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# The Energy Transition's Impact on the Texas Economy: A historical perspective

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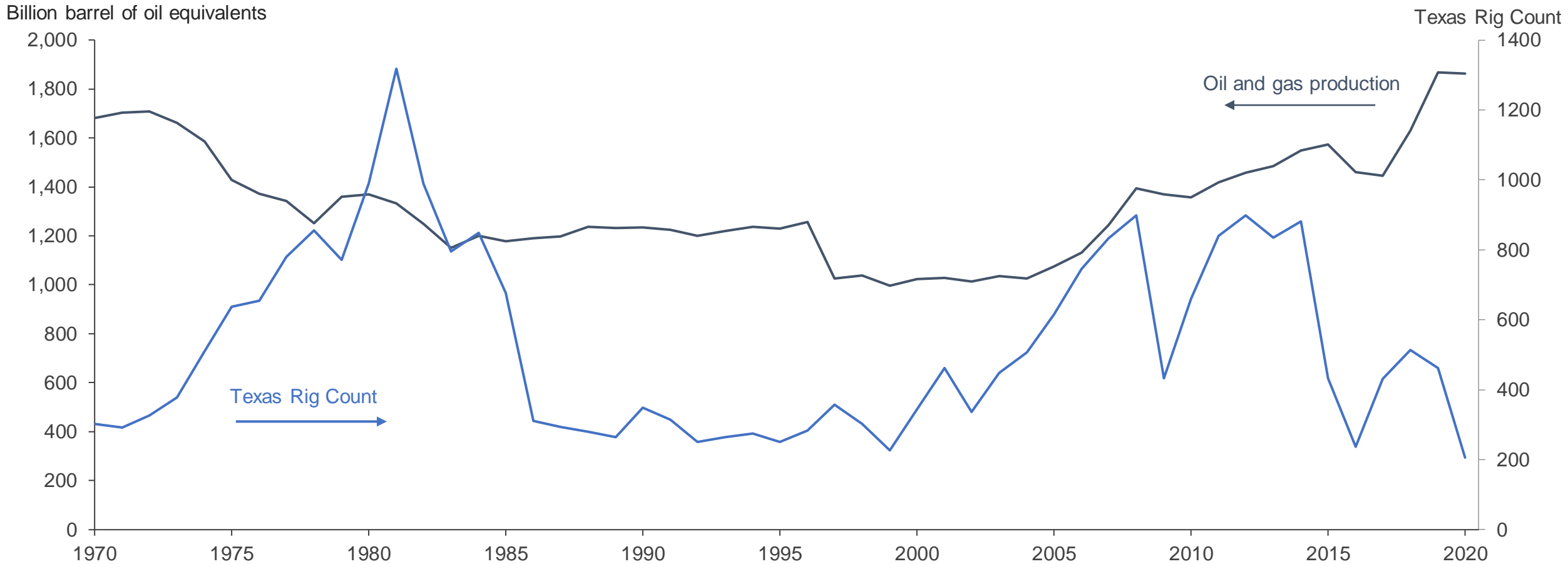
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# Outline

- This is not the first long-term decline in the Texas' Oil and Gas industry.
- Texas large petrochemical sector will continue to grow and consume fossil fuels.
- The production of renewables in Texas will continue to grow.
- The transition to renewables will need to be gradual
- While challenging, the expected energy transition is not likely to derail Texas' economy, and the state's long-term performance will depend on other factors such as cost of living and the business environment.

