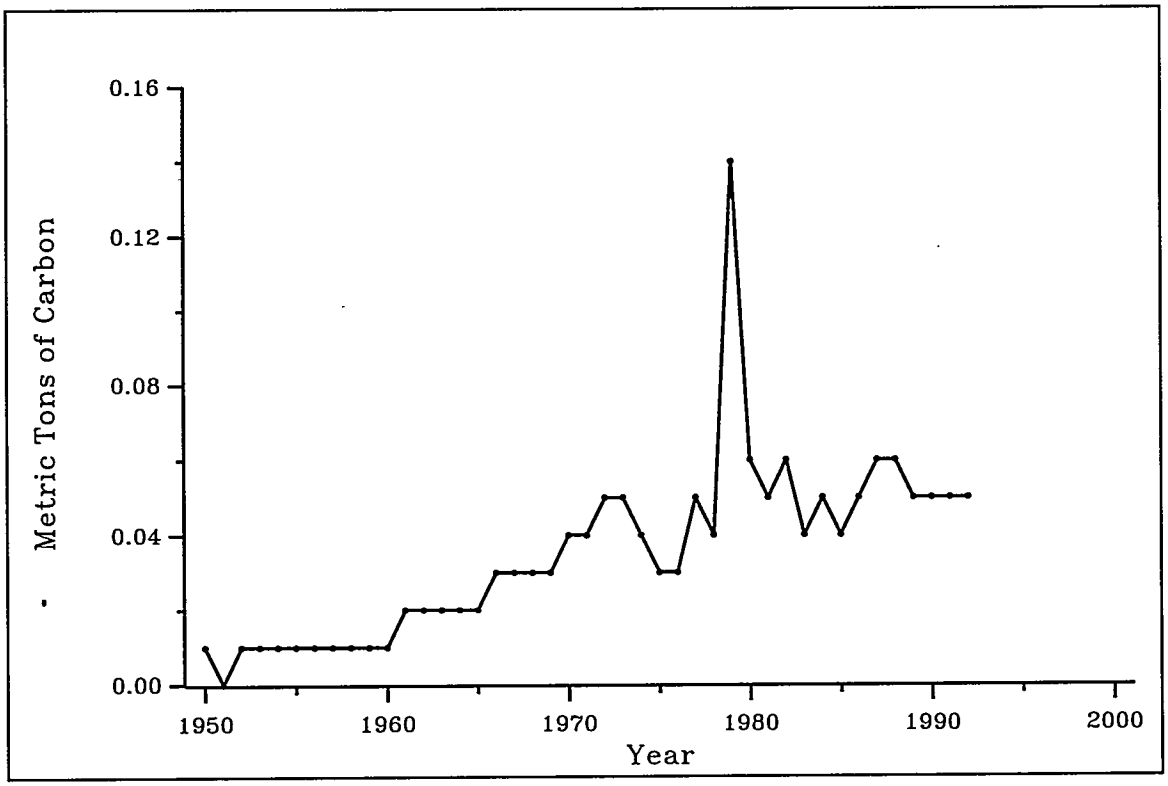
Thailand

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	260	13	225	0	23	0	0.01	.
1951	298	13	243	0	42	0	0.01	.
1952	349	15	301	0	34	0	0.02	.
1953	449	27	383	0	39	0	0.02	.
1954	561	57	451	0	52	0	0.03	.
1955	648	36	560	0	53	0	0.03	.
1956	715	31	630	0	54	0	0.03	.
1957	797	39	703	0	55	0	0.03	.
1958	823	39	723	0	62	0	0.03	.
1959	906	39	798	0	69	0	0.04	.
1960	1012	40	901	0	72	0	0.04	.
1961	1130	32	988	0	110	0	0.04	.
1962	1372	39	1201	0	131	0	0.05	.
1963	1518	40	1343	0	136	0	0.05	.
1964	2039	31	1865	0	144	0	0.07	.
1965	2031	39	1823	0	170	0	0.07	.
1966	2583	51	2330	0	202	0	0.08	.
1967	3316	99	2981	0	236	0	0.10	.
1968	4660	93	4246	0	322	0	0.14	.
1969	3967	104	3537	0	327	0	0.11	.
1970	4190	123	3710	0	357	0	0.12	.
1971	5239	141	4720	0	378	0	0.14	.
1972	5947	110	5378	0	460	0	0.16	.
1973	6664	118	6042	0	504	0	0.17	.
1974	6598	163	5902	0	534	0	0.16	.
1975	6633	168	5924	0	541	0	0.16	.
1976	7843	197	7040	0	607	0	0.18	.
1977	8763	167	7900	0	695	0	0.20	.
1978	9554	212	8650	0	692	0	0.21	.
1979	9998	409	8875	0	715	0	0.22	.
1980	10921	458	9738	0	726	0	0.23	.
1981	10372	502	8865	153	852	0	0.22	.
1982	10319	691	8062	668	899	0	0.21	.
1983	11573	665	9117	804	988	0	0.23	.
1984	12538	772	9433	1212	1121	0	0.25	.
1985	13234	1594	9014	1550	1077	0	0.26	.
1986	13506	1623	9331	1476	1076	0	0.26	.
1987	15447	2038	10381	1689	1340	0	0.29	.
1988	18211	2203	11629	2813	1566	0	0.34	.
1989	21442	2640	13962	2797	2043	0	0.40	.
1990	25979	3565	16923	3035	2455	0	0.48	.
1991	28665	4233	18208	3770	2455	0	0.52	.
1992	30698	4320	19870	4041	2468	0	0.55	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Togo

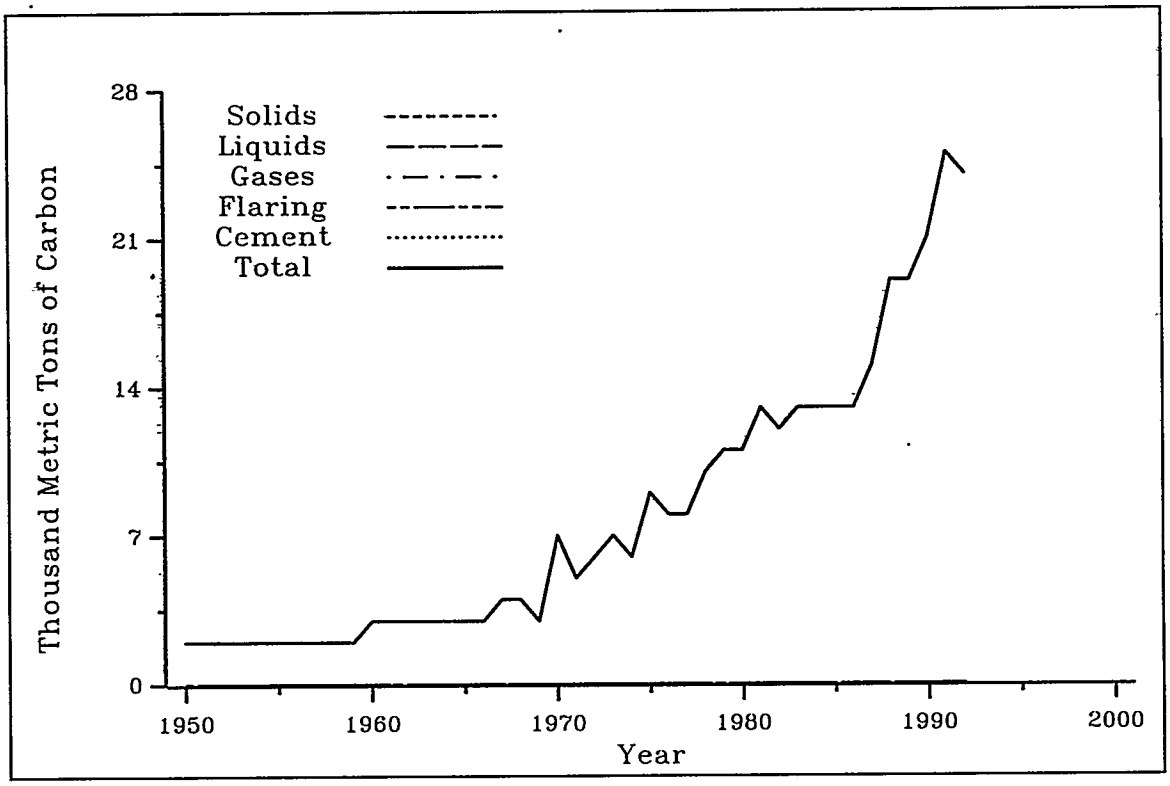


Per capita CO_2 emission rates for Togo

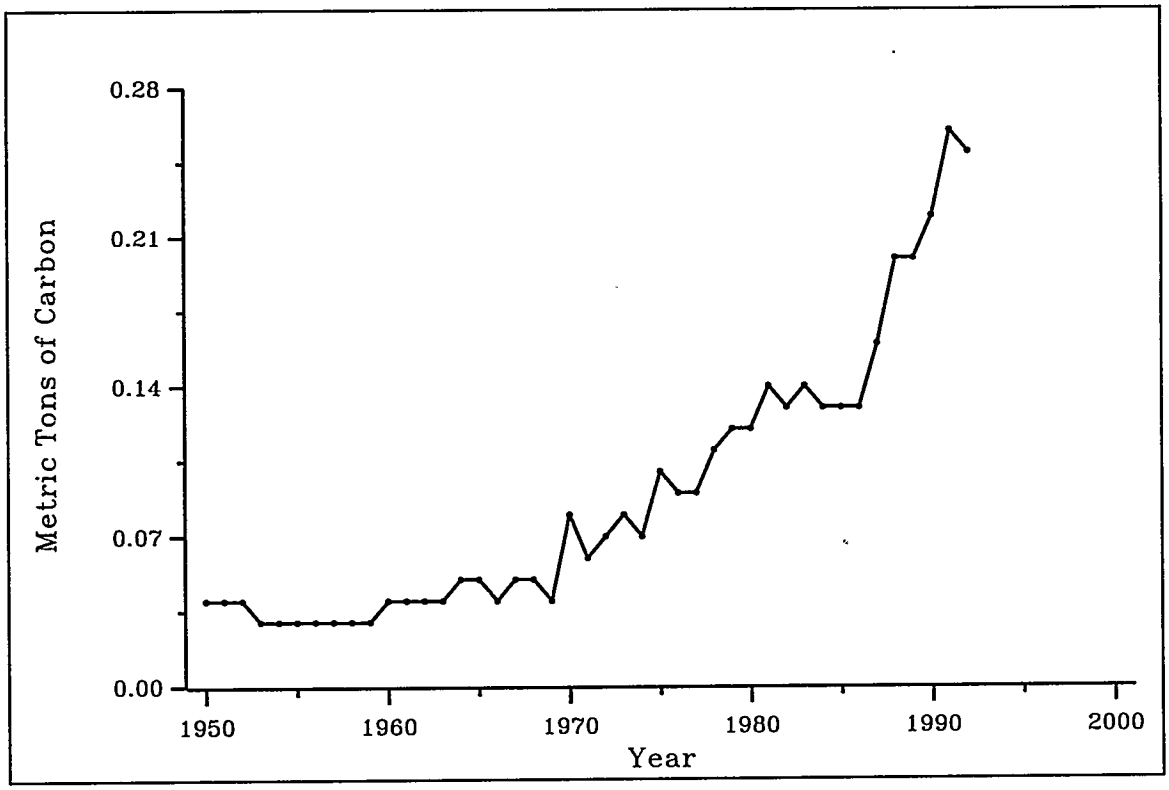
Togo

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	7	0	7	0	0	0	0.01	.
1951	7	0	7	0	0	0	0.00	.
1952	12	0	12	0	0	0	0.01	.
1953	8	0	8	0	0	0	0.01	.
1954	9	0	9	0	0	0	0.01	.
1955	11	0	11	0	0	0	0.01	.
1956	11	0	11	0	0	0	0.01	.
1957	13	0	13	0	0	0	0.01	.
1958	13	0	13	0	0	0	0.01	.
1959	15	0	15	0	0	0	0.01	.
1960	18	0	18	0	0	0	0.01	.
1961	25	0	25	0	0	0	0.02	.
1962	24	0	24	0	0	0	0.02	.
1963	29	0	29	0	0	0	0.02	.
1964	36	0	36	0	0	0	0.02	.
1965	36	0	36	0	0	0	0.02	.
1966	49	0	49	0	0	0	0.03	.
1967	54	0	54	0	0	0	0.03	.
1968	53	0	53	0	0	0	0.03	.
1969	66	0	66	0	0	0	0.03	.
1970	71	0	71	0	0	0	0.04	.
1971	85	0	85	0	0	0	0.04	.
1972	107	0	91	0	16	0	0.05	.
1973	104	0	89	0	16	0	0.05	.
1974	100	0	83	0	18	0	0.04	.
1975	77	0	77	0	0	0	0.03	.
1976	73	0	73	0	0	0	0.03	.
1977	110	0	110	0	0	0	0.05	.
1978	87	0	87	0	0	0	0.04	.
1979	367	0	367	0	0	0	0.14	.
1980	166	0	125	0	41	0	0.06	.
1981	138	0	100	0	39	0	0.05	.
1982	174	0	136	0	38	0	0.06	.
1983	126	0	95	0	32	0	0.04	.
1984	141	0	108	0	33	0	0.05	.
1985	130	0	91	0	39	0	0.04	.
1986	165	0	117	0	47	0	0.05	.
1987	179	0	129	0	50	0	0.06	.
1988	186	0	135	0	51	0	0.06	.
1989	186	0	133	0	53	0	0.05	.
1990	188	0	134	0	54	0	0.05	.
1991	196	0	143	0	53	0	0.05	.
1992	200	0	147	0	53	0	0.05	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Tonga

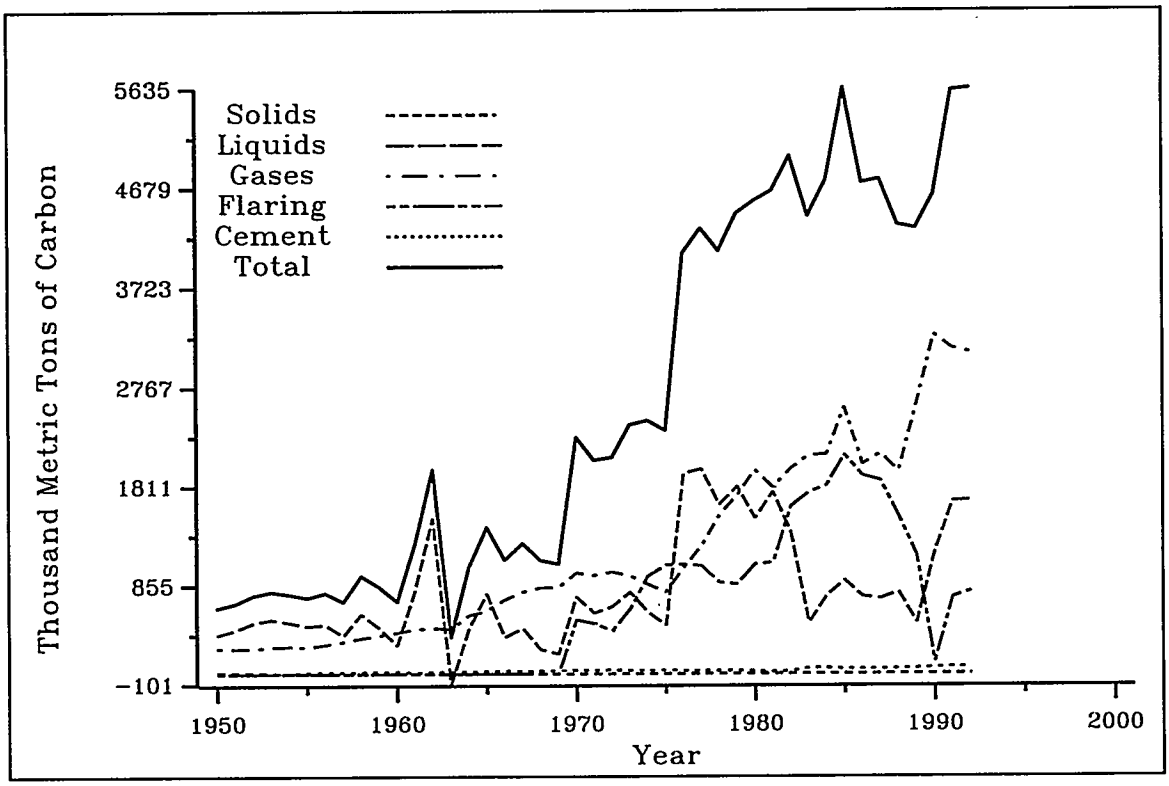


Per capita CO_2 emission rates for Tonga

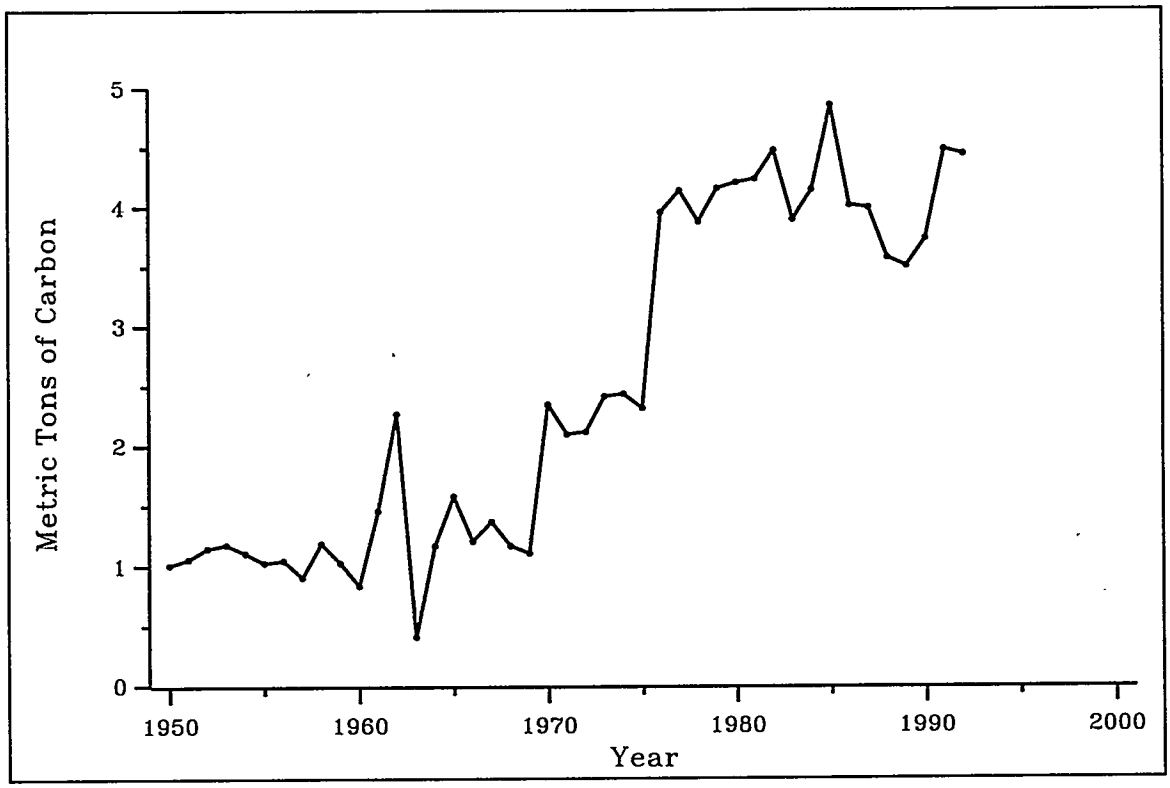
Tonga

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2	0	2	0	0	0	0.04	.
1951	2	0	2	0	0	0	0.04	.
1952	2	0	2	0	0	0	0.04	.
1953	2	0	2	0	0	0	0.03	.
1954	2	0	2	0	0	0	0.03	.
1955	2	0	2	0	0	0	0.03	.
1956	2	0	2	0	0	0	0.03	.
1957	2	0	2	0	0	0	0.03	.
1958	2	0	2	0	0	0	0.03	.
1959	2	0	2	0	0	0	0.03	.
1960	3	0	3	0	0	0	0.04	.
1961	3	0	3	0	0	0	0.04	.
1962	3	0	3	0	0	0	0.04	.
1963	3	0	3	0	0	0	0.04	.
1964	3	0	3	0	0	0	0.05	.
1965	3	0	3	0	0	0	0.05	.
1966	3	0	3	0	0	0	0.04	.
1967	4	0	4	0	0	0	0.05	.
1968	4	0	4	0	0	0	0.05	.
1969	3	0	3	0	0	0	0.04	.
1970	7	0	7	0	0	0	0.08	.
1971	5	0	5	0	0	0	0.06	.
1972	6	0	6	0	0	0	0.07	.
1973	7	0	7	0	0	0	0.08	.
1974	6	0	6	0	0	0	0.07	.
1975	9	0	9	0	0	0	0.10	.
1976	8	0	8	0	0	0	0.09	.
1977	8	0	8	0	0	0	0.09	.
1978	10	0	10	0	0	0	0.11	.
1979	11	0	11	0	0	0	0.12	.
1980	11	0	11	0	0	0	0.12	.
1981	13	0	13	0	0	0	0.14	.
1982	12	0	12	0	0	0	0.13	.
1983	13	0	13	0	0	0	0.14	.
1984	13	0	13	0	0	0	0.13	.
1985	13	0	13	0	0	0	0.13	.
1986	13	0	13	0	0	0	0.13	.
1987	15	0	15	0	0	0	0.16	.
1988	19	0	19	0	0	0	0.20	.
1989	19	0	19	0	0	0	0.20	.
1990	21	0	21	0	0	0	0.22	.
1991	25	0	25	0	0	0	0.26	.
1992	24	0	24	0	0	0	0.25	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Trinidad and Tobago

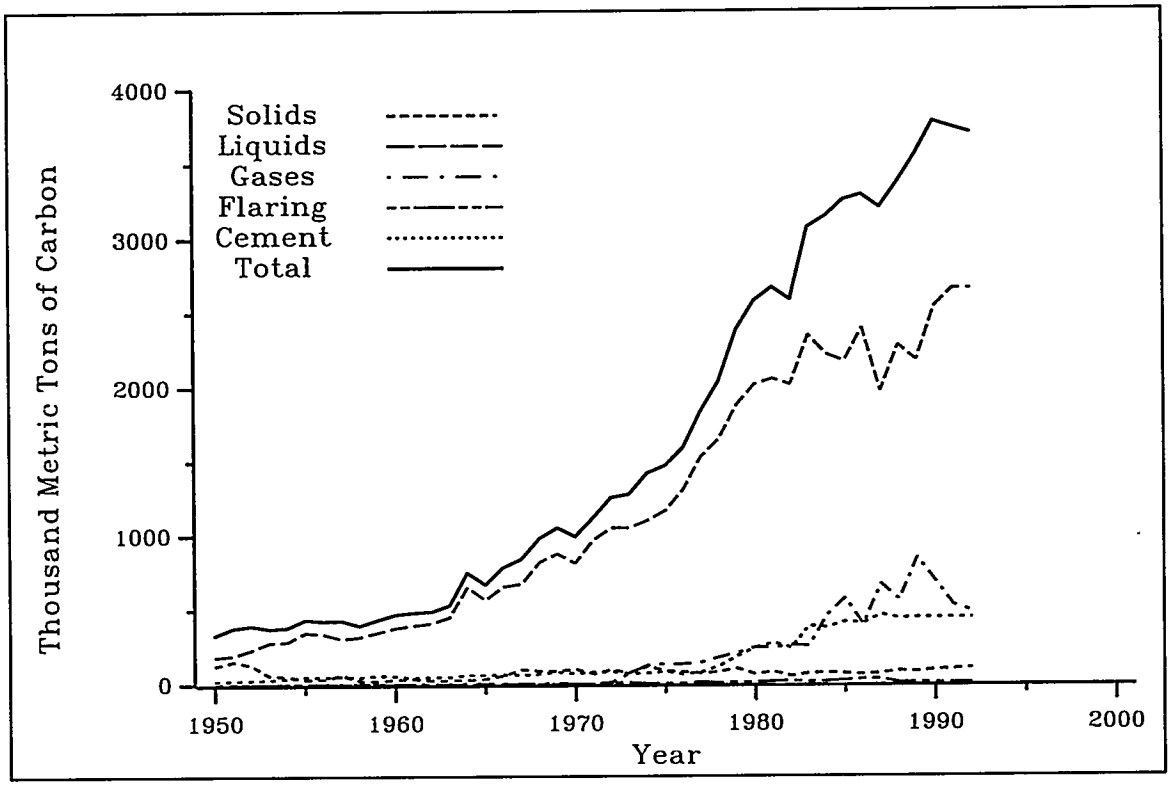


Per capita CO_2 emission rates for Trinidad and Tobago

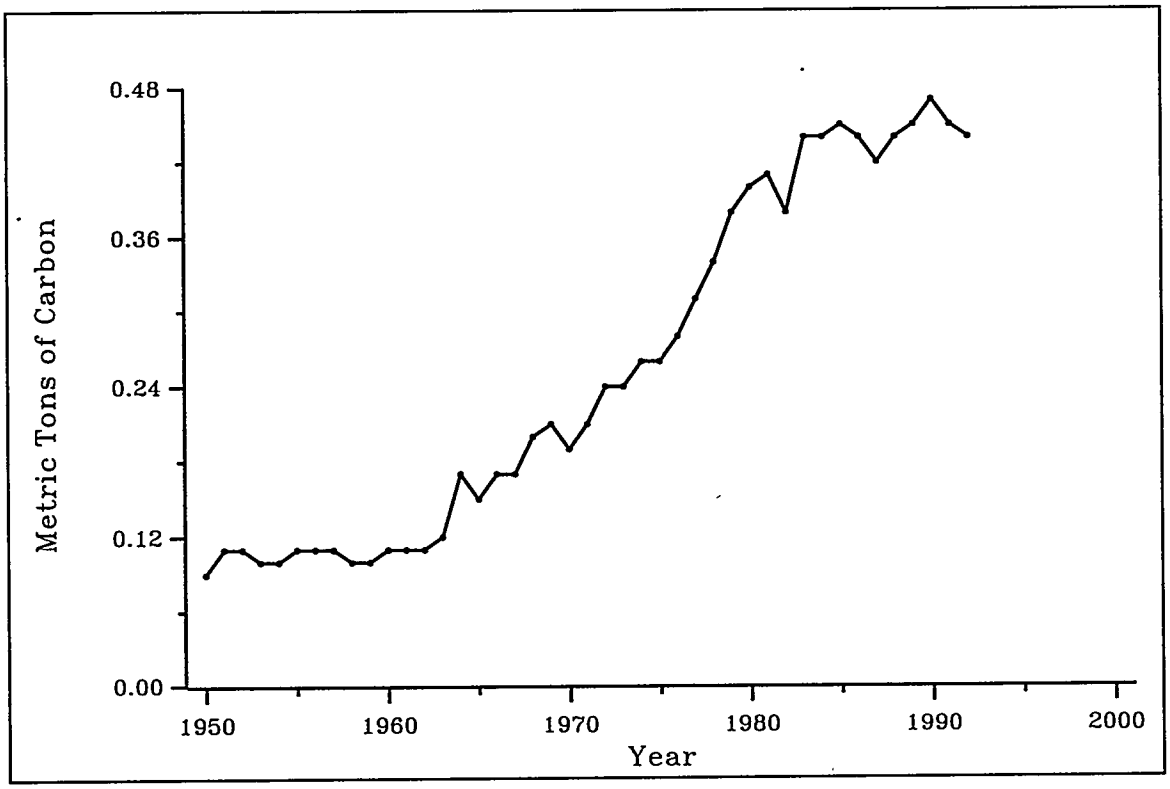
Trinidad and Tobago

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	642	15	379	248	0	0	1.01	.
1951	686	13	427	246	0	0	1.06	.
1952	763	15	498	250	0	0	1.15	.
1953	801	9	531	262	0	0	1.18	.
1954	774	3	499	269	3	0	1.11	.
1955	742	1	464	260	17	0	1.03	.
1956	786	1	481	286	19	0	1.05	.
1957	700	1	368	314	18	0	0.91	.
1958	950	0	583	347	20	0	1.19	.
1959	845	1	446	373	25	0	1.03	.
1960	704	1	278	400	24	0	0.84	.
1961	1255	0	807	435	13	0	1.46	.
1962	1975	1	1507	444	22	0	2.27	.
1963	357	1	-101	435	22	0	0.41	.
1964	1035	1	441	569	24	0	1.17	.
1965	1417	1	777	614	26	0	1.58	.
1966	1105	1	355	721	29	0	1.21	.
1967	1264	0	443	796	26	0	1.37	.
1968	1101	0	238	835	29	0	1.17	.
1969	1065	0	193	839	33	0	1.11	.
1970	2285	0	747	977	37	524	2.35	.
1971	2064	0	590	952	35	487	2.10	.
1972	2093	0	652	986	39	416	2.12	.
1973	2405	0	792	949	34	630	2.42	.
1974	2446	0	599	868	33	946	2.44	.
1975	2348	0	470	792	35	1052	2.32	.
1976	4050	0	1934	1027	32	1057	3.96	.
1977	4289	0	1977	1237	29	1045	4.14	.
1978	4073	0	1632	1529	30	883	3.88	.
1979	4430	0	1807	1725	29	869	4.16	.
1980	4552	0	1502	1966	25	1059	4.21	.
1981	4651	0	1756	1800	19	1076	4.24	.
1982	4985	0	1365	1980	26	1615	4.48	.
1983	4404	0	494	2108	53	1749	3.90	..
1984	4748	0	757	2118	55	1819	4.15	.
1985	5635	0	905	2573	45	2112	4.86	.
1986	4728	0	748	2024	44	1913	4.02	.
1987	4762	0	728	2125	44	1865	4.00	.
1988	4324	0	792	1956	49	1526	3.58	.
1989	4290	0	495	2596	52	1148	3.51	.
1990	4617	0	1172	3269	60	117	3.74	.
1991	5615	0	1668	3140	66	741	4.49	.
1992	5634	0	1672	3100	62	800	4.45	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Tunisia

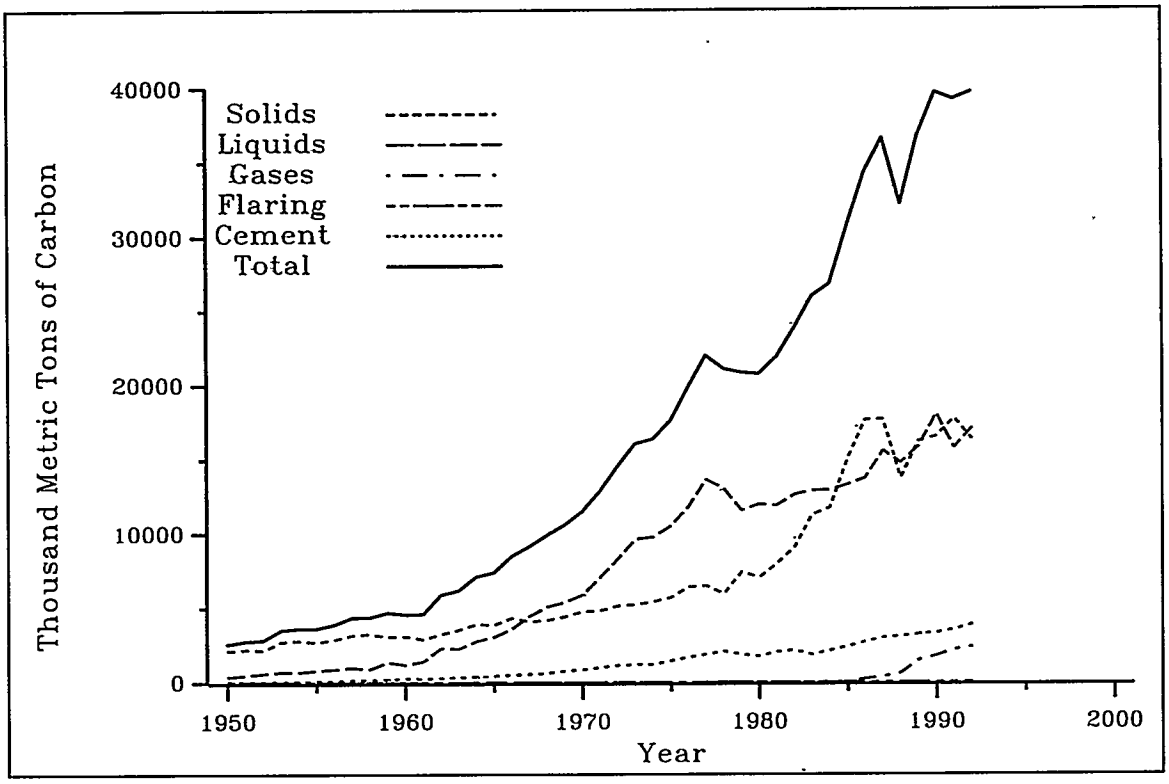


Per capita CO_2 emission rates for Tunisia

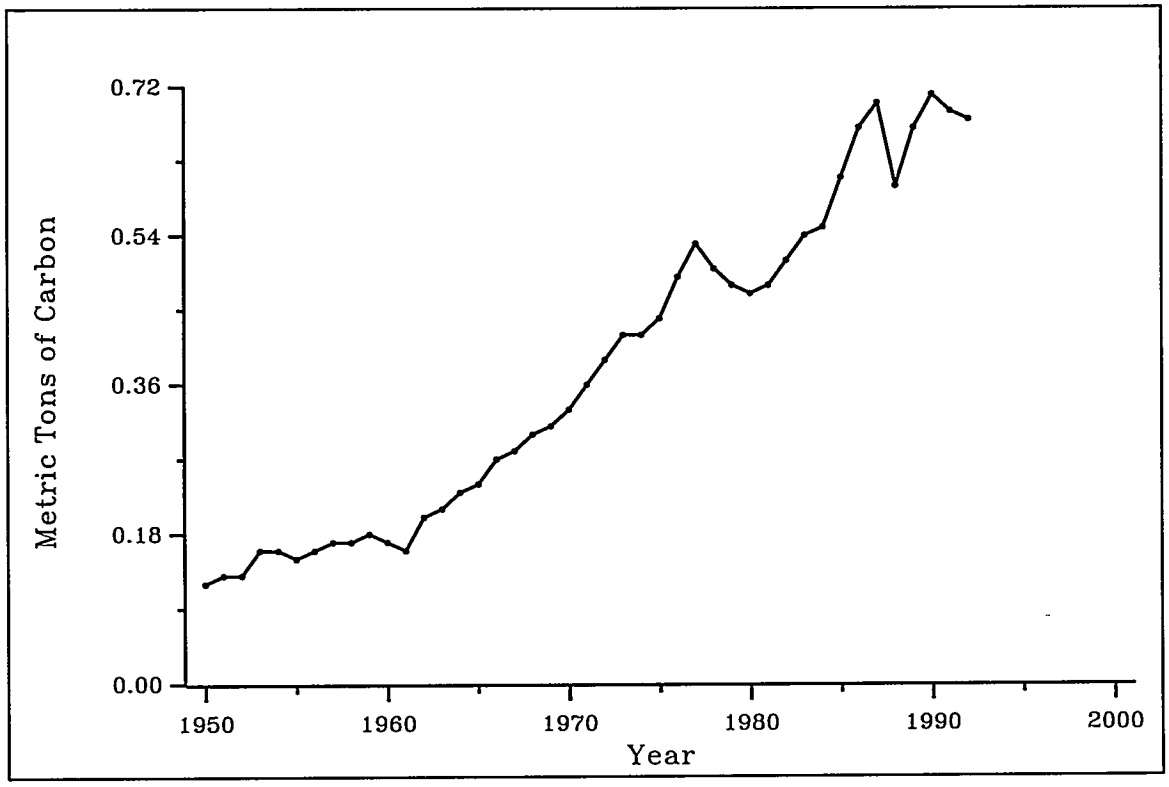
Tunisia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	334	126	185	1	23	0	0.09	.
1951	379	156	196	1	25	0	0.11	.
1952	396	132	234	2	28	0	0.11	.
1953	376	61	282	2	31	0	0.10	.
1954	384	54	289	2	39	0	0.10	.
1955	437	33	349	2	52	0	0.11	.
1956	426	34	340	4	49	0	0.11	.
1957	430	64	307	4	55	0	0.11	.
1958	396	25	320	4	47	0	0.10	.
1959	435	21	350	4	60	0	0.10	.
1960	471	32	380	4	55	0	0.11	.
1961	483	37	396	4	45	0	0.11	.
1962	490	26	411	4	49	0	0.11	.
1963	532	27	451	4	49	0	0.12	.
1964	752	30	656	5	62	0	0.17	.
1965	672	37	568	5	62	0	0.15	.
1966	788	59	659	5	65	0	0.17	.
1967	843	99	675	5	64	0	0.17	.
1968	982	88	820	6	69	0	0.20	.
1969	1053	89	877	6	82	0	0.21	.
1970	994	101	816	3	74	0	0.19	.
1971	1117	70	967	1	80	0	0.21	.
1972	1256	97	1050	12	85	11	0.24	.
1973	1277	76	1049	72	71	9	0.24	.
1974	1419	119	1097	127	73	4	0.26	.
1975	1471	87	1164	133	84	4	0.26	.
1976	1589	80	1304	135	65	4	0.28	.
1977	1835	71	1530	145	78	12	0.31	.
1978	2036	82	1648	180	120	7	0.34	.
1979	2385	103	1877	208	188	9	0.38	.
1980	2580	64	2016	246	242	12	0.40	.
1981	2671	82	2055	242	275	16	0.41	.
1982	2589	51	2016	261	242	19	0.38	.
1983	3073	71	2347	255	388	13	0.44	.
1984	3146	73	2218	462	378	16	0.44	.
1985	3255	69	2172	575	416	22	0.45	.
1986	3290	62	2395	396	406	31	0.44	.
1987	3204	69	1970	672	463	30	0.42	.
1988	3373	85	2280	562	439	7	0.44	.
1989	3560	82	2178	847	444	9	0.45	.
1990	3775	94	2538	692	444	7	0.47	.
1991	3736	98	2658	530	444	5	0.45	.
1992	3701	105	2660	487	444	6	0.44	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Turkey

