Greenhouse Gases, ***R***egulated ***E***missions, and ***E***nergy Use in ***T***ransportation
Graphical User Interface

GREET 1.6 GUI Beta Release II

Instructions: Revised August 1, 2001

INTRODUCTION

The simulation program GREETGUI has been developed in a user-friendly format to conduct simulation studies on energy efficiencies and emissions for different transportation fuels and vehicle technologies.

The program GREETGUI is a graphical user interface (GUI) developed in Microsoft Visual Basic 6.0. It takes the input from the user in the form of option buttons, check boxes and input text boxes and communicates these inputs (in the background) into the corresponding input cells of the GREET model, GREET1_6.xls. Then, GREETGUI runs the GREET model in Excel to generate the output results. The output results are automatically displayed in the form of tables and charts created in another Excel file, sessionout.xls. In addition, GREETGUI will generate a second Excel file, sessionin.xls, which is a record of user input during a particular GREETGUI session. This document describes the system requirements to install and run the simulation program GREETGUI as well as the instructions for input and output along with user-friendly features.

SYSTEM REQUIREMENTS

GREETGUI works on IBM compatible PCs running Microsoft's Windows 95, Windows 98, Windows 2000, Windows Millennium Edition (ME), Windows NT, or Windows XP. This application cannot run on the Windows 3.1 operating system. GREETGUI requires Microsoft Excel 2000 or higher versions to be installed on the user machine before running GREETGUI. Microsoft Excel 97 and earlier versions will not work with the GREETGUI program.

Absolute minimum hardware requirements: Pentium processor at 166 MHz or higher; at least 64 MB RAM; and at least 30 MB of free space on the hard drive.

Recommended hardware profile: Pentium processor at 400 MHz or higher, 128MB or more of RAM, 100MB of free hard disk space or more.

INSTALLATION

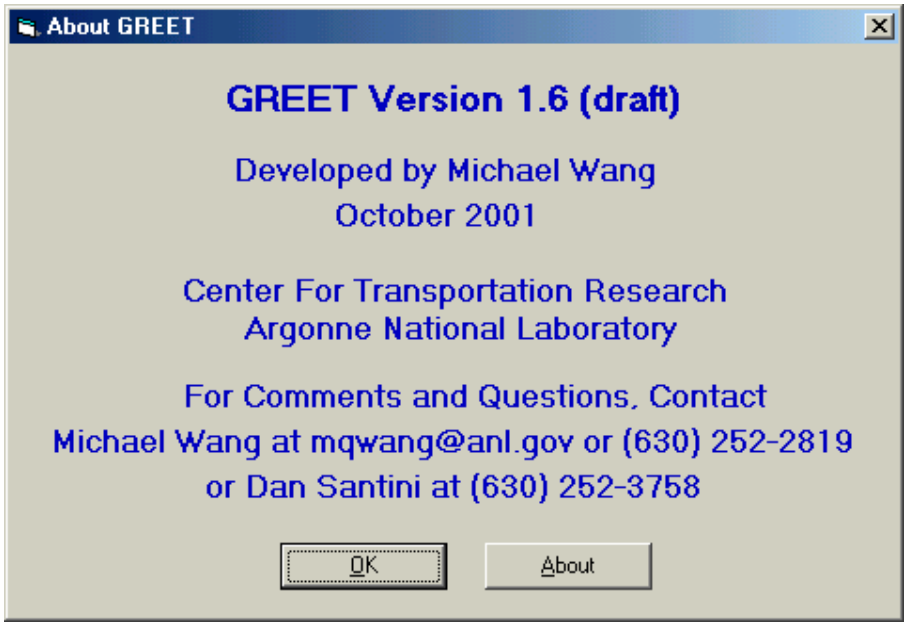
It is recommended that the user close all other applications before attempting to install GREETGUI. The user may specify the installation drive letter and the folder name or accept the default drive and folder name assigned by the installation program.

To begin installation, run the installation setup program setup.exe from the location on your PC it was downloaded to. Follow the on-screen instructions. If prompted, please restart your computer to allow the installation process to fully complete. The installation program will create shortcut to GREETGUI on the desktop displaying the program icon (the green Argonne National Laboratory triangle) and its name.

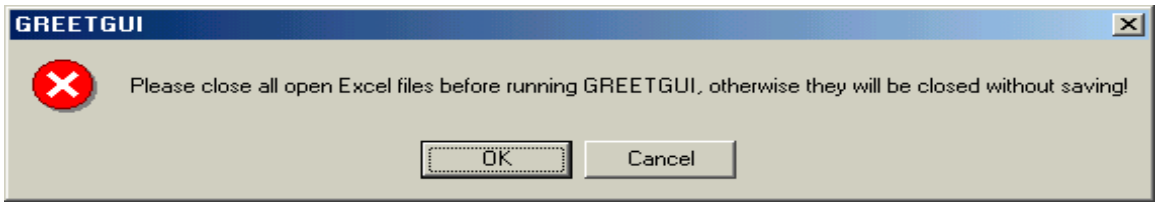
RUNNING THE APPLICATION

The GREETGUI program first seeks input from the user for the fuel pathways and vehicle technologies scenarios and simulation options. Then it proceeds to displaying the default assumptions of GREET input parameters for the selected fuel pathways. Finally, GREETGUI runs the main Excel program in the background and displays the output results in the form of tables. The following are the main steps involved in running the GREETGUI program:

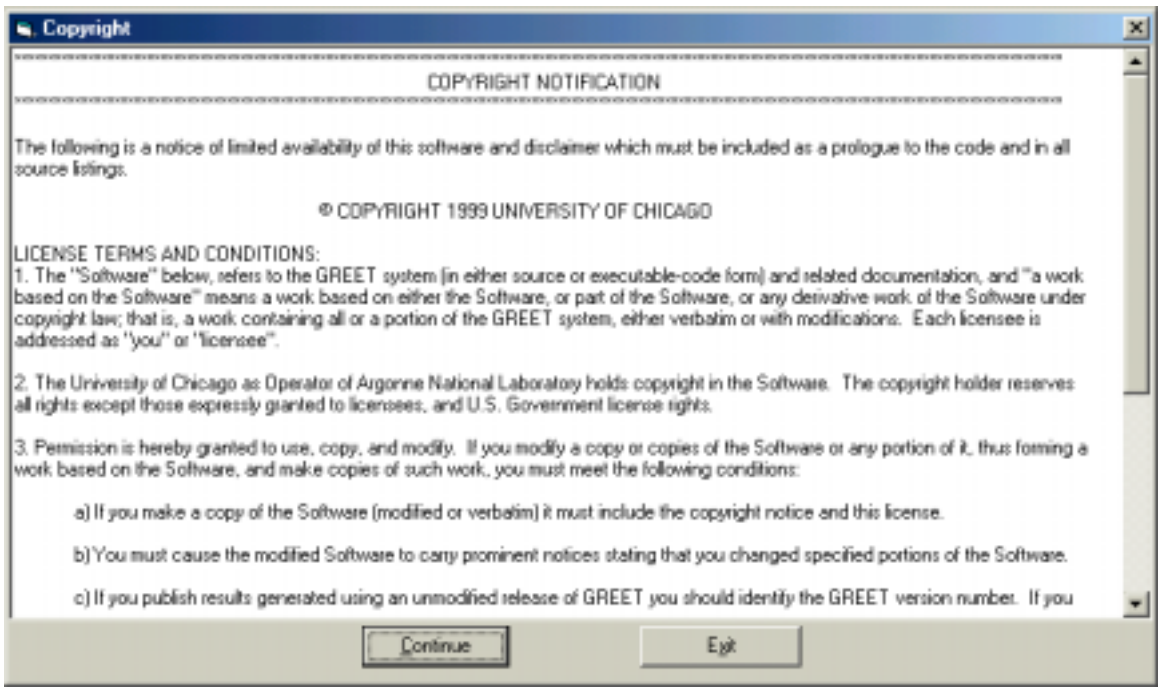
1. Double-click on the program icon on your desktop.
2. A welcome window will open. Click the "OK" button to continue. Click the "About" button to view the GREETGUI version information.