# Texas Oil and Gas Production Fell from mid-1970's to mid-2000's while Rig Count Fell from Early 1980's to mid-2000's

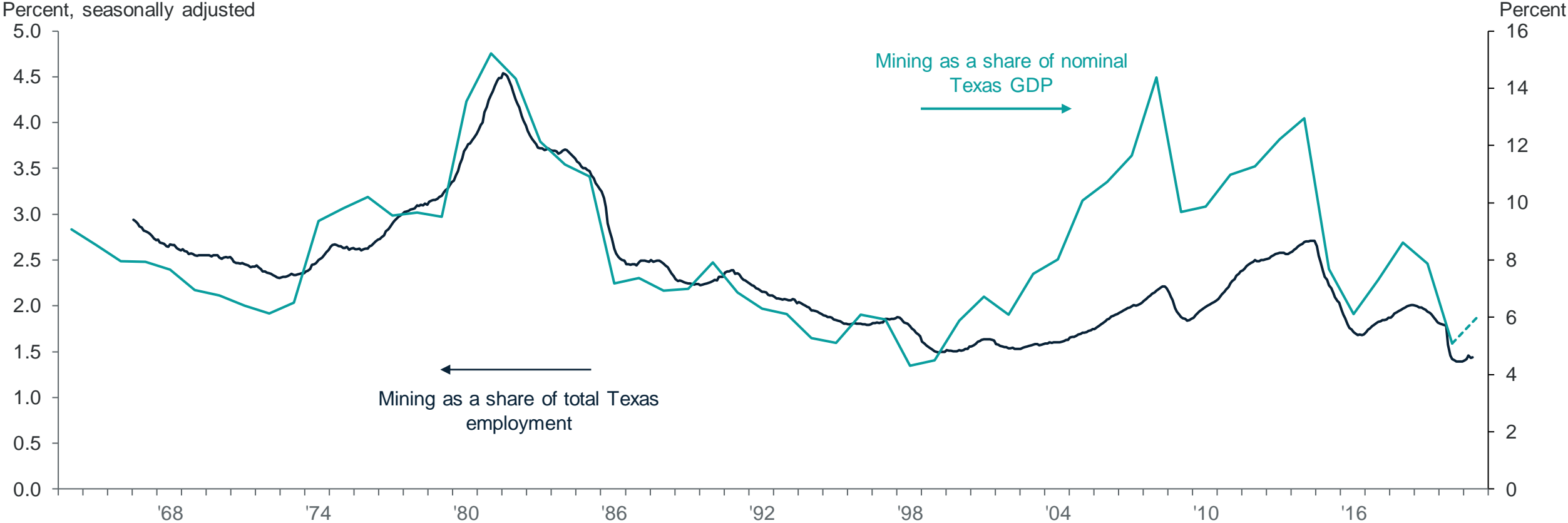


NOTE: Barrel of oil equivalent calculated using 1.037 million British thermal units (mmbtu) per thousand cubic feet of gas and 5.8 mmbtu per barrel of oil. Oil production data prior to 1981 comes from the Texas Railroad Commission.

SOURCES: Energy Information Administration; Baker Hughes; Texas Railroad Commission.

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# Oil and Gas Share of Texas Jobs, Output Peaked in 1980s



NOTE: Values prior to 1997 extrapolated from Standard Industrial Classification system coded data. "Mining" includes oil and gas extraction and support activities for mining, which account for over 95 percent of activity in the category in Texas. 2021 gross domestic product (GDP) data are through the first quarter.

SOURCES: Bureau of Labor Statistics; Bureau of Economic Analysis; Federal Reserve Bank of Dallas.

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# Energy Price Swings Impact Texas Short-Term Performance Relative to Nation – But not It's Trend Growth Premium

