



U.S. DEPARTMENT
of **ENERGY**

Office of Critical Minerals
and Energy Innovation



45ZCF-GREET 2026

Frequently Asked Questions

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Introduction

The U.S. Department of the Treasury adopted the 45ZCF-GREET model to determine emissions rates for purposes of the Clean Fuel Production Credit under Title 26 of the U.S. Code, Section 45Z. The [45ZCF-GREET user manual](#) describes the methodology the model uses to calculate life cycle greenhouse gas emissions of clean fuel production under a well-to-wheels system boundary and provides instructions on how the model should be used. The 45ZCF-GREET user manual provides instructions on use of the model. **Before reading through these Frequently Asked Questions (FAQs), ensure that you properly download and install 45ZCF-GREET by following the steps in Section 3 of the user manual.**

FAQs and answers in this document pertain only to the use of the 45ZCF-GREET model. Questions about the 45Z tax credit and eligibility for the tax credit should be directed to the [Internal Revenue Service](#).

FAQs will be updated on a continual basis. If you have questions about the use of the 45ZCF-GREET model, visit the [GREET website](#) for contact information.

List of Acronyms

CI	carbon intensity
DDG	distiller's dried grains
EAC	energy attribute credit
EVR	emissions value request
HHV	higher heating value
ILUC	indirect land use change
LCA	life cycle analysis
LHV	lower heating value
PER	provisional emissions rate
SAF	sustainable aviation fuel

Frequently Asked Questions

1. Can 45ZCF-GREET run on an Apple Mac or older versions of Microsoft Excel?

45ZCF-GREET was developed for use exclusively with Excel 365 on Windows operating systems. Older versions of Excel and Excel programs for different operating systems, such as Apple's macOS, will **not** properly run 45ZCF-GREET.

2. Do I need to open the Excel file in the “GREET1 Dependency” folder?

Users should only open the 45ZCF-GREET Excel file. The macros will take care of opening and setting up the link between the two files.

3. Do I need to move the Excel file out of the “GREET1 Dependency” folder?

Extracting the 45ZCF-GREET zip file creates a 45ZCF-GREET Excel file and a “GREET1 Dependency” folder, which contains the GREET1 Excel file. Please do **not** move this file out of the “GREET1 Dependency” folder. Your file arrangement should match what appears in Figure 1¹.

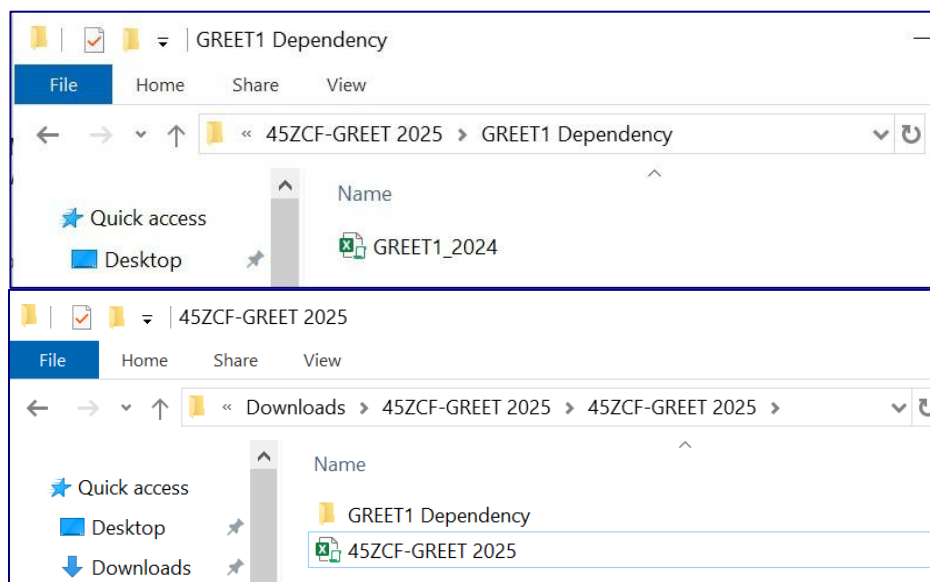


Figure 1. Necessary GREET file arrangement

¹ Note that the file names in pictures may include outdated years compared to the current version of 45ZCF-GREET.

4. Can I rename the files and folders located in the 45ZCF-GREET folder?

We do not recommend changing the names of any files or folders that are part of the unzipped file system, especially the “GREET1 Dependency” folder and the GREET1 Excel file within it.

