

Climate Game Changer

How a carbon
standard can cut
power plant emissions
in half by 2030

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[**Union of
Concerned Scientists**



UCS Analysis of a Power Plant Carbon Standard

- Examines U.S. electricity sector opportunities for carbon emissions reductions under different policy scenarios
- Uses the Annual Energy Outlook (AEO) 2013 version of the National Energy Modeling System (NEMS) developed by the U.S. Energy Information Administration (EIA)
- Includes some modifications to the cost and performance assumptions of energy technologies based on project-specific data and recent studies*.

Modeling Scenarios

Reference Case scenario that assumes no new state or federal policies beyond those which existed at the end of 2012

Carbon Standard scenario that analyzes the impacts of a federal carbon standard on the electric power sector

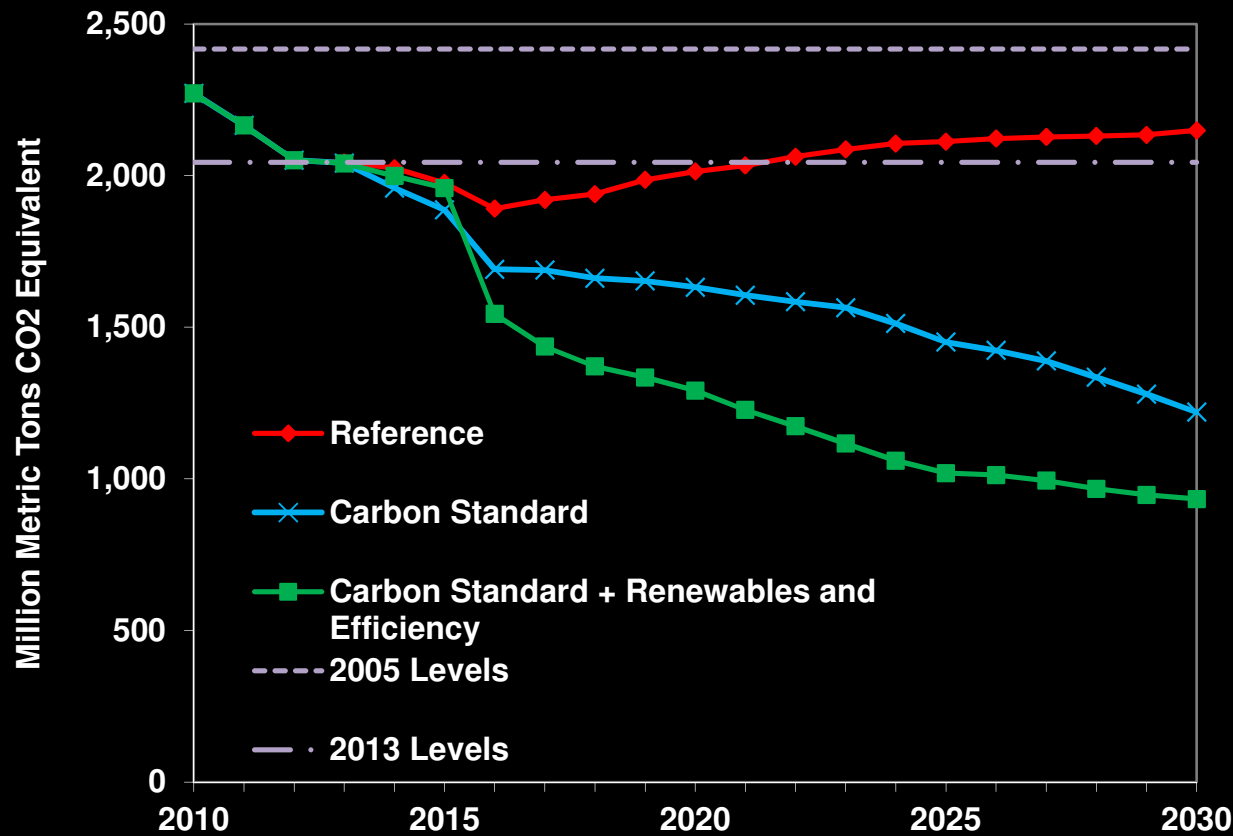
- using a carbon price of \$5/metric ton in 2018, increasing to \$35/ton in 2030 as proxy for reducing carbon

