

AEO2020: Alternative Policies - 50% Carbon-Free Generation by 2050



For

Resources for the Future

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By

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Renewable Electricity Analysis



Key Assumptions

Reference case

- Twenty-seven states and the District of Columbia have renewable portfolio standards
- Among the 29 states, 6 and the District of Columbia have 100% standards in place

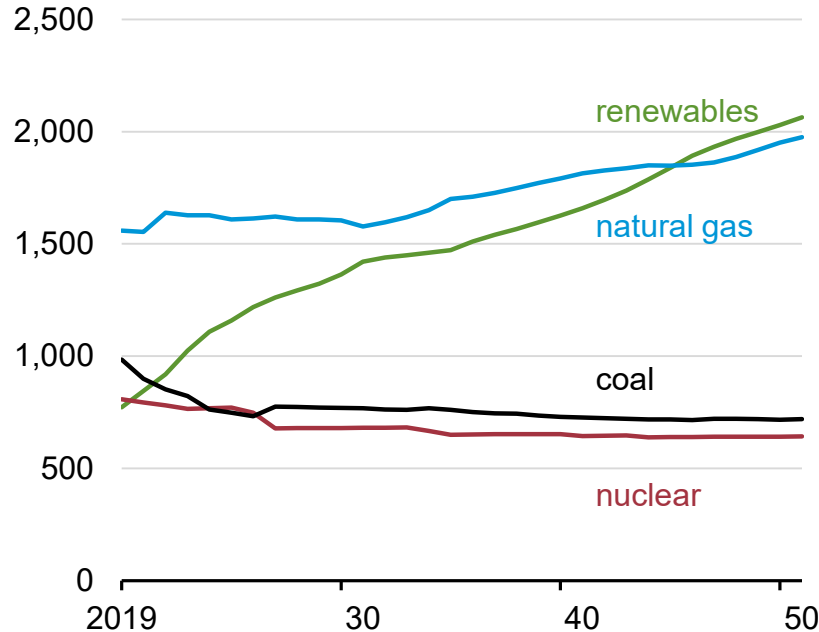
50% Carbon-Free Generation case

- States achieve a minimum 50% of sales by 2050 using zero- or low-carbon generating technologies.
- States with an RPS target of less than 50% by 2050 continue with their current RPS path to its terminal target year and then switch to a linear path that achieves the 50% carbon free generation standard by 2050. States with higher goals keep current policies intact.
- All other states are assumed to adopt a standard of 50% carbon-free generation by starting in 2025 with a linear progression.

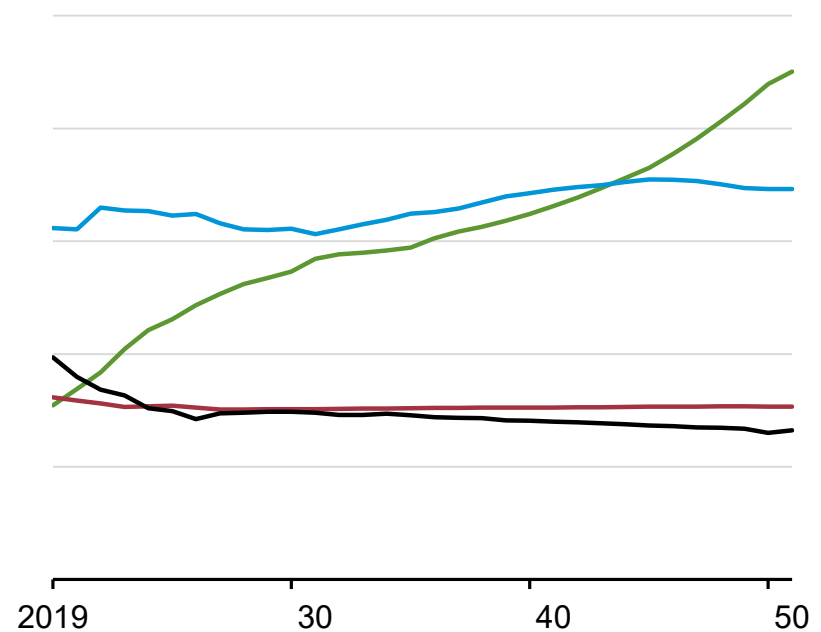
50% carbon-free generation by 2050 alters the projected fuel-mix

Reference case

billion kilowatthours (BkWh)



