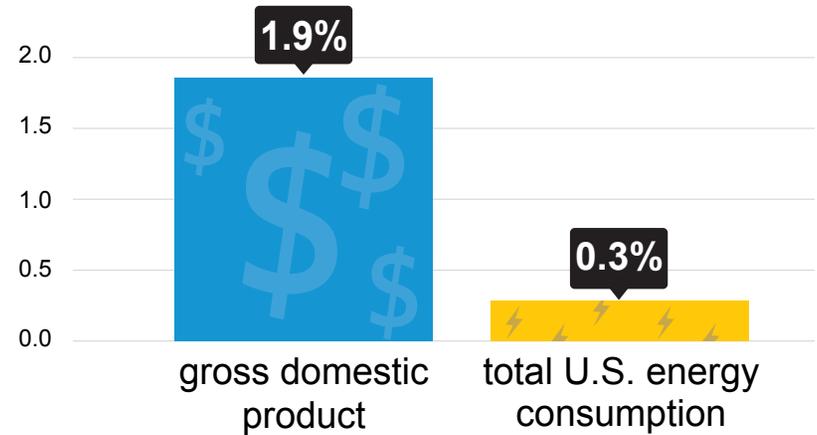


# U.S. energy consumption grows at a slower rate than gross domestic product through 2050 as U.S. energy efficiency continues to increase.

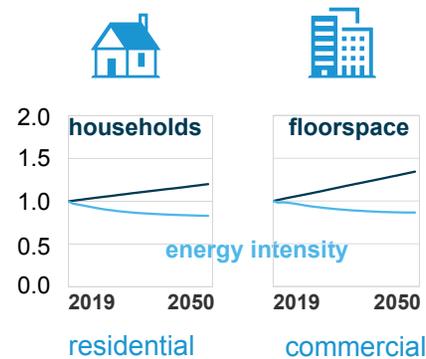
Average annual growth rate (2019-2050)  
percent growth



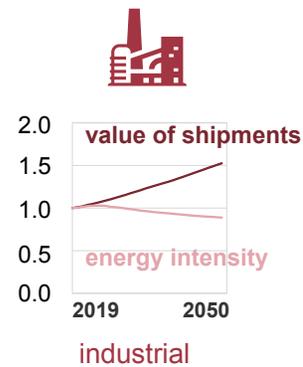
## U.S. energy intensity continues its long-term decline through 2050.

Indexed end-use demand drivers and energy intensities by sector (2019–2050)

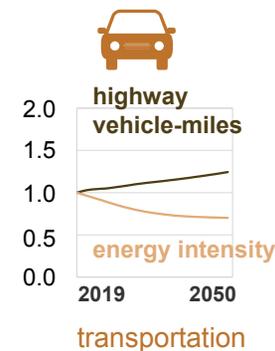
index (2019=1.0)



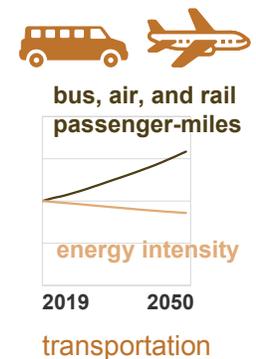
**Residential and commercial** sector energy efficiency improvements, increases in distributed generation, and regional population shifts partially offset the effects of higher growth rates in population, number of households, and commercial floorspace.



Energy intensity declines in the **industrial** sector as a result of increased energy efficiency of new capital equipment and the higher growth rate in non-energy-intensive manufacturing industries relative to energy-intensive manufacturing industries.



Energy use in the **transportation** sector per passenger-mile of travel in vehicles declines as newer, more fuel-efficient vehicles enter the market.

