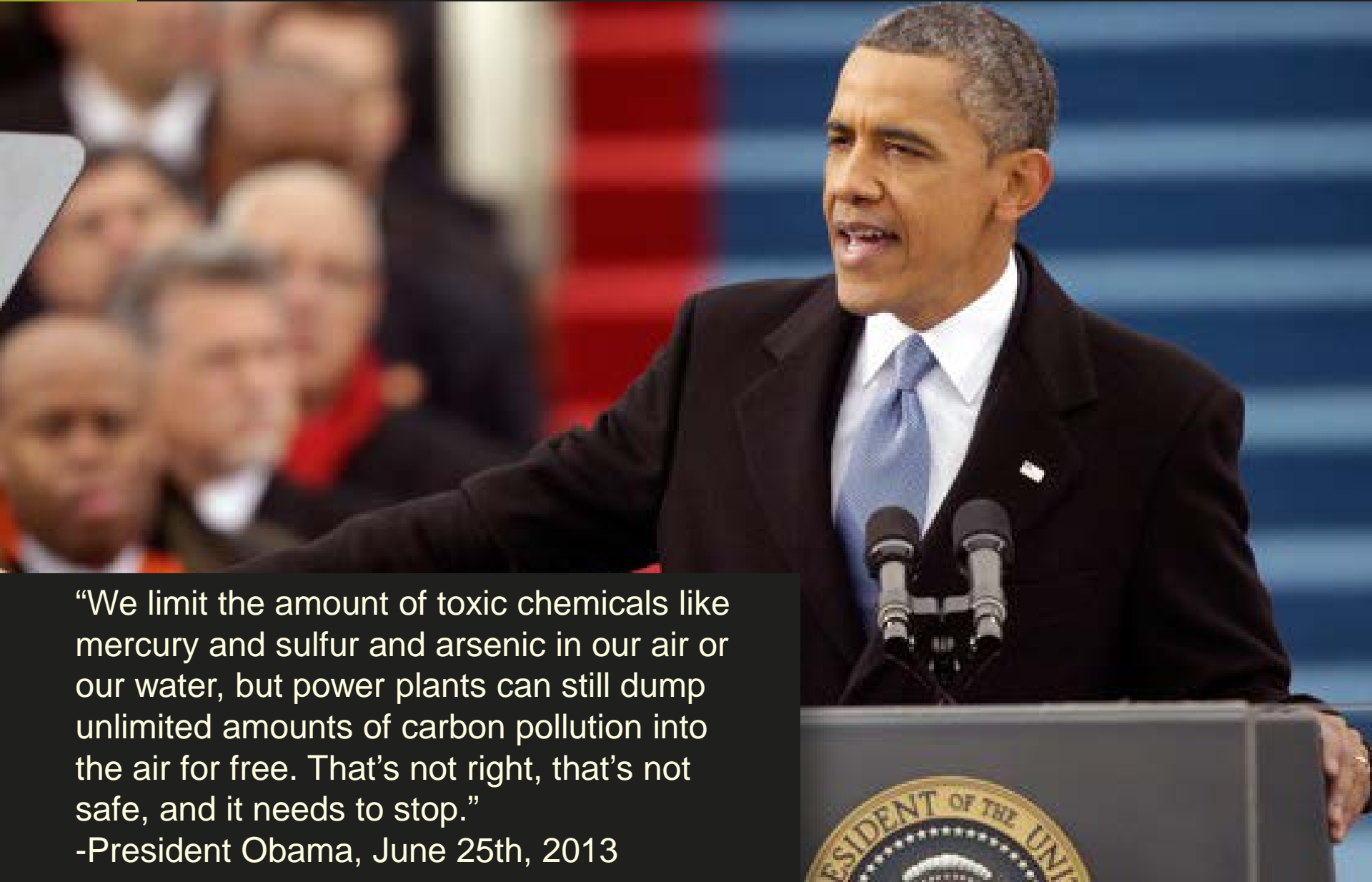




CLOSING THE POWER PLANT CARBON POLLUTION LOOPHOLE: SMART WAYS THE CLEAN AIR ACT CAN CLEAN UP AMERICA'S BIGGEST CLIMATE POLLUTERS



“We limit the amount of toxic chemicals like mercury and sulfur and arsenic in our air or our water, but power plants can still dump unlimited amounts of carbon pollution into the air for free. That’s not right, that’s not safe, and it needs to stop.”