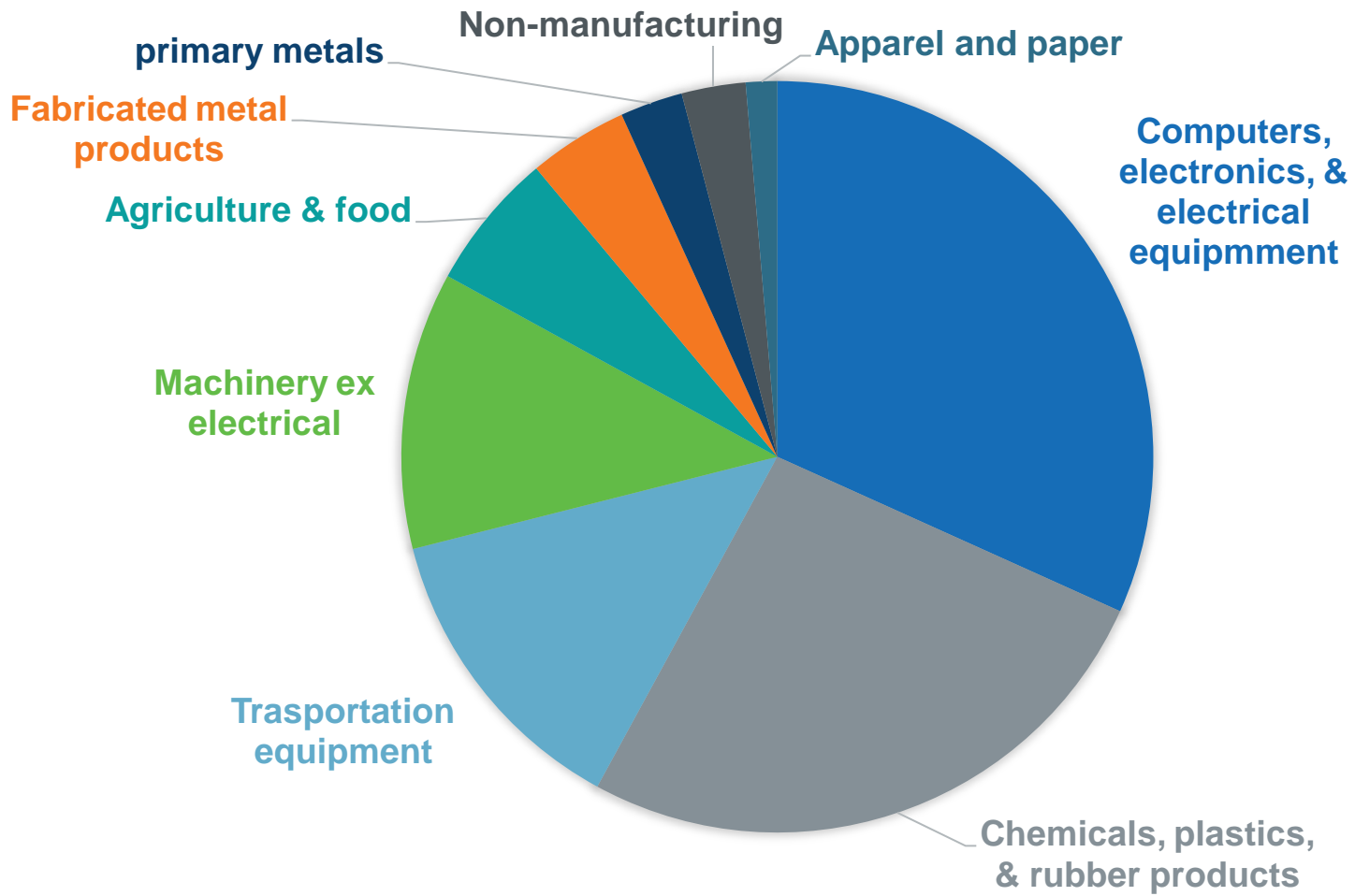


NOTES: Relative job growth is calculated as year-over-year percentage change in Texas payroll employment subtracted by year-over-year percentage change in U.S. payroll employment. WTI refers to West Texas Intermediate crude oil.

SOURCES: Bureau of Labor Statistics; *Oil and Gas Journal*.

