EIA's Energy Outlooks and Projections

Energy Council's Federal Energy and Environmental Matters Conference

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U.S. Energy Information Administration

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www.eia.gov

Short-Term Energy Outlook Overview

The U.S. Energy Information Administration (EIA) produces the Short-Term Energy Outlook (STEO) every month

Provides a forecast of U.S. energy prices and volumes and international petroleum market prices and volumes through the end of the next calendar year

Frequently publish supplements that further explore specific areas of energy markets and/or conducts scenario analysis on key areas of uncertainty

Annual Energy Outlook Overview

Utilizes EIA's National Energy Modeling System (NEMS) to generate projections and trends for the U.S. energy sector through 2050 in the Annual Energy Outlook (AEO)

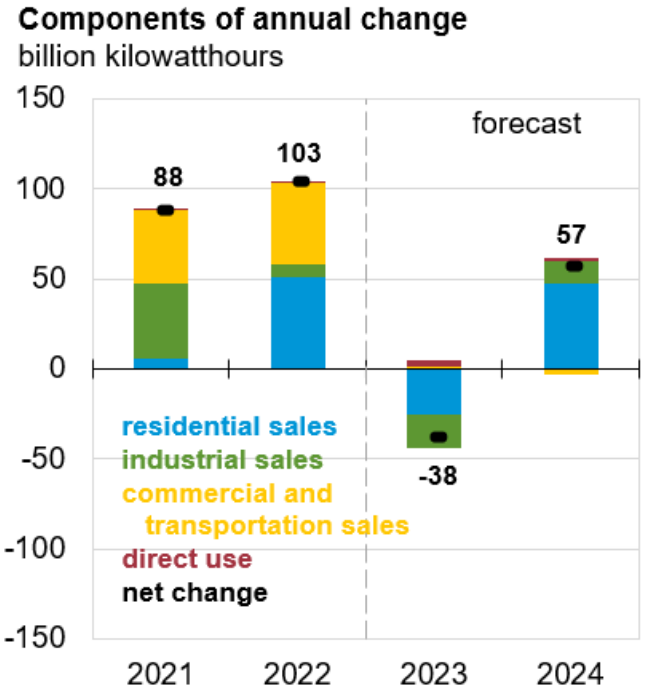
Reference case and 15 additional side cases that vary technical and economic assumptions

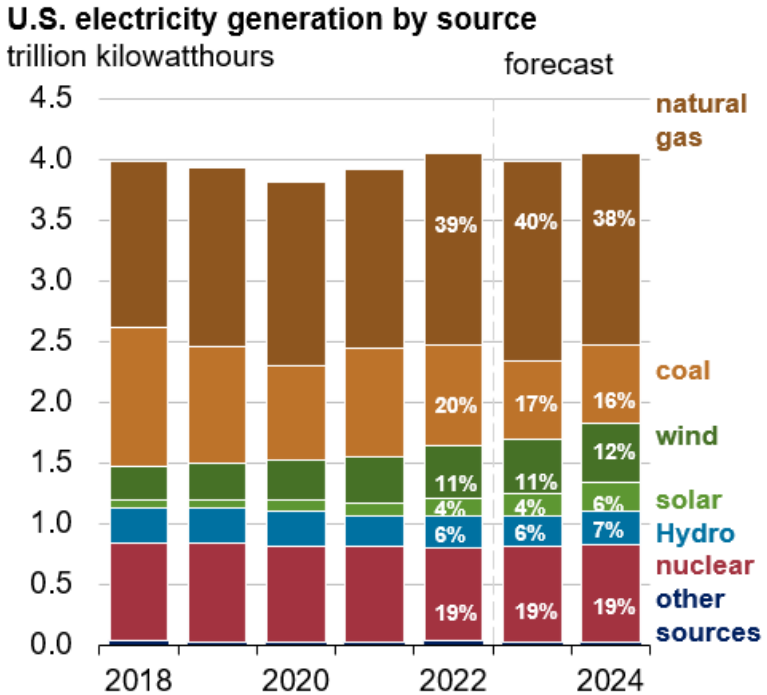
All cases reflect current laws and regulations as of November 2022, including the Inflation Reduction Act

By law, our data, analyses, and forecasts are independent of approval by any other officer or employee of the U.S. government

Electricity Markets

EIA forecasts that total U.S. electricity consumption will drop in 2023 (left), but that renewable generation will continue to grow (right)