-President Obama, June 25th, 2013

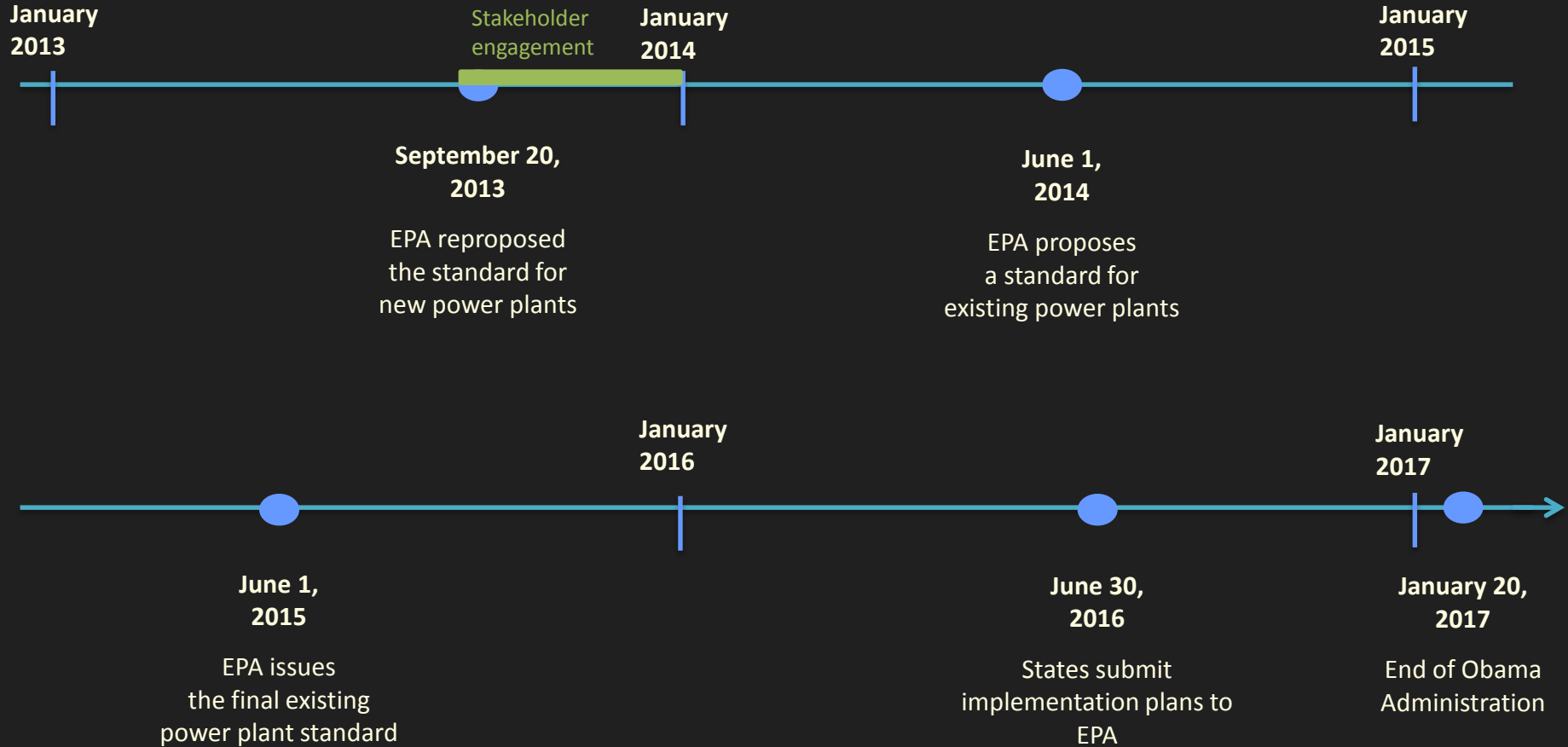


THE CLEAN AIR ACT AND EXISTING POWER PLANTS

THE “101” ON 111(d)

- **EPA CO2 Emissions Guideline & State Plans**
 - EPA proposes “emission guideline” June 2014, final June 2015.
 - Guideline includes performance standard and compliance provisions.
 - States have ‘til June 2016 to adopt and submit state plans. If a state submits no plan, or one EPA cannot approve, EPA must issue a federal plan.
- **“Best System of Emission Reduction”**
 - “Source-based” approach limited to options plants can do “within the fenceline” (e.g. heat-rate improvements) – yields limited reductions, higher costs
 - “System-based” approach includes *all options that reduce emissions* –yields deeper reductions, lower costs
 - Heat-rate improvements
 - Shifting generation from coal to gas
 - Increasing zero -emission power (renewables and nuclear)
 - Increasing energy efficiency

THE TIMELINE





NRDC PROPOSAL

SYSTEM-BASED, STATE-SPECIFIC STANDARDS

- **State-specific** fossil-fleet average CO₂ emission rates (lbs/MWh) for 2020 and 2025
- **Calculated** by applying target coal and gas rates to each state's baseline (2008-2010) fossil generation mix

2020 Target Rates

Coal: 1,500 lbs/MWh

Gas: 1,000 lbs/MWh

2025 Target Rates

1,200 lbs/MWh

1,000 lbs/MWh

- **Averaging** allowed among all fossil units in state (including new units subject to the 111(b) standard)
- **Credit for incremental** renewables and energy efficiency (equivalent to adding MWhs to denominator in calculating emission rate for compliance purposes)
- States may opt in to **interstate averaging** or credit trading
- States may adopt **alternative plans**, including **mass-based** standards, provided they achieve equivalent emission reductions