3. A warning window will next display asking the user to close all open excel files before proceeding with the GREETGUI session. The user must close any open Excel files before clicking the OK button to continue with the current session; otherwise all open Excel files will be closed by GREETGUI without saving. The open instances of Excel will be closed without saving when the user starts a new session and specifies a session name. Alternatively, the user can click the Cancel button to quit the GREETGUI Program and keep any open Excel files running.



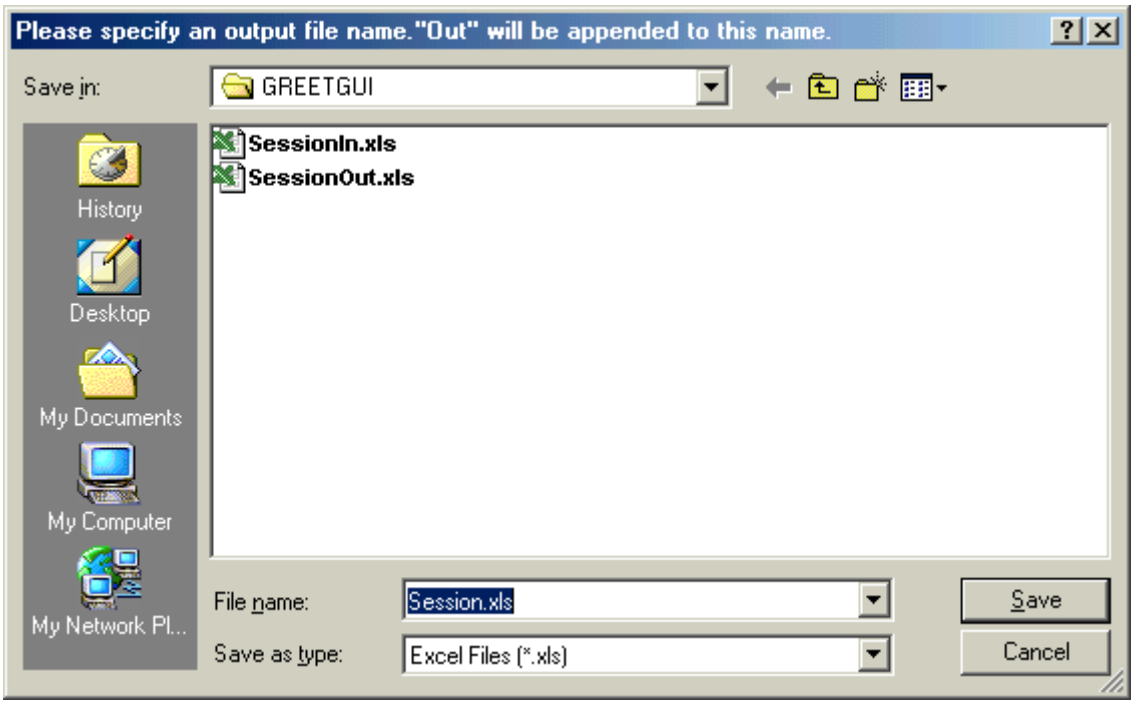
4. Next, a Copyright notification window will open to display the GREETGUI software license terms and conditions. The user is advised to scroll through the Copyright window and read the whole copyright statement before continuing with the GREETGUI software. If the user agrees to the stated terms and conditions, he/she can continue running GREETGUI, otherwise, the user must exit the GREETGUI program by clicking the Exit button.



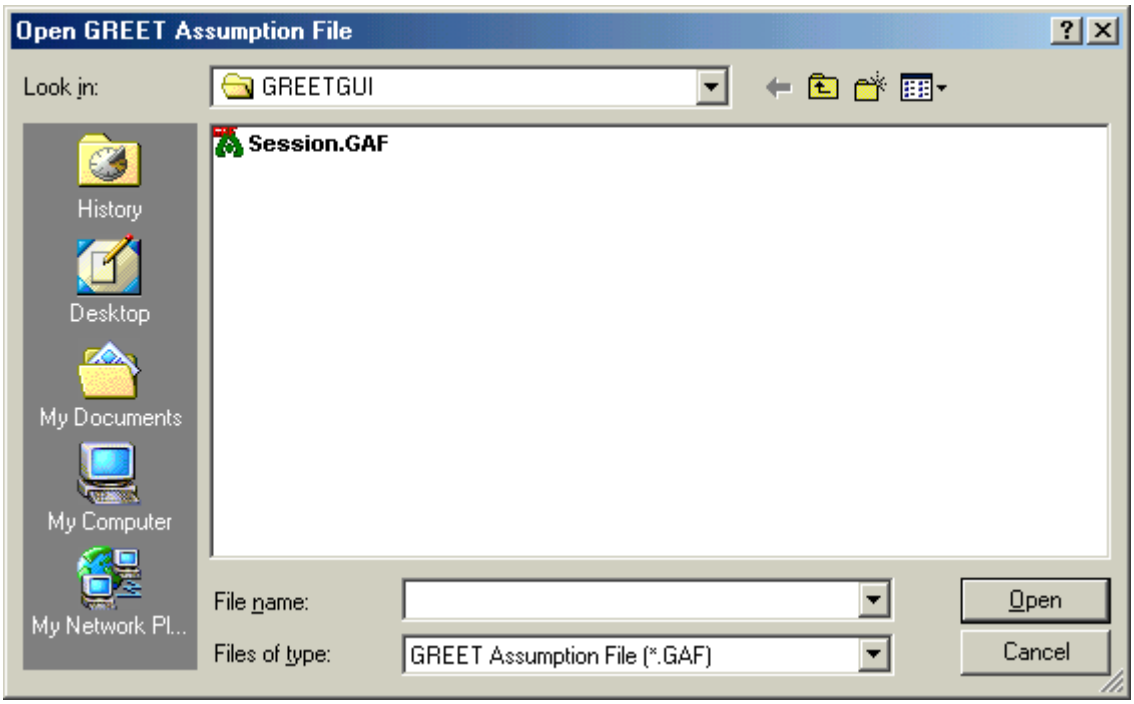
5. If the user clicks “Continue” in the Copyright window, another window will appear prompting the user to create New Session, Open Existing Session or Exit GREETGUI.