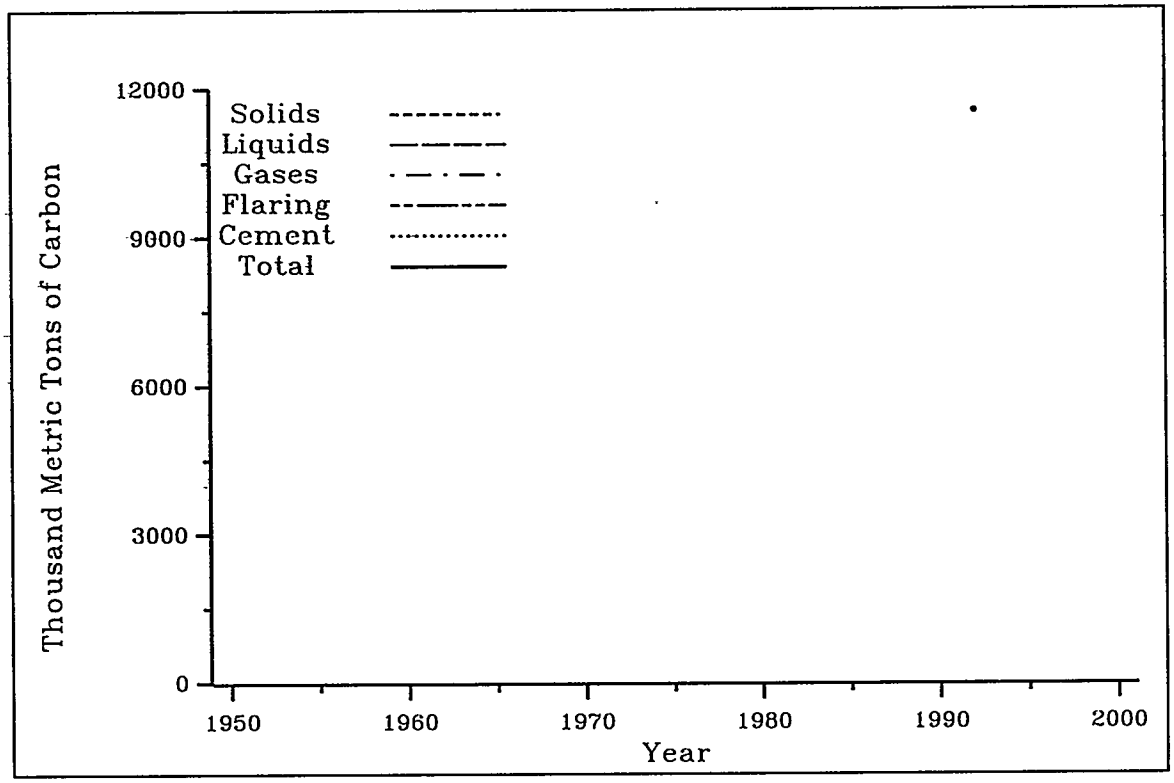


Per capita CO_2 emission rates for Turkey

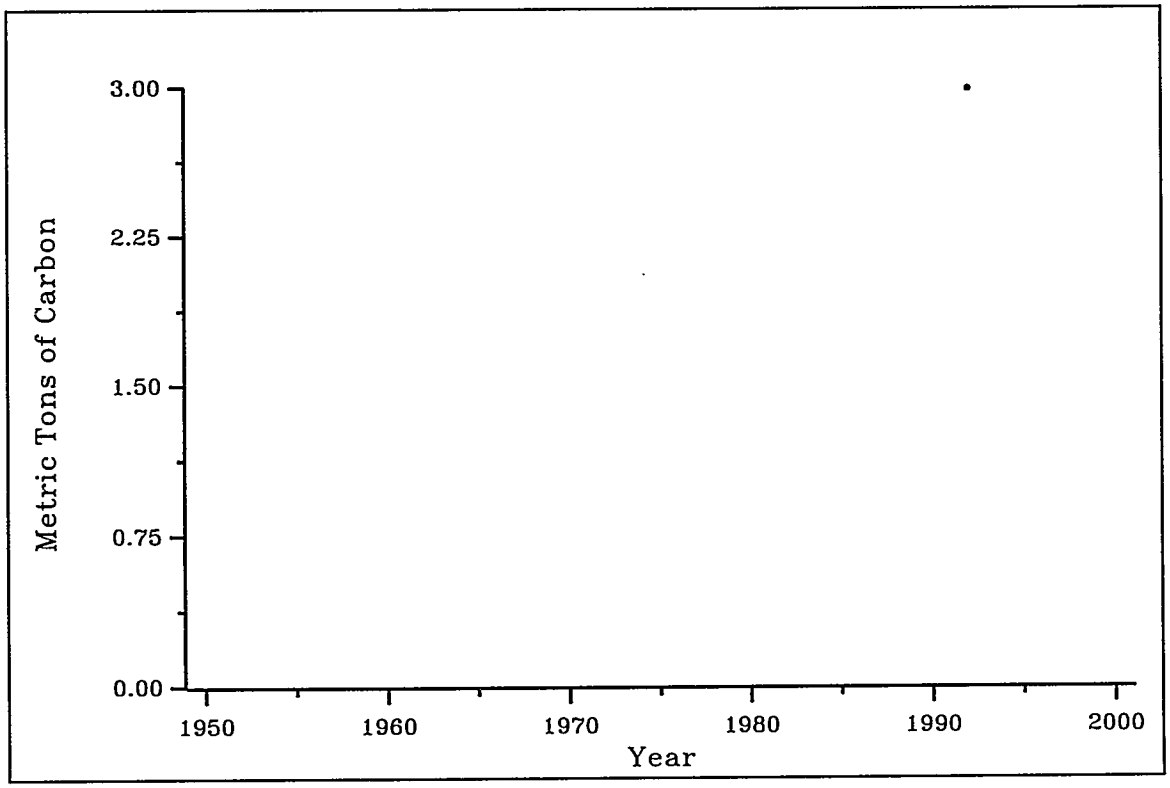
Turkey

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	2599	2137	408	0	54	0	0.12	.
1951	2789	2227	508	0	54	0	0.13	.
1952	2866	2173	630	0	62	0	0.13	.
1953	3546	2753	721	0	72	0	0.16	.
1954	3648	2816	736	0	96	0	0.16	.
1955	3658	2715	831	0	112	0	0.15	.
1956	3931	2901	898	0	132	0	0.16	.
1957	4378	3187	1020	0	172	0	0.17	.
1958	4401	3274	920	0	206	0	0.17	.
1959	4702	3089	1377	0	236	0	0.18	.
1960	4587	3107	1203	0	277	0	0.17	.
1961	4611	2916	1419	0	276	0	0.16	.
1962	5887	3262	2309	0	316	0	0.20	.
1963	6184	3550	2266	0	367	0	0.21	.
1964	7105	3929	2776	0	400	0	0.23	.
1965	7383	3878	3052	0	453	0	0.24	.
1966	8481	4339	3616	0	526	0	0.27	.
1967	9147	4108	4462	0	578	0	0.28	.
1968	9907	4189	5075	0	643	0	0.30	.
1969	10588	4417	5384	0	788	0	0.31	.
1970	11504	4762	5875	0	867	0	0.33	.
1971	12879	4817	7035	0	1027	0	0.36	.
1972	14538	5136	8257	0	1146	0	0.39	.
1973	16050	5225	9608	0	1217	0	0.42	.
1974	16384	5414	9756	0	1215	0	0.42	.
1975	17637	5691	10492	0	1454	0	0.44	.
1976	19847	6396	11773	0	1679	0	0.49	.
1977	21988	6478	13629	0	1881	0	0.53	.
1978	21080	5932	13051	11	2087	0	0.50	.
1979	20826	7398	11552	1	1875	0	0.48	.
1980	20741	7022	11957	12	1751	0	0.47	.
1981	21881	7953	11874	8	2046	0	0.48	.
1982	23824	9044	12614	20	2146	0	0.51	.
1983	25985	11245	12888	4	1849	0	0.54	.
1984	26821	11717	12943	20	2140	0	0.55	.
1985	30713	15005	13283	34	2391	0	0.61	.
1986	34344	17662	13731	231	2721	0	0.67	.
1987	36613	17683	15564	376	2989	0	0.70	.
1988	32206	13734	14758	629	3084	0	0.60	.
1989	36785	16204	15851	1494	3236	0	0.67	.
1990	39680	16532	18044	1783	3321	0	0.71	.
1991	39223	17755	15750	2179	3540	0	0.69	.
1992	39708	16334	17101	2383	3891	0	0.68	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Turkmenistan

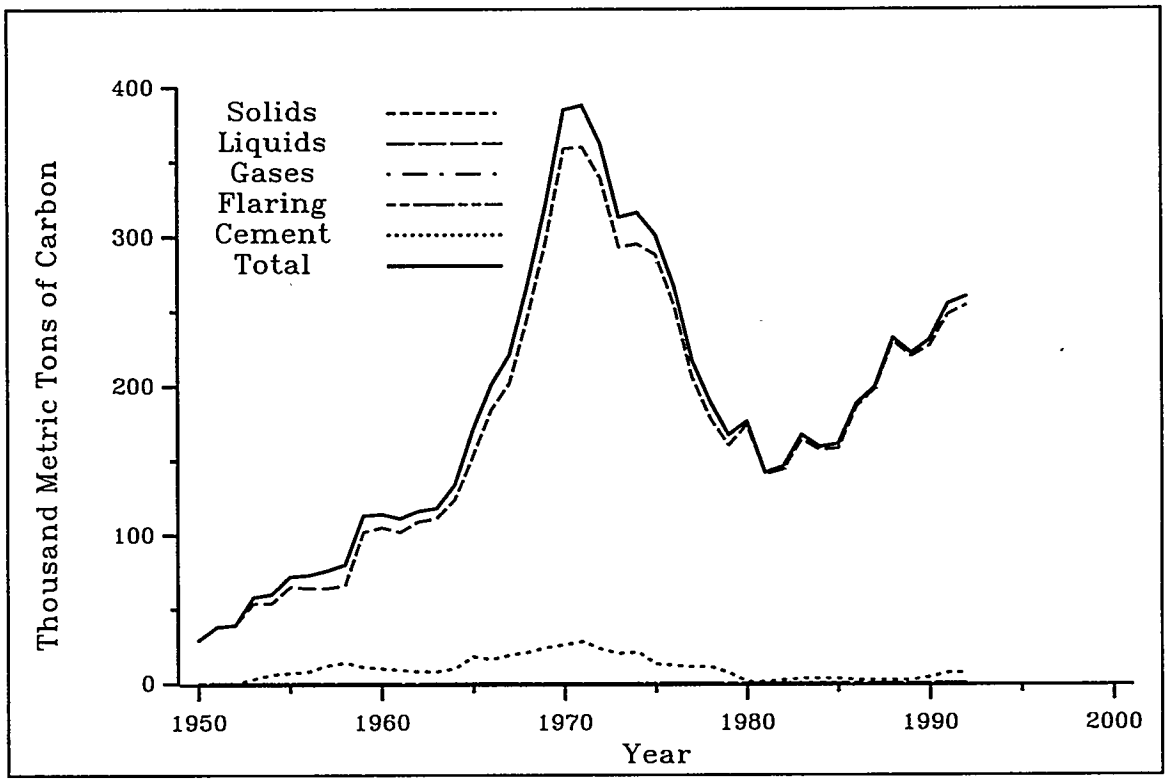


Per capita CO_2 emission rates for Turkmenistan

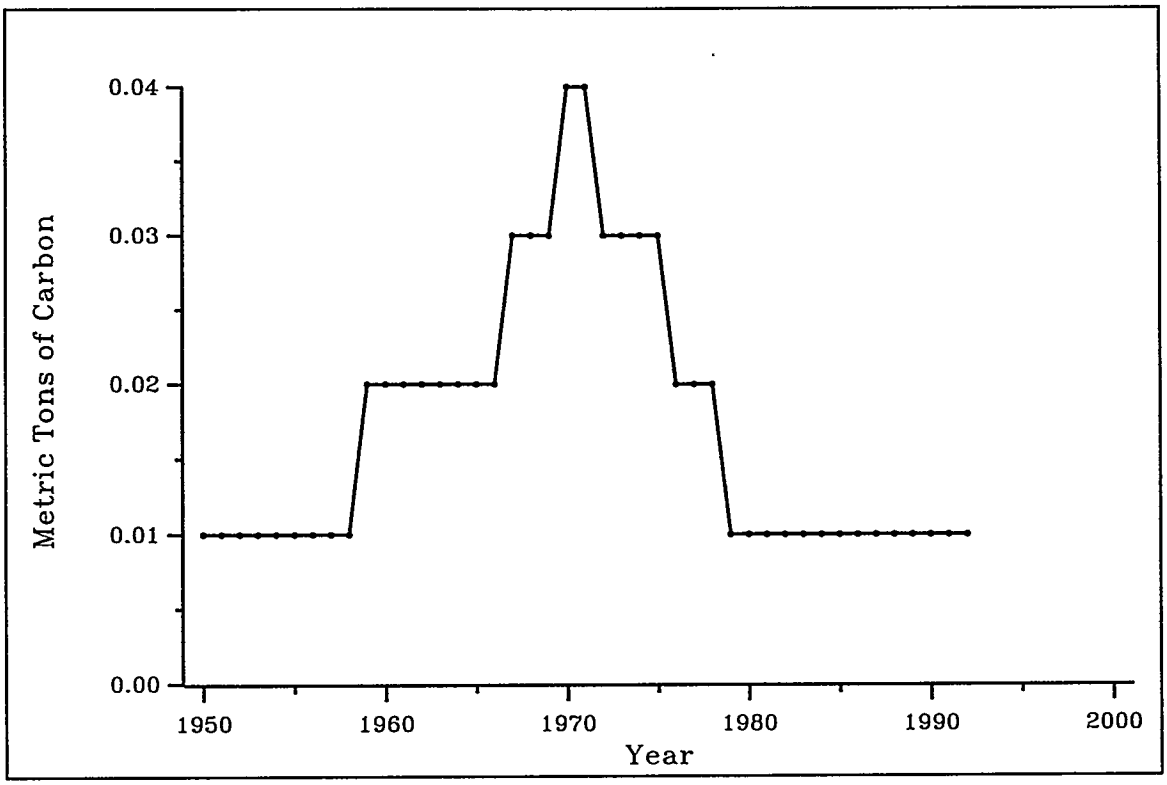
Turkmenistan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	11533	197	5374	5867	95	0	2.99	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Uganda

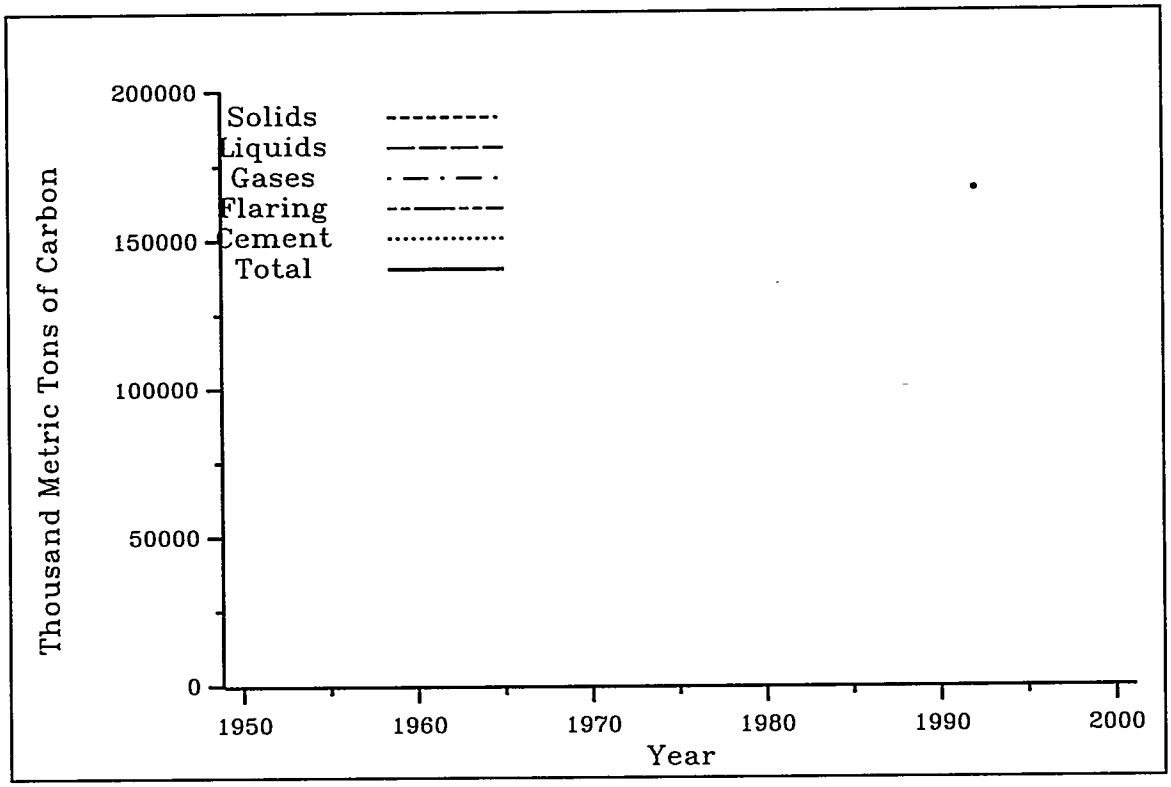


Per capita CO_2 emission rates for Uganda

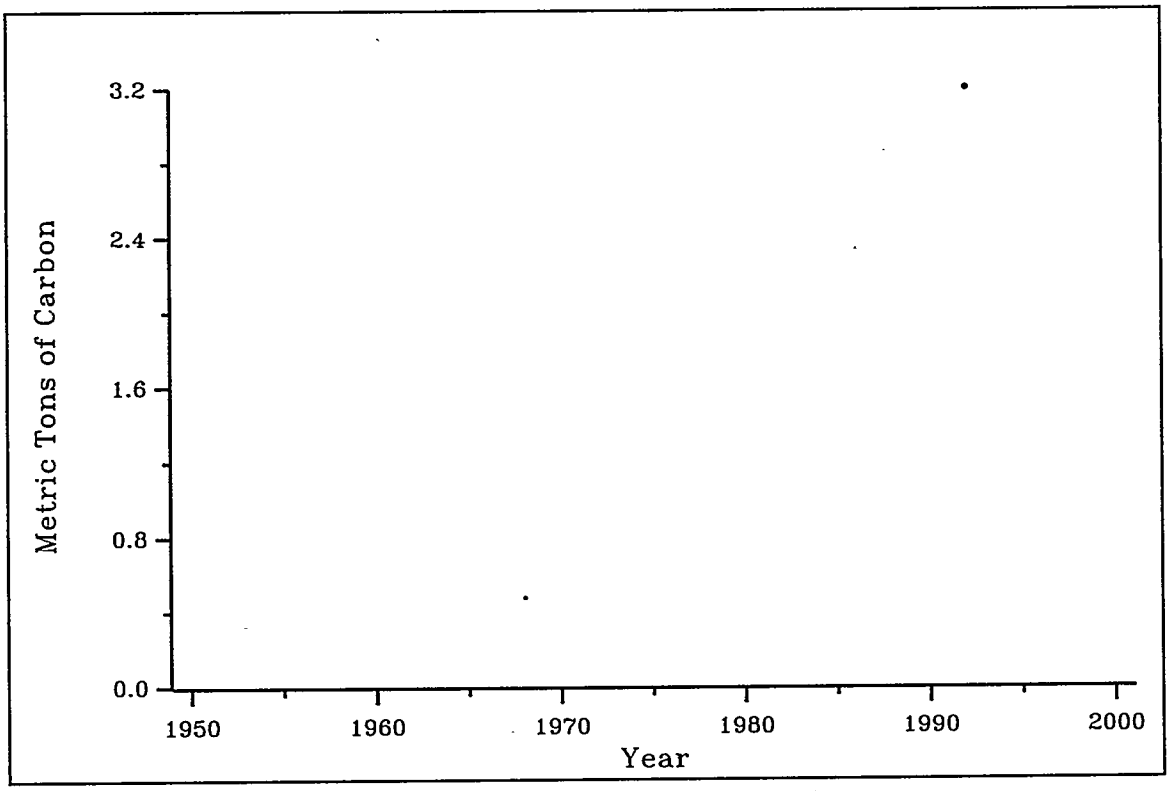
Uganda

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	29	0	29	0	0	0	0.01	.
1951	38	0	38	0	0	0	0.01	.
1952	39	0	39	0	0	0	0.01	.
1953	58	0	54	0	3	0	0.01	.
1954	60	0	54	0	6	0	0.01	.
1955	72	0	65	0	7	0	0.01	.
1956	73	0	64	0	8	0	0.01	.
1957	76	0	64	0	12	0	0.01	.
1958	80	0	66	0	14	0	0.01	.
1959	113	0	102	0	11	0	0.02	.
1960	114	0	105	0	10	0	0.02	.
1961	111	0	102	0	9	0	0.02	.
1962	116	0	109	0	8	0	0.02	.
1963	118	0	111	0	8	0	0.02	.
1964	134	0	124	0	10	0	0.02	.
1965	171	0	153	0	18	0	0.02	.
1966	201	0	184	0	16	0	0.02	.
1967	221	0	202	0	19	0	0.03	.
1968	268	0	247	0	21	0	0.03	.
1969	321	0	297	0	24	0	0.03	.
1970	385	0	359	0	26	0	0.04	.
1971	388	0	360	0	28	0	0.04	.
1972	362	0	339	0	23	0	0.03	.
1973	313	0	293	0	20	0	0.03	.
1974	316	0	295	0	21	0	0.03	.
1975	301	0	288	0	13	0	0.03	.
1976	267	0	255	0	12	0	0.02	.
1977	217	0	206	0	11	0	0.02	.
1978	189	0	178	0	11	0	0.02	.
1979	167	0	160	0	7	0	0.01	.
1980	176	0	174	0	1	0	0.01	.
1981	142	0	141	0	1	0	0.01	.
1982	146	0	144	0	2	0	0.01	.
1983	167	0	164	0	3	0	0.01	.
1984	159	0	157	0	3	0	0.01	.
1985	161	0	158	0	3	0	0.01	.
1986	188	0	186	0	2	0	0.01	.
1987	199	0	198	0	2	0	0.01	.
1988	232	0	230	0	2	0	0.01	.
1989	222	0	220	0	2	0	0.01	.
1990	231	0	227	0	4	0	0.01	.
1991	255	0	248	0	7	0	0.01	.
1992	260	0	254	0	7	0	0.01	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Ukraine

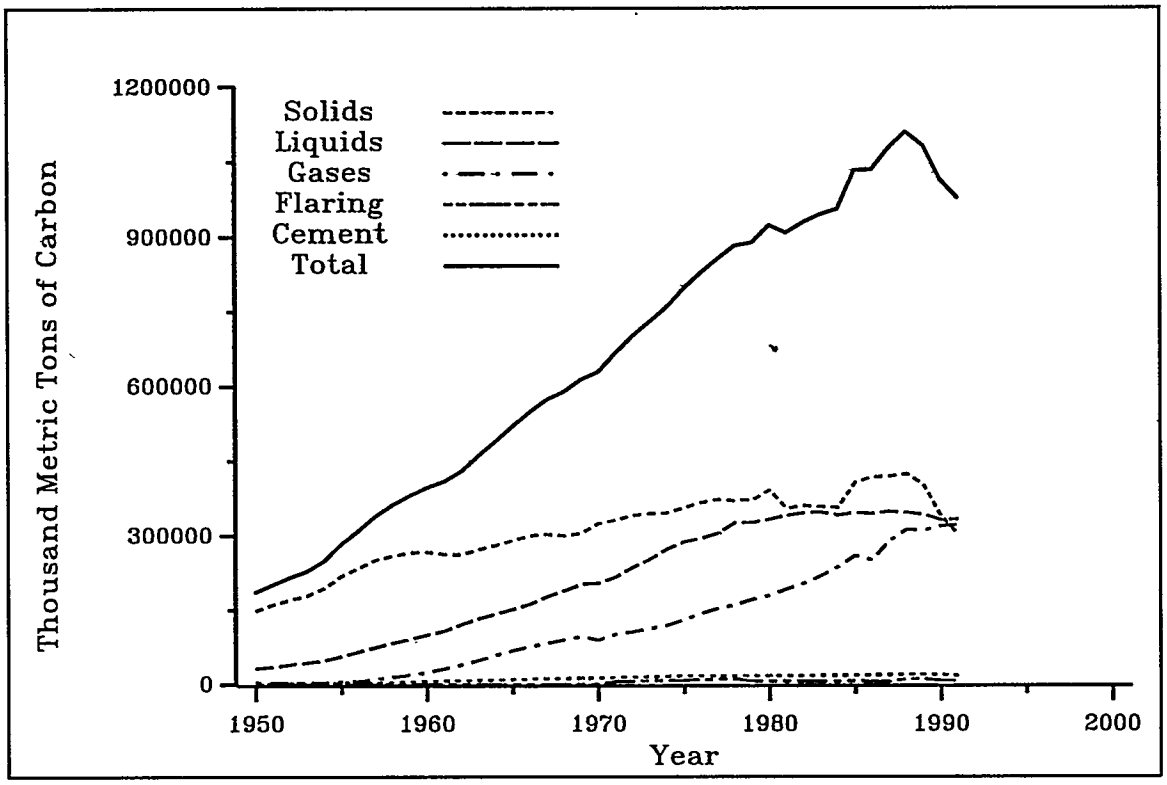


Per capita CO_2 emission rates for Ukraine

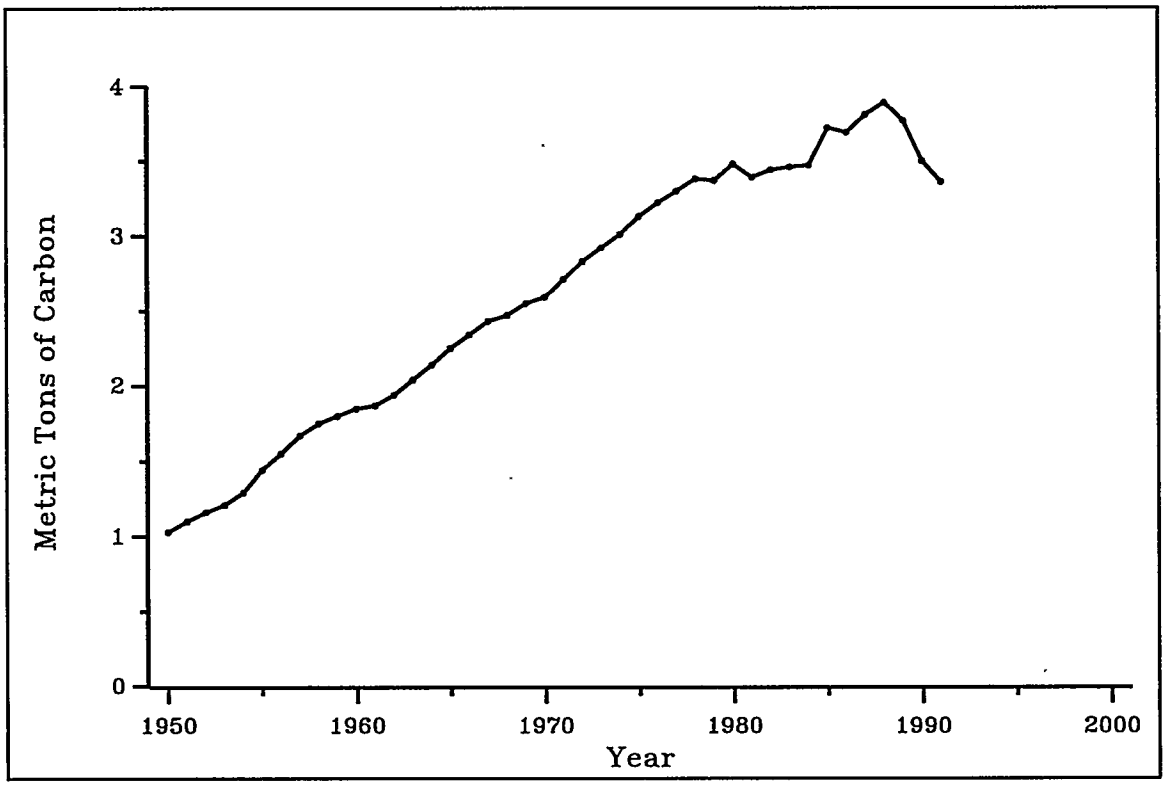
Ukraine

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	166851	84049	29481	50607	2714	0	3.20	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Union of Soviet Socialist Republic (former)

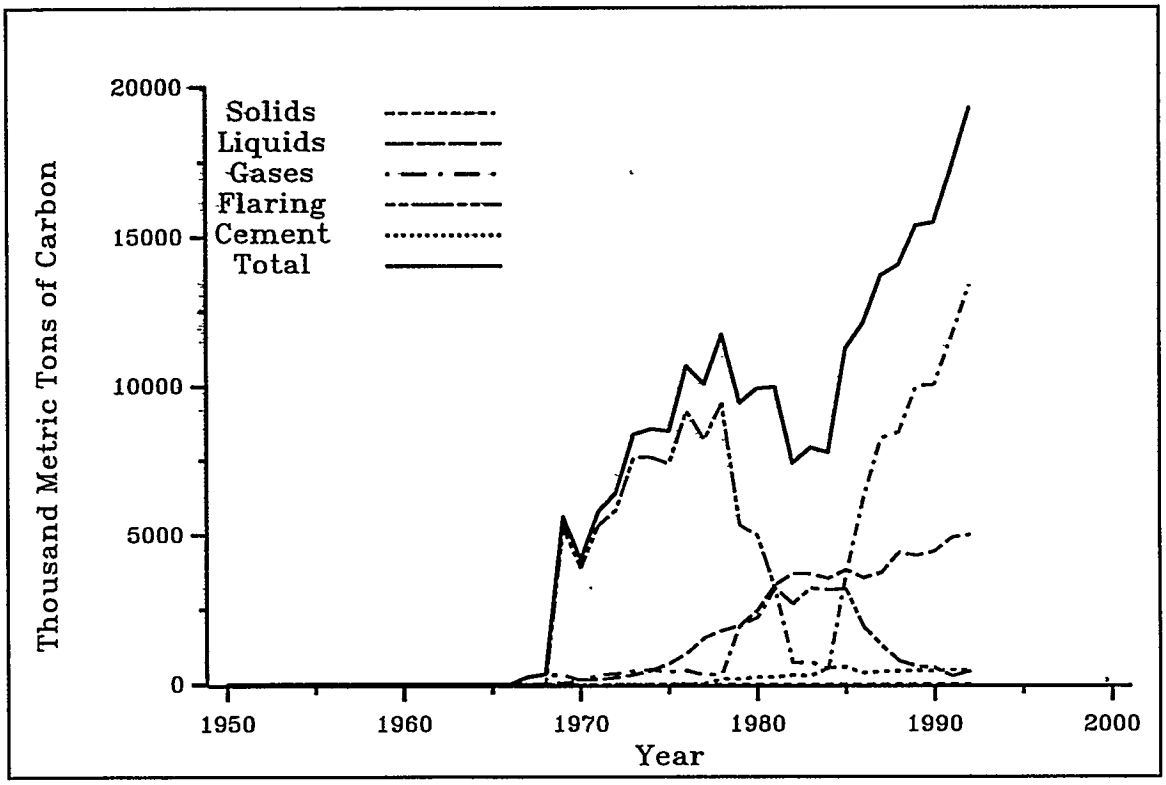


Per capita CO_2 emission rates for the Union of Soviet Socialist Republic (former)

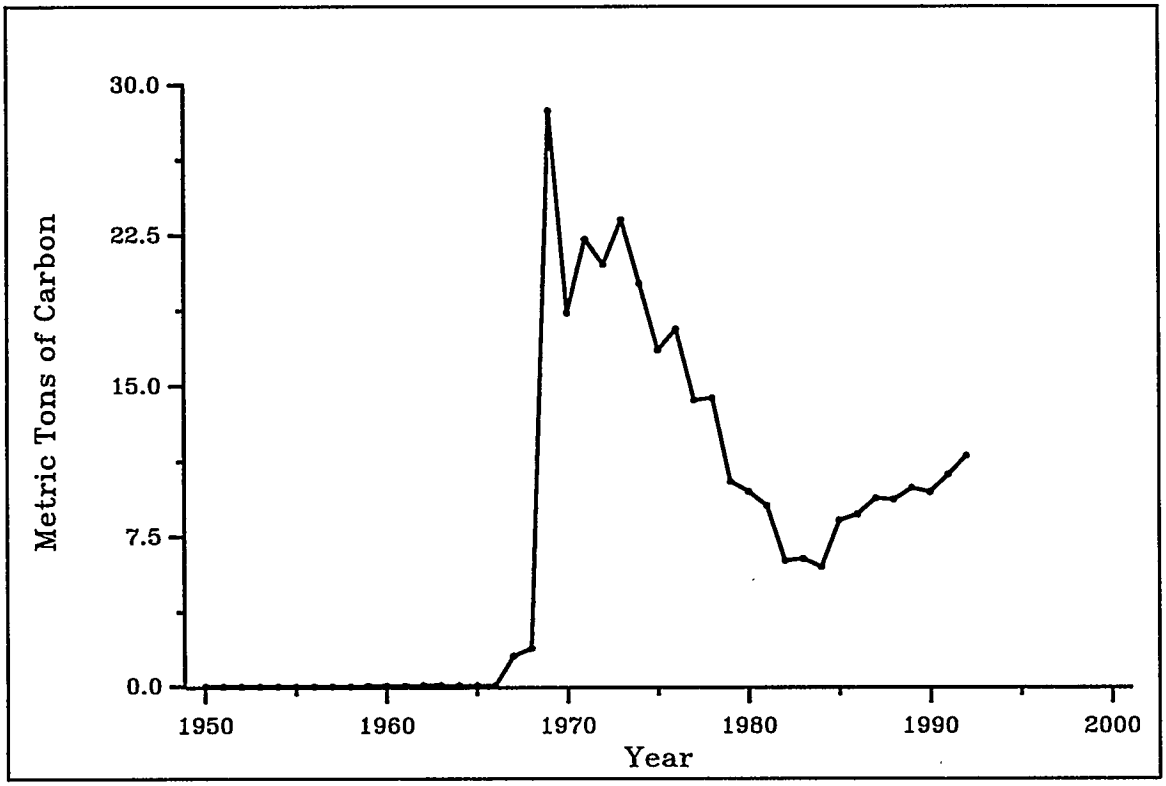
Union of Soviet Socialist Republic (former)

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	185786	148584	32664	3109	1429	0	1.03	.
1951	201380	161091	35237	3365	1686	0	1.10	.
1952	215670	170578	39749	3426	1918	0	1.16	.
1953	228094	178393	43852	3678	2171	0	1.21	.
1954	249095	193843	48652	4017	2583	0	1.29	.
1955	282467	217877	56721	4811	3058	0	1.44	.
1956	309756	234053	65838	6484	3381	0	1.55	.
1957	338871	250428	74402	10112	3930	0	1.67	.
1958	361673	258862	83241	15041	4530	0	1.75	.
1959	380278	264893	90961	19150	5275	0	1.80	.
1960	396016	266044	99415	24366	6191	0	1.85	.
1961	408412	262120	107736	31638	6917	0	1.87	.
1962	428731	261054	120514	39366	7797	0	1.94	.
1963	459516	270960	132012	48246	8298	0	2.04	.
1964	488640	279495	141607	58707	8831	0	2.14	.
1965	518494	289543	151111	67995	9845	0	2.25	.
1966	547451	299516	161638	75418	10879	0	2.34	.
1967	572504	302154	176242	82581	11527	0	2.43	.
1968	588697	299359	187912	89526	11902	0	2.47	.
1969	613107	303775	201305	95814	12213	0	2.55	.
1970	628209	323275	203222	88758	12954	0	2.59	.
1971	665371	330053	215288	100450	13645	5936	2.71	.
1972	700020	340105	234394	105660	14185	5677	2.83	.
1973	728613	343810	251444	111714	14892	6753	2.92	.
1974	757835	344869	271444	118449	15660	7414	3.01	.
1975	795865	355316	286417	129294	16600	8238	3.13	.
1976	827396	365377	293721	142247	16898	9153	3.22	.
1977	855150	371375	303995	152614	17280	9887	3.30	.
1978	882560	369540	324987	160138	17266	10629	3.38	.
1979	888360	370160	325180	170521	16731	5768	3.37	.
1980	922997	390426	331772	178006	17007	5787	3.48	.
1981	908144	354138	339815	191137	17295	5759	3.39	.
1982	929062	359311	344780	202415	16821	5735	3.44	.
1983	944142	357149	346394	217522	17429	5649	3.46	.
1984	954642	355496	340124	235748	17699	5575	3.47	.
1985	1033379	405400	345387	258868	17778	5946	3.72	.
1986	1033768	416855	343271	250063	18376	5203	3.69	.
1987	1077352	418037	347642	288213	18687	4772	3.81	.
1988	1109178	422882	345732	311098	18972	10496	3.89	.
1989	1082160	402015	341514	309297	19099	10234	3.77	.
1990	1012979	338492	330705	318337	18676	6770	3.50	.
1991	977396	301792	331965	320069	17273	6298	3.36	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the United Arab Emirates

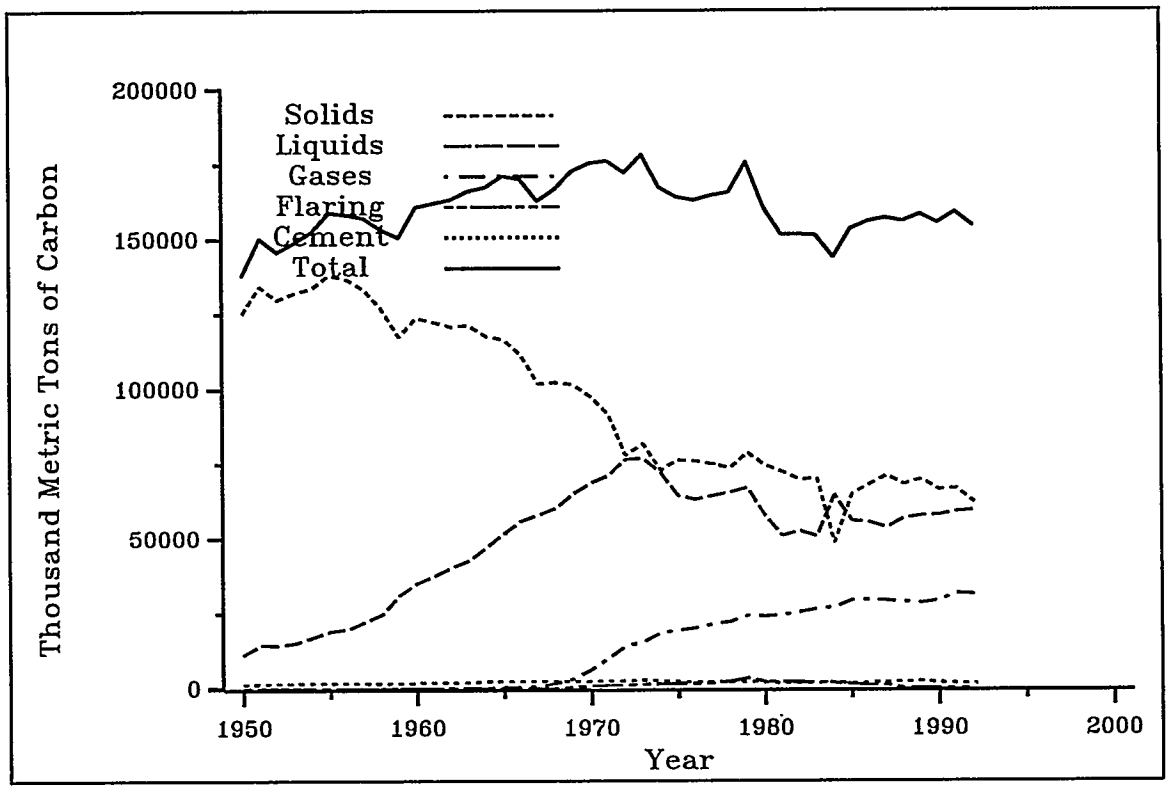


Per capita CO_2 emission rates for the United Arab Emirates

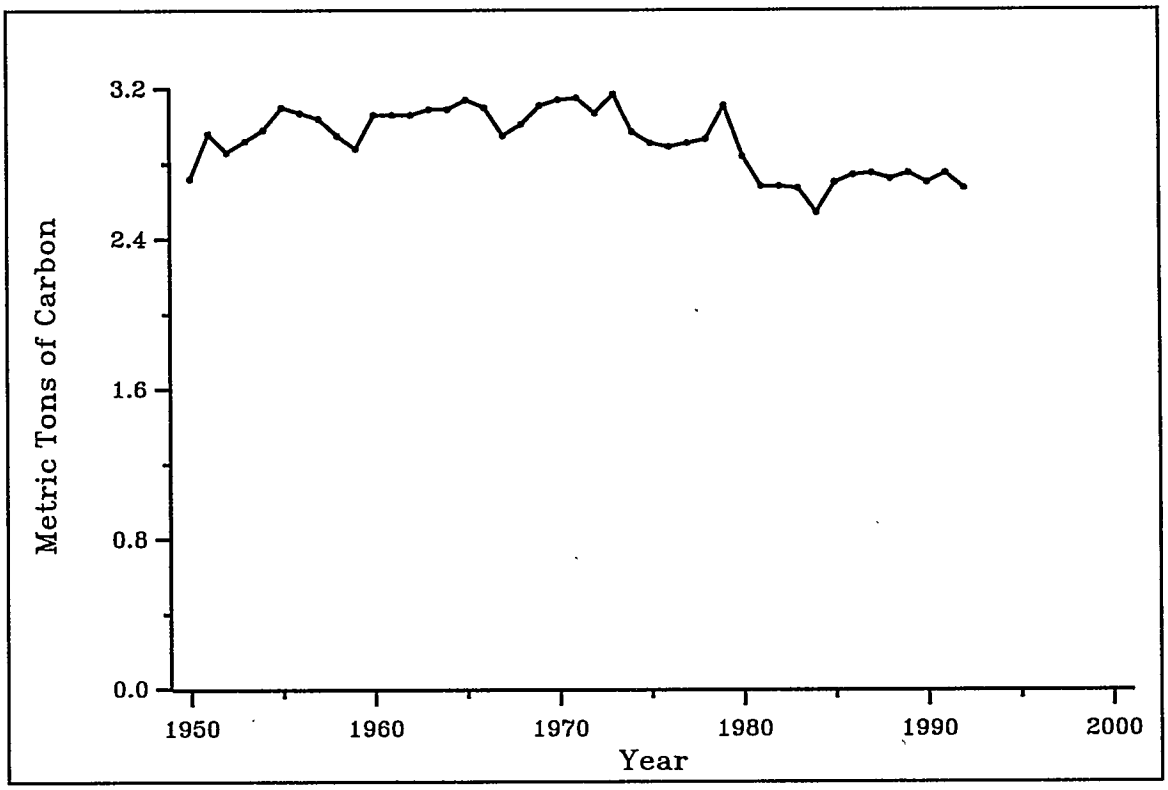
United Arab Emirates

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	0	0	0	0	0	0	0.00	.
1953	0	0	0	0	0	0	0.00	.
1954	0	0	0	0	0	0	0.00	.
1955	0	0	0	0	0	0	0.00	.
1956	0	0	0	0	0	0	0.00	.
1957	0	0	0	0	0	0	0.00	.
1958	0	0	0	0	0	0	0.00	.
1959	3	0	3	0	0	0	0.03	.
1960	3	0	3	0	0	0	0.03	.
1961	3	0	3	0	0	0	0.03	.
1962	5	0	5	0	0	0	0.05	.
1963	6	0	6	0	0	0	0.05	.
1964	5	0	5	0	0	0	0.04	.
1965	6	0	6	0	0	0	0.04	.
1966	7	0	7	0	0	0	0.04	.
1967	250	0	13	238	0	0	1.53	.
1968	339	0	25	314	0	0	1.92	.
1969	5597	0	38	309	0	5250	28.70	.
1970	4158	0	147	120	0	3891	18.64	.
1971	5777	0	161	302	0	5314	22.30	.
1972	6396	0	221	357	0	5819	21.04	.
1973	8353	0	322	445	0	7586	23.27	.
1974	8543	0	468	490	0	7586	20.10	.
1975	8473	0	683	415	0	7375	16.78	.
1976	10655	0	1026	460	27	9143	17.82	.
1977	10064	0	1546	304	27	8187	14.32	.
1978	11704	0	1786	349	169	9401	14.41	.
1979	9417	0	1964	1957	173	5323	10.25	.
1980	9897	0	2458	2229	234	4976	9.75	.
1981	9951	0	3316	3202	234	3200	9.05	.
1982	7401	0	3696	709	302	2693	6.31	.
1983	7912	0	3691	733	281	3208	6.40	.
1984	7759	0	3536	517	545	3162	6.00	.
1985	11243	0	3832	3655	572	3185	8.33	.
1986	12088	0	3556	6234	373	1926	8.62	.
1987	13683	0	3727	8232	422	1301	9.42	.
1988	14048	0	4401	8428	447	771	9.36	.
1989	15355	0	4303	9998	461	593	9.93	.
1990	15465	0	4445	10024	444	551	9.73	.
1991	17301	0	4903	11653	472	273	10.61	.
1992	19273	0	4990	13361	481	441	11.54	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the United Kingdom