FLEXIBLE COMPLIANCE OPTIONS



HEAT RATE REDUCTIONS



CLEANER POWER SOURCES

FLEXIBLE COMPLIANCE



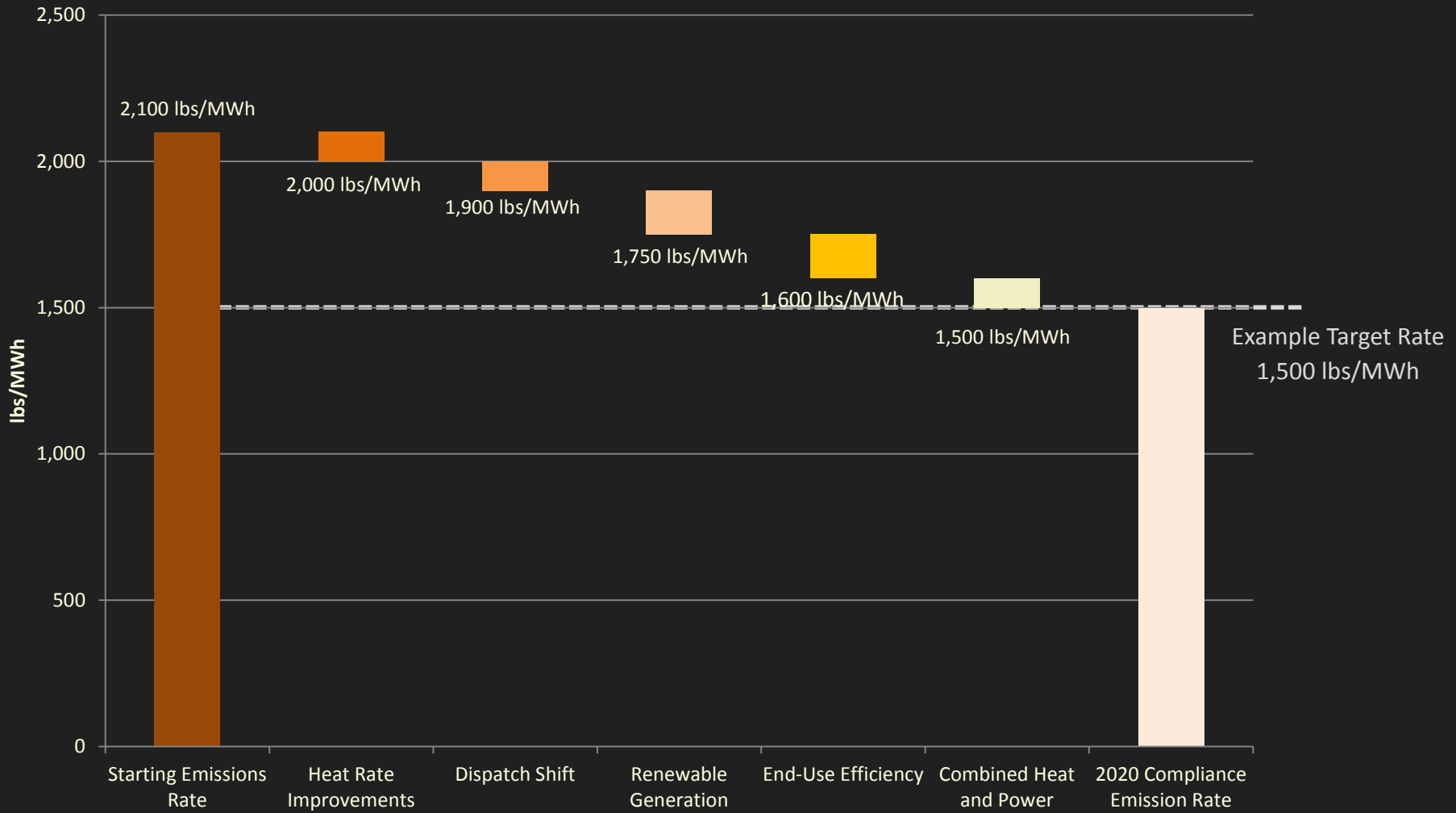
MORE RENEWABLES



INVESTMENTS IN EFFICIENCY



FLEXIBLE COMPLIANCE OPTIONS





NRDC SPECIFICATIONS

LIST OF SCENARIOS

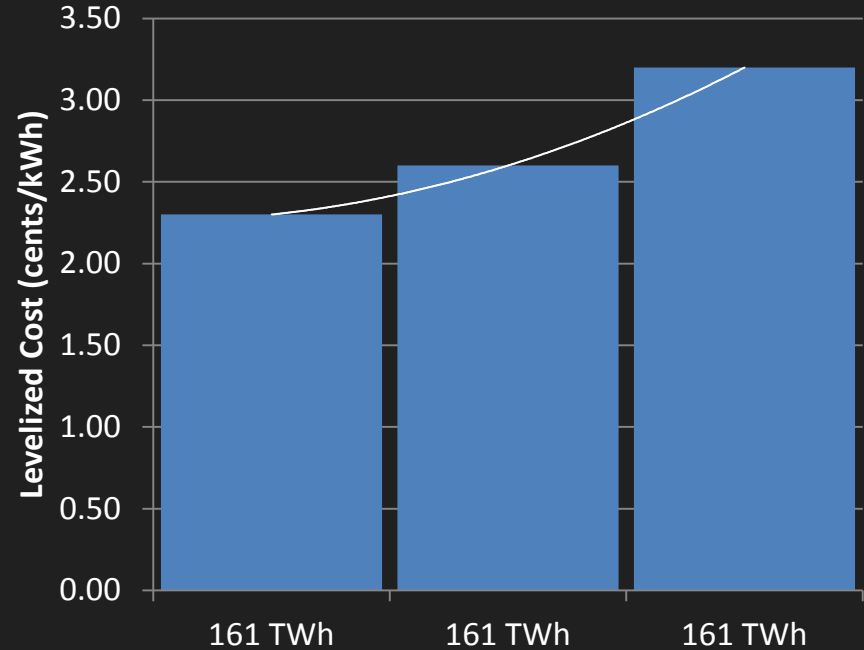
- **Reference Case**
 - AEO 2013 demand projections
 - Onshore wind costs: DOE/LBL 2012 Wind Technologies Report
 - Nuclear units re-licensed, 20-year extension
- **NRDC Policy – EE Utility Cost Test**
 - 2020 Nominal Targets: Coal = 1,500 lbs/MWh; Gas = 1,000 lbs/MWh
 - EE cost-quantity function, Synapse EE available, selected based on utility cost
- **NRDC Policy – EE Total Resource Cost Test**
 - 2020 Nominal Targets: Coal = 1,500 lbs/MWh; Gas = 1,000 lbs/MWh
 - EE cost-quantity function, Synapse EE available, selected based on total cost