Carbon Standard + Renewables and Efficiency scenario that complements the federal carbon standard with:

- stronger state renewable and energy efficiency resource standards, updated building codes, improved equipment efficiency standards, incentives for combined heat and power (CHP), new lower cost financing mechanisms, and short-term extension of federal renewable energy tax credits*

A strong carbon standard can deliver deep cuts in power sector emissions

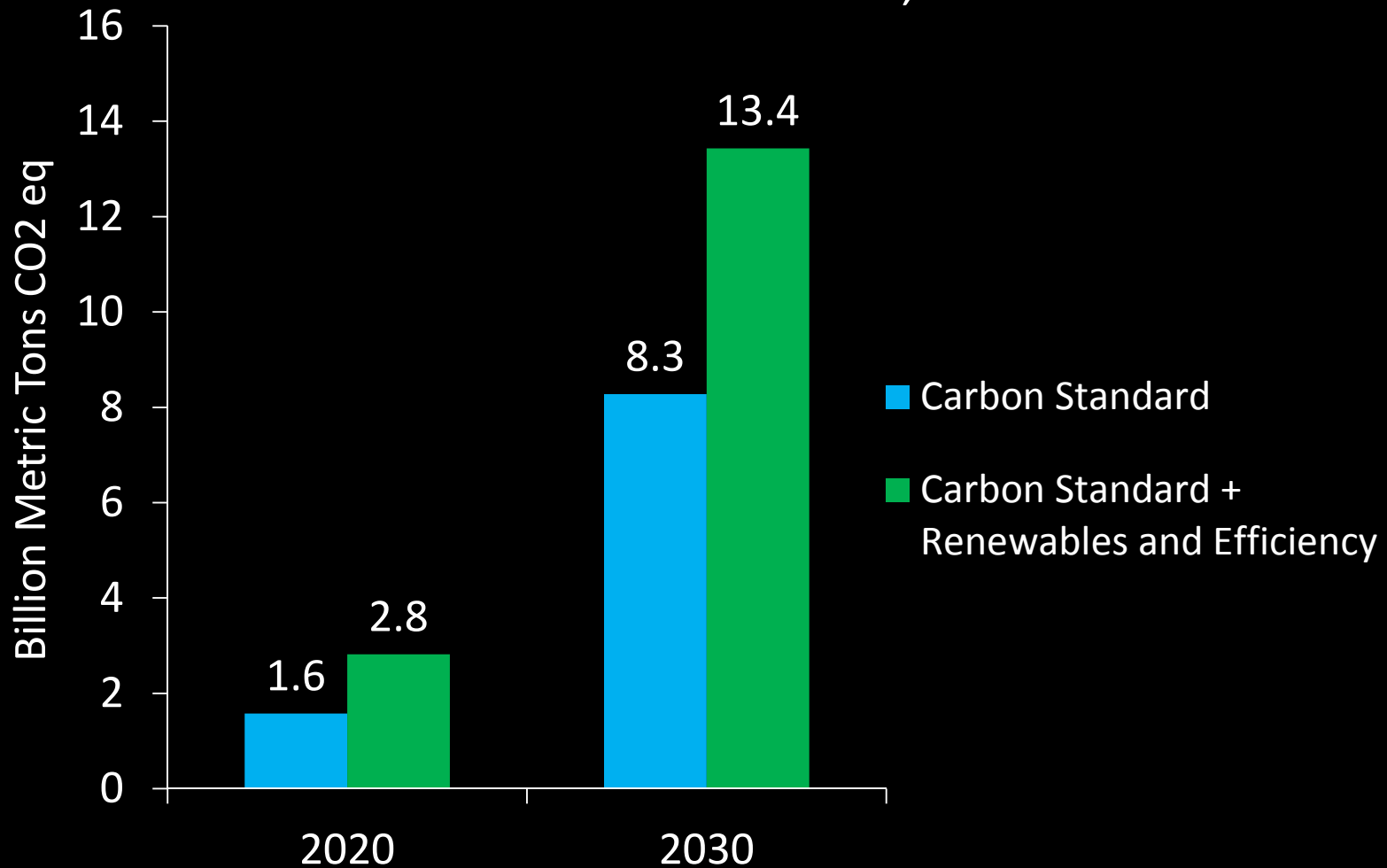
Power Plant Carbon Dioxide Emissions



Emissions Reduction, % Below 2013 Levels	2020	2030
Carbon Standard	20%	37%
Carbon Standard + Renewables and Efficiency	40%	54%

