

Analysis of a 30 Percent by 2030 National Renewable Electricity Standard

Alison Bailie, Steve Clemmer, and Jeff Deyette
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UCS Analysis of a National RES

- Examines the impact of a 30% by 2030 national Renewable Electricity Standard (RES) on the U.S. electricity sector
- Uses the Regional Energy Deployment System (ReEDS) model developed by the National Renewable Energy Laboratory
- Modifies some cost and performance assumptions of energy technologies based on project-specific data and recent studies*

*For more information, see technical appendix at www.ucsusa.org/30by2030nationalREStechappendix.pdf

Modeling Scenarios

Business as Usual scenario that assumes no new state or federal policies beyond those which existed at the end of 2014

30 percent by 2030 RES scenario modeled after S. 1264, co-sponsored by Senators Udall and Markey and several others. Key provisions include:

- Annual targets start at 7.5% in 2015, and ramp up gradually hitting 12% in 2020, 20% in 2025, and 30% in 2030
- Obligated utilities include investor-owned utilities with annual sales greater than 1 million MWh
- All municipal utilities and rural electric cooperatives are exempt
- Existing hydropower and municipal solid waste generation are excluded from baseline electricity sales; in calculating annual obligations
- Compliance demonstrated through national renewable energy credit tracking and trading system

Key Takeaways

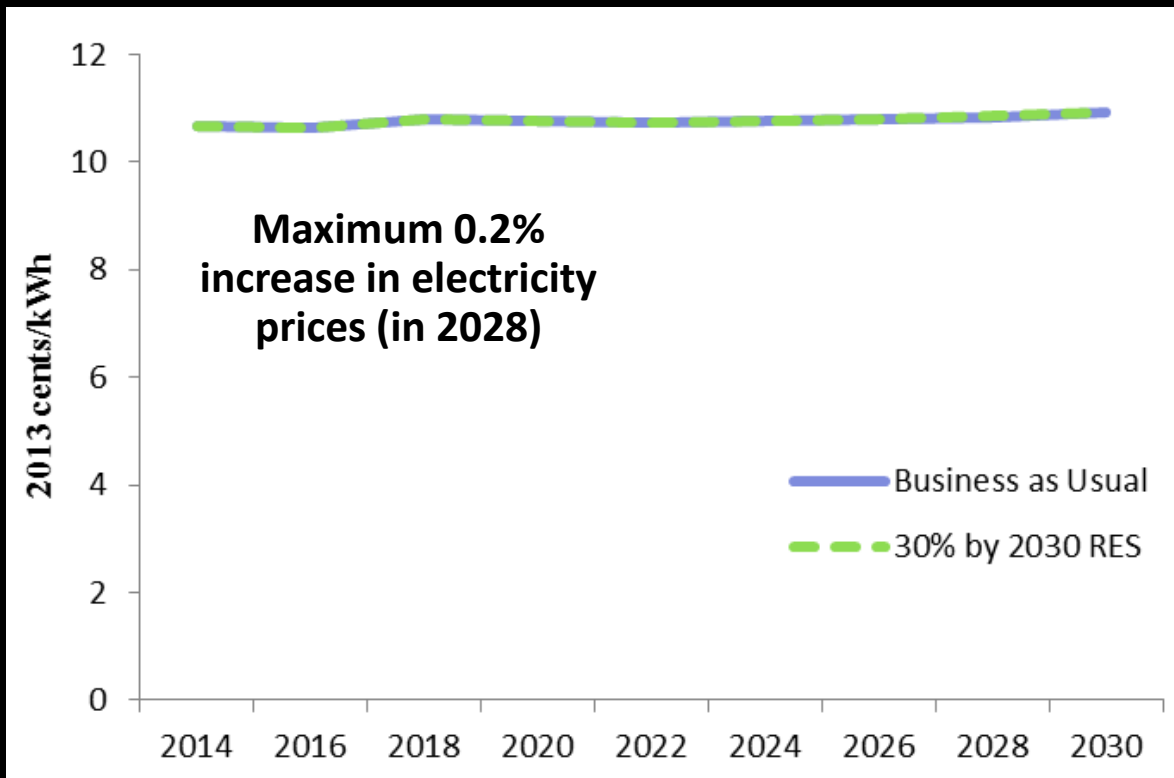
30% by 2030 National RES is achievable and provides important consumer, economic, and climate benefits:

- \$25.1 billion (0.5%) in cumulative savings on consumer electricity and natural gas bills from 2015-2030
- \$294 billion in cumulative new capital investments from 2015-2030; \$106 billion more than business as usual
- 10.8% reduction in power sector CO₂ emissions in 2030



A 30 Percent by 2030 National RES is Affordable

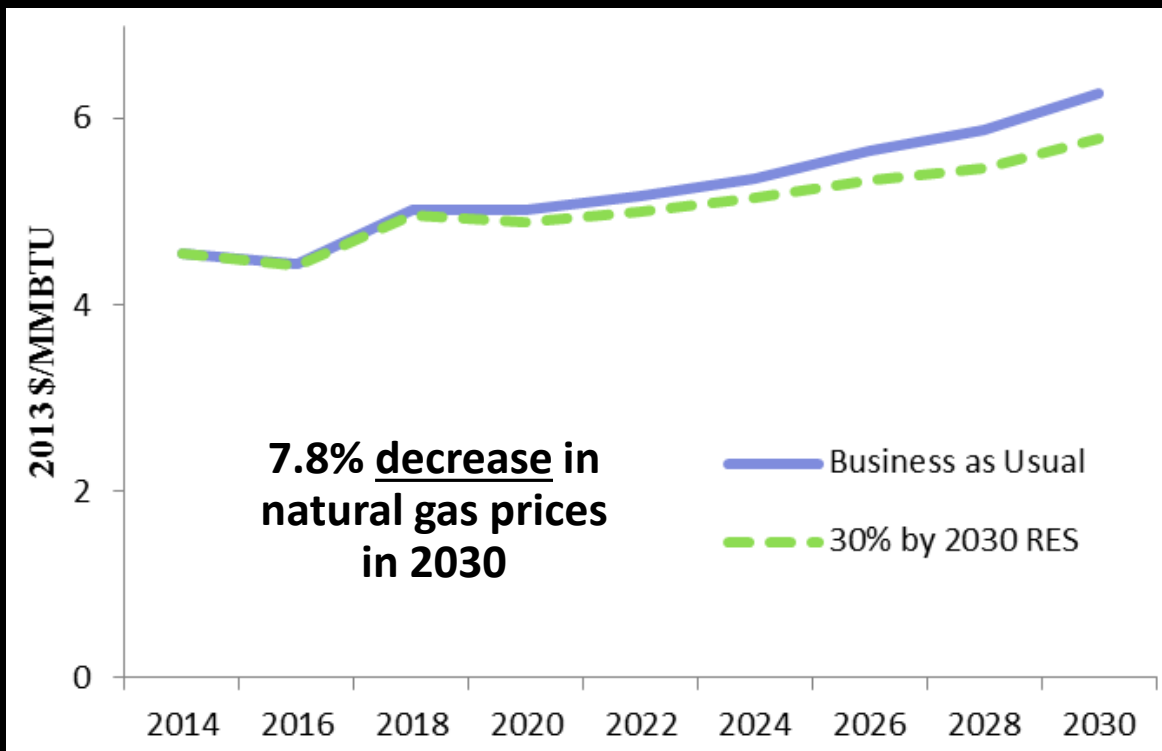
Average Retail Electricity Prices



Slightly higher costs of investing in renewable energy is largely offset by reductions in fossil fuel costs, leading to electricity prices that are virtually unchanged from 2015-2030 between Business as Usual and the 30 percent by 2030 RES.

Prioritizing Renewable Energy Reduces Natural Gas Prices

Average Power Sector Natural Gas Prices



By increasing competition and diversifying power supplies, a 30% by 2030 national RES helps lower natural gas prices for the power sector and consumers.