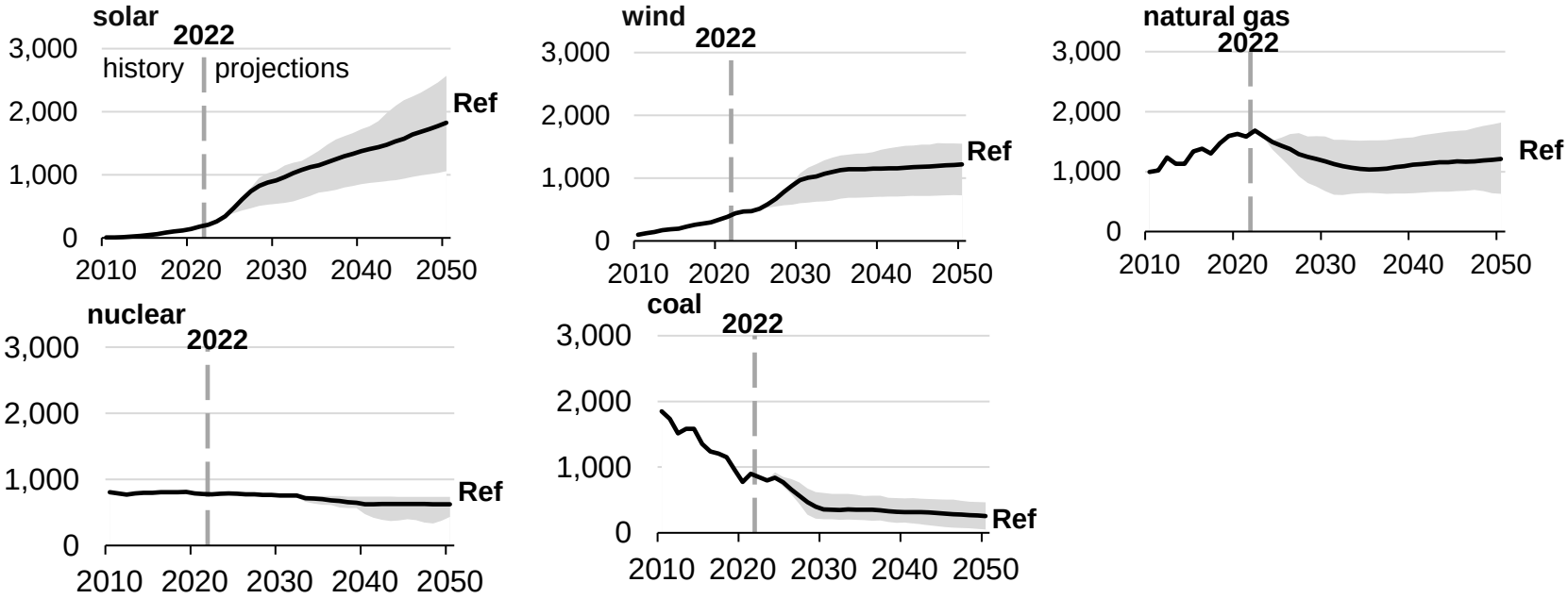


Data source: U.S. Energy Information Administration, *June Short-Term Energy Outlook*

In *AEO2023*, Power demand is increasingly met by renewables in the long-term

U.S. electricity generation by select technologies for all cases

billion kilowatthours



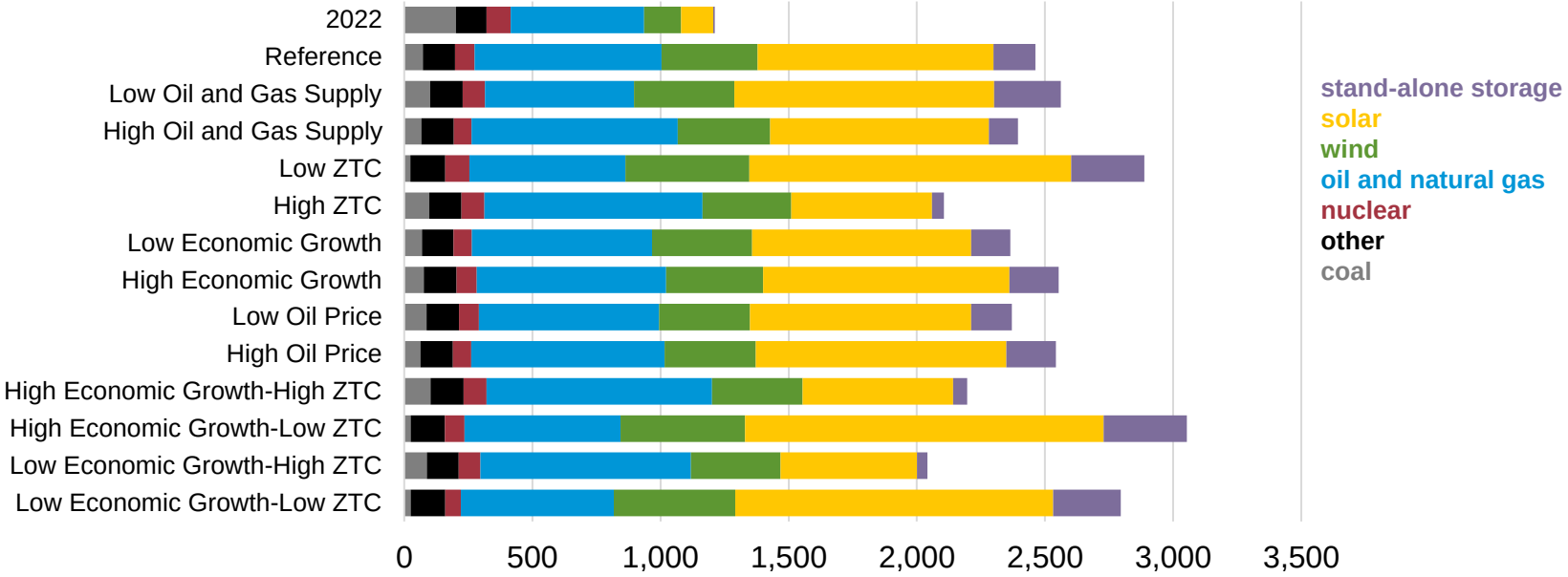
Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)

Note: Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases.

