

Annual Energy Outlook 2025 Fact Sheet: Hydrocarbon Supply Module

We are replacing the Oil and Gas Supply Module (OGSM) with the new Hydrocarbon Supply Module (HSM) in the *Annual Energy Outlook 2025* (AEO2025). HSM provides projections for production of crude oil, natural gas, and natural gas plant liquids by fuel type, region, and select geological formations. HSM and the Carbon Capture, Allocation, Transportation, and Sequestration Module are the first energy modules written entirely in Python in the National Energy Modeling System (NEMS).

Functionally, HSM is similar to OGSM, building on the analytic foundation developed over many AEO publications. The new module, however, contains several major updates and streamlined representations. These changes will make HSM easier to maintain than OGSM and improve transparency of results.

Like OGSM, HSM is an econometric module split into four submodules: Onshore, Offshore, Alaska, and Canadian Natural Gas. Although each submodule has its own nuances, the general methodology for the module relies on projected profitability to determine exploratory and developmental drilling activities for each region and fuel type. The default fuel types, regions, and geological formations represented in HSM are identical to those in OGSM.

HSM includes the following functional differences relative to OGSM:

- Single discounted cash flow methodology across all submodules
- Simplified methodology for calculating secondary oil recovery production volumes in the Onshore Submodule
- Geology-specific cost equations for calculating the economics of hydrocarbon production in the Onshore Submodule
- Updated drilling equation in the Canada Submodule
- Ability to run as part of every iteration in NEMS

In addition, HSM includes the following updates and improvements relative to OGSM:

- Incorporates costs related to penalties in the 2022 [Inflation Reduction Act](#) for venting and flaring methane
- Represents carbon capture volumes from natural gas processing facilities as part of the ongoing work on the new Carbon Capture, Transportation, Allocation, and Sequestration Module
- Calculates secondary well production volumes independent of primary well production volumes
- Distinguishes between hydrocarbon production on federal versus non-federal lands