6. Hit “New Session” to start a new simulation session
   OR
   Hit “Open Existing Session” to work from a previously saved session.
   OR
   Hit “Exit” to exit GREETGUI

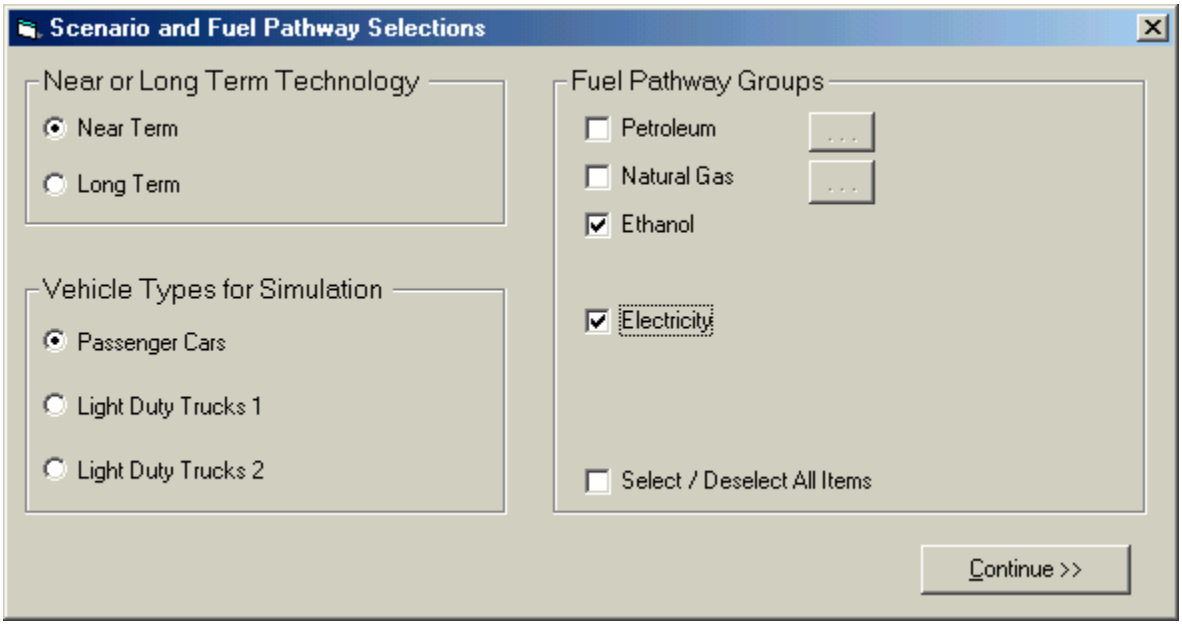
7. If you have chosen to create a new session, a dialogue box will appear prompting the user for a new session name (see below). Type in a file name for the session or accept the default name “Session.xls”, then click the “Save” button. The GREETGUI program will append “Out” to the given session name, “SessionOut.xls”, and use it as the output file name. Similarly, the GREETGUI program will append “In” to the given session name, “SessionIn.xls”, and use it as the input file name. The output file will include the output results of a completed session run, while the input file will include all pathways selections and key assumptions made by the user in the current completed session. These two files are the results of the session simulation to be completed.



8. If you have chosen to open a previously saved session by clicking the “Open Existing Session” button, GREETGUI will display a list of all previously saved sessions in the GREETGUI folder (see below). Select the session you want to open from the displayed list, and then click the “Open” button. The user will be warned that using the old name of the opened session will overwrite the results previously stored in this session name. Alternatively, the user has the option to continue the opened session with a new name, by specifying a different name for the opened session, thus leaving the old data of the opened session unchanged. The GREETGUI program will append “Out” to the given session name, “SessionOut.xls”, and use it as the output file name. Similarly, the GREETGUI program will append “In” to the given session name, “SessionIn.xls”, and use it as the input file name.

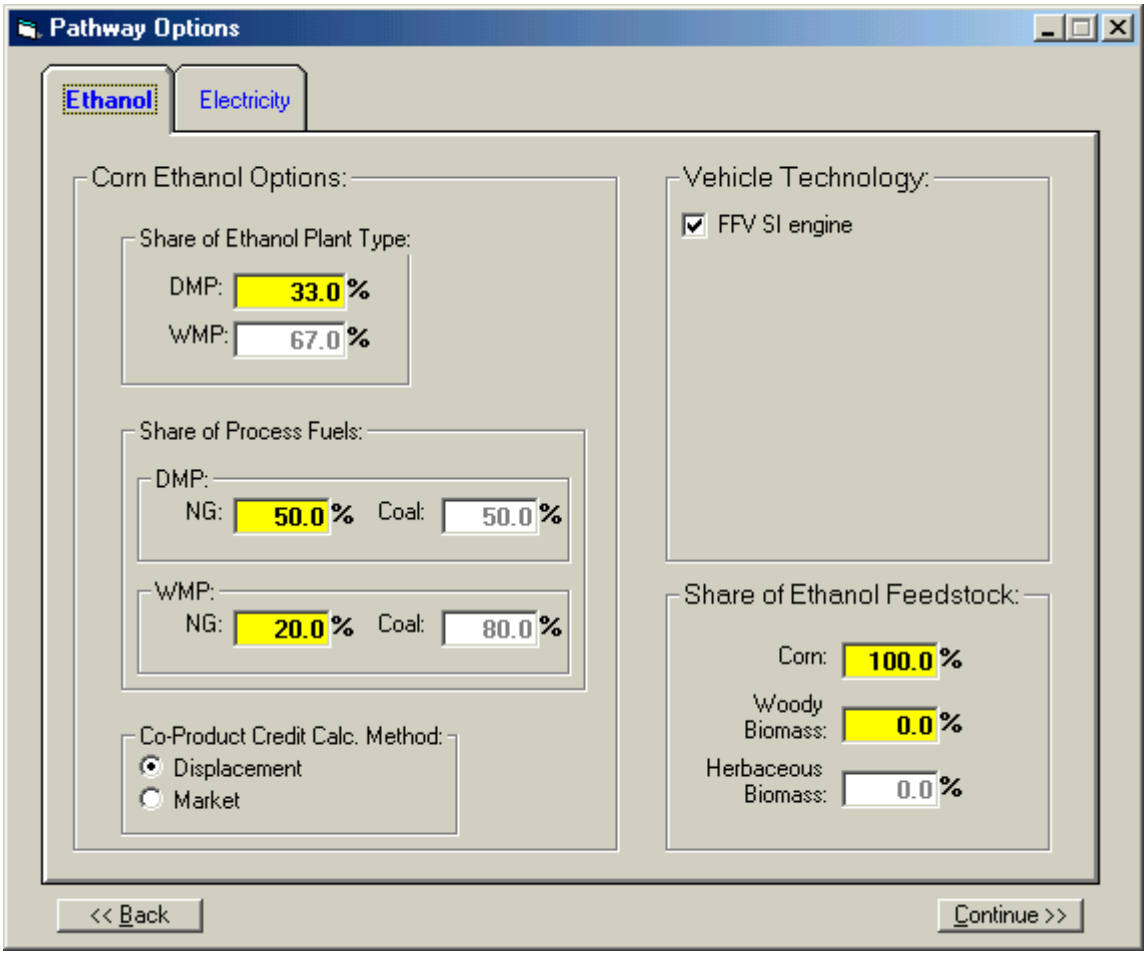


9. Next, a new window named "Scenario and Fuel Pathway Selections" will open (see below). Select either a near term or long term technology to simulate. Select the vehicle type, and the fuel pathways options you would like to simulate. Then click the "Continue" button.