- **NRDC – Stronger Standards**
 - 2020 Nominal Targets: Coal = 1,400 lbs/MWh; Gas = 700 lbs/MWh
 - EE cost-quantity function, Synapse EE available, selected based on utility cost



NRDC SPECIFICATIONS

SIMPLE ENERGY EFFICIENCY SUPPLY CURVE

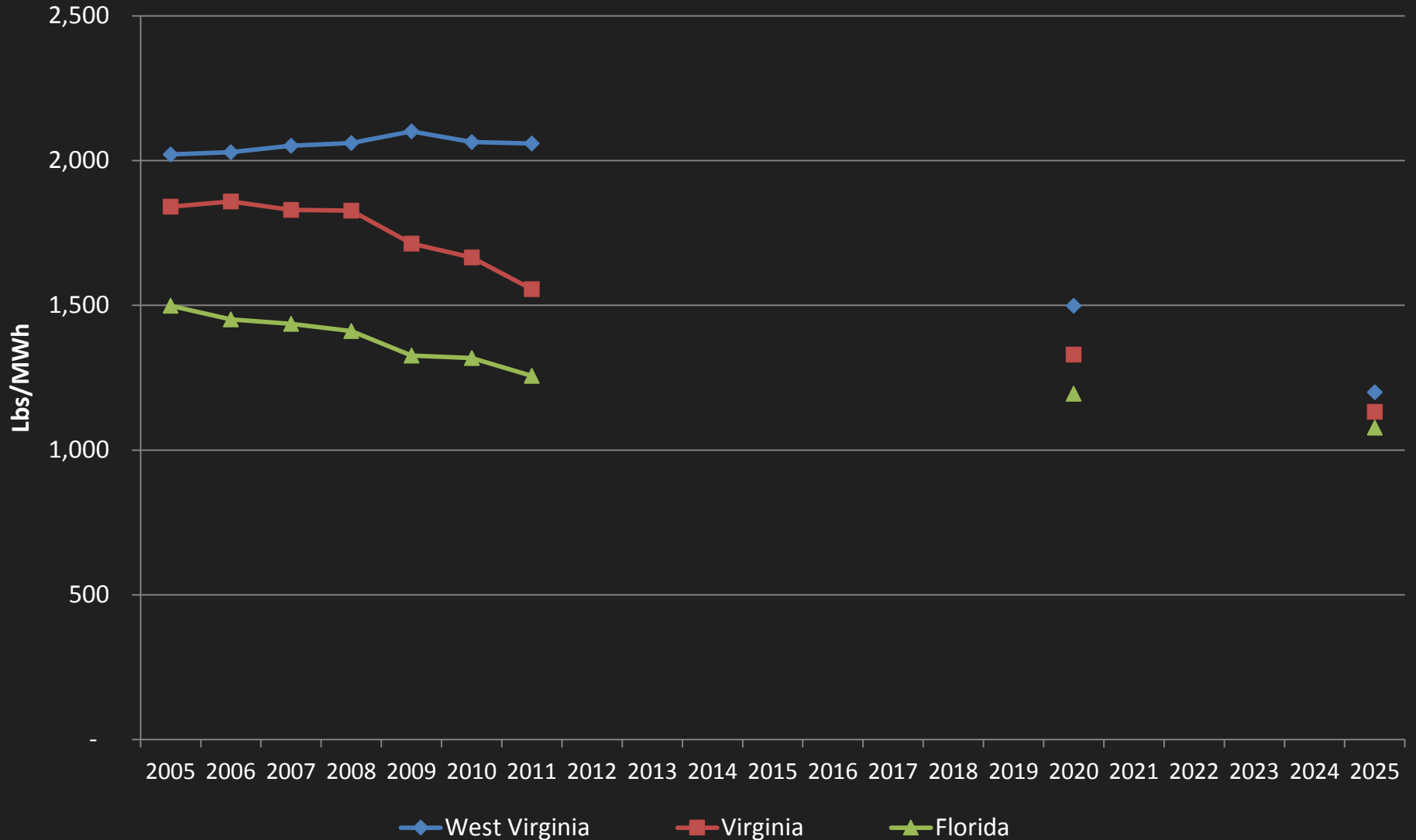
- **Energy Efficiency Quantity Assumptions**
 - Same energy efficiency potential (maximum MWhs saved) as in 2012 analysis
 - Divided evenly into three cost blocks in each region, 482 TWh in total
- **Energy Efficiency Cost Assumptions**
 - Costs apply nationwide, do not vary across regions
 - Derived based on utility program costs from Synapse and relative values from LBNL cost curve to estimate costs of each block
 - Middle cost block is equal to the Synapse utility program cost
 - Customer contribution at 45% of total cost is included in cost-benefit calculations



