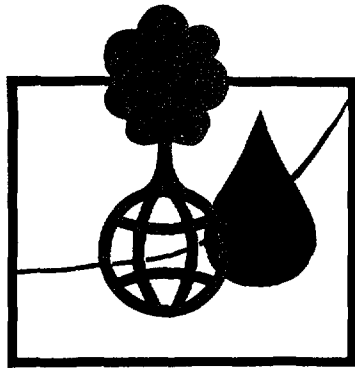




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ENERGY, ENVIRONMENT AND DEVELOPMENT

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Climate Policy Studies by the
Fridtjof Nansen Institute, ECON
and Energy Data: 10 Abstracts

EED Report 1993/8

A JOINT RESEARCH PROGRAMME
BY

FNI
THE FRIDTJOF NANSEN INSTITUTE

ECON
CENTER FOR ECONOMIC ANALYSIS

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ENERGY DATA

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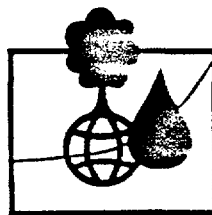
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ENERGY, ENVIRONMENT AND DEVELOPMENT (EED)

EED is a research programme carried out jointly by three institutions - the Fridtjof Nansen Institute (FNI), ECON - Center for Economic Analysis, and Energy Data (Energidata, ED) - all based in Norway. The overall focus is the relation between energy, environment and development on the national level, and international cooperation concerning sustainable energy management and global environmental change. A series of country studies analyses the economic, political and institutional factors influencing energy, environment and climate policies. The role of non-state actors like NGOs and the energy industries in international environmental affairs is also closely examined. Strategies to enhance energy efficiency are studied with a particular focus on identifying and overcoming barriers to policy implementation. The ways in which developments in international energy markets affect the potential and scope of international environmental agreements are analysed, as are the impacts of different international environmental regimes on energy markets. Particular attention is paid to the opportunities and limitations of international institutions like the European Community, the United Nations, the multilateral development banks and GATT, in promoting international cooperation on energy and environmental issues. Strategies to overcome North/South conflicts over global environmental issues are examined, including issue linkages in international negotiations and North/South transfer of resources and technology. Another important area of EED research is institutional- and policy reform to ensure more sustainable production and consumption of energy in developing countries.

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For further information please contact:

Kjell Roland
ECON - Center for Economic Analysis
Storgaten 11
0155 OSLO
NORWAY
Tel.: + 47 22 42 42 50
Fax.: + 47 22 42 40 49

Oddbjørn Fredriksen
Energy Data - ED
Øvre Flatåsveien 14
7079 FLATÅSEN
NORWAY
Tel.: + 47 72 98 67 11
Fax.: + 47 72 98 66 80

Anne Kristin Sydnes
Fridtjof Nansens Institutt
Fridtjof Nansensvei 17
1324 LYSAKER
NORWAY
Tel.: + 47 67 53 89 12
Fax.: + 47 67 12 50 47

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* Only in Norwegian version.

SUMMARY: 'LEADER' AND 'ENTREPRENEUR' IN INTERNATIONAL NEGOTIATIONS. A CONCEPTUAL ANALYSIS.

by Raino Malnes, Institute of Political Science, University of Oslo

Governments, organizations and individuals who do something out of the ordinary to influence the course and outcome of international negotiations, are sometimes called *leaders* or *entrepreneurs*. This paper discusses the meanings of the two concepts. The first part defines 'entrepreneur' and 'leader' in general terms, by reference to how the concepts traditionally have been used. The second part asks how leadership can be exercised in negotiations among states. It places this type of activity alongside other, more ordinary policies in a typology of negotiation behaviour.

An entrepreneur alters the course of history by setting an example to other, less inventive agents. His success marks him out for emulation, and he serves as a model for others. This may be called the demonstrative aspect of entrepreneurship. Entrepreneurship is also a question of undertakings that change the structural constraints and opportunities of many people's actions, altering social institutions, forms of organization or productive technology. A third characteristic of an entrepreneur is that he displays superior skill in utilizing complex information to find out how changing circumstances can be put to his advantage.

Leadership is a more elusive phenomenon than entrepreneurship. It is exercised by people with superior problem-solving ability. This may express itself in many ways, as when someone takes the initiative to sort out an intricate issue, or steps into the breach for a particular cause, or blazes new trails for society. This type of leadership may be called problem-solving leadership. It often involves efforts to change the constraints and opportunities of social interaction. Another type of leadership consists of the power of an agent to induce others to adopt a particular course of action. A leader is someone who takes the lead: an agent who makes people do what they would not otherwise have done. The crux of leadership, thus defined, is the ability to exercise influence - to direct other people's behaviour. It may therefore be called directional leadership.

The report focuses on leadership in international negotiations. It contrasts it to ordinary bargaining behaviour. A typical bargainer is an agent who tries to achieve as much as possible for himself by putting pressure on others to grant his demands. Leaders do not approach negotiations in this manner. They rely on other strategies than threats and offers, and their motives are more specific. Both the motivational side of leadership in negotiations and its strategic dimension are elaborated.

Finally, the report discusses two important contributions to defining leadership as a way of influencing international negotiations - the contributions of Oran Young and Arild Underdal. Their works contain numerous insights, but also suffer from shortcomings, and I shall be unfair enough to consider only the latter. The main problem is that neither Young nor Underdal draws a clear line between the activity of a leader and that of an agent who engages in ordinary bargaining.

SUMMARY: CHOOSING CLIMATE POLICY. DECISION THEORETICAL PREMISES.

by Raino Malnes, Institute of Political Science, University of Oslo

What should be done in response to the warning of global warming? Those who sound the warning say that human activity causes climate change which may prove disastrous in the near future. In order to prevent disaster, they continue, the activities in question must be curbed. This will involve drastic adjustments of public policy, economic activity and individual behaviour. We must, in particular, burn less fossil fuels because this activity produces carbon dioxide that concentrates in the atmosphere to create a greenhouse effect by trapping radiation from the earth. The question is: should we proceed to implement the adjustments advocated by those who warn of global warming?

The choice is between supporting or not supporting an international agreement to curb activities which some believe to precipitate global warming. This choice will have to be made under *ignorance*. The outcomes of taking or not taking drastic measures are not known. We have imperfect knowledge about (i) the processes that determine what climate the world has, (ii) the relationship between the climate and living conditions in various regions, and (iii) the effect of measures against warming upon the standard of living in different countries.

Our response to the warning of global warming should be premised on three sets of considerations: first, the general goals of public policy; second, our knowledge of what results various responses will bring; third, our conception of how our goals can best be pursued in the light of what we know about the problem before us. The major purpose of this report is to clarify the middle premise. I shall delineate the state of current knowledge about the climate and climate policy. A framework for defining public goals and deciding how they should be pursued will also be offered.

The report presents a comprehensive conceptual scheme for pinpointing what we know and do not know about the effects of our actions when, as in the choice of climate policy, we act under ignorance. Imperfect knowledge can take many forms, and the most important ones are described. The report then uses this conceptual scheme to make an epistemic diagnosis of our present knowledge about climate change and the consequences of alternative climate policies. The purpose is to find out what kind of decision we face in this particular case. Finally, the report provides basic premises for the further task of ascertaining what we ought to do in the light of what we know about the climate. What considerations should guide public policy, and how should rational decisions be made under ignorance? General guidelines are offered on both scores.