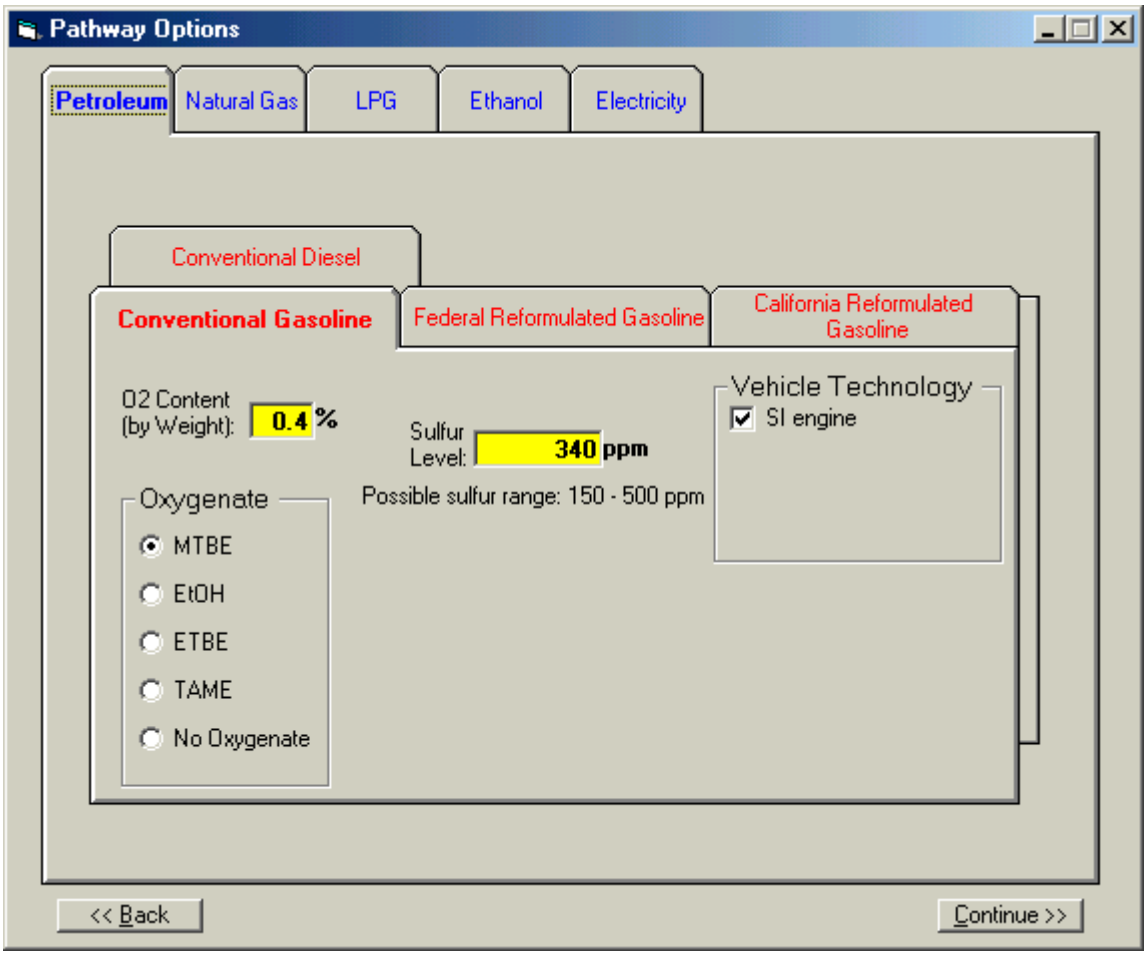


10. Next, a window will open showing blue tabs for the selected fuel pathways. The Electricity tab will show always regardless of the fuel pathway selections made by the user. This is because all other pathways use electricity. Each blue tab will display the input options of the corresponding pathway group. The yellow fields throughout the

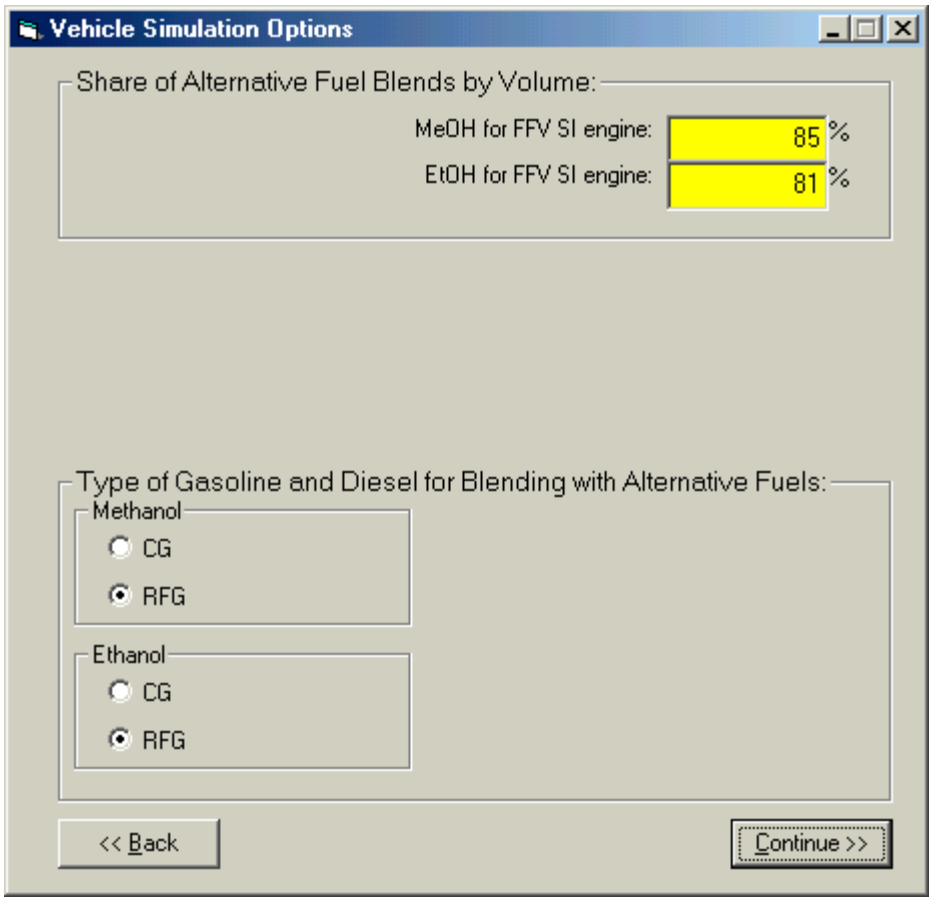
GREETGUI program are the input fields that can be changed by the user. The user can double-click inside the yellow field to modify the default value provided by GREET in that field. If you hold the mouse cursor above any of the input fields, a tool-tip box will be displayed describing the details of that field.



11. The Petroleum and Natural Gas tabs have several subgroups of pathways, divided into convenient sub-tabs, which are displayed in Red (see below for Petroleum Pathway Group). You must choose at least one vehicle technology for each fuel pathway you have selected. GREETGUI will remind you of doing so. The user must view all the displayed blue and red tabs before continuing to the next window, otherwise GREETGUI will remind the user to do so. Click the “Continue” button to proceed, or click the “Back” button to review your selections.



12. In the following window, pick the vehicle simulation options based upon the pathways you've selected. Click the yellow fields to change/modify the default values of GREET as desired. Click the "Continue" button to proceed, or click the "Back" button to review your selections.

