



Winter Fuels Outlook 2023–2024

A supplement to the Short-Term Energy Outlook

*Joseph F. DeCarolis, Administrator
October 16, 2023 | Washington, DC*

What is the *Winter Fuels Outlook*?

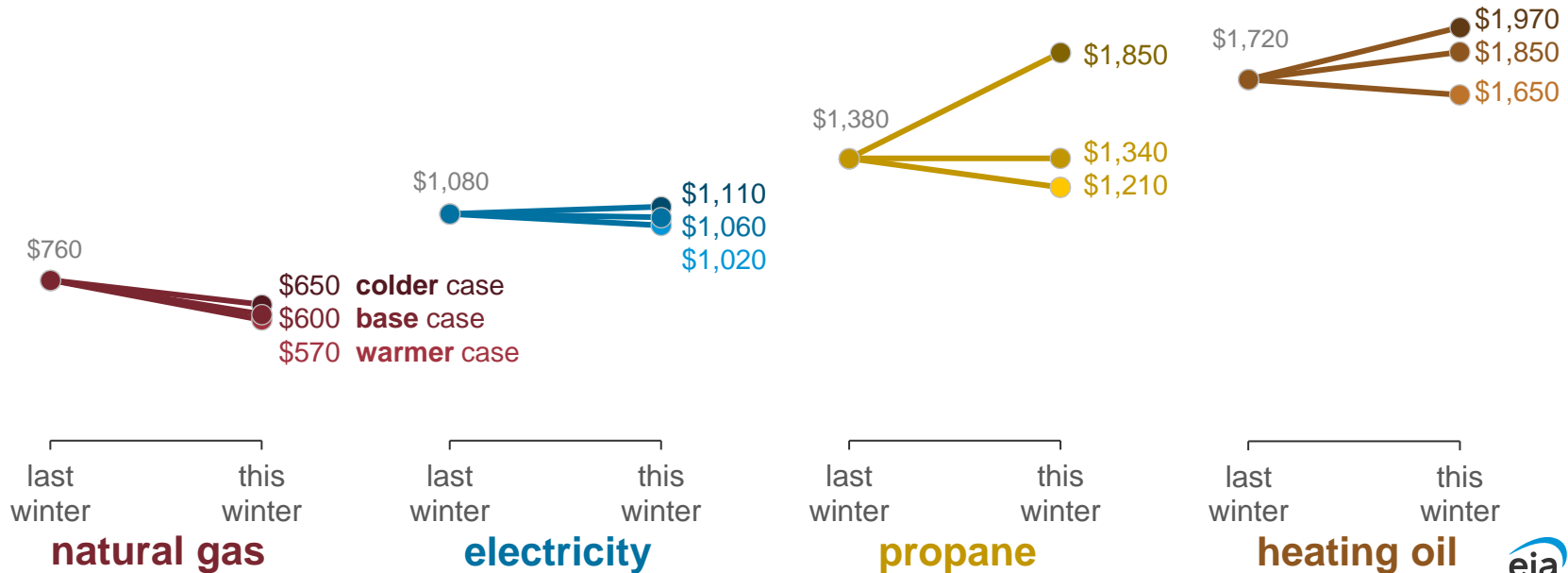
EIA's forecasts for
upcoming winter
**residential energy
expenditures**

Energy market
conditions for heating
fuels

We expect the majority of households will **spend less** on energy this winter

Residential energy expenditures

nominal dollars

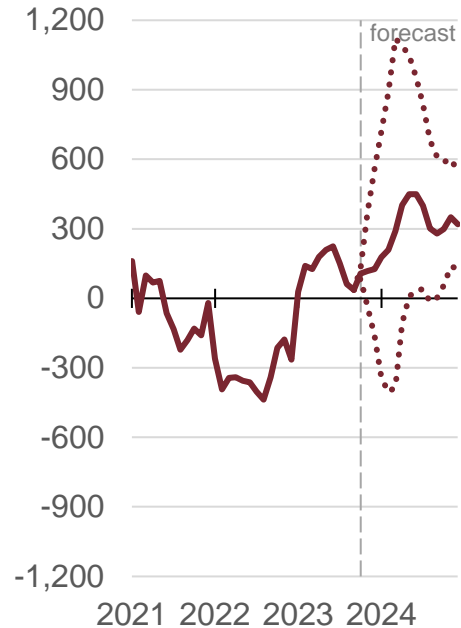


Source: Winter Fuels Outlook

Natural gas and propane inventories are **relatively high**; distillate inventories are **relatively low**

