Change log for 45VH2-GREET Model

45VH2-GREET (Rev. December 2025)

The 45VH2-GREET (Rev. Dec. 2025) model implements the following changes relative to 45VH2-GREET (Rev. June 2025):

- Added representation of four technologies: (1) partial oxidation of methane, (2) hydrogen production as a by-product of chlorine manufacturing, (3) co-electrolysis of carbon dioxide and water, (4) reformers that are integrated with carbon capture and sequestration (CCS) utilizing pressure swing adsorption (PSA), and can co-produce steam.
- As explained in 45VH2-GREET supporting documentation, changed pressure value in the functional unit for hydrogen production under niche cases where a user knows with certainty that the hydrogen is produced at a lower pressure but is not compressed prior to use.
- Corrects a programming error associated with the natural gas supply chain, wherein emissions would scale incorrectly when users changed the "Custom (user defined) NG Source Shares" field.
- Corrects a programming error associated with the mileage of renewable natural gas (RNG) transmission.
- Updated default assumption of methane leakage in the natural gas supply chain to 0.7%, in alignment with 2024 analysis.
- Updated default assumption of flaring efficiency under counterfactual for coal mine methane to 98%, based on analysis from the U.S. Environmental Protection Agency.

45VH2-GREET (Rev. June 2025):

The 45VH2-GREET (Rev. June 2025) model implements the following changes relative to 45VH2-GREET (Rev. May 2025):

- Correction of programming error introduced in the May 2025 release that resulted in incorrect calculations for natural gas pathways.
- Improved user interface for natural gas supply chain, including more options to specify energy consumption within pipeline transmission.
- Correction of the "pressure correction" feature. When the user specifies the pressure of hydrogen from their process, they are now directed to identify the grid region in which their facility is located. If the pressure is above 300 psi, 45VH2-GREET will calculate the carbon intensity of the process by assuming that compression downstream is being avoided and that such compression would have utilized the regional grid. If the pressure is below 300 psi, 45VH2-GREET assumes that compression downstream will be necessary and that such compression would have utilized the regional grid.

- Minor updates to background emissions factors associated with power generators and the electricity grid to align with R&D GREET 2024 Rev1.
- Updates to electrolysis pathways to prevent users from inputting energy consumption values below the higher heating value of hydrogen.

45VH2-GREET (Rev. May 2025):

The 45VH2-GREET (Rev. May 2025) model implements the following changes relative to 45VH2-GREET (Rev. January 2025):
- Ability for users to account for bespoke information (i.e. foreground data) to represent specific aspects of their natural gas supply chain.

45VH2-GREET (Rev. January 2025):

The 45VH2-GREET (Rev. January 2025) model implements the following changes relative to 45VH2-GREET (Rev. Sept. 2024):
- Ability to represent additional electricity inputs for high-temperature electrolysis.
- Ability to represent steam co-product for facilities that use reformers with cryogenic CCS.
- Revised approach to account for impurities and mixed gases, in alignment with the 45V Final Regulations.
- Representation of grid regions defined in 45V Final Regulations.
- Representation of additional methane feedstock (renewable natural gas (RNG) from manure, RNG from wastewater treatment plants, upgraded coal mine methane).

45VH2-GREET (Rev. September 2024):

The 45VH2-GREET (Rev. November 2024) model implements the following changes relative to 45VH2-GREET (Rev. August 2024):
- Improvements to user interface for electricity feedstock

45VH2-GREET (Rev. August 2024):

The 45VH2-GREET (Rev. August 2024) model implements the following changes relative to 45VH2-GREET (Rev. March 2024):
- Inclusion of renewable electricity feedstock for high-temperature electrolysis, as described in Section 2.3 of the "Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen production Pathways using 45VH2-GREET Rev. August 2024" document.

45VH2-GREET (Rev. March 2024):

The 45VH2-GREET (Rev. March 2024) model implements the following changes relative to 45VH2-GREET 2023:

- Modifications to address tool functionality (fixes to prevent crashes and popups to explain features).
- Correcting macros that utilize the heating value of natural gas and landfill gas.
- Correcting a programming error in simulation of the gasification of biomass.
- Removing the cap on the amount of nitrogen co-product that users can input for the autothermal reforming (ATR) process. Instead, a pop-up message was added notifying users to check their inputs.