Ref=Reference case

Total installed generating capacity more than doubles across most scenarios

Total installed capacity in all sectors, 2022 (history) and 2050
gigawatts

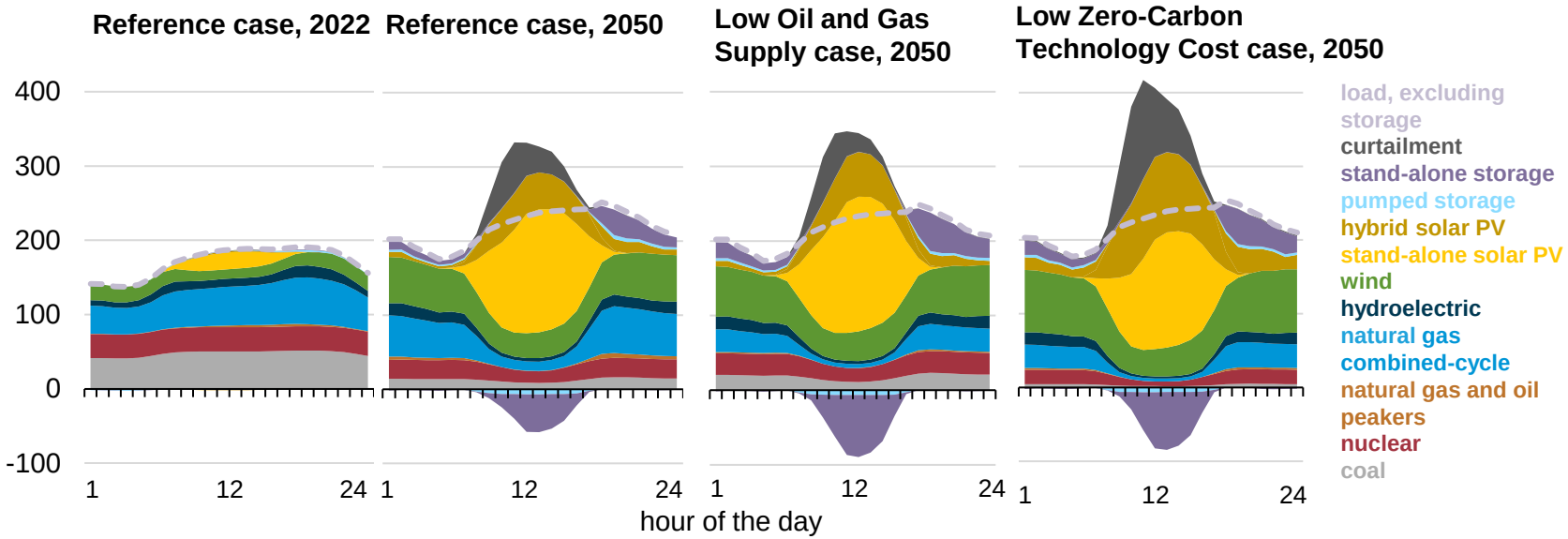


Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)

Note: ZTC=Zero-Carbon Technology Cost; other=geothermal, biomass, municipal waste, fuel cells, hydroelectric, pumped hydro storage

More intermittent renewables in 2050 lead to more curtailment and usage of battery storage

Hourly U.S. electricity generation and load by fuel for selected cases and representative years
billion kilowatthours

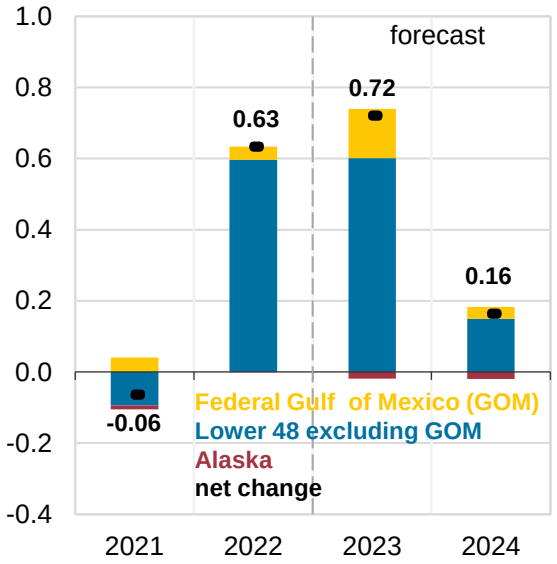


Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)
Note: Negative generation represents charging of energy storage technologies such as pumped hydro and battery storage. Hourly dispatch estimates are illustrative and are developed to determine curtailment and storage operations; final dispatch estimates are developed separately and may differ from total utilization as this figure shows. Standalone solar photovoltaic (PV) includes both utility-scale and end-use PV electricity generation.

