The Outlook for Renewable Electricity in the United States

Assessing the role of policy and other uncertainties

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By
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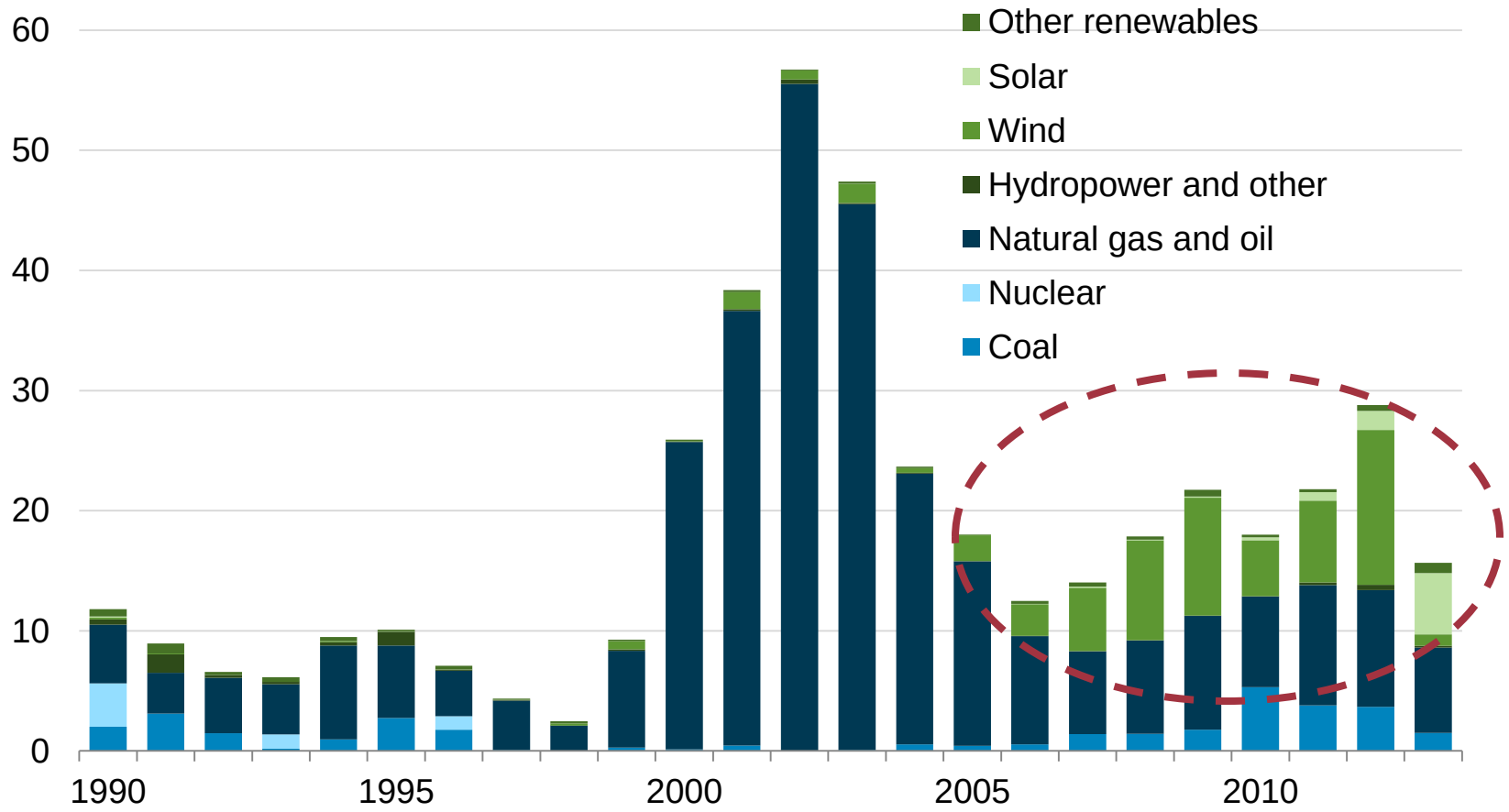
Renewables have accounted for an increasing share of capacity additions over the last decade