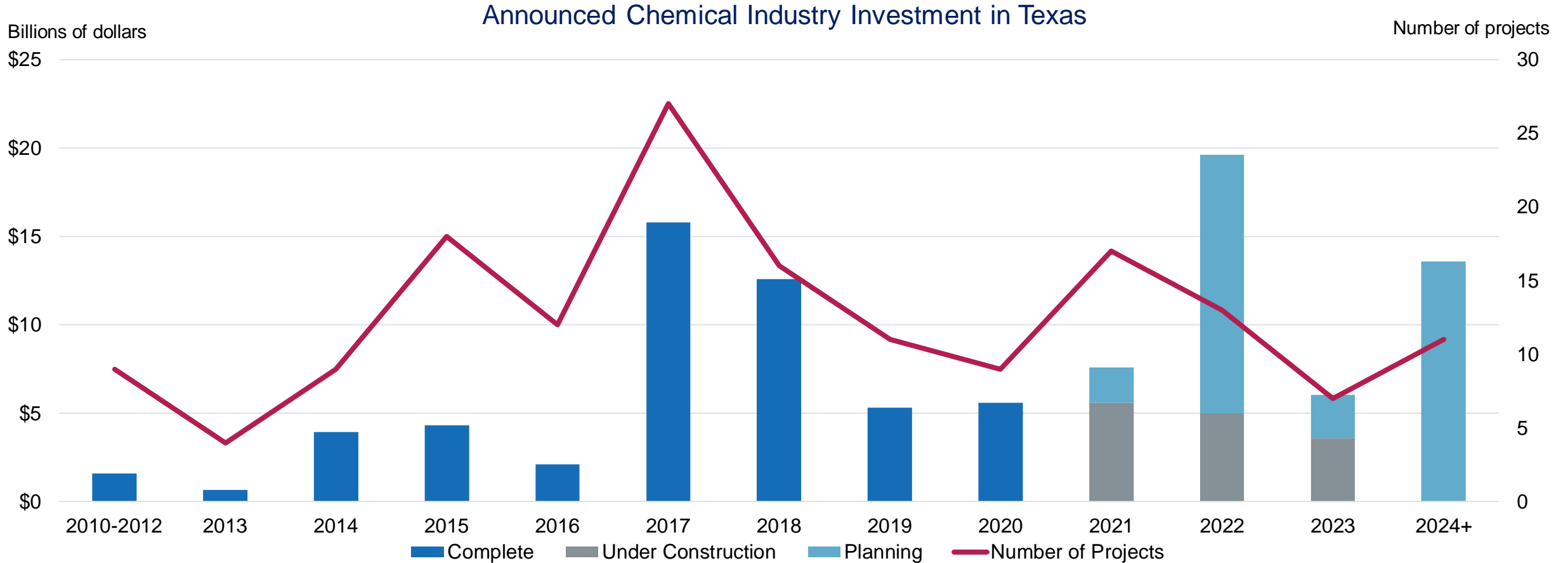
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# Petrochemicals Big Industry in Texas and Will Continue to Consume Oil and Gas



NOTE: Chart shows the share of real export values over the three years ending in 2020. Excludes energy exports of oil and gas and petroleum and coal products.  
SOURCE: U.S. Census, WisierTrade