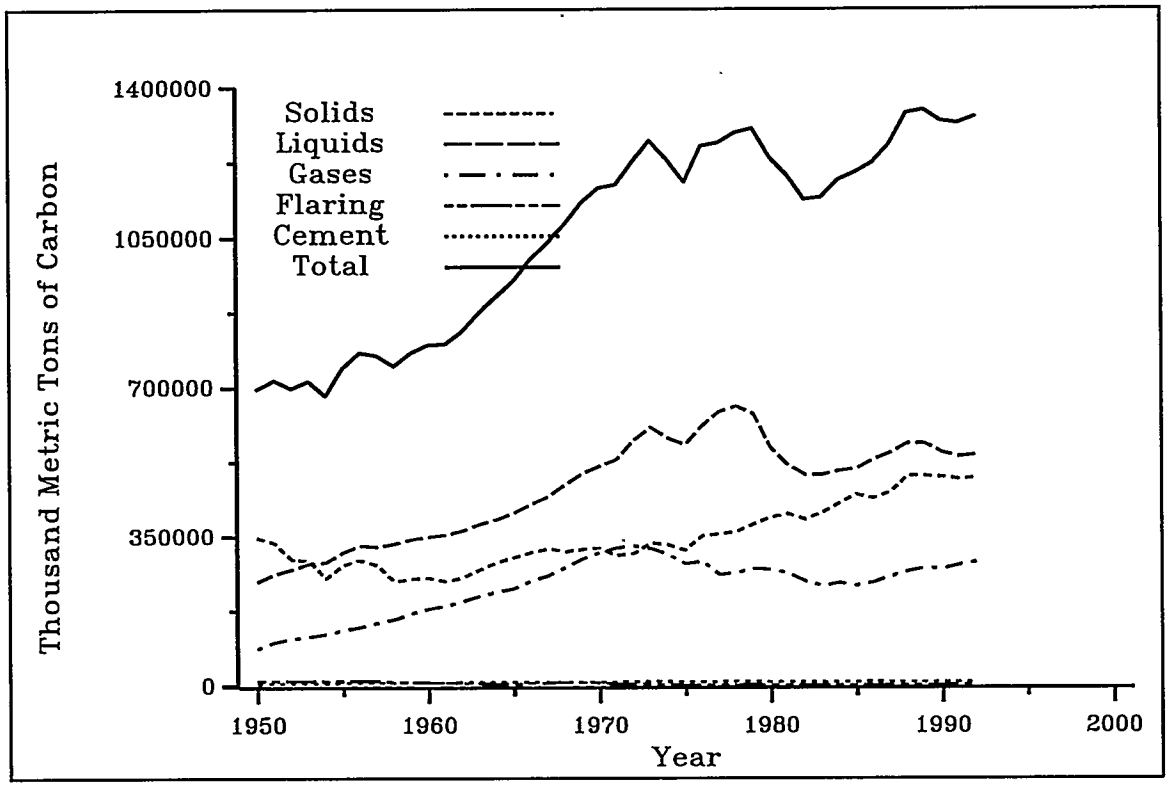


Per capita CO_2 emission rates for the United Kingdom

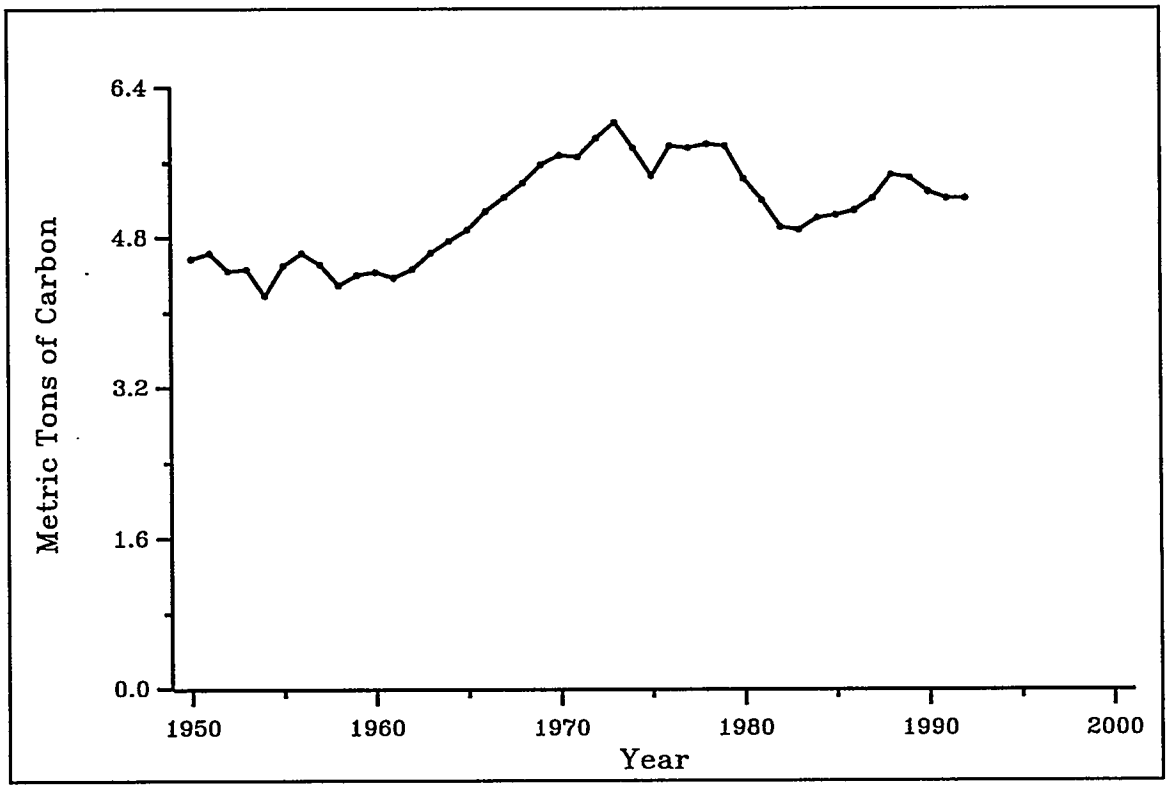
United Kingdom

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	138032	125322	11361	0	1348	0	2.72	5185
1951	150251	134201	14633	4	1413	0	2.96	5840
1952	145721	129699	14478	5	1539	0	2.86	6044
1953	148931	132095	15280	6	1550	0	2.92	5849
1954	152395	133628	17104	9	1653	0	2.98	6080
1955	158976	138036	19203	7	1730	0	3.10	6202
1956	158242	136646	19822	10	1764	0	3.07	5639
1957	157217	133249	22298	17	1653	0	3.04	4680
1958	153194	126700	24850	32	1612	0	2.95	4794
1959	150513	117503	31233	37	1739	0	2.88	4838
1960	160770	123715	35178	41	1836	0	3.06	5161
1961	162019	122287	37736	41	1955	0	3.06	4886
1962	163207	120749	40461	59	1938	0	3.06	4563
1963	166066	121299	42776	79	1912	0	3.09	4509
1964	167314	117693	47174	140	2307	0	3.09	4537
1965	171152	116596	51789	460	2307	0	3.14	4787
1966	170015	111370	55912	450	2281	0	3.10	4586
1967	162812	101744	57920	758	2390	0	2.95	4761
1968	166773	102246	60319	1710	2431	67	3.01	5097
1969	172762	101596	65049	3344	2369	404	3.11	5377
1970	175397	97388	68576	6306	2320	807	3.14	6211
1971	176130	91613	71007	10160	2407	942	3.15	6484
1972	172222	77824	76496	14372	2455	1076	3.07	6326
1973	178138	81689	76829	15556	2718	1345	3.17	6678
1974	167233	72715	72016	18603	2419	1480	2.97	5976
1975	164064	76256	64414	19482	2297	1615	2.91	4968
1976	162961	75917	63077	20207	2146	1615	2.89	5181
1977	164567	74850	64312	21564	2102	1739	2.91	4592
1978	165662	73467	65435	22249	2165	2346	2.93	4744
1979	175604	78717	66939	24344	2195	3409	3.11	4768
1980	160551	74434	57781	24132	2014	2191	2.84	4512
1981	151534	72261	50909	24456	1731	2177	2.68	3980
1982	151475	69643	52553	25468	1763	2049	2.68	4447
1983	151153	70153	50704	26520	1822	1954	2.67	4060
1984	143853	48538	64534	27186	1833	1762	2.54	4378
1985	153283	64712	55924	29460	1814	1374	2.70	4488
1986	155878	68051	55408	29549	1824	1047	2.74	4668
1987	156980	70970	53620	29342	1946	1102	2.75	4578
1988	155967	68121	56708	28893	2245	0	2.72	4856
1989	158217	69798	57549	28578	2292	0	2.75	5520
1990	155465	66344	57860	29358	1904	0	2.70	5687
1991	159054	66721	58999	31747	1586	0	2.75	5173
1992	154543	62220	59498	31366	1458	0	2.67	5435

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the United States of America

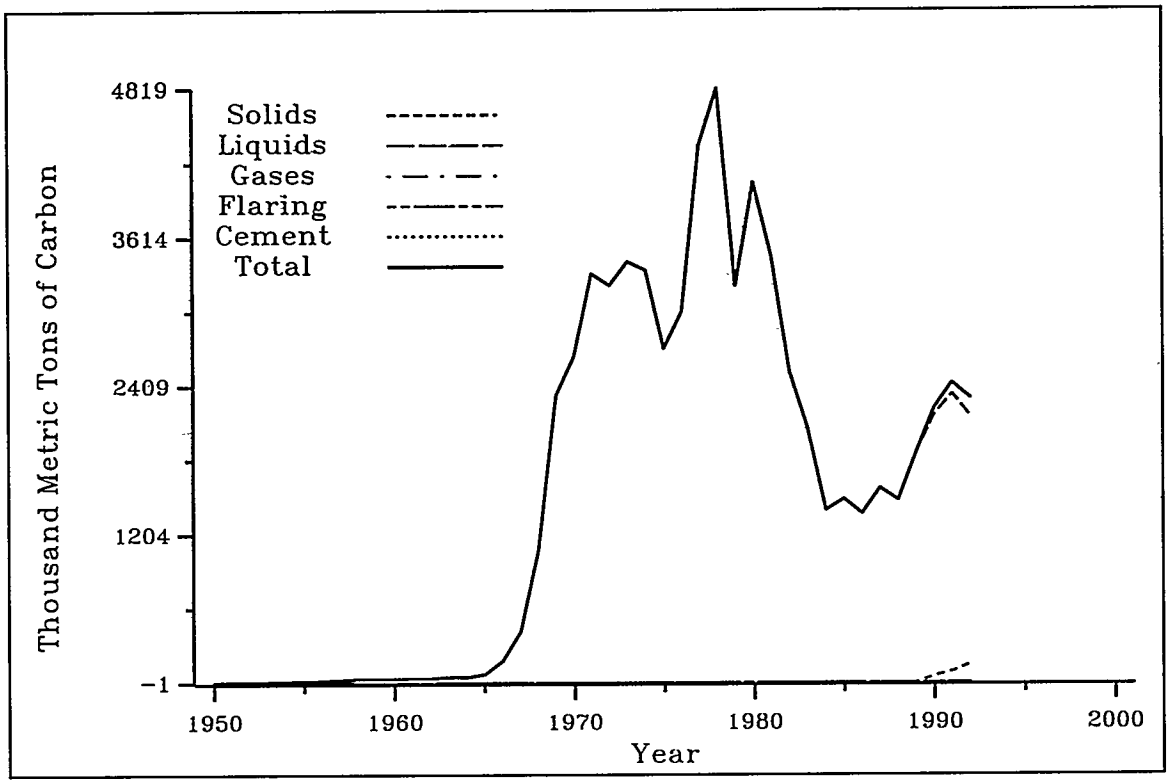


Per capita CO_2 emission rates for the United States of America

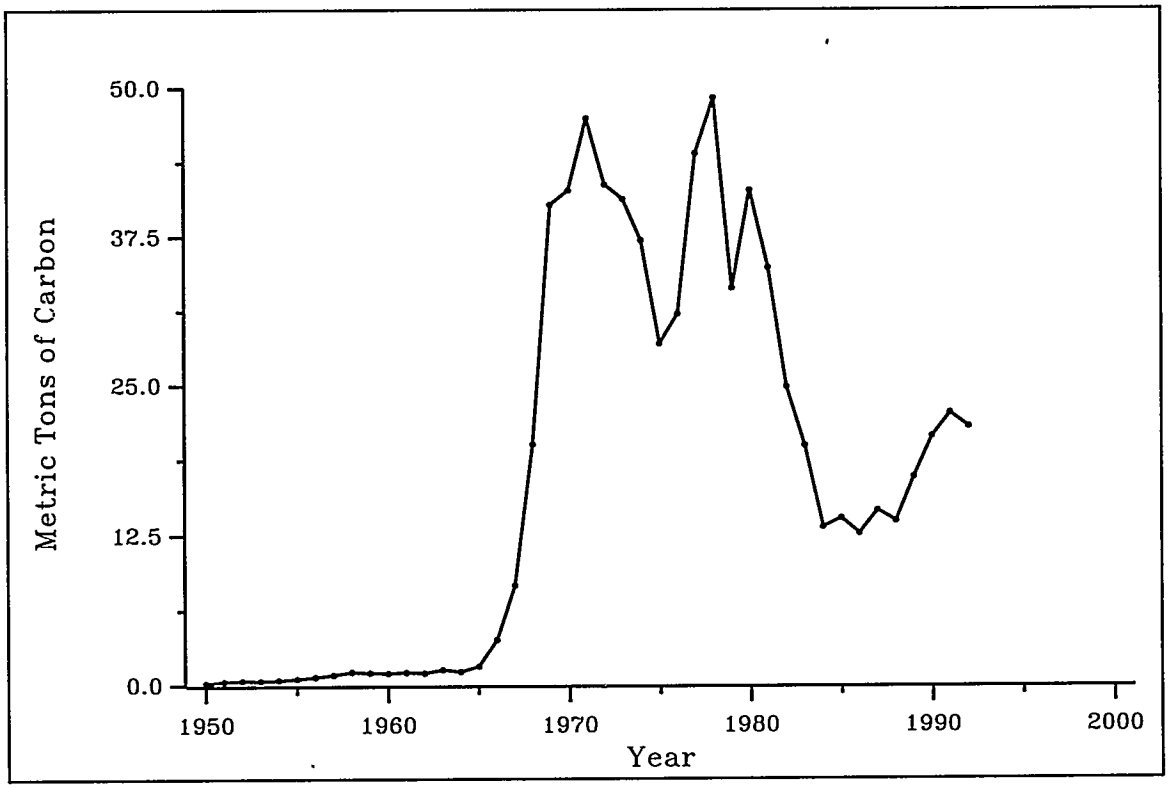
United States of America

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	696069	347108	244802	87123	5267	11769	4.57	8106
1951	716717	334509	262189	102677	5688	11654	4.63	10260
1952	697920	296567	273190	109931	5766	12468	4.44	10789
1953	714462	294299	286594	115541	6124	11905	4.46	10978
1954	680491	252189	290178	121179	6315	10631	4.18	10063
1955	745973	283324	313292	130784	7207	11366	4.50	10845
1956	781912	294962	328544	138070	7637	12699	4.63	11371
1957	775115	282739	325781	147556	7150	11888	4.51	12965
1958	750766	245262	332982	155759	7457	9306	4.29	11549
1959	781360	251509	343465	169868	8128	8390	4.40	11626
1960	799544	253437	349790	180422	7625	8270	4.43	11650
1961	801875	245006	354071	187392	7714	7692	4.37	11920
1962	831489	254222	364287	198711	8015	6254	4.46	11337
1963	875633	272502	378849	210271	8379	5633	4.63	10426
1964	912912	289665	389703	219793	8756	4996	4.76	10849
1965	948264	301107	405597	228034	8851	4676	4.88	10629
1966	999673	312723	425920	246394	9132	5504	5.08	11698
1967	1039174	321091	443613	258534	8760	7177	5.23	13197
1968	1080969	314767	471907	277378	9350	7567	5.38	14225
1969	1132028	319691	497405	297775	9462	7695	5.58	12375
1970	1165477	322436	514822	312070	8985	7164	5.68	13270
1971	1173242	305673	530479	323262	9663	4165	5.66	12774
1972	1227346	310413	575513	327598	10191	3632	5.86	12585
1973	1275365	334029	605443	321744	10550	3599	6.03	14614
1974	1231098	330068	580741	307877	9983	2429	5.76	14475
1975	1179027	317558	565124	285997	8407	1941	5.46	14717
1976	1262745	351556	608876	291309	9000	2003	5.78	16780
1977	1270549	355630	642715	260519	9703	1982	5.76	20623
1978	1293945	361158	655535	264673	10362	2217	5.80	23859
1979	1303822	378704	637521	274753	10424	2420	5.78	27492
1980	1236297	394640	558045	272505	9281	1826	5.43	30533
1981	1195706	403000	518184	264246	8847	1428	5.20	27835
1982	1139230	390091	494570	245390	7817	1362	4.91	23252
1983	1143714	405462	494390	233785	8688	1389	4.88	21424
1984	1184227	427795	503808	241457	9586	1580	5.01	21704
1985	1202453	448009	508581	234860	9611	1392	5.04	15450
1986	1224096	439581	530541	242823	9720	1431	5.09	15011
1987	1268062	454223	546028	256352	9648	1810	5.22	14876
1988	1340168	491669	568475	268455	9484	2086	5.47	16105
1989	1347634	491707	568143	276188	9523	2073	5.44	16816
1990	1322212	489444	547306	273734	9527	2201	5.29	16158
1991	1317297	484960	537687	283262	8906	2483	5.22	17267
1992	1332246	487491	542042	290728	9537	2449	5.22	17267

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the U.S. Virgin Islands

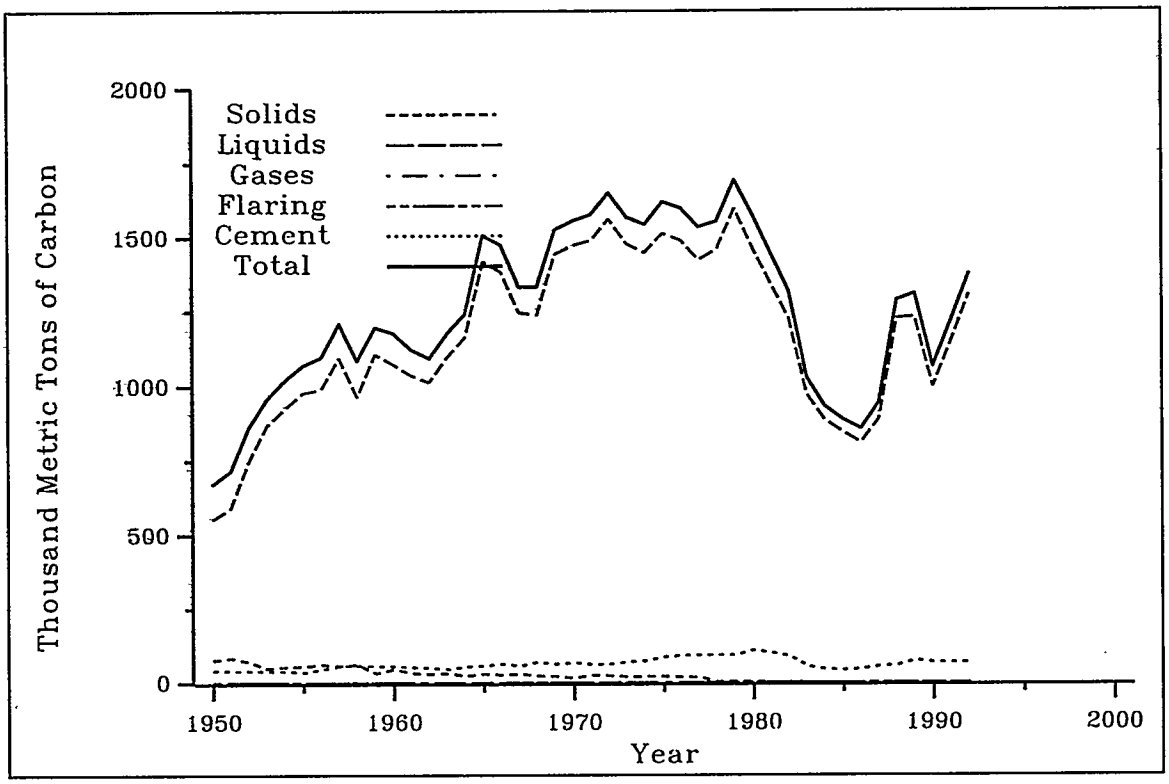


Per capita CO_2 emission rates for the U.S. Virgin Islands

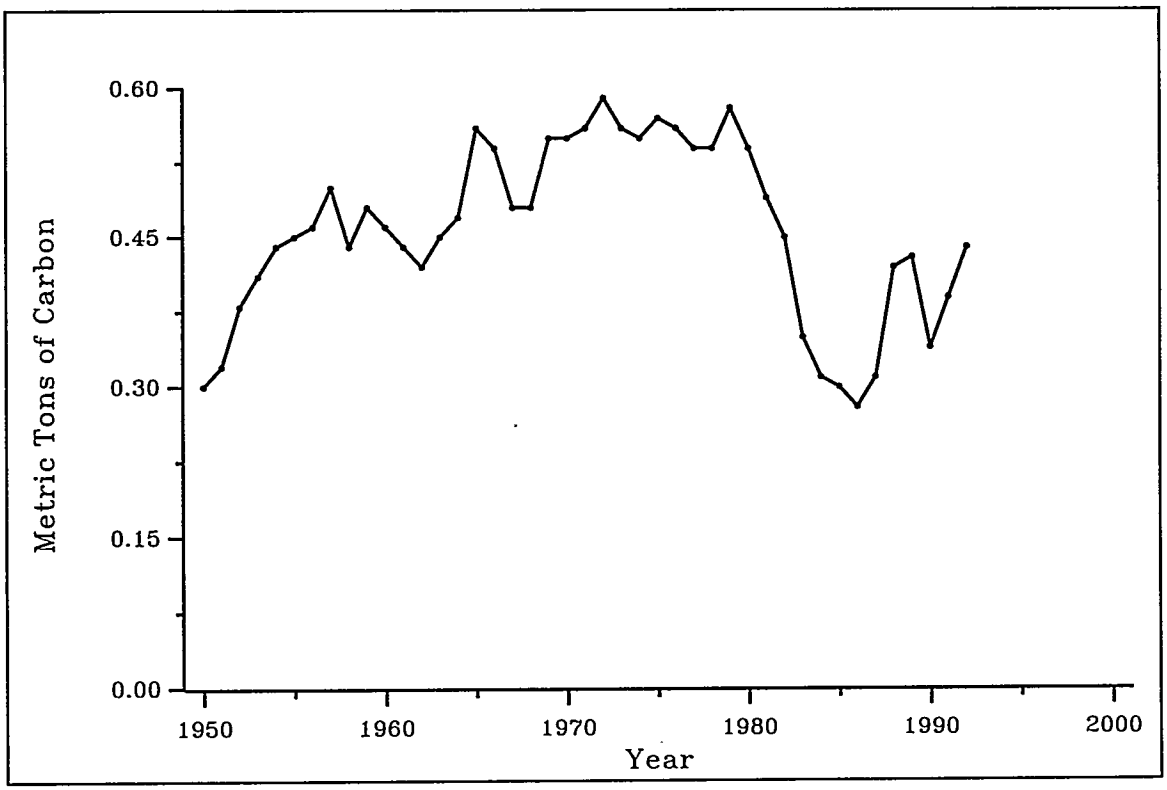
U.S. Virgin Islands

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	4	0	4	0	0	0	0.16	.
1951	8	0	8	0	0	0	0.31	41
1952	10	-1	12	0	0	0	0.38	48
1953	10	1	8	0	0	0	0.36	32
1954	12	0	12	0	0	0	0.43	44
1955	15	0	15	0	0	0	0.54	37
1956	19	0	19	0	0	0	0.69	47
1957	25	0	25	0	0	0	0.87	33
1958	33	0	33	0	0	0	1.12	28
1959	33	0	33	0	0	0	1.05	24
1960	33	0	33	0	0	0	1.01	40
1961	37	0	37	0	0	0	1.08	.
1962	37	0	37	0	0	0	1.02	.
1963	49	0	49	0	0	0	1.30	.
1964	47	0	47	0	0	0	1.14	.
1965	70	0	70	0	0	0	1.60	.
1966	179	0	179	0	0	0	3.81	.
1967	418	0	418	0	0	0	8.36	.
1968	1084	0	1084	0	0	0	20.08	.
1969	2333	0	2333	0	0	0	40.22	.
1970	2652	0	2652	0	0	0	41.43	.
1971	3322	0	3322	0	0	0	47.46	.
1972	3228	0	3228	0	0	0	41.92	.
1973	3418	0	3418	0	0	0	40.69	.
1974	3350	0	3350	0	0	0	37.22	.
1975	2714	0	2714	0	0	0	28.57	.
1976	3013	0	3013	0	0	0	31.06	.
1977	4363	0	4363	0	0	0	44.52	.
1978	4818	0	4818	0	0	0	49.16	.
1979	3223	0	3223	0	0	0	33.23	.
1980	4061	0	4061	0	0	0	41.44	.
1981	3459	0	3459	0	0	0	34.94	.
1982	2518	0	2518	0	0	0	24.93	.
1983	2060	0	2060	0	0	0	20.00	.
1984	1400	0	1400	0	0	0	13.21	.
1985	1490	0	1490	0	0	0	13.93	.
1986	1371	0	1371	0	0	0	12.69	.
1987	1576	0	1576	0	0	0	14.59	.
1988	1480	0	1480	0	0	0	13.71	.
1989	1861	0	1861	0	0	0	17.39	.
1990	2221	53	2168	0	0	0	20.76	.
1991	2431	90	2341	0	0	0	22.72	.
1992	2309	150	2159	0	0	0	21.58	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Uruguay

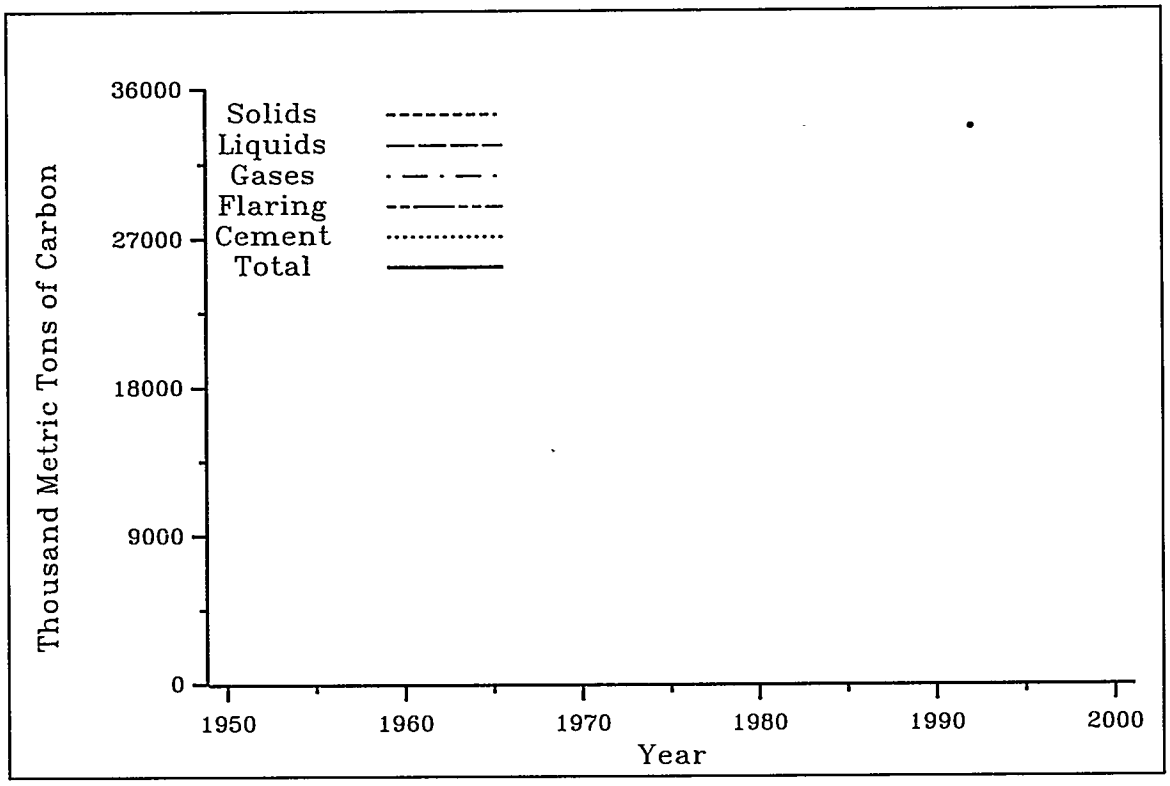


Per capita CO_2 emission rates for Uruguay

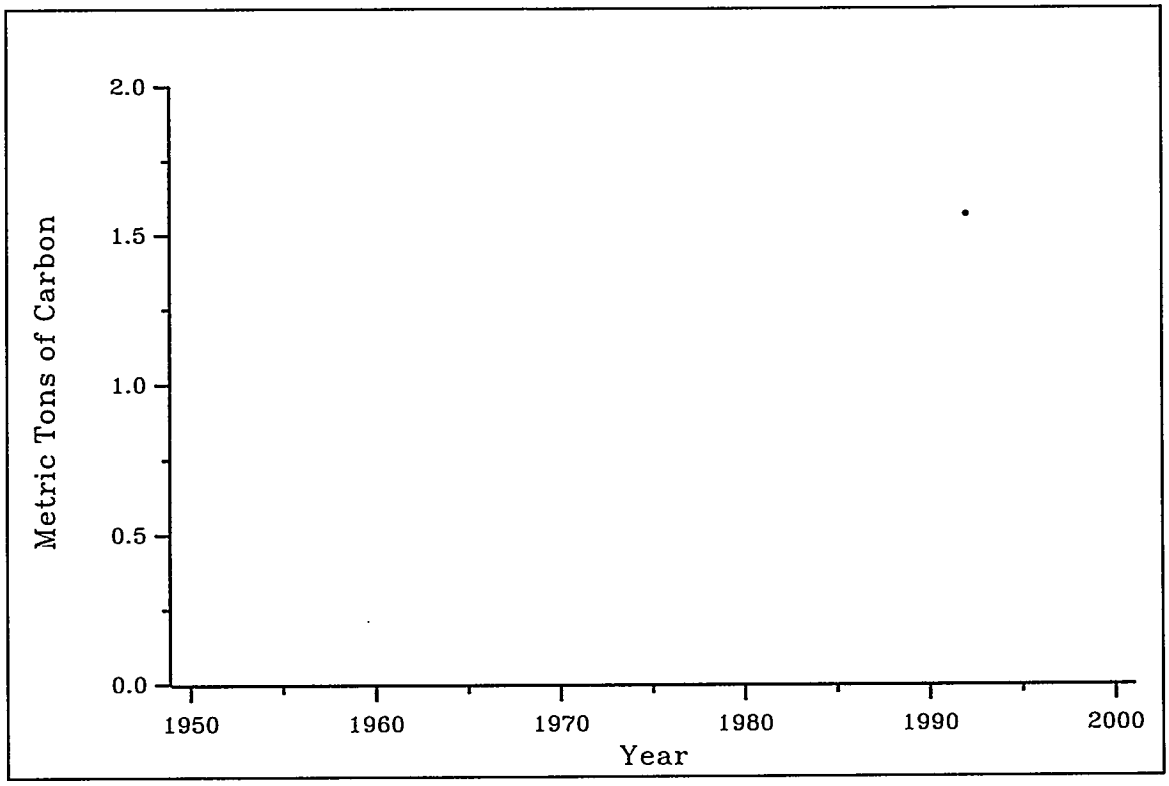
Uruguay

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	672	77	553	0	42	0	0.30	.
1951	717	84	592	0	41	0	0.32	.
1952	862	71	749	0	41	0	0.38	.
1953	958	49	868	0	40	0	0.41	.
1954	1021	54	927	0	40	0	0.44	.
1955	1071	56	979	0	36	0	0.45	.
1956	1098	62	990	0	46	0	0.46	.
1957	1210	58	1096	0	57	0	0.50	.
1958	1087	62	966	0	59	0	0.44	.
1959	1198	33	1108	0	57	0	0.48	.
1960	1179	47	1075	0	56	0	0.46	.
1961	1124	34	1037	0	53	0	0.44	.
1962	1095	30	1014	0	51	0	0.42	.
1963	1178	33	1099	0	46	0	0.45	.
1964	1243	23	1165	0	55	0	0.47	.
1965	1507	30	1419	0	58	0	0.56	.
1966	1474	27	1383	0	64	0	0.54	.
1967	1332	30	1246	0	57	0	0.48	.
1968	1333	24	1238	0	70	0	0.48	.
1969	1526	22	1442	0	63	0	0.55	.
1970	1556	16	1473	0	68	0	0.55	.
1971	1576	26	1488	0	62	0	0.56	.
1972	1650	24	1562	0	63	0	0.59	.
1973	1568	20	1477	0	70	0	0.56	.
1974	1544	21	1448	0	74	0	0.55	.
1975	1620	21	1513	0	87	0	0.57	.
1976	1599	19	1489	0	92	0	0.56	.
1977	1535	18	1423	0	93	0	0.54	.
1978	1553	2	1458	0	93	0	0.54	.
1979	1693	4	1596	0	93	0	0.58	.
1980	1576	3	1463	0	110	0	0.54	.
1981	1447	2	1344	0	101	0	0.49	.
1982	1318	2	1227	0	90	0	0.45	.
1983	1029	1	973	0	55	0	0.35	.
1984	933	1	886	0	45	0	0.31	.
1985	889	1	846	0	43	0	0.30	.
1986	857	1	810	0	46	0	0.28	.
1987	945	1	890	0	55	0	0.31	.
1988	1287	1	1227	0	59	0	0.42	.
1989	1309	0	1232	0	76	0	0.43	.
1990	1066	0	998	0	68	0	0.34	.
1991	1217	0	1149	0	68	0	0.39	.
1992	1375	1	1306	0	68	0	0.44	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Uzbekistan

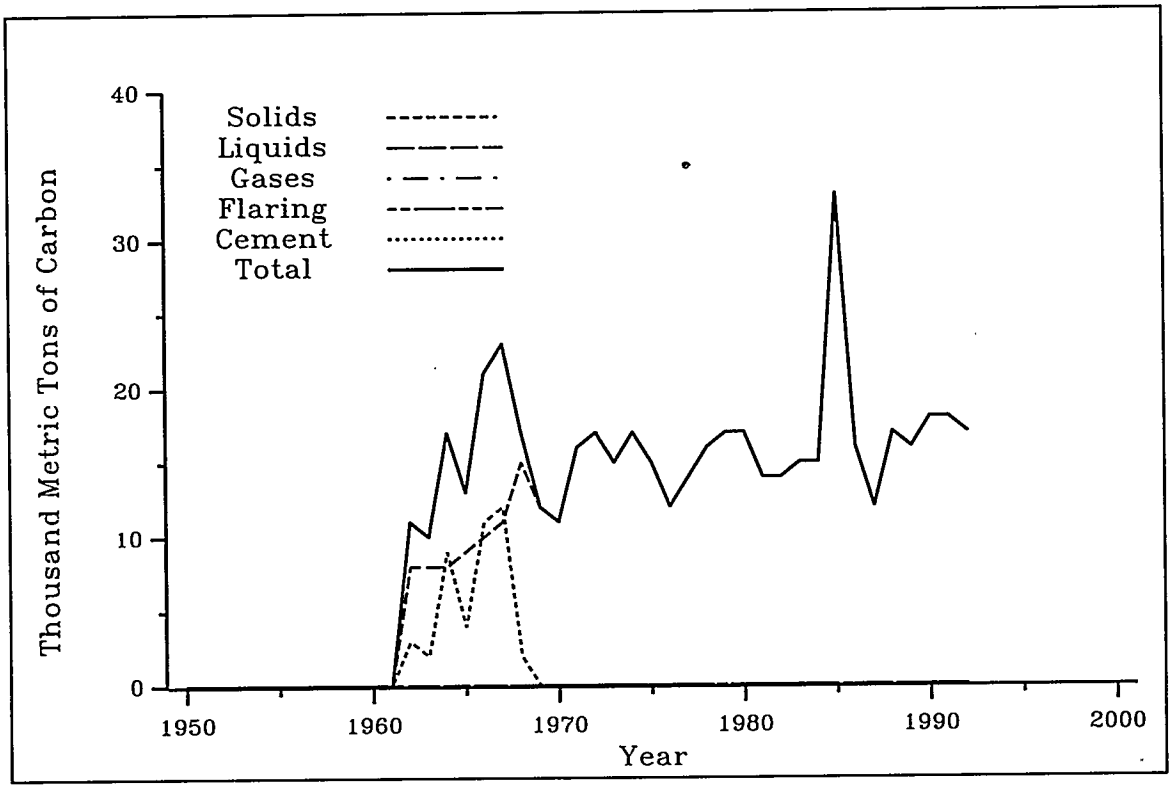


Per capita CO_2 emission rates for Uzbekistan

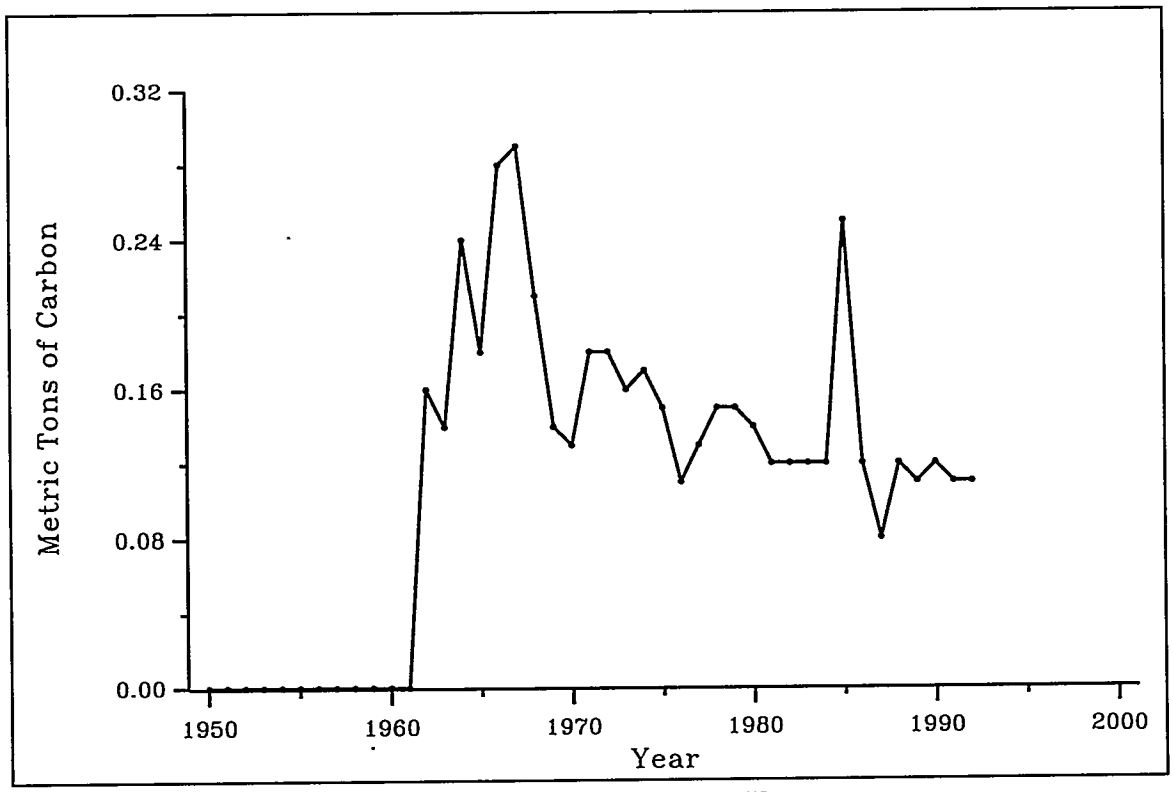
Uzbekistan

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	33639	5044	6156	21624	814	0	1.57	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Vanuatu

