

# Common GREET Frequently Asked Questions (FAQ)

Question	Answer
<b>R&amp;D GREET Updates</b>	
<p>How do I obtain the R&amp;D GREET model?</p>	<p>The R&amp;D GREET model is a publicly accessible model. You can download the most up-to-date version of the R&amp;D GREET model at Argonne’s R&amp;D GREET website upon free registration: <a href="https://greet.anl.gov">https://greet.anl.gov</a>.</p> <ol style="list-style-type: none"> <li>1. Select the platform of the model you would like to download on the left-hand side of the screen: R&amp;D GREET Excel or R&amp;D GREET .Net.</li> <li>2. Follow the instructions on the appropriate <b>R&amp;D GREET Model Platform</b> page</li> <li>3. For R&amp;D GREET Excel, enter your information and select Submit.</li> <li>4. For R&amp;D GREET .Net, install the software and then enter your information.</li> </ol> <p>Click here for a <a href="#">video tutorial</a>.</p>
<p>How often is the R&amp;D GREET model updated?</p>	<p>Argonne National Laboratory releases annual updates of the R&amp;D GREET model at Argonne’s R&amp;D GREET website: <a href="https://greet.anl.gov">https://greet.anl.gov</a>. Sometimes Argonne National Laboratory releases interim versions of the GREET model (e.g., R&amp;D GREET 2023 Rev. 1) in which the year refers to the year of the GREET release and Rev. 1 refers to the first interim version.</p>
<p>Can I download older versions of the R&amp;D GREET model?</p>	<p>Yes, you can download older versions of the R&amp;D GREET excel models at Argonne’s R&amp;D GREET website upon free registration: <a href="https://greet.anl.gov">https://greet.anl.gov</a>. Once registered, scroll down to the Prior Revisions section. Select the appropriate download link. For R&amp;D GREET .Net, it is recommended to always use the most recent version available due to the continuous efforts in software bug fix and data file improvement. In case that an older version of R&amp;D GREET model is needed, please send your request to <a href="mailto:greet@anl.gov">greet@anl.gov</a> and discuss with the R&amp;D GREET .Net development team.</p>

<p>Where can I get information about CA-GREET, 45VH2-GREET, 45ZCF-GREET, 40BSAF-GREET, or adapted versions of the GREET model?</p>	<p>Please refer to the government body associated with the GREET versions used for governmental regulatory or incentive programs. A page for most governmental GREET versions can be found at the Department of Energy's GREET website (<a href="#">GREET   Department of Energy</a>).</p>
<p>How do you cite the R&amp;D GREET model?</p>	<p>Each R&amp;D GREET version has its own doi, which can be located on the R&amp;D GREET webpage. You can also cite the "Summary of Expansions and Updates" documents in the desired citation format.</p>
<p><b>Frequent Requests</b></p>	
<p>Where can I learn more about the R&amp;D GREET model?</p>	<p>Please visit the GREET publication page (<a href="http://greet.es.anl.gov/publications">http://greet.es.anl.gov/publications</a>) for the Model Reports and the Workshop page (<a href="http://greet.es.anl.gov/workshops">http://greet.es.anl.gov/workshops</a>) for presentations to become more familiar with the model, upcoming in-person workshops, and contact information for certified GREET trainers. You can also refer to the <a href="#">GREET Tutorials YouTube Channel</a> for video tutorials or the Department of Energy's GREET webpage (<a href="https://www.energy.gov/cmei/greet">https://www.energy.gov/cmei/greet</a>) for more information.</p>
<p>Where can I find an R&amp;D GREET manual?</p>	<p>For R&amp;D GREET Excel, the most recent manual is available at the R&amp;D GREET publication page (<a href="http://greet.es.anl.gov/publications">http://greet.es.anl.gov/publications</a>). We suggest starting with the Operating Manual for R&amp;D GREET: Version 1.7, which is out of date but still useful. On the other hand, comments are populated inside of R&amp;D GREET and GREET YouTube Channel is also helpful.</p> <p>For R&amp;D GREET .Net, the user manual can be accessed through Menu Bar→"About"→"User Manuals".</p>
<p>Where can I find information about future R&amp;D GREET workshops?</p>	<p>Argonne National Laboratory does not have any plans for public workshops in the near-future; however, Argonne just certified 20 trainers from around the country to conduct R&amp;D GREET workshops. You can find the nearest in-person R&amp;D GREET workshop conducted by one of the R&amp;D GREET certified trainers by visiting the Workshop page (<a href="http://greet.es.anl.gov/workshops">http://greet.es.anl.gov/workshops</a>).</p>