SUMMARY: JAPAN IN THE GREENHOUSE: RESPONSIBILITIES, POLICIES AND PROSPECTS FOR COMBATING GLOBAL WARMING

by Gunnar Fermann, The Fridtjof Nansen Institute

The report aims at investigating three questions:

1. Does there exist - in one sense or another - a Japanese policy toward global warming?
2. Which factors and processes have most probably influenced policy-making in this issue area?
3. How may these determinants affect Japan's future climate-policy and the likelihood of achieving the CO₂-stabilization goal?

In addition to these questions, the report discusses the greenhouse problematic and the complexities involved in concerted action aiming at combating global warming.

In Chapter 2, we distinguish between a *natural* greenhouse effect being a precondition for life as we know it, and an enhanced greenhouse effect caused by anthropogenic emissions of CO₂, CH₄, CFC's, N₂O etc. The second threatens eco-systems of the earth by rapidly increasing the average earth temperature.

The problem of global warming may be characterized along four dimensions: Firstly, global warming is a *large-scale international challenge* threatening ecosystems in all regions of the world. Stabilization of world climate is likely to necessitate measures involving huge economic and social costs. Secondly, global warming is *uniquely complex*, in terms both of its plurality of causes and mechanisms, and its variety of consequences. Thirdly, the problem of global warming may be characterized as *asymmetrical* in the sense that responsibility, problem-solving capacity and affectedness is unevenly distributed among countries. There seems, moreover, to be a negative correlation between the two first and the third. Fourthly, greenhouse science works under a "veil of uncertainty". This means that efforts to combat global warming to a large degree will depend on the perceptions, problem-solving models and values of decision-makers in each country.

Chapter 3 discusses how the logic of the "tragedy of the commons" can be circumvented. That is, how the situation that individually rational choices produce collectively harmful outcomes can be overcome. Neither altruism nor supranational coercion seem to provide realistic alternatives in harmonizing individual and collective modes of rationality. Far more promising is a dynamic and enhanced conception of affectedness which not only focuses on the costs of

abatement efforts, but which also accounts for the probable costs of doing nothing (impact-costs).

An enhanced awareness of affectedness is potentially capable of strengthening the preferences of decision-makers towards international efforts to combat global warming. However, an effective international climate regime is not likely to materialize if principles of equitable burden-sharing and cost-efficiency are not accounted for. It is argued that the "equal reductions" formula of the national abatement targets approach to international abatement efforts is neither just nor cost-effective. Differentiated emission taxes and tradeable emission entitlements seem better equipped to account for both the ethical and the economic dimension.

Chapter 4 starts with a discussion of Japan's responsibility in the field of global warming. Estimation of this responsibility is complicated by the fact that several greenhouse-gases are at work and that various emissions criteria exist. Applying the *nation-based emissions criterion*, which is reflected in the 1992 *Rio Framework Convention on Climate Change*, Japan is responsible for 4-5% of the total anthropogenic greenhouse emissions whether based on estimates of current CO₂ emissions, accumulated CO₂ emissions, or the combined emissions of CO₂, CH₄ and CFC gases. However, the nation-based emissions criterion ignores the fact that some countries are responsible for emissions in *other* countries through their investments and ownership in industrial activities abroad. If Japan's *extra-territorial "shadow emissions"* were accounted for, Japan would probably be responsible for more than 5% of the total emissions of CO₂. The same goes for an even more encompassing *consumption-based emissions criterion* which includes emissions from the extraction and production of imported raw materials and goods not accounted for by the other emissions criterion. Whatever the merits of the ownership- and consumption-based emissions criteria, the overwhelming measurement problems make them difficult to apply in practice.

Having increased many times since World War II, the Japanese emissions of CO₂ virtually stabilized from 1973 to 1986. Obviously, the approximate stabilization of CO₂-emissions during the 1970s and 80s was not guided by any conscious Japanese policy on climate change, since the problem of global warming had yet to become a political issue of serious international concern. How, then, can the CO₂ emissions stabilization of the 1970s and 80s be explained? The question is relevant not only for historical reasons, but because the same factors which contributed to the stabilization in the 1970s and 80s are likely to be just as important for a climate policy of the 1990s aiming at stabilizing CO₂ emissions in the future. Two determining factors were at work:

First, competition from NICs in markets related to energy-intensive heavy-industries induced Japan to reallocate investments to high-tech industries in which markets were expanding and

Japan could utilize its comparative advantages in capital and know-how. This industrial restructuring contributed to the stabilization of the oil consumption during the 1970s and 80s, and thus to the stabilization of CO₂ emissions in the same period. Second, of even greater importance was price rise on oil in 1973-74 and again in 1979. Due to its dependence on oil for 78% of total energy-demand, the "oil crisis" put Japan in an extremely vulnerable position. The incentive was strong to reduce dependence on oil. Through efforts of energy-conservation and fuel-switching (energy-substitution), Japanese oil-consumption was reduced from 250 Mtoe in 1973 to 207 Mtoe in 1986. This development contributed strongly to the stabilization of CO₂ emissions during the same period.

In October 1990, Japan established a climate policy aiming, *inter alia*, at a per capita stabilization of CO₂ emissions by the year 2000 at the 1990 level. This relatively modest abatement goal can be explained by the high marginal costs of Japanese abatement efforts, and by the fact that Japanese impact studies indicate that Japan has little to fear from the effects of global warming. Why, then, did Japan establish a climate policy at all? The main motive belongs to the foreign policy dimension: The Japan-ese climate policy was designed to deflect pressures from certain EC-countries at the 1989 *Noordwijck Conference* inducing Japan and other countries to establish abatement targets.

For such reasons, the Japanese climate policy seems to be weakly founded in economic self-interest. This makes the CO₂ emission stabilization target vulnerable to the worsening abatement conditions of the 1990s:

(i) The 1986 drop and slow recovery of the *price of oil*, combined with relatively cheap coal, implies that attempts to reduce consumption of fossil fuels (which account for the major CO₂ emissions) encounter resistance from the market mechanism. After having remained stable for 15 years, Japan's oil consumption started to rise again in 1987 at an annual rate of 4% until 1992. In consequence, CO₂ emissions promptly climbed.

(ii) The introduction of a CO₂ tax would provide an incentive to slow the current rapid growth in the consumption of fossil fuels. However, in order to avoid deepening the Japanese economic "recession", the Japanese are reluctant to introduce such a tax.

(iii) In order to achieve its stabilization objective, Japan is counting on the effect of *energy-conservation measures*. Its potential is, however much reduced, since the low oil price deprives Japan-ese consumers of a basic motivation for saving energy, much of the potential for energy conservation has already been exploited within the industrial sector, and savings from energy conservation in the transport sector have been offset by more driving.