Increasing renewable energy can provide modest savings on combined consumer energy bills*

- \$25.1 billion (0.5%) in cumulative savings on consumer electricity and natural gas bills from 2015-2030
- For a typical household, \$0.72 in higher annual electricity bills in 2020, and \$1.69 higher in 2030
- For the nearly 50% of U.S. homes that heat with natural gas, typical annual natural gas bills are \$10.11 lower in 2020, and \$37.50 lower in 2030

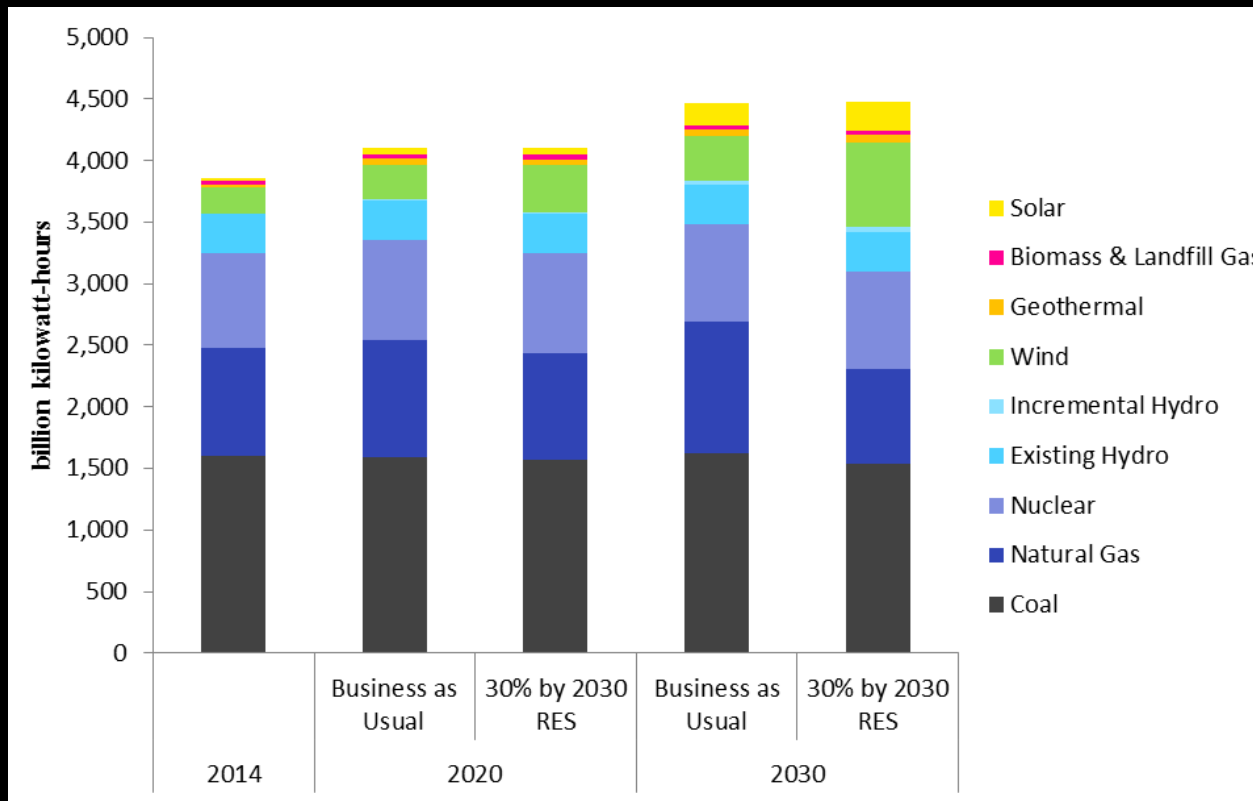


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*Cumulative results are NPV 2013\$ using a 6.24% discount rate. A typical household is assumed to consume 600 kWh/month, and homes that primarily use natural gas for heat consume 6.37 MMBTU/month.