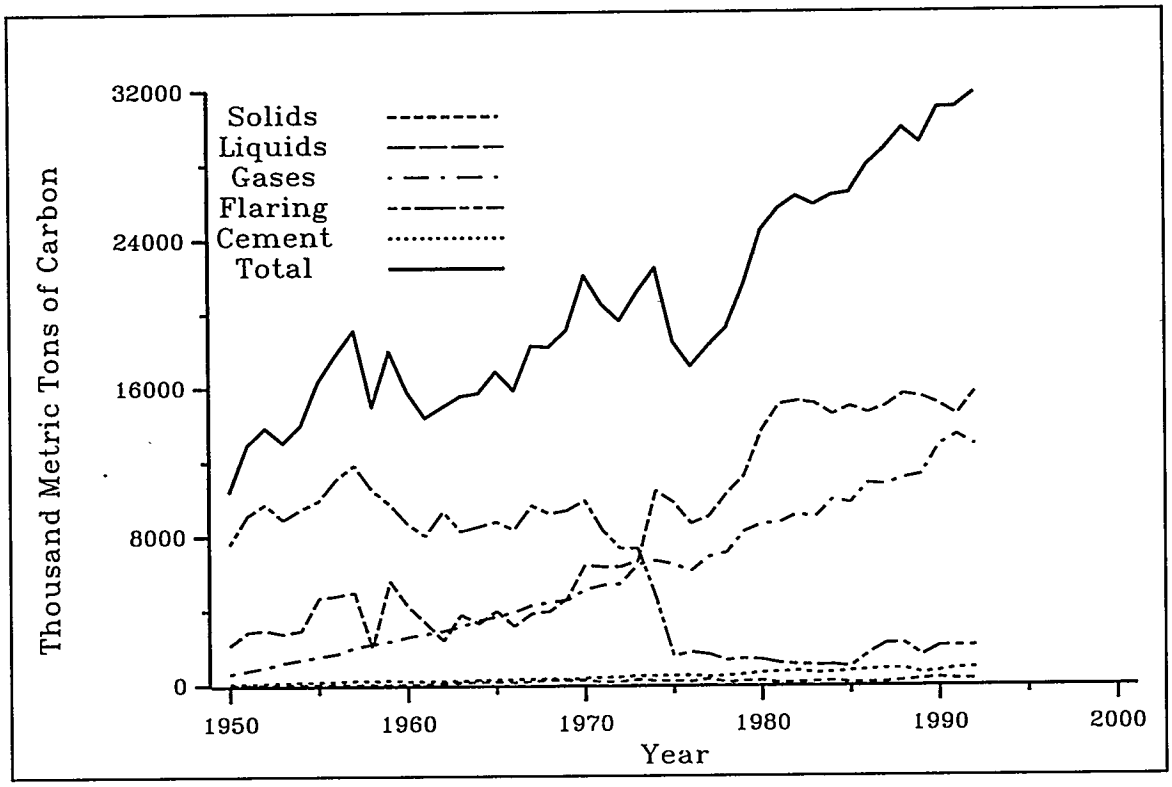


Per capita CO_2 emission rates for Vanuatu

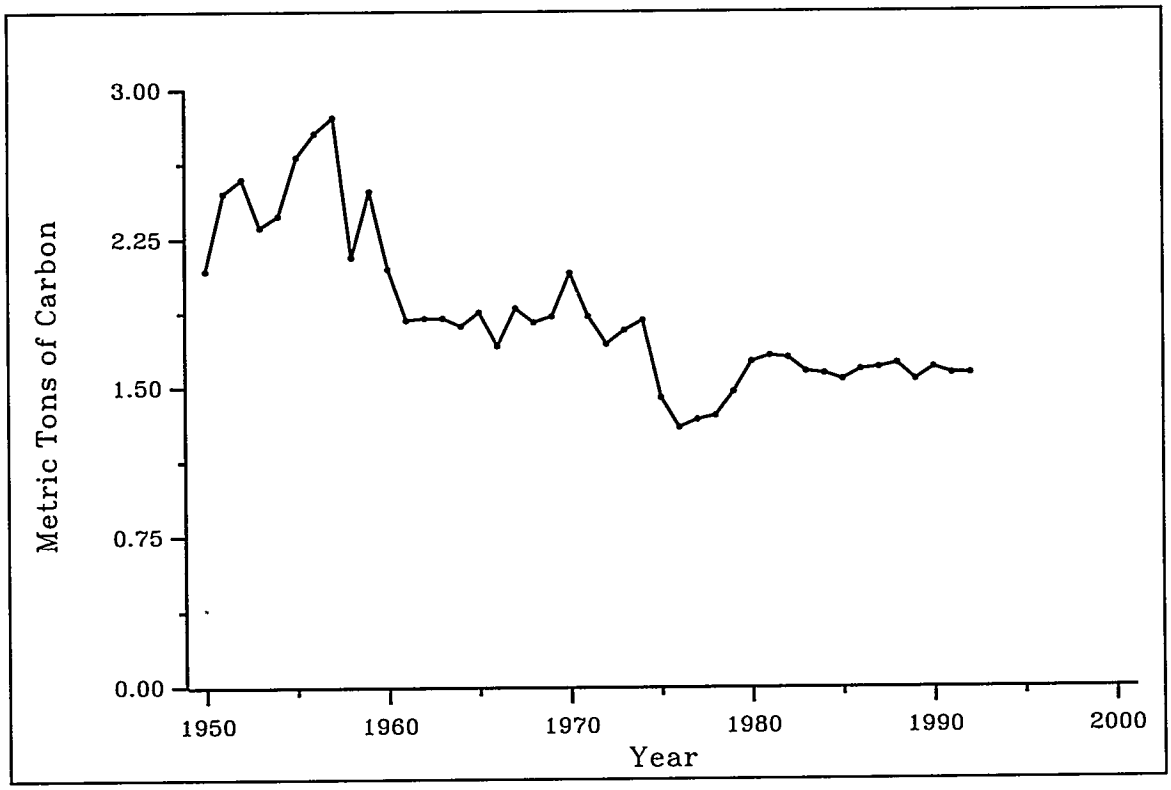
Vanuatu

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	0	0	0	0	0	0	0.00	.
1953	0	0	0	0	0	0	0.00	.
1954	0	0	0	0	0	0	0.00	.
1955	0	0	0	0	0	0	0.00	.
1956	0	0	0	0	0	0	0.00	.
1957	0	0	0	0	0	0	0.00	.
1958	0	0	0	0	0	0	0.00	.
1959	0	0	0	0	0	0	0.00	.
1960	0	0	0	0	0	0	0.00	.
1961	0	0	0	0	0	0	0.00	.
1962	11	3	8	0	0	0	0.16	.
1963	10	2	8	0	0	0	0.14	.
1964	17	9	8	0	0	0	0.24	.
1965	13	4	9	0	0	0	0.18	.
1966	21	11	10	0	0	0	0.28	.
1967	23	12	11	0	0	0	0.29	.
1968	17	2	15	0	0	0	0.21	.
1969	12	0	12	0	0	0	0.14	.
1970	11	0	11	0	0	0	0.13	.
1971	16	0	16	0	0	0	0.18	.
1972	17	0	17	0	0	0	0.18	.
1973	15	0	15	0	0	0	0.16	.
1974	17	0	17	0	0	0	0.17	.
1975	15	0	15	0	0	0	0.15	.
1976	12	0	12	0	0	0	0.11	.
1977	14	0	14	0	0	0	0.13	.
1978	16	0	16	0	0	0	0.15	.
1979	17	0	17	0	0	0	0.15	.
1980	17	0	17	0	0	0	0.14	.
1981	14	0	14	0	0	0	0.12	.
1982	14	0	14	0	0	0	0.12	.
1983	15	0	15	0	0	0	0.12	.
1984	15	0	15	0	0	0	0.12	.
1985	33	0	33	0	0	0	0.25	.
1986	16	0	16	0	0	0	0.12	.
1987	12	0	12	0	0	0	0.08	.
1988	17	0	17	0	0	0	0.12	.
1989	16	0	16	0	0	0	0.11	.
1990	18	0	18	0	0	0	0.12	.
1991	18	0	18	0	0	0	0.11	.
1992	17	0	17	0	0	0	0.11	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Venezuela

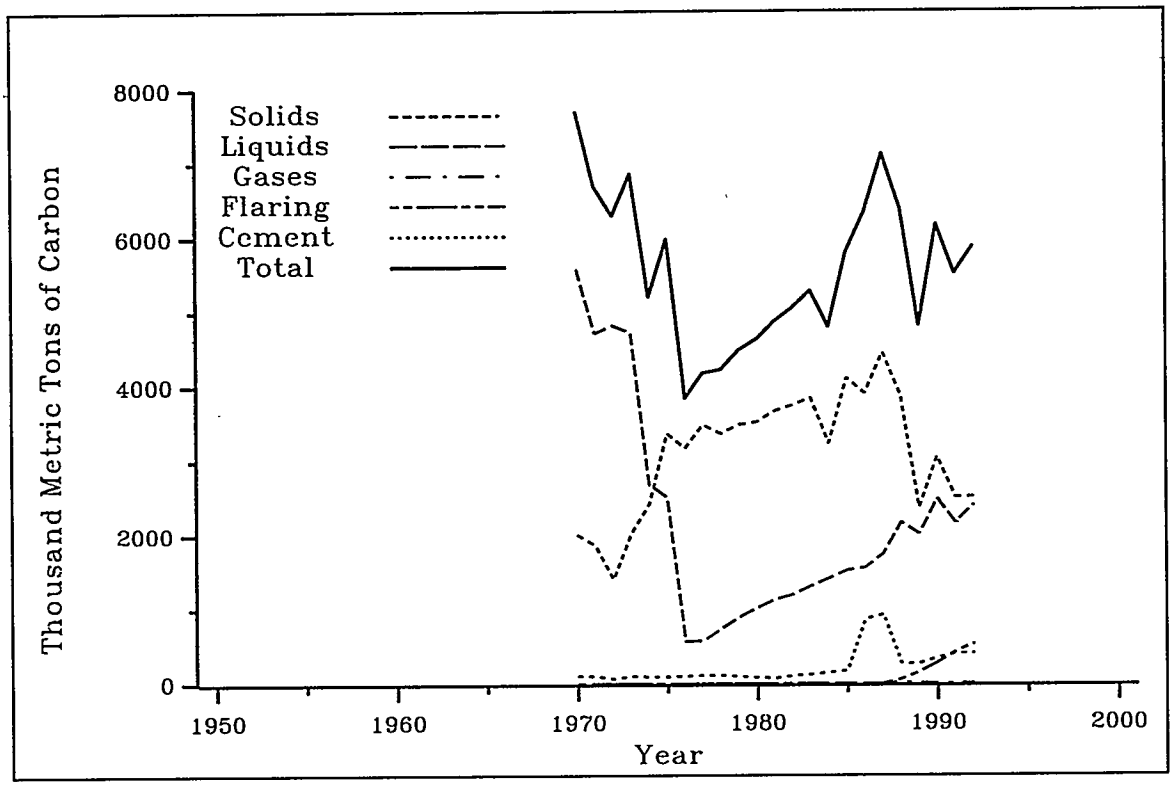


Per capita CO_2 emission rates for Venezuela

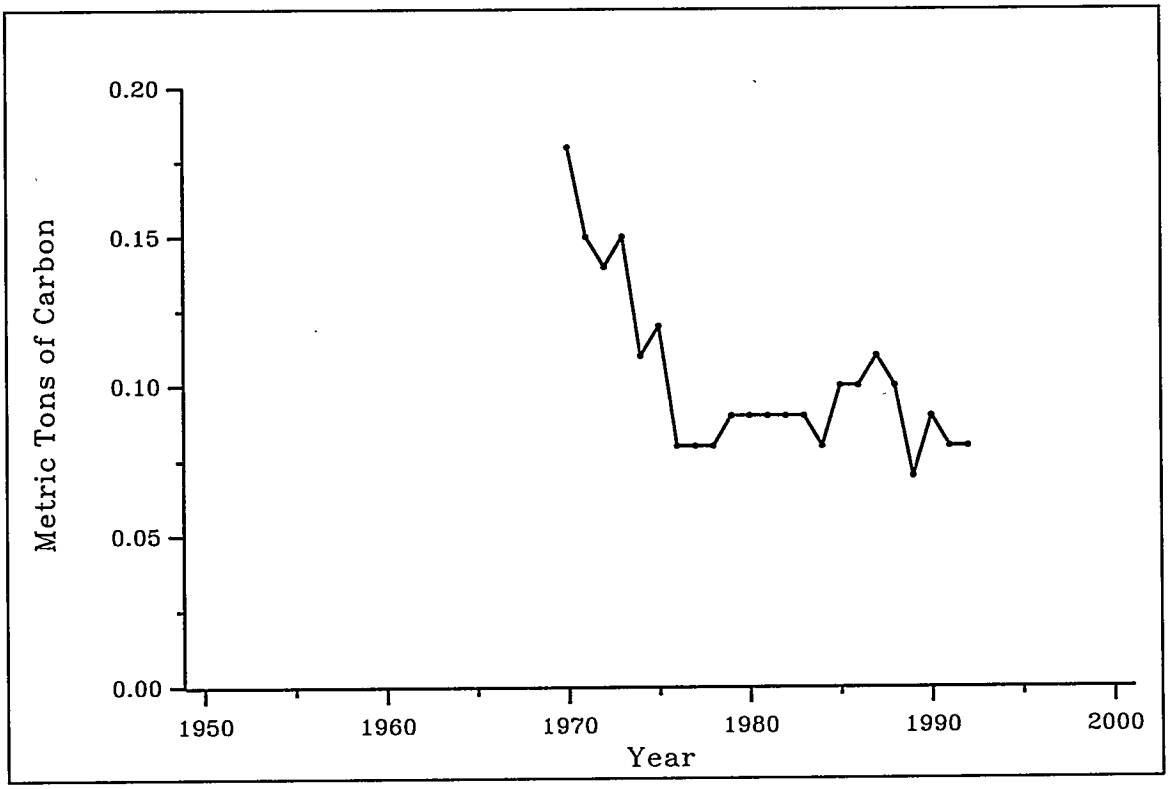
Venezuela

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	10447	1	2157	629	68	7592	2.09	.
1951	12933	21	2878	811	85	9138	2.48	.
1952	13850	19	2970	986	114	9761	2.55	.
1953	13062	22	2775	1223	134	8909	2.31	.
1954	14004	24	2957	1378	165	9480	2.37	.
1955	16344	23	4667	1547	174	9933	2.66	.
1956	17803	23	4799	1686	197	11098	2.78	.
1957	19097	26	4970	2040	238	11824	2.86	.
1958	14994	27	2018	2212	220	10518	2.16	.
1959	17953	26	5575	2360	255	9738	2.49	.
1960	15755	26	4253	2593	202	8680	2.10	.
1961	14360	31	3349	2760	206	8014	1.84	.
1962	14957	104	2396	2918	209	9329	1.85	.
1963	15525	124	3776	3155	215	8255	1.85	.
1964	15687	147	3310	3471	252	8506	1.81	.
1965	16849	157	3971	3677	287	8756	1.88	.
1966	15821	130	3163	3910	288	8330	1.71	.
1967	18228	165	3838	4283	306	9637	1.90	.
1968	18171	272	3951	4421	332	9196	1.83	.
1969	19073	223	4637	4551	291	9372	1.86	.
1970	22033	255	6412	5094	360	9911	2.08	.
1971	20465	136	6323	5328	381	8297	1.86	.
1972	19582	150	6319	5403	406	7304	1.72	.
1973	21129	272	6632	6455	464	7307	1.79	.
1974	22424	194	10413	6648	475	4695	1.84	.
1975	18425	186	9807	6436	476	1521	1.45	.
1976	17102	148	8645	6087	481	1741	1.30	.
1977	18209	296	9019	6852	427	1616	1.34	.
1978	19182	104	10237	7066	466	1310	1.36	.
1979	21538	166	11227	8214	541	1389	1.48	.
1980	24456	202	13645	8616	659	1335	1.63	.
1981	25623	75	15059	8679	663	1146	1.66	.
1982	26269	105	15202	9156	739	1068	1.65	.
1983	25815	139	15082	8954	604	1036	1.58	.
1984	26317	175	14501	9942	650	1049	1.57	.
1985	26457	90	14922	9758	720	966	1.54	.
1986	27918	93	14583	10803	782	1657	1.59	.
1987	28816	110	14941	10731	831	2203	1.60	.
1988	29924	183	15589	11084	843	2225	1.62	.
1989	29157	284	15442	11258	613	1560	1.54	.
1990	31000	336	15055	12838	711	2059	1.60	.
1991	31047	276	14462	13388	862	2059	1.57	.
1992	31775	278	15688	12854	888	2067	1.57	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Vietnam

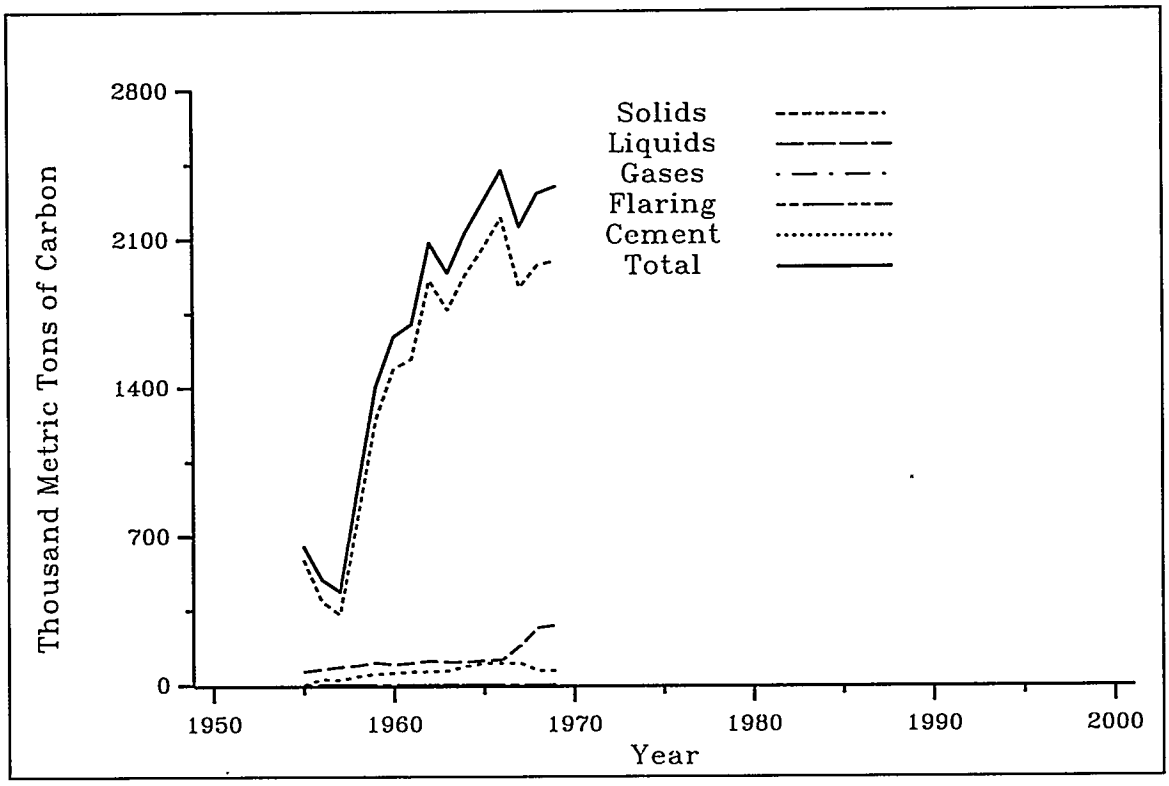


Per capita CO_2 emission rates for Vietnam

Vietnam

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	7696	2012	5577	0	107	0	0.18	.
1971	6690	1869	4718	0	104	0	0.15	.
1972	6296	1409	4819	0	68	0	0.14	.
1973	6859	2030	4725	0	104	0	0.15	.
1974	5208	2425	2688	0	95	0	0.11	.
1975	5983	3369	2518	0	95	0	0.12	.
1976	3844	3173	570	0	101	0	0.08	.
1977	4178	3484	579	0	115	0	0.08	.
1978	4224	3366	743	0	115	0	0.08	.
1979	4484	3487	898	0	99	0	0.09	.
1980	4633	3522	1024	0	87	0	0.09	.
1981	4877	3669	1134	0	74	0	0.09	.
1982	5055	3746	1201	0	109	0	0.09	.
1983	5286	3845	1314	0	126	0	0.09	.
1984	4802	3233	1419	0	149	0	0.08	.
1985	5810	4107	1526	0	176	0	0.10	.
1986	6331	3901	1561	0	869	0	0.10	.
1987	7123	4446	1747	0	930	0	0.11	.
1988	6376	3862	2172	15	266	61	0.10	.
1989	4817	2367	2014	9	271	156	0.07	.
1990	6172	3053	2488	1	346	284	0.09	.
1991	5516	2511	2168	1	407	429	0.08	.
1992	5874	2518	2410	1	407	537	0.08	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.

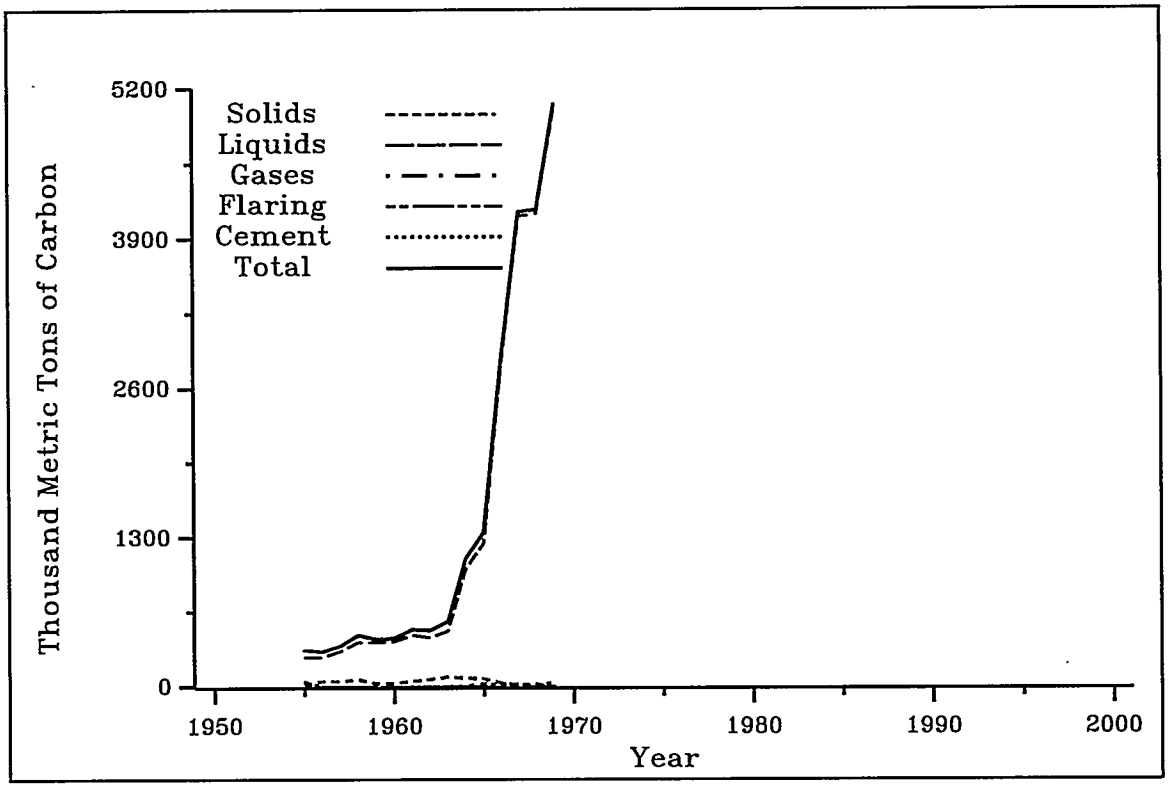


Total CO_2 emissions for the Democratic Republic of Vietnam

Democratic Republic of Vietnam

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1955	650	588	63	0	0	0	.	.
1956	494	392	75	0	27	0	.	.
1957	437	330	84	0	22	0	.	.
1958	929	796	92	0	41	0	.	.
1959	1403	1247	105	0	52	0	.	.
1960	1639	1487	96	0	56	0	.	.
1961	1699	1534	103	0	62	0	.	.
1962	2081	1905	113	0	63	0	.	.
1963	1940	1765	108	0	67	0	.	.
1964	2127	1931	108	0	88	0	.	.
1965	2274	2057	115	0	102	0	.	.
1966	2420	2200	118	0	102	0	.	.
1967	2157	1870	185	0	102	0	.	.
1968	2312	1976	268	0	67	0	.	.
1969	2345	1997	280	0	67	0	.	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.

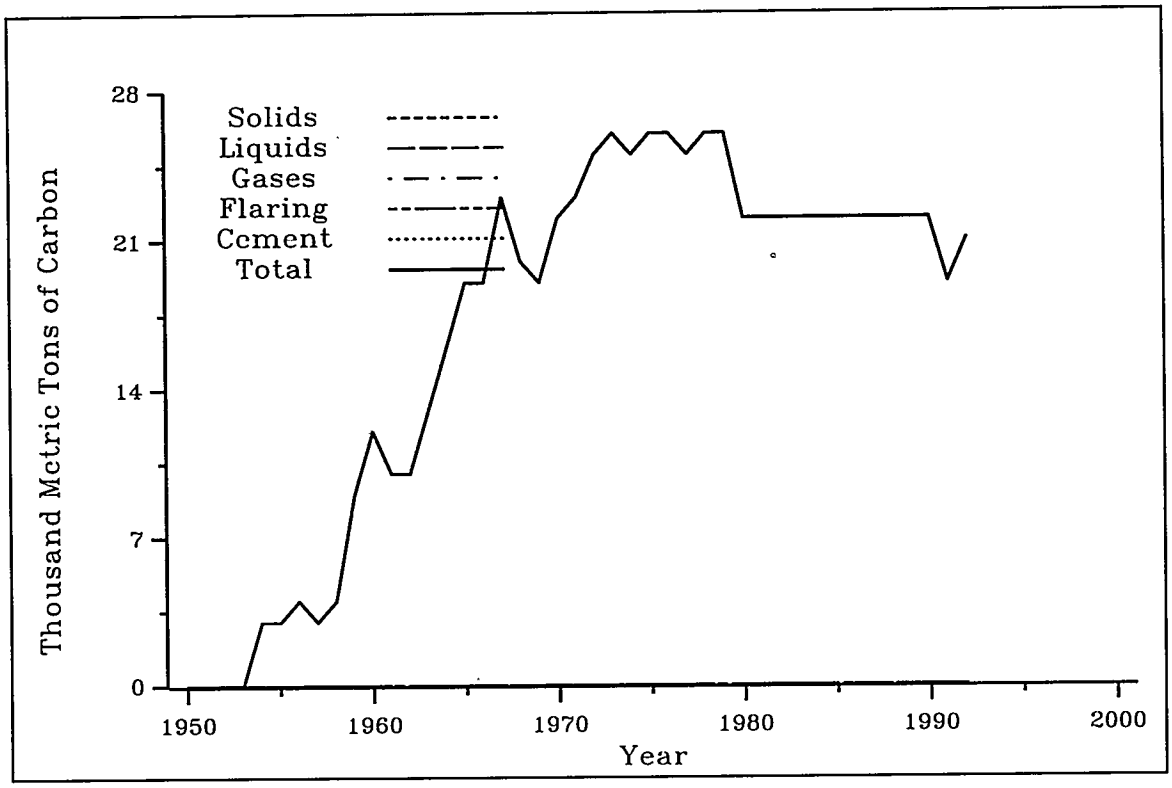


Total CO_2 emissions for the Republic of South Vietnam

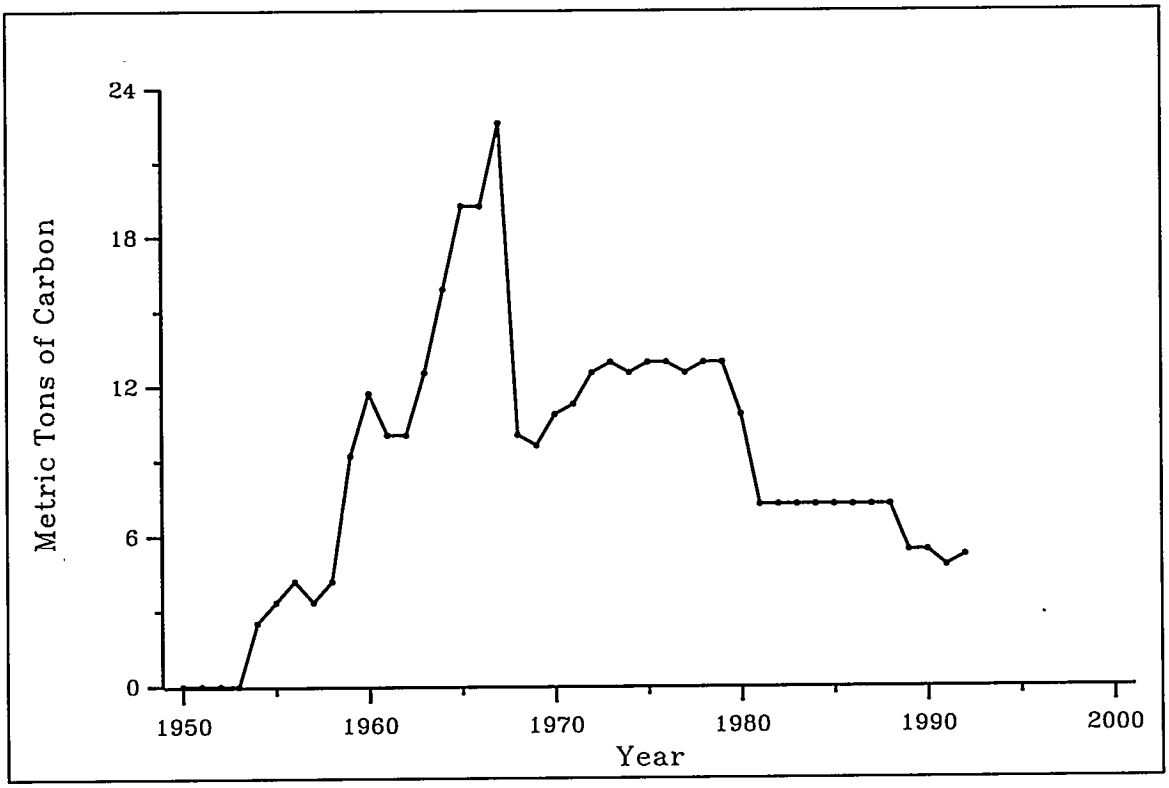
Republic of South Vietnam

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1955	318	19	258	0	41	0	.	.
1956	305	46	259	0	0	0	.	.
1957	354	45	309	0	0	0	.	.
1958	451	62	388	0	0	0	.	.
1959	414	26	388	0	0	0	.	.
1960	422	28	394	0	0	0	.	.
1961	498	47	450	0	0	0	.	.
1962	491	62	429	0	0	0	.	.
1963	569	83	486	0	0	0	.	.
1964	1114	73	1031	0	10	0	.	.
1965	1341	66	1248	0	27	0	.	.
1966	2841	29	2794	0	18	0	.	.
1967	4132	13	4094	0	25	0	.	.
1968	4152	17	4116	0	20	0	.	.
1969	5064	0	5030	0	34	0	.	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Wake Island

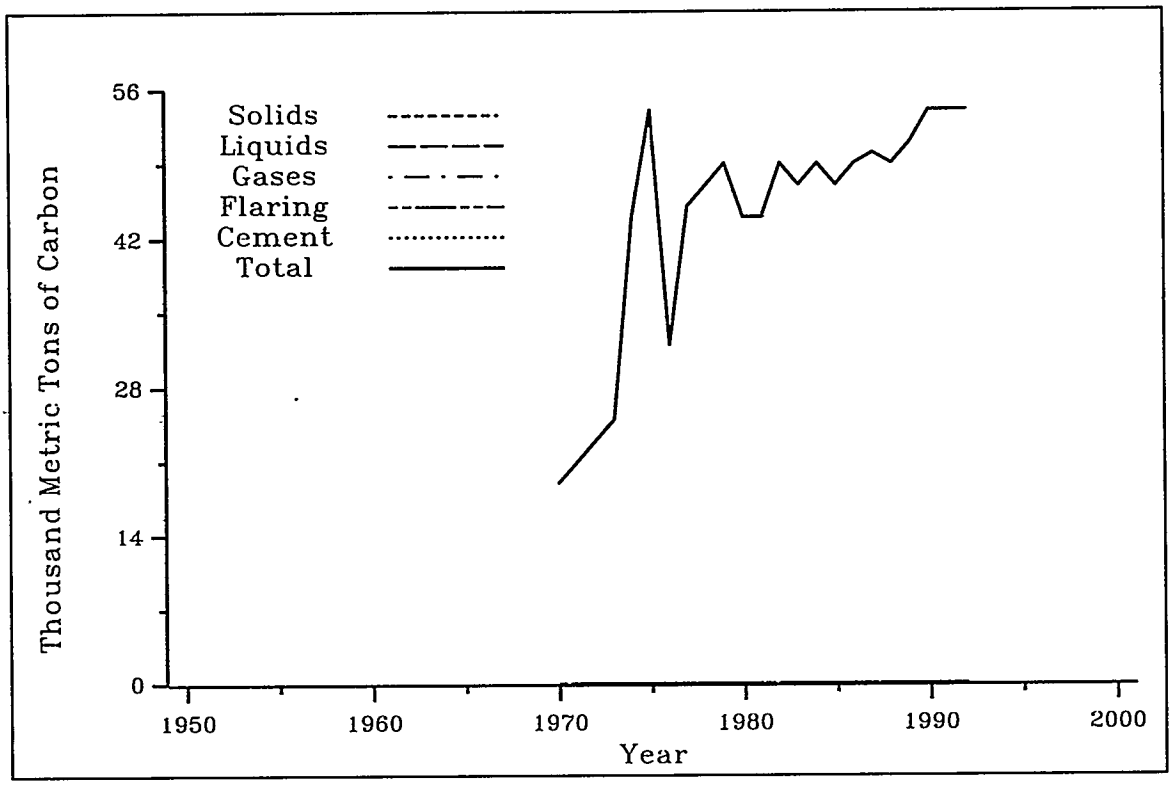


Per capita CO_2 emission rates for Wake Island

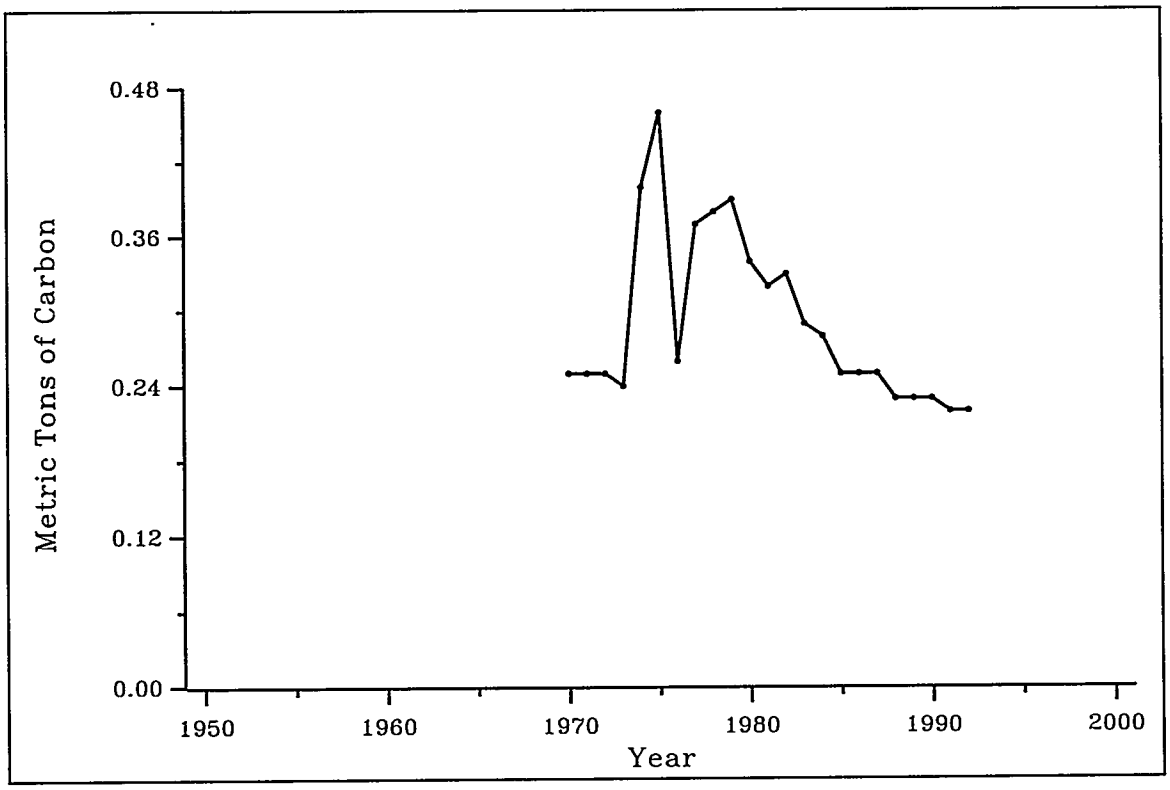
Wake Island

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	0	0	0	0	0	0	0.00	.
1951	0	0	0	0	0	0	0.00	.
1952	0	0	0	0	0	0	0.00	.
1953	0	0	0	0	0	0	0.00	.
1954	3	0	3	0	0	0	2.51	.
1955	3	0	3	0	0	0	3.35	.
1956	4	0	4	0	0	0	4.19	.
1957	3	0	3	0	0	0	3.35	.
1958	4	0	4	0	0	0	4.19	.
1959	9	0	9	0	0	0	9.21	.
1960	12	0	12	0	0	0	11.72	.
1961	10	0	10	0	0	0	10.05	.
1962	10	0	10	0	0	0	10.05	.
1963	13	0	13	0	0	0	12.56	.
1964	16	0	16	0	0	0	15.91	.
1965	19	0	19	0	0	0	19.26	.
1966	19	0	19	0	0	0	19.26	.
1967	23	0	23	0	0	0	22.61	.
1968	20	0	20	0	0	0	10.05	.
1969	19	0	19	0	0	0	9.63	.
1970	22	0	22	0	0	0	10.88	.
1971	23	0	23	0	0	0	11.30	.
1972	25	0	25	0	0	0	12.56	.
1973	26	0	26	0	0	0	12.98	.
1974	25	0	25	0	0	0	12.56	.
1975	26	0	26	0	0	0	12.98	.
1976	26	0	26	0	0	0	12.98	.
1977	25	0	25	0	0	0	12.56	.
1978	26	0	26	0	0	0	12.98	.
1979	26	0	26	0	0	0	12.98	.
1980	22	0	22	0	0	0	10.88	.
1981	22	0	22	0	0	0	7.26	.
1982	22	0	22	0	0	0	7.26	.
1983	22	0	22	0	0	0	7.26	.
1984	22	0	22	0	0	0	7.26	.
1985	22	0	22	0	0	0	7.26	.
1986	22	0	22	0	0	0	7.26	.
1987	22	0	22	0	0	0	7.26	.
1988	22	0	22	0	0	0	7.26	.
1989	22	0	22	0	0	0	5.44	.
1990	22	0	22	0	0	0	5.44	.
1991	19	0	19	0	0	0	4.81	.
1992	21	0	21	0	0	0	5.23	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Western Sahara