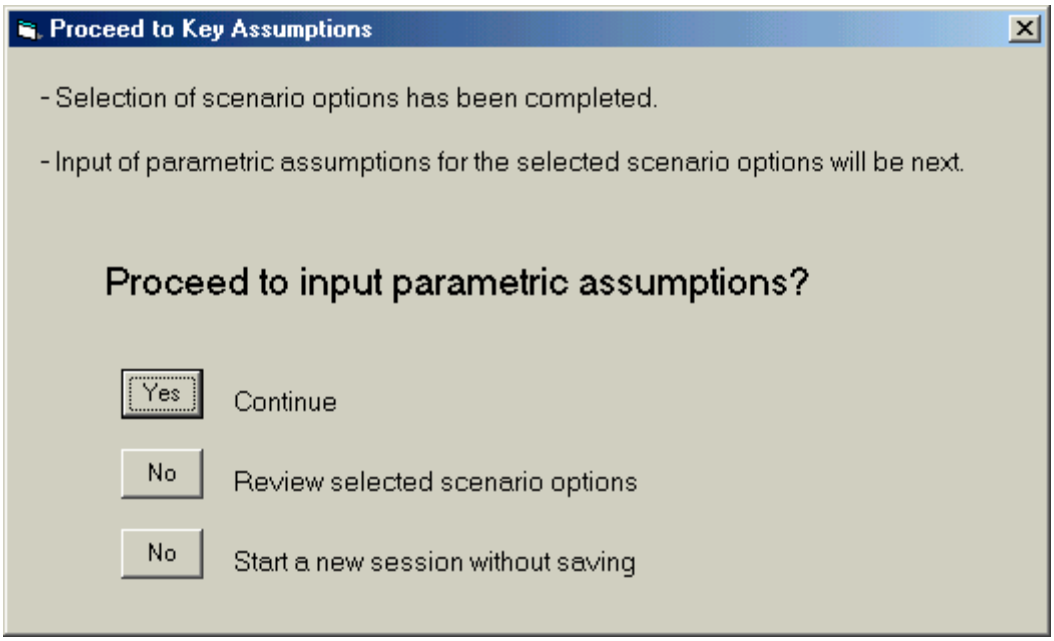


13. After the desired simulation scenarios have been completed, a frame will pop-up offering three options (see below):

    -**Continue**: This will take the user into the next phase of GREETGUI. The program will proceed to ask the user to view and/or change parametric assumptions for the scenario options selected.

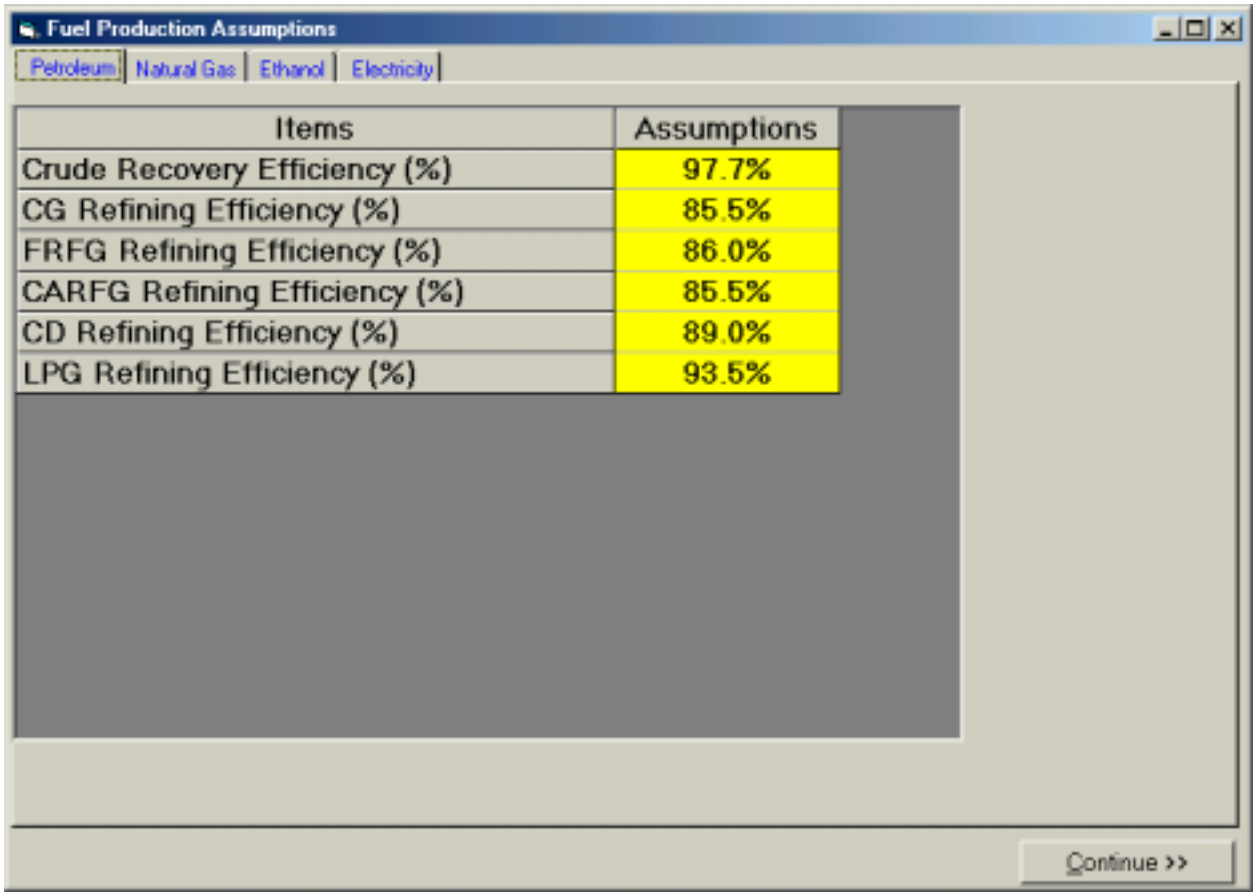
    -**Review selected scenario options**: This allows the user to return to the form of pathway options. Here the user can make any changes to previous selections by clicking on the appropriate blue pathway tabs and making new selections as desired.

    -**Start a new session without saving**: This allows the user to abort the current GREETGUI session and restart from the beginning. Note: this option will discard any selections the user has already made in the current session.