A national RES diversifies the power supply and helps reduce the risks of overreliance on natural gas

Electricity Generation Mix

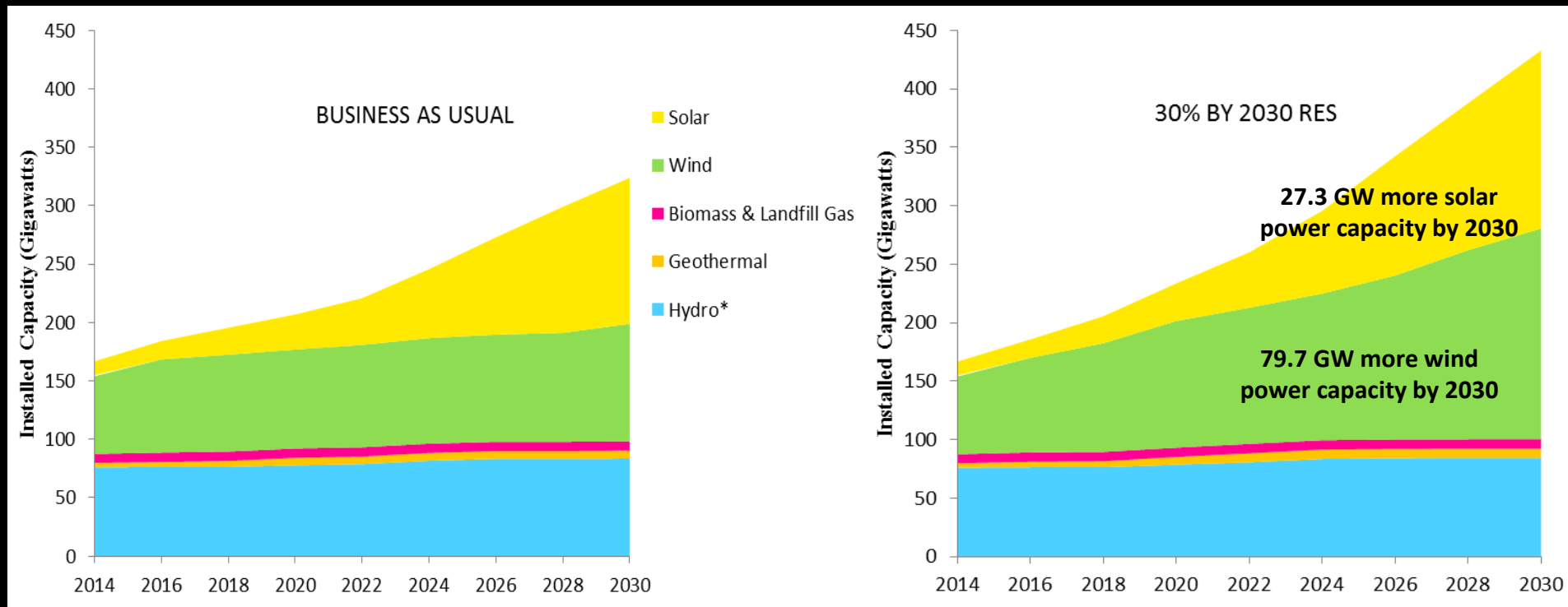


Compared with business as usual in 2030:

- 57% more renewable energy generation
- 27% less natural gas generation
- 6% cut in coal generation

A national RES spurs greater investments in renewable energy, primarily wind and solar

Renewable Energy Development



*Existing hydropower generation is eligible as an exclusion from baseline electricity sales for obligated power providers in calculating their annual renewable energy generation target.