50% Carbon-Free Generation case

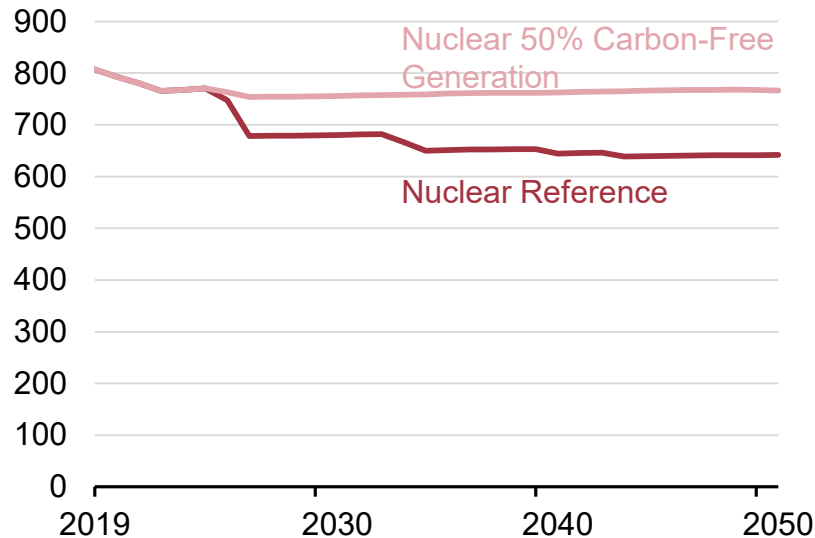


Source: U.S. Energy Information Administration, Annual Energy Outlook 2020

Less nuclear capacity retires in the early years, contributing to the carbon-free generation mix

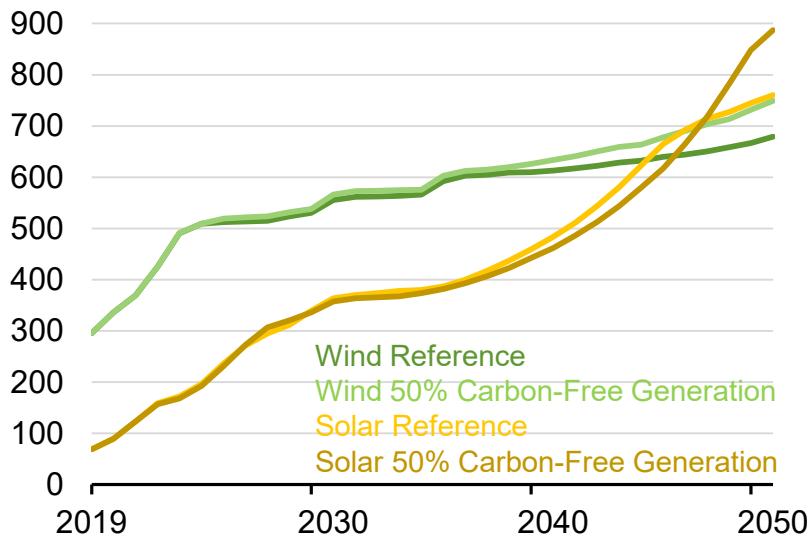
Nuclear

billion kilowatthours (BkWh)



Wind and Solar

billion kilowatthours (BkWh)



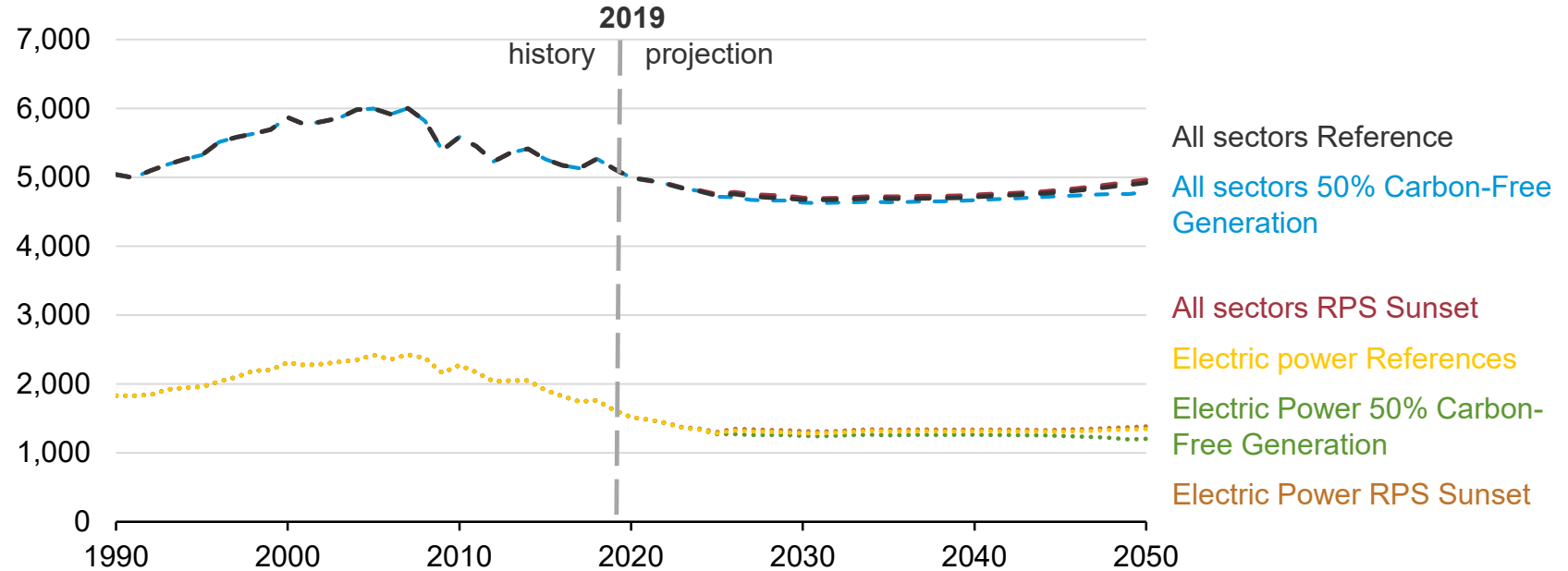
After 2035, wind, followed by solar, grow to meet the carbon-free generation demand.