U.S. annual electricity generation capacity additions

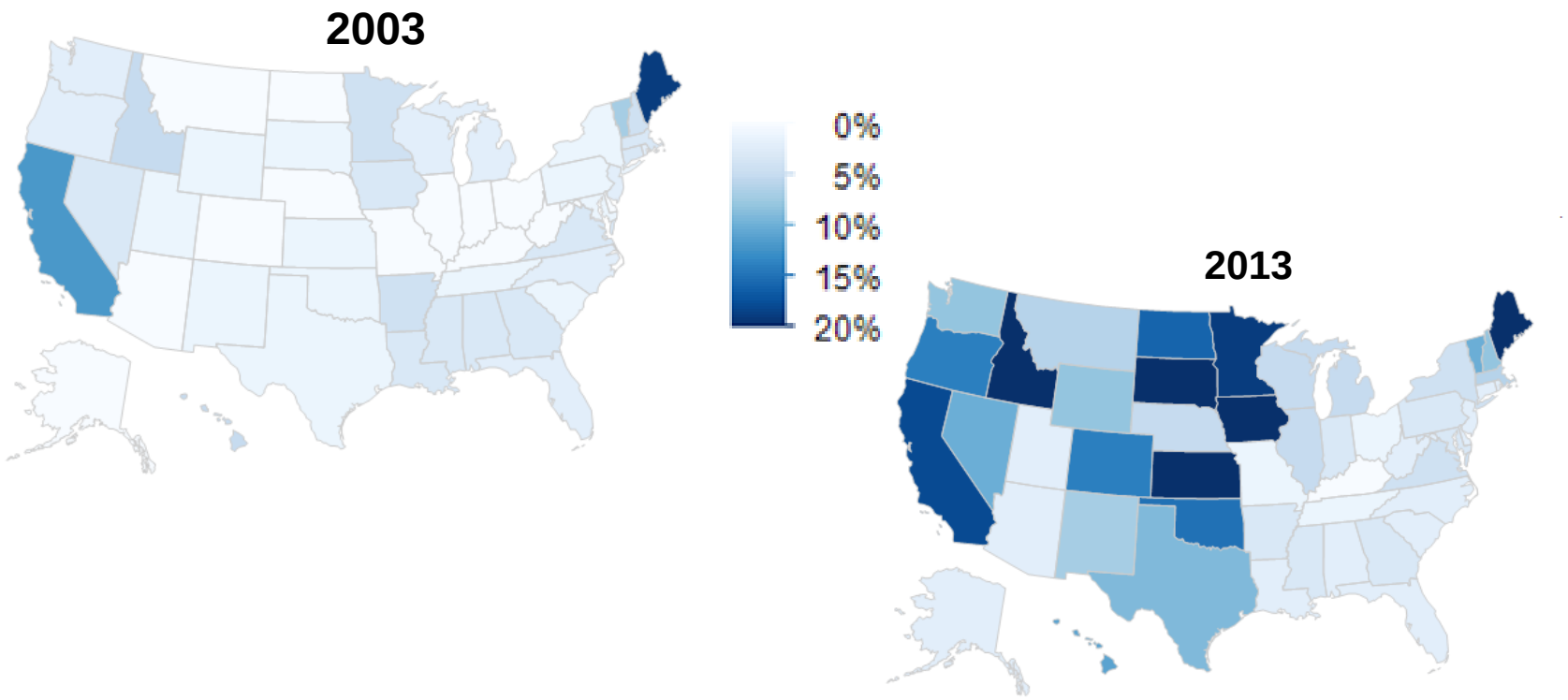
gigawatts



Source: EIA, Annual Energy Outlook 2014

The market share of non-hydro renewable generation has increased in almost all states over the last decade, with 9 states reaching penetration levels above 15% by 2013.

Percentage of generation from wind, solar, biomass, and geothermal



Source: EIA, Form EIA-923

Policy has played an integral - but not exclusive – role in supporting growth of renewables

Demand-side:

- State renewable portfolio standards and technology set-asides
- Green power markets
- Utility portfolio diversification

Supply-side:

- Federal tax credits (PTC and ITC)
- State and local tax credits, rebates, etc.
- Declining technology costs

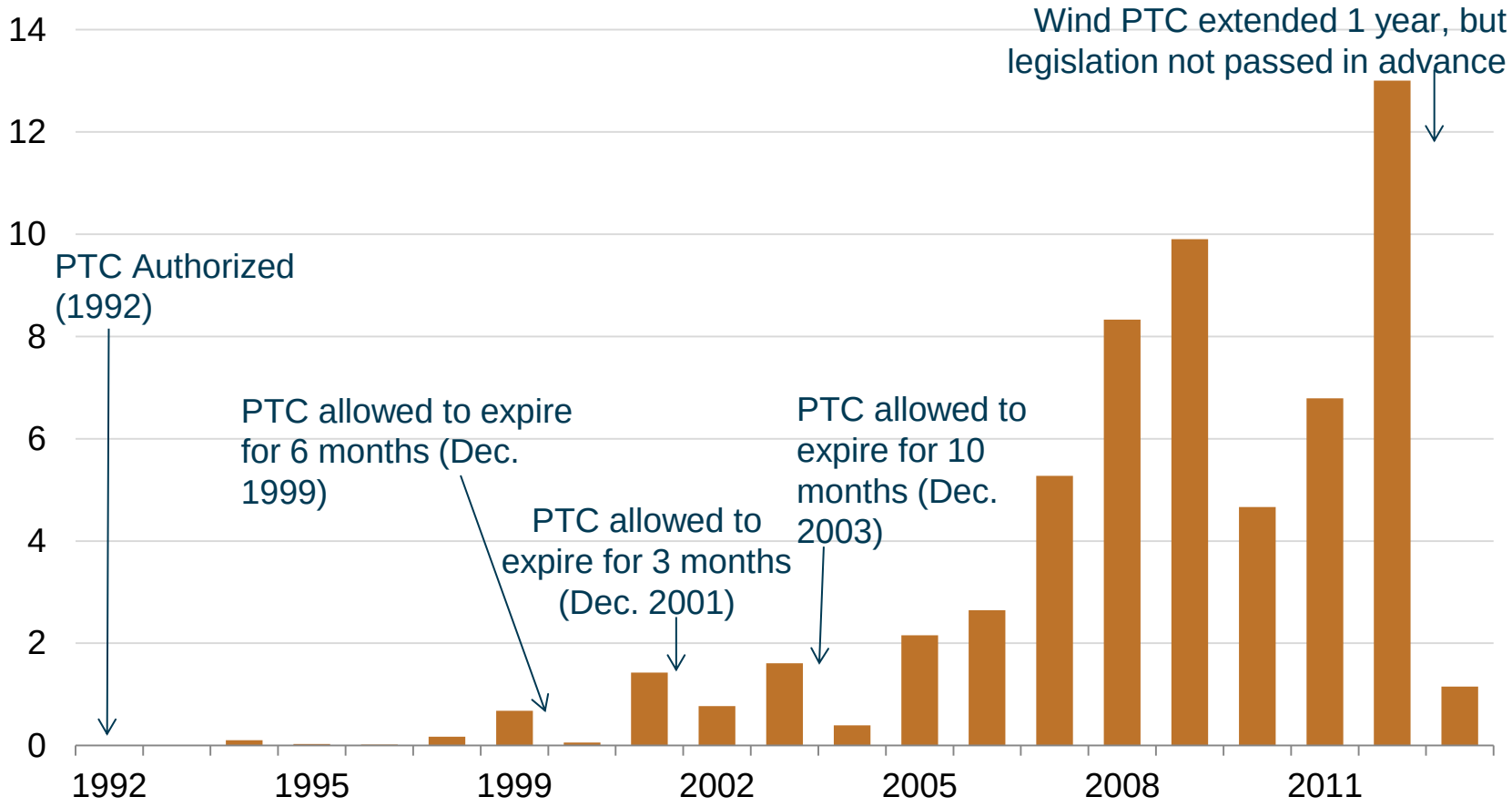
Other enabling factors:

- Net metering and interconnection rules
- Expanding transmission network
- Improved forecasting and scheduling

Policy example – the federal production tax credit (PTC) and growth in wind capacity

U.S. annual wind capacity additions

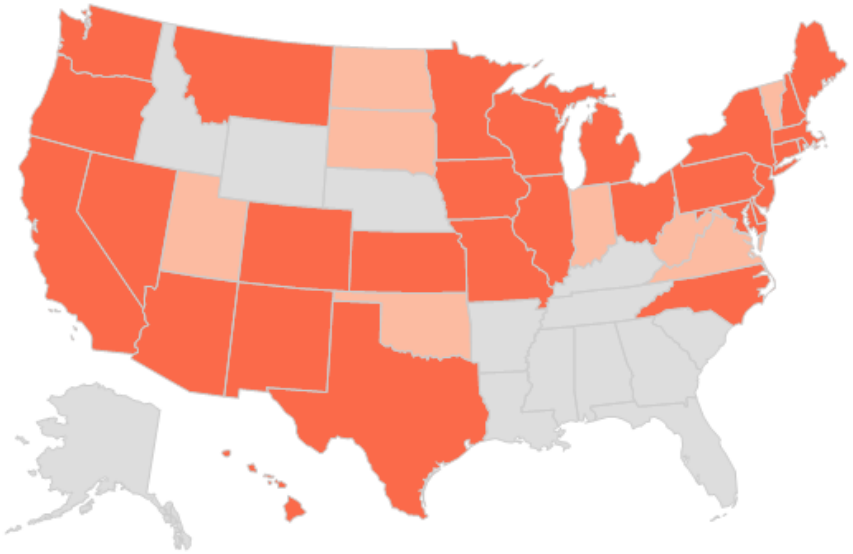
gigawatts



Source: EIA, Form EIA-860

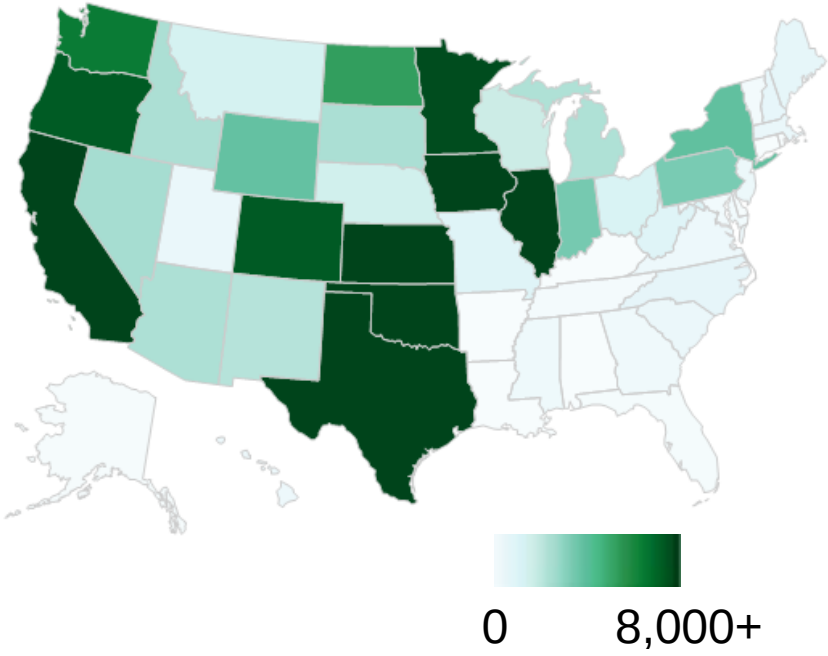
Policy example – state renewable portfolio standards

29 states + DC have a mandatory RPS; 8 have a renewble portfolio goal



Growth in non-hydro renewable generation, 2003-2013

thousand megawatthours



Sources: DSIRE and EIA, Form EIA-923

Many renewable policies that have supported the recent renewables growth are at a crossroads

- **The PTC has already expired; the ITC is set to decline or expire at the end of 2016.** While there have been various efforts to extend, prolong, or gradually taper, no such efforts have been successful in this Congress.

- **No new renewable portfolio standards have been passed since 2009.** Several existing policies reach their final target in the next couple of years, and nearly all RPS policies reach their maximum target in or prior to 2025. There have been numerous recent efforts across states to weaken or dismantle existing policies.