5. Can I replace the Excel file in the GREET1 Dependency folder with an older GREET file?

Please do not replace the GREET1 Dependency Excel file that comes with the zip file. Doing so may cause errors and inconsistent results.

6. The 45ZCF-GREET file allows me to enter process information; however, when I select “Generate LCA Results,” no results are produced, and there is no error message. What is the issue?

There could be a few reasons why users do not see generated results:

- a. Please ensure that the 45ZCF-GREET file and the “GREET1 Dependency” folder have been extracted into a local drive (e.g., C: or D:) and are being run from that drive. The security settings in some cloud drives (e.g., OneDrive) may prevent the execution of macros, so ensure that the folder where the 45ZCF-GREET file is saved does **not** back up to a cloud drive. Close all open instances of the 45ZCF-GREET file and “the GREET1 Excel file before trying again.

To know if a folder is being backed up to OneDrive, select the folder and look at the top ribbon in Windows Explorer. If the folder will sync with OneDrive, a yellow box with the title “OneDrive” will appear at the top of the window with a “Cloud Storage” tab below it (Figure 2).

Additionally, a “Status” column will appear with an icon next to each folder or file indicating the sync status. If the folder is not being backed up to OneDrive, this text and tab will not appear (Figure 3).

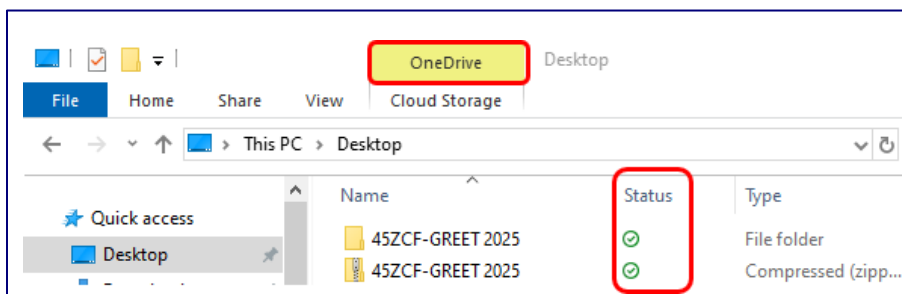


Figure 2. Folder synced with OneDrive

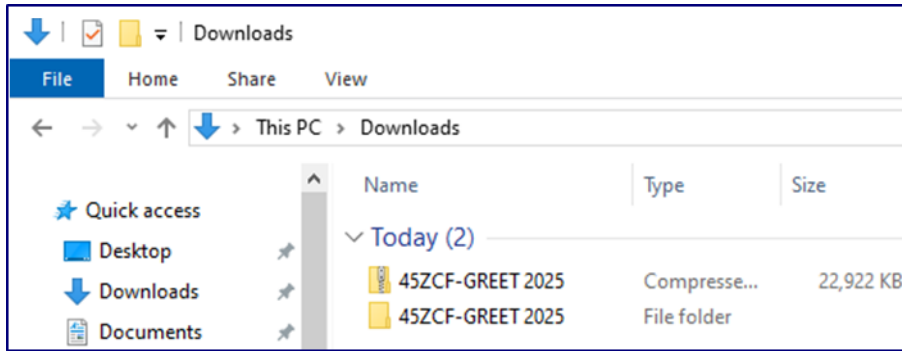


Figure 3. Folder not synced with OneDrive

- b. Please verify that both the 45ZCF-GREET file and the GREET1 Excel file (located in the “GREET1 Dependency” folder) are unblocked and macros are enabled (see Question **Error! Reference source not found.**). Close all open instances of the 45ZCF-GREET file and the GREET1 Excel file before trying to generate results again.
- c. Please ensure that another file with the same name is not open. This will prevent the 45ZCF-GREET file from opening the GREET1 Excel file, which is required to run its calculations. We recommend closing both files and then opening the 45ZCF-GREET file again.

7. The 45ZCF-GREET file does not allow me to enter process information, and I do not see any error messages. What is the issue?

Please refer to the possible reasons outlined in Question **Error! Reference source not found.** above.

8. After I enter my data into the 45ZCF-GREET file and click the “Generate LCA Results” button, Excel displays a pop-up that says, “Compile error in hidden module: Interface” (Figure 4). Why do I see this error message?