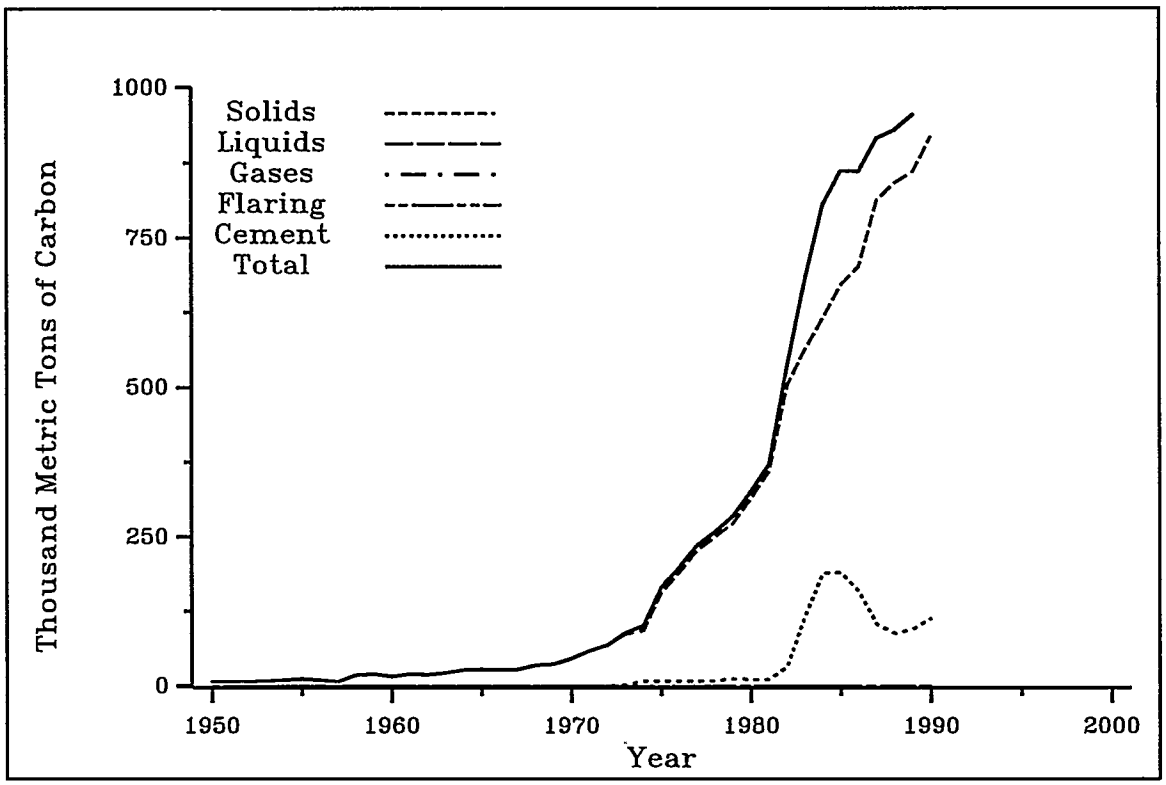


Per capita CO_2 emission rates for Western Sahara

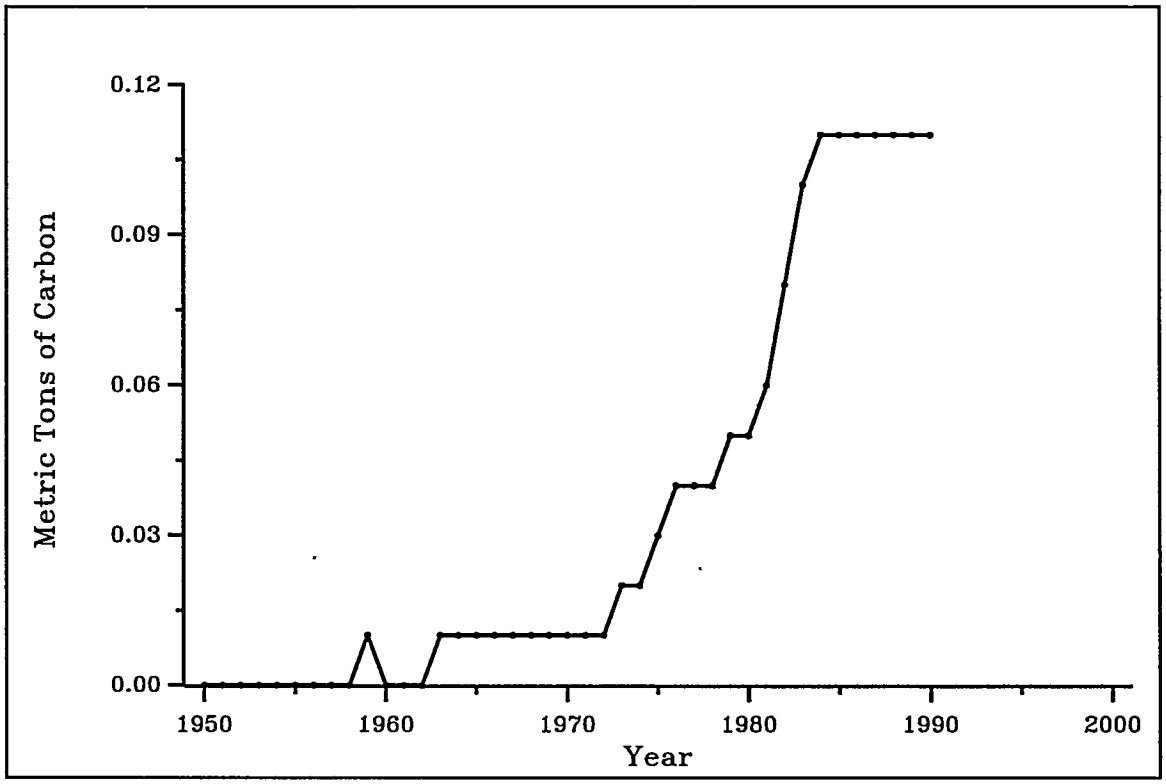
Western Sahara

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1970	19	0	19	0	0	0	0.25	.
1971	21	0	21	0	0	0	0.25	.
1972	23	0	23	0	0	0	0.25	.
1973	25	0	25	0	0	0	0.24	.
1974	44	0	44	0	0	0	0.40	.
1975	54	0	54	0	0	0	0.46	.
1976	32	0	32	0	0	0	0.26	.
1977	45	0	45	0	0	0	0.37	.
1978	47	0	47	0	0	0	0.38	.
1979	49	0	49	0	0	0	0.39	.
1980	44	0	44	0	0	0	0.34	.
1981	44	0	44	0	0	0	0.32	.
1982	49	0	49	0	0	0	0.33	.
1983	47	0	47	0	0	0	0.29	.
1984	49	0	49	0	0	0	0.28	.
1985	47	0	47	0	0	0	0.25	.
1986	49	0	49	0	0	0	0.25	.
1987	50	0	50	0	0	0	0.25	.
1988	49	0	49	0	0	0	0.23	.
1989	51	0	51	0	0	0	0.23	.
1990	54	0	54	0	0	0	0.23	.
1991	54	0	54	0	0	0	0.22	.
1992	54	0	54	0	0	0	0.22	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Yemen (former)

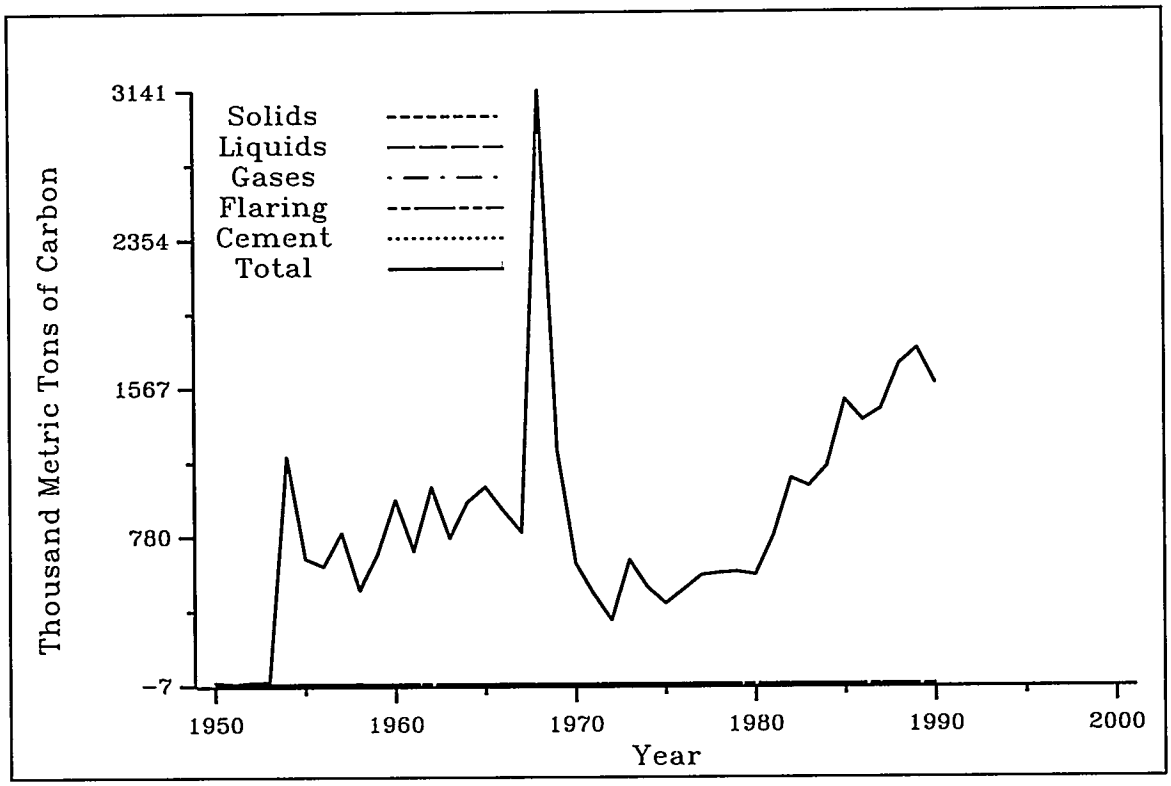


Per capita CO_2 emission rates for Yemen (former)

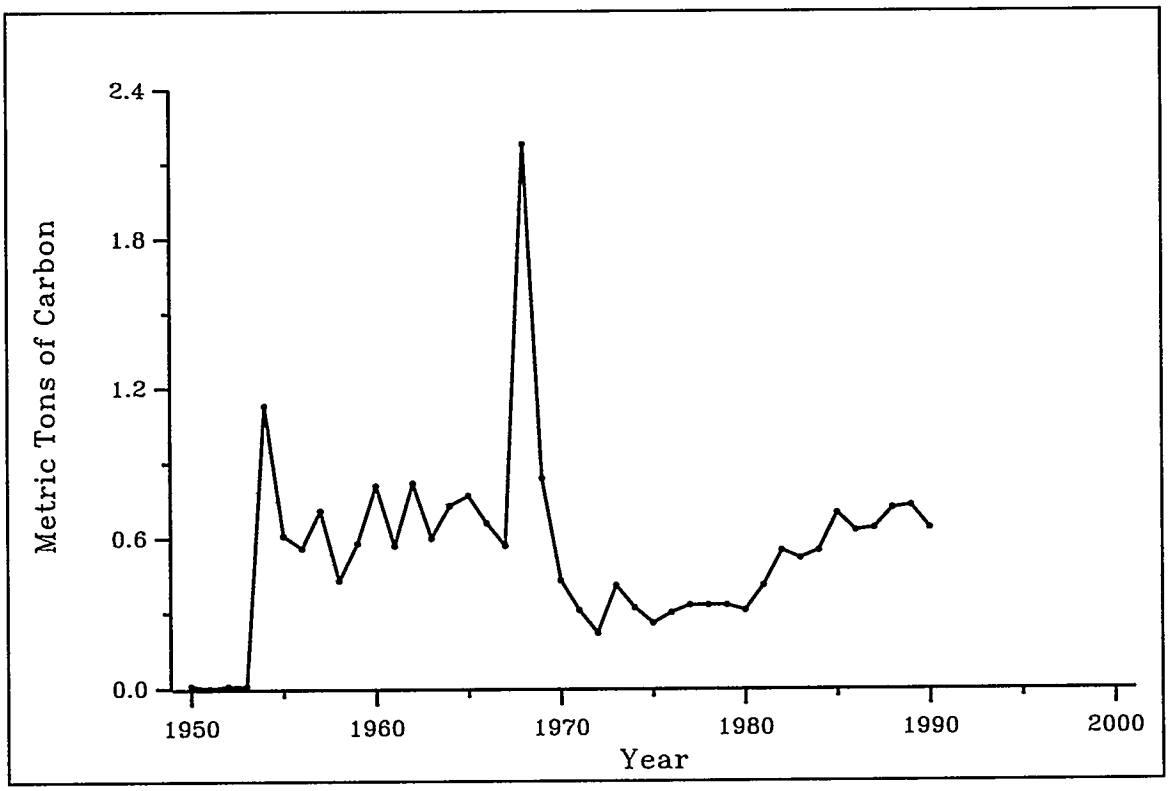
Yemen (former)

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	7	0	7	0	0	0	0.00	.
1951	7	0	7	0	0	0	0.00	.
1952	7	0	7	0	0	0	0.00	.
1953	8	0	8	0	0	0	0.00	.
1954	10	0	10	0	0	0	0.00	.
1955	12	0	12	0	0	0	0.00	.
1956	10	0	10	0	0	0	0.00	.
1957	7	0	7	0	0	0	0.00	.
1958	18	0	18	0	0	0	0.00	.
1959	20	0	20	0	0	0	0.01	.
1960	16	0	16	0	0	0	0.00	.
1961	20	0	20	0	0	0	0.00	.
1962	19	0	19	0	0	0	0.00	.
1963	22	0	22	0	0	0	0.01	.
1964	27	0	27	0	0	0	0.01	.
1965	28	0	28	0	0	0	0.01	.
1966	27	0	27	0	0	0	0.01	.
1967	28	0	28	0	0	0	0.01	.
1968	35	0	35	0	0	0	0.01	.
1969	37	0	37	0	0	0	0.01	.
1970	46	0	46	0	0	0	0.01	.
1971	59	0	59	0	0	0	0.01	.
1972	69	0	69	0	0	0	0.01	.
1973	89	0	87	0	2	0	0.02	.
1974	101	0	93	0	8	0	0.02	.
1975	166	0	157	0	8	0	0.03	.
1976	199	0	191	0	8	0	0.04	.
1977	236	0	228	0	8	0	0.04	.
1978	258	0	250	0	9	0	0.04	.
1979	285	0	273	0	12	0	0.05	.
1980	326	0	315	0	11	0	0.05	.
1981	371	0	360	0	11	0	0.06	.
1982	535	0	502	0	32	0	0.08	.
1983	678	0	563	0	116	0	0.10	.
1984	804	0	615	0	189	0	0.11	.
1985	861	0	671	0	190	0	0.11	.
1986	860	0	702	0	158	0	0.11	.
1987	915	0	812	0	103	0	0.11	.
1988	929	0	841	0	88	0	0.11	.
1989	959	0	859	0	95	0	0.11	.
1990	1031	0	918	0	113	0	0.11	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Democratic Yemen

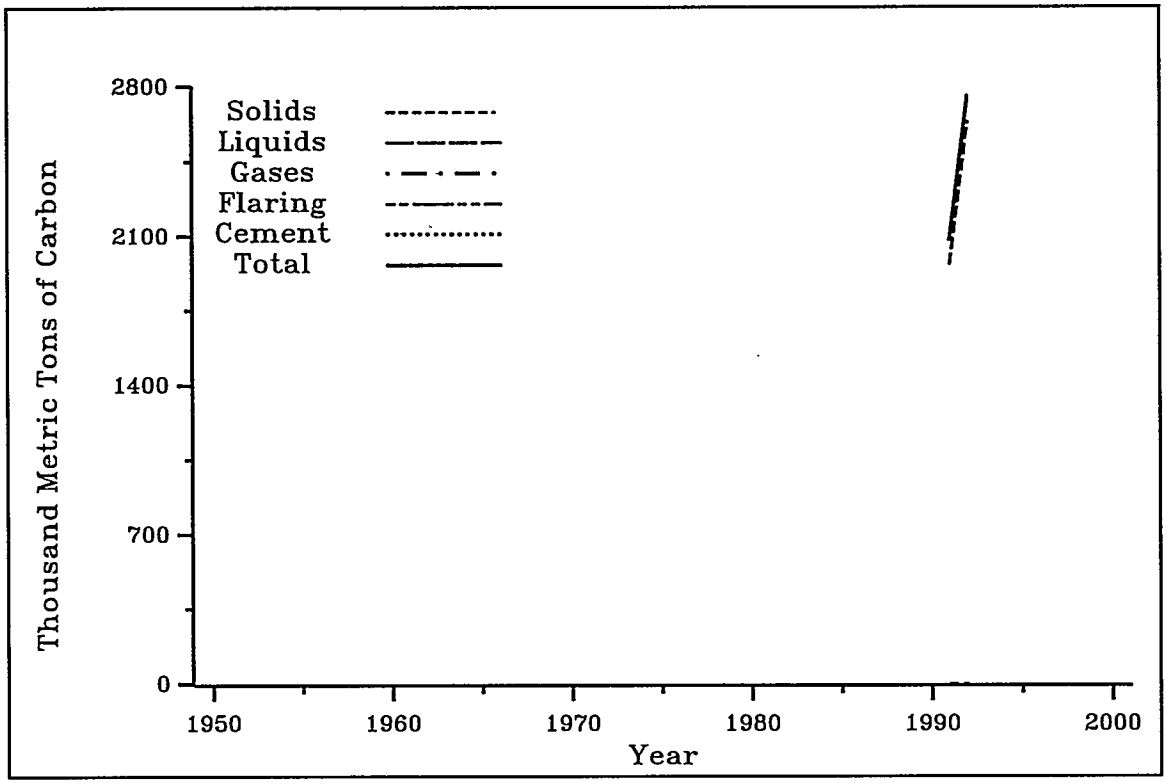


Per capita CO_2 emission rates for Democratic Yemen

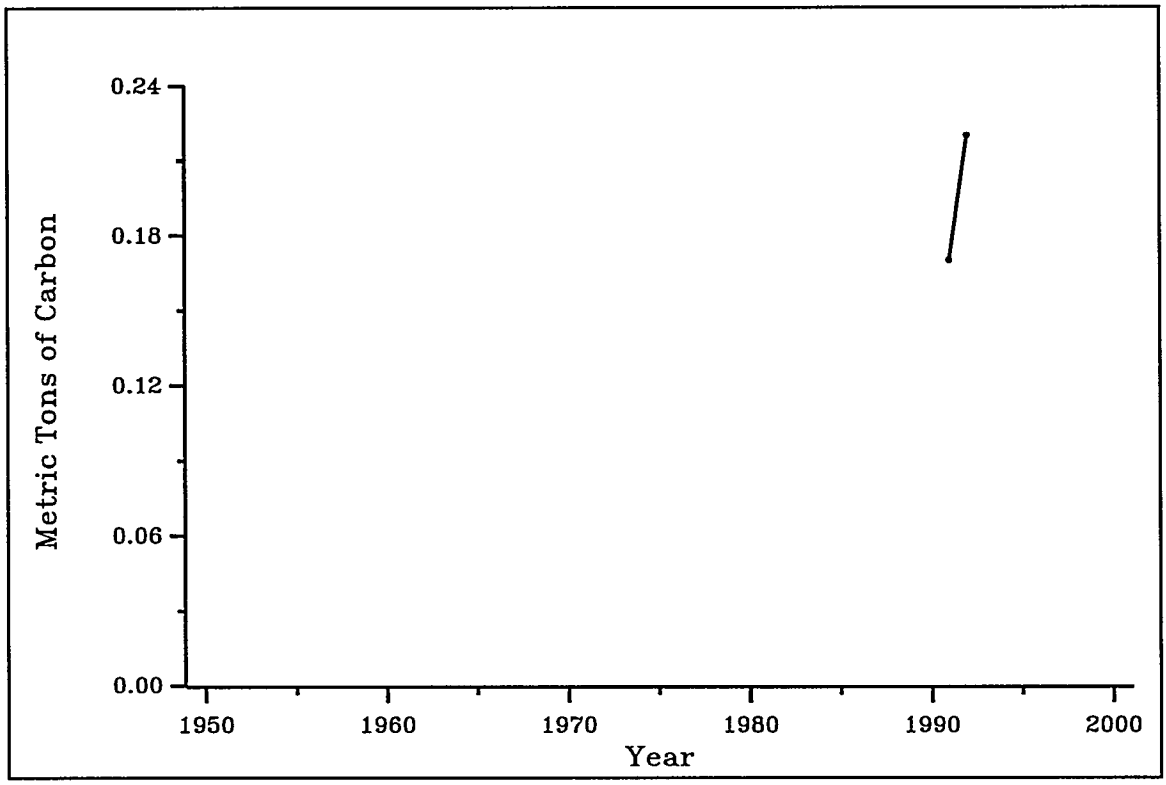
Democratic Yemen

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	9	0	9	0	0	0	0.01	.
1951	-3	-7	4	0	0	0	0.00	.
1952	8	0	8	0	0	0	0.01	.
1953	11	0	11	0	0	0	0.01	.
1954	1205	0	1205	0	0	0	1.13	.
1955	666	0	666	0	0	0	0.61	.
1956	626	0	626	0	0	0	0.56	.
1957	800	0	800	0	0	0	0.71	.
1958	501	4	496	0	0	0	0.43	.
1959	690	0	690	0	0	0	0.58	.
1960	975	0	975	0	0	0	0.81	.
1961	707	0	707	0	0	0	0.57	.
1962	1041	0	1041	0	0	0	0.82	.
1963	774	0	774	0	0	0	0.60	.
1964	964	0	964	0	0	0	0.73	.
1965	1044	0	1044	0	0	0	0.77	.
1966	918	0	918	0	0	0	0.66	.
1967	805	0	805	0	0	0	0.57	.
1968	3141	0	3141	0	0	0	2.18	.
1969	1239	0	1239	0	0	0	0.84	.
1970	639	0	639	0	0	0	0.43	.
1971	479	0	479	0	0	0	0.31	.
1972	339	0	339	0	0	0	0.22	.
1973	656	0	656	0	0	0	0.41	.
1974	512	0	512	0	0	0	0.32	.
1975	427	0	427	0	0	0	0.26	.
1976	501	0	501	0	0	0	0.30	.
1977	577	0	577	0	0	0	0.33	.
1978	588	0	588	0	0	0	0.33	.
1979	594	0	594	0	0	0	0.33	.
1980	579	0	579	0	0	0	0.31	.
1981	783	0	783	0	0	0	0.41	.
1982	1088	0	1088	0	0	0	0.55	.
1983	1047	0	1047	0	0	0	0.52	.
1984	1152	0	1152	0	0	0	0.55	.
1985	1500	0	1500	0	0	0	0.70	.
1986	1395	0	1395	0	0	0	0.63	.
1987	1453	0	1453	0	0	0	0.64	.
1988	1690	0	1690	0	0	0	0.72	.
1989	1772	0	1772	0	0	0	0.73	.
1990	1590	0	1590	0	0	0	0.64	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Yemen

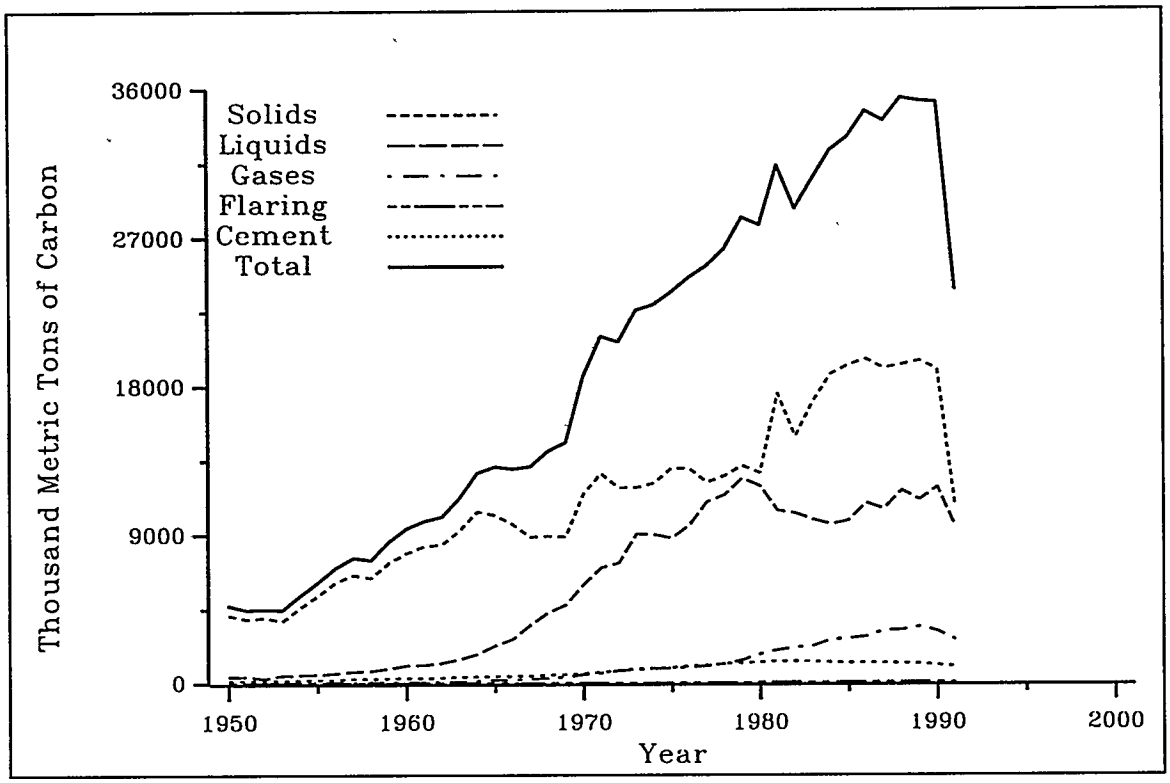


Per capita CO_2 emission rates for Yemen

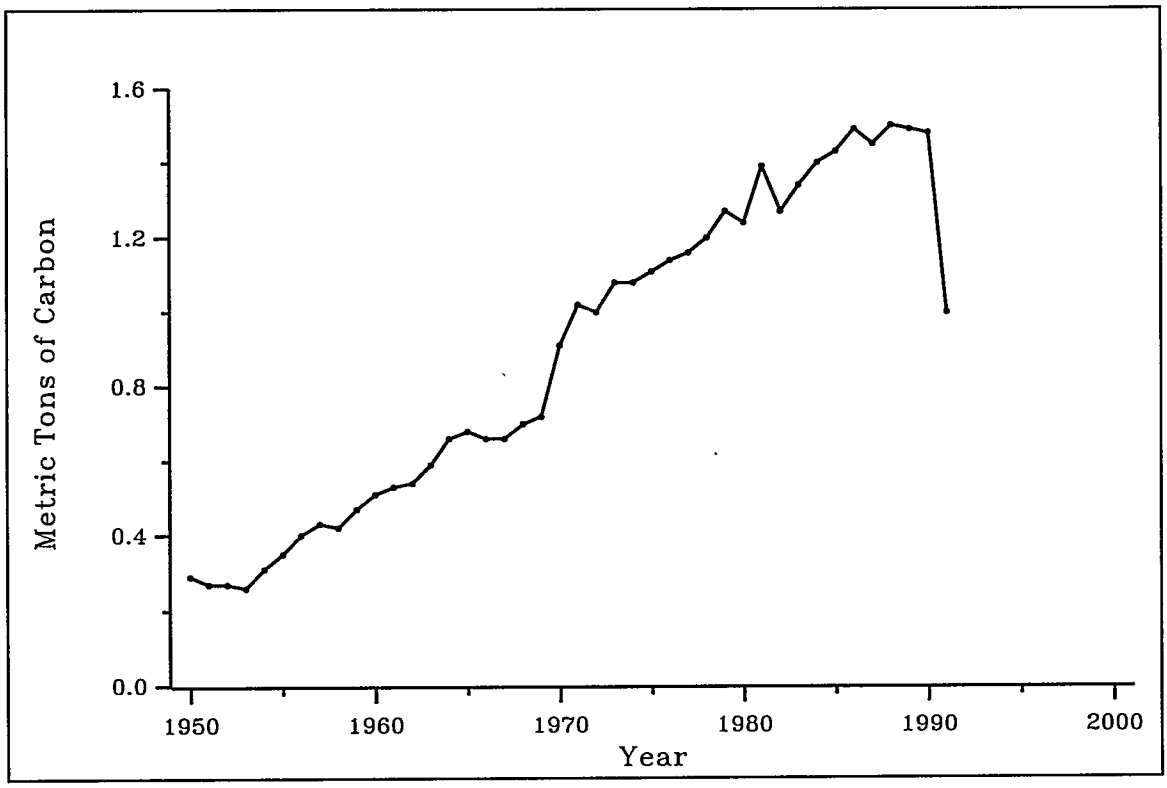
Yemen

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1991	2080	0	1964	0	116	0	0.17	.
1992	2752	0	2636	0	116	0	0.22	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Yugoslavia

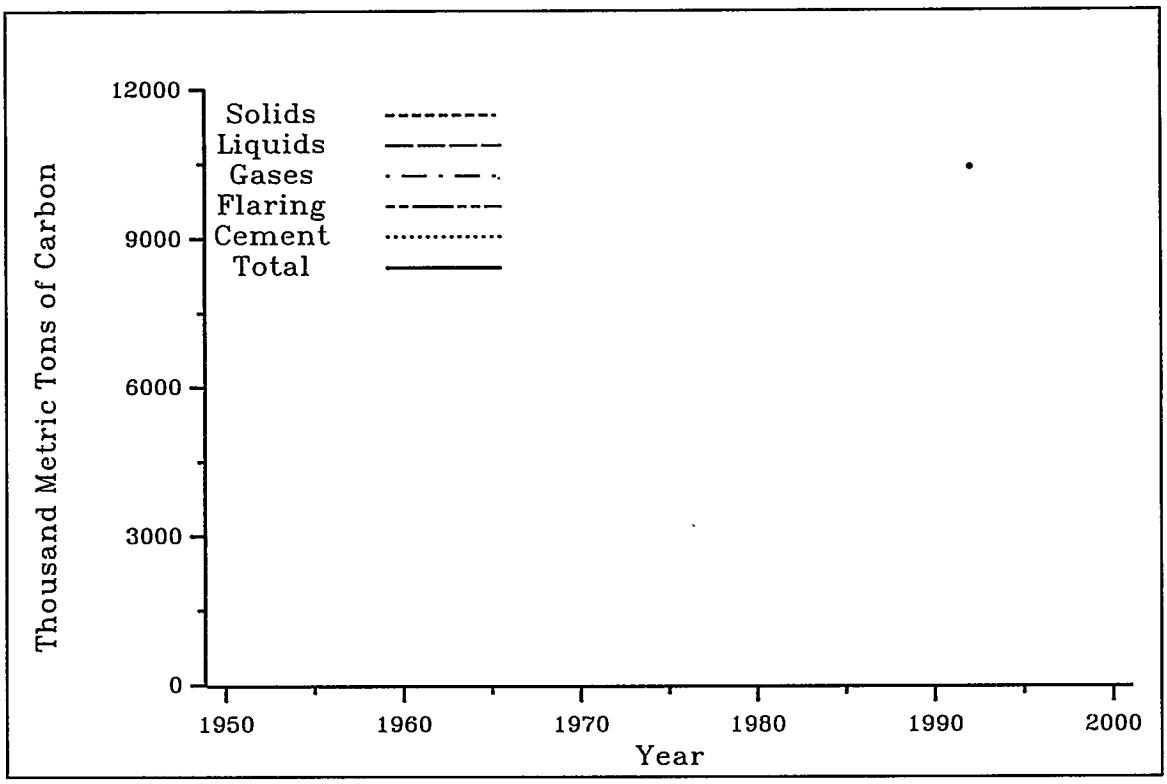


Per capita CO_2 emission rates for Yugoslavia

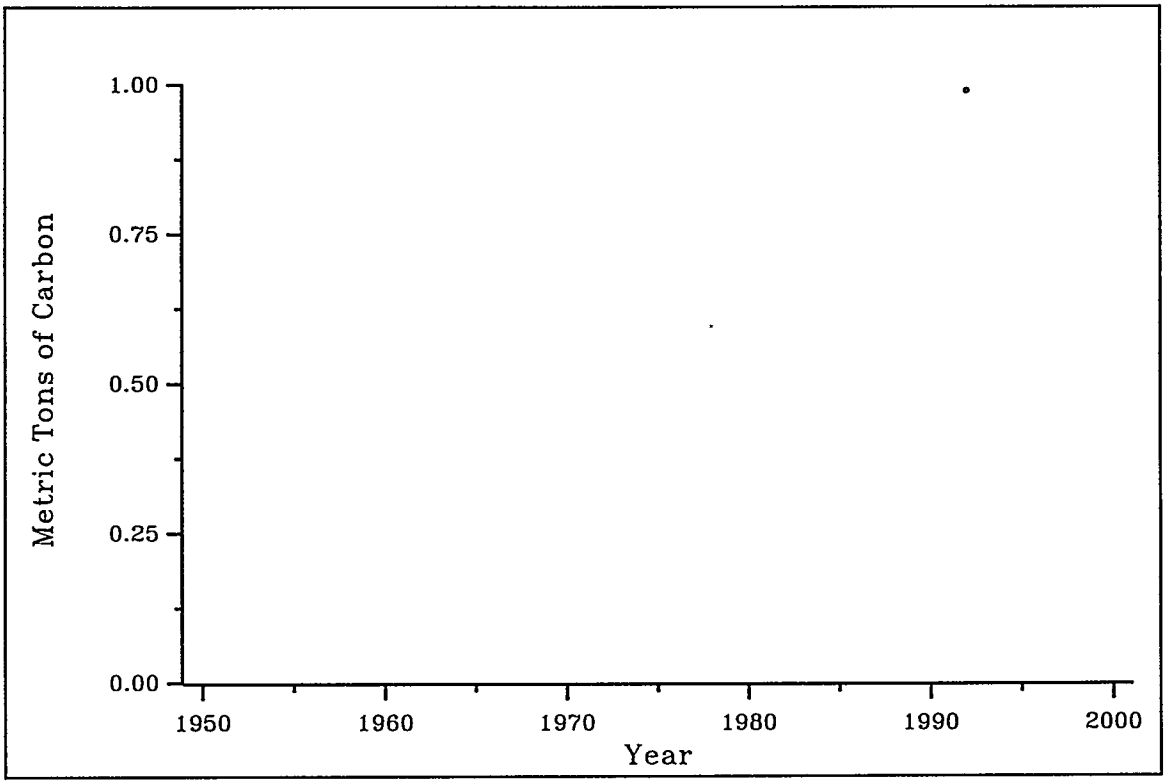
Yugoslavia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	4745	4149	412	19	166	0	0.29	108
1951	4494	3923	397	16	158	0	0.27	108
1952	4513	4020	296	18	179	0	0.27	102
1953	4488	3803	478	33	174	0	0.26	106
1954	5351	4604	522	35	190	0	0.31	103
1955	6132	5335	541	43	213	0	0.35	101
1956	7014	6137	617	48	212	0	0.40	99
1957	7621	6575	723	53	270	0	0.43	98
1958	7494	6406	762	58	268	0	0.42	129
1959	8598	7319	916	62	302	0	0.47	92
1960	9393	7895	1103	69	326	0	0.51	75
1961	9841	8318	1124	81	318	0	0.53	17
1962	10096	8417	1253	84	342	0	0.54	15
1963	11230	9266	1473	104	387	0	0.59	13
1964	12741	10391	1795	142	413	0	0.66	12
1965	13123	10186	2307	207	422	0	0.68	9
1966	12992	9629	2705	219	440	0	0.66	8
1967	13148	8869	3575	254	450	0	0.66	7
1968	14076	8926	4319	318	512	0	0.70	5
1969	14602	8876	4789	398	539	0	0.72	4
1970	18599	11460	5997	543	598	0	0.91	0
1971	21006	12702	7005	625	674	0	1.02	0
1972	20684	11840	7290	772	782	0	1.00	0
1973	22581	11850	9036	829	867	0	1.08	0
1974	22908	12113	8988	903	904	0	1.08	0
1975	23686	13027	8787	912	961	0	1.11	0
1976	24544	12982	9563	963	1036	0	1.14	0
1977	25252	12149	10959	1055	1089	0	1.16	0
1978	26285	12548	11377	1177	1183	0	1.20	0
1979	28190	13151	12399	1404	1235	0	1.27	0
1980	27738	12721	11931	1776	1267	44	1.24	0
1981	31332	17518	10421	2018	1330	45	1.39	0
1982	28732	14941	10266	2160	1322	44	1.27	0
1983	30520	17037	9882	2257	1305	39	1.34	0
1984	32245	18685	9604	2651	1267	38	1.40	0
1985	33053	19250	9817	2715	1228	44	1.43	0
1986	34607	19601	10888	2833	1241	44	1.49	0
1987	34022	19040	10518	3194	1219	52	1.45	0
1988	35392	19268	11641	3228	1202	53	1.50	0
1989	35204	19490	11072	3422	1164	56	1.49	0
1990	35132	18998	11849	3149	1082	55	1.48	0
1991	23806	10666	9453	2631	1020	34	1.00	0

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for the Federal Republic of Yugoslavia

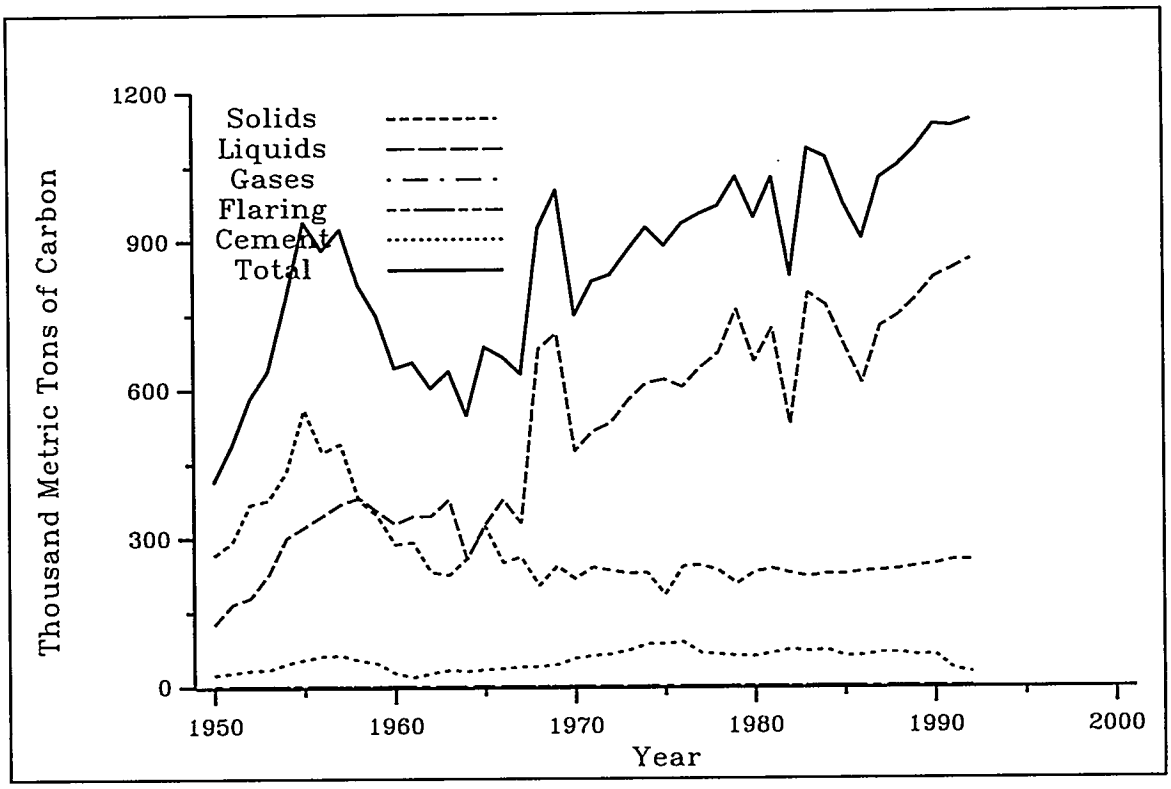


Per capita CO_2 emission rates for the Federal Republic of Yugoslavia

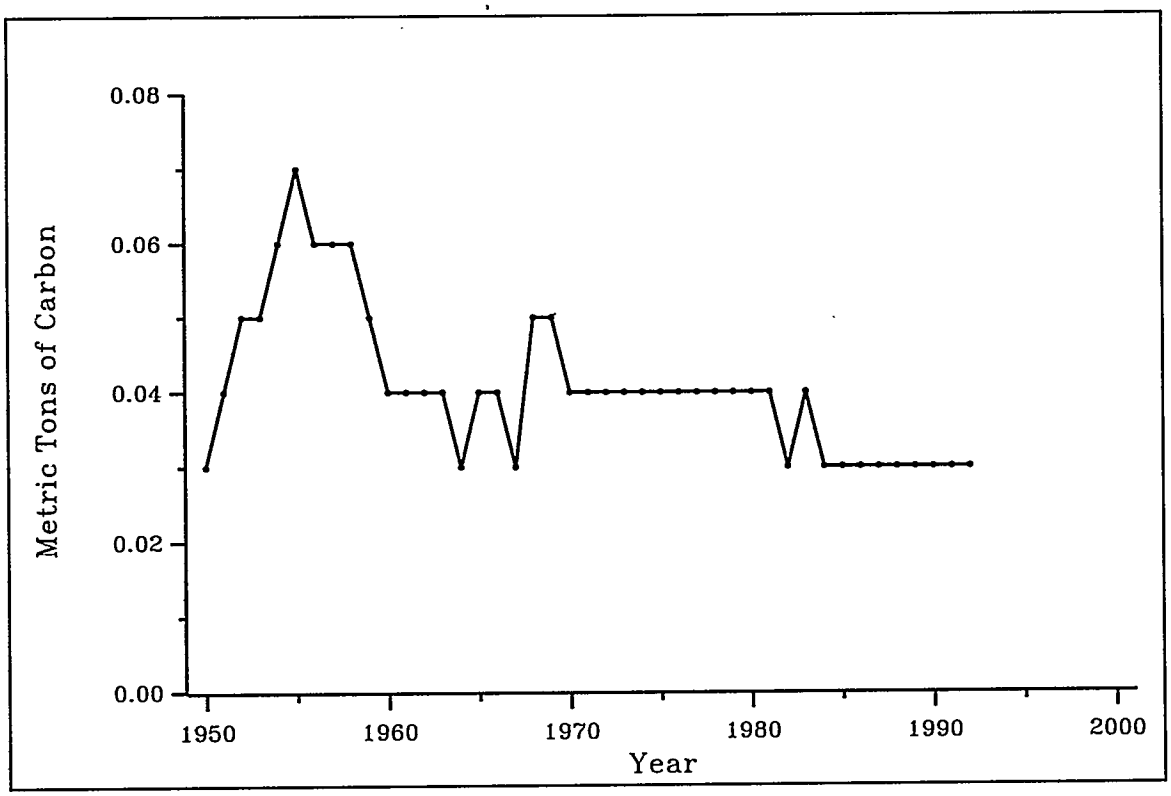
Federal Republic of Yugoslavia

	Carbon dioxide emissions (thousand metric tons of carbon)							
Year	Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1992	10425	6834	2145	1040	407	0	0.99	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Zaire