(iv) Japan's stabilization objective has been based on the precondition of a continued shift in energy consumption from oil and coal to nuclear energy, gas and renewable energy sources. However, such *energy substitution* is playing a less prominent role in the 1990s than in the 1970s and 80s. Not only is cheap oil depriving the consumers of the incentive to switch to non-fossil fuels, energy substitution is hampered by the lack of practicable alternatives: Most of Japan's hydro-electric potential has already been developed, while its nuclear programme has fallen greatly behind schedule due to technical problems, failing profitability, and environmental-political opposition. Natural gas alone cannot fill the gap resulting from a reduction in oil and coal consumption.

(v) The *industrial transformation* of the 1970s and 80s from energy-intensive heavy-industry to capital-intensive high-tech industry is likely to slow down during the 1990s. The low oil and coal prices have strengthened the competitiveness of energy-intensive heavy industry.

(vi) A series of Japanese *global warming impact-studies* have strengthened the view that Japan has little to fear from global warming, and, hence, should not accept high abatement costs.

(vii) *The Japanese environmental movement* is not likely to act as a corrective to this attitude: It is fragmented and primarily focusing on local issues, and more interested in opposing nuclear power - a key-alternative to fossil fuels.

(viii) *EC pressures* in the field of climate change seem to be decreasing. EC reluctance to introduce a CO₂ tax, is a strong signal to Japan to act likewise.

The worsening abatement conditions pointed to above, most probably make the Japanese CO₂ stabilization goal *incompatible* with economic growth. In such a situation it is easy to foresee that it will only be a matter of time before Japan finds itself forced to abandon its stabilization objective. That Japan would relinquish its objective for economic growth is far less likely. Strong economic growth is, to an even greater degree than elsewhere, virtually *sacred* in Japan. After all, it is economic growth that has established Japan as a "miracle" and an economic superpower, while also ensuring the majority position of its Liberal Democratic Party ever since the early 1950s.

SUMMARY: IMPACTS ON DEVELOPING ECONOMIES FROM CHANGING TRADE REGIMES AND GROWING INTERNATIONAL ENVIRONMENTAL CONCERNS

by Stein Hansen, Nordic Consulting Group A.S., Oslo, Norway

Developing Country Exports Structure

Developing countries' share in world trade has increased from 21% in 1973 to 26% in 1986. Their trade with industrialised countries dominates in the sense that 79% of all exports from Africa goes to industrialised countries while the corresponding share for Asian exports is 60%.

The structure of developing country trade varies significantly between regions. Manufactures constitute 75% of the developing country exports in Asia, but only 20% in Africa. Among manufactures, clothing constitutes 15% of all exports, and 83% of it is destined for industrialised country markets.

South-North Trade- and Growth Dependencies

The import demand elasticity of OECD-countries is as high as 1.5 - 1.75 with respect to GDP. Prices of food and raw materials imported from developing countries are very elastic with respect to OECD demand. As a result a sustained real annual OECD growth rate as high as 3 - 4% is needed to sustain primary commodity prices on imports from developing.

A sustained 1% increment in real GDP of OECD countries would raise non-OECD exports 1.65%. A drop in non-OECD imports reduces OECD's export revenue, and as a consequence, the non-OECD exports drop by half as much as the drop in non-OECD imports. Thus the GDP-multiplier of OECD plays a crucial role for the level of non-OECD exports. Very little is known about whether this virtual one-way dependency trap can be broken; there exists little in the form of strategies for developing sustainable non-OECD locomotive growth power.

OECD Trade Rule Impacts on Non-OECD GDP

21% of developing country exports was subject to hard-core non-tariff barriers from OECD in 1986. Foregone export revenue due to such trade restrictions was equal to total official development assistance. The impact was twice as severe on developing countries exporting manufactures as on raw materials exporters. The economic loss to OECD countries themselves was estimated to be twice the value of their official development assistance.

Trade liberalization will impact on developing country exports primarily through productivity growth of the markets they depend on, and less so through changes in trade policies in the OECD. In fact, general economic reforms that remove price distortions and enhance competition may be responsible for both superior export performance and high GDP growth, and much more so than the country's trade policy.

Trade liberalization will almost double exports of clothing and textiles from developing countries, and this will increase sectoral labour demand 20%. Agricultural price instability would be reduced and world agricultural prices would go up some 9%, but the variation between commodities would be substantial. By and large, developing country exporters will gain whereas developing country importers will lose. Asian exporting countries will come out as overall winners and Sub-Sahara Africa importing countries will be the main losers. While exporters win, consumers and tax-payers in developing countries will lose due to higher prices.

On Industrial Trade and Environment Interactions

Among rapidly growing economies, those with open trade regimes and minimal price distortions have systematically less pollution intensive industrial development.

Clean technologies appear to be faster and more frequently adopted in an open trade regime as compared to observed protectionist and strictly regulated regimes.

However, polluting industries have expanded faster than non-polluting industries in developing countries, and faster than polluting industries in industrialized countries. A comparative developing country advantage in most "dirty" industries has been increasing since the mid-1960s. This does not, however, prove that "dirty" industries have migrated to "pollution havens". The observed development could just as well be a repeat industrial revolution, because differences in labour and other input costs are much more important for locational choices than differential environmental costs. In fact, multinationals tend to bring with them whatever technology they use at home when they establish abroad, as illustrated by the steadily cleaner fertilizer industry in Bangladesh.

However, even with cleaner processes sector by sector, more output yields more overall pollutants to be stored or recycled. As a result of Indonesia's economic liberalization, industrial scale has expanded substantially both for "clean" and "dirty" sectors. At the same time the "dirty" ones have become cleaner. No simple net environmental impact emerges from this change of trade regime.

Demand for consumer durables is both price- and income elastic. Therefore, trade liberalization which reduces import barriers and/or -prices and enhances income leads to an upsurge of such demands, and associated increases in emissions and pollution levels.

Trade Regime, Agriculture and Environment

It is very difficult to generalize on what will be the net environmental impact from trade liberalization on farmer management of natural resources. Under certain circumstances they may decide to cultivate the land they already manage in a more environmentally benign way, whereas in other situations they may accelerate erosion on the very same land and/or clear new and ill-suited land for cultivation or grazing.

There is some evidence to suggest that use of labour, capital and crop enhancing inputs is responsive to increased crop prices, whereas land use is not. However, where the farmer faces supply constraints on the former intensifying inputs, he may resort to land clearing as a "second best" option.

Is Developing Country Awareness and Legislation Required?

So long as developing countries depend on industrial country technology for their industrial development, and official development assistance is an important actor in technology transfer, developing countries will receive and install "off the shelf" latest environmental technologies regardless of their own environmental awareness, standards, legislation and enforcement capabilities, as illustrated by the Bangladesh fertilizer industry development and that of thermomechanical pulping.

Developing countries will receive environmentally cleaner investments due to: (a) technology bundling, (b) green consumerism pressures on multinationals in their home countries, (c) rapidly growing firms tend to install whatever is latest in technology, (d) preemptive purchases take place in anticipation of stricter regulations.

However, this benign outcome is a result of competitive openness where profitability dominance of the clean technology has been established. Where such dominance has yet to be established, one would expect developing country investors to adopt cheaper and dirtier technologies for competitive reasons. The overall environmental effect from technology transfer therefore depends crucially on the extent to which such dominance is predominant in industry.