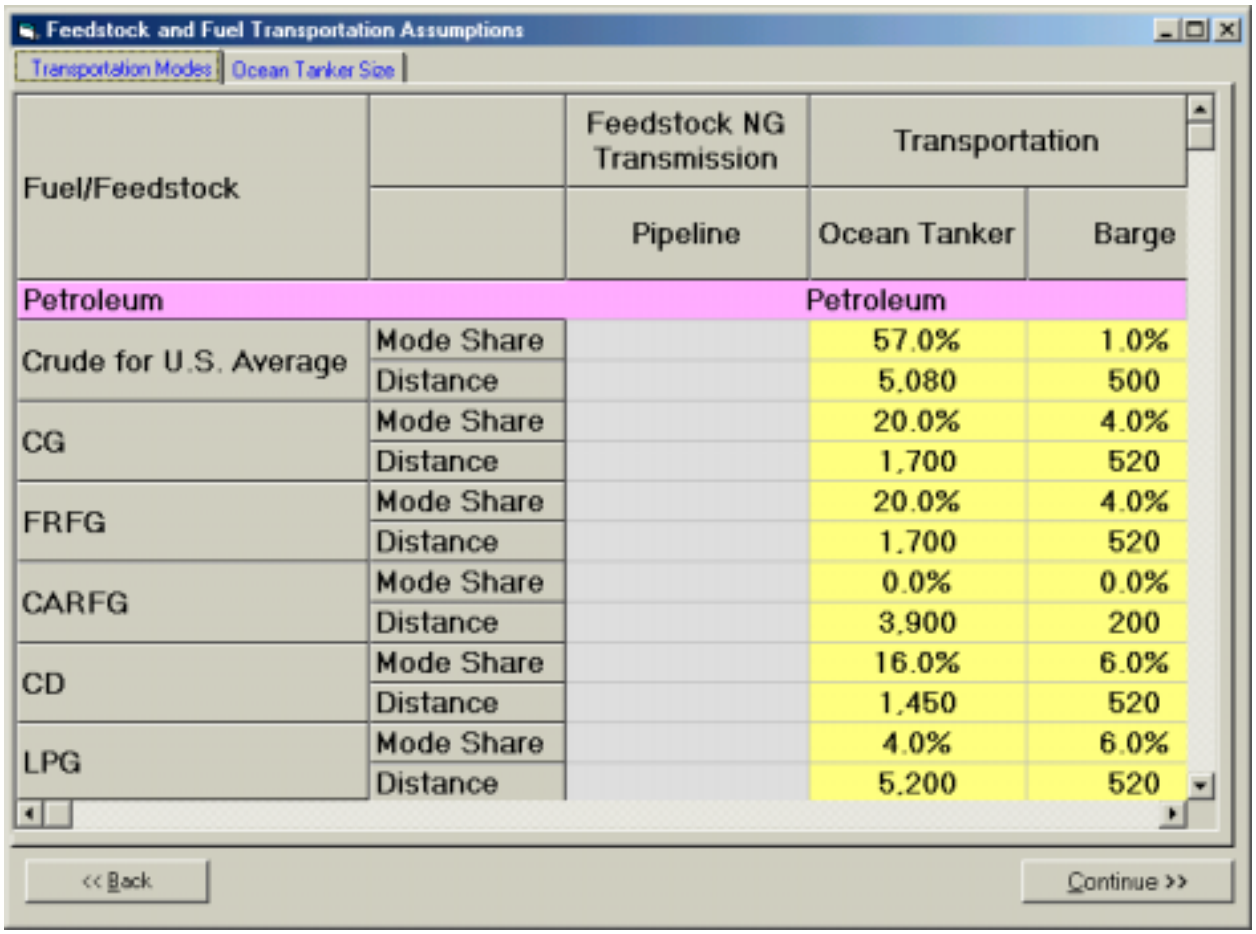


14. Use the Continue button to proceed to the key assumptions of the selected fuel pathways and options scenarios. The key assumptions will be listed in table format. Only the key assumptions are displayed in the assumptions tables for user modification. Other assumptions used by greet are not listed in the displayed tables and cannot be changed by the user in GREETGUI. However, the user can always go to the GREET model in Excel to change any assumptions.

15. The key assumptions will be displayed in three successive windows, “Fuel Production Assumptions”, “Feedstock and Fuel Transportation Assumptions” and “Vehicle Operation Assumptions”. The first window, “Fuel Production Assumptions”, will include a blue tab for each of the fuel pathways selected (see below). The yellow cells in the table can be edited, by a single-click in the cell, to modify the key assumptions as desired. After reviewing the fuel production assumptions, click the “Continue” button to proceed to the “Feedstock and Fuel Transportation Assumptions” window.

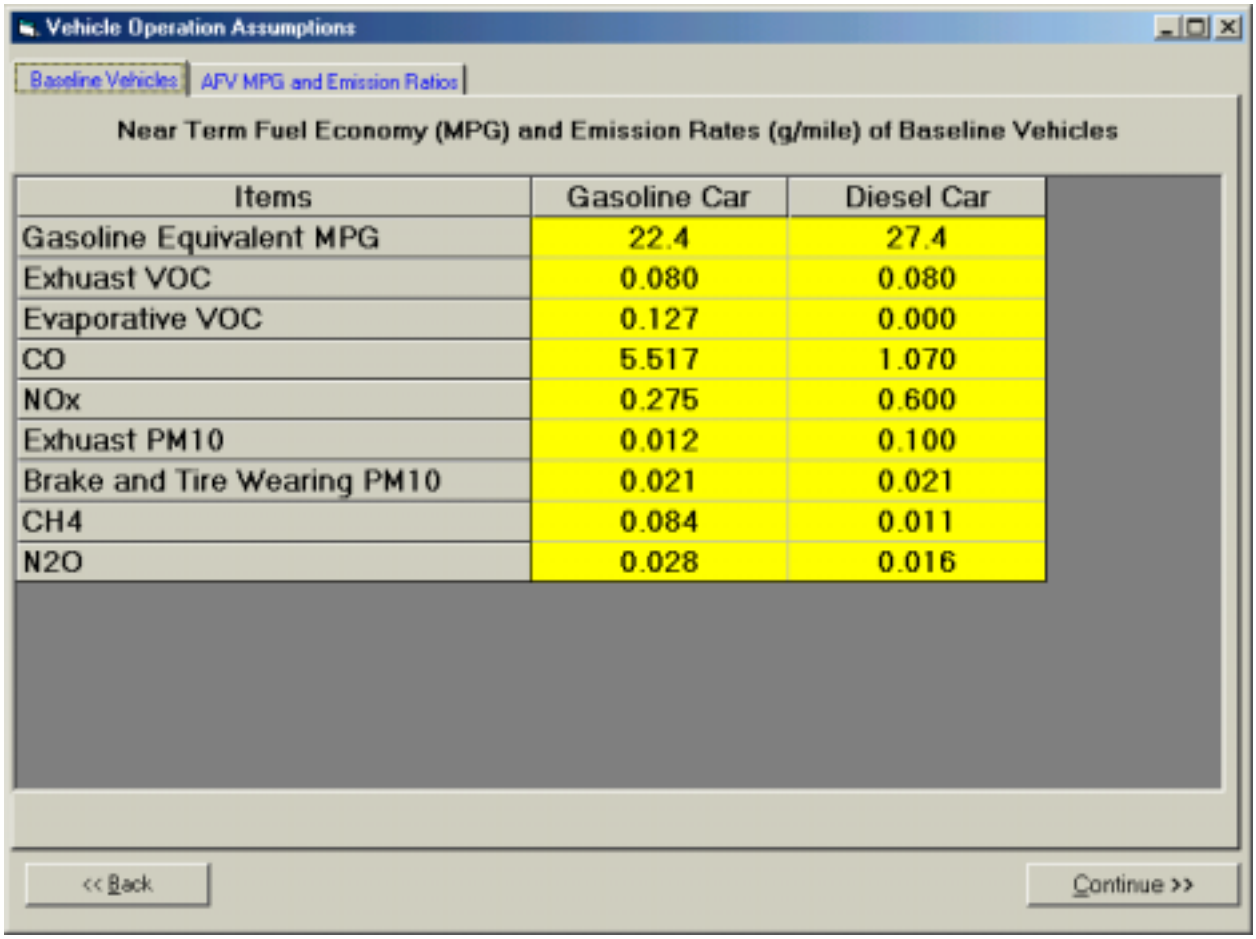


16. The second key assumptions window, “Feedstock and Fuel Transportation Assumptions”, will include two blue tabs (see below). The first tab includes the key assumptions for the fuel transportation modes of the selected feedstock fuels. The second tab includes the key assumptions for the ocean tanker size of the selected fuels. The yellow cells in the table can be edited, by a single-click in the cell, to modify the key assumptions as desired. The white cells cannot be edited because no assumptions are applicable to these cells. After reviewing/editing the “Feedstock and Fuel Transportation Assumptions”, click the “Continue” button to continue to the “Vehicle Operation Assumptions“ window or click the “Back” button to review the “Fuel Production Assumptions” window.