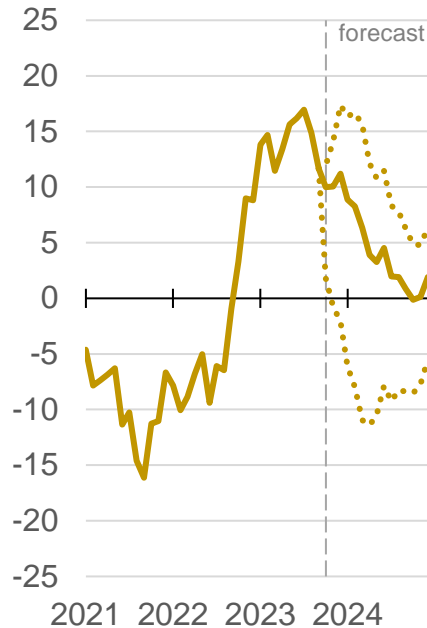
U.S. natural gas inventory

billion cubic feet



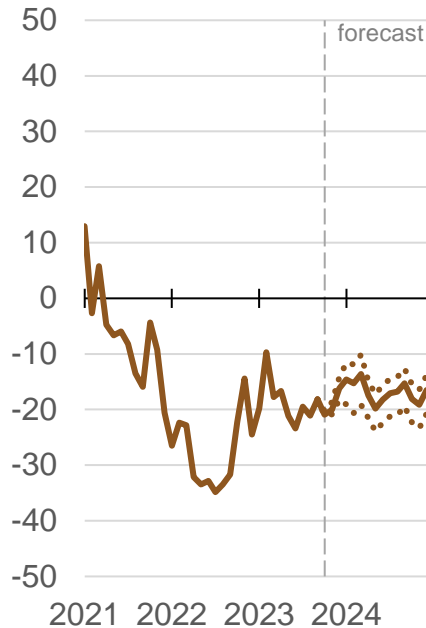
U.S. propane inventory

million barrels



U.S. distillate fuel oil inventory

million barrels



↑ **more fuel** in storage than previous five-year average

warmer case
base case
colder case

↓ **less fuel** in storage than previous five-year average

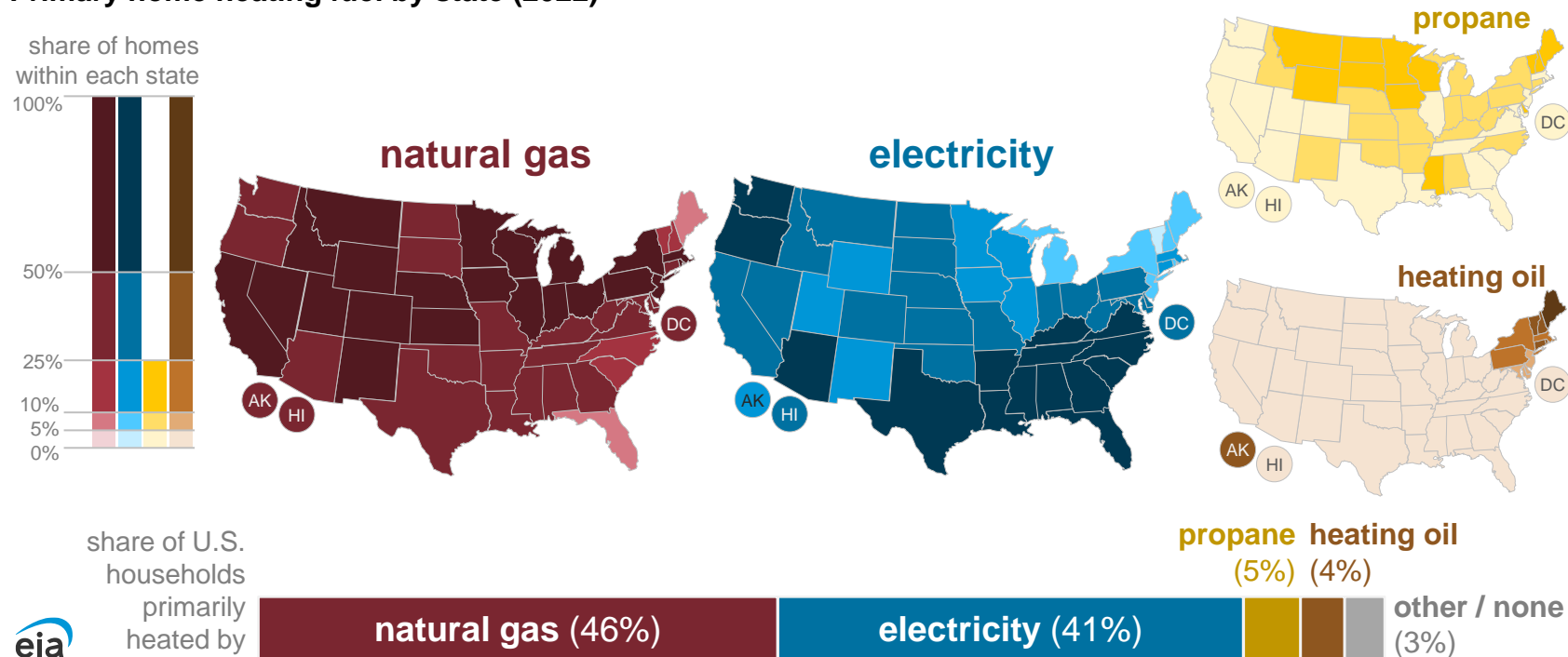


Source: Winter Fuels Outlook

Energy Expenditures

97% of U.S. homes are primarily heated with one of four fuels

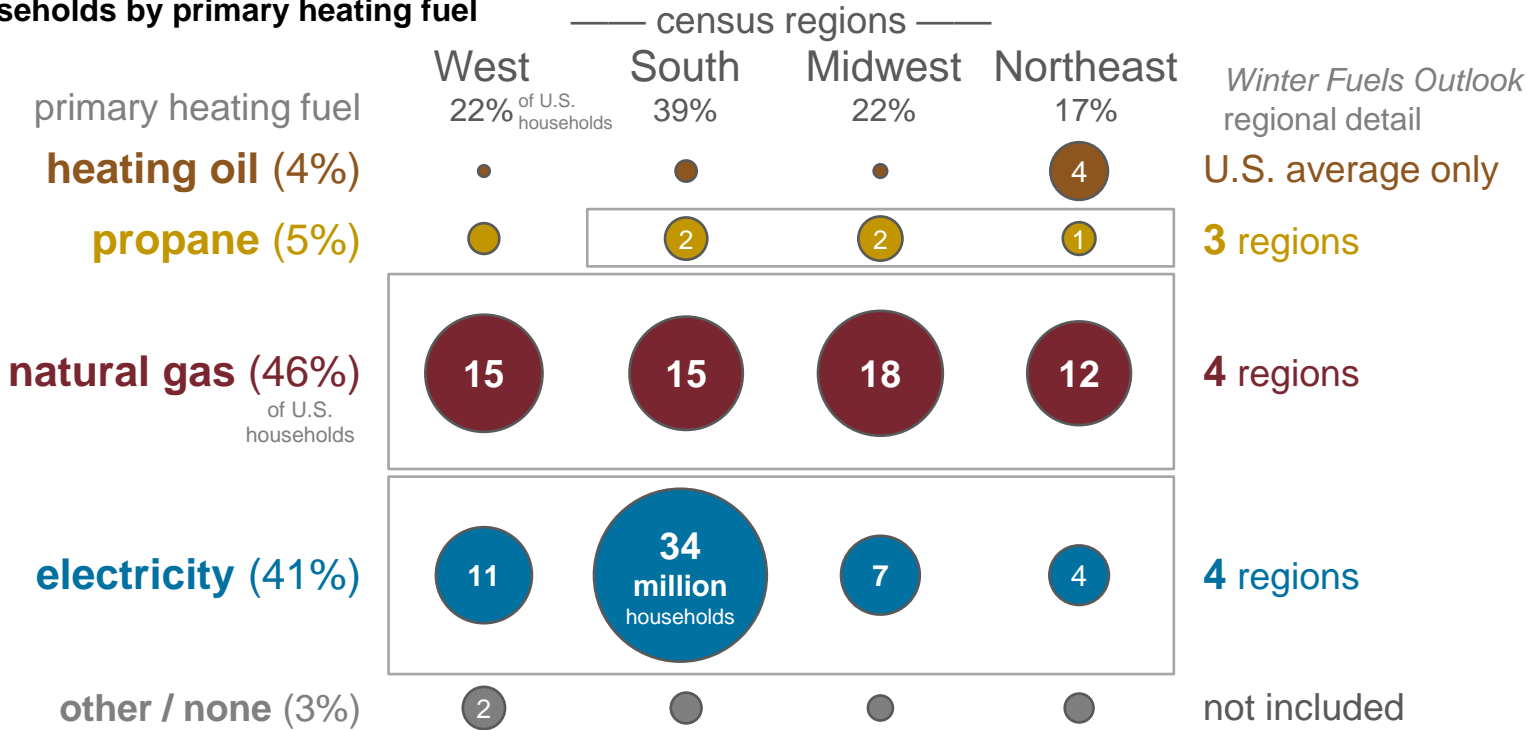
Primary home heating fuel by state (2022)



Data source: U.S. Census Bureau American Community Survey (ACS)

Our *Winter Fuels Outlook* has regional detail for three fuels

U.S. households by primary heating fuel

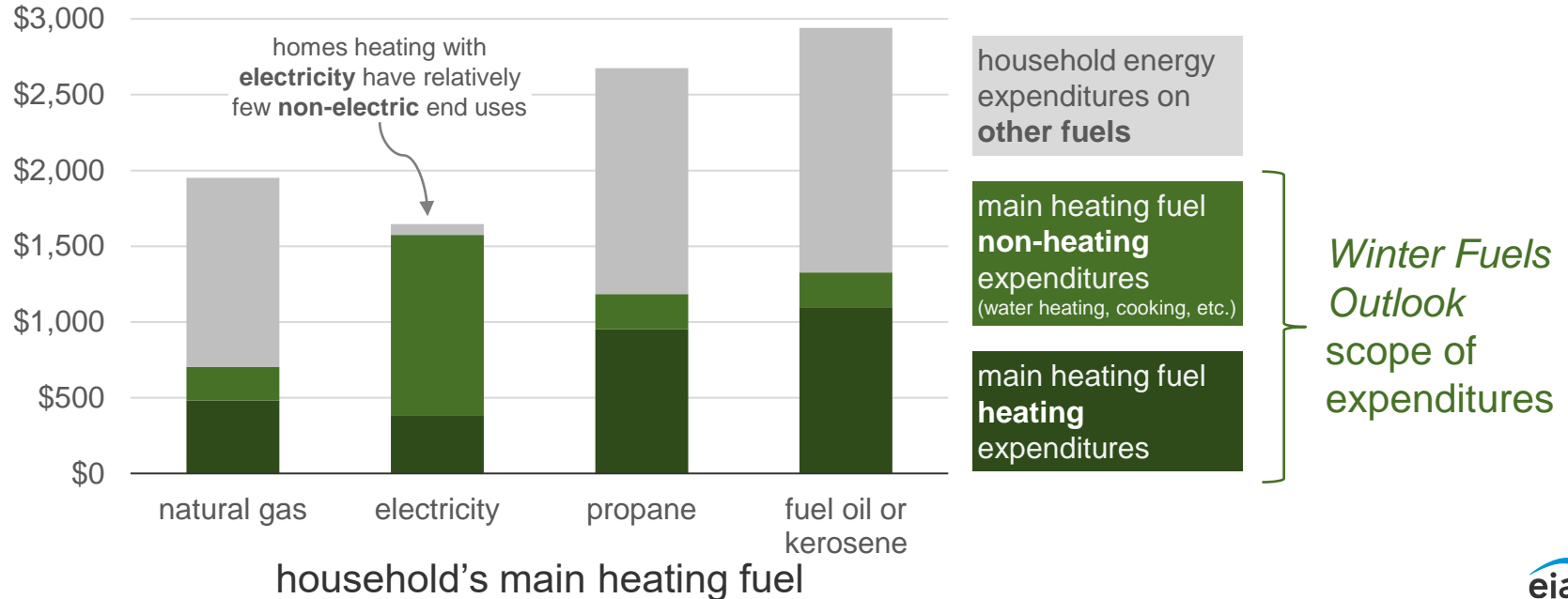


Data source: Short-Term Energy Outlook

Estimates for expenditures include **all end uses** for that fuel, not just heating

U.S. average energy expenditures (2020)

dollars

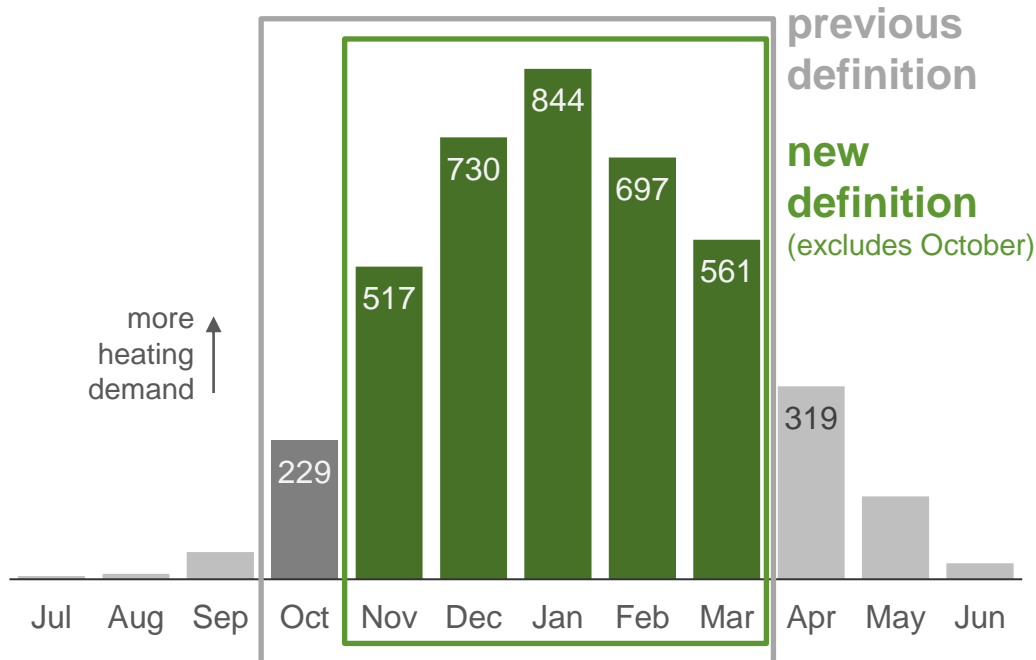


Source: Residential Energy Consumption Survey, 2020, Table CE4.16

We've changed our definition of the **winter season**

U.S. population-weighted heating degree days

previous ten-year average



- October usually has warmer temperatures and less heating demand than April.
- New definition has about 6% less heating demand for the *winter season*.
- We've recalculated previous winter estimates to exclude October.