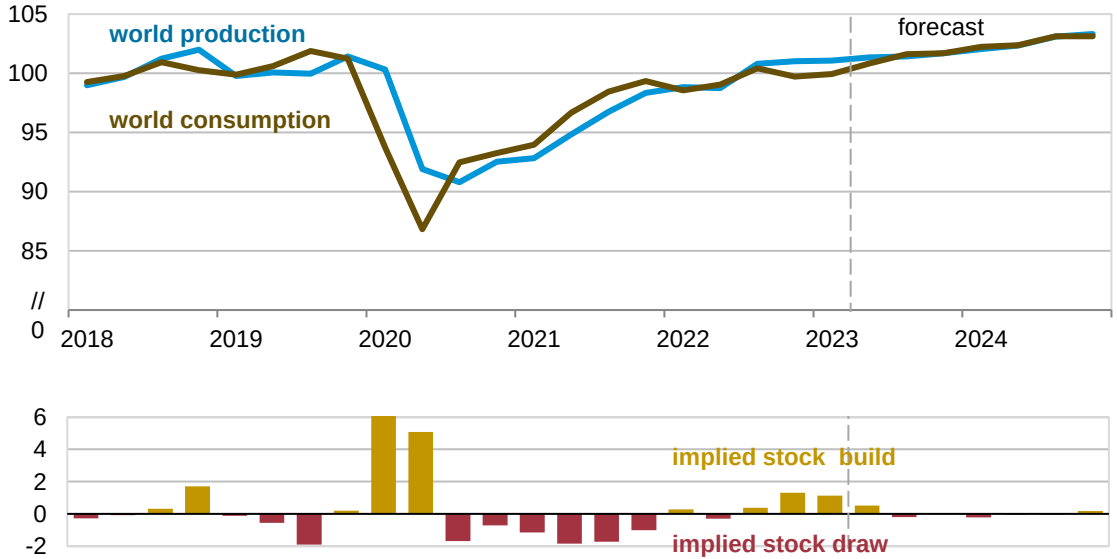
Petroleum and Natural Gas Markets

Even though U.S. oil production growth slows in 2024 (left), EIA expects global petroleum markets to be roughly balanced next year (right)

U.S. production, components of annual change
million barrels per day



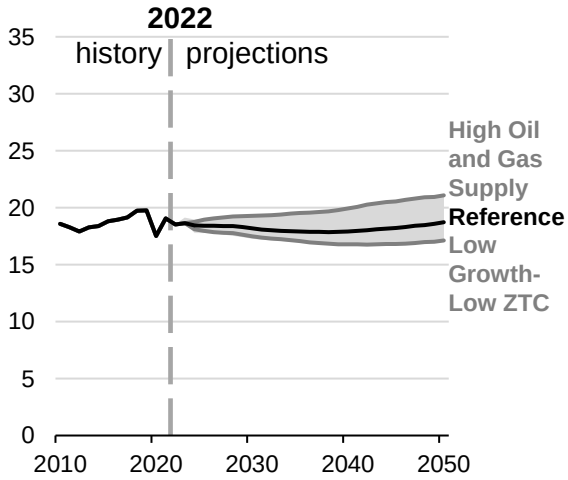
World liquid fuels production and consumption balance
million barrels per day



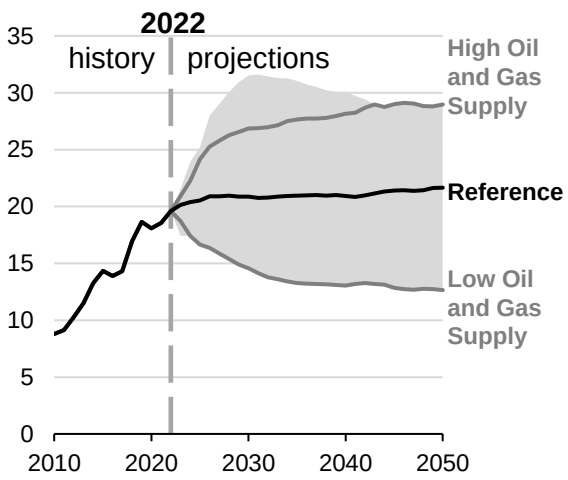
Data source: U.S. Energy Information Administration, Short-Term Energy Outlook, June 2023

In all *AEO2023* cases, we project that the United States will remain a net exporter of petroleum products through 2050

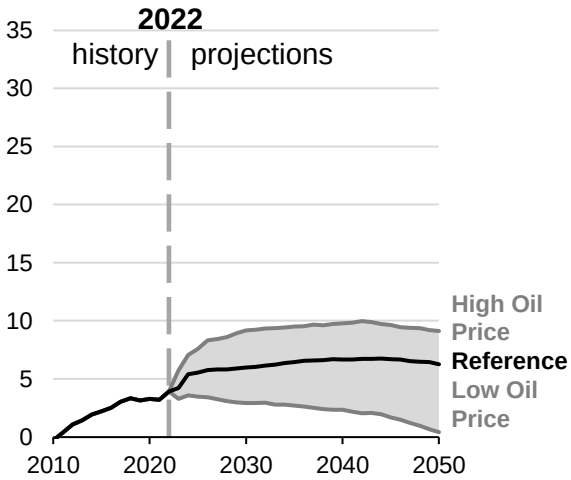
Petroleum and other liquids consumption
million barrels per day