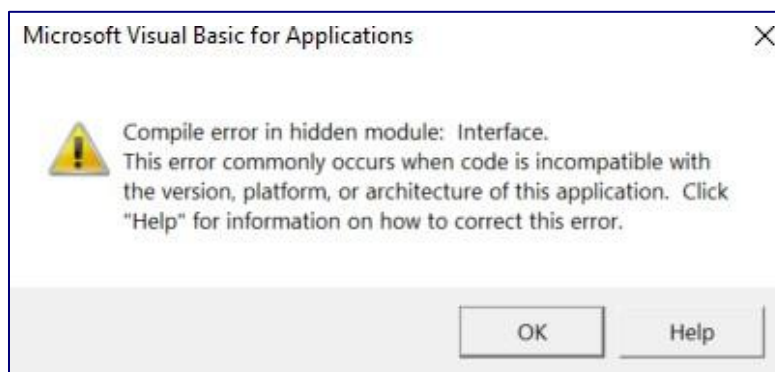


Figure 4. “Compile error in hidden module: Interface” error message

The “Compile error in hidden module: Interface” error message appears because 45ZCF-GREET was designed for the 64-bit version of Office 365, and the user is running the 32-bit version. Users with the 32-bit version may experience issues with 45ZCF-GREET, so we recommend running the 64-bit version.

9. Why am I seeing the error message “Could not find the GREET1_2024.xlsm workbook”?

This error message appears because the Excel macro is not able to locate the GREET1 Excel file in the “GREET1 Dependency” folder. Please ensure that the 45ZCF-GREET file and the “GREET1 Dependency” folder are in the same folder and that the GREET1 Excel file is in the “GREET1 Dependency” folder. In addition, verify that the file and folder are correctly named as stated above.

10. After entering all my process data into “45ZCF-GREET 2025.xlsm,” clicking “Generate LCA Results” produces “#NAME?” errors. Why am I seeing these errors?

Please ensure that the Excel version being used is Microsoft 365. “45ZCF-GREET” is not compatible with older versions of Microsoft Excel (e.g., Excel 2021, Excel 2019, Excel 2016).

11. Upon opening “45ZCF-GREET 2025.xlsm,” I see the banner message “Microsoft has blocked macros from running because the source of this file is untrusted.” How do I address this?

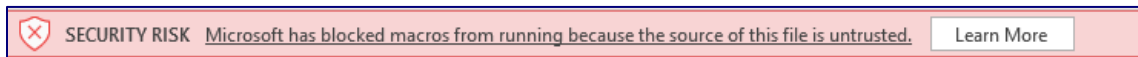


Figure 5. “Microsoft has blocked macros” banner message

To resolve this issue, a user must “unblock” “45ZCF-GREET 2025.xlsm.” To do so, the user should right-click on the XLSM file and select “Properties” (Figure 6).

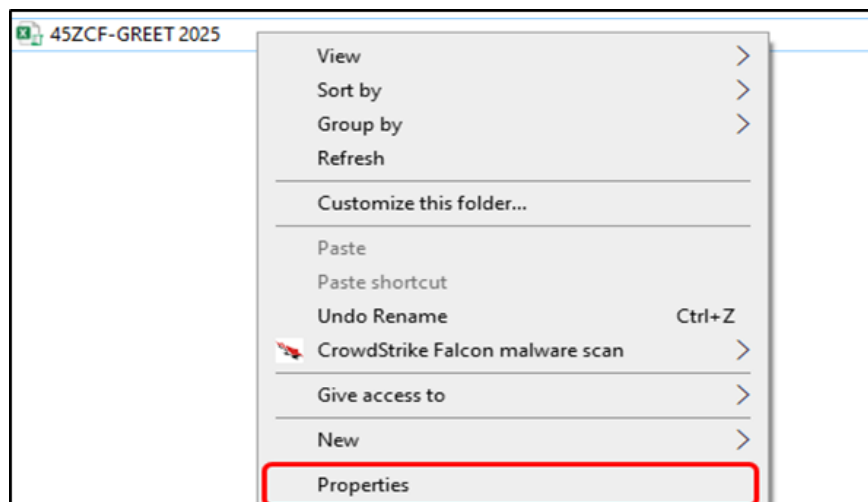


Figure 6. Menu that appears after right-clicking on the XLSM file

Under the “General” tab under “Properties,” at the bottom, the user should check the “Unblock” box and then select “Apply” (Figure 7). When the user reopens “45ZCF-GREET 2025.xlsm,” the security risk banner should no longer appear.