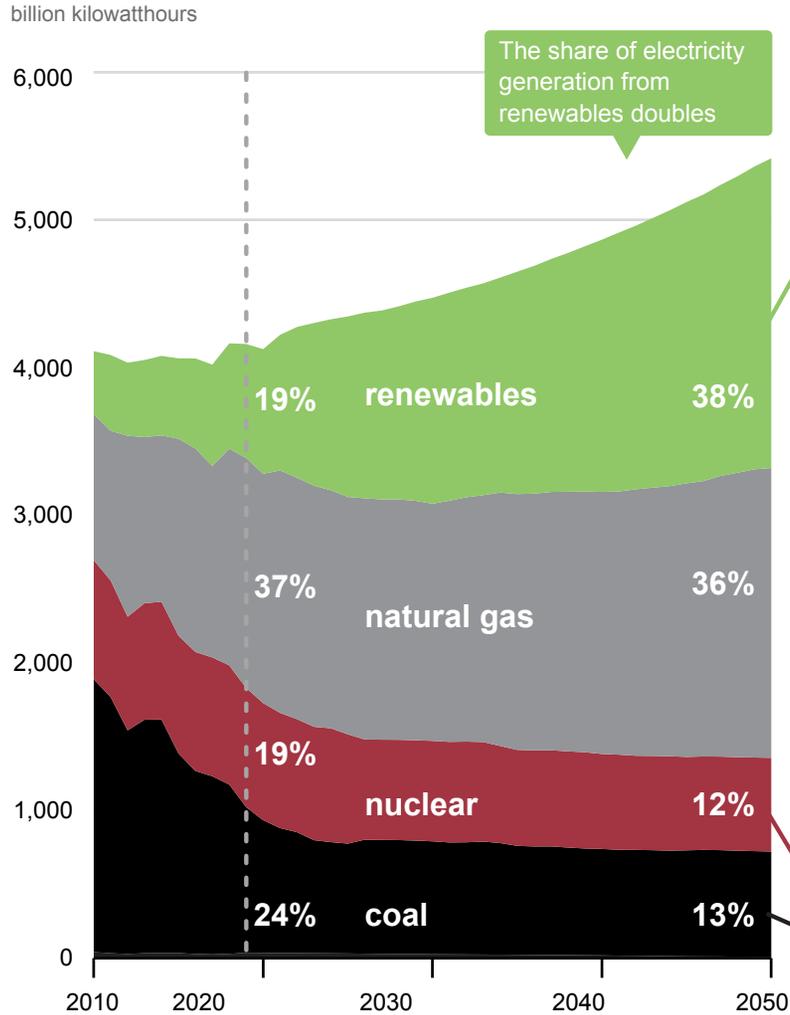


In the **transportation** sector, adoption of energy-efficient technology and practices results in decreasing energy use per passenger-mile for rail, bus, and air travel.

Note: Energy intensities are a lighter shade of the same color as the respective driver, and they are calculated as energy used per unit of respective demand driver.

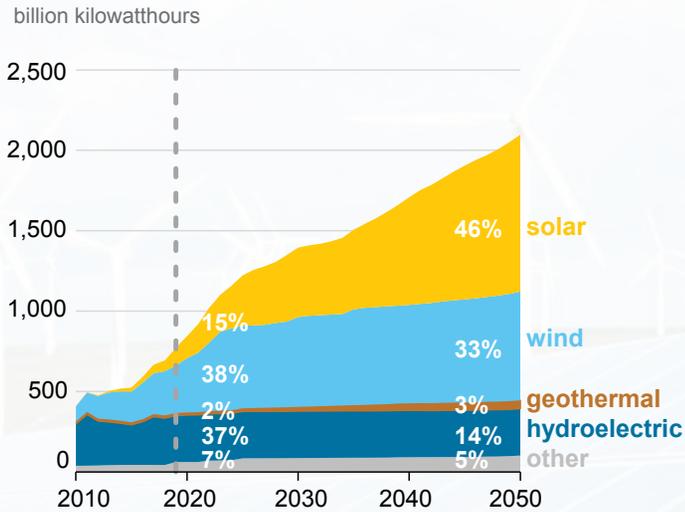
Source: U.S. Energy Information Administration, *Annual Energy Outlook 2020* (AEO2020) Reference case

# Electricity generation from selected fuels



## U.S. renewable electricity generation is the fastest-growing electricity resource throughout the projection period.

### Renewable electricity generation, including end use



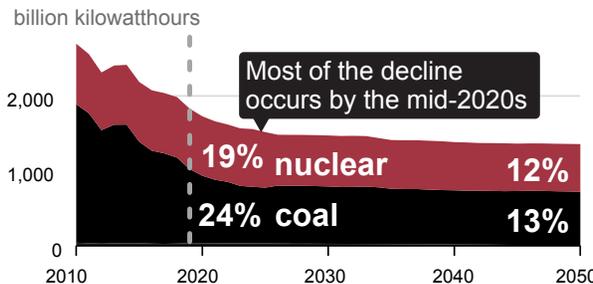
Most of the growth in renewable electricity generation is from solar and wind.



Continued declines in the capital costs for solar and wind are supported by federal tax credits and higher state-level renewables targets.

## U.S. coal-fired and nuclear electricity generation declines

### Electricity generation from nuclear and coal



The share of coal-fired electricity generation falls from 24% to 13%.