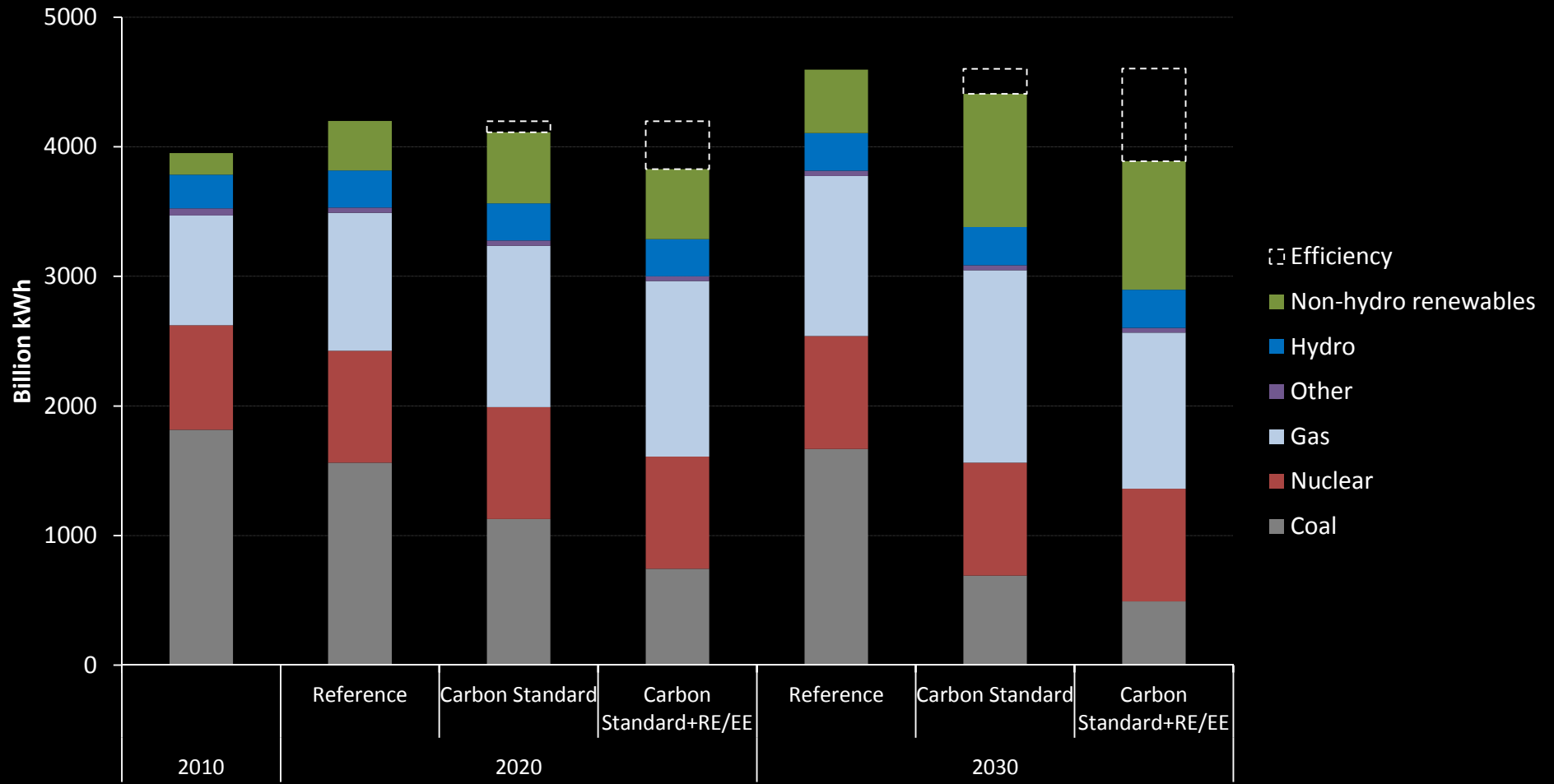
A carbon standard complemented by renewables and efficiency policies accelerates emissions reductions