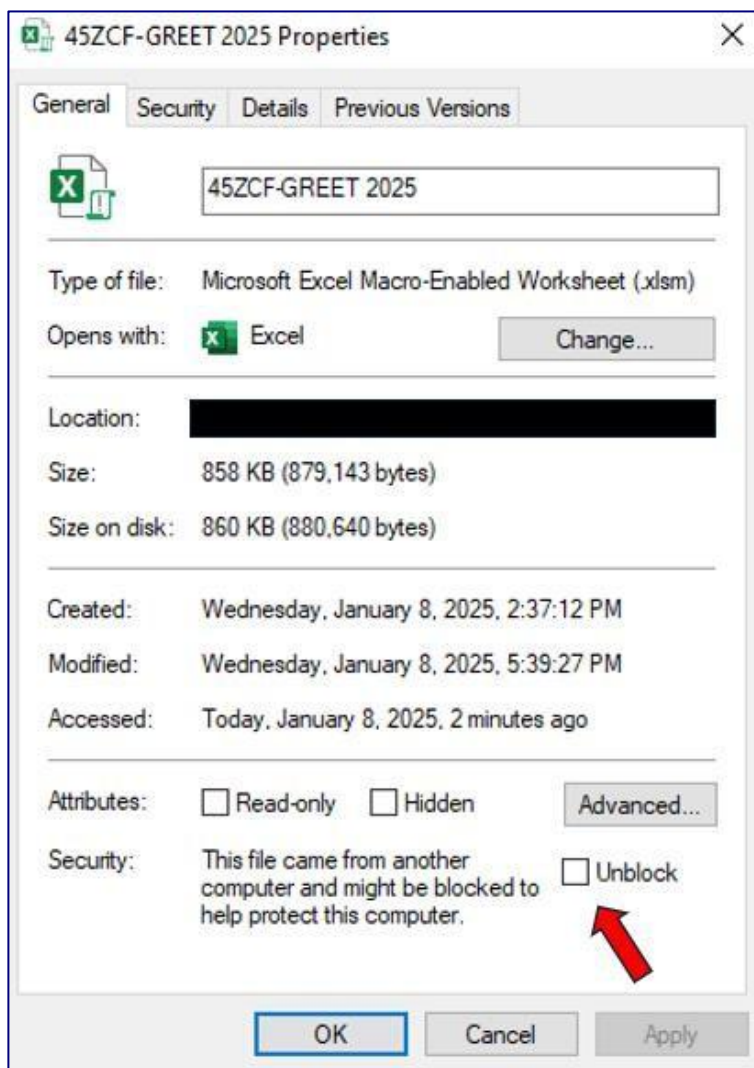


Figure 7. “Unblock” box in Properties window

12. When I open “45ZCF-GREET 2025.xlsm,” I see the error “There are one or more circular references where a formula refers to its own cell either directly...”. Then, when I click “OK” and run the model, I see “N/A” for D-LCA results. How can I get my model to run correctly?

This error is likely to appear when a user opens a new Excel file before opening “45ZCF-GREET 2025.xlsm.” The solution is to close all Excel files and only open “45ZCF-GREET 2025.xlsm.” Do not open the 45ZCF-GREET file when other Excel files are already open, as this may cause the model not to function properly.

13. Can I have access to the VBA password to see the macros in 45ZCF-GREET?

The VBA code is password-protected to prevent the alteration of any coding that could affect the functionality of the model. An explainer document is forthcoming, and it will walk through how user inputs trace back to the dependency file and how results are pulled from it once calculations are finished.

14. My pathway is not represented in 45ZCF-GREET. What do I do?

If your pathway is not represented in 45ZCF-GREET, you will not be able to generate LCA results. Updates to 45ZCF-GREET may include more fuel pathways in the future. Alternatively, taxpayers will be able to request a provisional emissions rate (PER) from DOE for their specific fuel production pathway once the 45Z Emissions Value Request (EVR) process is available.

15. Should I include energy used for drying distiller's grains in my energy inputs?

Yes. All energy used within the facility boundary should be included in the energy input parameters, including inputs associated with processing co-products such as distiller's dried grains (DDG). The greenhouse gas displacement credit for DDG is calculated using background data and attributed to ethanol, and the co-product energy and associated CI is also attributed to ethanol.

16. Should the volume of ethanol production entered in the model be reported on a denatured or undenatured basis?

Ethanol volumes should be entered into 45ZCF-GREET on an undenatured (neat ethanol) basis. The model evaluates emissions from the fuel production process prior to blending or denaturing. Any denaturant added downstream (e.g., gasoline) should not be included in the ethanol production volume in 45ZCF-GREET.