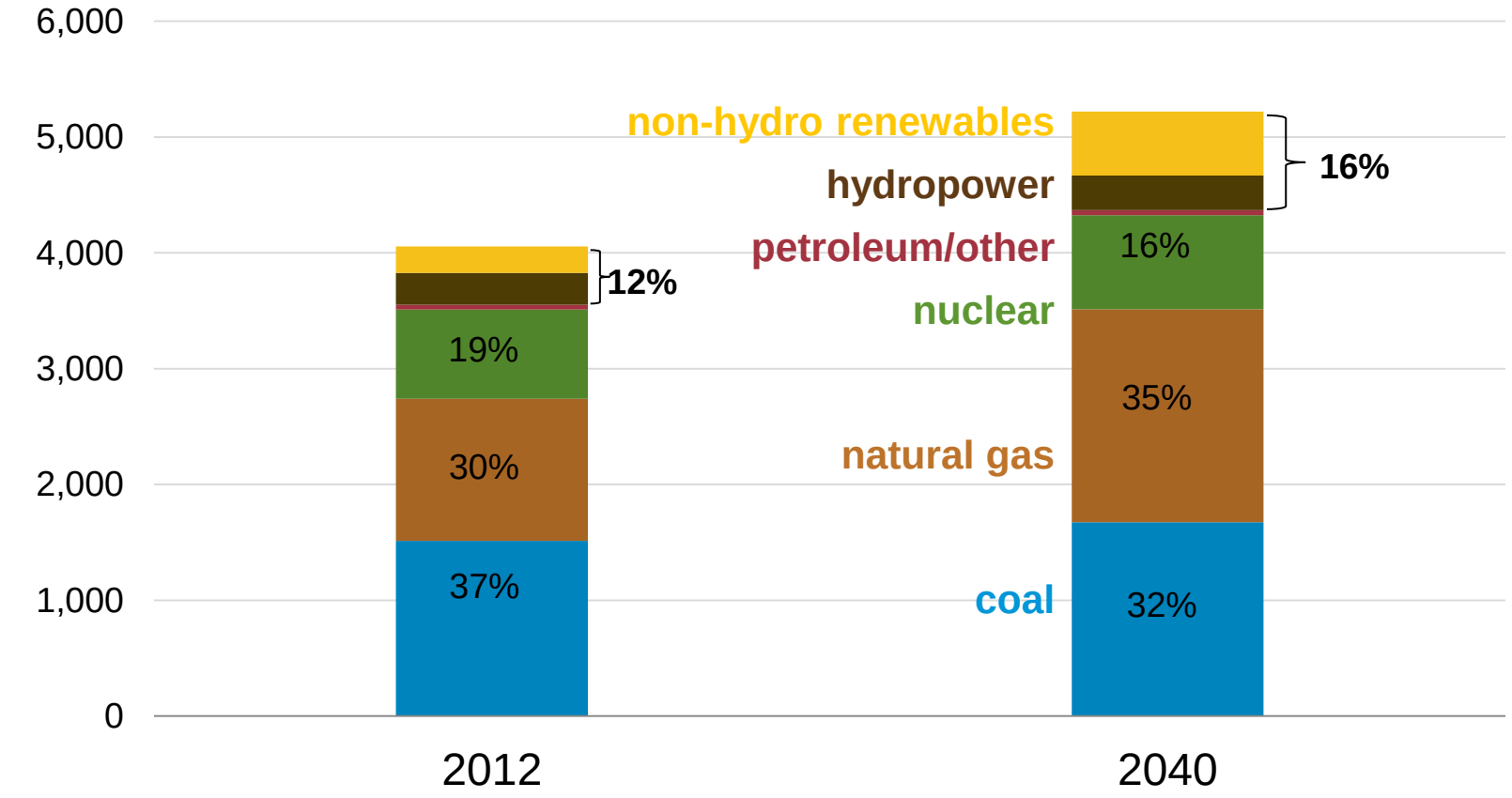
- **The rules for net metering limits, compensation, and grid charges are still being worked out.** This has been a topic of debate and regulatory action in several state legislatures, public utilities commissions, and utilities over the last year.

Looking Forward

What do EIA's Annual Energy Outlook 2014 projections say about the role of renewable electricity in the generation mix?

Net generation by fuel source in the AEO2014 Reference case

billion kilowatthours



Source: EIA, Annual Energy Outlook

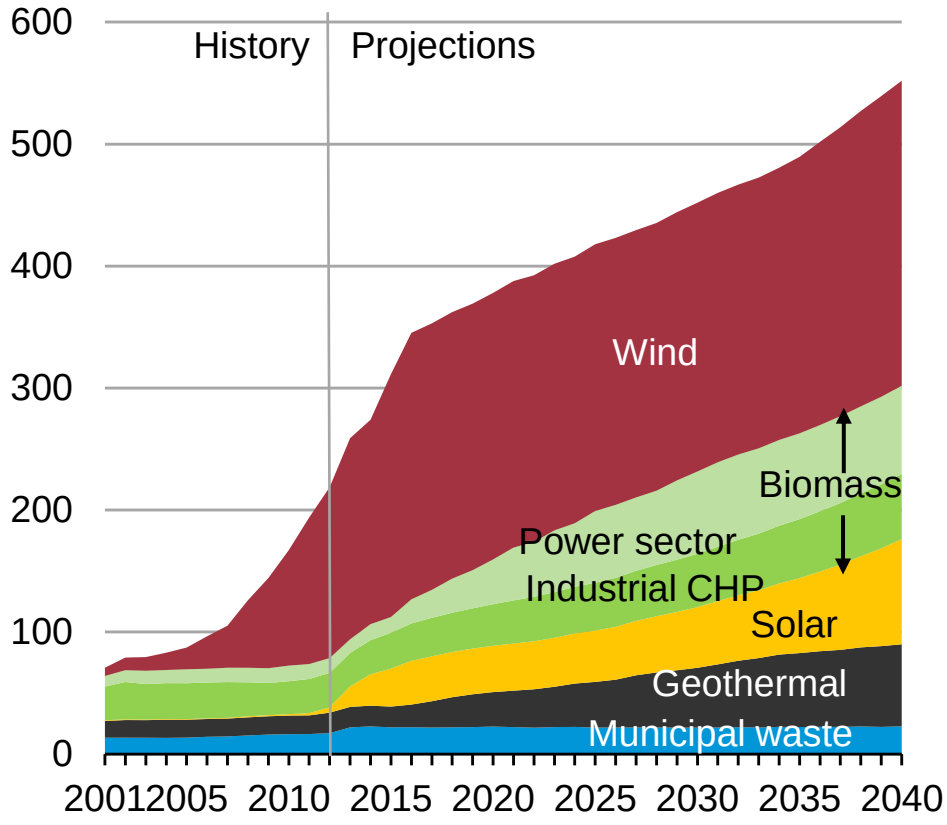
The Reference case is not EIA's prediction of the future