EE Program Costs (cents/kWh)	2013-2020	2021-2030
Low	2.3	2.6
Middle	2.6	2.9
High	3.2	3.5

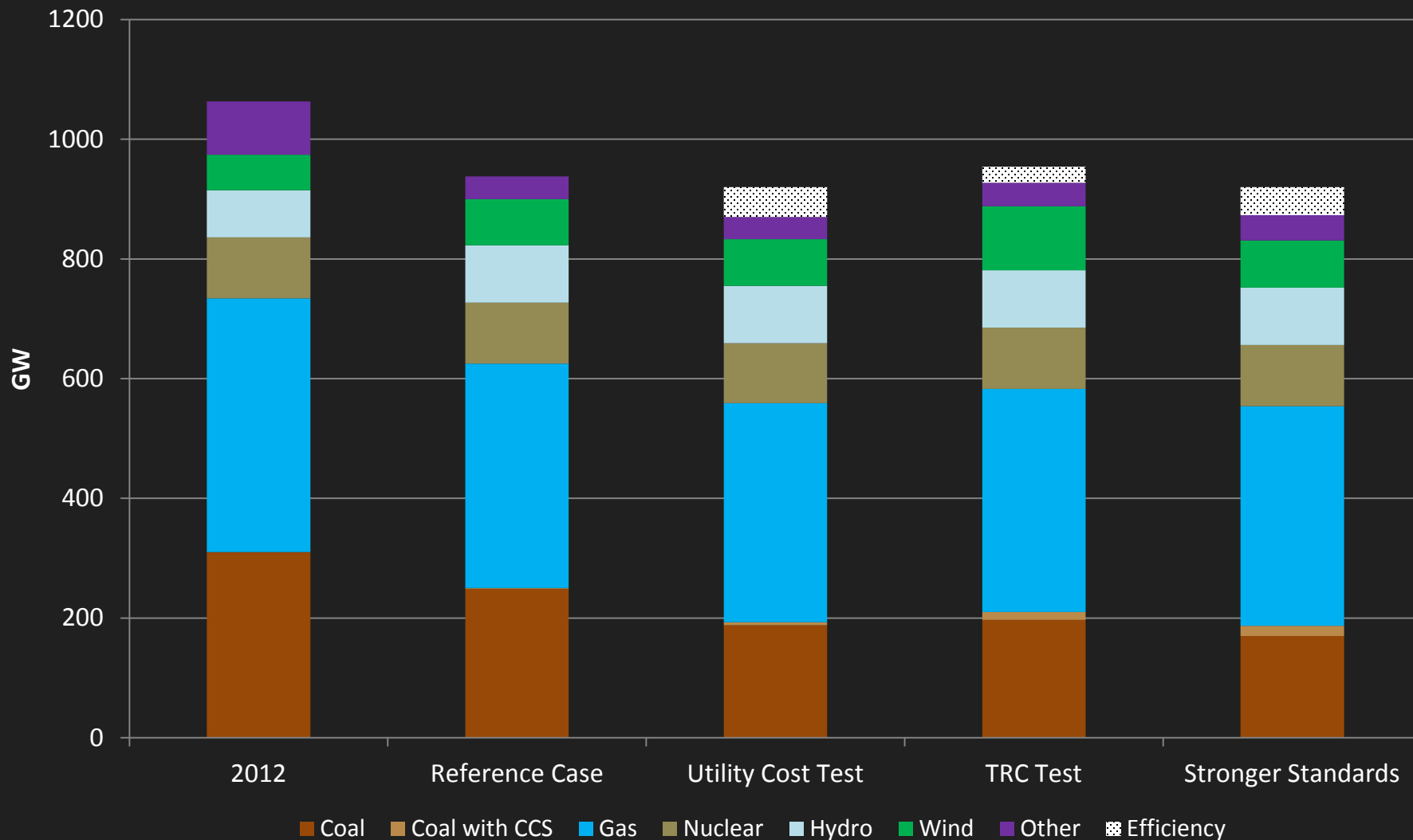


STATE EMISSION RATES TRAJECTORIES UNDER NRDC POLICY ILLUSTRATIVE 2005-2020





NRDC POLICY CASES vs. REFERENCE CASE PROJECTED CAPACITY IN 2020

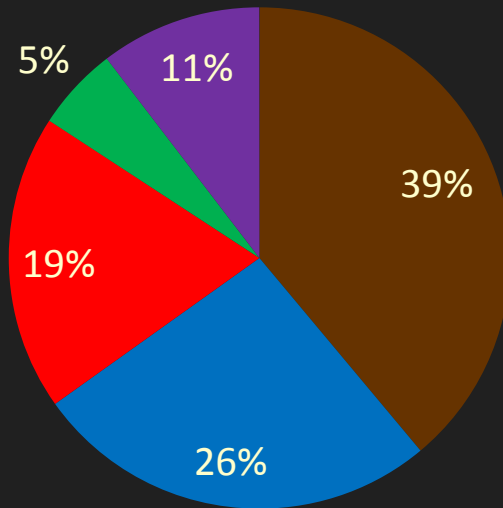


PRELIMINARY RESULTS