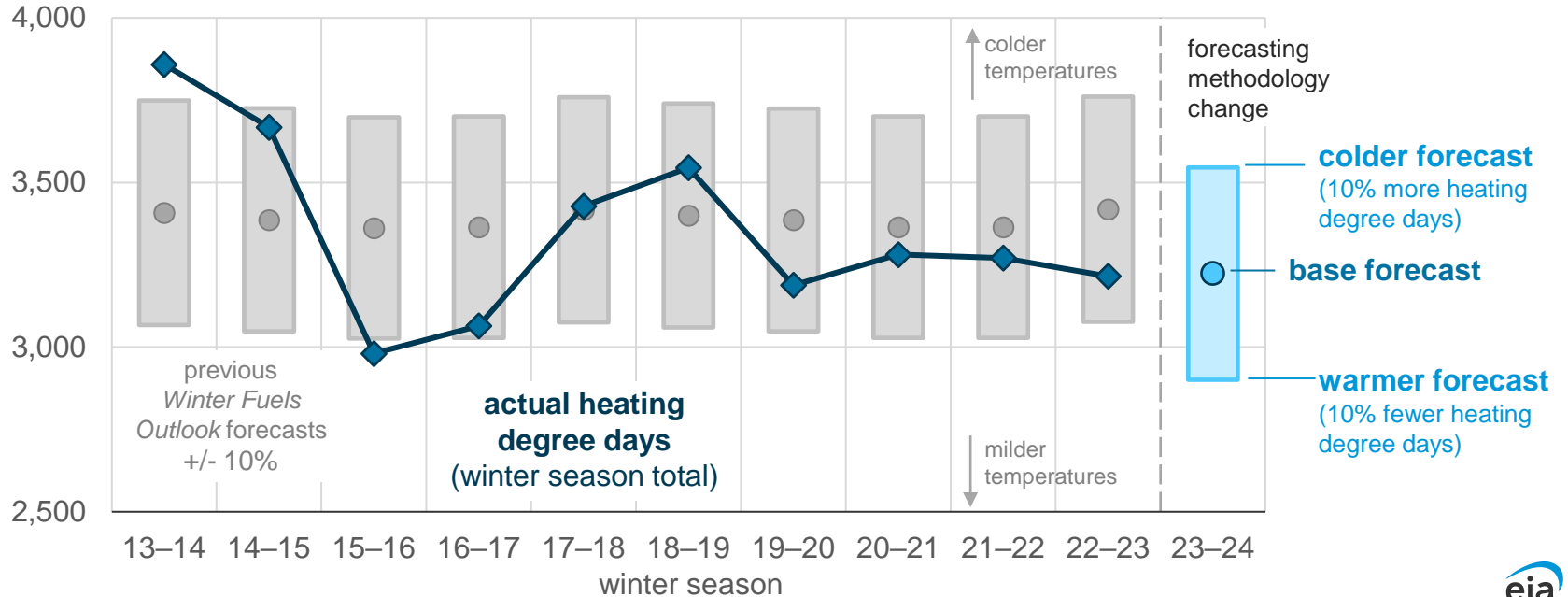


Source: Short-Term Energy Outlook

Temperatures are a key source of uncertainty in our forecasts

U.S. population-weighted heating degree days

degree days



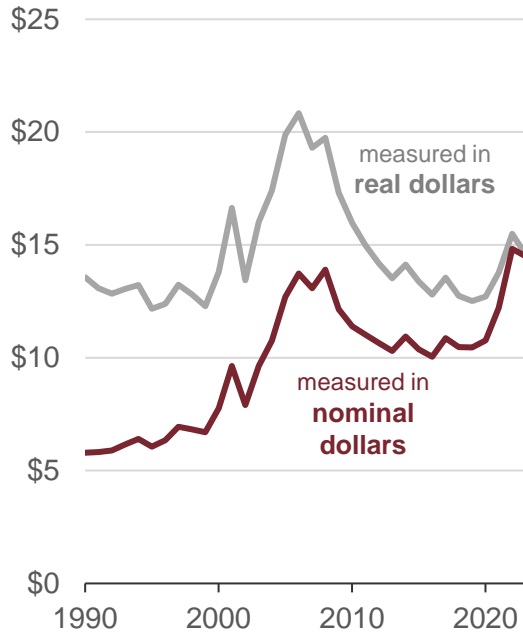
Source: Short-Term Energy Outlook



Long-term price and expenditure comparisons can differ if measured in **real dollar terms**

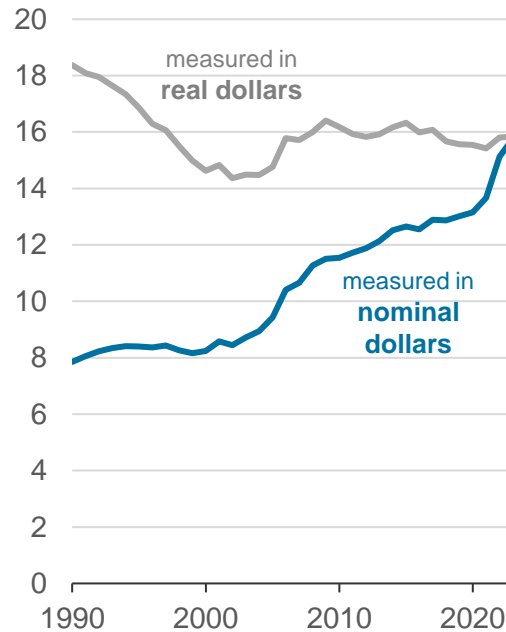
Retail natural gas prices

dollars per thousand cubic feet



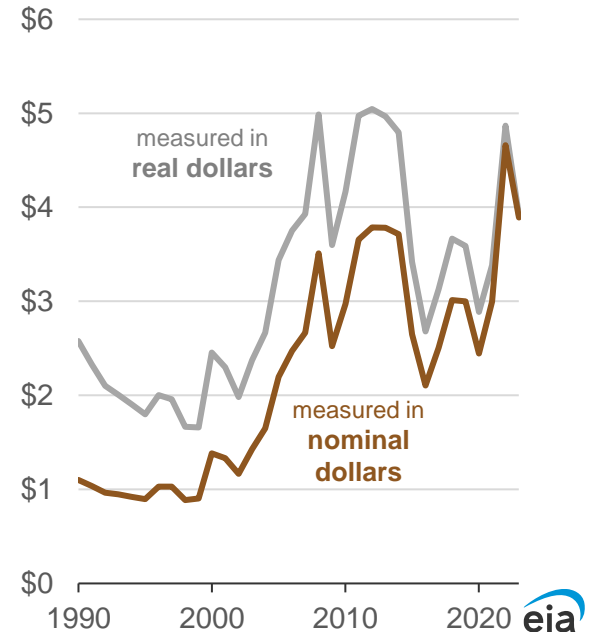
Retail electricity prices

cents per kilowatthour



Retail heating oil prices

dollars per gallon

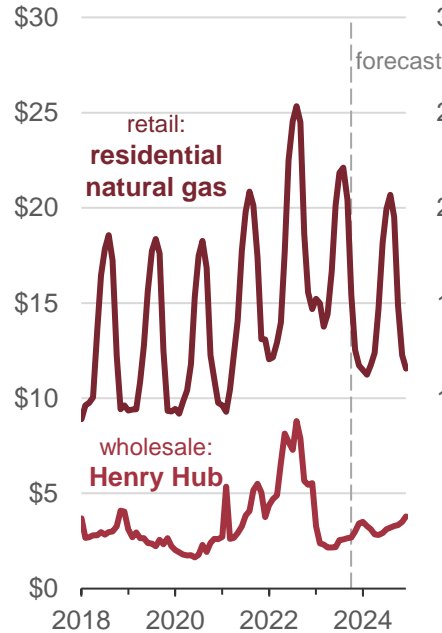


Source: Short-Term Energy Outlook Real Prices Viewer

Changes in wholesale prices ultimately affect retail prices, but the timing of these changes varies by market