Fuel/Feedstock		Feedstock NG Transmission	Transportation	
		Pipeline	Ocean Tanker	Barge
Petroleum			Petroleum	
Crude for U.S. Average	Mode Share		57.0%	1.0%
	Distance		5,080	500
CG	Mode Share		20.0%	4.0%
	Distance		1,700	520
FRFG	Mode Share		20.0%	4.0%
	Distance		1,700	520
CARFG	Mode Share		0.0%	0.0%
	Distance		3,900	200
CD	Mode Share		16.0%	6.0%
	Distance		1,450	520
LPG	Mode Share		4.0%	6.0%
	Distance		5,200	520

17. The third key assumptions window, “Vehicle Operation Assumptions”, will include two blue tabs (see below). The first tab includes the key assumptions for the fuel economy and emission rates of the baseline vehicles, i.e., the gasoline and diesel vehicles. The second tab includes the key assumptions for the fuel economy and emission ratios of the selected vehicle technologies relative to the baseline vehicles. The yellow cells in the table can be edited, by a single-click in the cell, to modify the key assumptions as desired. The white cells cannot be edited because no assumptions are applicable to these cells. After reviewing/editing the “Vehicle Operation Assumptions”, click the “Continue” button to continue to the final dialogue box or click the “Back” button to review any of the previous key assumptions windows.



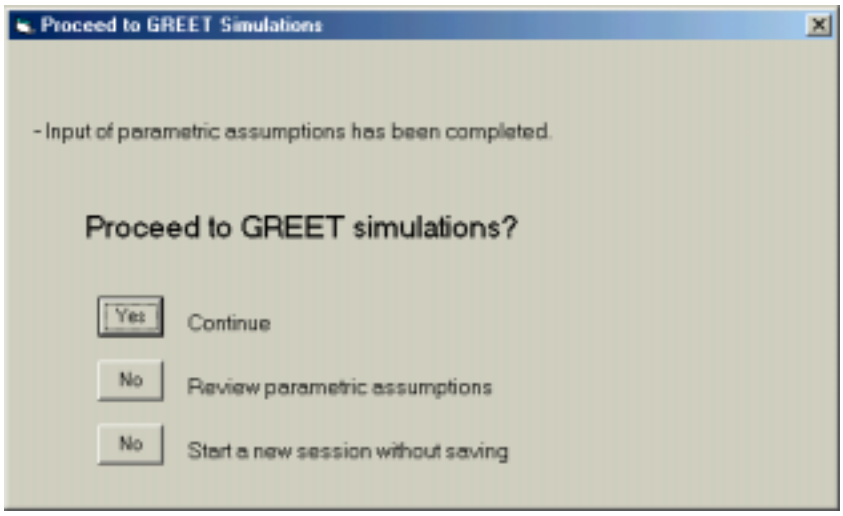
Items	Gasoline Car	Diesel Car
Gasoline Equivalent MPG	22.4	27.4
Exhuast VOC	0.080	0.080
Evaporative VOC	0.127	0.000
CO	5.517	1.070
NOx	0.275	0.600
Exhuast PM10	0.012	0.100
Brake and Tire Wearing PM10	0.021	0.021
CH4	0.084	0.011
N2O	0.028	0.016

18. After all key assumptions have been reviewed and/or edited, another pop-up frame will present three options (see below):

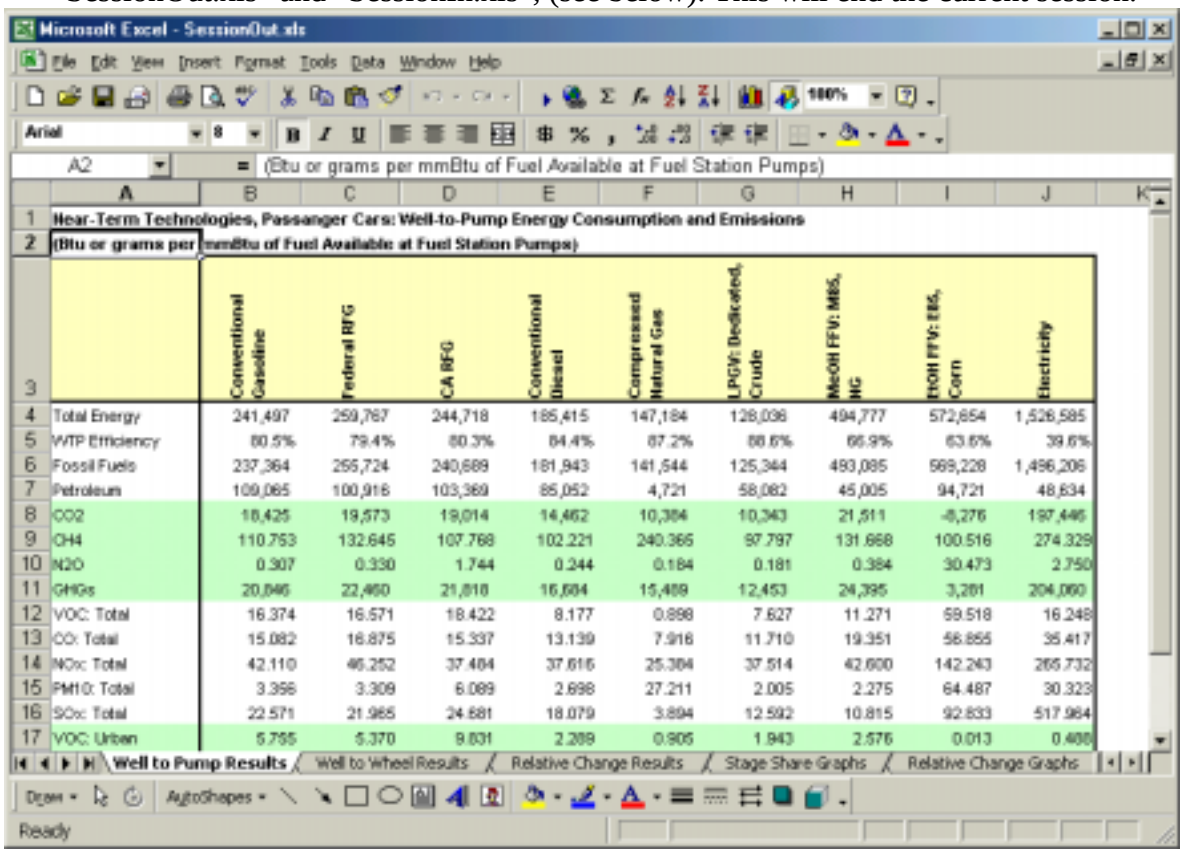
    - **Continue:** The option will allow the user to proceed to the completion of the GREET simulation. GREETGUI will take the user’s selected scenario options, together with the parametric assumptions and will generate the files “SessionOut.xls” and “SessionIn.xls”, which displays the results of the GREET model simulation and the pathways selected scenarios.

- **Review parametric assumptions:** This option will allow the user to return to the beginning of the parametric assumptions and review his/her selections and/or make any changes.

- **Start a new session without saving**: This allows the user to abort the current GREETGUI session and restart from the beginning. Note: this option will discard any selections the user has already made in the current session.