Where can I find information about future R&D GREET trainings?	Argonne National Laboratory just certified 20 trainers from around the country to conduct R&D GREET workshops. You can find contact information for the nearest R&D GREET-certified trainer by visiting the Workshop page ( <a href="http://greet.es.anl.gov/workshops">http://greet.es.anl.gov/workshops</a> ).
Where can I find information about R&D GREET tutorials?	For video tutorials on downloading R&D GREET and more, visit the <a href="#">GREET Tutorials YouTube Channel</a> .
Can you share the model code?	At this time, ANL does not share the source codes/passwords for critical macro functions built in GREET.
Where do I find supporting documents for specific pathways?	<p>There are many ways you can locate the supporting documents and data sources used within the R&amp;D GREET model.</p> <ol style="list-style-type: none"> <li>1. Review the comments included throughout the pathway in R&amp;D GREET Excel. Comments are indicated by purple flags in the upper right-hand corner of certain cells.</li> <li>2. Review the notes associated with various pathways in the R&amp;D GREET. Net model.</li> <li>3. Refer to ANL's GREET publication page (<a href="http://greet.es.anl.gov/publications">http://greet.es.anl.gov/publications</a>), which includes the most recent release report for each GREET version, GREET manuals, technical publications, and presentations.</li> <li>4. Email <a href="mailto:greet@anl.gov">greet@anl.gov</a> with the specific topic area in the email title for any questions about specific pathways.</li> </ol>
<b>Compatibility</b>	
What version of Excel is the R&D GREET Excel model compatible with?	R&D GREET Excel is currently known to be compatible with Excel 2021 and Office 365. Users of older Excel versions should proceed with caution.
<b>R&amp;D GREET Capabilities</b>	
What does the R&D GREET model do?	The R&D GREET life cycle analysis model allows users to analyze the energy and emissions impacts of various vehicle technologies, transportation fuel pathways, energy systems, materials, and technologies.
What are R&D GREET outputs?	By evaluating the supply chains of a technology's life cycle, the R&D GREET model quantifies the life-cycle total energy use, fossil energy use, renewable energy use, water consumption, air

	<p>pollutant emissions (i.e., volatile organic compound (VOC), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM<sub>10</sub> or PM<sub>2.5</sub>), sulfur oxides (SO<sub>x</sub>), black carbon (BC), and organic carbon (OC)) and greenhouse gas emissions (i.e., carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and carbon dioxide equivalent (CO<sub>2</sub>e)).</p>
<p>What can be changed in R&amp;D GREET?</p>	<p>Each fuel has its own suite of specific inputs the user can change. Some common inputs include the target year for simulation, vehicle types and technologies, technology shares and options, efficiencies, electricity grid region, fossil fuel production infrastructure, and emission factors. For the R&amp;D GREET Excel model, these inputs are located on the “Inputs” or within the “Fuel-specific” tabs and are indicated by yellow or peach cells. For the R&amp;D GREET .Net model, these inputs can be found throughout the model in the resources tab, emissions tab, processes tab, technologies tab, modes tab, vehicles tab and more.</p>
<p><b>Common Errors</b></p>	
<p>#Name Error/ Circular Calculations Error</p>	<p>This error typically occurs in Excel when “Iterative Calculations” are turned off. You will need to go to Excel options and make sure you enable them. You can do this by selecting File, Options, and Properties from the upper left-hand corner of the Excel sheet. In the Calculations options section, check the box labeled Enable iterative calculation.</p> <p>Also, the #Name error can occur if you accidentally make an error in a cell. If this happens, don’t save the model as you cannot undo the error. Just download a clean version of the model at <a href="https://greet.anl.gov">https://greet.anl.gov</a>.</p> <p>If the #Name Error occur immediately after opening the GREET R&amp;D Excel file, please try disable automatic calculation in Excel before opening the R&amp;D GREET file. You can do so by the following steps:</p> <ol style="list-style-type: none"> <li>1. Open a blank workbook.</li> <li>2. Select Formulas -&gt; Calculation Options -&gt; Manual from the menu bar.</li> <li>3. Open the R&amp;D GREET file.</li> <li>4. When re-calculation is desired, do one of the following: <ol style="list-style-type: none"> <li>a. Select the “Results” tab.</li> </ol> </li> </ol>