Imposition of uniform environmental standards in industrialized countries is in reality a discriminatory and cost ineffective way of protecting markets for their home industry. Envi-

ronmental factors such as differential absorptive capacities are comparative advantages along with differential labour productivities and relative capital costs. Domestic economic and environmental policies should be stimulated in order to internalize or ban harmful extraction and production methods, whereas harmful products can be screened and banned both at home and by the importing country. To the extent accumulation of packaging waste is considered environmentally harmful, recyclable packaging may well become an environmentally founded competitive trade factor in the years to come, and something it will take a special effort for developing country producers to adjust to.

SUMMARY: US ENERGY POLICY IN THE GREENHOUSE: FROM THE NORTH SLOPE FORESTS TO THE GULF STREAM WATERS - THIS LAND WAS MADE FOR FOSSIL FUELS?

by Per Ove Eikeland, The Fridtjof Nansen Institute

The report is a study of current US energy policy - more specifically, a study of the 1992 Energy Policy Act which passed Congress in October 1992 and the policy process behind the enactment. As indicated by the question posed in the title, energy policy is related to the problem of global warming. However, direct US climate policy is not discussed in the report as this was taken care of in a parallel study conducted by Steinar Andresen, research director at the Fridtjof Nansen Institute. Instead, it concentrates on the internal processes set in motion during the three year process of establishing a comprehensive new energy law - an issue which evidently has major effects on greenhouse gas emissions.

The outcome of the lengthy process is attempted explained through a set of explanatory variables. First, the *US political system* is used as an explanatory factor of why the final act is less comprehensive and quite different from the version launched by the Bush Administration and from the versions originally launched by Congress. As is often the case with large and comprehensive policy processes in the USA, provisions were scrapped and modified due to influence by a multitude of actors in the process. Provisions were scrapped during Congressional debate also because of veto threats from the Bush Administration. The fact that the Administration was headed by Republicans whereas the Congress majority was Democratic blocked several provisions from surviving the Administration threat of veto - a so-called 'gridlock' occurred.

Second, the political system ensures extensive interests group-participation in the policy process. The interests of the various energy industries and environmental organizations are outlined and compared to the final Energy Policy Act. The Act has a slight bias favouring the renewable energy industries, the natural gas industry and the energy efficiency cause - at least when compared to the original National Energy Strategy launched by the Bush Administration. Environmental protection was a far more dominant issue than in any previous energy strategy.

This is attempted explained by looking at the various energy industries' most tangible '*capabilities*'. Among the more material capabilities is the energy industries' relative contribution to the fueling of the economy, both in terms of energy delivered and economic output. Such capabilities had far less influence than expected. None of the large energy deliverers - the oil and the coal industry - have reason for cheering the new act. The big oil companies

in particular got few of their claims met. On the other hand, the smaller renewable energy industries are far more content with the final act.

For the environmental organizations - 'material' capability is basically defined as the size of their constituency. As an indication of the strength of the environmental cause in the US public, this factor probably had an effect on the outcome.

Also studied is the various interest groups' *lobbying capabilities* - in terms of the number of lobbyists engaged at Capitol Hill and their mode of organization. Again, the large number of energy lobbyists seem to have had less success compared to environmental lobbyists. This may be because of the impressive network built between the various environmental groups which enabled them to communicate and cooperate during the process. A factor reinforcing this is the fact that the conventional energy industries did not easily form coalitions whereas influential alliances in which environmental lobbyists participated were formed several times during the process.

Other explanatory factors are '*cognitive*' and '*ideological*' variables. 'Cognition' is defined in terms of changed attitudes towards environmental threats in the US public. Several opinion polls released during the energy policy process indicated a growing awareness in the US public of environmental protection. This may to some extent have influenced the Congressional debate and the final outcome.

The old 'ideological' cleavage between those in favour and those opposing intervention in the market also appeared during the policy process. The non-interventionist strategy was most profoundly stated by certain key players in the Bush Administration, most notably by then Chief of Staff John Sununu, who intervened and stopped an early version of the National Energy Strategy pending in the Department of Energy. This version contained too much governmental promotion of demand-side policies aimed at increasing energy efficiency to be accepted by the powerful Mr. Sununu. The final version launched by the DOE was scaled-back on demand-side policies and more supportive of energy supply.

Another cleavage with ideological undertones has emerged as perhaps more prominent than the traditional market-intervention cleavage - between those believing that the goals of economic growth and environmental protection may be achieved simultaneously and those doubting it. This cleavage stems from different approaches to energy policy analyses which result in different estimates on how extensively policy-fostering energy efficiency could be promoted at negative net costs. The cleavage is basically made visible through the debate between macro-economists performing 'top down' studies being pessimistic and energy efficiency groups performing 'bottom up' studies with an optimistic view on the feasibility of achieving the two goals simultaneously provided the government pursue the right policy. Whereas the

economic advisors to the Bush Administration managed to let their view dominate the National Energy Strategy, the final Energy Policy Act is more promotive of energy efficiency. This indicates that the optimistic view promoted by the energy efficiency groups had decisive effect during Congressional debate and is better taken care of in the final outcome.

The report concludes that the Energy Policy Act is not a very innovative piece of legislation. Many provisions have long been debated and several have long been implemented at state level. In light of a lacking federal energy policy, US energy policy may so far be said to have developed at the state and utility levels. Despite this, the new act may be a crossroad for establishing a comprehensive federal energy policy provided it is followed up by the Clinton Administration. So far, signals have been provided that energy policy - energy efficiency policy in particular - will constitute an important compound of the economic package of the new Administration. Furthermore, that the Department of Energy will be playing a far more important role than has been the case under previous administrations. Whether Clinton will succeed in pursuing his stated goals of simultaneously achieving economic growth and improved environmental quality by increased backing of energy efficiency, natural gas and renewable energy is left for the future to reveal. There seems to be better opportunities for this now than before. First, accordance between the political shade of the Administration and that of the Congress majority reduces the likelihood of the administration using the veto instrument - hence, there seems to be less chance that a gridlock will block comprehensive policies. Second, a 'paradigm shift' seems to have occurred - the new administration seems more apt to actively pursue policies for capturing the energy efficiency potential indicated by the bottom up analysts as contrasted by the Bush Administration which restricted such policies believing they would impede economic growth. Third, new coalitions seem to have grown out of the energy policy process which may be expected to pull policies in the same direction. The most important one is perhaps an alliance between energy efficiency industries, the natural gas industry, renewable energy industries and state energy officials - intended to cooperate for better integration of environmental concerns in US energy policy. Finally, whether the trend showing increased awareness in the US public of environmental protection will continue and increasingly pull also energy policy towards more sustainable solutions. If these factors have a decisive effect, then the question raised in the title of the report may get a negative answer.