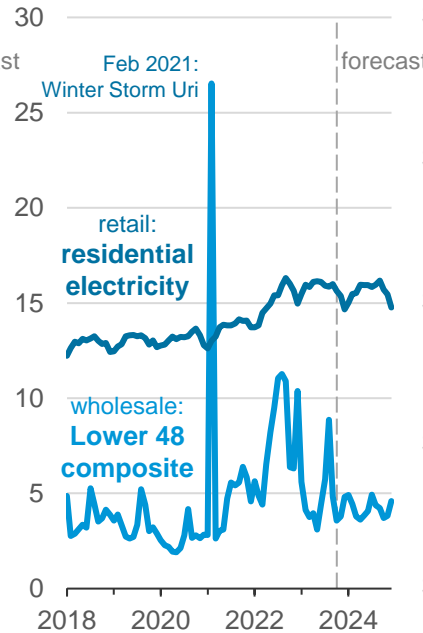
Natural gas prices

dollars per thousand cubic feet



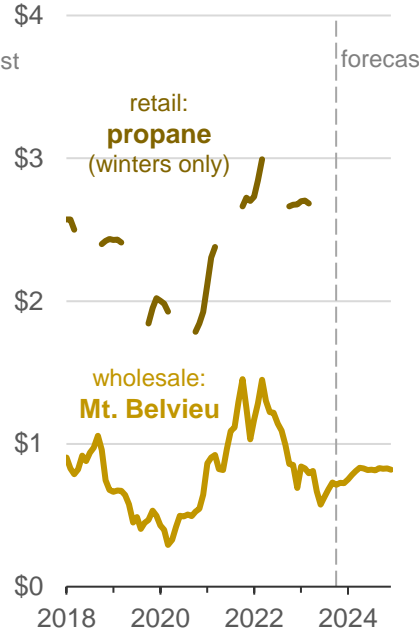
Electricity prices

cents per kilowatt-hour



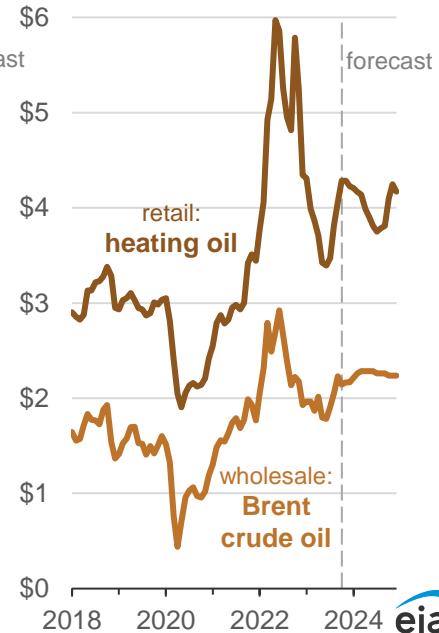
Propane prices

dollars per gallon



Heating oil prices

dollars per gallon

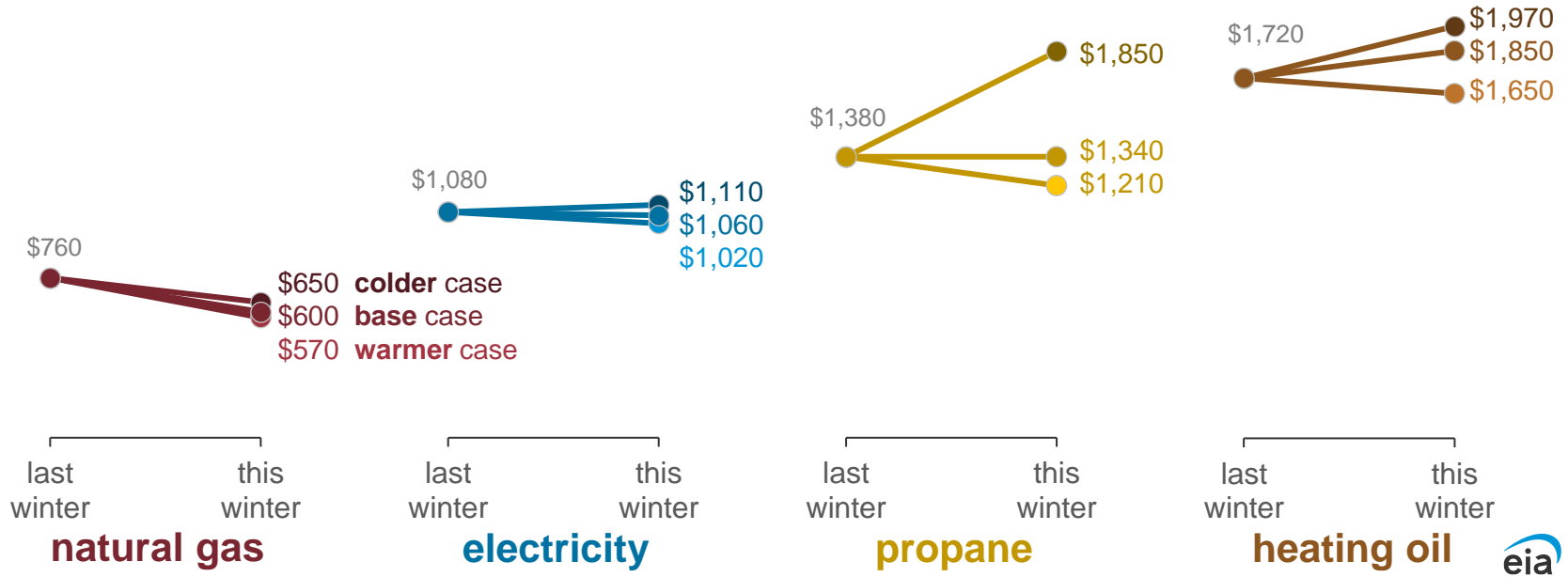


Source: Short-Term Energy Outlook; Heating Oil and Propane Update

Weather affects energy expenditures in two ways

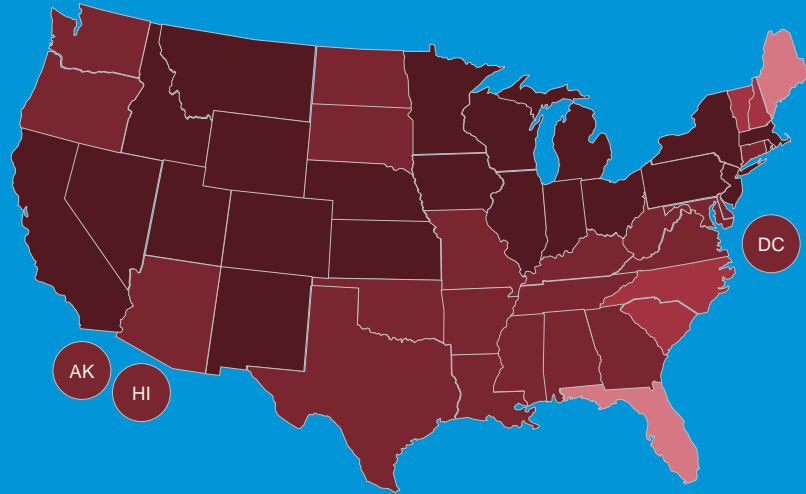
Residential energy expenditures

nominal dollars



Source: Winter Fuels Outlook

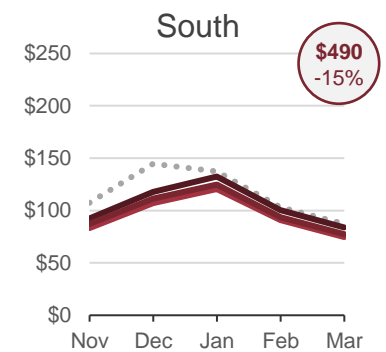
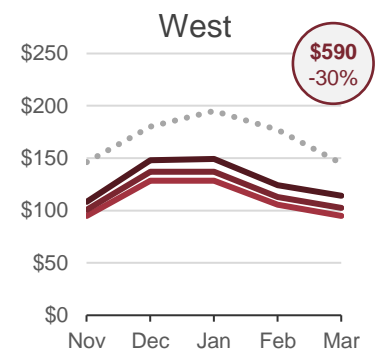
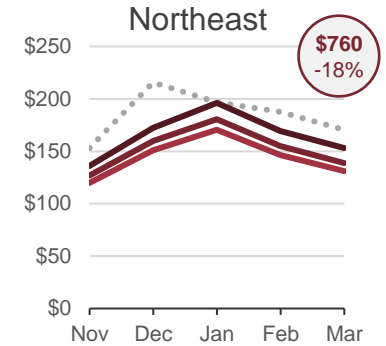
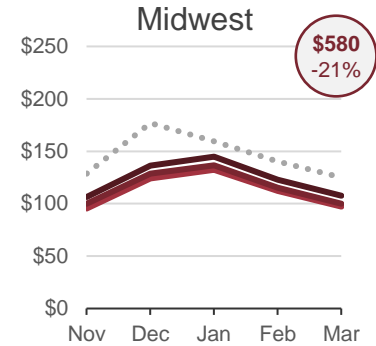
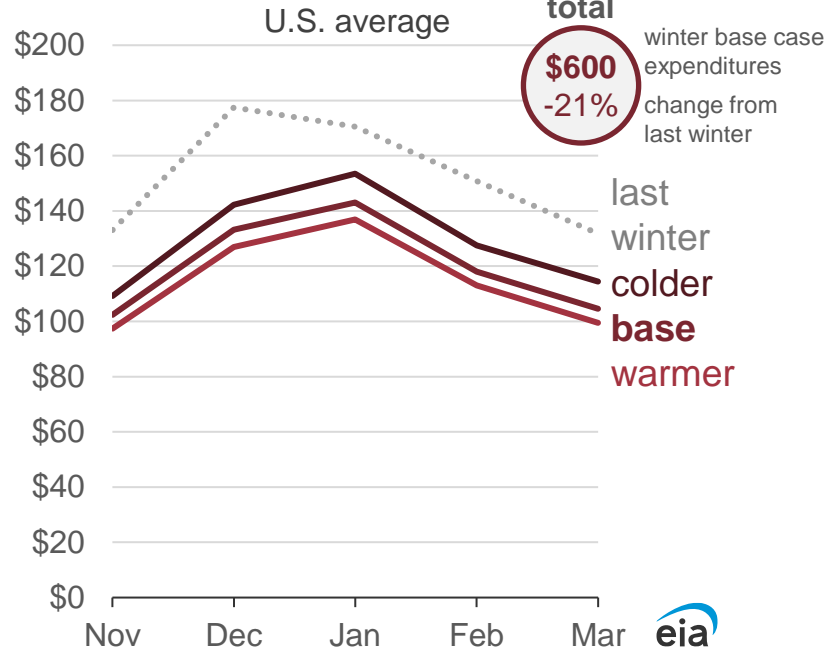
Natural Gas