# Texas Chemicals Expansion Ongoing

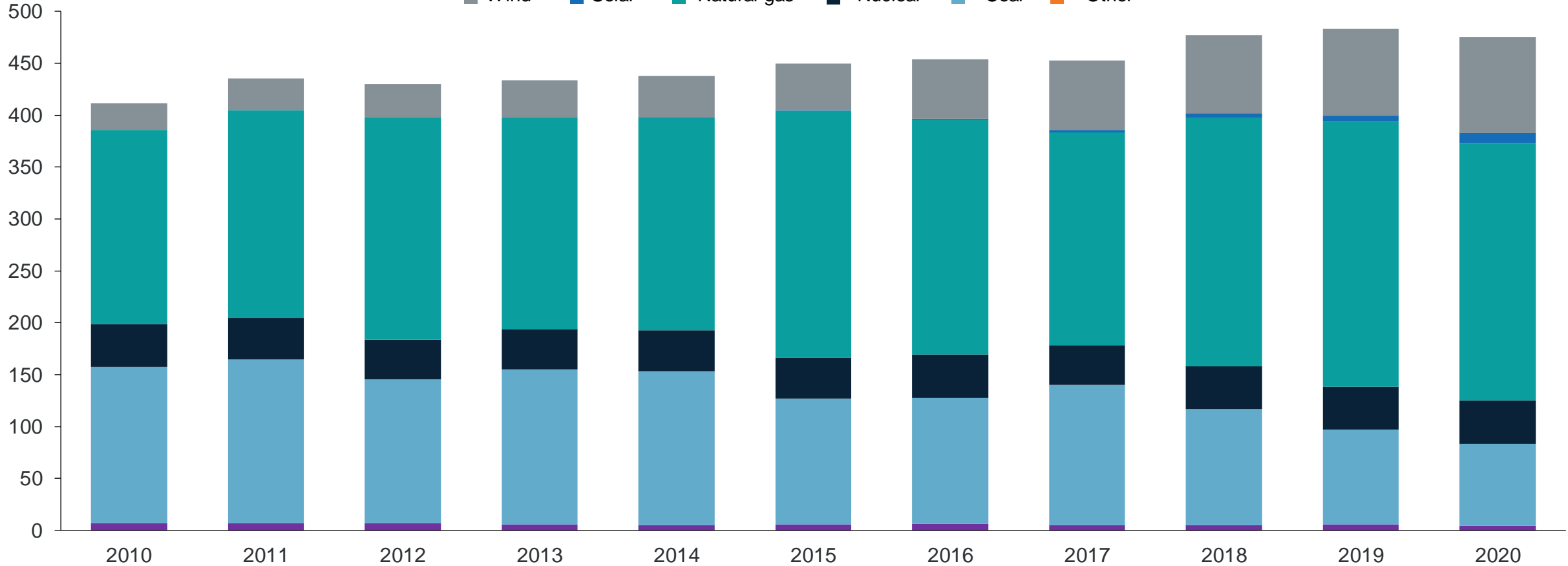


Source: American Chemistry Council analysis. NOTE: The data is based on publicly available information, which is believed to be accurate, but have not been independently verified by ACC. Updated 10/21/2021.

