EPA'S CLEAN POWER PLAN
THE ROLE OF ADVANCED ENERGY

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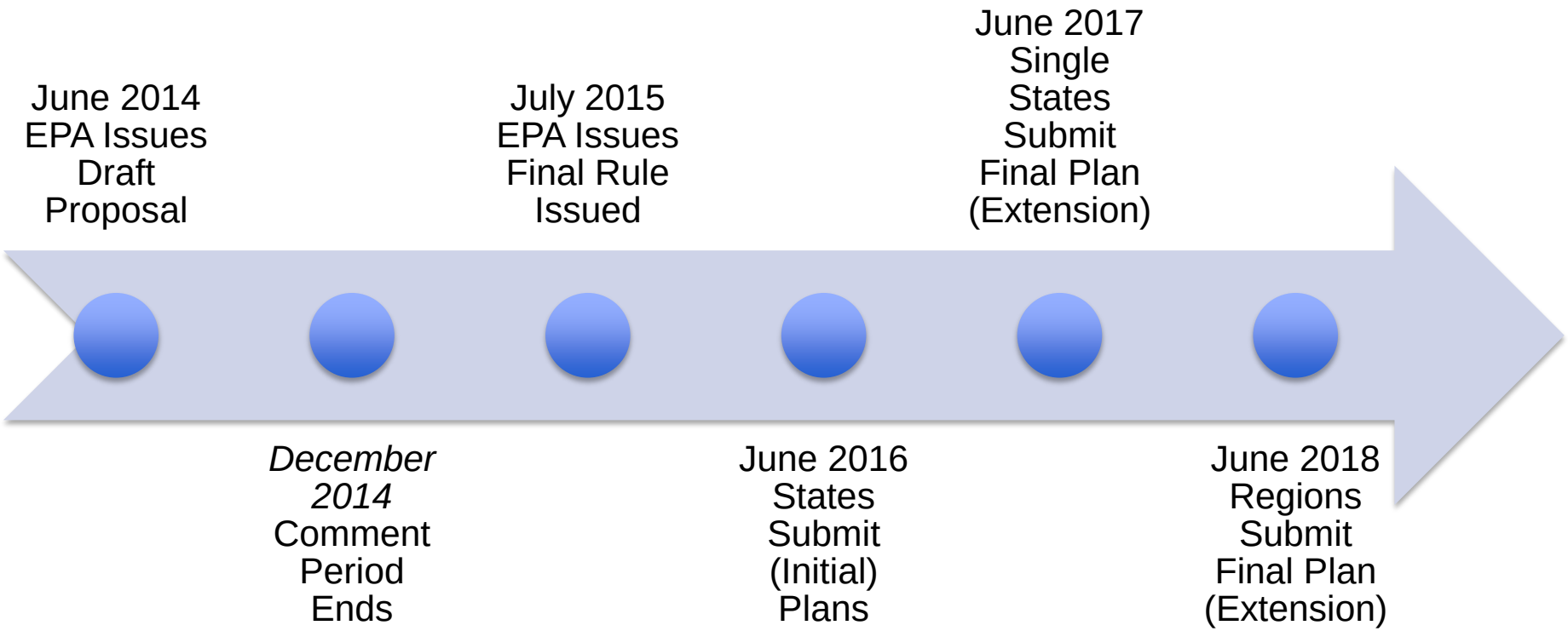
SINCE 2007 EPA HAS BEEN WORKING THROUGH CARBON EMISSION SECTORS

2007 ▶	*Mass. v. EPA*: Supreme Court finds CO_2 is an air pollutant.
2009 ▶	EPA finds 6 GHGs threaten public health & welfare.
2010 ▶	EPA proposes mobile source carbon standards. EPA issues Tailoring Rule to prepare for power sector.
2011 ▶	*AEP v. CT*: S. Court affirms EPA's CO_2 role.
2012 ▶	EPA proposes new plants rule under CAA § 111b.
2013 ▶	President announces Climate Change Plan in June. EPA re-proposes new plants rule Sept 20.
2014 ▶	*UARG v. EPA*: S. Court nixes tailoring. Affirms EPA's CO_2 role. EPA proposes existing plants rule under CAA § 111d June 2.