Natural gas expenditures forecast to be **21% lower** this winter

Monthly natural gas expenditures

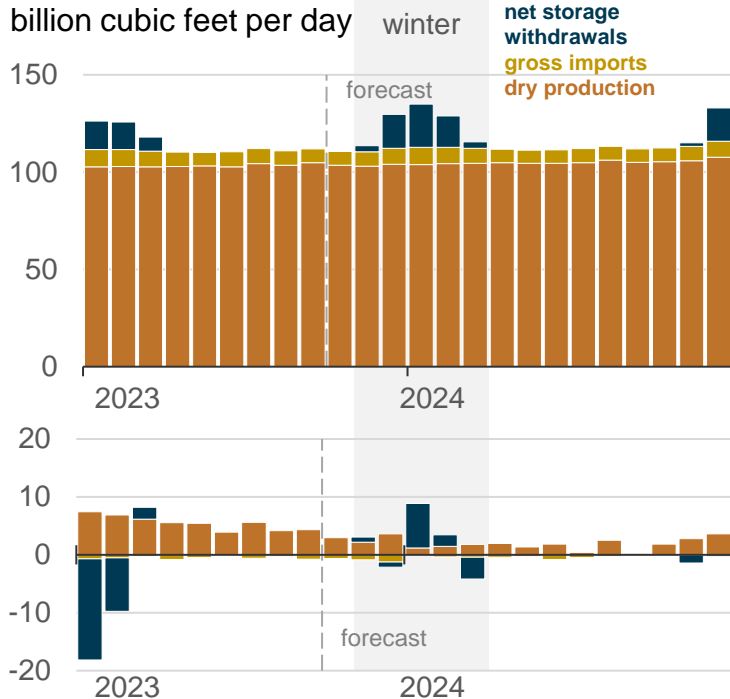
nominal dollars



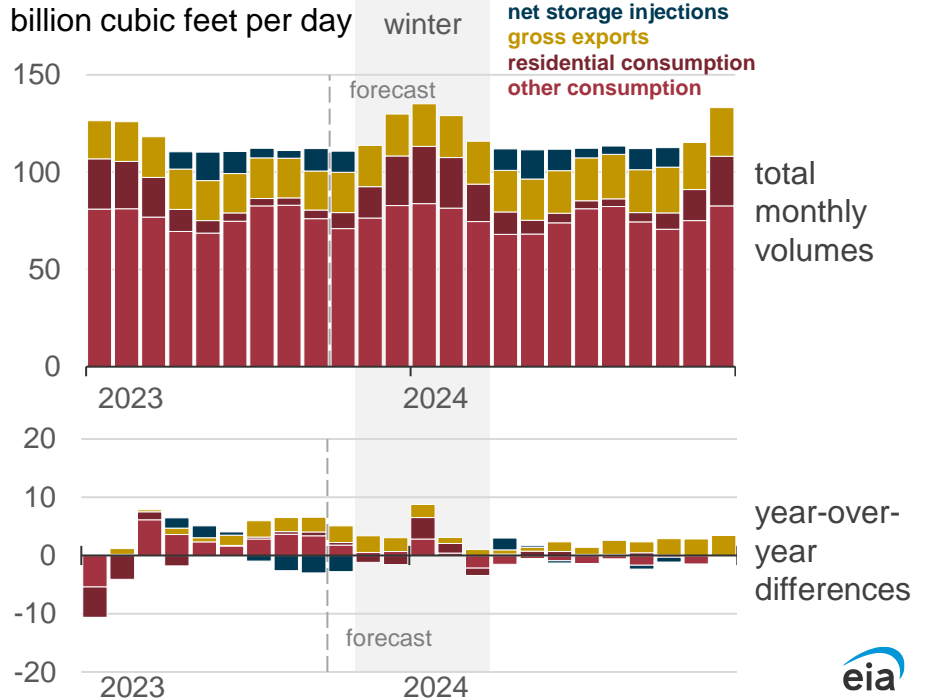
Data source: Winter Fuels Outlook

Natural gas production has continued to increase

Natural gas supply



Natural gas disposition



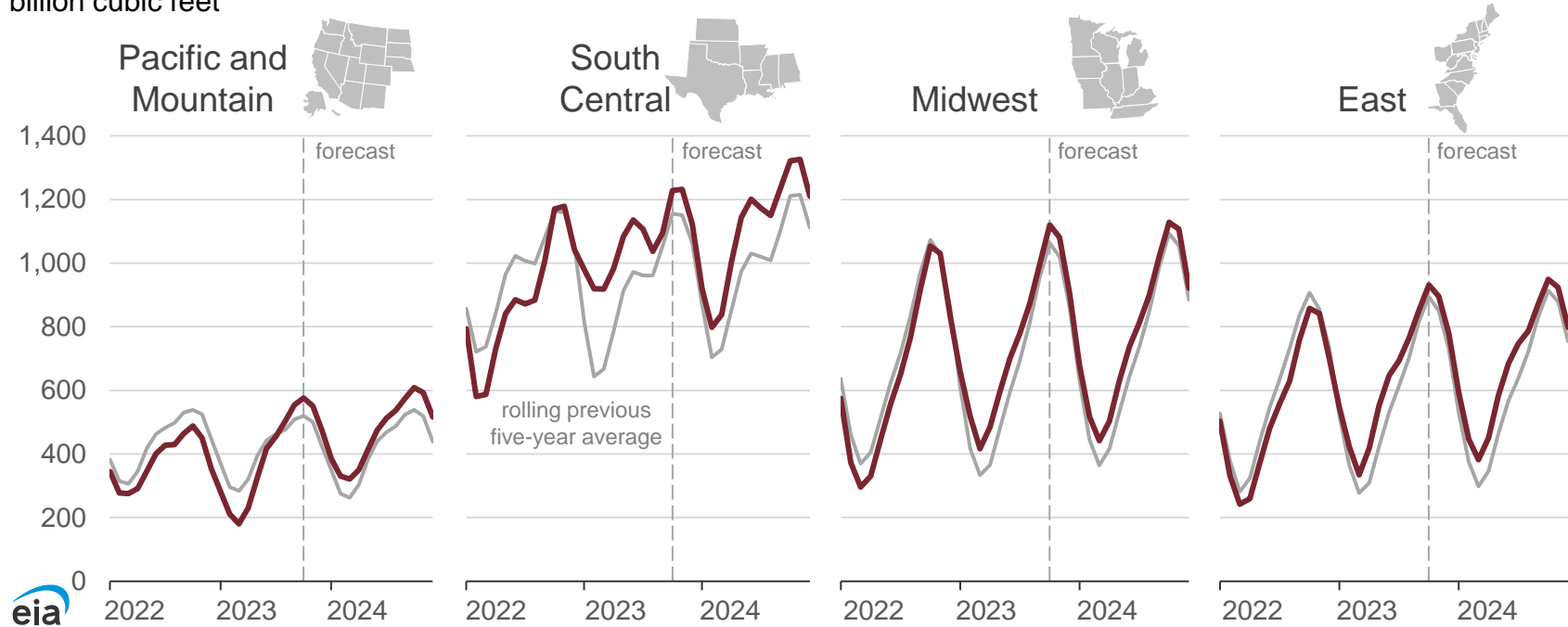
Data source: Short-Term Energy Outlook



Natural gas inventories are **above average** across the country

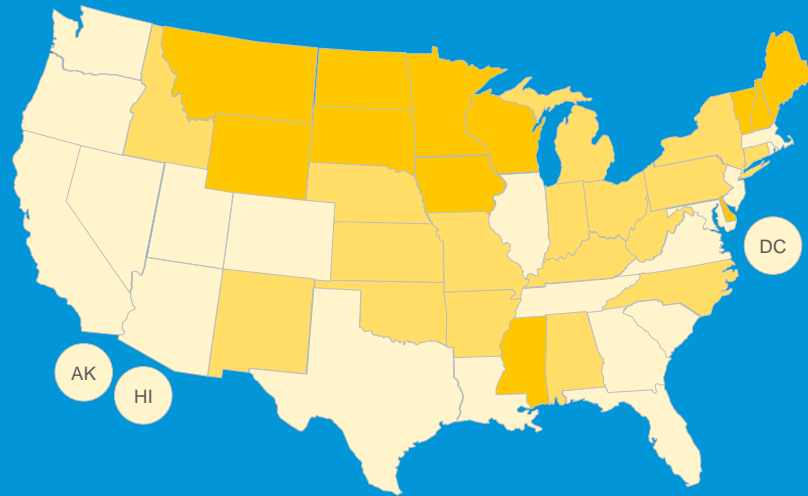
Regional natural gas inventories

billion cubic feet



Data source: Short-Term Energy Outlook

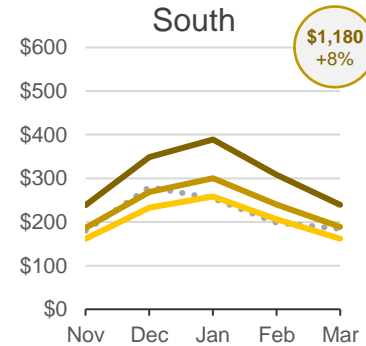
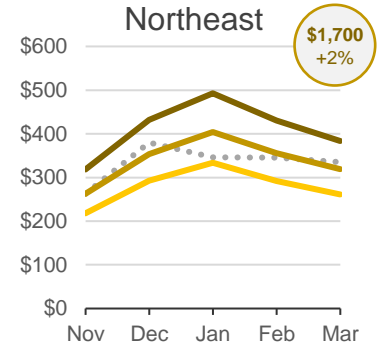
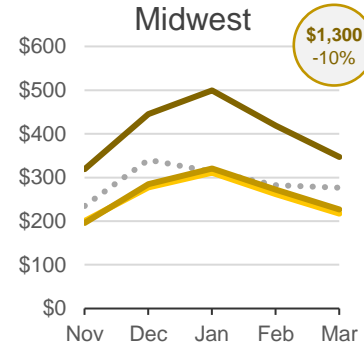
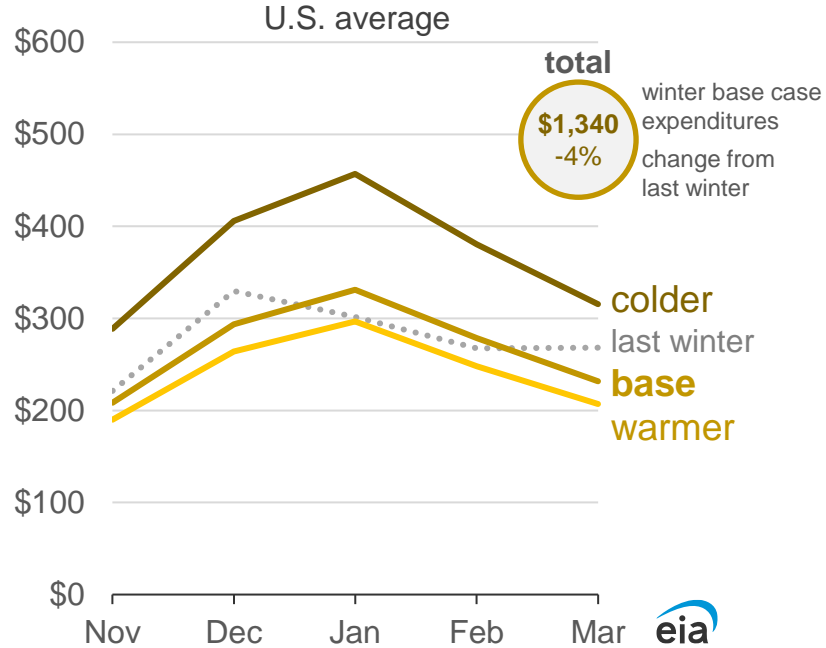
Propane



Propane expenditures forecast to be **slightly lower** this winter

Monthly propane expenditures

nominal dollars



Data source: Winter Fuels Outlook

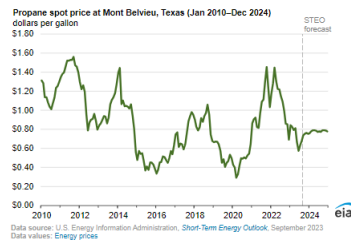
We now publish a propane spot price forecast

- In the September STEO, we added a forecast of the wholesale price of propane at the hub in Mont Belvieu, Texas
- *STEO Between the Lines*
 - How propane is produced
 - How propane is priced
 - What factors affect wholesale propane prices

Read the article

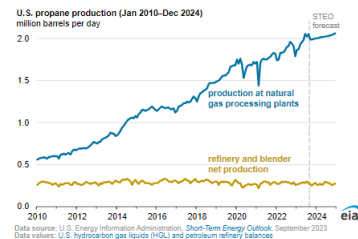
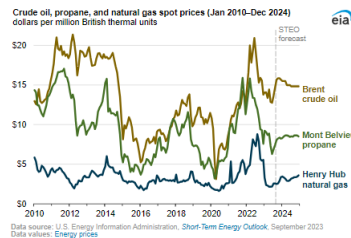
STEO Between the Lines: EIA now publishes a short-term forecast of the propane spot price

Beginning with our September Short-Term Energy Outlook we now include a forecast of the propane spot price at Mont Belvieu, Texas. Mont Belvieu, located on the U.S. Gulf Coast near Houston, is a major storage and trading hub for propane and other hydrocarbon gas liquids. Because propane is a product of refining crude oil and processing natural gas, the propane spot price is linked to the prices of those energy sources and factors specific to propane markets.



Propane spot prices typically fall between Brent crude oil and Henry Hub natural gas prices on an energy basis because propane is a product of both crude oil and natural gas. Generally, fossil fuels with a higher heat content are more valuable because they have more energy, and the heating value of propane is more than natural gas and less than crude oil. Although our propane spot price forecast covers the main drivers of price movements, weather events such as a winter storm or a hurricane are difficult to forecast in advance and can affect prices.