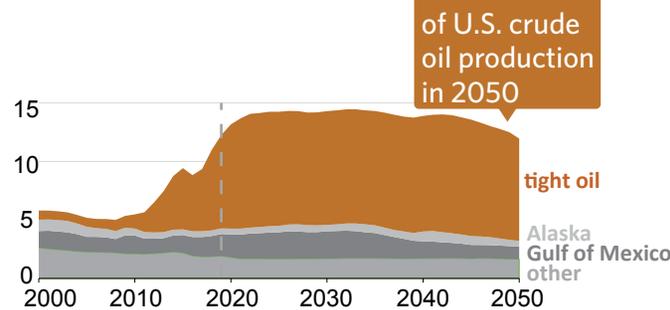
The share of nuclear generation falls from 19% to 12%.

# The United States continues to produce historically high levels of...



## crude oil...

U.S. crude oil production  
million barrels per day

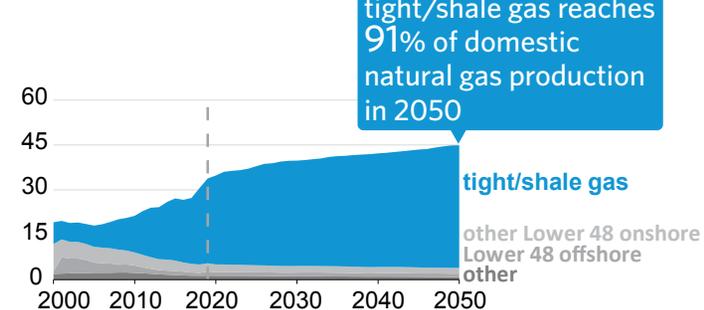


Tight oil development continues to be the main driver of total U.S. crude oil production.



## and natural gas.

Dry natural gas production by type  
trillion cubic feet



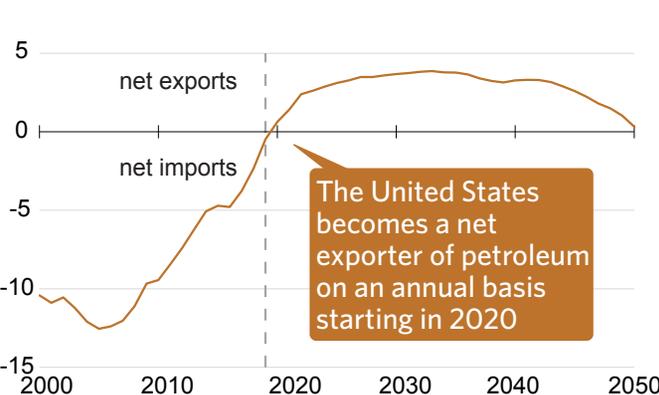
Development of tight and shale resources continues to be the main driver of U.S. dry natural gas production.

# Slower growth in domestic consumption of these fuels leads to increasing exports of...



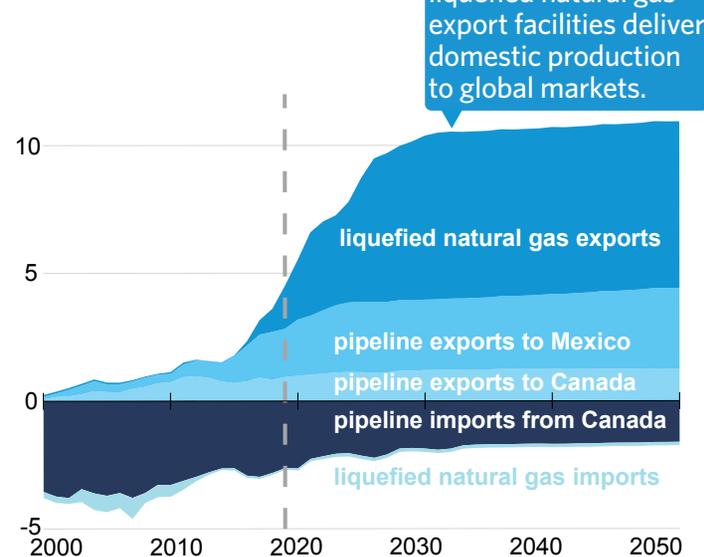
## crude oil, petroleum products...