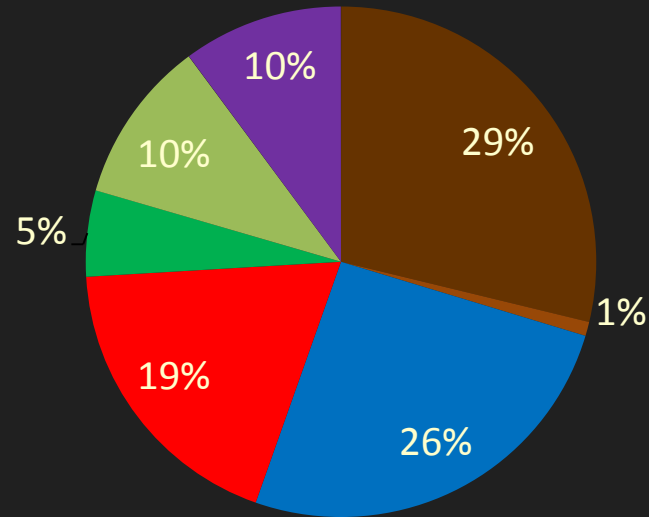


NRDC POLICY CASES vs. REFERENCE CASE PROJECTED GENERATION MIX IN 2020

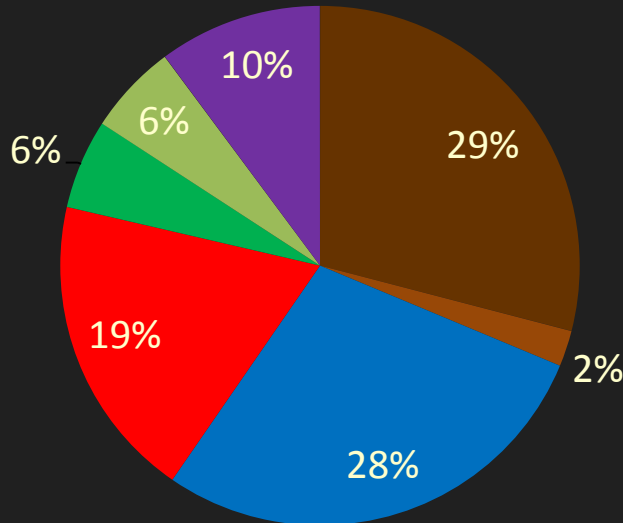
**2020
Reference**



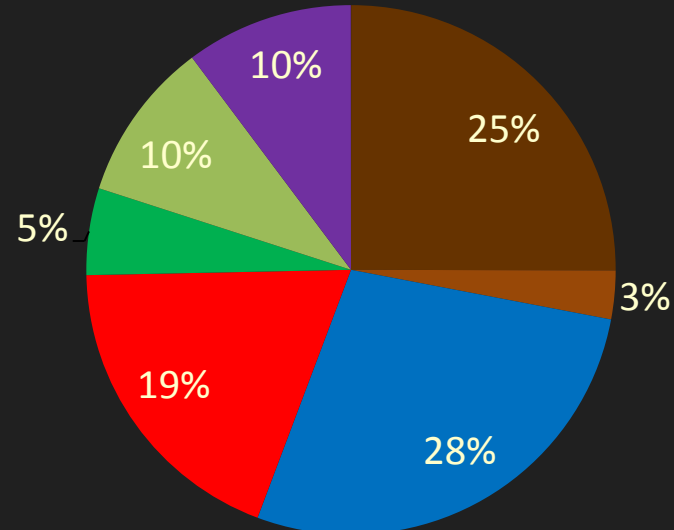
**Utility
Cost Test**



TRC Test



**Stronger
Standards**

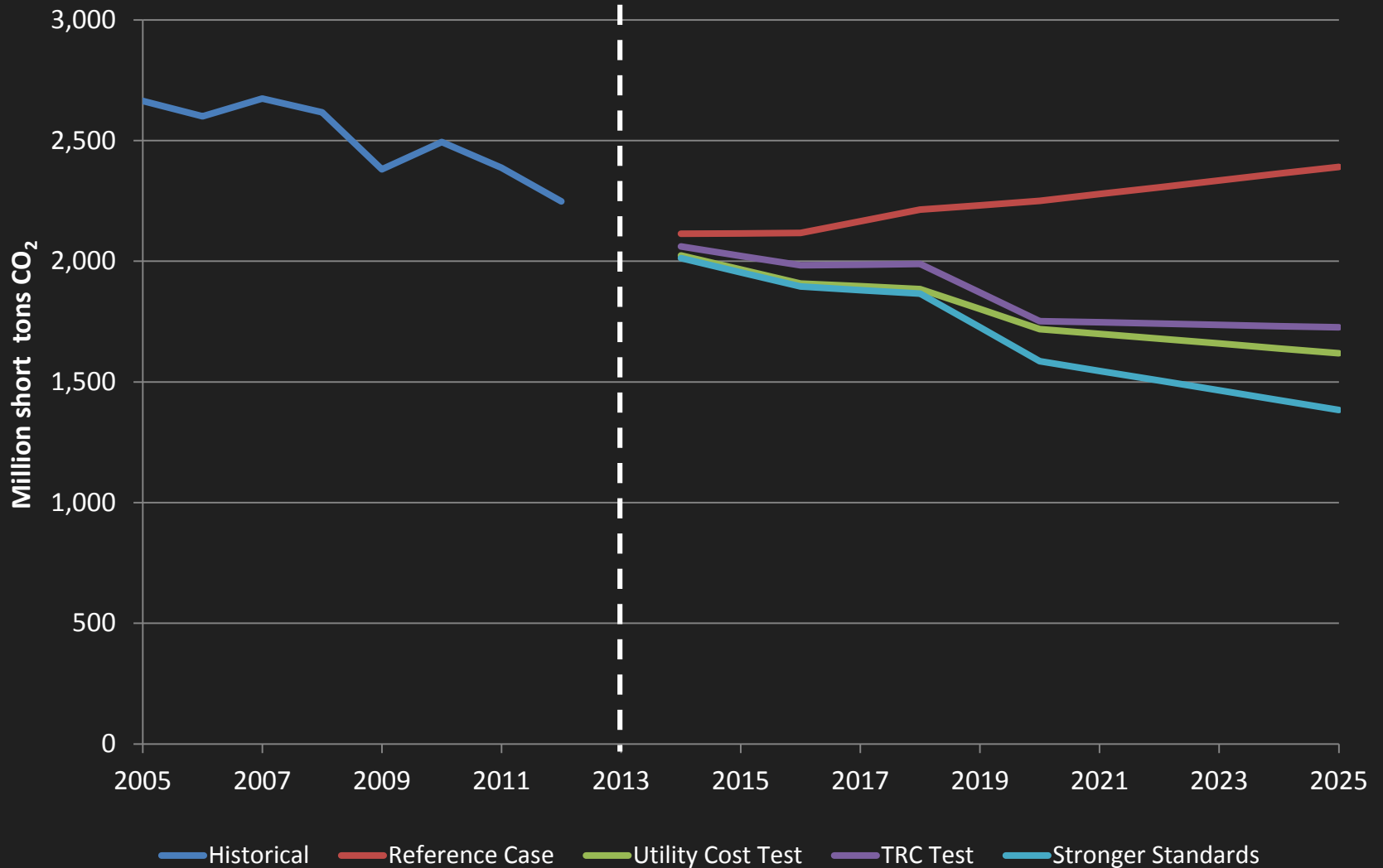


■ Coal ■ Coal w/CCS ■ Gas ■ Nuclear ■ Wind ■ Efficiency ■ Other