Source: U.S. Energy Information Administration, Annual Energy Outlook 2020

Emissions decline in 50% Carbon-Free Generation case

U.S. energy-related carbon dioxide emissions by end-use sector in two cases

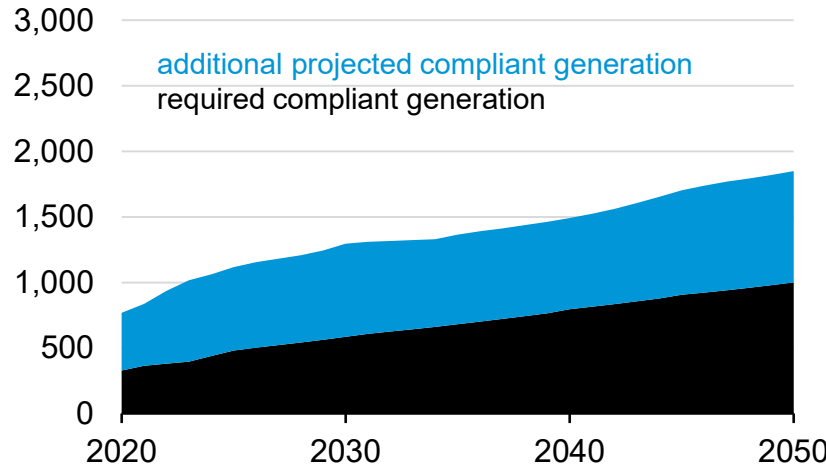
billion metric tons



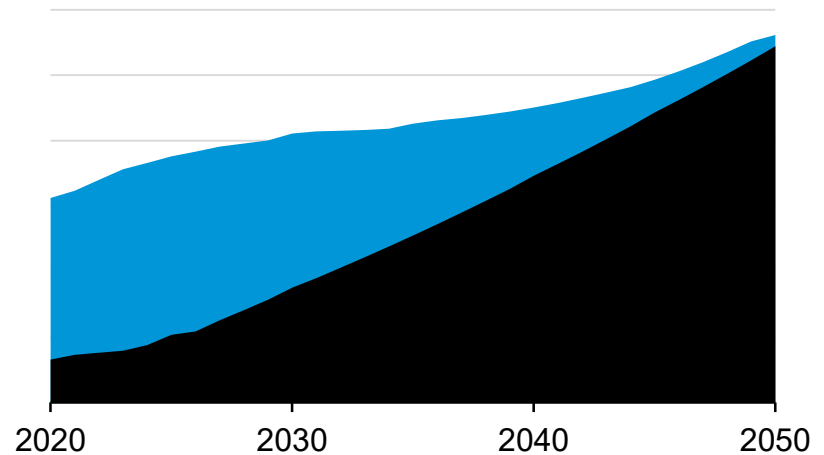
Source: U.S. Energy Information Administration, Annual Energy Outlook 2020

Reference case results suggest that favorable renewables economics is causing the market to exceed RPS requirements

Reference case
billion kilowatthours



50% Carbon-Free Generation case
billion kilowatthours



- Excess compliant generation exists in the Reference case already, with more than twice as much available by 2050 than needed to comply with RPS policies
- 50% Carbon-Free Generation gradually diminishes that excess generation, but doesn't eliminate it

Source: U.S. Energy Information Administration, Annual Energy Outlook 2020

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For more information

U.S. Energy Information Administration homepage | www.eia.gov

Annual Energy Outlook | www.eia.gov/aeo

Short-Term Energy Outlook | www.eia.gov/steo

International Energy Outlook | www.eia.gov/outlooks/ieo/

Monthly Energy Review | www.eia.gov/mer

Today in Energy | www.eia.gov/todayinenergy