SUMMARY: THE CLIMATE POLICY OF THE EC - TOO HOT TO HANDLE?

by Jon Birger Skjærseth, The Fridtjof Nansen Institute

The main focus of this study is to analyze "internal" Community processes and structures that may shed light on the development of EC climate policy. This implies that less attention is paid to the EC as an actor in the global negotiations. The aim of this study is twofold. First, I seek to develop an analytical framework for the study of environmental policy of the EC in general, and climate policy in particular. National interests and preferences as opposed to the Community's institutional problem-solving capacity will represent the main explanatory perspectives. Secondly, this framework will be used to analyze the climate policy of the EC from the late 1980s up to the Rio Conference in June, 1992.

The first phase leading to the 1990 EC target aimed at stabilising CO₂ emissions by 2000 at their 1990 levels, evolved remarkably rapidly and smoothly. In contrast, the second phase of policy response ran into severe difficulties. According to the Commission, emissions of carbon dioxide are expected to increase by at least 12% for the Community in the absence of new stabilisation measures. Against this backdrop, a climate package including measures on renewables, energy-efficiency and a carbon/energy tax was designed to achieve the goal and promote EC leadership in world climate politics. This package was substantially watered down and postponed throughout the process. For example, the proposed carbon/energy tax which represented about half of the climate package measured in expected reductions, was made conditional upon other OECD countries undertaking similar actions. This represents apparently a definite farewell to the leadership by example aspirations. Moreover, none of the proposed legislative texts have yet been adopted as binding measures by the Council. Lastly, only three of the member states have adopted a national climate policy encompassing both targets and measures. In 1991, after the stabilisation goal was adopted, CO₂ emissions increased by about 4% in the Community.

To explain this development, our first task was to chart state interests based on the assumption that these could be derived from expected affectedness by climate change and measures. This analysis showed that: a) Most of the member states did not fear the consequences of global warming; b) there would be costs involved by adopting the climate package especially for energy intensive industry, though very limited at aggregate EC level; c) the least developed states had least incentives to adopt a strong national climate policy due to expected increases in energy demand; d) some of the most developed states were in a better position, but they had no strong incentives either due to an already high energy efficiency and/or limited possibilities for fuel switching. The member states' preferences were as incompatible as expected, but especially Denmark, Germany and the Netherlands had adopted targets and measures

extending far beyond their "objective" interests. This mismatch could be explained at least partly by domestic factors such as the different norms for environmental behaviour.

It was assumed that the supranational structure of the Community would promote higher problem-solving capacity, in contrast to "traditional" environmental regimes. While the EC clearly has the potential to avoid various "dysfunctions" present in other types of environmental cooperation, this potential has only to a limited extent been realized for environmental policy in general, and climate policy in particular. While the EC still requires unanimity to adopt the climate package, capacity to integrate asymmetrical state interests has been high due to the Commission's authority and capacity, high level of integration, and funding mechanisms available to "correct" asymmetrical interests. However, the outcome(s) show that this capacity has so far been insufficient to ensure the adoption of the climate package.

Some of the explanation can also be found in various non-governmental actors' behaviour at the Community level. While the Commission has been the principal driving force among the "systemic" actors, it was initially split on the question of the carbon/energy tax. In this situation, the business organisations launched the most ferocious lobby campaign ever seen in Brussels against the tax. The environmental NGOs could not match this massive block. Heavy pressure against the tax came also from outside Europe, for example the OPEC countries. Thus, the Commission launched the principle of conditionality both to reach a compromise within the Commission, and to bridge the gap to the industry. This proposal led to some of the member states stopping further progress in the spring of 1992, arguing that the package had become too weak. However, other member states claimed that the measures proposed were going too far, at a too early stage.

SUMMARY: US CLIMATE POLICY: IDEOLOGY VS. PRAGMATISM

by Steinar Andresen, The Fridtjof Nansen Institute

During the UNCED meeting in Rio this summer, the U.S. was pinpointed as the most important obstacle to more forceful action on the part of the world community. The U.S. was the only country voting against a convention on biodiversity and was accused of watering down the convention on climate change. The narrow purpose of this article is to explain and analyze U.S. climate policy. However, as ideology and general principles are at stake on this issue, the broader aim is to look at the "myths" and "facts" behind the U.S. image as an environmental laggard.

The U.S. started earlier and has done more than any other country regarding *research* on climate change, be it of a more basic kind or of a more policy-oriented nature. Thus, when the issue hit the international agenda with full force in 1988, the U.S. was in a position to take a lead role, but according to most observers, what actually happened was just the opposite. After a seemingly "positive" start, the U.S. from the fall of 1989, came out as the strongest opponent of fixed targets and dates on CO₂ emissions. As this was the one issue most focused upon in the ensuing negotiations, the U.S. laggard image was confirmed. Ideologically, the U.S. also played a very "negative" role in the sense that the assumed problems associated with the changing climate were toned down, she was unwilling to accept the principle that massive aid was needed to help the developing countries on this account and preferred a "no-regret" rather than a precautionary approach. Although there was some development in the U.S. position over time, not much attention was paid to this by most observers.

What was the main explanation both in the apparent shift in the U.S. position as well as the strong and "negative" attitude? A small group of players in the White House, centred around the Chief of Staff John Sununu, seemed to be pulling the decisive strings. They did not really believe that global warming was a serious problem and they were afraid that costly measures against this alleged threat would ruin the country's economy. Few key decision-makers dared face this small but powerful alliance, and those who did were not very successful. However, when Mr. Sununu left the White House during the fall of 1991, the "counter-forces" grew stronger. Thus, in the final end the U.S. supported a climate treaty and President Bush did go to Rio after all.

This "person-oriented" approach seems to get us a long way in explaining U.S. climate policy. However, this tells no more than half the story, though the most visible part, of the forces behind the making of U.S. climate policy. A very large apparatus, consisting mainly of scientists and bureaucrats had been set in motion to investigate the basic scientific questions as well

as to discuss the different policy options to deal with the climate issue. Towards this end a number of concrete measures had been taken and climate strategies had been developed. These might not be very spectacular, but also according to analysts they were very far removed from the ideology of the Bush administration, and would thus without doubt have a positive impact upon U.S. greenhouse gas emissions. Thus, although not very visible, the influence in practice of this large apparatus should not be ignored.

Taking a closer look at the weight attributed to environmental questions, especially at the domestic level, it is also apparent that the Bush-administration did more than previous U.S. administrations had done to cope with environmental problems. On many accounts, the U.S. is at the very forefront among the OECD countries. Generally, this seems to have gotten less attention than the obvious flaws in the U.S. policy; the extremely low prices for gasoline and the fierce opposition by the Bush administration to energy taxes in any shape or form.

Thus, there seems to have been an element of duality in U.S. climate policy; the "ideologists" in the White House have provided a very "negative" wrapping of U.S. policies, but the "pragmatists" have succeeded in adopting concrete measures that have a positive impact on greenhouse emissions. President Bush has been caught in between these two main forces, unsure in which "camp" he really belonged.

As to the future U.S. climate policy, there is bound to be a shift with the new democratic administration. Rhetorically, the Clinton administration will be among the "good guys" wanting - at least - to stabilize emissions, and his proposal for a modest energy tax indicates that he might be willing to use stronger measures than his predecessor also at the practical level. However, whether the U.S. will change from a laggard to a leader on the international scene is not only a question for the new administration to decide; congress and people at large will have to decide whether they are willing to make some sacrifices to stabilize the global climate. In my opinion that remains an open question, both regarding the U.S. as well as most other countries.