PRELIMINARY RESULTS



NRDC POLICY CASES vs. REFERENCE CASE EMISSIONS 2014-2025

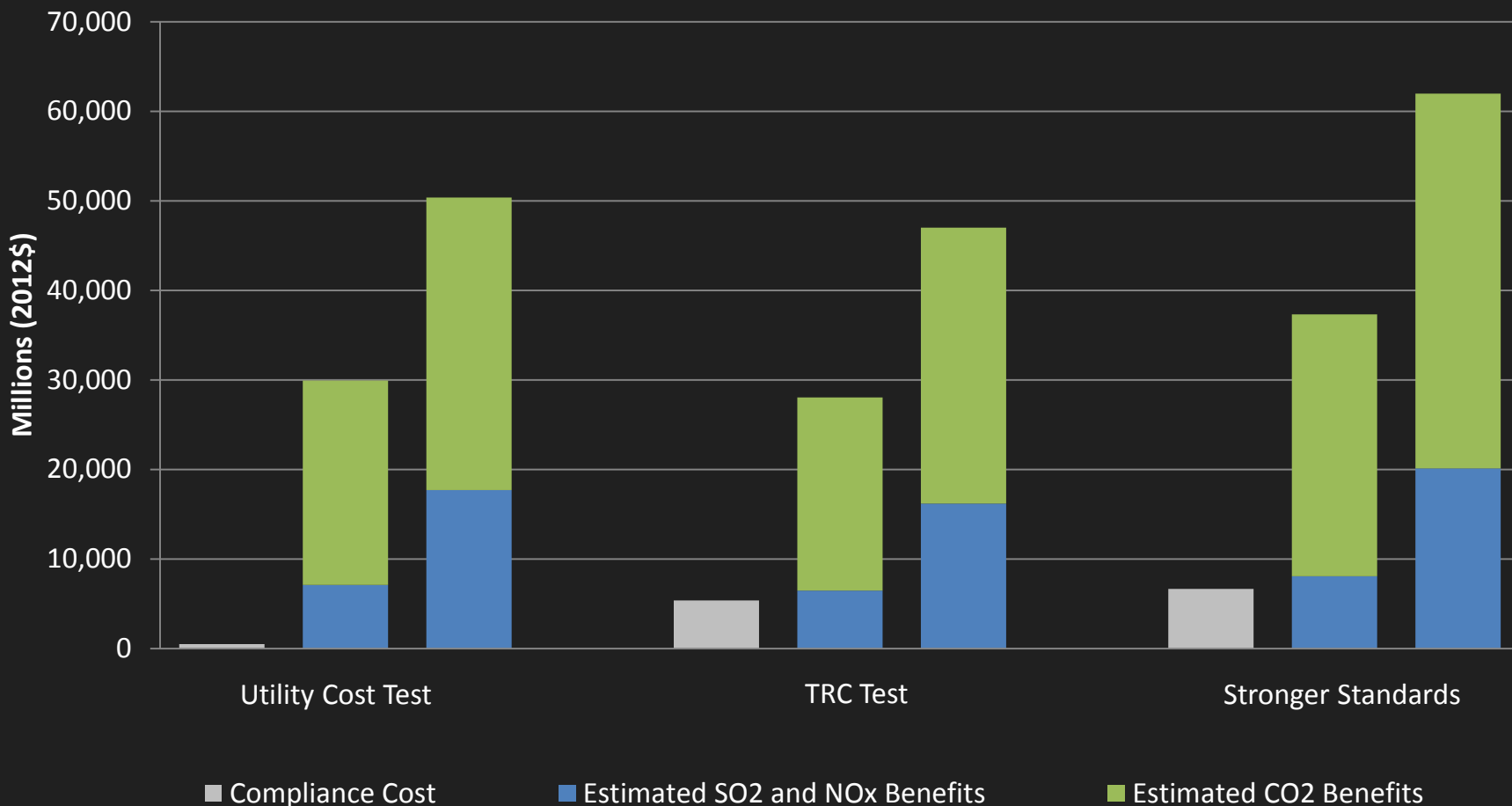


PRELIMINARY RESULTS



LARGE BENEFITS, LOW COSTS

COSTS AND BENEFITS FROM REDUCED EMISSIONS IN 2020



NOTE: Carbon reduction benefit (low) calculated according to Administration's updated Social Cost of Carbon (SCC) of \$43 (2012\$) per short ton in 2020, reflecting the 3% discount rate case. Carbon reduction benefit (high) calculated according to an estimate for the SCC of \$62 (2012\$) per short ton, using a 2% discount rate case. Benefits for SO₂ and NO_x reductions are preliminary estimates based on scaling previous estimates.

PRELIMINARY RESULTS