Petroleum and other liquids production
million barrels per day

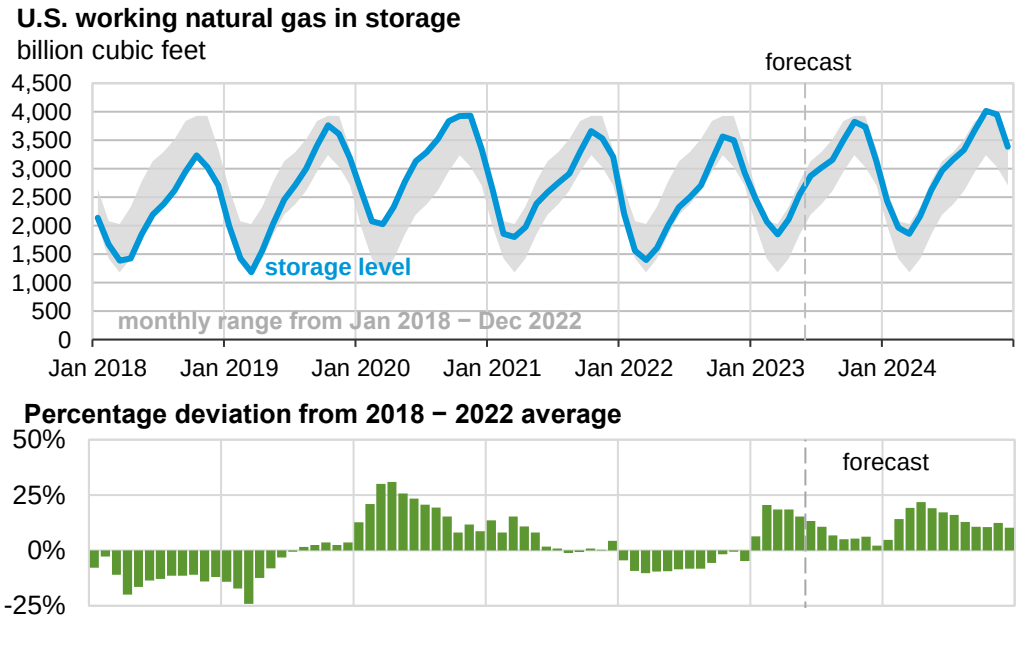


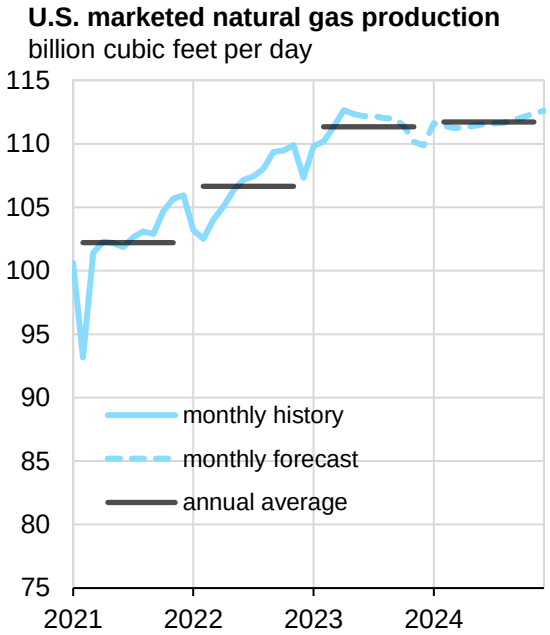
Petroleum products net exports
million barrels per day



Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)
Note: Biofuels are not included in *petroleum and other liquids* production or consumption. Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases. ZTC=Zero-Carbon Technology Cost

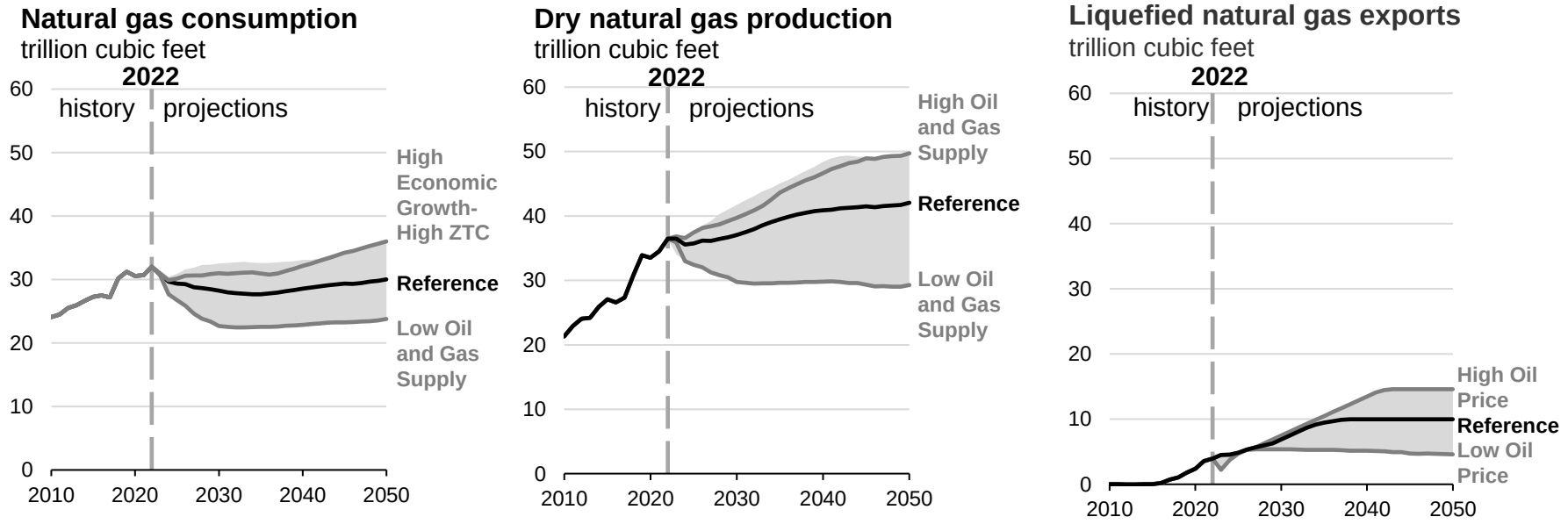
The U.S. natural gas market flipped from low storage levels to high storage levels from 2022 to 2023 as domestic production increased