EPA'S PROPOSAL BEGINS REGULATORY PROCESS FOR EXISTING POWER SECTOR



3

CLEAN POWER PLAN PROPOSAL IS DIVIDED INTO TWO PARTS

Front End – State Emission Targets

- Clean Air Act prevents EPA from picking reductions
- “Best system of emissions reduction” formula sets enforceable state rates (can convert to mass limit)
- EPA projects national emissions fall 30% from 2005 to 2030 – not enforceable

Back End – Rules for State Compliance Plans

- Interim Compliance: 2020-2029, Final: 2030-2032
- States have broad flexibility to develop plans
- States may partner to create regional approaches

THE STATE TARGETS ARE CALCULATED USING A FORMULA

Start → 2012 lbs CO_2/MWh from fossil plants

Block 1 Reduce CO_2 with 6% heat rate increase for coal plants

+ Block 2 Reduce CO_2 by increasing existing/under-construction NGCC use to decrease coal use

+ Block 3

A. Add MWh for nuclear under-construction and at-risk (6% of existing fleet)
B. Add MWh of RE: Use 2012 actual for 2017 target and regional average RPS in 2020 for 2030

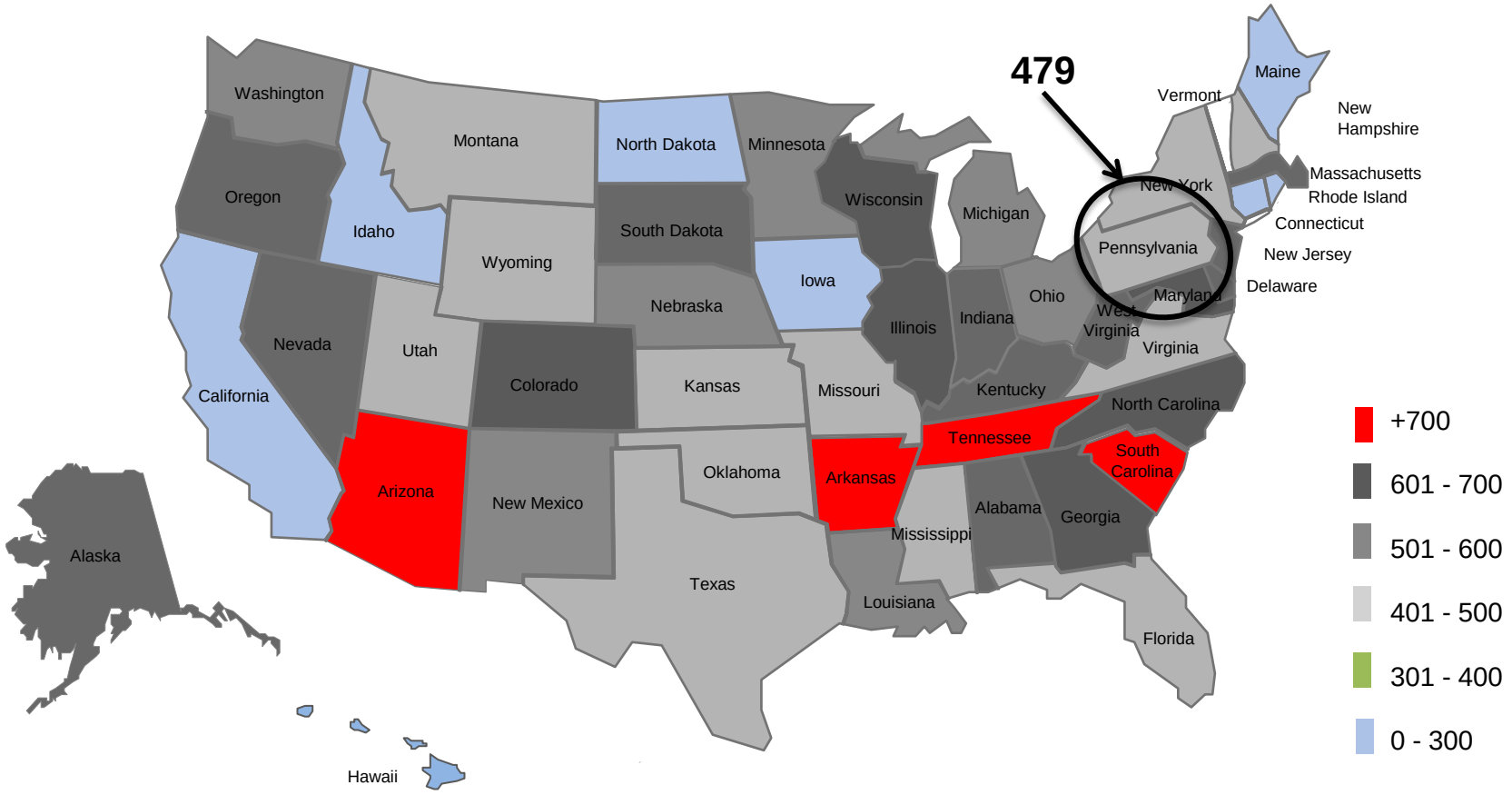
+ Block 4 Add MWh saved by EE: Use 2012 actual for 2017 target rising over time to 1.5%/yr through 2030