Cumulative CO2 Reduction, from 2013



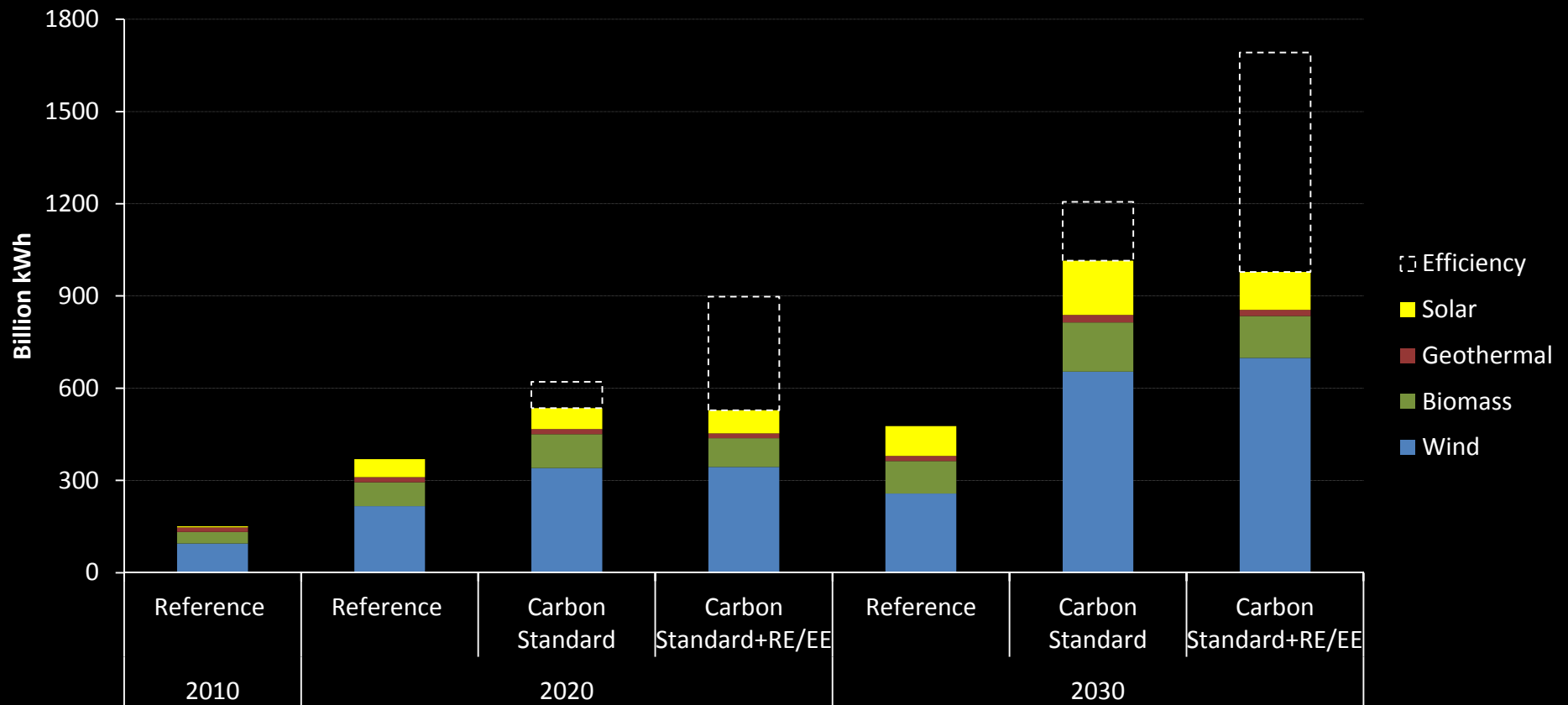
Emissions reductions driven by shift from coal to renewables, efficiency and gas