19. Hit continue and the Excel spreadsheets of this session will be generated, "SessionOut.xls" and "SessionIn.xls", (see below). This will end the current session.



Microsoft Excel - SessionOut.xls

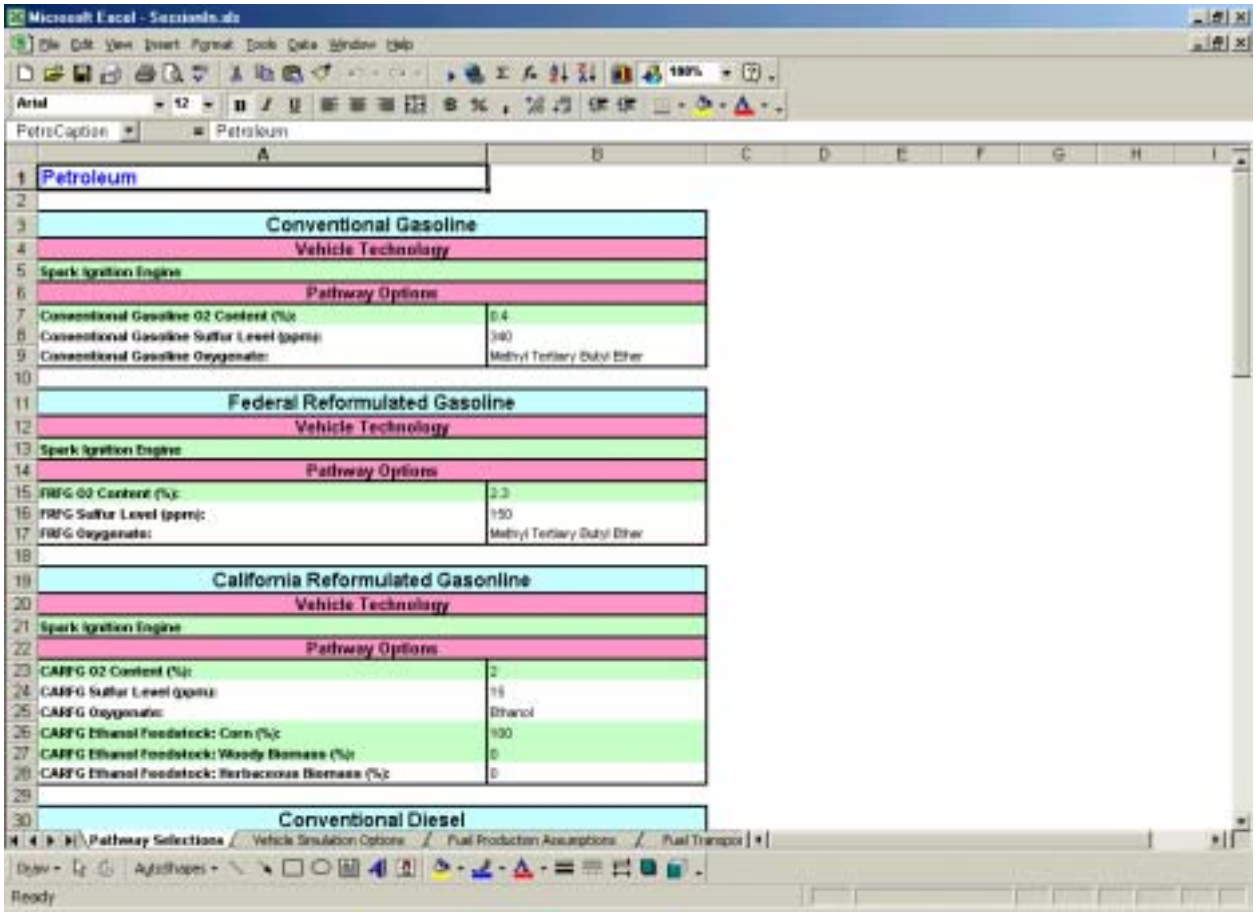
A2 = (Btu or grams per mmBtu of Fuel Available at Fuel Station Pumps)

Near-Term Technologies, Passanger Cars: Well-to-Pump Energy Consumption and Emissions
(Btu or grams per mmBtu of Fuel Available at Fuel Station Pumps)

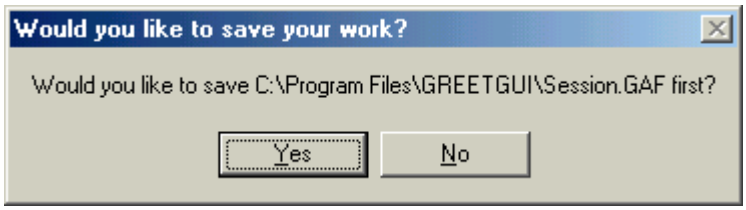
	Conventional Gasoline	Federal RFG	CA RFG	Conventional Diesel	Compressed Natural Gas	LPGV: Dedicated, Crude	MeOH FFV: M85, NG	EtOH FFV: E85, Corn	Electricity
Total Energy	241,497	259,767	244,718	185,415	147,184	128,036	494,777	572,654	1,526,585
WTP Efficiency	80.5%	79.4%	80.3%	84.4%	87.2%	88.6%	66.9%	63.6%	39.6%
Fossil Fuels	237,364	255,724	240,689	181,943	141,544	125,344	493,085	569,228	1,496,206
Petroleum	109,065	100,916	103,369	85,052	4,721	58,082	45,005	94,721	48,634
CO2	18,425	19,573	19,014	14,462	10,384	10,343	21,511	-8,276	197,446
CH4	110.753	132.645	107.768	102.221	240.365	97.797	131.668	100.516	274.329
N2O	0.307	0.330	1.744	0.244	0.184	0.181	0.384	30.473	2.750
GHGs	20,846	22,460	21,818	16,684	15,489	12,453	24,395	3,281	204,060
VOC: Total	16.374	16.571	18.422	8.177	0.898	7.627	11.271	59.518	16.248
CO: Total	15.082	16.875	15.337	13.139	7.916	11.710	19.351	56.855	35.417
NOx: Total	42.110	46.252	37.484	37.616	25.384	37.514	42.600	142.243	265.732
PM10: Total	3.356	3.309	6.089	2.698	27.211	2.005	2.275	64.487	30.323
SOx: Total	22.571	21.965	24.681	18.079	3.894	12.592	10.815	92.833	517.984
VOC: Urban	5.755	5.370	9.031	2.289	0.905	1.943	2.576	0.013	0.408

Well to Pump Results / Well to Wheel Results / Relative Change Results / Stage Share Graphs / Relative Change Graphs

Ready



20. As GREETGUI closes, you will be prompted as to if you'd like to save this session as a ".GAF" file (see below). If you would like to run GREETGUI again from the inputs you have made into this GREETGUI session or would like to later modify these inputs and rerun GREETGUI, please save the prompted file by clicking the "Yes" button. This may take several seconds to save the completed session.



TECHNICAL ISSUES OF RUNNING GREETGUI

System Speed Considerations

GREETGUI is a very calculation-intensive program. If it appears that GREETGUI has frozen up after hitting the “Continue” button, please let the program complete its calculations by allowing it sufficient time before clicking the “Continue” button again. In field-testing on a Pentium III 500MHz machine with 192MB of RAM, GREETGUI took 30 seconds to generate input and output spreadsheets and 40 seconds to fully save the sessionout.gaf file and close properly.