Result →

$$\text{Adjusted Emissions Rate} = \frac{\text{Emissions from EGUs}}{\text{Generation from EGUs + RE Generation + Nuclear Generation + EE Adjustment}}$$

DIFFERENT STATE RESOURCES MEAN REQUIRED REDUCTIONS DIFFER

CO_2 Emission Rate Reduction, (lbs CO_2/MWh)



Source: Bloomberg New Energy Finance

6

WHAT QUESTIONS HAVE BEEN RAISED BY STATES REGARDING COMPLIANCE?

- Reliability
- Flexibility
- Cost-effectivess

7

CONCERN 1: RESOURCE ADEQUACY

Market mechanisms are in place to ensure resource adequacy

- Plants can have lower capacity factor and still contribute
- Capacity market mechanisms can help retain coal if least cost option

Other flexibility measures in CPP can help mitigate reliability risks

CONCERN 2: GAS-ELECTRIC INTERFACE

- Shift from coal to gas is already underway for most of the country
  - Low gas prices are increasing demand
  - Response to interface issue underway because of already increasing reliance on gas (independent of Clean Power Plan)
- Short-term options are available
  - Operational Fixes (pay for performance, better gas/electric scheduling and coordination
  - Technical Fixes (dual fuel, gas storage, LNG, gas demand response, etc)
- Likely more investment in pipeline infrastructure over the long-term

CONCERN 3: INTEGRATING CLEAN ENERGY

- Increases in renewable energy penetration already occurring
  - Driven by state RPS laws and existing CO2 reduction programs
  - Rapidly declining technology costs

- Even in 2030, penetration levels remain below those achieved or assumed achievable without significant integration costs

- Operational and technological options exist and continue to emerge that will help defray integration costs

FLEXIBILITY FOR STATE PLANNING

- States have discretion in designing plans
  - Propose any mix of technologies & policies
  - No requirement to use “building blocks”
  - Can convert emission rate limit to mass limit
  - States may join to submit a single multi-state plan

- Non exclusive list of compliance actions provided (eg, RE, EE, T&D efficiency, gas, nuclear, storage)

- Non exclusive list of polices to support the actions provided (eg, credit trading, RPS, EERS, IRPs)

COST-EFFECTIVE COMPLIANCE OPTIONS

- The cost of clean energy continues to come down
  - Over the past five years, the levelized cost of energy for wind and solar has decreased 58% and 78% respectively
  - Residential and small commercial solar cost dropped by almost 60% between 2002 and 2013

- Lawrence-Berkeley National Lab estimates average “total costs of saved energy” at $46 MWh based on an analysis of programs in 20 states over a 5 year period

THANK YOU!

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