17. Should energy inputs be entered as lower heating value (LHV) or higher heating value (HHV)?

For any user inputs that use an energy measurement, such as MMBtu, the LHV should always be used. Users are recommended to pay close attention to the units provided for user inputs.

18. How is the Needs Region determined? What if my facility is near a regional boundary?

The Needs Region is determined based on the Balancing Authority to which the facility is electrically interconnected, not just geographic location. Users should reference Table 6 in the GREET User Manual and confirm their Balancing Authority through interconnection records, utility agreements, or resources such as EIA Form 861 or the OpenEI Balancing Authority Map.

19. If I enter imported renewable electricity using energy attribute credits (EACs), should I subtract the amount from the grid electricity input?

Yes. To avoid double-counting, the same quantity of electricity claimed through imported renewable EACs should be subtracted from the grid electricity input in the user dashboard.

20. Should quantities of sodium methoxide or sodium methylate be included in the methanol input in 45ZCF-GREET?

If sodium methoxide and/or sodium methylate used in the conversion process is produced on-site using methanol, the amount of methanol utilized to produce it may be deducted from the total amount of 'Methanol' in the user inputs. If not produced on-site, sodium methoxide and/or sodium methylate should not be factored into the 'Methanol' figure as the impact of sodium methoxide and sodium methylate in the process is modeled as a background assumption.

21. Should data from facility shut-downs, including energy use for warm idle, be included as inputs in 45ZCF-GREET?

You should not include data from a shutdown period, including energy used during warm idle, as these data are not relevant to fuel production.

22. What parameter should be entered in the 'Final RNG Pressure' field?

This user input intends to reflect the RNG pressure exiting the upgrader, prior to pipeline injection and the subsequent feeding to the compressor at the fueling station. This user input is now rephrased as "RNG Pressure Exiting Upgrader" to be clear. We would anticipate that this pressure in some cases would be around 50 psi.

23. Why does the model show two separate LCA results: one result for 2025 and one result for fuels produced after December 31, 2025?

The One Big Beautiful Bill Act included several amendments to Section 45Z that affected fuel eligibility and lifecycle analysis, which took effect for fuels produced after December 31, 2025. Claimants may have tax years that do not align with the calendar year, thus the 45ZCF-GREET model must provide lifecycle analysis results for claimants whose fuel production includes a portion that was produced before December 31, 2025 and a portion that was produced after this date.

24. How do I model RNG production via anaerobic digestion with manure from other sources (e.g., poultry manure, beef cattle manure)?

45ZCF-GREET currently only supports pathways for dairy and swine manure. DOE anticipates that RNG pathways from anaerobic digestion of additional manure types, including poultry and beef cattle, will be added in the future.

25. What qualifies as food scraps in the model? Does this include all food processing waste?

Food scraps are defined as the portion of municipal solid waste (MSW) that consists of inedible or post-consumer food collected from residences, hospitality facilities, institutions, and grocery stores. This does not include feedstocks that are not typically landfilled, which include: fats, oils, or greases (FOG), liquids at the point of collection, and materials from industrial food manufacturing or processing facilities.

26. If a portion of my feedstock is grown using regenerative agriculture practices and I enter this feedstock amount along with the coinciding CI, do I enter the total feedstock amount below or only the net feedstock that is not grown with regenerative agriculture?

You should enter the total amount of feedstock in the Process Inputs. If the volume of regenerative agriculture feedstock entered exceeds the total volume entered in the Process Inputs, the model will not run and will issue an error message. Any volume of total feedstock that not accounted for as regenerative agriculture feedstock volume will be modeled using a U.S. average carbon intensity based on GREET defaults.

27. Why are some cells in 45ZCF-GREET crossed out?

This is a Microsoft Excel feature that creates strikethrough formatting on 'stale values'. This feature can be turned off via "Formulas" > "Calculation Options" > Uncheck "Format Stale Values".

28. Why am I getting the error message "Please check user inputs. The CI is outside the expected range" when clicking 'Generate Results'?

The 45ZCF-GREET model has established a range of expected values for feedstocks that are produced using regenerative agriculture practices to ensure the model functions properly. The low end of the range for all feedstocks is zero. The high end of the range is set at the U.S. Average GREET Default CI for the given feedstock.

For more information, visit: energy.gov/cmei

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