SUMMARY: THE DEVELOPMENT OF TECHNOLOGY AND COSTS IN ELECTRIC POWER PRODUCTION

by Arve Halseth, ECON - Center for Economic Analysis

The development of new technologies for generating electricity follows many patterns. The evolution of more efficient gas turbines means that natural gas can be used to a larger extent in production of power. The development of the Fluidized-Bed Combustion have shown that solid fuels such as coal and biomass can be used in a more efficient way with reduced environmental emissions. Emerging technologies for removal of SO_2 , NO_x and particles also contribute to less environmental impacts of burning coal for electricity generation. Furthermore, the development of smallscale nuclear plants may offer electricity at acceptable costs and security. Finally, the evolution of technologies using solar and wind energy means that renewable resources may be used to an increased extent.

The generating costs may be significantly reduced as a result of technological progress. The cost difference between technologies may be smaller in the future. Together with differing fuel prices, environmental regulations, discount rate etc. this will probably mean that in general no particular technology will offer the lowest costs.

The emissions of SO_2 , NO_x and particles may also be significantly reduced by the new technologies. This does not depend on whether the investments will be made in gas, coal or nuclear power, or in renewables. This implies that a environmental policy for reducing acid rain and other regional problems will not necessarily give a different combination of generating capacity.

In some cases, on the other hand, authorities may face a trade-off between different environmental impacts when the need for new capacity emerges. For example, use of the clean coal technologies with small emissions of SO_2 , NO_x and particles will have little impact on the level of the CO_2 emissions. A continued use of coal for electricity generation may therefore be sustainable in a regional sense, but not in a global sense.

SUMMARY: ENERGY CONSERVATION POSSIBILITIES AND THE USE OF TOOLS IN NORWAY AND INTERNATIONALLY

by **Torleif Haugland, ECON - Center for Economic Analysis**
Ragnar Ottosen, ED - Energy Data
Oddbjørn Fredriksen, ED - Energy Data

The report is the first in a project aiming at estimating energy conservation means in order to arrive at certain environmental objectives. In the report, the development of the energy consumption and the utilisation of energy conservation tools in Norway and internationally is being estimated. In addition to this, on the basis of already existing analyses, a description of energy-efficiency possibilities is provided, together with an account of possible effects on the environment caused by increasing energy efficiency. At the end appear some empirical inquiries accomplished in Norway regarding the effect various means have on the energy consumption. In an enclosure, a brief description of some energy conservation means or tools and a principal evaluation of the qualities they possess, is presented.

In the period 1973 to 1990, Norway's energy consumption outgrew every major OECD-country. There is reason to believe that the economic growth has been a significant driving force in the increased energy consumption, due both to the fact that a higher production activity simultaneously has demanded more use of energy and that income growth has increased household demand for energy.

A prerequisite for shedding light upon the development in the energy intensity faced by various countries, is the implementation of more detailed analyses of the development in different subsectors. Chiefly due to limitations concerning statistics, the explicitness of comparable examinations of the development in energy conservation and energy intensity, is reduced. The report however contains a brief description of the development in the industry sector as well as in the residential and commercial sectors put together.

Regarding the development in the industry's energy consumption, Norway occupies a unique position compared to other OECD-countries. The energy consumption level in 1990 was about 15% above what it was in 1973, while the other OECD-countries showed consumption 10-20% lower than in 1973. In Norway, the energy consumption in the household and commercial sectors is per capita not higher than the OECD average, due to the relatively high efficiency in the end use of energy (incl. low heat loss from buildings). In addition, Norway has a relatively low building area per capita, both in the household sector and in the service sector.

Insufficient data basis makes it difficult to assess a fully comprehensive estimation of Norway's effort within the realms of energy conservation compared to other countries, though it is important to point out that Norway does not spend less resources on energy conservation measures than other countries, nor does it have substantially less regulatory measures. Moreover, viewed from a socio-economic or energy-political stand-point, Norway seems to lack the motivation for pursuing extensive energy conservation activities compared to other countries. Norway is not dependent on unreliable energy deliveries from abroad, and the imperfections in the energy market are relatively modest.

Since not all the consumers choose the most plausible solutions from a use of energy point of view, there will exist a so-called efficiency gap or a potential for improved energy efficiency.

The energy potential, calculated with a return of investment of 7%, totals about 17% of the energy consumption in Norway. The private-economic energy conservation potential, with calculations based on a higher return on investment, amounts to about 10% of energy consumption. Bearing in mind that parts of the private economic potential will be difficult to realize, a more probable energy conservation potential would be about 15% of energy consumption. The data basis used in order to implement such calculations is however subject to certain insecurities. Additionally, the potential is affected by possible means or tools implemented by the authorities in an attempt to influence the consumers' priorities.

In connection with energy conservation analyses, particularly four factors are regarded as important in order to explain the existence of suboptimal adjustments concerning the energy consumers: Inadequate information, high cost of capital, lack of interest and incentive problems. Different energy conservation tools can be used in order to overcome these imperfections; these including information campaigns, regulatory measures, monetary measures and fiscal measures.

Measuring the result of the utilisation of tools is very difficult, due chiefly to the fact that the hypothetical result reached when not considering the tools is not supplied. Included in the report is a summing up of some results acquired from certain empirical inquiries implemented in Norway during the past years, regarding energy conservation barriers and results of energy conservation measures.

SUMMARY: AFRICA'S RESPONSE TO CLIMATE CHANGE

by Ewah Otu Eleri, The Fridtjof Nansen Institute

The African region is beset by multiple development and environment crises. Particularly the current drought and economic problems confronting many countries in the region has compromised their capability in meeting the primary needs of their people, including food, water, fuel and shelter. Meanwhile current conditions of poverty are aggravating environmental decline in the region. Though the African region is yet to become a major contributor to the emission of greenhouse gases, increases in its potential contributions are very likely.

According to the Brundtland Commission, solving major environmental problems confronting mankind will demand a new international order of partnership. However, the absence of substantive commitments by rich countries to offset the costs of constructing a new path to sustainable development in developing countries is putting such a future cleaner development prospect in jeopardy. Moreover, the deepening crisis of the African region has also reduced the capacity of the state and society to adequately respond to calls for joint efforts in solving global environmental problems.

In assessing the prospects for meeting the challenges of a deteriorating environment, a pertinent question seems to be: *under what conditions will poor countries take upon themselves international obligations that they would rather avoid?*

There has been a theoretical lure to focus on the primacy of states and their preferences in international economic and environmental governance. However, of equal importance are variables such as capabilities and capacities of states, the role of international institutions, knowledge-based communities and the dynamics of learning. The study made therefore an attempt to construct a framework of analysis that incorporates these concerns.

States are not always autonomous and do not always pursue national interests. The state in the Third World is frequently an arena for competing interests, a gate keeper channelling domestic demand on the international system, and itself an actor with specific preferences in competition with other domestic actors. Moreover, some less cohesive and development-minded states exist. Many operate under mechanisms of patron-client relations and with rent-seeking objectives often subversive to national interests.