U.S. petroleum and other liquids net exports  
million barrels per day



## and liquefied natural gas.

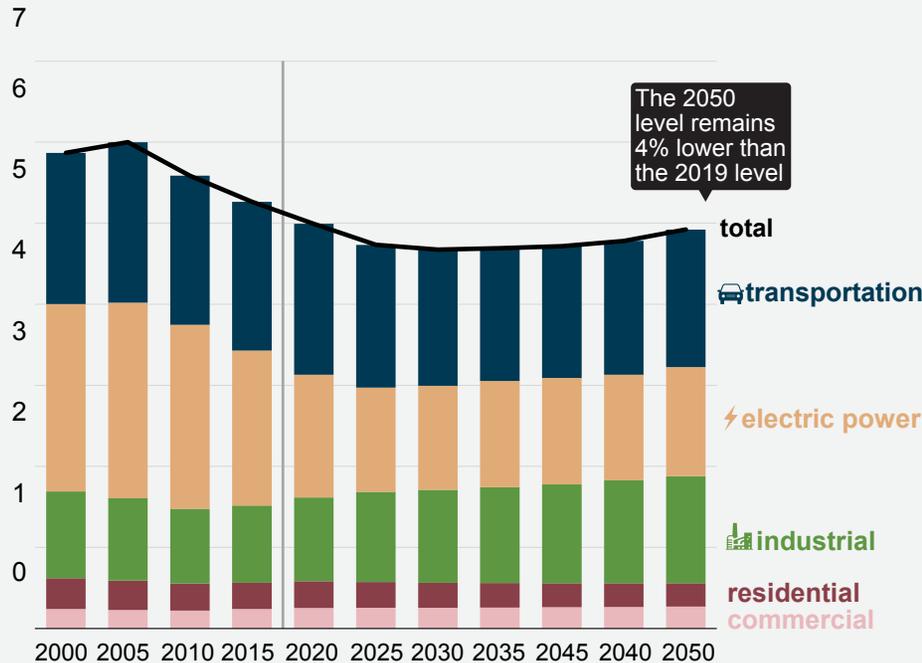
Natural gas trade  
trillion cubic feet



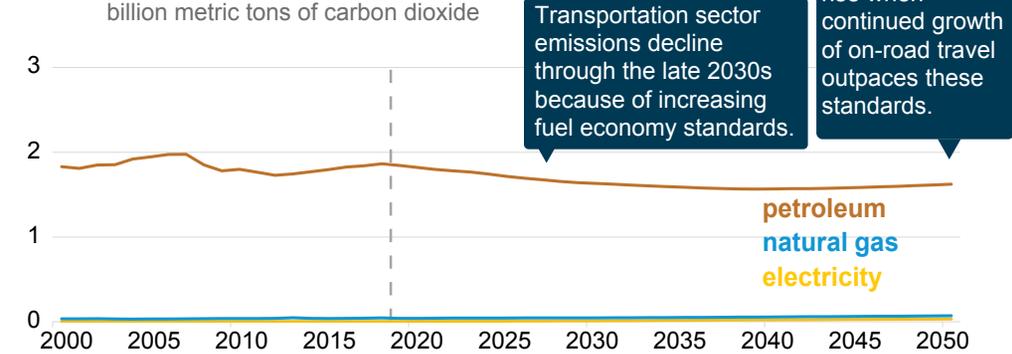
# After falling in the first half of the projection period, total U.S. energy-related carbon dioxide emissions resume modest growth in the 2030s.



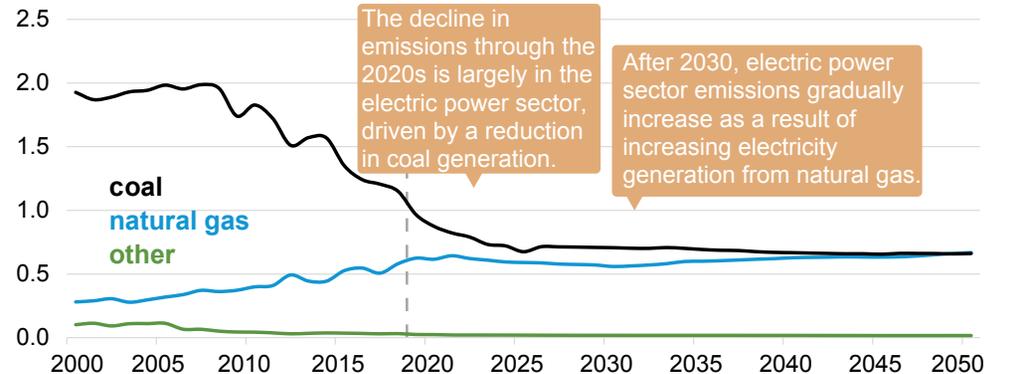
**Energy-related carbon dioxide emissions by end-use sector**  
billion metric tons of carbon dioxide



**Transportation sector carbon dioxide emissions by fuel**  
billion metric tons of carbon dioxide



**Electric power sector carbon dioxide emissions by fuel**  
billion metric tons of carbon dioxide



**Industrial sector carbon dioxide emissions by fuel**  
billion metric tons of carbon dioxide