- The Reference case assumes current laws and policies as of October 2013 – which means the current expiration of the PTC (2013) and ITC (2016), no new or changed RPS policies, and no new EPA regulations

- The Reference case incorporates known information regarding natural gas supply, prices, and macroeconomic growth.

Non-hydro renewable generation in the AEO2014 Reference case

billion kilowatthours



Source: EIA, Annual Energy Outlook 2014

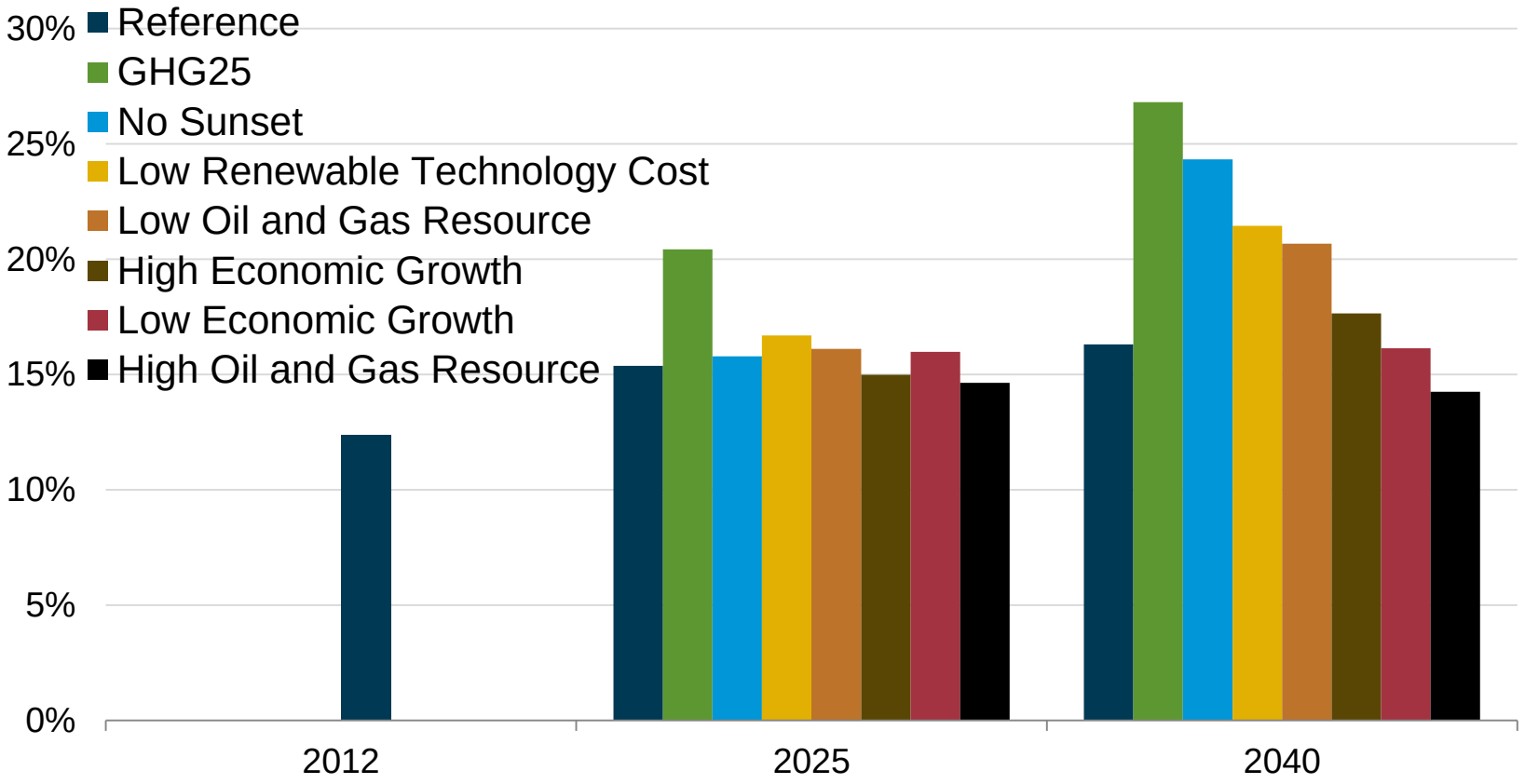
The AEO2014 includes an analysis of how renewable projections change if we vary key assumptions, including policy