States of the African region persistently operate in an increasingly constrained policy environment. The sovereignty of these countries has been eroded by poverty and their economic life under the administration of the Bretton Woods institutions. This has far-reaching political

ramifications. States have therefore been caught in the middle of pressure, domestically by NGOs, business and other groups of civil societies; exogenously, African states are challenged by the weight of influence exerted by the World Bank, IMF, and other donor agencies. It becomes pertinent to raise the question of the *capacity* of the state in autonomously responding to emerging economic, political and ecological issues. State actions, in this context, are seemingly subordinate to the balance of capabilities between it and other actors whose actions impinge on its choices.

Chances exist that we may have placed an unwarranted emphasis on the role of the state. For it is also reasonable to expect that societies respond through other non-governmental channels, and that changes made by actors outside the realms of officialdom will be important components of a country's overall response to an international problem. Moreover, the climate problem is complex, fraught with uncertainties and research intensive. It will therefore be reasonable to expect that the responses of states and societies will correlate with developments in knowledge.

The study attempted therefore to understand a country's preliminary response to the current international politics of global warming by reviewing the severity of the country's *vulnerability* to impacts of potential increases in global temperatures, the need to *avert abatement* costs; and the imperative of seeking *development assistance*. Furthermore, it is important to evaluate *society's response* outside the realms of officialdom or how much their response reflects the *constrained sovereignty* of their states, or the impacts of *epistemic communities* and the *issue framing* of global warming in the domestic agenda.

Case studies were drawn from Nigeria and Zimbabwe. In all departments of government and in the society at large, including major actors such as the Ministry of Environment and Tourism, the Ministry of Energy and Transport, the Meteorological Department and the Confederation of Zimbabwean Industries there is a consensus that drought is the single most important environment and development problem, and as such the primary consideration for government in its climate policy.

Confronting environmental problems, particularly drought, enjoys the highest level of political support. Moreover, Zimbabwe is endowed with a corps of young career-minded professionals manning public departments. Compared to Nigeria, Zimbabwe is relatively homogeneous with national unity among Africans cemented through the liberation struggle. The bureaucracy is therefore relatively free from being an arena for competing geopolitical interests.

The large presence of donor interests is also a relevant part of explaining Zimbabwe's international as well as its local environmental orientation. With the increased demand for environ-

mental accountability of development projects, as well as the availability of resources through international assistance for participation in international actions on the environment, Zimbabwe has been able to participate in major discussions on the global environment. Multilateral institutions have also supported and financed national conferences on the environment and international obligations.

As a result of its general orientation, Zimbabwe became active in climate negotiations, and became particularly enlightened through studies on the cost of greenhouse abatement strategies. The capability to acquire knowledge and to mobilize was enhanced by an active NGO community, most of these financed with international development assistance resources. In all, UNCED processes and their outcomes have helped create new alliances between the different segments of society, including government, industry and non-governmental organisations. It has also given expression to the concerns of the masses particularly as regards drought.

Compared to Zimbabwe, Nigeria is large, diverse and complex. Though Nigeria's economic and environmental problems are equally huge, political problems still dominate the business of the state. UNCED rarely meant as much to the Nigerian government as it did to Zimbabwe.

Nigeria has important interests related to the global warming problem. These stem largely from dependence on the export of oil for development. Nevertheless, climate-related policies have never really entered the mainstream agenda of domestic and international policy-making. Arguably, the active participation of OPEC under climate negotiations may have cushioned any major initiative from Nigeria. However, within the corridors of affected interests such as the Ministry of Petroleum Resources, the Nigerian National Petroleum Corporation, the Federal Environmental Protection Agency, as well as industry and the rest of society, climate and the national interest have yet to become major issues.

The only opposition to government policy in areas pertinent to the climate problem, including gas flaring and the inefficient pricing of petroleum products has been from the World Bank. These issues, for their economic importance, and not for their environmental implications have led to the current stand-off between government and the Bank.

The vulnerability of Zimbabwe to drought, the issue framing of the climate problems to correlate with local drought conditions, the competence of the administrative professional and the NGO community, as well as the entrepreneurial state behaviour may be part of an explanation of the forces behind climate-related policies in Zimbabwe. However, it is inconceivable that this level of activity could have been achieved without the support, supervision and finances of the donor community. Likewise, in Nigeria, the only credible proponent for

government policies that advance Nigeria's positive contribution to reducing greenhouse emissions is the World Bank.

In this context, the traditional focus on the state as an autonomous actor in global environmental management might prove to be a blind alley in the search for positive contributions by these states to global efforts in abating a greenhouse future. It seems necessary, particularly in the case of Africa, to address the call for action simultaneously to external actors, states and their societies, particularly the NGO communities and local administrations.

Energy, Environment and Development (EED)

EED is a research programme carried out jointly by three institutions - the Fridtjof Nansen Institute (FNI), ECON - Center for Economic Analysis, and Energy Data (Energidata, ED) - all based in Norway. The overall focus is the relation between energy, environment and development on the national level, and international cooperation concerning sustainable energy management and global environmental change. A series of country studies analyses the economic, political and institutional factors influencing energy, environment and climate policies. The role of non-state actors like NGOs and the energy industries in international environmental affairs is also closely examined. Strategies to enhance energy efficiency are studied with a particular focus on identifying and overcoming barriers to policy implementation. The ways in which developments in international energy markets affect the potential and scope of international environmental agreements are analysed, as are the impacts of different international environmental regimes on energy markets. Particular attention is paid to the opportunities and limitations of international institutions like the European Community, the United Nations, the multilateral development banks and GATT, in promoting international cooperation on energy and environmental issues. Strategies to overcome North/South conflicts over global environmental issues are examined, including issue linkages in international negotiations and North/South transfer of resources and technology. Another important area of EED research is institutional- and policy reform to ensure more sustainable production and consumption of energy in developing countries.

Publications from the EED Programme

1993

Ewah Otu Eleri, FNI, **Africa's Response to Climate Change: The Role of Governments, Societies and External Actors**. EED Report 1993/6, NOK 120.

Torleif Haugland, ECON, Ragnar Ottosen & Oddbjørn Fredriksen, Energidata, **ENØK muligheter og virkemidler i Norge og internasjonalt**, (Energy Efficiency in Norway and Internationally: Opportunities and Instruments). EED Report 1993/5, NOK 120.

Arve Halseth, ECON, **Teknologi og kostnadsutvikling i kraftproduksjonen**, (The Development of Technology and Costs in Electric Power Production). EED Report 1993/4, NOK 120.

Steinar Andresen, FNI, **US Climate Policy: Ideology versus Pragmatism**, EED Report 1993/3, NOK 120.

Jon Birger Skjærseth, FNI, **The Climate Policy of the EC - Too Hot to Handle? A study of interests and preferences versus EC problem-solving capacity**. EED Report 1993/2, NOK 120.

Per Ove Eikeland, FNI, **US Energy Policy in the Greenhouse: "From the North Slope Forests to the Gulf Stream Waters -This land was made for Fossil Fuels?"**. EED Report 1993/1, NOK 120.