Data source: U.S. Energy Information Administration, *June Short-Term Energy Outlook*

In *AEO2023*, Liquefied natural gas exports drive production; domestic consumption remains stable



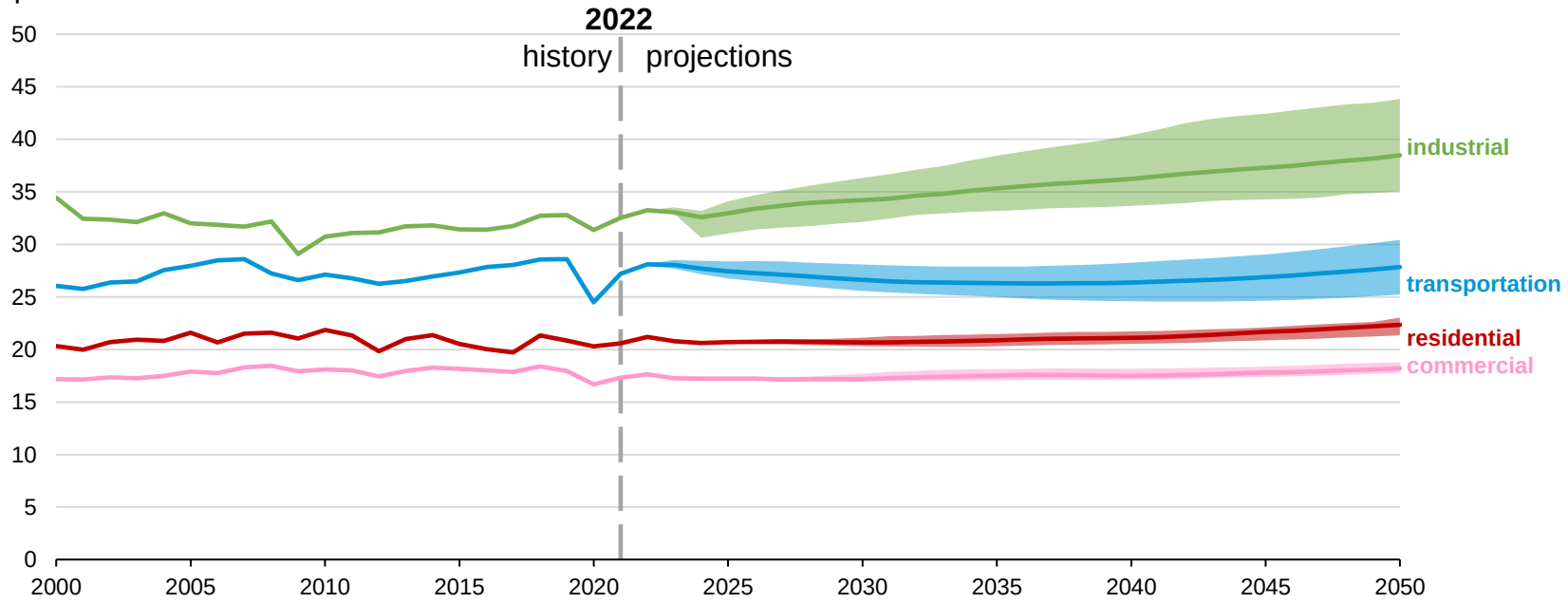
Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)
Note: Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases. ZTC=Zero-Carbon Technology Cost

Energy Consumption and Emissions

U.S. energy consumption in *AEO2023* increases by 2050, as economic and population growth outweigh gains in efficiency