	Key uncertainties	Relevant AEO2014 side cases
Technology uncertainty	• How much will it cost to build and operate a renewable generation facility?	• Low Renewable Technology Cost
Policy Uncertainty	• Will current policies be extended? • Will new policies be enacted?	• No Sunset • GHG25
Macroeconomic and Price Uncertainty	• Will natural gas prices increase more than currently projected in the Reference case? • Could the economy (GDP) grow faster or slower than the average of 2.4% per year assumed in the Reference case?	• High/Low Oil and Gas Resource • High/Low Macroeconomic Growth

Projected renewable generation market shares vary significantly under alternative assumptions

Renewable share of electricity generation in eight cases

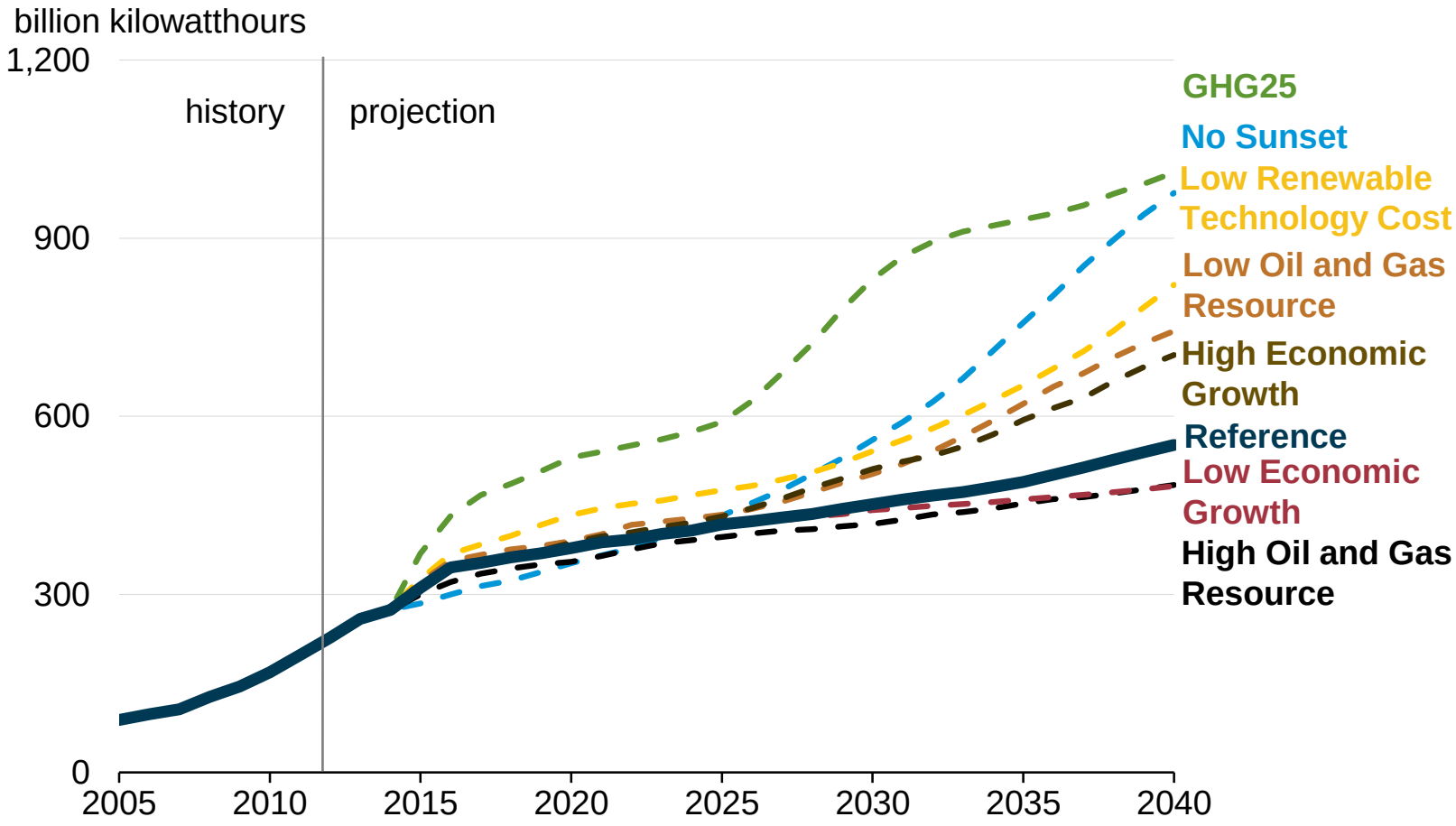
billion kilowatthours



Source: EIA, Annual Energy Outlook 2014

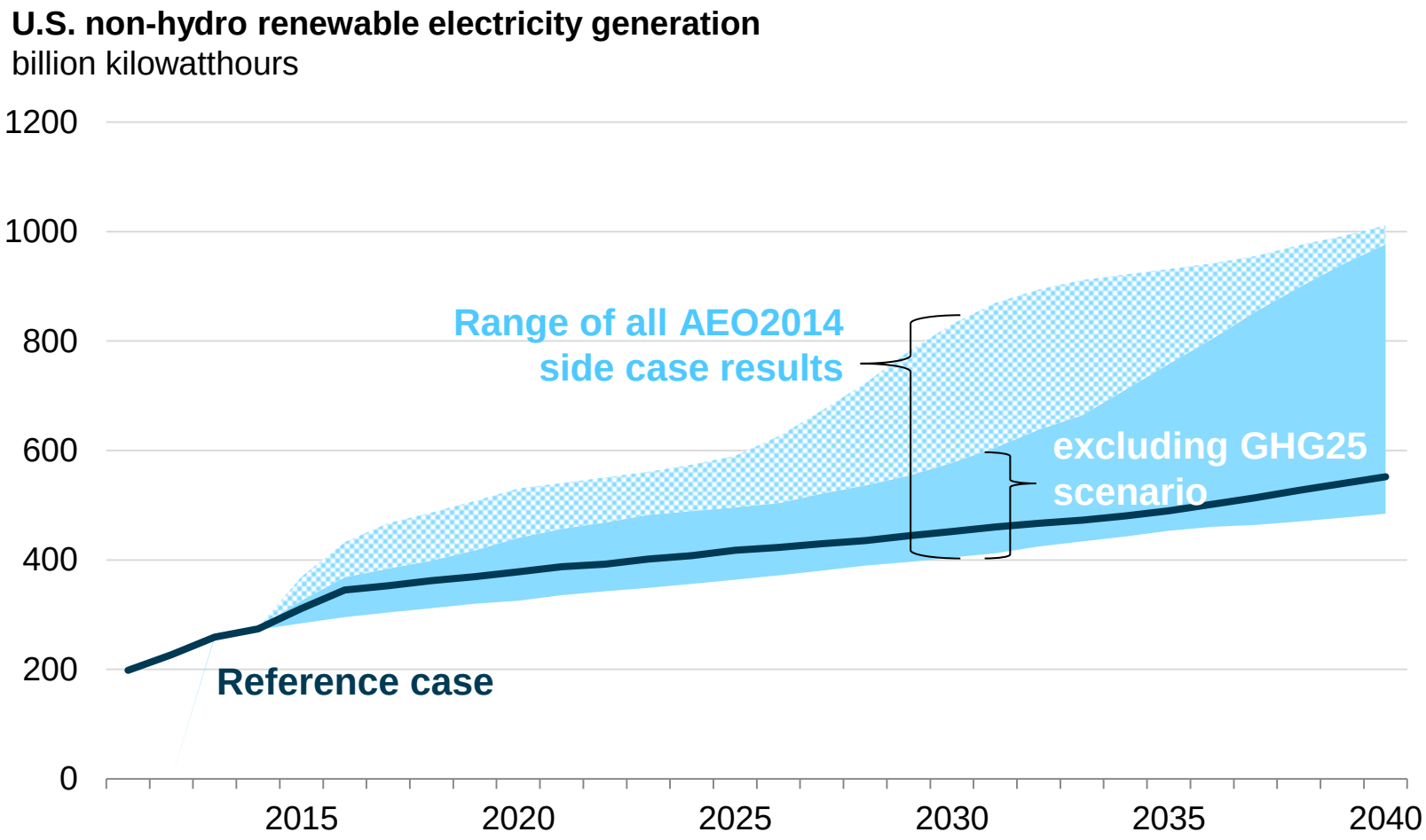
Uncertainty in renewable projections is skewed to the upside of the Reference case

U.S. non-hydro renewable electricity generation in eight cases (2005-40)



Source: EIA, Annual Energy Outlook 2014

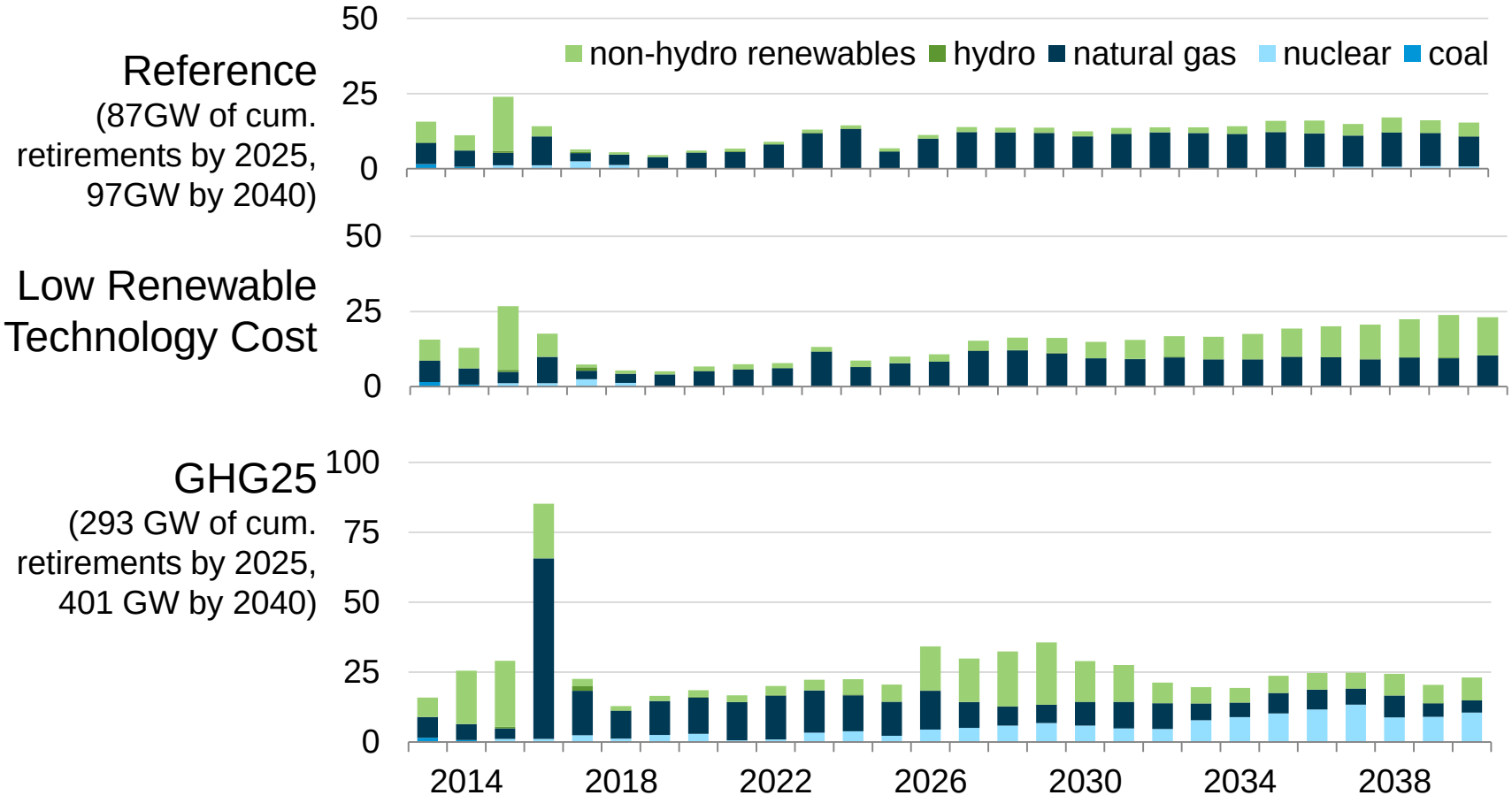
Long-term renewable projection results are more sensitive to changes in assumptions than short or mid-term results