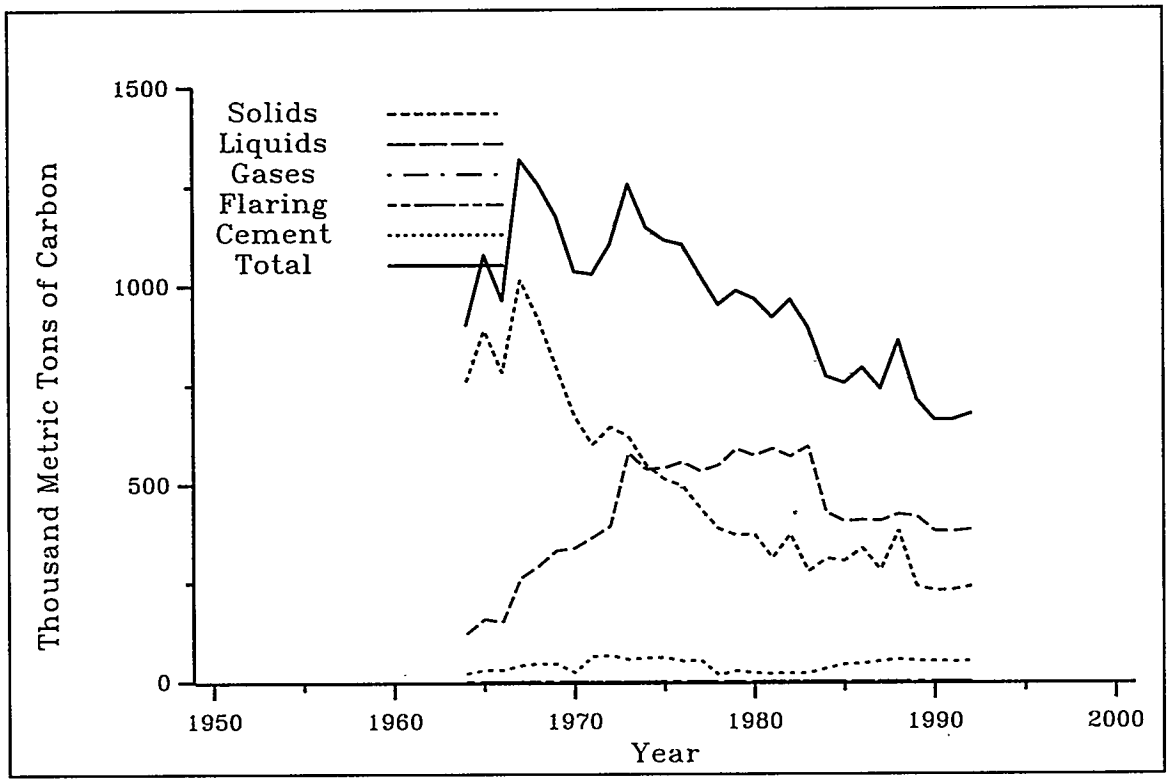


Per capita CO_2 emission rates for Zaire

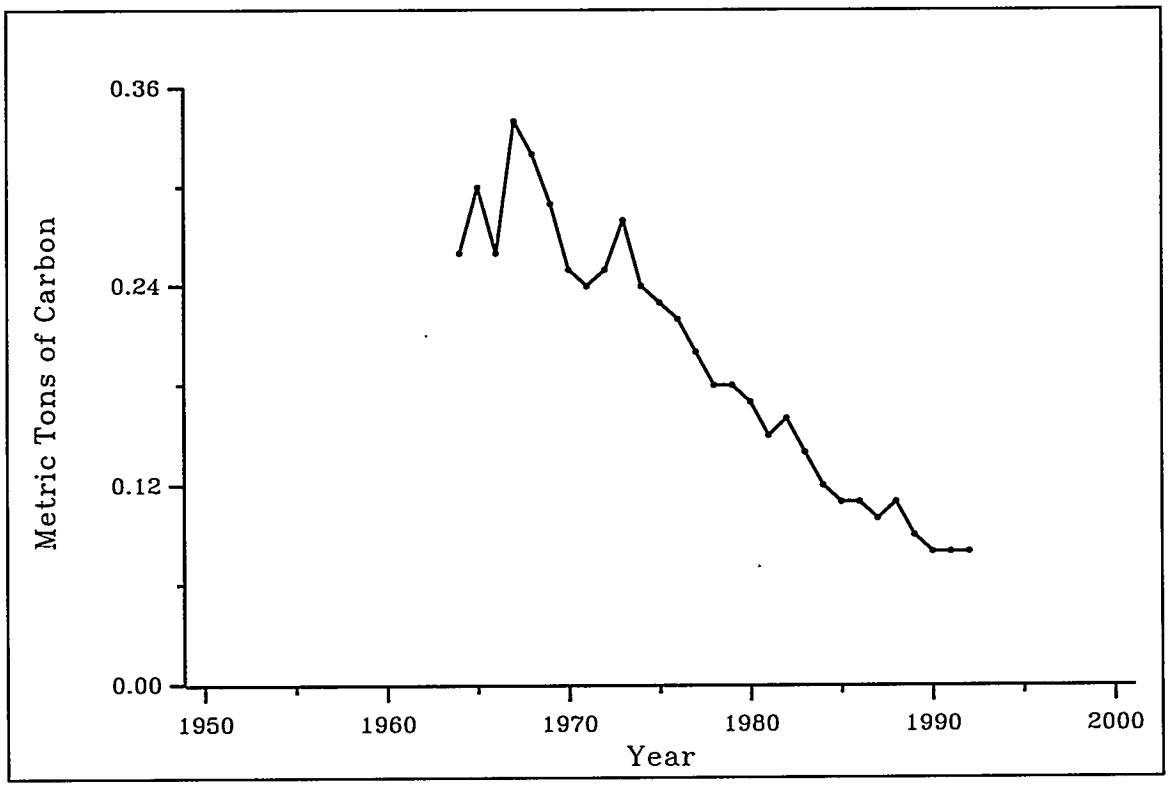
Zaire

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	415	266	126	0	24	0	0.03	.
1951	488	293	167	0	28	0	0.04	.
1952	582	369	180	0	33	0	0.05	.
1953	638	377	227	0	34	0	0.05	.
1954	782	434	301	0	47	0	0.06	.
1955	939	561	323	0	55	0	0.07	.
1956	882	473	346	0	62	0	0.06	.
1957	924	491	369	0	63	0	0.06	.
1958	813	378	382	0	53	0	0.06	.
1959	750	347	355	0	47	0	0.05	.
1960	644	288	329	0	27	0	0.04	.
1961	655	292	344	0	19	0	0.04	.
1962	603	232	345	0	27	0	0.04	.
1963	637	226	378	0	33	0	0.04	.
1964	548	259	258	0	31	0	0.03	.
1965	686	325	327	0	34	0	0.04	.
1966	666	251	378	0	36	0	0.04	.
1967	632	262	330	0	40	0	0.03	.
1968	926	204	682	0	40	0	0.05	.
1969	1002	244	713	0	44	0	0.05	.
1970	750	218	475	0	57	0	0.04	.
1971	818	241	515	0	62	0	0.04	.
1972	831	234	532	0	65	0	0.04	.
1973	880	229	578	0	73	0	0.04	.
1974	926	230	612	0	85	0	0.04	.
1975	889	185	619	0	85	0	0.04	.
1976	934	242	604	0	89	0	0.04	.
1977	954	245	643	0	67	0	0.04	.
1978	969	233	672	0	64	0	0.04	.
1979	1028	207	760	0	61	0	0.04	.
1980	946	231	655	0	60	0	0.04	.
1981	1026	237	722	0	67	0	0.04	.
1982	828	228	527	0	74	0	0.03	.
1983	1084	221	793	0	70	0	0.04	.
1984	1067	227	768	0	73	0	0.03	.
1985	973	226	687	0	60	0	0.03	.
1986	903	231	611	0	61	0	0.03	.
1987	1025	233	725	0	67	0	0.03	.
1988	1050	236	747	0	67	0	0.03	.
1989	1086	242	782	0	62	0	0.03	.
1990	1132	246	824	0	63	0	0.03	.
1991	1129	254	841	0	34	0	0.03	.
1992	1141	254	860	0	27	0	0.03	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Zambia

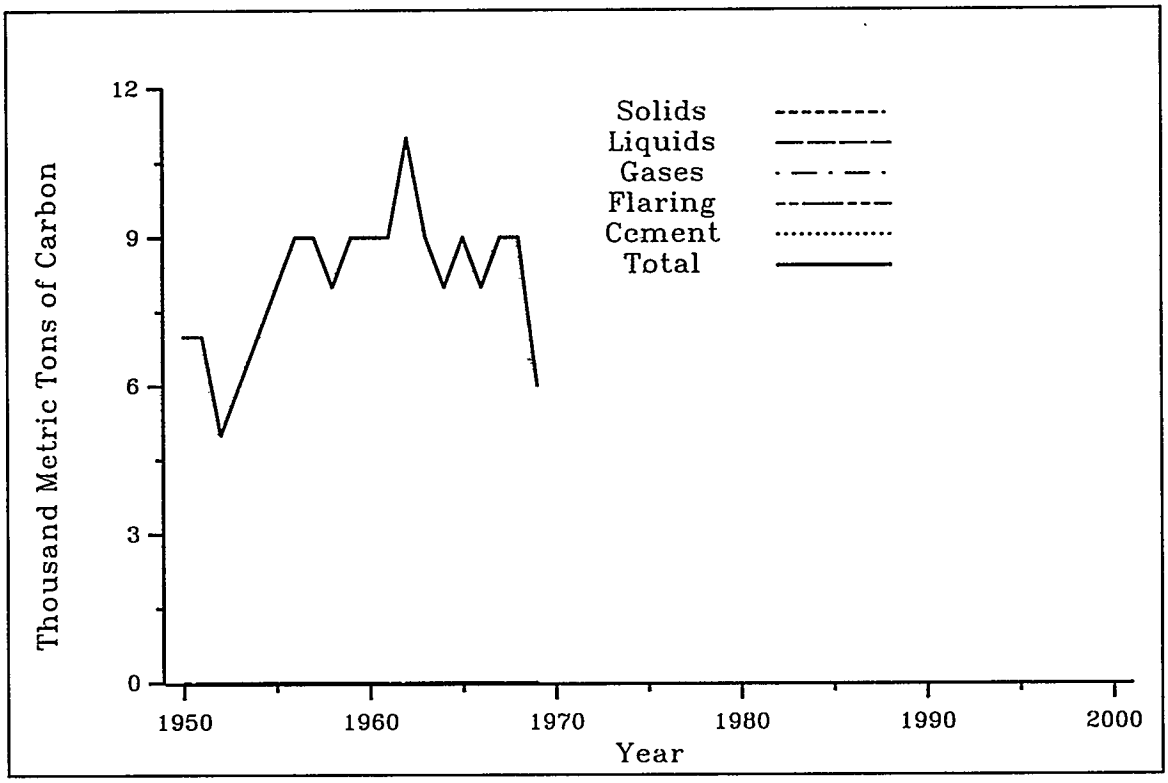


Per capita CO_2 emission rates for Zambia

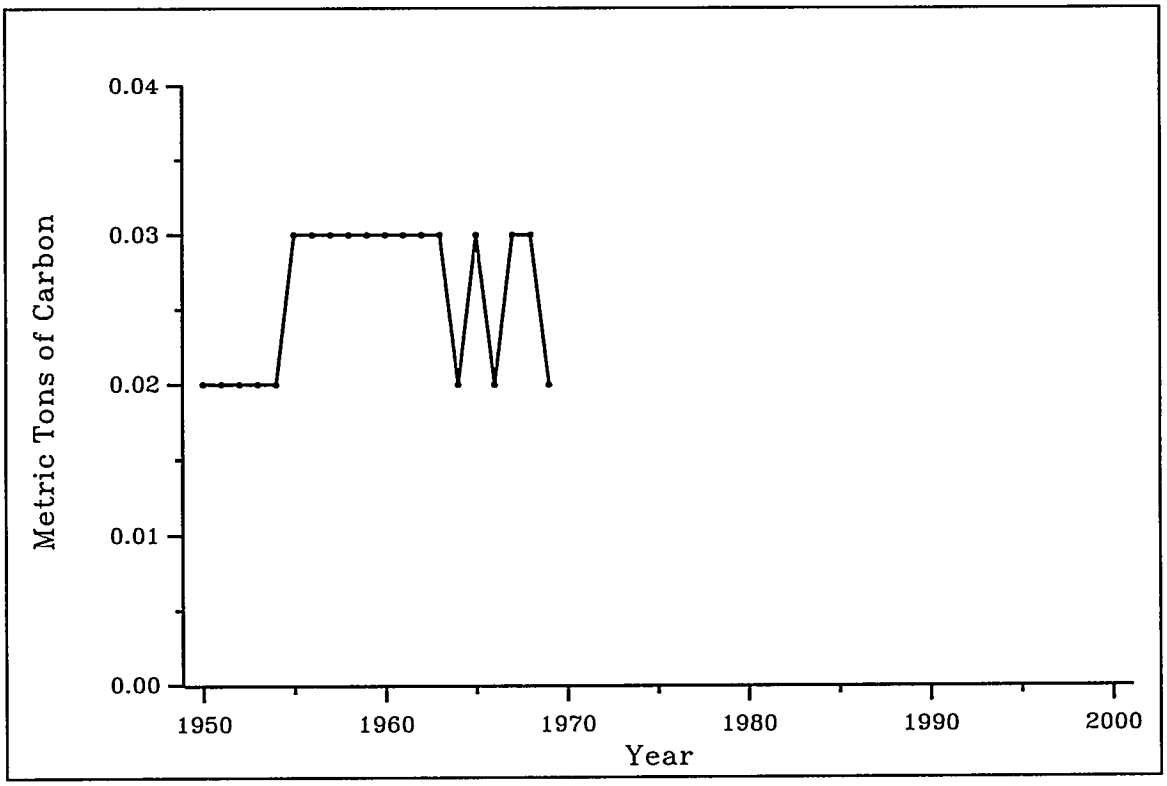
Zambia

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1964	903	760	122	0	21	0	0.26	.
1965	1078	889	159	0	30	0	0.30	.
1966	964	783	151	0	30	0	0.26	.
1967	1319	1015	263	0	41	0	0.34	.
1968	1258	918	294	0	46	0	0.32	.
1969	1175	797	333	0	45	0	0.29	.
1970	1036	673	339	0	24	0	0.25	.
1971	1030	600	366	0	64	0	0.24	.
1972	1106	645	395	0	66	0	0.25	.
1973	1256	621	579	0	56	0	0.28	.
1974	1147	548	538	0	60	0	0.24	.
1975	1115	513	541	0	61	0	0.23	.
1976	1104	496	556	0	52	0	0.22	.
1977	1026	439	533	0	54	0	0.20	.
1978	952	388	548	0	17	0	0.18	.
1979	987	371	589	0	27	0	0.18	.
1980	967	374	572	0	22	0	0.17	.
1981	921	313	589	0	20	0	0.15	.
1982	964	373	570	0	21	0	0.16	.
1983	895	279	595	0	21	0	0.14	.
1984	772	312	428	0	33	0	0.12	.
1985	755	306	406	0	43	0	0.11	.
1986	793	338	409	0	45	0	0.11	.
1987	741	283	407	0	51	0	0.10	.
1988	861	382	424	0	55	0	0.11	.
1989	713	242	419	0	52	0	0.09	.
1990	662	230	381	0	51	0	0.08	.
1991	662	232	380	0	50	0	0.08	.
1992	677	241	385	0	51	0	0.08	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Zanzibar

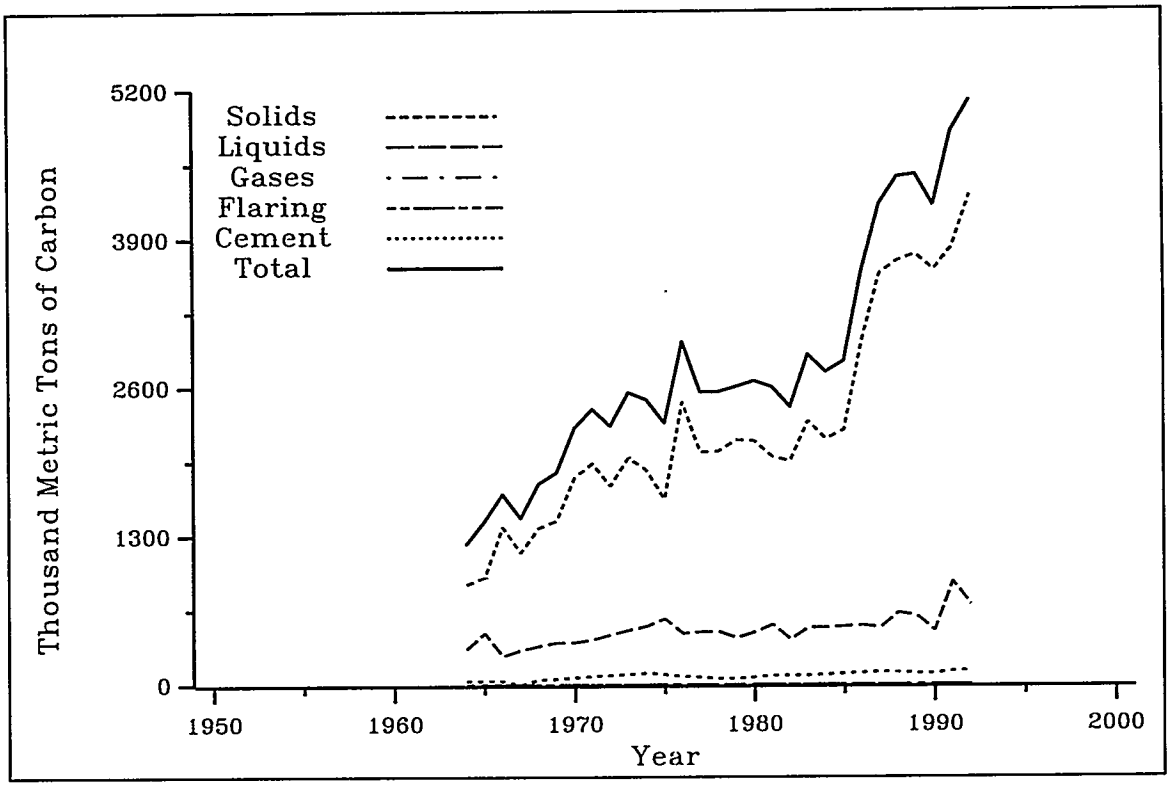


Per capita CO_2 emission rates for Zanzibar

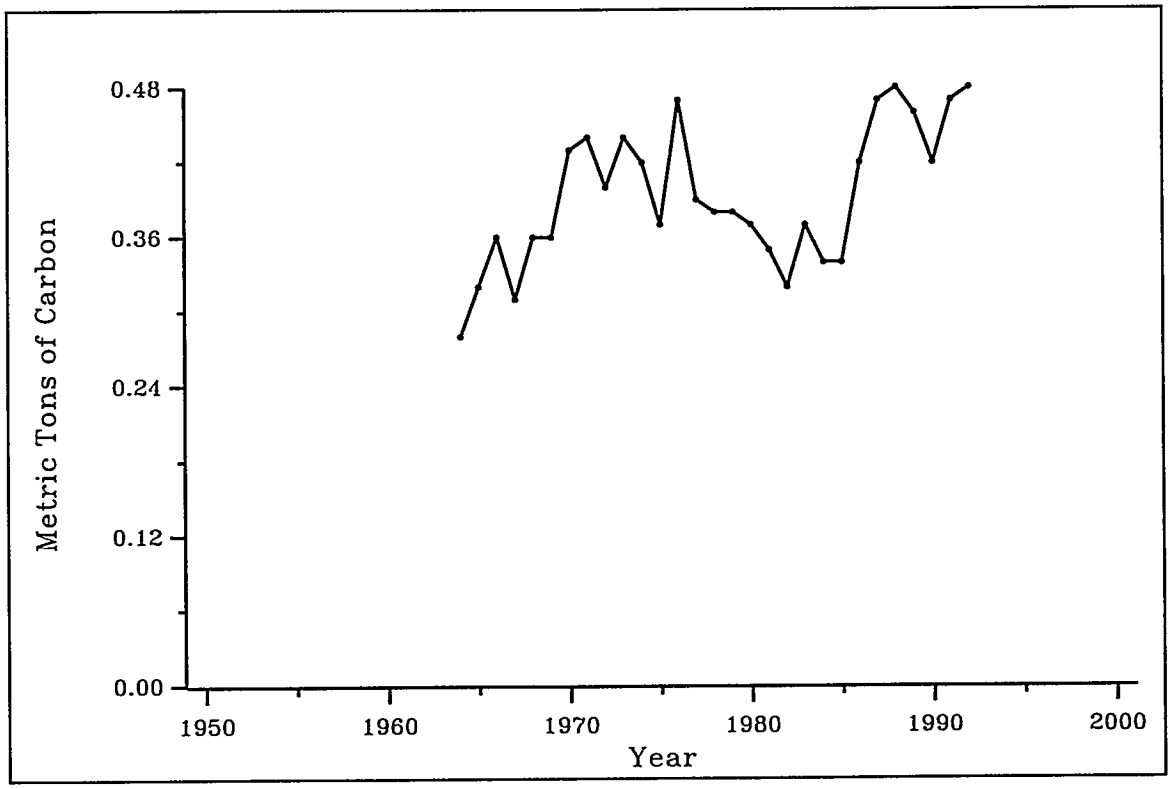
Zanzibar

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1950	7	0	7	0	0	0	0.02	.
1951	7	0	7	0	0	0	0.02	.
1952	5	0	5	0	0	0	0.02	.
1953	6	0	6	0	0	0	0.02	.
1954	7	0	7	0	0	0	0.02	.
1955	8	0	8	0	0	0	0.03	.
1956	9	0	9	0	0	0	0.03	.
1957	9	0	9	0	0	0	0.03	.
1958	8	0	8	0	0	0	0.03	.
1959	9	0	9	0	0	0	0.03	.
1960	9	0	9	0	0	0	0.03	.
1961	9	0	9	0	0	0	0.03	.
1962	11	0	11	0	0	0	0.03	.
1963	9	0	9	0	0	0	0.03	.
1964	8	0	8	0	0	0	0.02	.
1965	9	0	9	0	0	0	0.03	.
1966	8	0	8	0	0	0	0.02	.
1967	9	0	9	0	0	0	0.03	.
1968	9	0	9	0	0	0	0.03	.
1969	6	0	6	0	0	0	0.02	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.



Total CO_2 emissions for Zimbabwe



Per capita CO_2 emission rates for Zimbabwe

Zimbabwe

Year	Carbon dioxide emissions (thousand metric tons of carbon) Total	Solid	Liquid	Gas	Cement	Gas flaring	Per capita CO_2 emissions (metric tons of carbon)	Bunkers[a]
1964	1229	879	316	0	34	0	0.28	.
1965	1429	940	455	0	34	0	0.32	.
1966	1665	1378	253	0	34	0	0.36	.
1967	1458	1154	305	0	0	0	0.31	.
1968	1757	1369	342	0	46	0	0.36	.
1969	1857	1433	372	0	52	0	0.36	.
1970	2247	1809	373	0	65	0	0.43	.
1971	2407	1934	397	0	76	0	0.44	.
1972	2263	1738	440	0	85	0	0.40	.
1973	2554	1984	478	0	92	0	0.44	.
1974	2491	1876	512	0	103	0	0.42	.
1975	2289	1621	576	0	91	0	0.37	.
1976	2993	2469	451	0	73	0	0.47	.
1977	2559	2031	461	0	67	0	0.39	.
1978	2559	2038	465	0	56	0	0.38	.
1979	2602	2137	411	0	54	0	0.38	.
1980	2652	2130	459	0	64	0	0.37	.
1981	2596	1992	524	0	80	0	0.35	.
1982	2426	1952	396	0	78	0	0.32	.
1983	2879	2301	499	0	79	0	0.37	.
1984	2731	2144	498	0	88	0	0.34	.
1985	2824	2223	507	0	95	0	0.34	.
1986	3614	2996	517	0	102	0	0.42	.
1987	4197	3590	496	0	110	0	0.47	.
1988	4435	3701	628	0	106	0	0.48	.
1989	4457	3758	601	0	98	0	0.46	.
1990	4189	3623	471	0	95	0	0.42	.
1991	4832	3817	898	0	117	0	0.47	.
1992	5097	4275	700	0	122	0	0.48	.

[a]Bunkers refer to emissions, expressed in thousand metric tons of carbon, resulting from fuels consumed by ships and aircraft engaged in international transportation. Emissions from bunker fuels are shown with the country where the fuel loading occurred but are not included in the national total.

APPENDIX B

Reprints of Pertinent Literature

Marland, G., and R. M. Rotty. 1984. Carbon dioxide emissions from fossil fuels: A procedure for estimation and results for 1950–1982. *Tellus* 36(B):232–61.

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Tellus (1984), *36B*, 232–261

Carbon dioxide emissions from fossil fuels: a procedure for estimation and results for 1950–1982

By GREGG MARLAND and RALPH M. ROTTY, *Oak Ridge Associated Universities, Institute for Energy Analysis, P.O. Box 117, Oak Ridge, Tennessee 37830, USA*

(Manuscript received August 4, 1983; in final form January 23, 1984)

ABSTRACT

With growing concern about climatic changes that could result from increased atmospheric carbon dioxide, it is appropriate to use the improved statistics on the production and use of fossil fuels which are now available and to review the CO_2 discharges to the atmosphere from fossil fuel burning. Data on global fuel production and the chemical composition of these fuels have been re-examined and an attempt has been made to estimate the fraction of fuel which is used in the petrochemicals industry or otherwise not soon oxidized. Available statistics now permit more systematic treatment of natural gas liquids than in earlier calculations. Values used for combustion efficiency and non-fuel use on a global scale still require some estimation and extrapolation from United States data but can be bounded with sufficient precision that they add little uncertainty to the calculation of global CO_2 emissions. Data now available permit the computation to be made with confidence that there are no major oversights. The differences from earlier calculations of CO_2 emissions are minor, well within the uncertainty limits in the data available. The fundamental problems of assembling a data set on global fuel production limit the utility of striving for too much precision at other steps in the calculation. Annual CO_2 emissions retain an uncertainty of 6–10%.

Results of the calculations for 1980 through 1982 show decreases from 1979 CO_2 emissions. This is the first time since the end of World War II that the emissions have decreased 3 years in succession. During the period following the 1973 escalation of fuel prices, the growth rate of emissions has been less than half what it was during the 1950s and 1960s (1.5%/year since 1973 as opposed to 4.5%/year through the 1950s and 1960s). Most of the change is a result of decreased growth in the use of oil.

1. The problem

In attempting to identify the possible causes and consequences of the observed increasing atmospheric CO_2 concentration, the source of the CO_2 is a major concern. Through the past several decades, the combustion of fossil fuels has grown immensely and it is clearly an important source of CO_2.

The intent of this study was two-fold: (1) to provide detailed documentation for a procedure to estimate CO_2 emissions from fossil fuels, and (2) to make independent and updated estimates of the rate at which fossil fuel combustion has released carbon dioxide to the atmosphere. The CO_2 issue has achieved such significance that it is appropriate to review the analysis of Keeling (1973) and affirm that the much used data sets of CO_2 emissions from Rotty (1979, 1981), using Keeling's procedure, do not contain significant oversights. This work is intended to provide independent and updated estimates of CO_2 emissions and undue significance should not be attached to minor differences from peviously published values.

The result of the calculations described here will be a table which displays, for the period 1950 through 1982, the amount of fossil fuel produced and the amount of CO_2 discharged to the atmosphere as a consequence. A final graph will display, for each fuel and for the global total, how CO_2 emissions have varied as a function of time.

2. Rationale

The calculation of CO_2 emissions from fossil fuels is conceptually very simple. For each type of fuel, the annual CO_2 emissions are the product of three terms: the amount of fuel produced, the fraction of the fuel that becomes oxidized, and a factor for the carbon content of the fuel. For CO_2 calculations, fossil fuels can conveniently be divided into the usual groups of gases, liquids, and solids. For each fuel goup, we start with annual fuel production data (P). Multiplying P by the fraction of each year's fuel production that is oxidized (FO) and by the average carbon content of each fuel group (C) will give the CO_2 emissions for that fuel group. That is,

$$CO_{2_i} = (P_i)(FO_i)(C_i) \quad (1)$$

where subscript i indicates a particular fuel group and CO_{2_i} is expressed in mass of carbon.

The data for annual fuel production must recognize that all coal (or natural gas or crude oil) is not of the same composition, and thus may have varying energy content and CO_2 potential. It is easiest to accomplish this by using fuel production data in either energy or energy equivalent units (for example, tons of coal equivalent).

The second factor in eq. (1), the fraction becoming oxidized, requires examining the use of fuels. For coal, nearly all the production at present is for combustion, and the effectiveness of the combustion process determines the fraction of the carbon that is oxidized. For liquids and gases we must account not only for inefficient combustion but also for non-fuel uses. Derivation of this factor for each fuel group is based on data for the products of petroleum refineries and natural gas processing plants.

There is no systematic tabulation of data on the carbon content of fuel produced all over the world. For liquid fuels and for natural gas, the hydrogen–carbon ratio largely determines the heating value and for solid fuels most of the combustion energy is from oxidation of carbon. Thus, for each fuel the heating value is closely correlated to the carbon content and the energy equivalence concept used in the tabulation of production data makes it possible to deduce fuel composition quite accurately. The final term in eq. (1) is a factor which relates carbon content to energy content for each fuel group.

The complete combustion of a fossil fuel can be represented by

$$C_xH_y + (x + \tfrac{1}{4}y)O_2 \rightarrow x CO_2 + \tfrac{1}{2}y H_2O(\text{gas}) + \Delta H_L \quad (2a)$$

or

$$C_xH_y + (x + \tfrac{1}{4}y)O_2 \rightarrow x CO_2 + \tfrac{1}{2}y H_2O(\text{liquid}) + \Delta H_H \quad (2b)$$

where ΔH is the heat of reaction and C_xH_y denotes generalized fuel. For combustion of hydrocarbons, the heat of reaction is negative in the thermodynamic sense, meaning that heat is given off. When all the water in the products of combustion is liquid (for combustion at relatively low temperature) the higher (or gross) heating value, ΔH_H, is appropriate. ΔH_H is always greater than the lower (or net) heating value ΔH_L because of the energy required in the vaporization of water. Real fuels vary considerably in composition—both in time and place—hence x and y are different not only for average natural gas and petroleum, and for different petroleum products (gasoline versus fuel oil), but also for crude oil from different fields. This makes development and use of global averages very important and is accomplished by using the energy equivalence basis, i.e. the implicit relations between ΔH and x and y.

In the past, CO_2 emissions have often been based on United Nations fuel production data using similar procedures (described by Keeling (1973) and Rotty (1973)). During the past decade, the UN statistical office has modified its reporting toward a more consistent fuel equivalence basis. This has necessitated modifications in the procedures for calculating CO_2 emissions to assure consistency. Most recently, Rotty (1983) calculated the global emissions from fossil fuel for the years 1950–79 and estimated 1980 emissions from incomplete data. The final section of this report contains an updated version of these emissions computations with values for 1981 and 1982.

3. Fuel production data

In approaching calculations of CO_2 emissions, it is useful to begin by examining the first term on the right in eq. (1). A consistent set of global fuel data is clearly required and the form of the other two

factors will be dictated by the definitions and accounting units used in the fuel production data.

Most investigators calculating the production of CO_2 from fossil fuels have relied on data published by the United Nations. The US Bureau of Mines, the Energy Information Administration of the US Department of Energy, the World Bank, the Organization for Economic Cooperation and Development, and numerous other national and international organizations also maintain data on fuel use and energy activities. The UN Statistical Office energy unit offers the most complete and consistent time series for global fossil fuel production and consumption, partly because information from the other sources is used in the development of the UN data, but most importantly because the UN data set is continually modified and updated. The reliability of the data (and the suitability of its use in CO_2 calculations) has consistently improved through the years as more information has become available to the UN staff and as energy information has become more important in world activities.

Although the UN data are now in relatively consistent energy or energy-equivalent units, the nature of our computations and common usage in the various disciplines insure that a mixture of units of measure are encountered. Despite the potential for confusion with mixed units, we believe it important to distinguish between data taken from other sources and data which have been manipulated by us. Although our computations are in SI units we have tried to consistently indicate the primary units from our sources of data and any manipulations requiring, for example, mass to volume or mass to energy-content conversions are carefully documented. Throughout this document "tons" should be understood to be metric tons.

3.1. *Production of natural gas*

Although we are interested in global data, the pattern for gas production and distribution in the US is useful in helping to understand terms and processes. Fig. 1 has been prepared from data published by the Energy Information Agency of the US DOE and shows the 1980 flows of natural gas in the United States. In calculating the CO_2 emissions, we must account for all the gas that is withdrawn from wells and becomes oxidized. Gas reinjected into the earth to repressure oil wells should not be counted and we will account separately for gas vented and flared. Hence "marketed production" is our starting point. The tabulations illustrated in Fig. 1 permit accounting for the loss of gas volume during processing for recovery of liquids ("extraction loss"). The systematic approach of combining liquids extracted from natural gas with other liquid fuels has been adopted here. To avoid counting this quantity twice, the basic number we must consider in our analysis of CO_2

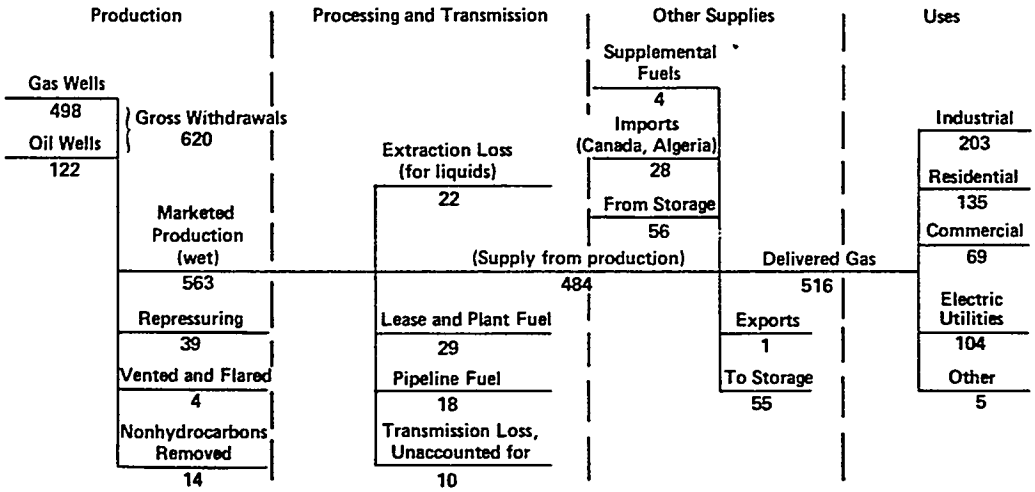

Fig. 1. US flows of natural gas, 1980 (in 10^9 m^3; converted from cubic feet at 1 ft^3 = 0.0283 m^3). Data from US DOE (1982a).

emissions from gas is the marketed production minus the extraction loss. In fact, this is the number now recorded by the UN Statistical Office as natural gas production. The UN reports this natural gas production for all the producing countries.

Of course, all of the gas produced in a given year is not necessarily consumed in the same year. One reason for this is net changes in storage, but the numbers shown as "to storage" and "from storage" in Fig. 1 show that for 1980, the error on this account is less than 1% in the US. Over periods of very few years, the changes in storage will tend to balance and global totals of imports and exports should also balance. Fig. 1 suggests another issue which cannot be neglected by balancing over a few years or integrating over the whole globe. Some fraction of the industrial-use gas is for non-fuel uses and will be oxidized over time periods ranging from essentially immediate to decades. These uses include, for example, ammonia and methyl alcohol production and a variety of other petrochemical feedstock requirements. In the following section we will make allowance for the fraction of fuels produced but not oxidized.

In their early fuel data the UN tabulated natural gas production in cubic meters, counting gases with widely varying compositions on the same basis. Natural gas data were later changed to reflect the energy content of the gas and were tabulated in teracalories. Beginning with the publication of the *1979 Yearbook of World Energy Statistics* (UN, 1981) the data are given in terajoules. The UN has now converted all the published gas data (i.e., back to 1950) to the TJ basis. Because the carbon content is closely correlated with the heating value of the gas, we believe that this has improved the estimates of CO_2 emissions from natural gases.

Many of the UN data sets for natural gas are received in the statistical office in energy units. That is, in response to the UN questionnaires, the individual countries (or organizations acting on behalf of individual countries) submit natural gas data in terms of the energy content of the gas. The UN maintains a reference table of heating values for gas from each country, but it must be pointed out that the published values are not usually used in making volume to energy conversions in the UN office. Although it is not always clear, most of the published values are as reported by the individual countries, and most appear to be based on higher heating values of the fuel. We will use these conversion factors to characterize the carbon content of natural gas. The most recently revised UN data for natural gas production during the period 1950–82, are given in our summary, Table 14, column 1. Because the gas industry has been so tightly regulated, recent gas production numbers for the US are likely to be correct within $\pm 5\%$. Non-US production numbers are less accurate, but we suggest that the figures for annual global totals are within $\pm 10\%$. Our confidence in the global figures is enhanced by recognition that the quality of the data should be improving with time, and that the historic data are heavily dominated by US production. It was in 1974 that US production first dropped below 50% of the world total and as recently as 1960, US production of natural gas exceeded 75% of the world total.

3.2. *Production of liquid fuels*

As in the case of natural gas, the global production and use of liquid fuels can be viewed through the analog of the detailed flow of liquid fuels for the United States. Based on data from the US DOE, the 1981 mix and flow of liquid fuels in the US can be depicted as in Fig. 2. Note that liquids derived from natural gas are treated here as a separate production source.

Just as with natural gas, imports and exports do not have to be considered if CO_2 emissions are based on global fuel production. However, if interest is on the distribution of CO_2 emissions among countries (or parts of the world), different procedures must be considered. The distribution based on consumption is drastically different from the distribution based on production because such a large fraction of the crude petroleum produced is involved in international trade. On the other hand, because the net change in stocks is a small number, using total production numbers to indicate total consumption and CO_2 emissions introduces negligible error.

As indicated in Fig. 2, most of the liquids are used as fuels and hence oxidized within a relatively short time of production. However, the use of production data for liquid fuels in computing CO_2 requires a correction for the liquids that are not oxidized in their use. Non-fuel uses of petroleum liquids come primarily under the "other" category in the last column of Fig. 2 and it is here that major adjustments will be made.