# Renewables Provide Second-Largest Source of Texas Electric Power Generation

Gigawatt hours

Wind Solar Natural gas Nuclear Coal Other

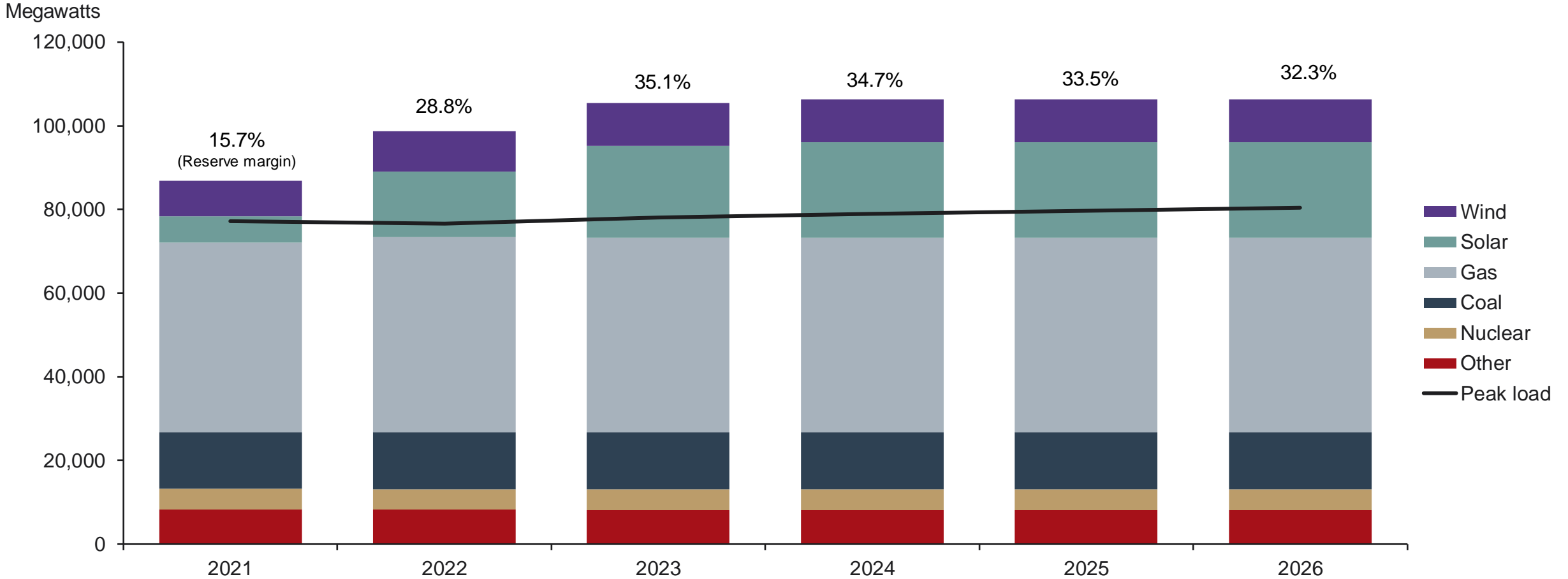


SOURCE: U.S. Energy Information Administration.

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# ERCOT Summer Available Generation Capacity Shows Reserve Margins Exceeding 30 Percent by 2023

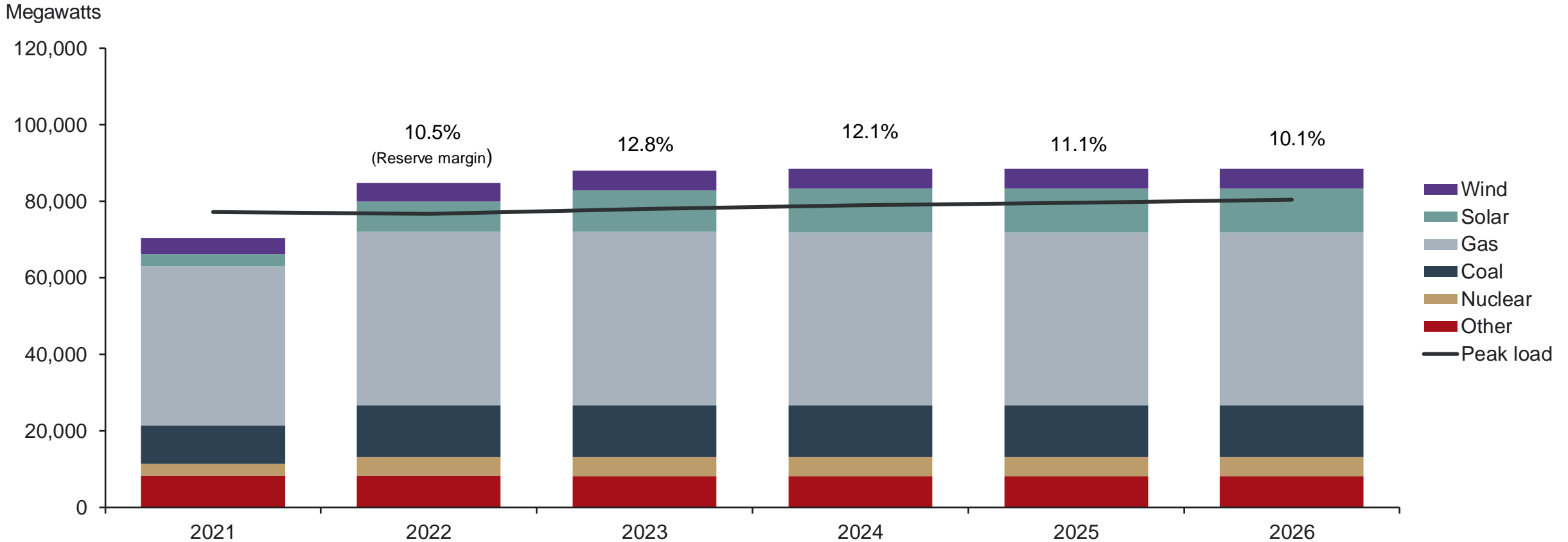


NOTES: Percentages indicate ERCOT's reserve margin. Chart depicts generation capacity, peak load and reserve margin for the summer period. "Other" includes hydroelectric, biomass, grid interconnections and private-use networks.