Minimal need for new capacity over the next decade limits the mid-term growth of renewable capacity

Annual electricity generation capacity additions in three cases

gigawatts

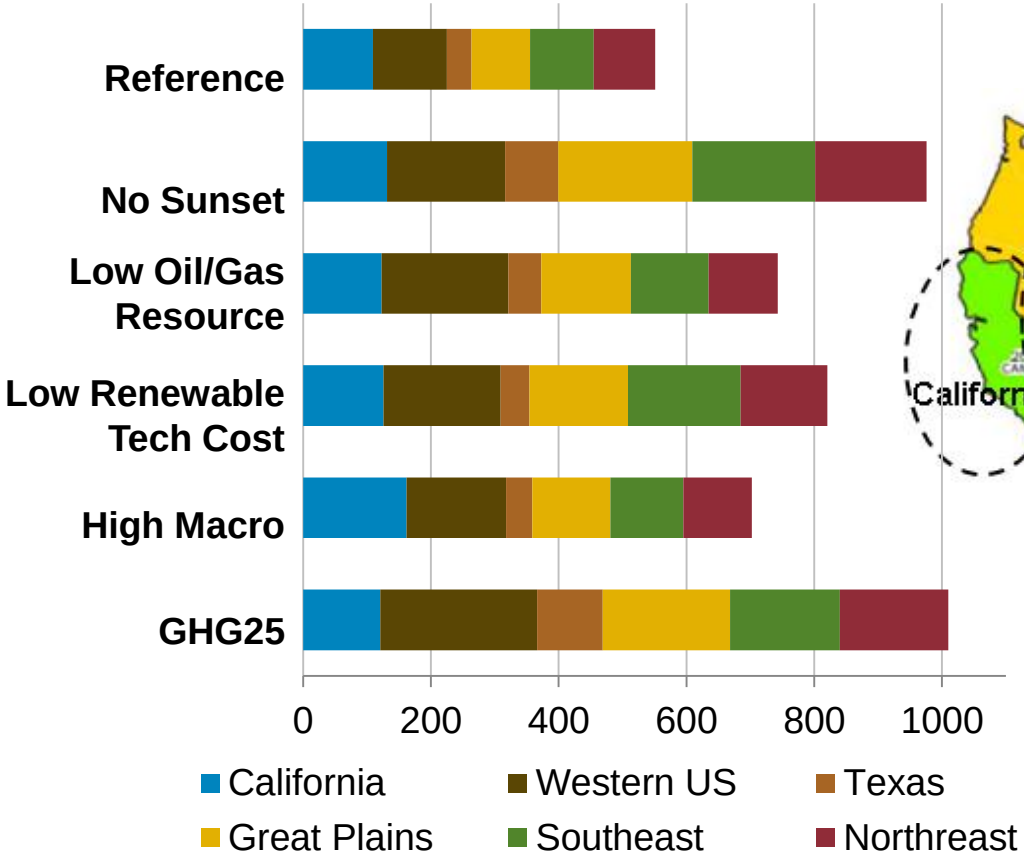


Source: EIA, Annual Energy Outlook 2014

Regions respond differently to high-renewable penetration scenarios

Non-hydro renewable generation by region, 2040

billion kilowatthours



Source: EIA, Annual Energy Outlook 2014

High-penetration renewable scenarios do not impact all renewable technologies proportionately

Non-hydro renewable generation in eight cases

billion kilowatthours

Source: EIA, Annual Energy Outlook 2014

What are the policy implications?

- Renewables are increasingly competitive with traditional generation technologies over time, but growth potential is limited, particularly in the near term, by several factors:

- Potential for growth is limited by factors such as
  - slow electricity demand growth combined with a relative surplus of existing generation capacity
  - relative cost of renewable and traditional generation technologies
  - low natural gas prices
  - grid integration concerns

- Policies can address these factors to varying degrees, but the "devil is in the details" in terms of the degree of impact, distributional effect across technologies and regions, and interactions with other economic factors.

For more information

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