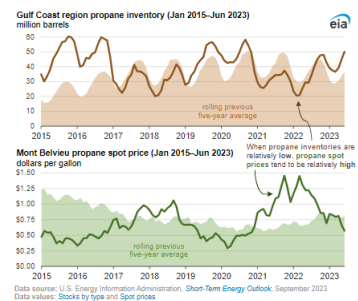
We forecast the Mont Belvieu wholesale propane price to increase from 70 cents per gallon (centiga) in August 2023 to 74 centiga by the end of this year, based largely on a similar increase in our Brent crude oil price forecast. In 2024, we forecast that the wholesale propane price will reach a high of \$1.10 centiga in September before dropping to 79 centiga at the end of the year.



Increasing production and additional export capacity shifted the United States from importing more propane than we exported to exporting more than we import. In every year since 2010, the United States has been a net exporter of propane. Key export markets for U.S. propane in 2022 included Japan, China, and South Korea as well as neighboring Mexico.

In many places around the world, propane is consumed as a petrochemical feedstock; most propane consumed in the United States is as a winter heating fuel. A colder-than-normal winter will reduce propane inventories, which can put downward pressure on prices. Alternatively, a warmer-than-normal winter usually puts downward pressure on U.S. prices.

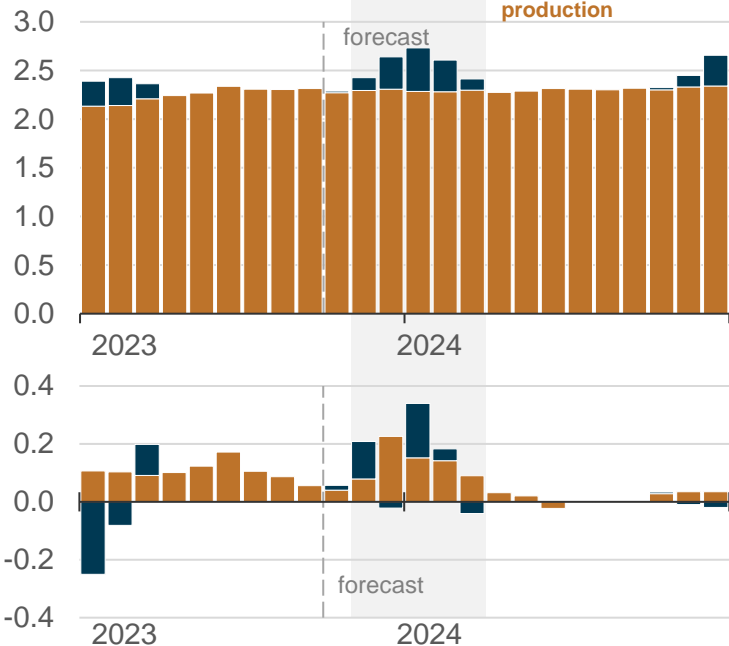
We also base our propane spot price forecast on domestic propane supply and demand balances, as captured by propane inventory changes. When forecasting propane spot prices, we consider propane inventories in the Gulf Coast region, where most U.S. petrochemical consumption, propane export capacity, and propane storage capacity are located. Generally, propane prices tend to be relatively high when inventories are relatively low; the reverse is also true.



Increases in propane **consumption** can be met with **withdrawals** from inventory; **exports** remain relatively high