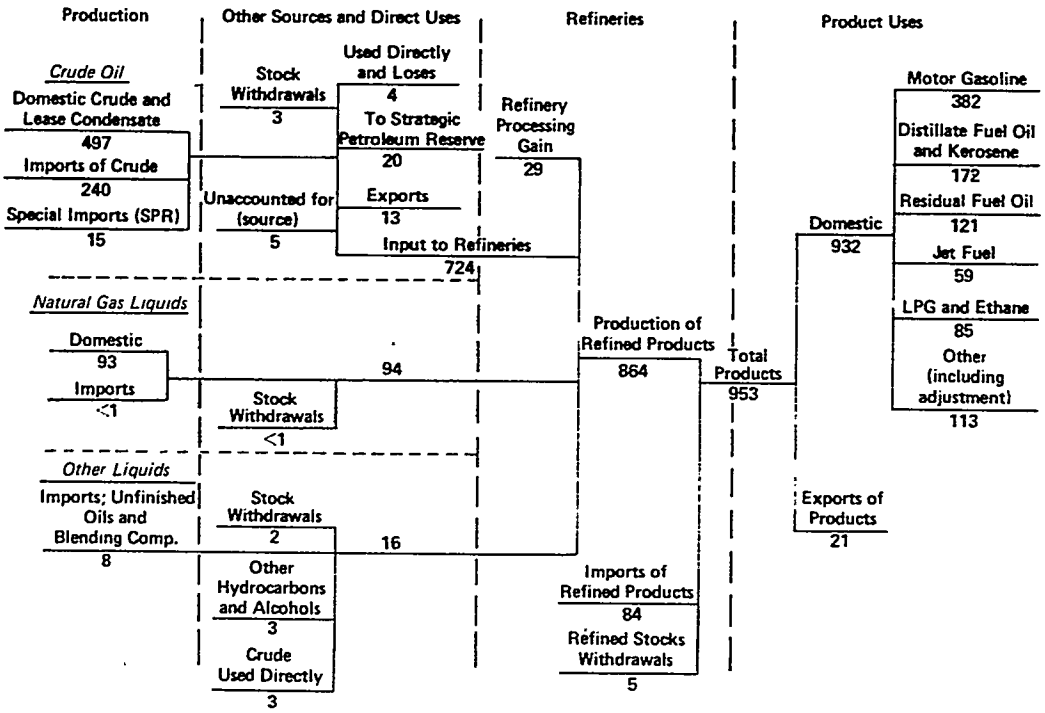

Fig. 2. US flows of liquid fuels. 1981 (in 10^6 m^3: converted at 1 barrel = 0.159 m^3). Data from US DOE (1982b). (In keeping with the US DOE data source. units in this figure are measures of volume whereas later calculations are based on UN values in mass units.)

The United Nations combines US DOE statistics with official or unofficial tabulations from other nations to arrive at world production statistics for crude petroleum and for natural gas liquids. As in the case of natural gas. the UN data are taken to be the best available for our purposes because of their completeness, historical consistency. and clear conformity with other available data. The UN production data for liquids. like those for other fuel types. are widely quoted by others and are essentially identical to "independent" values published elsewhere (see. for example. Table 1). The agreement of the UN data with data published by other organizations does not imply that the data are accurate to a limit described by these variances. Frequently. the primary sources are identical. and some of the differences are due to interpretations and assumptions about standards.

In considering sources of error in the data on liquid fuels. an area of concern is the handling of natural gas liquids. These liquids comprise a mixture of compounds. some of which are used directly

Table 1. *World crude oil production as reported by different sources**
(*10^6 tons oil equivalent*)

	UN (1982)**	Enright et al. (1981)	US CIA (1981)	API (1981)
1980	2986	2974	2974	
1979	3127	3122	3134	
1978	3012	3011	3011	3033
1977	2985	2982	2987	2998
1976	2870	2872		2901
1975	2644	2651		2669
1974	2789	2795		2811
1973	2780	2793		2788
1972	2548	2514		2546
1971	2413	2394		2418
1970	2275	2266		2288

* All data (except UN) were reported in barrels or barrels per day and were converted to tons oil equivalent by assuming a mean gravity of 32.5° API.

** UN (1982) and Data Tape of UN Energy Statistics.

as fuel or chemical feedstocks and some of which are combined with crude petroleum or its intermediate products in refineries. On the average, natural gas liquids (NGLs) have a lower carbon-to-hydrogen ratio than crude petroleum, and thus, on a per unit mass basis, a higher energy content. Because the UN data on liquid fuels are designed to be representative of the energy content of the fuel, their liquid fuel data set (on an energy equivalent basis) is compiled by multiplying NGLs by 1.06052 and then adding this figure to the crude petroleum production. The factor 1.06052 is the UN correction factor to reflect that the NGLs have a 6.052% greater heating value per unit of mass than average crude petroleum.

For the purpose of calculating CO_2 emissions, we do not wish to employ this weighting factor introduced to account for more hydrogen in the fuel, so have adopted the procedure of simply adding the mass of natural gas liquids to the mass of crude petroleum. On the assumption that crude petroleum contains 85% carbon (see discussion below regarding carbon content of crude petroleum) and that NGLs contain between 80 and 84% carbon (C_2H_6 is 80% carbon, C_5H_{16} is 84% carbon), the error in considering the combination as all crude is very small. For the world as a whole, the mass of NGLs is about 3% of the mass of crude petroleum production. The carbon fraction for the mixture should be about

$$(0.97)(0.85) + (0.03)(0.82) = 0.8491,$$

which is so close to the carbon fraction of crude petroleum as to make any error from the combination procedure negligible. However, in the future, as more liquids are captured from natural gas and as the mixture of natural gas liquids shifts toward lighter compounds, consideration might be given to revising the procedure of simply adding data for NGLs to data for crude production. At present, the most appropriate liquid fuel data for our purpose are obtained by adding the UN data for mass of crude petroleum to the UN data for mass of natural gas liquids. The result for world liquid fuel production is given in column 3 of the summary table (Table 14).

The global accounts for world production of liquid fuels consist of data for many parts of the world. In some cases these data appear to be highly reliable, e.g. OECD nations, but in others where smaller resources are committed to documentation, the data are less reliable. The UN staff has attempted to evaluate the reports and make appropriate adjustments when evidence warrants, but quantifying the reliability is impossible. Because most of the crude oil is produced in relatively few countries and because the value of each unit of oil has become so high, we believe that since 1974 the world oil accounts involve uncertainty that does not exceed some ±8%, and would be better if data from Iran and Iraq were more reliable. Before the higher prices and more careful accounting resulting from the 1973–74 embargo, the uncertainty could have been more, but at that time the data from Iran were much better than now, and the data from the US, USSR, and Saudi Arabia have probably been consistently reliable. Information now available is inadequate to allow formal calculations of uncertainties for global petroleum production. We estimate the data for the period before 1974 to contain an uncertainty of ±10%.

3.3. *Production of solid fuels*

Coal is an immensely variable commodity: both its heating value and carbon content vary over wide ranges. The American Society for Testing and Materials (ASTM) scheme for classification of coals by rank (Table 2) makes it clear that tons of "coal" is not a fully adequate value for establishing how much carbon is likely to be released during burning. We need, in addition, some indication of the quality of the coal and this is basically what the UN Statistical Office has tried to achieve in reporting tons of coal equivalent. The UN basis for coal equivalency comprises 29.31×10^9 J/t (7000 cal/g).

Adopting United Nations data for coal production subsumes most of the questions about coal quality in the coal production numbers. When the UN reports coal production in units of tons of coal equivalent, they have already made the conversion, in energy-equivalent units, from a ton of, say New Zealand brown coal, to tons of coal equivalent. We consider how well the UN standard of 29.31×10^9 J/t represents average coal.

That 29.31×10^9 J/t is an appropriate base for coal equivalents is supported by the compilation of Zubovic et al. (1979), who summarized analytical data on 617 bituminous coal samples from the eastern US. The arithmetic mean heating value came out to be 29.45×10^9 J/t (12,670 Btu/lb), the

Table 2. *Classification of US coals by rank*

Class	Group	Fixed carbon limits (%) (dry, mineral-matter-free basis)		Volatile matter limits (%) (dry, mineral-matter free basis)		Calorific value limits (Btu/lb)* (moist, mineral matter free basis)		Agglomerating character
		>	<	>	<	>	<	
(I) Anthracitic	1. Meta anthracite	98	--		2		—	non-agglomerating
	2. Anthracite	92	98	2	8			
	3. Semianthracite	86	92	8	14	-	-	
(II) Bituminous	1. Low volatile bituminous coal	78	86	14	22	—	—	commonly agglomerating
	2. Medium volatile bituminous coal	69	78	22	31	-	—	
	3. High volatile A bituminous coal	—	69	31	--	14,000	—	
	4. High volatile B bituminous coal	--	—		-	13,000	14,000	
	5. High volatile C bituminous coal	—	—	—	—	11,500	13,000	
						10,500	11,500	agglomerating
(III) Subbituminous	1. Subbituminous A coal	—	—	—	—	10,500	11,500	non-agglomerating
	2. Subbituminous B coal	—	—	—	—	9,500	10,500	
	3. Subbituminous C coal	—	—		--	8,300	9,500	
(IV) Lignitic	1. Lignite A	--	—	-	--	6,300	8,300	
	2. Lignite B	—	—	—	—	—	6,300	

From: ASTM (1974), reproduced with original units for heating value.
* 12,600 Btu/lb = 29.31 × 10⁶ J/t.

geometric mean heating value 29.26 × 10^9 J/t (12.590 Btu/lb). An earlier study by Swanson et al. (1976) led to a mean heating value at 28.50 × 10^9 J/t (12.260 Btu/lb) for 277 bituminous coal samples. The US Bureau of Mines has consistently used a heating value of 29.52 × 10^9 J/t (12.700 Btu/lb) for anthracite.

US BOM and US DOE data show the decreasing higher heating value of bituminous coal and lignite produced in the US (Table 3). The US value has been below 29.31 × 10^9 J/t since 1967 as the electric utility industry has increased use of western coals with reduced heating values. Coal used at large US electric power plants (>25 MW) had an average heating value of only 25.23 × 10^9 J/t (10.850 Btu/lb) in 1976 and 25.63 × 10^9 J/t (11.030 Btu/lb) in 1977 (National Coal Association, 1978). To have the reported amount of coal truly reflect the annual energy use (and carbon content), the UN has countered the decreasing heating values by applying correction factors to lower grade fuels and reporting coal equivalent tons.

Table 3. *Decreasing heating value of produced US coal*

	Higher (gross) heating value[a] (× 10^9 J/t)		Lower (net) heating value[b] (× 10^9 J/t)	
1980		(26.34)[c]	25.03	(25.03)[c]
1979	26.10	(26.31)[c]	24.99	(24.99)[c]
1978	26.10	(26.77)[c]	25.43	(25.43)[c]
1977	26.41		25.54	
1976	26.91		25.58	
1975	26.96		25.63	
1974	27.58		25.21	
1973	27.90		26.55	
1972	27.95		26.59	
1971	28.17		26.80	
1970	28.57		27.17	
1969	28.94		27.51	
1968	29.12		27.68	
1967	29.24		27.80	
1966	29.40		27.97	
1965	29.54		28.10	
1964	29.64		28.18	
1963	29.66		28.22	
1962	29.73		28.26	
1961	29.73		28.26	
1960	29.82		28.35	
1959	29.85		28.39	
1958	30.19		28.72	
1957	30.19		28.72	
1956	30.19		28.72	
1955	30.22		28.72	
1954	30.45		28.93	
1953	30.45		28.93	
1952	30.45		28.93	
1951	30.45		28.93	
1950	30.45		28.93	

[a] 1973–79 data from US DOE (1980a); 1972 and prior from US BOM (1976).
[b] UN (1983).
[c] 1978–80 data in parentheses are from UN (1981a).

Beginning with the publication of *World Energy Supplies 1973–78*, (UN, 1979) the UN staff has made efforts to insure that all coal is adjusted to coal equivalents. Between 1973 and 1979 there were adjustments for low grade hard coals in Norway, United Kingdom, Czechoslovakia, New Zealand, USSR, India, Pakistan, German Democratic Republic, and Hungary (UN, 1979). Prior to 1973, there was adjustment only for USSR and Pakistan. Table 4 shows the progressive changes in world coal production reported by successive UN annual volumes. *The World Energy Supplies* series published prior to 1979, indicate the changes made as a result of additional information or revisions of individual country data. Beginning with UN (1979), changes in the data are larger and consistently downward, reflecting the adjustments for reduced heating value of coals from more and more countries.

The changes between times of publication of UN (1979) and UN (1981b) included not only downward adjustment made for lower grade coals, but also a beginning of a change from a higher heating value to a lower heating value basis ("gross heat value" to "net heat value," in UN terms). Thus, for example, the reduction in the value reported for 1975 between UN (1979) and UN (1982) is 246 × 10^6 t of coal equivalent (9.5%) and is the result of a combination of further adjustments for coal quality plus adjustment to "net heat value." The UN has now completed the shift to a "net heat value" basis for at least 60% of the world coal production. It appears that the coefficient to convert Chinese coal to coal equivalents is also on a "net heat value" basis and this would raise the percentage to 77% of the total world production. Table 3, column 2, gives the heating values used by the UN (1982) when converting tons of US coal to tons of coal equivalent.

Table 4. *World coal production as reported by the UN statistical office in successive annual reports (in 10^6 tons of coal equivalent)*

	World Energy Supplies (annual volumes)				*Yearbook of World Energy Statistics*	
Year	UN (1976)	UN (1977)	UN (1978)	UN (1979)	UN (1981b)	UN (1982)
1979					2737	2614
1978				2784	2608	2476
1977			2775	2763	2570	2447
1976		2714	2702	2650	2482	2393
1975	2634	2640	2633	2577	2427	2331
1974	2513	2517	2503	2457	2325	2234
1973	2481	2483	2470	2426	2308	2220
1972	2439	2438	2426	2384	2275	2191
1971	2398	2397	2395	2362	2256	2173
1970	2420	2397	2399	2356	2260	2179

The UN decision to tabulate coal production on a "net heat value" basis complicates the computation of CO_2 emissions because most coal analytical data provide chemical composition and higher heating value. However, because the UN publications provide the most reliable and consistent set of global data for coal, we will continue to rely on them and make an adjustment to the factor for the carbon content to accommodate the UN use of "net heat values." Thus the UN data for solid fuel production form the base used in calculating CO_2 emissions. These production data for solid fuels are given in column 5 of the summary table (Table 14).

The estimation of uncertainty in the solid fuel data, already difficult, is made even more so because the process of revising the coefficients for coal equivalents is still in progress at the UN (but appears to be nearing completion). With some uncertainty still associated with the change to net heat value, we judge these data to include an uncertainty of around 11%. This is based on an uncertainty of ±5% for the production data in mass units and ±10% for the conversion to a coal equivalence basis. Collecting these as $\sqrt{\sum E_i^2}$, where the E_i's are the individual uncertainty estimates, we have $\sqrt{100 + 25} = 11.2\%$.

3.4. *Flaring of natural gas*

The lack of markets and infrastructure for using natural gas as a fuel leads to massive flaring at oil fields in some remote locations. The UN makes no attempt to tabulate the amounts of natural gas flared from any nation. Data for non-US levels of natural gas flaring prior to 1971 are nonexistent. To develop a usable data set, Rotty (1974) used unpublished gas flaring data for 1968–71 (included on questionnaires returned to the US BOM) with published oil production data from many countries to estimate a time series for gas flaring. Rotty assumed that essentially all gas flared is "associated gas" from oil fields where facilities for the recovery of the gas are not present, and used the ratio of gas flaring to oil production for separate areas of the world. Although Rotty's numbers are somewhat speculative, they contribute a small fraction of the total emissions and are used here for the period 1950–70 without change.

Beginning about the time of Rotty's estimates, the US DOI, and more recently the US DOE, have published annual values for the global flaring of natural gas. We use these data for the years 1971 through 1978 (US DOI, 1974; US DOE, 1979; US DOE, 1980b) but note that the published values are labeled "partly estimated." This data set appears fully compatible with the estimates of Rotty (1974) and this combination provides the best available consistent data sequence for global gas flaring (see Table 14).

Although there is no strong incentive to account for gas flaring, the recent data represent an attempt to account for this loss. Formal calculation of the

uncertainty involved in these data would require more information than is available. The flaring of gas associated with oil production is at best as uncertain as the oil production, but the approximate agreement of the estimates of Rotty (1974) with attempts by the US DOE to tabulate a time sequence of recent global flaring suggests the uncertainty is not unbounded. We lack great confidence in all flaring data (earlier values in particular) and believe an uncertainty of ±20% is appropriate here.

3.5. *Production data versus consumption data*

Carbon dioxide is emitted when fossil fuel is oxidized, i.e., consumed. Global fuel accounts are published as both fuel production and fuel consumption. The difference is not simply an increase or decrease in storage, but includes adjustments for various amounts of the fuel produced that are employed in many different end uses. In addition to use as common fuels and in processing fuels, some is used as special fuel, some as "non-fuel" in which the carbon is quickly oxidized, and some as "non-fuel" in which the carbon remains unoxidized for very long times.

Keeling (1973) elected to use production data and make estimates of the fraction of the fuel that was ultimately oxidized. At that time, fuel accounting for many parts of the world was not sufficiently advanced to provide suitable data sets to account for all the end uses all over the world. Production data have been and are more reliable and consistent from year to year. Using the fuel production numbers to calculate CO_2 emissions can be thought of as metering the man-induced carbon flow from the earth's crust to the atmosphere at the boundary where the carbon crosses the earth's surface.

Use of fuel consumption data might be intellectually more satisfying because it is in the consumption that the CO_2 is produced. However, the consumption data available cover what the UN calls "apparent consumption." The UN obtains "apparent consumption" by adding a country's excess of imports over exports to its production, and subtracting the amount used in bunkers and for increases in stocks. The amounts of consumption as tabulated by the UN have been consistently less than the aggregated amounts of production—even when changes in stocks are considered. Much of the difference appears to be in the use of fuel to produce fuel, particularly the use of oil in refineries to produce those products that make up the consumption numbers.

Coal and gas consumption data can easily give a reasonably accurate picture because very little transformation takes place between the raw (mined) fuel and the fuel used by the consumer. The calculation of emissions from inland consumption data for coal and gas is straightforward and gives results that are consistent and nearly identical with those determined from fuel production data. The fact that global imports of each fuel for a given year almost always exceed global exports indicates that "apparent consumption" data include some accounting difficulty, but the difference is generally about 0.1% of production.

Crude petroleum presents a different problem in that almost none of the fuel is consumed as crude. Rotty (1983) attempted to reconcile the world production of crude petroleum and natural gas liquids with the consumption of liquid fuels and other petroleum products as tabulated by the UN Statistical Office. The balance he achieved for the liquid fuels account for 1979 is indicated in Table 5. In the same paper, Rotty (1983) calculated the 1979 CO_2 emissions from all of the fossil fuels on both production and consumption bases. When all of the fuel consumption data were considered along with properly corrected CO_2-factors, the calculations for 1979 showed a total of 5191×10^6 t of carbon as CO_2. For comparative purposes, the calculations based on production data showed a total of 5224×10^6 t—a difference of 0.6%. (Later in this report 5254×10^6 t C is given as the result for 1979, the difference being a combination of using recently revised UN fuel data and new estimates for (FO) and (C) developed in the following sections.) Clearly, the difference between the result based on fuel consumption data and that based on fuel production data is small in comparison to the probable error in fuel statistics.

Because fuel production and consumption data are so closely linked and because the production data are easier to use and are more reliable as an historic data set, our computations will continue to rely on the fuel production data.

4. Fuel fraction not oxidized

As acknowledged in eq. (1), a fraction of the fossil fuel produced each year is not oxidized

Table 5. *1979 world liquid fuels balance sheet*

Production	Amount (10^6 t)	Consumption	Amount (10^6 t)
Crude petroleum production	3123	Loss of mass in refineries (used as fuel?)	113 (3.5%)
Gain in commerce of crude (imports–exports–increased stocks)	23	Energy products (2817):	
		inland consumption by nations	2605 (80.3%)
		bunkers (international)	152 (4.7%)
Natural gas liquids to refineries	38	increase in stocks	16 (0.5%)
Subtotal, input to refineries	(3184)	loss in commerce of products (exports–imports)	44 (1.4%)
LPG from natural gas	60	Non-energy products (314):	
		rapid oxidation	118 (3.6%)
		slow or non-oxidation	196 (6.0%)
Total	3244	Total	3244

From: Rotty (1983) based on data from UN (1981b).

during time frames of interest here. Part of the unoxidized carbon results from incomplete combustion in burners (resulting in soot and unburned hydrocarbons) and part of it results from diversion of some of the produced "fuel" to non-fuel uses (e.g., use as raw materials for the chemical industries). In this section, we derive values for FO_t in eq. (1), the effective fraction of each year's production which is soon oxidized. In both the fuel and the non-fuel cases, the hydrocarbons not burned are oxidized in the environment with times varying from very short (weeks or months) to many years. In the aggregate, this slow (non-combustion) oxidation could be approximated by an exponential decay law. In such a situation, over long-time scales, the amount oxidized each year will equal the amount produced each year as long as the amount produced each year is nearly constant. When the average lifetime of the unoxidized materials is very long or when the amount produced each year is growing, there is a net amount that remains unoxidized. We suggest that when the mean life of a species exceeds some 6 to 10 years and the production rate is growing, the total amount not oxidized in a given year can be approximated as a fraction of that year's production, and this is what is implied in speaking of "long-lifetime products." Attempting to estimate production growth rates and decay rates for each unburned or incompletely oxidized hydrocarbon species would become extremely involved. Instead we have aggregated for all liquid fuels and have made subjective estimates of the extent to which production and net oxidation are likely to differ during a given year. Although this is never fully satisfying, it is important to recognize that most of the hydrocarbons are oxidized as fuels and that the data cited do provide close bounds for the fractions which are likely not to be oxidized. The probable error introduced through this aggregation and estimation procedure is small in comparison to uncertainties in the fuel production data, and more rigorous examination of the non-combustion oxidation rates does not seem justified for the calculation of CO_2 emissions.

4.1. *Natural gas produced but not oxidized*

As illustrated in Fig. 1, most of the natural gas produced in the United States is used for fuel. Data required to obtain the non-fuel use of natural gas globally are not available in formal references, so we have based our estimates on what data are available for the US. Non-fuel gas use in the United States is no longer being published by the US DOE, but we note the mean value for 1970–76 is 3.16% of production (Table 6). The lack of markets and infrastructure for using natural gas as a fuel leads to massive flaring at oil fields in some parts of the world and also leads us to expect that the fraction of marketed gas that ends up in non-fuel uses may be significantly larger in those areas than in the US. On the other hand, the total world production is still dominated by countries like the US, the UK, Canada, and the Netherlands where gas is largely used as a fuel. Based on the data for the US given in Table 6, we estimate that global non-fuel use of gas is about 3% of production. Because the non-fuel use is small, any error in

Table 6. *Non-fuel use of US natural gas (10^9 m^3)*

Year	Gas production	Non-fuel use	Non-fuel as a % of production
1976	540.6	17.4	3.22
1975	545.1	16.8	3.09
1974	580.8	20.1	3.46
1973	615.8	19.8	3.22
1972	618.8	18.5	2.99
1971	618.6	18.4	2.97
1970	601.3	18.9	3.14
1970–76 average			3.16

Gas production data from UN (1981b) (heating value of US natural gas taken to be 38,017 kJ/m³); non-fuel use is from API (1977).

basing the estimate on the biggest producers gives uncertainties that are small fractions of total marketed production. A large fraction of the non-fuel gas goes to ammonia production during which the carbon in the gas is mostly oxidized, the remainder to uses in which the carbon will be oxidized at varying rates over a period of years. The total quantity for non-fuel use has been increasing with time and, in accord with the principle—that slowly oxidizing material decays exponentially with time, this suggests that a small amount of unoxidized gas accumulates each year. As a result of increasing non-fuel use and the production of long-lifetime products, we assume that over time, an amount of carbon equivalent to 2/3 of the carbon in each year's non-fuel-use gas is oxidized during that year. Because non-fuel use is 3% of production, this is the same as assuming that, on the average, 1% of each year's produced gas remains unoxidized for long periods as a result of non-fuel uses. Although not clearly related to fossil fuel production, recent measurements do show an increasing atmospheric concentration of methane (Rasmussen and Khalil, 1981).

Because of incomplete combustion, a small amount of the carbon in the gas used as a fuel will not be oxidized and will remain as soot either around the burner, in the stack, or in the environment. Although the amount of unoxidized carbon is impossible to determine on a global scale, it is extremely small in modern combustion systems and we use, as an upper limit, that 1% of the carbon in gas produced globally remains unoxidized during combustion processes.

For natural gas, the fraction of annual production remaining unoxidized each year is thus taken to be 0.02, i.e. 0.01 for unoxidized non-fuel uses and 0.01 for unoxidized carbon in combustion. The sequence of assumptions here imposes an uncertainty on the gas oxidized of about 1% of the gas produced. Thus the fraction of gas oxidized is $FO_g = 0.98 \pm 0.01$.

4.2. *Liquids produced but not oxidized*

A key question for CO_2 production from crude oil and natural gas liquids is the fraction of production which is burned or otherwise oxidized on a short time scale as opposed to that which ends up in e.g., fibers, lubricants, or paving materials, and is oxidized only over a longer interval.

The UN statistics separate refinery output into energy products (aviation gasoline, motor gasoline, jet fuel, kerosene, gas-diesel oil, residual fuel oil, LPG, and refinery gas) and non-energy products (naphthas, white spirits, lubricants, bitumen (asphalt), petroleum waxes, petroleum coke, and others) with the non-energy products comprising 10.2% of the total in 1979. UN data also distinguish the components of natural gas liquids (natural gasoline, condensate, LPG, and "other natural gas liquids"). With the exception of some of the LPG, most of the natural gas liquids are consumed as fuels.

Turning again to US data for guidance, we find in Fig. 2 that about 12% of US refinery output in 1981 is "other" products. Table 7 subdivides this "other" category and allows identification of petroleum fractions which are used in ways that do not lead to immediate oxidation. In addition, a major fraction of the liquified petroleum gases and ethane in Fig. 2 may not undergo prompt oxidation. The total remaining unoxidized depends to a large degree on both the amounts used in the petrochemical industry and the way in which those products are used. Without a belabored analysis of the world petrochemical industry, we use US data as an analog in making estimates of unoxidized carbon from UN data. Starting with the UN tabulations for refinery non-energy products and the LPG and ethane from gas liquids plants, we estimate the fraction that is likely to remain unoxidized for long periods of time.

Most of the LPG from refineries is probably consumed as fuel and the UN lists LPG as an energy product from refineries. Therefore, we

Table 7. *1981 US refinery output of "other" products (see Fig. 2) (10^6 t)*

Natural gasoline	4.2
Unfractionated stream	Neg.
Aviation gasoline	1.3
Petrochemical feedstocks	23.9
Special naphthas	3.1
Lubricants	8.0
Wax	0.9
Coke	16.7
Asphalt	20.5
Road oil	0.1
Still gas for fuel	23.6
Miscellaneous products	4.9
DOE reclassification (adjustment)	−13.3
	93.9

From: US DOE (1982b). (All products converted from barrels to tons using factors in UN (1982) except petrochemical feedstocks and still gas at 0.1144 t/bbl, wax and road oil at 0.1431 t/bbl and unfractionated, miscellaneous and reclassified at 0.1350 t/bbl.)

estimate the amount of LPG and ethane that is used in the petrochemical industry as a fraction of only the LPG and ethane produced in natural gas liquids plants. This does not imply that all the LPG used in the petrochemical industry comes from gas processing plants, but only that the global quantity can be estimated as a fraction of the LPG produced in gas processing plants. In the US, the LPG and ethane sold for chemical and industrial uses in 1981 represent 50.7% of that produced in gas processing plants. The industrial sales include use as a standby fuel, in space heating, flame cutting, metallurgical furnaces, and plumber's torches. They also include sales for use as refinery fuel. Chemical use includes those gases employed as raw materials, solvents, and in the production of synthetic rubber. Data for 1981 are not available, but in 1979 the split was 80% to chemical use and 20% to industrial fuel use. Thus, the equivalent of (0.8)(50.7) = 40.6% of the LPG and ethane produced in US natural gas liquids plants is used in applications in which oxidation occurs very slowly. Because the petrochemical industry outside the US depends more heavily on feedstocks from refineries, especially certain naphthas, we estimate that, on a worldwide basis, about 40% of the LPG and ethane produced from natural gas processing plants ends up in materials which are not soon oxidized. (That is, for a given year, oxidation of current year production plus the sum from continuing oxidation of previous year's production amounts to 60% of current year production.)

In the UN tabulation of non-energy refinery products, what is defined as naphthas is largely used as chemical feedstocks, and nearly half of the petrochemical feedstocks in Table 7 is naphtha. This is a major feedstock to the western Europe petrochemical industry and we estimate that about 80% of the naphthas produced globally remain unoxidized for long times in plastics, tires, and fabrics.

A substantial part of the non-energy refinery products is asphalt. Even when paved roads, parking areas, and roofs deteriorate or are removed, most of the asphalt remains in an unoxidized state. Thus, assuming that virtually all of the UN reported asphalt production from petroleum refineries remains unoxidized for long periods, introduces a small overestimation. Petroleum waxes are used in manufacture of candles, polishes and water-proofing of containers, wrappings, etc. White spirits are used as paint solvents and as dry cleaning materials. Petroleum coke is mostly used in metallurgical processes and the fraction of the carbon that remains unoxidized is probably small. We estimate that these non-energy products except asphalt are mostly oxidized rather promptly and that assuming full oxidation introduces small error of opposite sign from assuming that all asphalt is not oxidized.

The UN category of lubricants gives us a problem because a non-negligible part of lubricating oil is oxidized in use. Spillage and oil drained from engines are frequently flushed into other waste liquid streams or disposed of in absorbants or containers in land fills. We have used the estimate that approximately 50% of lubricants produced by petroleum refineries remain unoxidized for long periods of time.

Our assumption is that, allowing for errors of both inclusion and omission, the quantity of liquid fuels not oxidized each year is approximated by the sum of 40% of the LPG and ethane from gas liquid plants, 80% of the naphthas from petroleum refineries, all of the asphalt, and 50% of the lubricants. This is summarized in Table 8. The conclusion is that 6.5 to 6.9% of petroleum liquids is not soon oxidized and we adopt 6.7% for our computations. For comparison Hatch and Matar

(1977a) reported that in 1974, 6.5% of world crude went into petrochemicals. Also, Flavin (1980) estimated that 1979 production of synthetic materials amounted to 10×10^6 t of synthetic rubber, 10×10^6 t of synthetic fiber, and 60×10^6 t of plastic. The sum of the unoxidized LPG, ethane and naphthas in Table 8 is 93.5×10^6 t. Our analysis suggests it is unlikely that the true value of unoxidized liquids is greater than 8.7% or less than 4.7% of annual production.

Having based this analysis on data for the last decade, there remains the question of changes in the unoxidized fraction during earlier decades in the 1950–82 period. UN data on non-energy products from refineries for 1970–80 published in UN (1981b, 1982) differ markedly from those published in UN (1976), the most recent figures being, on average, a factor of 1.33 larger for the 5 years of overlap. Thus, we assume that data for non-energy products before 1970 are subject to sizable revision and a better estimate of non-oxidative uses can be obtained by applying a 1971–80 average to the crude production uniformly rather than trying to itemize non-energy uses. API (1975) data also suggest that the time-dependent bias implicit in carrying a constant fraction back to 1950 is small. Lacking better information, we shall use the 6.7% factor for the entire 1950–82 period.

The other situation for which we should make some adjustment in the CO_2 computation is the failure to achieve 100% combustion of fuels actually delivered to burners. Carbonaceous materials that are discharged not completely oxidized include those, like CO, which undergo complete oxidation fairly promptly in the environment; others, like soot, which do not oxidize to a significant degree on time scales of interest here; and others, like methane, which oxidize in the environment at a rate such that some finite fraction is oxidized in the first and each succeeding year of interest. For this third class of compounds, any difference between the total amount of carbon being oxidized in a given year and an estimate thereof based on full oxidization of current year discharge must be a consequence of an increase in production rate. The simple assumption of an equivalent fraction of material not oxidized during a current year will not introduce significant error so long as the total fraction of material in this class is small.

To estimate the fraction of liquid fuel which goes to burners but is not fully oxidized, we used US EPA estimates of nationwide pollutant emissions in the United States (US EPA, 1977). In 1976, US emissions of hydrocarbons to the atmosphere amounted to 27.9×10^6 t, of which 14.7×10^6 t were related to transportation and oil and gas refining, production, and marketing (Table 9). Another 1.4×10^6 t were from stationary fuel combustion sources. Of the 13.4×10^6 t of total suspended particulates discharged to the atmosphere, 1.3×10^6 t were from transportation and

Table 8. *Estimate of world petroleum liquids produced but not oxidized each year (10^6 tons)*

	40% of LPG and ethane from gas plants	80% of naphtha	Asphalt	50% of lubricants	Total	% of liquids produced
1980	25.8	58.5	97.9	19.6	201.9	6.53
1979	26.0	67.5	101.5	19.7	214.7	6.63
1978	23.4	66.0	97.8	18.4	205.6	6.62
1977	23.2	66.4	91.4	17.6	198.5	6.45
1976	22.2	65.9	85.9	16.5	190.5	6.44
1975	21.9	56.2	85.7	15.6	179.4	6.57
1974	21.8	70.9	88.1	17.2	198.0	6.88
1973	21.2	70.6	90.0	16.5	198.4	6.92
1972	20.2	60.7	83.6	15.2	179.7	6.83
1971	18.5	55.4	80.4	14.8	169.1	6.79
						av. 6.67

1976–80 data from UN (1982).
1971–75 data from UN (1981b).

Table 9. *1976 US emission of hydrocarbons and total suspended particulates* (10^6 t/yr)*

Source category	TSP	HC
Transportation	1.2	10.8
highway vehicles	0.8	9.3
non-highway vehicles	0.4	1.5
Stationary fuel combustion	4.6	1.4
electric utilities	3.2	0.1
industrial	1.1	1.2
residential, commercial and institutional	0.3	0.1
Industrial processes	6.3	9.4
chemicals	0.3	1.6
petroleum refining	0.1	0.9
metals	1.3	0.2
mineral products	3.2	0
oil and gas production marketing	0	3.0
industrial organic solvent use	0	2.9
other processes	1.4	0.8
Solid waste	0.4	0.8
Miscellaneous	0.9	5.5
forest wildfires and managed burning	0.6	0.8
agricultural burning	0.1	0.1
coal refuse burning	0.1	0.1
structural fires	0.1	0
miscellaneous organic solvent use	0	4.5

* From: US EPA (1977).

petroleum refining with another 4.6×10^6 t from stationary fuel combustion sources. Table 9 lists emissions from many sources, but we are concerned here only with those associated with combustion of liquid fossil fuels, having already discounted quantities for non-fuel uses such as organic solvents.

In these calculations, we assume that 1/2 of the hydrocarbons and 1/4 of suspended solids from stationary fuel combustion represent carbonaceous materials attributable to burning liquid fuels, the remainder being from other fuels. Then, for the United States, 15.4×10^6 t of hydrocarbons and 2.5×10^6 t of suspended carbonaceous particulate material represent incompletely oxidized liquid fuels from combustion applications. If this material undergoes oxidation in the environment with time (some of it very slowly), we can consider that some fraction of 17.9×10^6 t represents the portion of the 1976 US liquid fuel consumption which should not be counted as CO_2 production.

Many of the hydrocarbons emitted, especially from engine exhausts, are partially oxidized and hence highly reactive (NRC, 1979). Data on selected urban aerosols suggest that the aerosols are of the order of 20% carbon and that 30–40% of this carbon is graphitic soot and the remainder primary and secondary organic material (NRC, 1979). The total, 17.9×10^6 tons, represents about 2.4% of the 751×10^6 tons of liquid fuels consumed in the US in 1976. Because a fraction of the 17.9×10^6 tons is oxidized in the environment in a relatively short time, something approximating $1.5 \pm 1\%$ of the liquid fuel that goes to burners each year remains in the environment unoxidized.

The US data can only provide a useful approximation of the extent of unburned material globally. The amount unburned is clearly a small fraction of the total and we note that US emissions of some materials have declined in recent years because of technological improvements. Our procedure probably gives low estimates of global emissions of unburned carbon (and hence high CO_2 estimates). In addition, the assumption of a constant 1.5% for the unburned fuel introduces some time-dependent bias in the estimate.

The total mass of liquid fuels lost directly to the environment is not large in comparison to the amount produced. Oil spills at sea amounted to 237,600 tons in 1978 (UN Environment Programme, 1979) and there are smaller but much more numerous losses throughout the processing/delivery system. Loss of organic compounds as liquid effluent at an oil-fired power plant is estimated to be of the order of 15% of the airborne hydrocarbons (UN Environment Programme, 1979). None of these is large enough to make a significant correction to the calculations already detailed.

In summary, about $6.7 \pm 2\%$ of the liquids produced end up in petrochemical applications where they are not soon oxidized and another equivalent fraction of $1.5 \pm 1\%$ passes through burners and is deposited in the environment without being oxidized. We believe the factor for oxidation of liquid fuel produced is $FO_l = (1 - 0.082) = 0.918 \pm 0.03$.

4.3. *Solid fuels produced but not oxidized*

Incomplete combustion results in the discharge from boilers of coal dust, gaseous hydrocarbons, and unburned char. The concentration of carbon monoxide (CO) in flue gas can be used as a first-order indicator of the completeness of the combustion process and data on CO emissions collected

by the US National Air Pollution Control Administration (1970) show that emission factors depend strongly on the type and size of the coal-burning unit. Carbon monoxide emissions per unit of energy can be two orders of magnitude larger from small and/or less efficient units than from large, modern pulverized-coal boilers. Any attempt at a general, time-independent factor to compensate for incomplete combustion must recognize that, e.g., 82% of the US coal consumed in 1981 was burned in utility boilers while only 17% was so burned in 1949 (Fig. 3). Transportation accounted for 15% of US consumption in 1949 and virtually none in 1981. Employing a constant for the unburned fuel fraction for both current US electric utility boilers and steam locomotives is, of course, only marginally justifiable, and then only because the total fuel used in locomotives (in 1949, for example) was of the order of 10% of present solid fuel use.

The UN Environment Programme (1979) has estimated that of 3×10^6 t of coal burned in a 1000 MW(e) power plant, 860 t of carbon end up in CO, 3000 t as particulates, and about 400 t in unburned hydrocarbons. If we assume, as a first approximation, that the CO and unburned hydrocarbons are soon fully oxidized in the environment (Chameides and Davis (1982) show the lifetimes of CO and methane in the atmosphere as about 65 days and 7 years, respectively) while the particulate matter remains largely unoxidized, the unoxidized fraction will amount to only 0.14% of the carbon. As an extreme example, Harding (1920) has written "probably the worst fuel loss that a locomotive fireman has to contend with is that which occurs through the escape of unburned fine coal. When the percentage of fine coal is very high, this loss may amount to one-quarter or even one-third of the coal fired," and "even at best there is considerable fuel loss through soot."

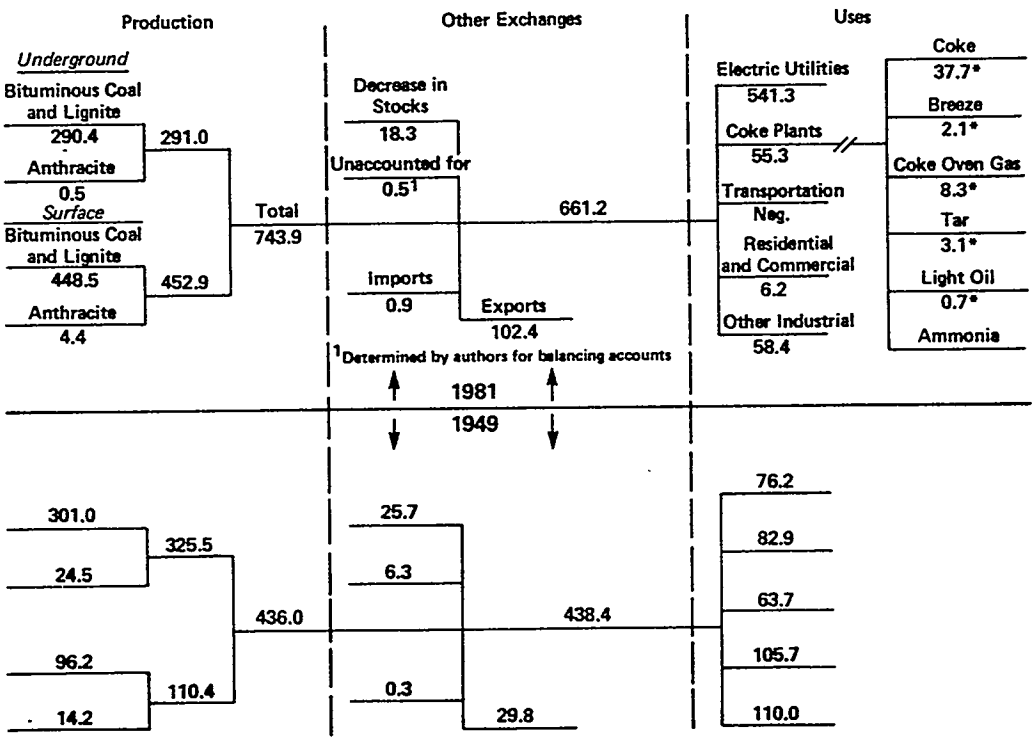

Fig. 3. US flows of coal in 1981 and 1949 (in 10^6 t). Data from US DOE (1982c, 1982d).
The most recent data available for coke plant products are for 1980 when 60.5×10^6 t of coal were consumed by coke plants. Data are in coal equivalents with both data and heating values taken from US DOE (1982d). Coke converted to coal equivalents at 0.9 from UN (1982).

Block and Dams (1976) compared the composition of fly ash from an industrial boiler (24-h capacity of 14 t of coal) with that of a small home furnace in Belgium (24-h capacity of 0.024 t of coal). The concentrations of inorganic components in fly ash from the home furnace were 2–10 times smaller than in the industrial boiler, apparently due to dilution with large emissions of unburned material. Unburned material comprised about 35% of the fly ash from the home furnace.

