

**PACKAGE ID** - 001350IBMPC00 GREETV1.5

**KWIC TITLE** - Greenhouse gases, Regulated Emissions, and  
Energy use in Transportation fuel-cyl

**AUTHORS** - Wang, M  
Argonne National Lab., IL (United States)

**LIMITATION CODE** -COPY                   **AUDIENCE CODE** - UNL

**COMPLETION DATE** - 08/01/1999   **PUBLICATION DATE** - 08/01/1999

**DESCRIPTION** - The GREET model estimates the full fuel-cycle energy use and emissions associated with various transportation fuels and advanced vehicle technologies applied to motor vehicles. GREET 1.5 includes the following cycles: petroleum to conventional gasoline, reformulated gasoline, conventional diesel, reformulated diesel, liquefied petroleum gas, and electricity via residual oil; natural gas to compressed natural gas, liquefied natural gas, liquefied petroleum gas, methanol, Fischer-Tropsch diesel, dimethyl ether, hydrogen, and electricity; coal to electricity; corn, woody biomass, and herbaceous biomass to ethanol; soybeans to biodiesel; flared gas to methanol, Fischer-Tropsch diesel, and dimethyl ether; and landfill gases to methanol. For a given fuel/transportation technology combination, GREET 1.5 calculates (1) the fuel-cycle consumption of total energy (all energy sources), fossil fuels (petroleum, natural gas, and coal), and petroleum; (2) the fuel-cycle emissions of GHGs -- primarily carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O); and (3) the fuel-cycle emissions of five criteria pollutants: volatile organic compounds (VOCs), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), and particulate matter with a diameter measuring 10 micrometers or less (PM<sub>10</sub>). The model is designed to readily allow researchers to input their own assumptions and generate fuel-cycle energy and emission results for specified fuel/technology combinations.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Transportation Fuel-Cycle Model Volume 1: Methodology, Development, Use, and Results, Volume 2; Appendices of Data and Results; Media includes MS Excel 97 Model;

**SOURCE CODE INCLUDED?** - No

**MEDIA QUANTITY** - 1 CD Rom

**METHOD OF SOLUTION** - GREET 1.5 is a multidimensional spreadsheet model developed in Microsoft Excel 97 TM. Within the model, some cells present default assumptions used for fuel-cycle energy and emission calculations, while others are logic calculations. Users have the option to change any of the default assumptions. GREET 1.5 consists of 15 sheets: Overview, EF, Fuel\_Specs, Petroleum, NG, Ag\_Inputs, EtOH, BD, Coal, Uranium, LF\_Gas, Electric, Vehicles, Results, and

**PACKAGE ID** - 001350IBMPC00 GREETV1.5

**METHOD OF SOLUTION - (CONT)** Graphs. The Overview sheet presents a brief summary of each of the GREET sheets; it is intended to introduce the functions of each. The Results sheet is in two sections. Fuel-cycle energy use and emissions for each vehicle type are calculated in three stages: feedstock (including recovery, transportation, and storage, fuel (including production, transportation, storage, and distribution), and vehicle operation. Also calculated in this section are shares of energy use and emissions by each of the three stages and both urban and total emissions for the five criteria pollutants. In the second section, changes in fuel-cycle energy and emissions by alternative-fueled and advanced technology vehicles are calculated against conventional gasoline vehicles fueled with conventional or reformulated gasoline. The Graphs sheet presents graphically shares of energy use and emissions by feedstock, fuel, and vehicle operations for each vehicle type, and more importantly, it shows energy use and emissions reductions by individual vehicle technologies relative to baseline gasoline vehicles.

**COMPUTER** - IBM PC

**OPERATING SYSTEMS** - Microsoft Windows 95 TM and above

**PROGRAMMING LANGUAGES** - Microsoft Excel 97 TM and above

**SOFTWARE LIMITATIONS** - Before running the model, the user must ensure that the circular feature in Excel is turned on. This setting is incorporated in GREET 1.5; however, if a user already has a different open Excel file with that feature turned off this will prevent the GREET model's execution of circular calculations.

**SOURCE CODE AVAILABLE (Y/N)** - N

**UNIQUE FEATURES** - GREET 1.5 is a comprehensive, user-friendly, fuel-cycle model designed to estimate the energy and emission impact of transportation fuels and advanced vehicle technologies.

**OTHER PROG/OPER SYS INFO** -

**HARDWARE REQS** - In order to run the model, Microsoft Excel97 TM must be installed and 2.5 Mbytes of hard-disk memory available.

**TIME REQUIREMENTS** - Execution time varies, dependent upon the user's input specifications.

**REFERENCES** - Wang, M.Q., GREET 1.5 Transportation Fuel-Cycle Model: Volume 1, Methodology, Development, Use, and Results, ANL/ESD-39, August 1999. Wang, M.Q., GREET 1.5 Transportation Fuel-Cycle Model: Volume 2, Appendices of Data and Results, ANL/ESD-39, August 1999. Wang, M.Q., GREET 1.0 Transportation Fuel Cycles Model: Methodology and Use, ANL/ESD-33, Center for Transportation

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ENERGY SCIENCE & TECHNOLOGY SOFTWARE CENTER  
SOFTWARE ABSTRACT

PAGE 3  
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**PACKAGE ID** - 001350IBMPC00 GREETV1.5

**REFERENCES - (CONT)** Research, June 1996.

**ABSTRACT STATUS** - Released 8/25/00

**SUBJECT CLASS CODE** - T

**KEYWORDS -**

ENGINEERING  
POLLUTION  
EFFICIENCY  
GASES  
CARBON  
PETROLEUM  
COMPUTER PROGRAM DOCUMENTATION

**EDB SUBJECT CATEGORIES -**  
990200

**SPONSOR** - DOE

**PACKAGE TYPE** - AS - IS