Total energy consumption by end-use sector

quadrillion British thermal units

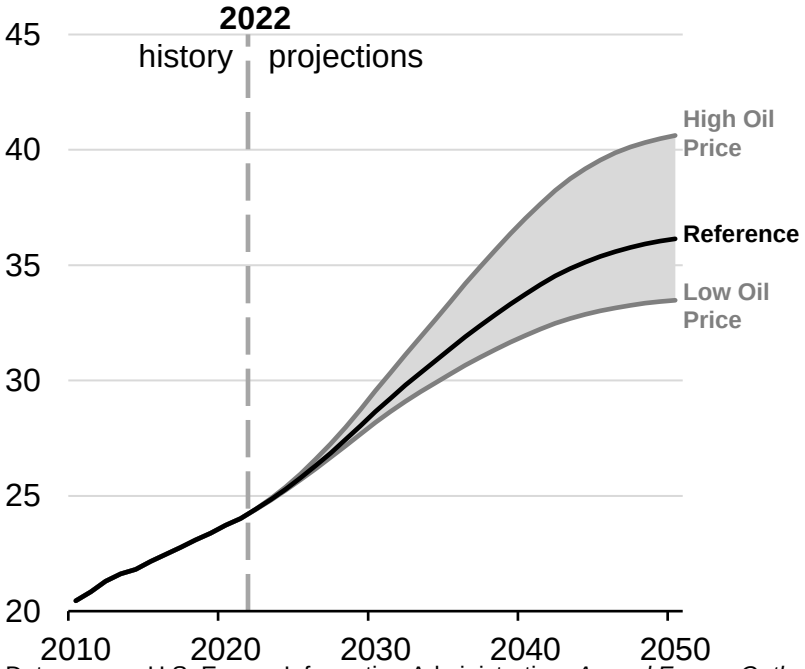


Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)

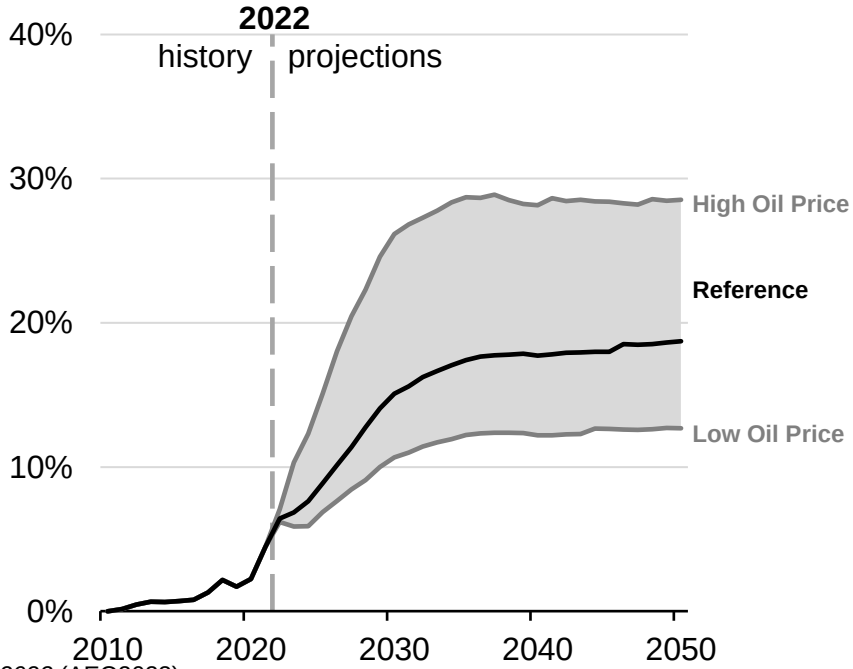
Note: Total consumption in end-use sectors includes purchased electricity and electricity-related losses. Each line represents AEO2023 Reference case projections. Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases.

Light-duty vehicle fuel economy and electric vehicle market share increase through 2050 due to rising CAFE Standards and other incentives

Light-duty vehicle average fuel economy
miles per gallon



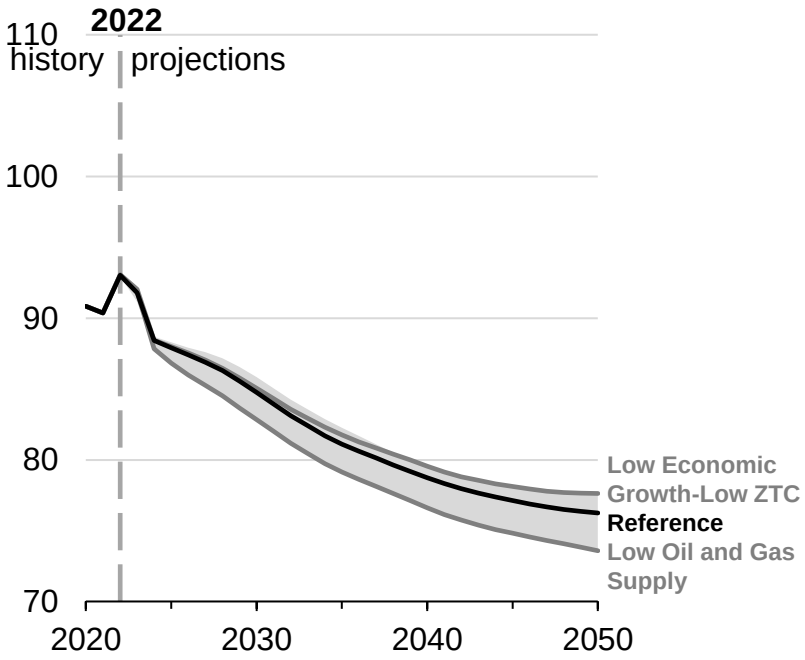
Market share of electric light-duty vehicles*
percentage of sales