U.S. Generation Mix



A diverse mix of renewable generation and efficiency is developed to achieve the carbon standard

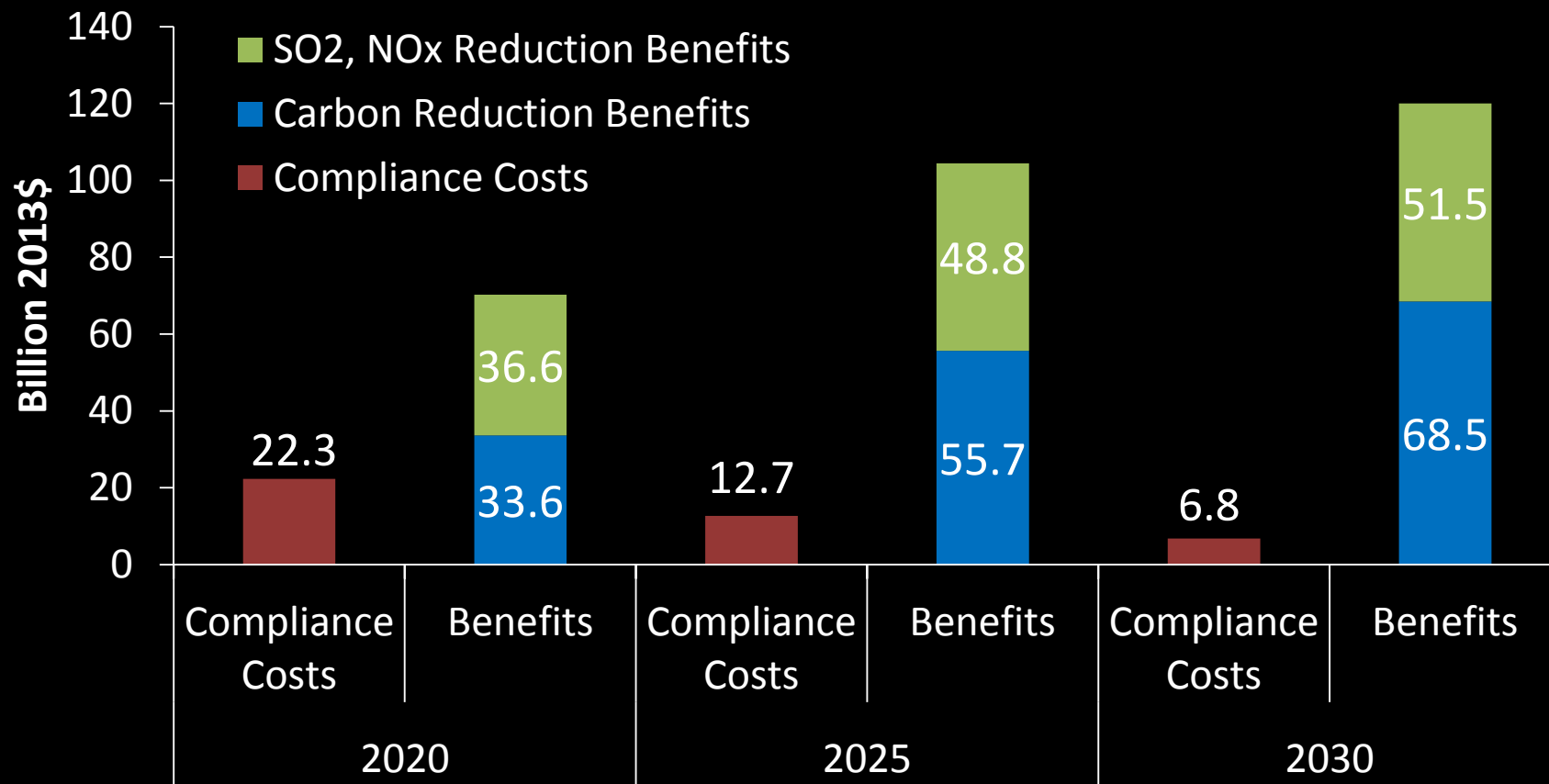
Renewable Energy Generation and Energy Efficiency Savings



