Short-Term Energy Outlook: Macroeconomic Forecasts

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Table of Contents

Table of Figures

Introduction

The macroeconomic forecast in our *Short-Term Energy Outlook* (STEO) is generated using S&P Global Markit Intelligence's Short-Term U.S. Macroeconomic Model (S&P Global Model). EIA supplies input to the S&P Global Model in the form of energy prices from the previous month's STEO. Taking our most recent month's energy prices as inputs, we use the S&P Global Model to produce a conditional macroeconomic forecast for the current month (Figure 1). These forecasted macroeconomic assumptions are used by other models within the Short-Term Integrated Forecasting System (STIFS)—the larger modeling platform that generates the monthly STEO. This process ensures consistency across various modeling components, by aligning macroeconomic forecasts with energy prices.

Figure 1. Generation of STEO Macroeconomic Assumptions

EIA also uses forecasts of industrial production from S&P Global to calculate additional macroeconomic variables. More specifically, we take the S&P Global Model's industrial production forecasts in conjunction with data from EIA's Manufacturing Energy Consumption Survey (MECS) to calculate an index that quantifies energy use by fuel in manufacturing industry groups.

This document describes how EIA generates the STEO's macroeconomic forecasts and calculates the macroeconomic variables published in the STEO Tables.

S&P Global Markit Intelligence's Short-Term U.S. Macroeconomic Model

The S&P Global Model is an econometric model that is grounded in economic theory. The model is estimated with quarterly time series data, but the historical data and forecasts are updated monthly. The current month's STEO uses the S&P Global Model forecasts released in the previous month. For example, the STEO released in January 2026 reflects assumptions underlying the S&P Global Model released in December 2025.

The S&P Global Model is built in EViews and EIA does not alter the underlying structure of the model or re-estimate it with alternative macroeconomic data. However, EIA does provide its own forecasts of energy prices, which are used as input to the S&P Global Model, to produce a conditional macroeconomic forecast. In other words, EIA uses the S&P Global Model to forecast how the macroeconomy would respond if EIA's forecasted energy prices were realized. The result is a macroeconomic forecast that is different than S&P's baseline forecast due to differences in assumptions regarding the future path of energy prices.

EIA's energy price forecasts: inputs to the S&P Global Model

We use the future path of energy prices—which are taken from our previous month's STEO energy price forecasts—as input to the S&P Global Model, to produce a conditional forecast of the U.S. macroeconomy. The energy prices that we use as input to the S&P Global Model include:

- MGRARUS: Retail price of motor gasoline: self-service, regular grade
- MGEIAUS: Retail price of motor gasoline: self-service, all grades
- RFTCUUS: Wholesale price of No. 6 residual fuel oil
- WP57IUS: Producer price index: petroleum
- D2RCAUS: No. 2 heating oil, residential price including taxes
- NGRCUUS: Price of natural gas, residential sector
- NGCCUUS: Price of natural gas, commercial sector
- NGICUUS: Price of natural gas, industrial sector
- NGEUDUS: Price of natural gas to electric utilities
- NGHHUUS: Henry Hub spot price of natural gas
- CLEUDUS: Price of coal to electric utilities
- ESRCUUS: Price of electricity, residential sector
- ESICUUS: Price of electricity, industrial sector
- RAIMUUS: Average price of crude oil imported into the United States

Before being used as inputs for the S&P Global Model, these variables are seasonally adjusted using the U.S. Census Bureau's X12 ARIMA seasonal adjustment methodology.

After seasonally adjusting our energy prices, we map them to a corresponding variable in the S&P Global Model. For example, we map EIA's price of coal to S&P Global's Producer Price Index for Coal. The future paths of these variables are then fixed, and we run the S&P Global Model to generate a conditional macroeconomic forecast that can be used by the STIFS.

EIA's energy-weighted industrial production indices

As a part of the STEO forecast, EIA calculates indices that measure energy use by fuel type in manufacturing. The indices, referred to as energy-weighted industrial production (EWIP) indices, are calculated using data from EIA's MECS and the U.S. Federal Reserve's Industrial Production and Capacity Utilization Survey, the G.17. The MECS collects data on energy consumption by fuel and industry group and the G.17 collects data on industrial production by industry group. The EWIP indices are calculated by taking the sum of industrial production industry groups within manufacturing after they are weighted by their share of energy consumption of a specific fuel.

The EWIP indices are computed as follows,

$$\mathrm{EWIP}_{\mathrm{fuel}} = \sum_{\mathrm{group}} \mathrm{w}_{\mathrm{fuel,group}}\ \mathrm{IP}_{\mathrm{group}}$$

Where,

- $EWIP_{fuel}$ is the energy-weighted industrial production index for a given fuel
- $w_{fuel,group}$ is the industry groups's share of energy consumption for a given fuel
- IP_{group} is the industry group's production index

For example, the natural gas energy-weighted industrial production index is computed by taking the sum of industrial production industry groups in manufacturing after weighting each by its share of total natural gas consumption in manufacturing. EIA computes energy-weighted indexes for four energy sources: coal, distillate fuel, electricity, and coal.

MECS reports energy consumption for 21 separate manufacturing industry groups identified by their three-digit North American Industry Classification System (NAICS) code. More information is available in this supplement to the STEO.

Variable conversions

Regional-to-national geographic conversion

The STEO model uses macroeconomic variables as explanatory variables at both the national and Census region levels. S&P Global provides models that generate both national and regional macroeconomic forecasts, and their regional forecasts align with their national forecast. However, because we revise S&P's national forecast to ensure consistency with EIA's STEO energy price forecasts, S&P's regional forecasts must also be updated so that, when aggregated, they remain consistent with the revised national forecast.

STEO Table 9b (U.S. Regional Macroeconomic Data) includes macroeconomic variables at the Census Region level: Real Gross State Product, Industrial Output in the Manufacturing Sector, Real Personal Income, Number of Households, and Total Non-Farm Employment. More information about the procedure to adjust the regional macroeconomic variables is available in this documentation.

Quarterly-to-monthly frequency conversion

Because STIFS forecasts variables at a monthly frequency, we convert the national and regional macroeconomic series generated by the S&P Global model from quarterly to monthly frequency. The conversion method varies based on the characteristics of each variable. For example, most variables are reported as averages over a period. These variables are converted using the *quadratic-match average* method, which fills the monthly series with a quadratic equation where the average of the three months matches the quarterly series. More information about the procedure to convert frequencies from quarterly to monthly is available in this documentation. In addition, two variables are defined as end-of-period values: number of households and housing stocks. End-of-period values are converted from monthly to quarterly frequency using the *cubic-match last* method, where quarterly values are assigned to the last month of the quarter, and interim period values are interpolated with a cubic spline.