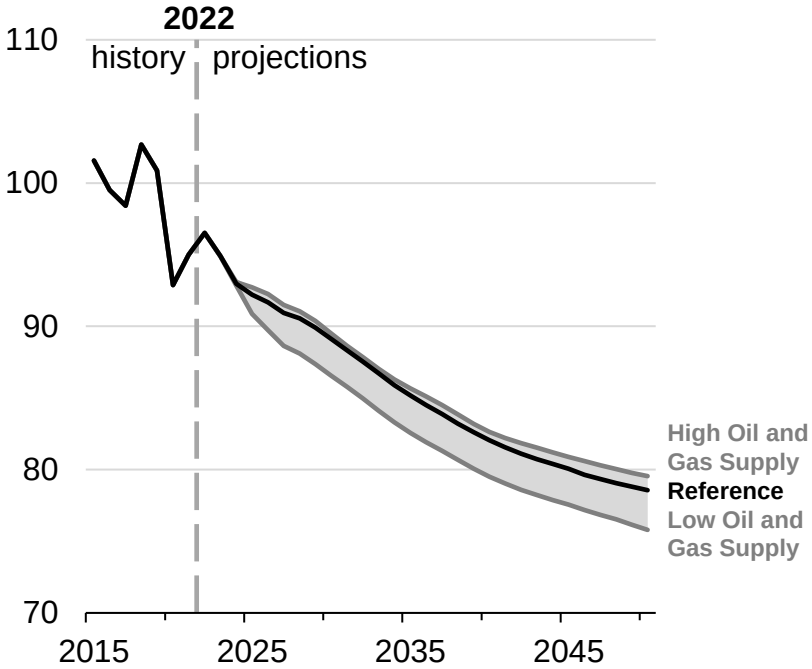
Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)
Note: *Includes battery electric and plug-in hybrid electric vehicles. Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases.

Average energy intensity in the residential and commercial sectors declines through 2050 across all cases

Residential delivered energy intensity
million British thermal units per household

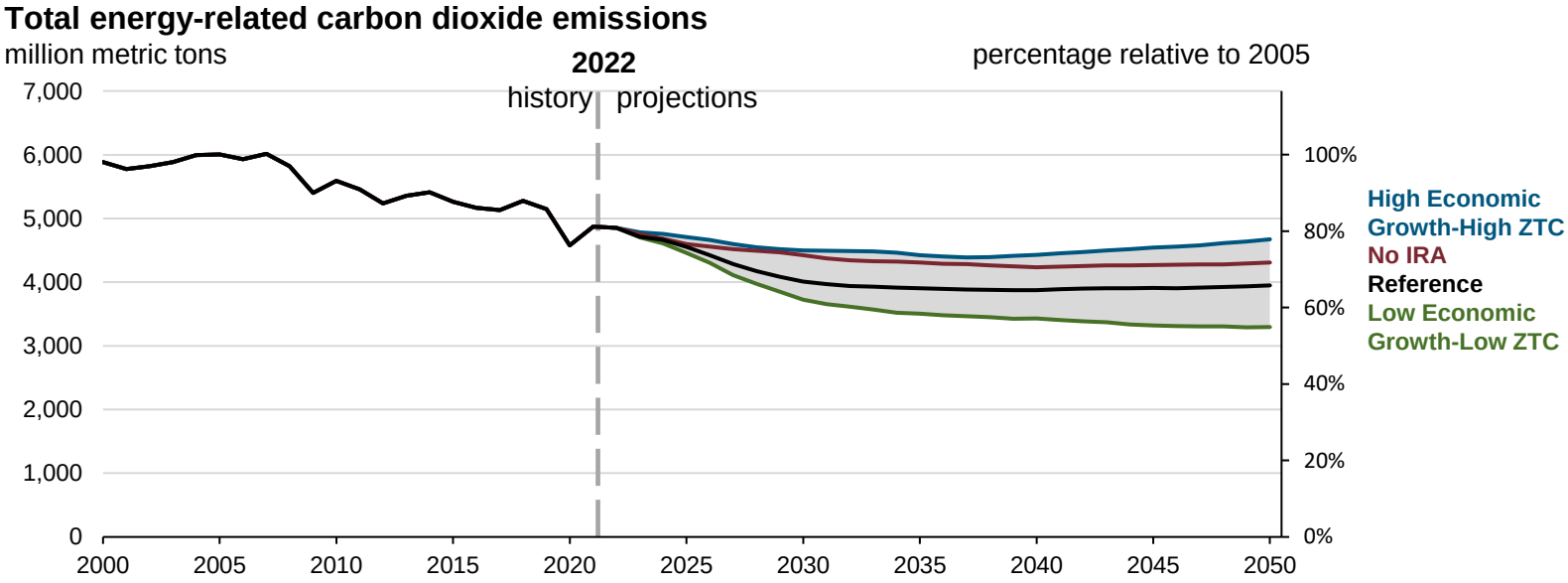


Commercial delivered energy intensity
thousand British thermal units per square foot



Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)
Note: Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases.
ZTC=Zero-Carbon Technology Cost

By 2030, energy-related CO_2 emissions fall 25% to 38% below 2005 levels



Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)
Note: Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases. ZTC=Zero-Carbon Technology Cost; IRA=Inflation Reduction Act.

Independent Statistics and Analysis

U.S. Energy Information Administration

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