Another useful perspective can be obtained by examining data from current large coal consumers. Data on combustion efficiency at the Tennessee Valley Authority's Bull Run Steam Plant show that 1% of the stack ash is combustible matter; for the Shawnee Plant, 5% is more typical, and during a recent period of poor performance the Widows Creek Plant ran between 9 and 20% combustible matter in the fly ash (J. Lokey, 1981, personal communication). Because these plants operate on pulverized coal with about 80% of the ash being collected by the stack precipitators, this is probably representative of the average fraction of unburned coal. Taking a representative value of mean ash content for the coal of about 12%, between 0.14 and 2.7% of the combustible fraction of the coal remains unburned. Typical values are near 0.7% and the lower limit is similar to the UNEP number cited above. The Belgian home mentioned above was burning anthracite with 3.1% ash, implying that 1.1% of the coal was discharged unburned.

With this information, it seems reasonable to assume that above 1 ± 1% of the carbon in coal currently supplied to furnaces is discharged unoxidized. Using this fraction over the full 1950–present interval probably introduces a time-dependent bias because the number has almost certainly been decreasing with time.

The other adjustment for unburned coal has to do with coal which is used for non-fuel purposes. Fig. 3 shows the flow of US coal from the mine to the sectors in which it is ultimately consumed and allows identification of the principal portion which is not used as a fuel. Of coal which is used for cooking, two by-products form the bases for a very large chemical industry—the crude light oil and crude tar of Fig. 3. The quantities of light oil and tar shown in the figure are given in coal equivalents by heating value. Of the coal tar fraction, some 21% is typically used for fuel while benzene (21%), crosote oil (20%), and road tars (17%) are the other principal products (Wainwright, 1977). Benzene, toluene, and xylene typically account for 75% of the crude light oil.

Thus it appears that about 75% of the coal equivalents which are accounted for as light oil and tar represent the coal which ends up in applications where oxidation is long delayed. From US data, Table 10 shows that on average 5.91% of the coal going to coke plants ends up as light oil and crude tar, and 75% of that, or 4.4% has oxidation long delayed. Using this number and statistics for world coke, we can estimate the fraction of the global coal production that does not enter the CO_2 route. This calculation of the mass of US non-fuel coal use agrees within 5% with the numbers compiled by Dupree and West (1972).

There are three other considerations associated with coal production that could affect CO_2 releases. These are burning of wasted coal on abandoned mine lands, methane ventilated from coal mines, and the use of SO_2 scrubbers at coal-burning plants.

Chaiken (1980) cites a 1968 US BOM survey that found 292 waste banks on fire, and in a 1977 survey, 261 coal deposits in the US were classified as burning. The 292 waste banks contained an estimated 49 × 10^6 t of coal. Even if all of this coal was burned over a 10-year period it would still amount to less than 1% of US coal consumption.

Table 10. *Light oil and tar produced from coal in US coke plants*
(in 10^6 t coal equivalent by heating value)

Year	Crude light oil and crude tar	Coal to coke plants	% coal converted to light oil and tar
1980	3.63	60.51	6.00
1979	4.01	69.94	5.74
1978	3.68	64.77	5.68
1977	4.03	70.49	5.72
1976	4.36	76.84	5.68
1975	4.40	75.84	5.80
1974	4.68	81.83	5.71
1973	5.01	85.37	5.87
1972	5.04	79.56	6.33
1971	4.61	75.48	6.11
1970	5.25	87.54	6.00
1969	5.36	84.73	6.33
		12-year mean	5.91

From: US DOE (1982c, 1982d) and US BOM (1973).

Although it is difficult to estimate tonnages involved, burning in coal deposits is probably no greater than burning on waste piles. The US EPA (1977) has estimated that coal refuse burning contributes 0.3% of US carbon monoxide emissions, but because refuse burning occurs in an oxygen-deficient environment, the contribution to carbon monoxide discharge should be a much larger fraction than the contribution to carbon dioxide discharge. Thus much less than 0.3% of the CO_2 emissions can be attributed to this source, and ignoring this as a source of CO_2 seems to be justified.

In considering methane ventilated from coal mines, the content of gas in coalbeds varies considerably but Science Applications, Inc. (1980) estimates an average of 6.25 m^3/t in bituminous coal and anthracite, 2.5 m^3/t in subbituminous coal, and 1.25 m^3/t in lignite. Coal mined in the US in 1979 was composed of 622×10^6 t of bituminous coal, 109×10^6 t of subbituminous, 43×10^6 t of lignite, and 4×10^6 t of anthracite (US DOE, 1981). The ratio among the four types is 0.799/0.140/0.055/0.006 (although this has been changing in recent years with increasing amounts of lower grade coal being used) and using methane emission rates of 6.25/2.50/1.25/6.25 cubic meters per ton respectively, the total methane emissions from US coal mined in 1979 were (at an average of 5.45 m^3/t) 4.24×10^9 m^3. Fully oxidized, this would produce 2.16×10^{12} g C as CO_2. Again this number is a very small fraction of a percent of the emissions from coal burning and will be ignored.

The use of SO_2 scrubbing at coal burning plants is still at a sufficiently small scale that it too can be safely ignored as a source of CO_2 to the atmosphere. Coal with 1.5% S and 29.31×10^9 J/t (12,600 Btu/lb) would discharge 1.025 g SO_2 per J (2.381 lb per 10^6 Btu). If SO_2 emissions were limited to the current 0.258 g/J (0.6 lb $SO_2/10^6$ Btu), scrubbing would have to collect 0.0112 t S per ton of coal or 1.781 lb $SO_2/10^6$ Btu. Approximating the SO_2 scrubbing reaction as a stoichiometric exchange of C for S in the gas phase means that the collection of 0.0112 t S would release 12/32 (0.0112) = 0.0042 t C/t coal. Widespread use of SO_2 scrubbing in the future could result in a small but measurable increase in the CO_2 emission rate.

The conclusion at this point is that from the total mass of coal mined (in tons coal equivalent on a 29.31×10^9 J/t basis) we will subtract 4.4% of the mass which goes to coke plants (about 0.8% of the coal mined) to accommodate long-term non-oxidative uses, and subtract 1% of the remainder to accommodate the fraction which passes through furnaces without being oxidized. Our factor for oxidized fraction of world solid fuel production is thus $FO_s = (1 - 0.008)(1 - 0.01) = 0.982 \pm 0.02$.

5. Carbon content of fuels

The remaining component required to calculate CO_2 emissions is the global average carbon content of each fuel group (C_i in eq. (1)). Because carbon content is correlated with heating value, and because the UN tabulation of gases is in terajoules and of solids in tons of coal equivalent at 29.31×10^9 J/t (7000 calories per gram), the resulting calculations are straightforward.

5.1. *Gases*

Although there are compositional data available for many individual natural gases, we have been unable to locate any statistical summary of the composition of natural gases produced over large geographic areas. From the analytical data for 252 well-head samples of wet gas from 17 states as analyzed by the US BOM in 1976 (Moore, 1977), we eliminated those few samples least likely to be produced as fuels or indicating contamination (i.e., those with heating values less than 33,510 kJ/m^3 (900 Btu/SCF) or oxygen concentrations greater than 0.2%). For the remaining data, a mean composition was calculated for samples from each state having data available; then these state means were weighted according to the marketed production for that state and a "weighted mean" for the United States as a whole was calculated (Table 11, column 1). This we call the 1976 US reference gas. For comparison, a similar "weighted mean" from the 373 samples analyzed in 1970 (Cardwell and Benton, 1971) was calculated and, using their 1970 data, simple unweighted national means and standard deviations were tabulated (Table 11, columns 2, 3, and 4).

Similarly, 174 non-US samples from 18 countries were used to calculate individual country means; data from these 18 countries were combined with the US data by weighting each according to 1970 production statistics to produce a world mean

Table 11. *Composition of natural gas (in volume percent)*

	1976 US reference gas	1970 weighted US mean	1970 unweighted US mean	1970 unweighted US standard deviation	Weighted world mean (circa 1970)	1976 adjusted dry gas
methane	88.32	89.32	86.63	9.63	89.24	92.88
ethane	4.65	4.66	5.02	3.52	4.52	3.91
propane	2.12	2.04	2.57	2.56	1.95	0.62
other Hydrocarbons	1.53	1.56	1.88	—	1.54	—
CO_2	0.92	0.65	0.63	1.11	0.78	—
other	2.46	2.33	3.26	—	2.42	2.59
Higher heating value						
kJ/m³	40.530	40,680	41.250	4.230	40.500	38.090
(Btu/SCF)	(1088)	(1093)	(1108)	(114)	(1088)	(1023)

Table 12. *Mean heating value of dry natural gas*

	US[a] (kJ/m³)	World[b] (kJ/m³)
1980		36,920
1979	37,940	36,980
1978	37.940	37.030
1977	38.020	37,040
1976	38,020	37.090
1975	38.120	37.130
1974	38,020	37,210
1973	38,240	37.330
1972	38.390	37,340
1971	38.390	37.360
1970	38.390	37.470
1969	38.390	
1965–68	38,430	
1964 and before	38,540	

[a] From American Gas Association (1979), except 1979 value from US DOE (1980a).

[b] These values are derived by using a representative (constant) heating value of gas from individual countries as reported in the UN (1982), and calculating a weighted mean, based on annual production statistics. The weighted means are based on the 6 countries that have dominated world gas production over the last decade: US. USSR, Netherlands, Canada, UK. and Romania. The decline in the heating value so determined is a consequence of changing fractions of world total being supplied by the USSR and Netherlands.

composition (Table 11, column 5) (data from Moore (1976)). This aggregation includes countries which represent 75% of the world production, but does not include the USSR.

The 1976 US reference gas composition (Table 11, column 1) should closely describe natural gas reported by the US BOM and US DOE as "marketed production." Marketed production means wet gas and the "extraction loss" shown in the gas flow accounts represents processing to remove liquids which subsequently appear in the accounts as "natural gas liquids." The change in gas composition which occurs during the removal of natural gas liquids results in a reduction of heating value. For dry natural gas delivered to customers in 1976, the American Gas Association (1979) reports 38,020 kJ/m³. Taking the 1976 reference gas. assuming removal of 20% of the ethane, 72% of the propane (Hatch and Matar, 1977b), all of the heavier hydrocarbons, and all of the H_2S, CO_2, and H_2O, the resulting gas (Table 11, column 6), has a calculated heating value of 38,090 kJ/m³. This adjusted "dry gass" should closely resemble the composition of gas delivered to US customers in 1976 and that counted by the UN as gas production. For other years, the composition should be closely approximated by using the same wet gas composition and adjusting to the heating value of delivered gas, as published by the AGA (see Table 12). This is done by removing appropriate amounts of "natural gas liquids," ethane and heavier hydrocarbons, and recognizing that this removal has become increasingly efficient with time.

The 1976 adjusted dry gas contains 0.550 g C/l at 0 °C and, with the separated CO_2 included, would discharge 0.555 g C/l as CO_2 when completely oxidized. Adjusted to 15.6 °C (60 °F), the temperature at which US gas volumes are measured, and assuming ideal gas behavior, this amounts to 525.4 g C/m³ or 13.81 t C/TJ (tons of carbon per terajoule). Doing similar calculations for the other mean gas compositions, we found that the carbon content per unit of energy could be closely represented by a linear relationship with heating value.

This relationship is expressed by the equation,

$$C_g = 13.708 + 0.0828 \times 10^{-3} (\Delta H_H - 37{,}234) \quad (3)$$

where C_g is the amount of carbon (in t C/TJ), and ΔH_H is the higher heating value of the gas (in kJ/m³ at 15.6 °C). Eq. (2) shows that the carbon content per unit of energy of the gas is not very sensitive to the heating value of the gas. Even though the heating value of "average" natural gas has changed slightly with time (as shown in Table 12), little information is lost by assuming a time-averaged heating value. The 1970–80 world average is 37,170 kJ/m³. For the following reasons we have adopted the upward rounded value of 37,200 kJ/m³:

1. Heating values for individual countries are not well-known, but the UN reports larger values for most small producers not included in our average,
2. The pre-1970 values were probably higher because US gas made up a larger fraction of the total,
3. The carbon calculation is not very sensitive to small changes in heating value.

The regression equation then gives C_g = 13.7 t C/TJ, and implies that "average" natural gas contains 510 g C per m³. The value for carbon content of gases obtained by this procedure appears to be accurate to within ±2%.

For flared gas there are no data from which to estimate the carbon content directly. Because flared gas is largely associated gas from oil fields, it seems unlikely that its heating value is as low as is suggested by the heating value we have used for our global mean gas (heavily affected by Soviet gas). Although some gas is flared without processing, in other cases gas liquids are recovered before flaring. In view of these considerations, the assumption that gas flared globally has a carbon content close to that of dry gas marketed in the US (525 g C/m³) appears reasonable. Because flared gas almost certainly contains more carbon than the "average" global gas (510 g C/m³), and gas with more than 540 g C/m³ would be most unusual, the uncertainty on the assumed value of 525 g C/m³ is taken to be ±3%.

5.2. *Liquids*

Crude oil is a complex collection of hydrocarbons with about 600 individual hydrocarbons identified to date (Hunt, 1979). The American Petroleum Institute's detailed analysis of Ponca City Crude isolated some 295 hydrocarbons which made up 60% of the total crude. "The remaining 40% undoubtedly consists of thousands of compounds many of which will never be identified" (Hunt, 1979, p. 34). Petroleum is the raw material for an estimated 7000 end-use chemicals. Thus the analysis of crude petroleum for CO_2 emissions could be extremely complex.

Variations in petroleum are most often expressed in terms of its specific gravity at 15 °C (60 °F). The API gravity, where

$$\text{API gravity} = \frac{141.5}{\text{specific gravity}} - 131.5, \quad (4)$$

is an indication of the molecular size, carbon/hydrogen ratio, and hence carbon content of a crude oil. Coleman et al. (1978) have assembled analytical data, including API gravity, for 800 important US crudes representing major fields and producing formations. The gravities of this sample varied from 8.9° API (specific gravity = 1.0078) to 62.9° API (specific gravity = 0.7279) with a mean of 34.75° API (specific gravity 0.8511) and a standard deviation of 7.71° API. There is a similar diversity among major world sources of crude and even for the US, the mean of 34.75° API is only indicative because it treats all 800 analyses equally without regard for production rate. According to Carter (1979), the average gravity of world crude varied between 32.0 and 32.9° API for the years 1970–79 and might be expected to drop only slightly lower over the next 5 years. Carter shows North American averages between 31.8 and 32.2 for those years.

For converting volume to mass units, the UN (1982) assumes US crude oil has a specific gravity of 0.848 (35.4° API). We used UN single-country values for specific gravity and took the weighted

average value for the 10 largest crude-producing countries in 1978 (77% of the total). The result was a specific gravity of world crude of 0.857 (33.6° API). Considering this in combination with Carter's conclusion, world average crude appears to have an API gravity of 32.5° ± 2°.

In Fig. 4 we have plotted percent carbon versus API gravity for a few typical North American crudes (Marks, 1978). There is a good correspondence between percent carbon and gravity with 32.5° API suggesting a composition of about 85.25% carbon. Brame and King (1967) give a range of 79.5–87.1% carbon for crudes, with a mean of 84.5% carbon and Hunt (1979) also lists 84.5% as the carbon content of crude oil. The mean carbon content of crude oil will vary slightly from year to year as the distribution of sources changes, and we conclude that $C_l = 85.0 \pm 1.0\%$ carbon should adequately describe the mean composition of world crude oil during the period of interest here. Because natural gas liquids comprise only 3% of the total liquids, little error can be introduced by applying this factor to the sum of crude petroleum and natural gas liquids, as pointed out above.

5.3. *Solids*

As indicated earlier, the UN now attempts to evaluate coals and tabulates production in the energy units "tons coal equivalent" at 29.31×10^9 J/t (7000 cal/g). The correlation between heating value and carbon content suggests that we can establish estimates for carbon content using the knowledge that the UN has considered the heating value in their published production data. That the correlation between heating value and carbon content is good but not perfect is seen clearly in attempts to write formulas for calculating heating value from chemical analyses. For example, one such attempt arrived at the formula:

$$\Delta H_H = 146.58\,C + 568.78\,H + 29.4\,S - 6.58\,A - 51.33\,(O + N) \quad (5)$$

where ΔH_H is the higher heating value in Btu/lb and C, H, S, A, and $(O + N)$ are weight percents, respectively, of carbon, hydrogen, total sulfur, ash, and oxygen plus nitrogen by difference (all on a moisture-free basis). While this was the most successful of five published equations which were evaluated by the Institute for Gas Technology (1978), when calculated and measured values for 775 US coals (including lignites and subbituminous coals) were compared, the average of the absolute value of the differences was 93 Btu/lb (0.22×10^9 J/t). It is clear that whether or not the precise expression of eq. (4) is used, having the heating value of coal makes it possible to estimate the carbon content.

A higher heating value of 29.31×10^9 J/t is a reasonable standard for coal equivalents and until recently it was the standard employed in the UN data tabulations. To determine the factor C_s to be used in eq. (1), it is then necessary to establish the average carbon content of 29.31×10^9 J/t coal. Although the carbon content of solid fuels is variable, for 29.31×10^9 J/t coal, close definition is possible. For the Zubovic et al. (1979) compilation of coal analyses (mean heating value of 29.66×10^9 J/t), the arithmetic mean carbon content was 70.9% for the 491 samples for which ultimate analyses were available. These were samples with heating values varying from 19.69×10^9 J/t to 34.76×10^9 J/t and carbon content from 48.2 to 85.9%. For the 26 samples with heating values between 28.87 and 29.71×10^9 J/t (6900 and 7100 cal/g), the mean heating value was 29.28×10^9 J/t and the mean carbon content 70.7%. "Coal equivalent" is thus assumed to contain 70.7% carbon. We suggest $C_s = 70.7\%$ carbon describes coal equivalent within ±2%, although it does appear that the carbon fraction per unit heating value increases slightly for low grade coals.

The higher heating value of coal is a commonly measured value and most of the discussion above

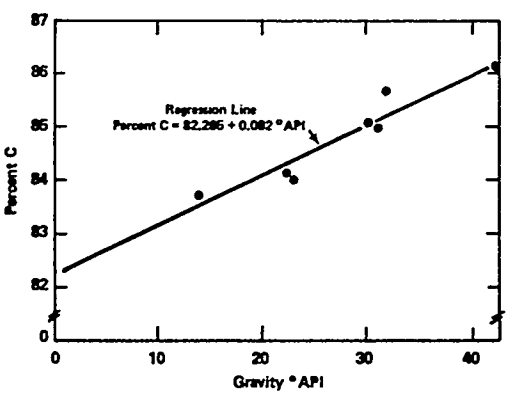

Fig. 4. Percent carbon as a function of specific gravity for samples typical of North American crude petroleum. Data from Marks (1978).

has been based on higher heating value. However, in its most recent tabulations, the UN has attempted to base coal equivalents on lower heating value ("net heat value" in their terminology) while staying with a 29.31×10^9 J/t (7000 cal/g) basis. Therefore we must make some adjustment. To use the UN data set for coal production with coal composition information based on the higher heating value, the coal composition factor must include a multiplier which simultaneously converts tons of coal equivalent from a lower to a higher heating value basis. Our factor is based on US data and assumes only that the ratio of $\Delta H_H/\Delta H_L$ is the same for average world coal as for US coal. Table 3 shows, by year, the ΔH_H of US coals as reported by the US BOM and US DOE and the heating value assumed by the UN in converting tons of US coal to tons coal equivalent. By including a factor of $\Delta H_H/\Delta H_L$ in the multiplication, we effectively revert to a 29.31×10^9 J/t ΔH_H basis, and this can be regarded simply as a heating value adjustment factor. It should be changed if the UN alters its accounting basis in the future.

From the heating values used by the UN in tabulating US coal production in UN (1982) (Table 3), the mean heating value adjustment factor for 1970–79 data is found to be 1.055. We asume this factor is appropriate for world coal. Combining the composition and heating value adjustment factors, the effective carbon content of world average coal is found to be $C_s = (0.707)(1.055) = 0.746 \pm 0.02$. We emphasize that this factor is uniquely appropriate for the UN coal statistics reported on a "net heat value" basis.

6. Calculation of CO_2 emissions and estimation of error

6.1. *CO_2 emissions from fossil fuel burning*

The computation of CO_2 emissions from fossil fuel burning is accomplished by multiplying the factors developed above and summarized in Table 13. The fuel data taken from UN (1983) and the calculated values for CO_2 emissions are presented and summed in Table 14. A large number of

Table 13. *Factors and units for calculating annual CO_2 emissions from global fuel production data**
$CO_{2i} = (P_i)(FO_i)(C_i)$

From natural gas production
CO_{2g} = CO_2 emissions in 10^6 tons C
P_g = annual production in thousands of 10^{12} J ($\pm \approx 10\%$)
FO_g = effective fraction oxidized in year of production = $0.98 \pm 1\%$
C_g = carbon content in 10^6 tons per thousand 10^{12} Joules = $0.0137 \pm 2\%$
From crude oil and natural gas liquids production
CO_{2l} = CO_2 emissions in 10^6 tons C
P_l = annual production in 10^6 tons ($\pm \approx 8\%$)
FO_l = effective fraction oxidized in year of production = $0.918 \pm 3\%$
C_l = carbon content in tons C per ton crude oil = $0.85 \pm 1\%$
From coal production
CO_{2s} = CO_2 emissions in 10^6 tons C
P_s = annual production in 10^6 tons coal equivalent ($\pm \approx 11.2\%$)
FO_s = effective fraction oxidized in year of production = $0.982 \pm 2\%$
C_s = carbon content in tons C per ton coal equivalent = 0.746** $\pm 2\%$
From natural gas flaring
CO_{2f} = CO_2 emissions in 10^6 tons C
P_f = annual gas flaring in 10^9 m^3 ($\pm \approx 20\%$)
FO_f = effective fraction oxidized in year of flaring = $1.00 \pm 1\%$
C_f = carbon content in tons per thousand m^3 = $0.525 \pm 3\%$

* Units are chosen to be consistent with fuel production data compiled in UN (1983). All masses are in metric tons (10^3 kg).

** The 0.746 value includes a heating value adjustment to recognize that the carbon content, developed on a higher heating value basis, must be increased when used with UN production data (UN, 1983) based on "net" or lower heating values.

Table 14. *Summary table of CO_2 emissions from fossil fuels, 1950–82*

Year	Gas fuel production[1] (10^{12} J) (thousands)	CO_2 from gas fuel (10^6 t C)	Liquid fuel production[2] (10^6 t oil)	CO_2 from liquid fuel (10^6 t C)	Solid fuel production[3] (10^6 t coal) (eq.)	CO_2 from solid fuel (10^6 t C)	Gas flared and vented[4] (10^9 m^3)	CO_2 from flared gas (10^6 t C)	Total CO_2 from fossil fuels (10^6 t C)
1950	7,190	97	542	423	1,471	1,077	44	23	1,620
1951	8,560	115	613	479	1,552	1,137	46	24	1,755
1952	9,240	124	646	504	1,538	1,127	50	26	1,781
1953	9,770	131	684	533	1,546	1,132	51	27	1,823
1954	10,250	138	714	557	1,532	1,123	52	27	1,845
1955	11,140	150	801	625	1,659	1,215	58	30	2,020
1956	12,030	161	870	679	1,748	1,281	61	32	2,153
1957	13,250	178	915	714	1,798	1,317	67	35	2,244
1958	14,300	192	938	732	1,834	1,344	66	35	2,303
1959	15,980	214	1,012	790	1,883	1,380	69	36	2,420
1960	17,500	235	1,089	850	1,953	1,430	75	39	2,554
1961	18,870	253	1,161	906	1,831	1,341	79	41	2,541
1962	20,590	276	1,258	981	1,875	1,373	84	44	2,674
1963	22,360	300	1,351	1,054	1,953	1,431	90	47	2,832
1964	24,450	328	1,458	1,138	2,022	1,481	97	51	2,998
1965	26,170	351	1,563	1,220	2,051	1,503	104	55	3,129
1966	28,310	380	1,696	1,323	2,080	1,524	115	60	3,287
1967	30,500	409	1,822	1,421	2,000	1,466	126	66	3,362
1968	33,130	445	1,988	1,551	2,043	1,497	139	73	3,566
1969	36,270	487	2,139	1,669	2,080	1,524	152	80	3,760
1970	38,440	516	2,350	1,833	2,152	1,577	167	88	4,014
1971	41,200	553	2,491	1,944	2,146	1,572	171	90	4,159
1972	43,390	583	2,632	2,054	2,163	1,584	180	95	4,316
1973	45,280	608	2,868	2,238	2,190	1,604	213	112	4,562
1974	45,880	616	2,877	2,245	2,202	1,613	204	107	4,581
1975	46,230	621	2,731	2,131	2,297	1,683	183	96	4,531
1976	48,040	645	2,962	2,311	2,357	1,727	210	110	4,793
1977	49,730	668	3,064	2,391	2,428	1,779	206	108	4,946
1978	51,740	695	3,106	2,423	2,450	1,795	201	106	5,019
1979	54,380	730	3,238	2,527	2,583	1,892	200	105	5,254
1980[5]	53,440	718	3,091	2,412	2,641	1,935	194	102	5,167
1981[5]	54,120	727	2,909	2,270	2,658	1,947	178	93	5,037
1982[5]	54,170	727	2,771	2,162	2,729	1,999	175	92	4,980

[1] Data from UN (1983) and corresponding data tape of UN Energy Statistics.
[2] Data from UN (1983) and corresponding data tape of UN Energy Statistics. Numbers are the sum of crude oil and natural gas liquids, both in mass units.
[3] Data from UN (1983) and corresponding data tape of UN Energy Statistics; in 10^6 t of coal equivalent, where coal equivalent means net heating value of 29.31×10^9 J/t (7000 cal/g).
[4] 1950–70 data from Rotty (1974). 1971, 1972 data from US DOI (1974). 1973 data from US DOE (1979). 1974–78 data from US DOE (1980b). 1979–82 data are estimates by authors.
[5] Data for 1980–82 are from UN (1984, in press, private communication UN statistics office staff).

assumptions and approximations are embodied in these computations but in every case, the values are rather well-bounded. We have tried to draw these approximations in such a way as to acknowledge the uncertainties but to show also that the results cannot lead to large errors in the calculation of CO_2 emissions.

Because liquids probably provide the worst case for accumulation of errors, assembling and contemplating all of the errors and approximations contained in the calculation of CO_2 emissions from liquids provides bounds for other fuels as well. Global production data can be used as a surrogate for annual consumption if identifiable non-oxidative uses are subtracted. Changes in stocks are small compared to production and, over a series of years, must contain positive and negative numbers summing to near zero. Assuming that crude oil and natural gas liquids could be summed on a mass basis introduces little error because of the demonstrated small difference in mean carbon content and the small contribution of NGLs to the total. Global fuel production numbers compiled by the UN are consistent with numbers published elsewhere and represent the best efforts of a staff dedicated to the sole task of bringing together all of the available information. All production data are subject to revision as additional information becomes available, but ultimately all data depend on the reporting of individual nations and production companies. The error estimates for production data (±8% for liquids) are judgments made after discussing global and some individual country data with the UN staff plus discussions with others more familiar with US data.

The most speculative numbers in our computation are those that relate to how crude oil is ultimately used and the rate at which it is oxidized. It is absolutely clear, however, that over 90% of crude is used for fuels that are burned within a short time of production and errors of only a few percent of total CO_2 emissions are possible as a result of accounting inadequacies within the fraction remaining unoxidized. The fraction not oxidized results from both non-fuel use and combustion inefficiencies. The assumption of 98.5 ± 1% oxidization effectively recognizes that CO and most unburned or partially oxidized hydrocarbons will soon be oxidized in the environment while soot will remain unoxidized for long periods of time. Although recognizing that we have committed errors of both omission and inclusion, we have listed a variety of non-fuel petroleum products that have long lifetimes before oxidation, and have assumed that the sum closely approximates the fraction of petroleum which is not oxidized each year. Recent year data suggest this is about 6.7% of production and we conclude that errors of greater than ±2% of production are unlikely. One problem is that this fraction (and the combustion efficiency) are functions of time and place and we are forced to rely on recent US data to infer long-term global averages. If the fraction of fuel going into long-lifetime products has been increasing over the last several decades, use of estimates of that fraction based on present data will result in CO_2 emissions that are slightly too low for earlier years. However this will be, at least partially, compensated for by an increase in fuel combustion efficiency with time. The data cited above also suggest that non-fuel uses of coal and natural gas have been decreasing with time while average coal combustion efficiency has been increasing with time. Data are not available to try to discern quantitatively the effect of changing non-fuel uses and increasing combustion efficiencies on the growth rate of CO_2 emissions.

There are enough data published on the composition of world crudes, partly because so much of world crude enters into international commerce, that we can be quite confident in establishing its mean carbon content. Errors in the procedures and the calculations stemming from carbon content or from fraction oxidized are much smaller than those from fuel data.

With present global fuel data, error limits cannot be assigned with scientific precision, but rather the ± values indicated represent our subjective judgment for an approximate 90% confidence interval over distributions not unlike normal. This is distorted somewhat when we recognize that some of the factors used are dominated by data from the most recent third of the data sequence and that time-dependent biases have been introduced by employing constant multipliers for the entire 1950–82 period. Working largely in energy units should suppress time-dependent, systematic errors in the fuel production and fuel composition data, but fuel combustion efficiency and non-fuel use have almost certainly undergone systematic changes not recognized in our calculation. Since these changes affect quantities which are of the order of a few

percent and the quantities are then subtracted from unity, any adjustments can give only small changes in net CO_2 production or its rate of increase.

We have estimated the overall uncertainty associated with CO_2 emissions by the analysis depicted in Table 15. In 1980, the CO_2 emissions from each fuel group were divided as follows: 14% from natural gas, 47% from liquid fuels, 37% from solid fuels, and 2% from flaring gas. Using these percentages as weighting factors on the uncertainties for each fuel group, this analysis suggests that the estimates on the global total emissions of CO_2 from fossil fuels presented in Table 14 have an uncertainty of between 6 and 10%, depending on how one chooses to aggregate the uncertainties.

The uncertainty in the value used for fuel produced is independent of the uncertainty in the estimate for fraction oxidized and the estimated carbon content. The uncertainty in the product of the three terms is estimated by the square root of the sum of the squares of the uncertainty in each individual component. However, in summing the uncertainties for CO_2 emissions from each fuel type to obtain an overall uncertainty for global CO_2 emissions, independence is not assured. If the data for each fuel type were totally independent, the square root of the sum of the squares would be the appropriate procedure and the estimated uncertainty would be 6.1%. In at least a few cases, it is likely that data for gases, liquids and/or solids are developed and tabulated in the same office or even by the same individual and errors of the same type may occur in data for more than one fuel type. In this case, compensating errors would not occur and the cumulative uncertainty could be as much as $\sum f_i\sqrt{\sum E_j^2}$, 10.2% in this case (see Table 15). The estimated uncertainty in the final emission numbers of between 6 and 10% is based on a 90% confidence interval.

The uncertainty of 6 to 10% is applicable to CO_2 emissions for a given year, but the uncertainty in the relative change from year to year is a different problem. Growth rates are determined by linear least squares fitting of the logarithms of the annual emissions and thus confidence in growth rates can be different from confidence in annual values. There is a memory component in the annual fuel data; that is, fuel production data for a given year are influenced by, and hence not totally independent of, the previous year's data. One of the checks employed by the UN is that reported production data must demonstrate continuity with the previous year's values. In addition, some time-dependent bias may be introduced by the calculative procedure used. However, if we assume that there is a constant exponential growth in CO_2 emissions for a particular period, then we can use some simple statistics to estimate confidence limits on the annual

Table 15. *Uncertainties in CO_2 emissions* (%)

	E_1 fuel produced (P)	E_2 fraction oxidized (FO)	E_3 carbon content (C)	Emissions* $\sqrt{\sum E_j^2}$	Weighted** emissions $f_i\sqrt{\sum E_j^2}$
gases	10	1	2	10.3	1.5
liquids	8	3	1	8.6	4.0
solids	11.2	2	2	11.6	4.3
gas flared	20	1	3	20.3	0.4

Total uncertainty: a. If uncertainties for the individual fuels are mutually independent $[\sum(f_i\sqrt{\sum E_j^2})^2]^{1/2} = 6.1$

b. If uncertainties for the individual fuels are not independent $\sum f_i\sqrt{\sum E_j^2} = 10.2$

* E_j is the uncertainty in the factors P, FO, and C for a given fuel type i.

** Weighted by 1980 weighting factor f_i = 1980 emissions from ith fuel type divided by total 1980 emissions.

growth rate. Assuming that the yearly emissions are independent, and that the statistical deviation from constant exponential growth is the same as the statistical deviation in the individual annual emissions, and that ±8% is the 90% confidence bound on individual values, we calculate that the annual growth rate for the period 1950–73 is 4.44 ± 0.26%. For the period 1973–82 it is 1.46 ± 1.11%.

Because of the memory in the data system, data precision can be much greater than data accuracy; the uncertainty in individual values is not reflected in the difference between successive annual values. Thus, in determining year to year differences, using annual values calculated to four significant figures is not inappropriate.

To reduce the uncertainty in the final result would require that the reliability (or confidence in) the fuel production data be substantially improved. It is shown clearly in Table 15 that most of the uncertainty in calculating CO_2 emissions from fossil fuels comes directly from this source. Developing improved confidence in the UN fuel statistics for even that small group of countries that produce most of the world's fuel, would require a major effort.

We have made no attempt to examine CO_2 emissions prior to 1950. Estimates of Keeling (1973) remain the only source extending back to 1860. There is virtually no difference between the results presented here for the early 1950s and Keeling's values for the same period (e.g., 1618×10^6 t C for 1950 calculated here compares with 1613×10^6 tons carbon calculated by Keeling). Although this apparent agreement makes it easy to combine data for the two periods into a single sequence, we caution that the two series have been developed by different methods from data sets having different uncertainties.

6.2. *CO_2 emissions from other industrial activity*

The only other significant contribution to CO_2 emissions from industrial activities appears to be related to cement manufacture. In cement manufacture, limestone, chalk, oyster shells or some other raw material rich in calcium is a major ingredient. In a cement kiln, calcium carbonate ($CaCO_3$) is broken down into carbon dioxide and the calcium oxide (CaO) which ultimately combines with silicates from other ingredients to form tricalcium and dicalcium silicates.

Portland cements vary as to exact composition depending on the characteristics desired in the product. The common types of cement vary from 62.3 to 65.0% CaO (Helmuth et al., 1979). Type I and Type II cements are the most common and these average 64.0 and 63.6% CaO, respectively. The weighted average of the 1975 cement shipments in the US is 63.8% CaO, and we have accepted 0.638 as an appropriate value for CaO content of the world average cement.

For each mole of CaO produced from $CaCO_3$, one mole of CO_2 must be driven off. Thus in the production of one ton of cement $12.01/56.08 \times (0.638) = 0.137$ t C are released to the atmosphere as CO_2. The annual CO_2 emission from cement manufacture is obtained by multiplying the mass of global cement production by 0.137.

The most consistent series for global cement production that we have been able to identify is that given in the Minerals Yearbooks of the US BOM. Data from the UN Statistical Yearbooks and the UN Monthly Bulletin of Statistics are similar but require some careful interpretation to develop a consistent time series. Table 16 gives world cement production and our estimate of the CO_2 emissions from this source.

7. Conclusions

An important outcome of this exercise is that an independent examination of the full computation of CO_2 emissions from fossil fuels has been completed and no fundamental oversights in the earlier methods of Keeling and of Rotty have been found. Differences from the earlier results are minor, well within the uncertainty limits in the data available. At the same time, we emphasize the uncertainties in the results, and any effort toward a global carbon balance should acknowledge that CO_2 production numbers reported to four significant figures are nonetheless subject to substantial uncertainty.

The CO_2 emissions given in Table 14 are displayed in Figs. 5 and 6. Fig. 5 shows graphically the rate at which CO_2 emissions have been growing and the relative contributions of the various fuels. This figure shows the early dominance of emissions from coal and the rapid increase in emissions from liquids between 1950 and the early 1970s. The disruption of the growth in emissions that ac-

Table 16. *CO_2 emissions from cement, 1950–82*

Year	Cement production[a] (10^6 t cement)	CO_2 from cement (10^6 t C)	Total CO_2 from fuels + cement (10^6 t C)
1950	133	18	1638
1951	150	21	1776
1952	161	22	1803
1953	178	24	1847
1954	195	27	1872
1955	218	30	2050
1956	236	32	2185
1957	247	34	2278
1958	262	36	2339
1959	294	40	2460
1960	317	43	2597
1961	334	46	2587
1962	358	49	2723
1963	377	52	2884
1964	415	57	3055
1965	434	59	3188
1966	464	63	3350
1967	480	66	3428
1968	515	70	3636
1969	543	74	3834
1970	572	78	4092
1971	617	84	4243
1972	657	90	4406
1973	702	96	4658
1974	703	96	4677
1975	702	96	4627
1976	746	102	4895
1977	797	109	5055
1978	853	117	5136
1979	872	119	5373
1980	885	121	5288
1981	892	122	5159
1982	892	122	5102

[a] Cement production data from US BOM Minerals Yearbooks.

companied the dramatic change in energy prices and availability beginning in 1973 is clearly evident and appears to be mostly a consequence of reduced rate of growth in the use of oil and gas.

In Fig. 6, the percentages shown are average exponential growth rates calculated by linear least squares fitting of the logarithms of the annual emissions. Although the trends indicated in Fig. 6 for the period following 1973 are based on only ten points and hence are susceptible to some adjustment as additional years are added to the data, the change in growth rates around 1973 is quite evident. The pre-1973 4.5% annual rate of growth in CO_2 emissions from all fossil fuels has been reduced to less than half that (1.5%). Carbon dioxide emissions from oil and gas show the 1973 change even more clearly. The apparent small increase shown in the growth rate in coal production following 1973 must be considered in terms of the relatively short period over which the 2.59% annual rate was determined. The basic change in total fossil fuel use that occurred in 1973 could be quite important.

Although the estimated uncertainty in the CO_2 emissions is about 10%, the trend of increasing emissions from fossil fuels is firmly established. There may be a small time-dependent error in the emissions calculation but the 1950–73 annual

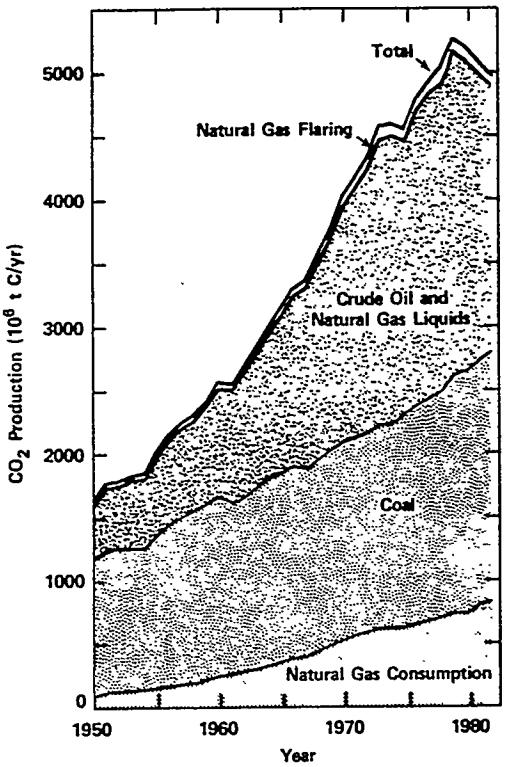

Fig. 5. Annual CO_2 production from fossil fuel burning, 1950–82.

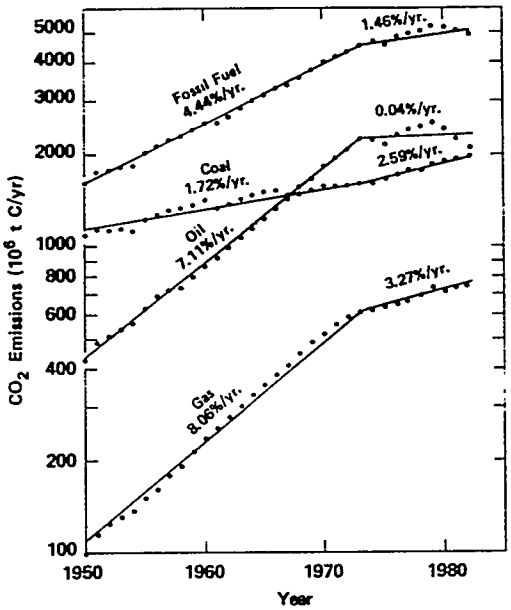

Fig. 6. Annual CO_2 production from each fossil fuel group and total fossil fuels.

growth rate cannot be far from the 4.5% per year calculated here and, although not as well-defined, the growth rate following 1973 is less than half the earlier rate. Even prior to the 1980–82 recession (during which the emissions actually *decreased* for three consecutive years) the reduced growth rate was clearly evident.

8. Acknowledgements

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