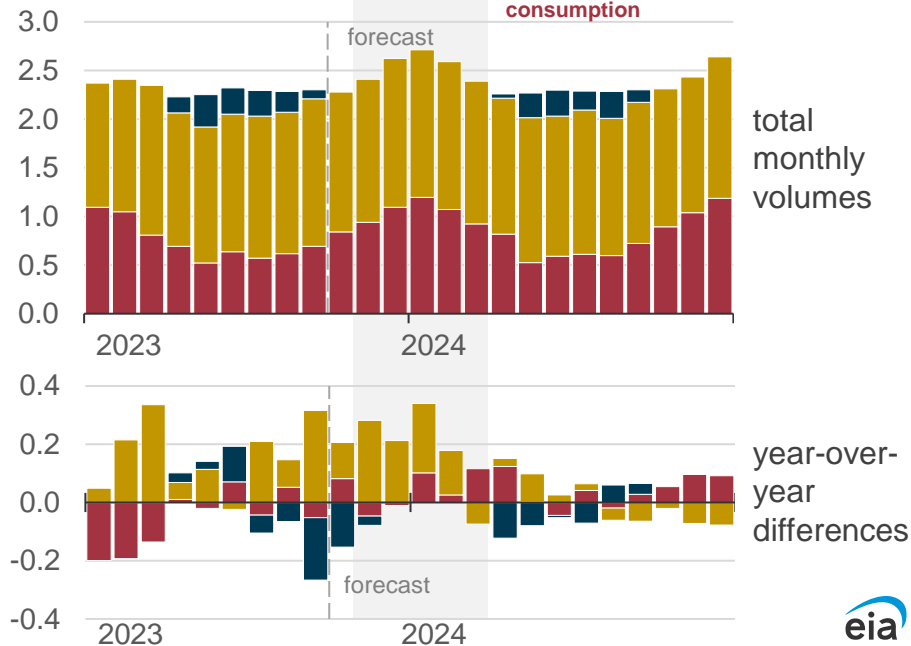
Propane supply

million barrels per day



Propane disposition

million barrels per day



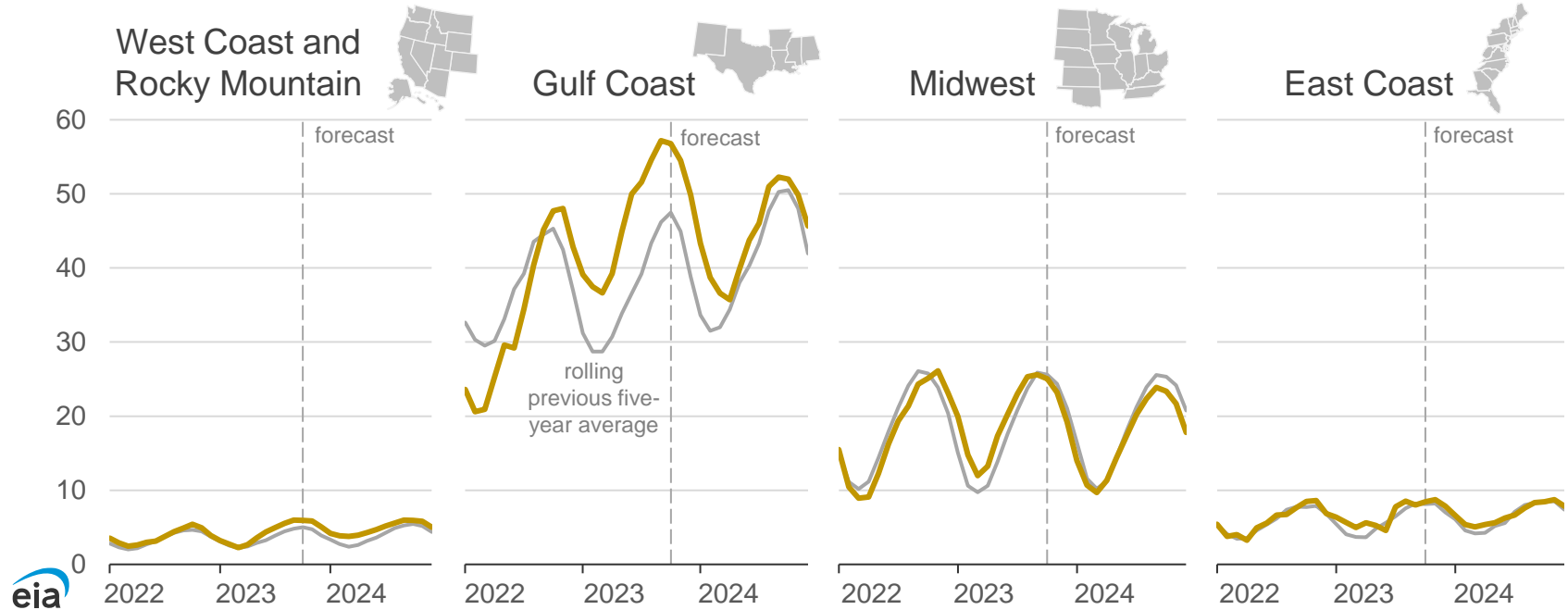
Data source: Short-Term Energy Outlook

Note: Trade volumes include propylene

Propane inventories are **above average**, especially in the Gulf Coast region

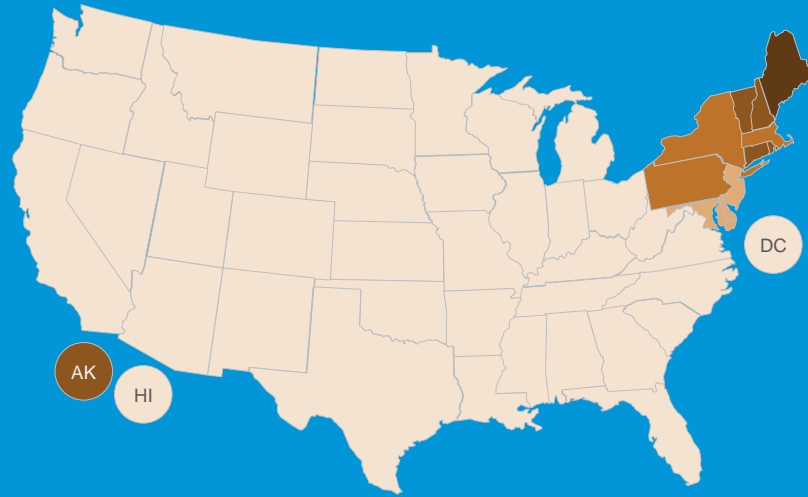
Regional propane inventories

million barrels



Data source: Short-Term Energy Outlook

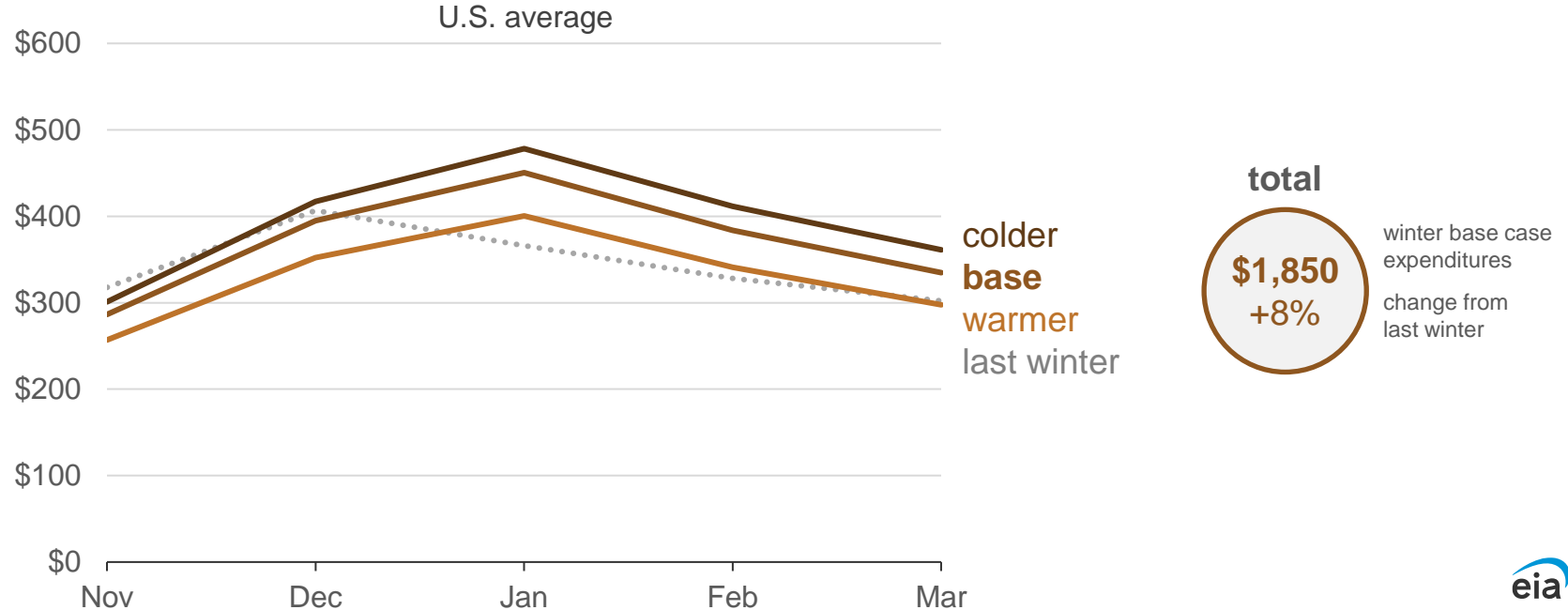
Heating Oil



Heating oil expenditures forecast to be **higher than** last winter

Monthly heating oil expenditures

nominal dollars

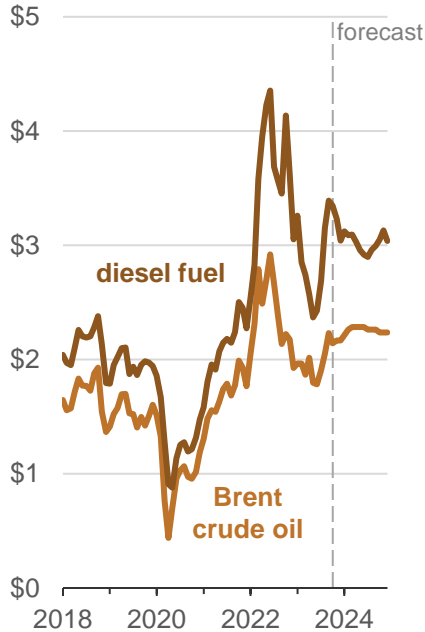


Data source: Winter Fuels Outlook

The diesel crack spread is lower than it was last year, but still high and encouraging refinery production

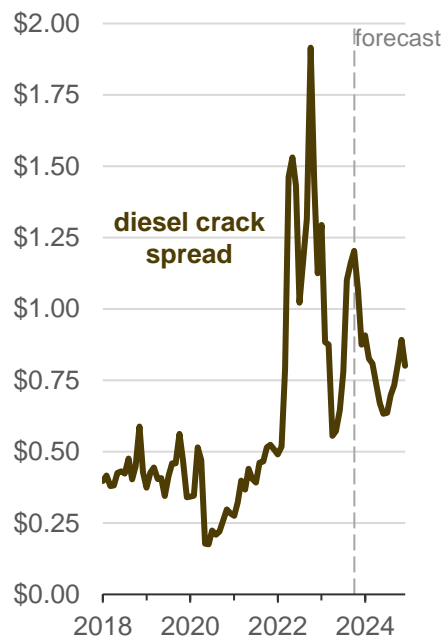
Wholesale spot prices

dollars per gallon



Crack spread

dollars per gallon

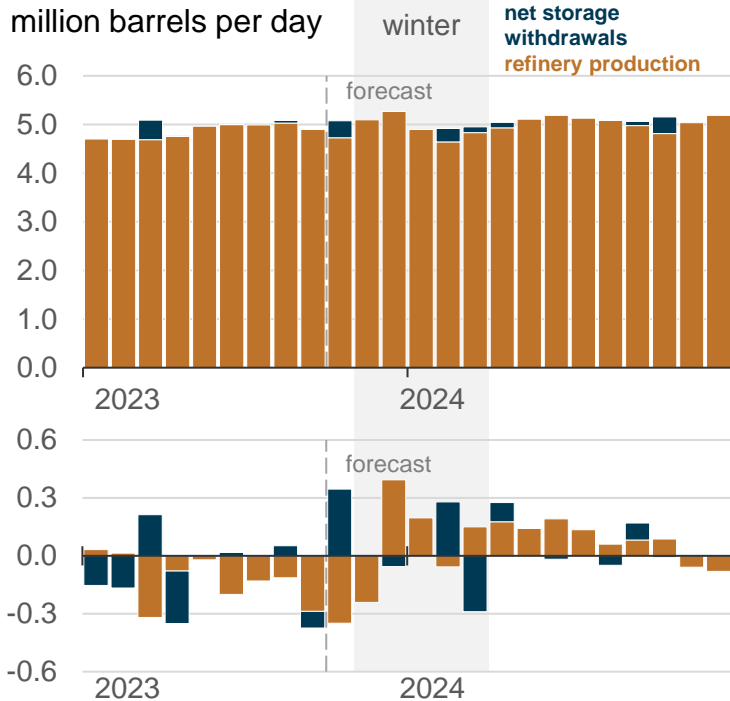


- Crack spreads are the price difference between crude oil and refined petroleum products and can indicate refineries' short-term profits.
- Higher crack spreads provide more incentive to produce that fuel.