Annual health and environmental benefits are much larger than the annual compliance costs

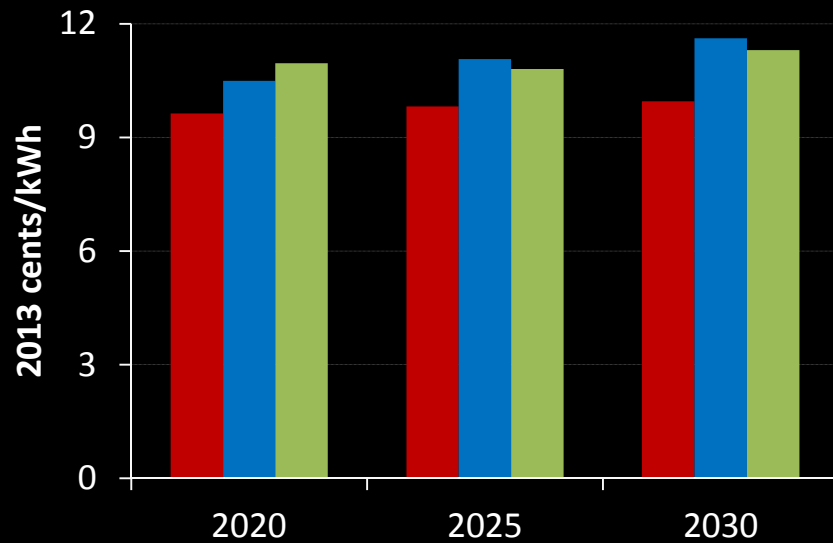
Reducing carbon has co-benefits in reducing SO₂ and NO_x

Carbon Standard + EERE Scenario

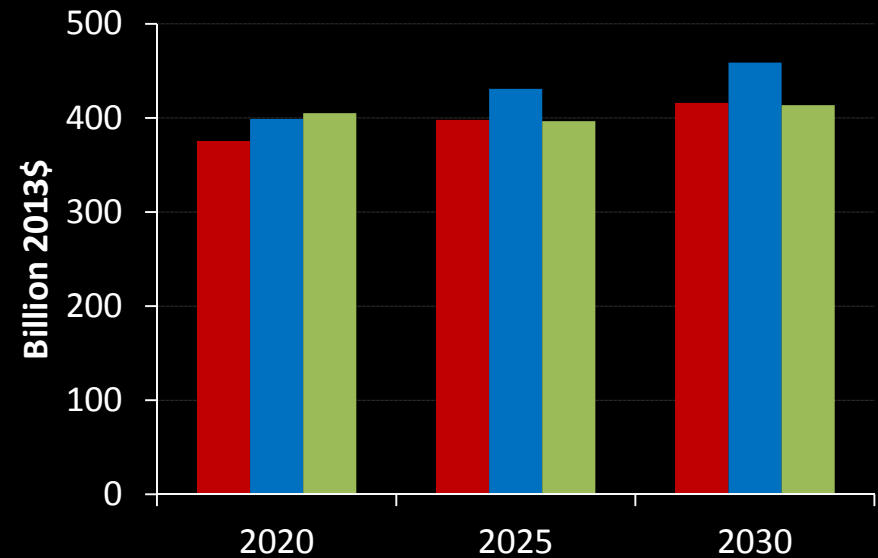


Efficiency and renewable energy lower the cost of the carbon standard

Average Consumer* Electricity Prices



Consumer* Electricity Bills



- Reference
- Carbon Standard
- Carbon Standard + Renewables and Efficiency

Recommendations for the EPA

- Set a strong emissions reduction target, both for the near-term and the long-term
- Enable renewable energy (RE) and energy efficiency (EE) to play a significant role
- Allow multi-state compliance options
- Provide tools to help states account for emissions reductions from investments in RE and EE

Recommendations for states

- Ramp up renewable energy and energy efficiency, which are cost-effective compliance options
- Explore opportunities for multi-state cooperation
- Create carbon reduction programs that generate resources for transition assistance for workers

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