1992

Stein Hansen, Nordic Consulting Group AS, **Impacts on Developing Economies from Changing Trade Regimes and Growing International Environmental Concerns**. EED Report 1992/14, NOK 120.

Gunnar Fermann, FNI, **Japan in the Greenhouse: Responsibilities, Policies and Prospects for Combating Global Warming**. EED Report 1992/13, NOK 120.

Helge Ole Bergesen, FNI, **Key variables in national climate policies: a conceptual effort**. EED Report 1992/12, NOK 120.

Torleif Haugland, ECON, Helge Ole Bergesen & Olav Kjørven, FNI, **ESMAP: Past failures and future potential**. EED Report 1992/11, NOK 120.

Raino Malnes, Universitetet i Oslo, **Choosing Climate Policy: Decision Theoretical Premises**. EED Report 1992/10, NOK 120.

Raino Malnes, Universitetet i Oslo, **'Leader' and 'entrepreneur' in international negotiations. A conceptual analysis**. EED Report 1992/9, NOK 120.

Leiv Lunde, Anne Kristin Sydnes, FNI, **Fra vitenskapelig konsensus til handling i internasjonal klimapolitikk: Utfordringer for Norge**, (From Scientific Consensus to Action in International Greenhouse Politics: Challenges for Norway). EED Report 1992/8, NOK 120.

Torleif Haugland, ECON, **Abatement Costs for Developing Countries**. EED Report 1992/7, NOK 120.

Torleif Haugland, Åmund Lunde, Kjell Roland, ECON, **A Comparison and Review of CO₂ taxes in the Nordic countries**, EED Report 1992/6, NOK 120.

Torleif Haugland, ECON, **Energidatabase for Den tredje verden**, (Energy data base for the third world). EED Report 1992/5, NOK 120.

Olav Kjørven, Anne Kristin Sydnes, FNI, **Funding for the Global Environment: The Issue of Additionality**, EED Report 1992/4, NOK 120.

Olav Kjørven, FNI, **Facing the Challenge of Change: The World Bank and the Global Environment Facility**. EED Report 1992/3, NOK 240.

Kåre Willoch, County Governor of Oslo and Akershus, **International Harmony requires Global Environmental Protection**, EED Report 1992/2, NOK 120.

Kjell Berger, Olav Kjørven, Leiv Lunde, **Strukturen i u-landenes oljeforbruk til transport**, (The structure of oil consumption in the transport sector of developing countries), EED Report 1992/1, NOK 120.

1991

International Challenges, Special Issue on Energy, volume 11, No. 4, 1991, NOK 50.

Leiv Lunde, FNI, **Science or Politics in the Global Greenhouse? A Study of the Development towards Scientific Consensus on Climate Change**, EED Report 1991/8, NOK 240.

Helge Ole Bergesen, FNI, **Symbol or Substance? The climate policy of the European Community**, EED Report 1991/7, NOK 120.

Dag Harald Claes, FNI, **Internasjonale klimaforhandlinger og teorier om kollektiv handling**, (International climate negotiations and theories of collective action), EED Report 1991/6, NOK 120.

H.O. Bergesen, S. Andresen, K. Dahl Martinsen, T. Haugland, K. Roland, Ø. Olsen, I. Rivedal, B.S. Tranøy, J. Lohmann, L. Lunde, A.K. Sydnes, S. Hansen, J. Wettestad, I. Isaksen, **Greenhouse Policy Studies by the Fridtjof Nansen Institute and ECON: 13 Abstracts**. EED Publication 1991/5, free of charge.

Anne Kristin Sydnes, FNI, **Developing Countries in Global Climate Negotiations**, EED Report 1991/4, NOK 120.

Helge Ole Bergesen, Kjell Roland & Anne Kristin Sydnes, **Petroleum in Sustainable Development - A Contradiction in Terms or a Bridge to the Future?**, EED Report 1991/3, NOK 120.

Bent Sofus Tranøy & Helge Ole Bergesen, FNI, **Sustainable Development in UN Agencies: "Old Wine in New Bottles?"**, EED Report 1991/2, NOK 120.

Stein Hansen, **Energy, Environment and Economic Growth in a Developing Country Perspective**, EED Report 1991/1, NOK 120.

1990

H.O. Bergesen, S. Andresen, K. Dahl Martinsen, T. Haugland, K. Roland, I. Rivedal, B.S. Tranøy, J. Lohmann, L. Lunde, A.K. Sydnes, S. Hansen, J. Wettestad, I. Isaksen, **Klimastudier ved Fridtjof Nansens Institutt og ECON: 12 sammendrag**, EED Publication 1990/20, free of charge.

Jørgen Wettestad, Steinar Andresen, Torleif Haugland, Ivar Isaksen, **Effektiv verifikasjon av internasjonale drivhusavtaler: Teknisk oppnåelig, men politisk komplisert?**, (Effective Verification of International Greenhouse Agreements: Technically Feasible, but Politically Complicated?) EED Report 1990/19, NOK 120.

Steinar Andresen, FNI, **USAs drivhuspolitikk: Bakstreversk eller realistisk?**, (US Greenhouse Policy: Reactionary or Realistic?) EED Report 1990/18, NOK 120.

Kjell Roland & Torleif Haugland, ECON, **Energy, Environment and Development in China**, EED Report 1990/17, NOK 120.

Jens Lohmann, **Energy, Environment and Development in Mexico**, EED Report 1990/16, NOK 200.

Ingebjørg Rivedal & Bent Sofus Tranøy, FNI, **Energy, Environment and Development in Brazil**, EED Report 1990/15, NOK 120.

Kåre Dahl Martinsen, FNI, **Sovjetunionen og klimaendringene**, (the Soviet Union and the climate changes). EED Report 1990/13, NOK 120.

Helge Ole Bergesen, FNI, **Environment, Security and Politicians: Do They Really Mean (and Know) what They are Saying? Proposal for a Litmus Test of Commitment to Global Environmental Regimes**, EED Report 1990/12, NOK 120.

Torleif Haugland, Øystein Olsen and Kjell Roland, ECON, **Stabilizing CO₂-Emissions by Carbon Taxes - A Viable Option?**, EED Report 1990/11, NOK 120.

Torleif Haugland, ECON, **Energy - A Growth-Limiting Factor?**, EED Report 1990/10, NOK 120.

Leiv Lunde, FNI, **The North/South Dimension in Global Greenhouse Politics; Conflicts, Dilemmas, Solutions**, EED Report 1990/9, NOK 120.

Jayanth Sathaye, Lawrence Berkeley Laboratory, **Developing Countries and Global Climate Change**, EED Report 1990/8, NOK 200.

William U. Chandler and Stanislav Kolar, Battelle, Washington D.C., **Carbon Emissions Futures for Eight Industrialized Countries**, EED Report 1990/7, NOK 200.

Researchers from the Beijer Institute, ECON - Center for Economic Analysis, and the Fridtjof Nansen Institute, **Towards Sustainable Energy Development. The Energy Activities of the UN System and the Development Banks**, EED Report 1990/6, NOK 120.

David Pearce, London Environmental Economics Institute, **Economics and the Global Environmental Challenge**, EED Report 1990/5, NOK 200.

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