SOURCE: Electric Reliability Council of Texas (ERCOT).

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# Intermittency of Renewables Creates Risk: In Extreme Scenario Wind, Solar Output Falls During Unexpected Thermal Plant Downtime in Summer



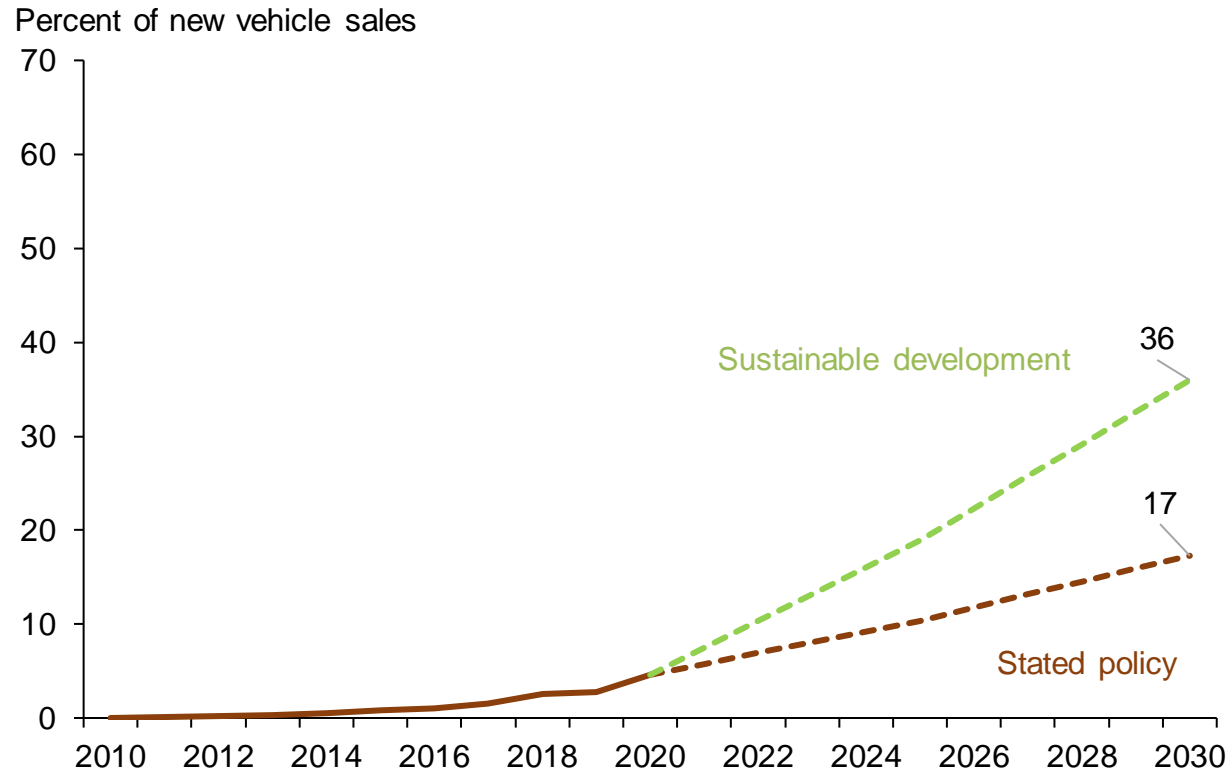
NOTES: Percentages indicate ERCOT's reserve margin. "Other" includes hydroelectric, biomass, grid interconnections and private-use networks. Scenario calculated for Surging Renewable Energy in Texas Prompts Electricity Generation Adequacy Questions, by Garrett Golding on the DallasFed Economics blog.

SOURCES: Electric Reliability Council of Texas (ERCOT); Federal Reserve Bank of Dallas calculations.

