

United States Energy Policy Simulator (EPS) Summary Documentation

Estimating Economywide Emissions for the United States

The United States Energy Policy Simulator (EPS) accounts for emissions produced in the following sectors: electricity generation, building energy consumption, industrial energy consumption, industrial process emissions, agriculture process emissions, land use change, and transportation.

Our primary sources are federal data sets from the Energy Information Association (EIA), Environmental Protection Agency (EPA), and the National Renewable Energy Lab (NREL). The table below summarizes our data sources and methodology. For benchmarking against historical emissions, see the Start Year 'Calibration.xlsx' file. For emissions projections, we primarily benchmark against the EIA's [Annual Energy Outlook](#). As of version 3.2.0 of the EPS, we use the EIA's High Oil and Gas Supply scenario, which has historically tracked more closely with natural gas prices.

► PRIMARY DATA SOURCES

Model component	Source
ELECTRICITY	For existing capacity and expected capacity factors: EIA's Form 923 and EIA's Form 860 & NREL's Annual Technology Baseline (only for new wind and solar capacity factors) For imports/exports: EIA's Annual Energy Outlook 2021 For power plant costs: NREL's Annual Technology Baseline , mid-case
BUILDING ENERGY USE	EIA's Annual Energy Outlook 2021
INDUSTRIAL ENERGY USE	EIA's Annual Energy Outlook 2021
INDUSTRIAL PROCESS EMISSIONS, INCLUDING AGRICULTURE	For methane from natural gas and petroleum systems: International Energy Agency Methane Tracker For HFCs: Data provided by the United States Climate Alliance For all other process emissions: EPA Global Non-CO2 Greenhouse Gas Emissions Projections & Mitigation Potential: 2015-2050
LAND USE AND FORESTRY	EPA Draft Inventory of US Greenhouse Gas Emissions and Sinks
TRANSPORTATION	For transport demand, vehicles, and fuel economy: EIA's Annual Energy Outlook 2021
INTEGRATED INPUT-OUTPUT MODEL	Organisation for Economic Co-operation and Development Input-Output Tables , supplemented by data from the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis where necessary
HEALTH IMPACTS	For health impacts per ton pollutant: EPA Technical Support Document

Understanding the Business-as-Usual and Reference Projections

The United States EPS model includes three scenarios. The first is a **business-as-usual (BAU) scenario**, which represents all policy that is currently enacted. The BAU Scenario is the model's foundation, capturing projected changes based on economic growth, technology and cost changes, and existing policy commitments.

► SUMMARY OF POLICY ASSUMPTIONS

Sector	BAU Scenario
Electricity	<ul style="list-style-type: none">Expected retirements from EIA's Annual Energy OutlookTax credit extensions from latest spending bill passed in December 2020Aggregated state clean electricity standards and renewable portfolio standards
Buildings	<ul style="list-style-type: none">Efficiency improvements assumed in EIA's Annual Energy Outlook
On-Road Transportation	<ul style="list-style-type: none">Includes 2012 Federal Corporate Average Fuel Economy Standards (CAFE) standards (full text via AEO)Federal EV subsidiesEconomic adoption of EVs¹
Industry	<ul style="list-style-type: none">Does not include implementation of Kigali Amendment to the Montreal Protocol.Includes methane regulations for new and modified wells
Land use/Agriculture	<ul style="list-style-type: none">Extrapolated data from Second Biennial Update Report

Example Climate Mitigation Scenarios

► U.S. NDC PATHWAY SCENARIO

Energy Innovation developed a US NDC Pathway scenario, which is designed to achieve the US NDC of reducing greenhouse gas emissions 50%-52% below 2005 levels by 2030. See the file 'NDC policy settings and calculations.xlsx' for more detail on policy assumptions.

► U.S. EXAMPLE SCENARIO

Energy Innovation developed an Example Scenario, which includes a few illustrative policies to demonstrate several features of the EPS.

¹ Electric vehicle adoption in the BAU case is based on economic adoption modeled in the EPS, detailed info available here:

<https://us.energypolicy.solutions/docs/transportation-sector-main.html>. EPS transportation data, such as vehicle prices, is largely taken from EIA, and the resulting EV adoption curve rates are similar to other studies, including the "Electric Vehicle Outlook 2020": <https://about.bnef.com/electric-vehicle-outlook/#toc-viewreport>.

Calculating Policy Impacts

For additional information on Energy Innovation's Energy Policy Simulator, please view the tutorial [here](#). Detailed model documentation is also available [here](#).

About the EPS

The Energy Policy Simulator is a non-partisan, open-source, and peer-reviewed model. The EPS was developed to evaluate the impacts of climate and energy policies on emissions, costs and savings, and fuel consumption. The EPS model is used by policymakers to select and refine climate legislation. For example, the EPS model was used to assess the impact of climate policies for the U.S. House Select Committee on the Climate Crisis.² EPS users input climate policies and the model then analyzes interacting policy impacts to forecast environmental and economic outcomes. The model generates a variety of data outputs including greenhouse gas emissions, criteria pollutant emissions, capital and operating cash flow changes, and macroeconomic changes to GDP and jobs. RMI and Energy Innovation are currently developing EPS models for all 50 U.S. states.

The EPS model is available for download online [here](#).³ And full documentation on methodology and assumptions are available online [here](#).⁴

Contact

If you have questions about using the EPS, we recommend first watching our video series, available [here](#).⁵ For further information on the EPS, contact us at policy@energyinnovation.org.

² <https://energyinnovation.org/2020/07/28/hal-harveys-insights-and-updates-congressional-climate-plan-is-a-bet-your-country-moment/>

³ <https://us.energypolicy.solutions/docs/download.html>

⁴ <https://us.energypolicy.solutions/docs/index.html>

⁵ <https://us.energypolicy.solutions/docs/video-series.html>