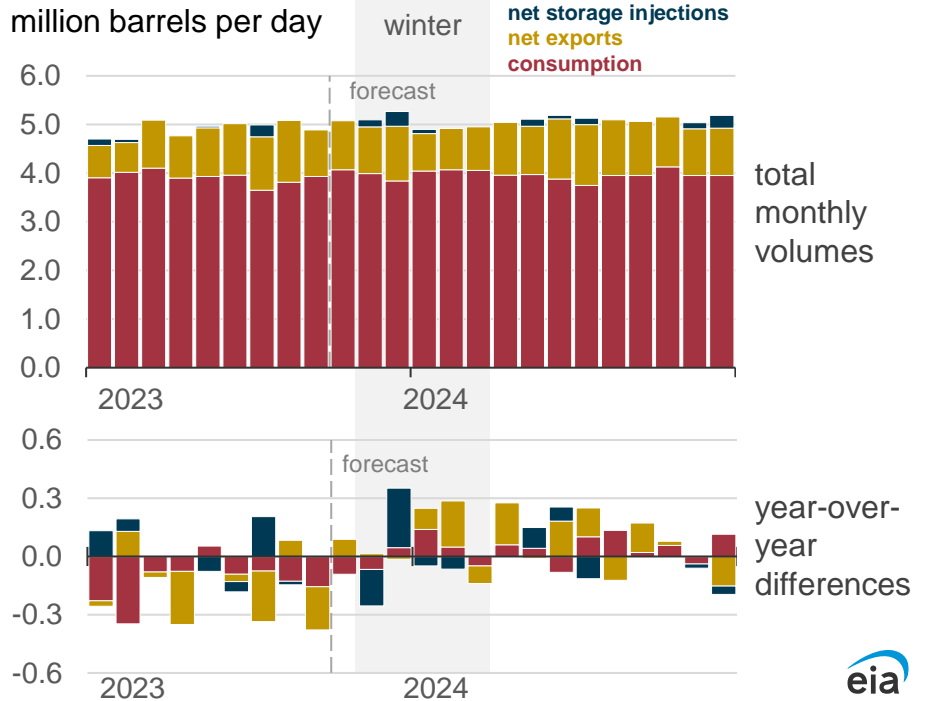
Data source: Short-Term Energy Outlook

Distillate balances are relatively steady as production rises

Distillate fuel oil supply



Distillate fuel oil disposition



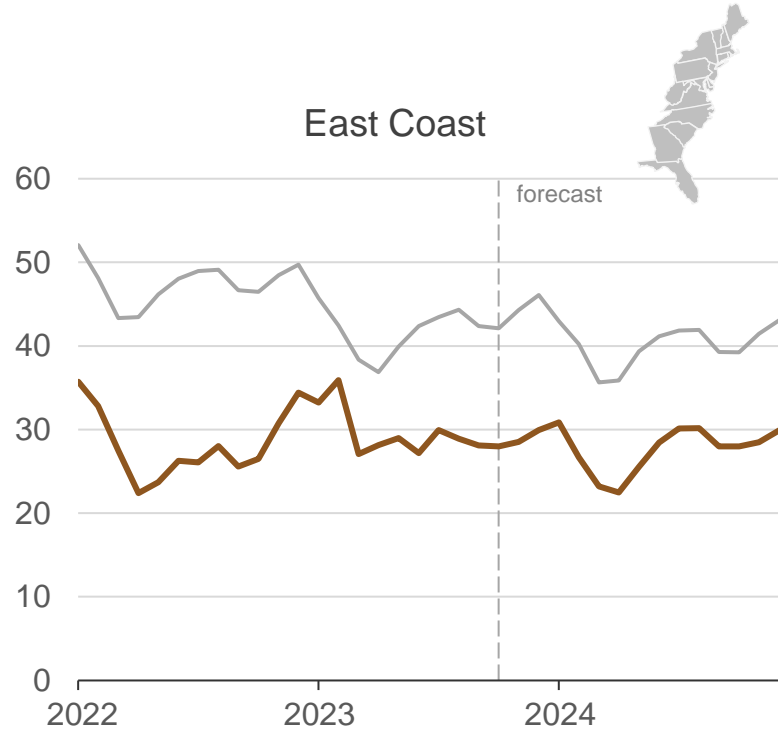
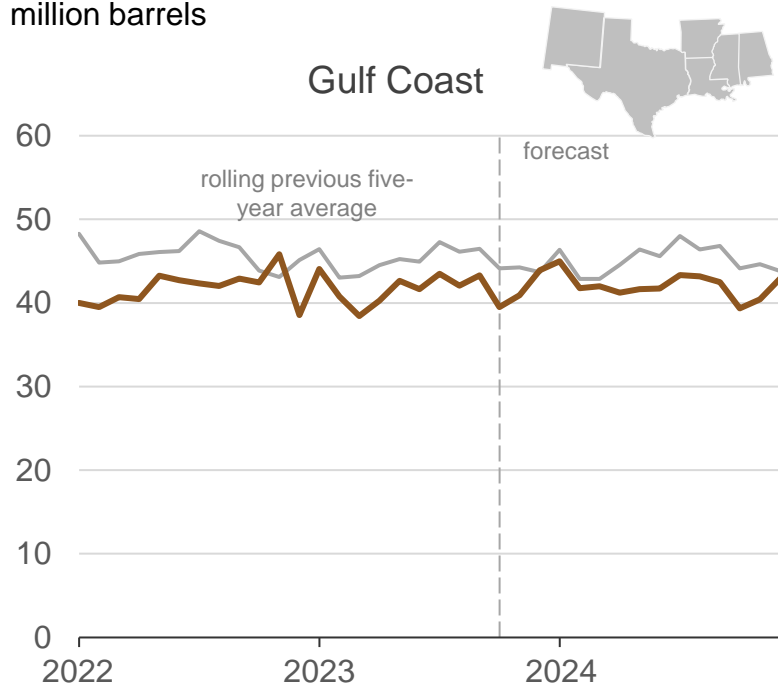
Data source: Short-Term Energy Outlook



Heating oil inventories are **below average** in the Gulf Coast and East Coast regions

Regional distillate fuel oil inventories

million barrels



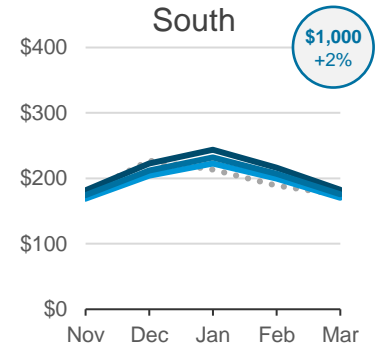
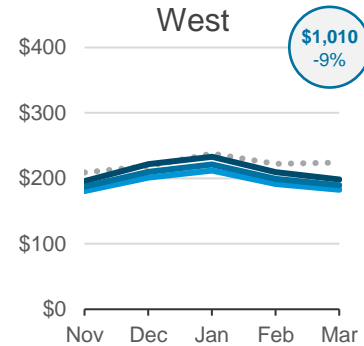
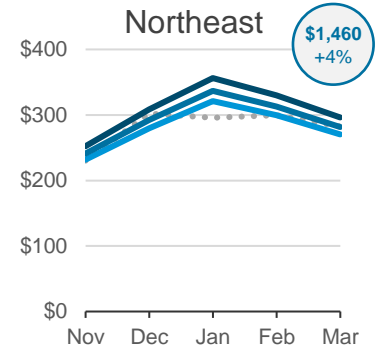
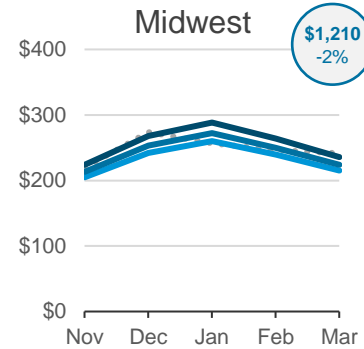
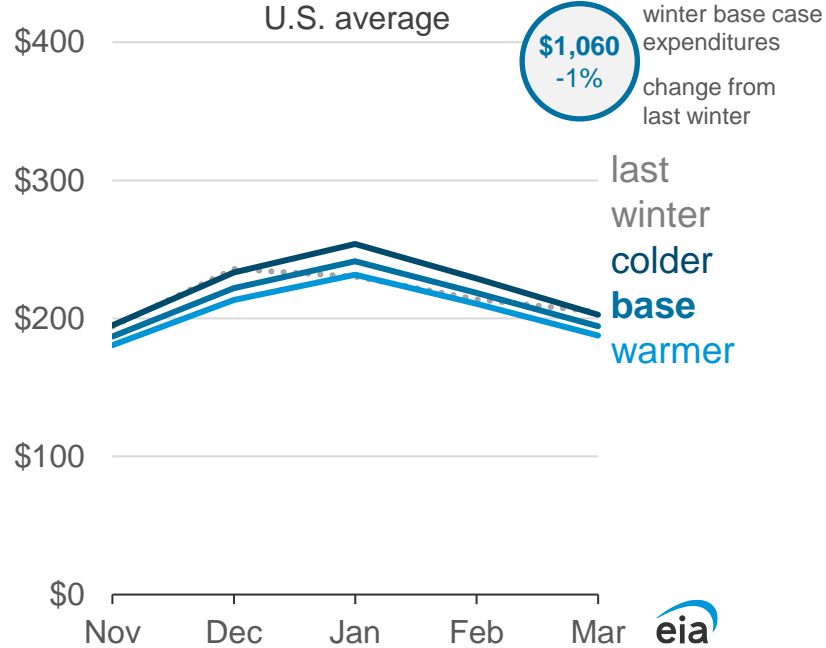
Data source: Short-Term Energy Outlook



Electricity expenditures forecast to be similar to last winter

Monthly electricity expenditures

nominal dollars

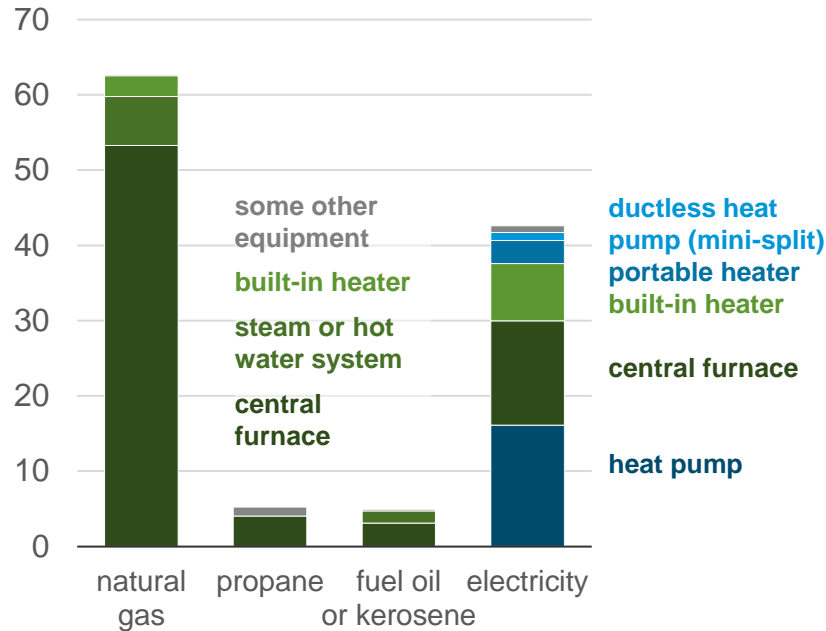


Data source: Winter Fuels Outlook

Electricity has more equipment options and is the most common secondary heating fuel

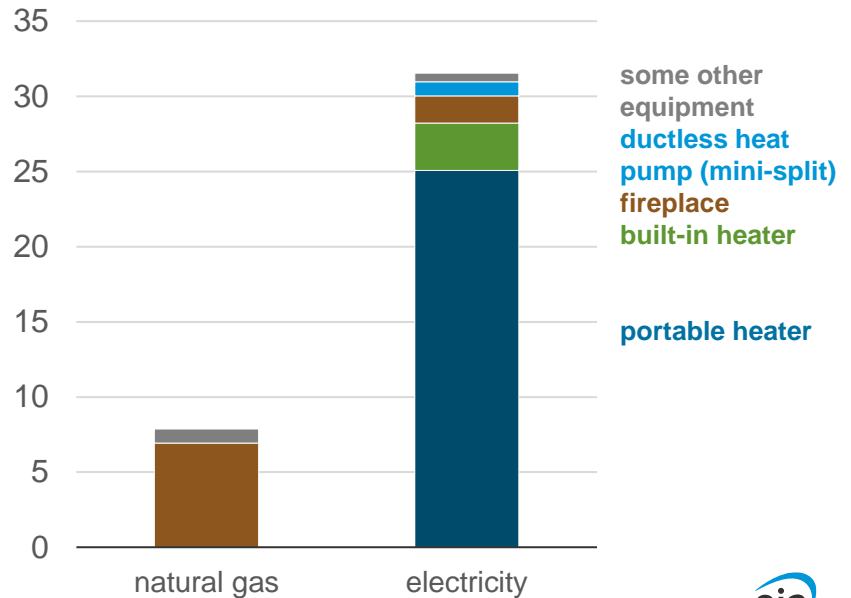
Main heating fuel and equipment (2020)

million households using each equipment type



Secondary heating fuel and equipment (2020)

million households using each equipment type



Source: Residential Energy Consumption Survey, 2020, Tables HC 6.7 and 6.8

EIA resources

Winter Fuels Outlook updates and other EIA resources

- We plan to update household consumption, price, and expenditure estimates with each edition of the *Short-Term Energy Outlook* through March 2024
- EIA data sources
 - [Heating Oil and Propane Update](#)
 - [Winter Propane Market Update](#)
 - [Weekly Petroleum Status Report](#)
 - [Weekly Natural Gas Storage Report](#)
 - [Hourly Electric Grid Monitor](#)
 - [Residential Energy Consumption Survey](#)

Question and Answer session

Moderator: Hannah Breul, Team Lead, Short-Term Integrated Products

Short-Term Energy Outlook analysts

- Tim Hess, STEO Product Manager
- Josh Eiermann, Economist, Petroleum & Liquid Fuels Markets
- Matt French, Senior Analyst, Petroleum & Liquid Fuels Markets
- Tyler Hodge, Senior Economist, Electricity, Coal, Nuclear, and Renewables Markets
- Corrina Ricker, Senior Natural Gas Modeler, Natural Gas Markets

You can submit questions at any time during the presentation using the chat function in the WebEx control panel. Please direct your questions to “All panelists.”