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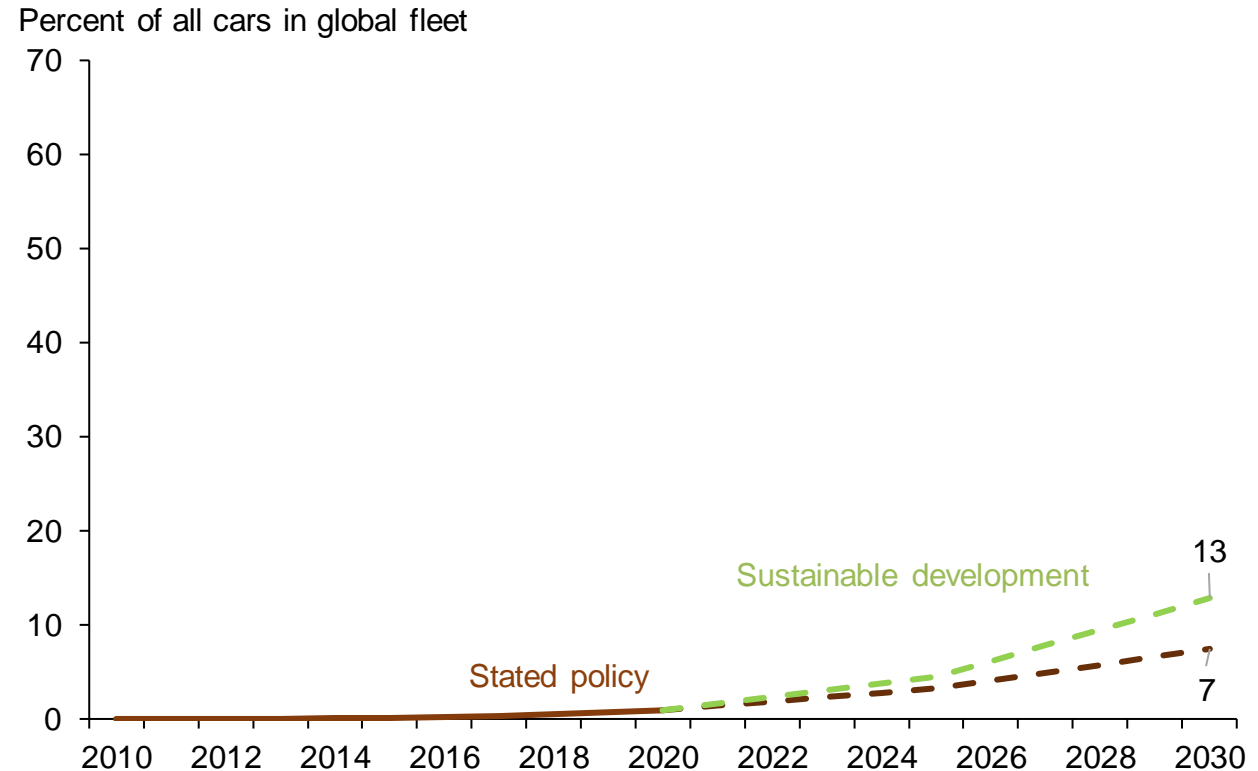
# Electrifying Transportation Will Take Time

EV share of new vehicle sales reaches 36% of new vehicle sales by 2030 in Sustainable Development Scenario



Source: IEA (*Global EV Outlook 2021*).

EV share of Global Vehicle fleet rises to 13% by 2030



Source: IEA (*Global EV Outlook 2021*).

## Summary

- Long period of decline in Texas oil and gas sector from mid-1980s to mid-2000s suggests that state can continue to grow a pace stronger than the nation even with a gradual energy transition
- Some of the lost oil and gas consumption from electric power and transportation will be made up by growing production of petrochemicals
- Past long-term decline in oil and gas not replaced by other energy sources – this one will include growth in renewables
- Transition will need to be gradual due to intermittency of renewable power and capital stock replacement
- Over the next 20 years, growth in the Texas economy will be more of a function of factors that determine where people want to live and where companies can maximize profits – factors such as a low cost of living and doing business – attributes that have attracted companies and workers to the state in the past.

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