	<p>b. Press F9.</p> <p>c. Select Formulas -&gt; Calculate Now from the menu bar.</p>
Macros Error	When you plan to modify R&D GREET, Macros should be enabled. You can enable Macros by right-clicking on each of the R&D GREET files, selecting properties, and checking the unblock option at the bottom of the General tab of the properties window.
<b>Specific Questions</b>	
Why are there differences between the results in a journal article and the relevant pathway?	The most common reason for this difference is due to using different versions of R&D GREET with different background datasets. Already published journal articles might have relied on previous R&D GREET versions at the time when the publication were produced. In addition, the results in research papers might have considered different conditions to present the impact of various parameters, which may be different from the default R&D GREET settings.
How do you use the Stochastic Simulation tool?	<p>For R&amp;D GREET Excel, you need to go to Windows Excel: Tools&gt; Add-Ins&gt;, select “Stochastic Simulation” option in the left box menu, and click OK. Go back to View&gt; Toolbars&gt;, and you should be able to see the Stochastic Simulation toolbar.</p> <p>For R&amp;D GREET .Net, please refer to section 5.3 “Stochastic Simulations” of the user manual through Menu Bar→"About"→"User Manuals".</p>
How can I include my own forecasts into the stochastic analysis?	<p>For R&amp;D GREET Excel, please refer to the following link: <a href="https://greet.anl.gov/files/he5am4um">https://greet.anl.gov/files/he5am4um</a>.</p> <p>For R&amp;D GREET .Net, please refer to section 5.3 “Stochastic Simulations” of the user manual through Menu Bar→"About"→"User Manuals".</p>
How do I change the fuel economy of vehicles in R&D GREET?	<p>For R&amp;D GREET .Net, please refer to section 3.8.8 “Vehicle Editor” of the user manual through Menu Bar→"About"→"User Manuals".</p> <p>For R&amp;D GREET Excel: Before adjusting the fuel economy values, you will want to go to cell B16 in Inputs sheet and change the value from 1 to 2. For vehicle fuel economy values, you could enter them in a few places inside GREET.</p>

	<p>The first place is in the time-series tables of the LDT1_TS sheet. There, you will see a table for each vehicle technology. The table contains fuel economy and emission rates for baseline technologies from 1990 to 2050. For new technologies such as fuel-cell vehicles, the values are relative changes from the baseline technology to the new technology.</p> <p>The second place is the Vehicles sheet. You will see Table/Section 3, where fuel economy and emissions are presented for all vehicle technologies contained in GREET. Row 72 presents fuel economy values. You can find the cell for fuel-cell vehicles (e.g., DM72 for gaseous H<sub>2</sub> FCVs) to enter the Autonomie-simulated fuel economy value. Emission rates for vehicle technologies are in Rows 78-95, where you can change emission rates manually for given technologies.</p>
<p>How does R&amp;D GREET model carbon accounting?</p>	<p>The R&amp;D GREET model conducts life-cycle carbon accounting by tracking all carbon emissions and removals throughout the entire supply chain of fuel and energy systems from feedstock production and processing to fuel combustion.</p> <p>A key aspect of carbon accounting in R&amp;D GREET is the application of carbon balance principles. For most processes, CO<sub>2</sub> emissions are estimated based on the carbon content of inputs and outputs.</p> <p>R&amp;D GREET distinguishes between fossil carbon and biogenic carbon. Fossil carbon originates from geologic sources (e.g., petroleum, coal, natural gas) and is considered a net addition to atmospheric CO<sub>2</sub> when combusted. In contrast, biogenic carbon is derived from biomass sources that remove CO<sub>2</sub> from the atmosphere during growth. When bio-based fuels are combusted, the resulting CO<sub>2</sub> emissions are generally considered carbon neutral, as they are offset by previously absorbed atmospheric carbon. Biogenic CO<sub>2</sub> emissions released during specific processes (such as ethanol fermentation) are treated as zero-emission. This treatment aligns with widely accepted LCA conventions and carbon accounting protocols. However, when presenting vehicle operation emissions, GREET explicitly shows biofuel combustion CO<sub>2</sub> emissions to allow comparison across fuels. In</p>

	<p>this case, an equivalent biogenic CO<sub>2</sub> credit is applied in the feedstock stage to reflect atmospheric carbon uptake.</p> <p>For e-fuels or fuels produced through CO<sub>2</sub> utilization technologies, R&amp;D GREET treats combustion emissions of e-fuels as carbon neutral regardless of the original CO<sub>2</sub> source. This is based on the assumption that the CO<sub>2</sub> used for fuel production would otherwise be emitted from the first sources to the atmosphere. Thus, R&amp;D GREET credits e-fuel systems with avoided emissions.</p>
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**Terminology**

Feedstock Stage: life-cycle stage associated with feedstock production, feedstock transportation, and feedstock storage

Fuel Stage: life-cycle stage associated with fuel production, fuel transportation, fuel distribution, and fuel storage

Well-to-Pump (WTP): life-cycle stage associated with the feedstock and fuel stages combined

Vehicle Operation (aka Pump-to-Wheel or Pump-to-Wake or PTW): life-cycle stage associated with fuel combustion, fuel conversion, fuel evaporation, and tire/brake wear

Well-to-Wheel (WTW): WTP and vehicle operation combined

Vehicle Cycle: life-cycle stage associated with raw material recovery, material processing and fabrication, vehicle component production, vehicle assembly, recycling, and disposal

Cradle-to-Grave (C2G): WTP, vehicle operation, and vehicle cycle combined

Urban Emissions: the emissions produced throughout the life cycle that only occur within the boundaries of a given metropolitan area

Lower Heating Values: thermal energy produced by the combustion of a fuel, not incorporating the latent heat of vaporization of water produced during the combustion process. By default, GREET uses lower heating values

Higher Heating Values: thermal energy produced by the combustion of a fuel, incorporating the latent heat of vaporization of water produced during the combustion process