Renewable energy development drives economic benefits*



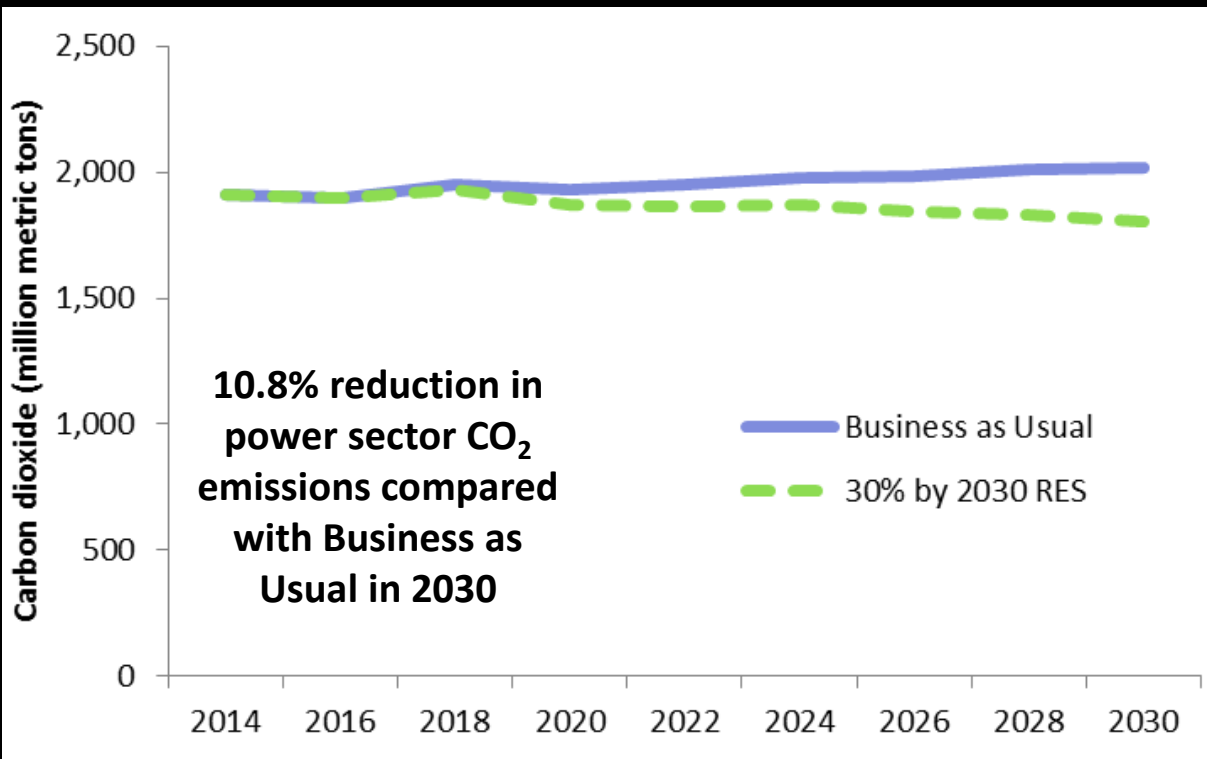
- \$294 billion in cumulative new capital investments from 2015-2030; \$106 billion more than business as usual
- Nearly \$4.3 billion in annual operation and maintenance payments in 2030
- \$2.6 billion in cumulative property taxes paid to local governments from 2015-2030
- \$830 million in cumulative wind power land lease payments to rural landowners from 2015-2030

*All results reflect net economic benefits of 30% by 2030 national RES compared with Business as Usual. Cumulative results are NPV 2013\$ using a 6.24% discount rate. Property tax payments are assumed to total 0.41% of capital investment cumulatively. Land lease payments are assumed to be \$3,000/MW/year.

Investing in Renewable Energy Cuts Carbon

Power Sector CO₂ Emissions

- More than one-third of emission cuts required under the Clean Power Plan by 2030
- \$12.7 billion in net societal benefits* in 2030 from reducing CO₂ emissions
- 1.5 billion fewer metric tons of CO₂ emissions cumulative from 2015-2030



10.8% reduction in power sector CO₂ emissions compared with Business as Usual in 2030

— Business as Usual
- - 30% by 2030 RES

*Based on the U.S. government's estimates for the social costs of carbon, which includes the dollar damages to public health and the environment caused by emission of an additional metric ton of CO₂ in a given year.

For more information,
please contact:

Alison Bailie
Energy Modeler
abailie@ucsusa.org

Steve Clemmer
Energy Research Director
sclemmer@ucsusa.org

Jeff Deyette
Senior Energy Analyst
jdeyette@ucsusa.org

