

FUTURE OF NUCLEAR IN THE PJM FOOTPRINT

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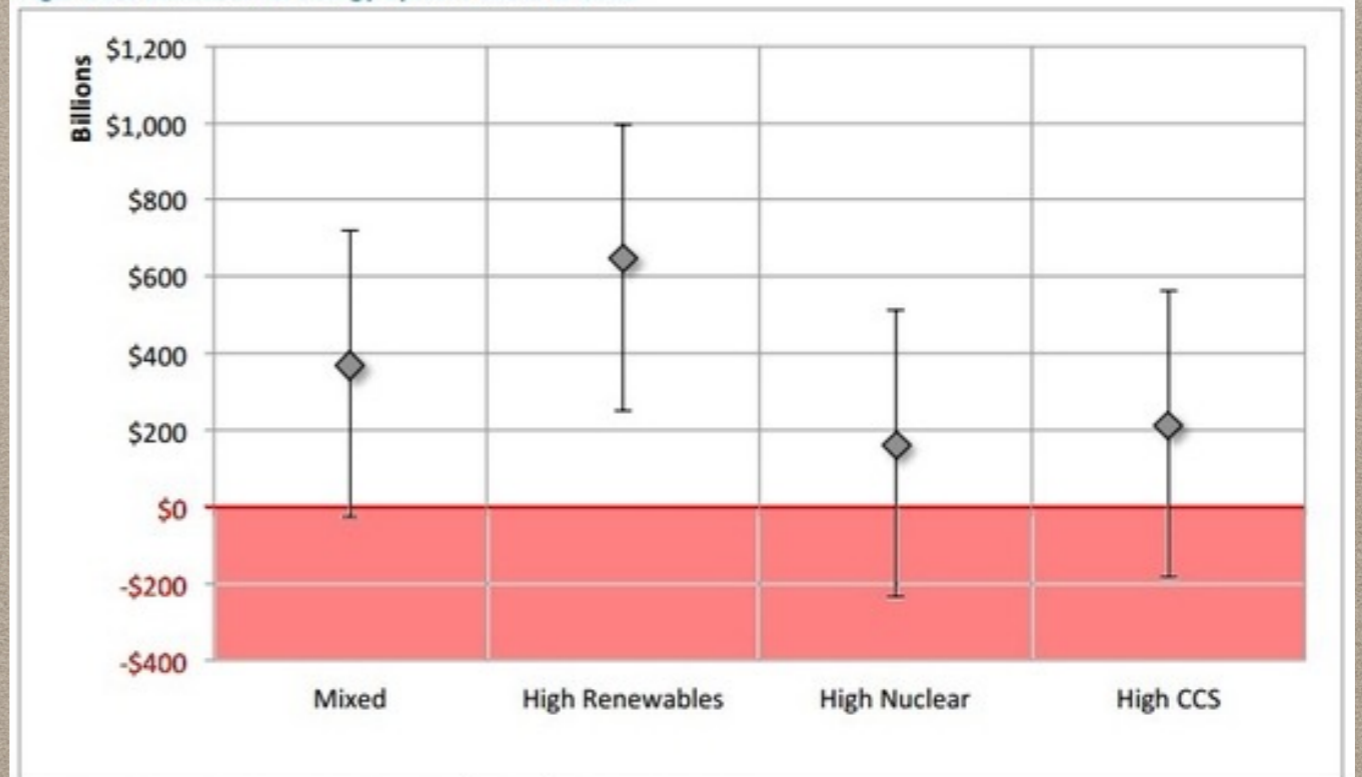


BREAKTHROUGH
INSTITUTE

WHY NUCLEAR MATTERS

- Low-Carbon (and zero emissions for all other air pollutants)
- Reliable, baseload
- On-Site Fuel
- Blackstart
- Phase Stabilization

Figure 12. Incremental Energy System Costs in 2050



Note: The error bars in the figure show the 25th and 75th percentile values.

Williams et al. (2014) Pathways to Deep Decarbonization in the United States.

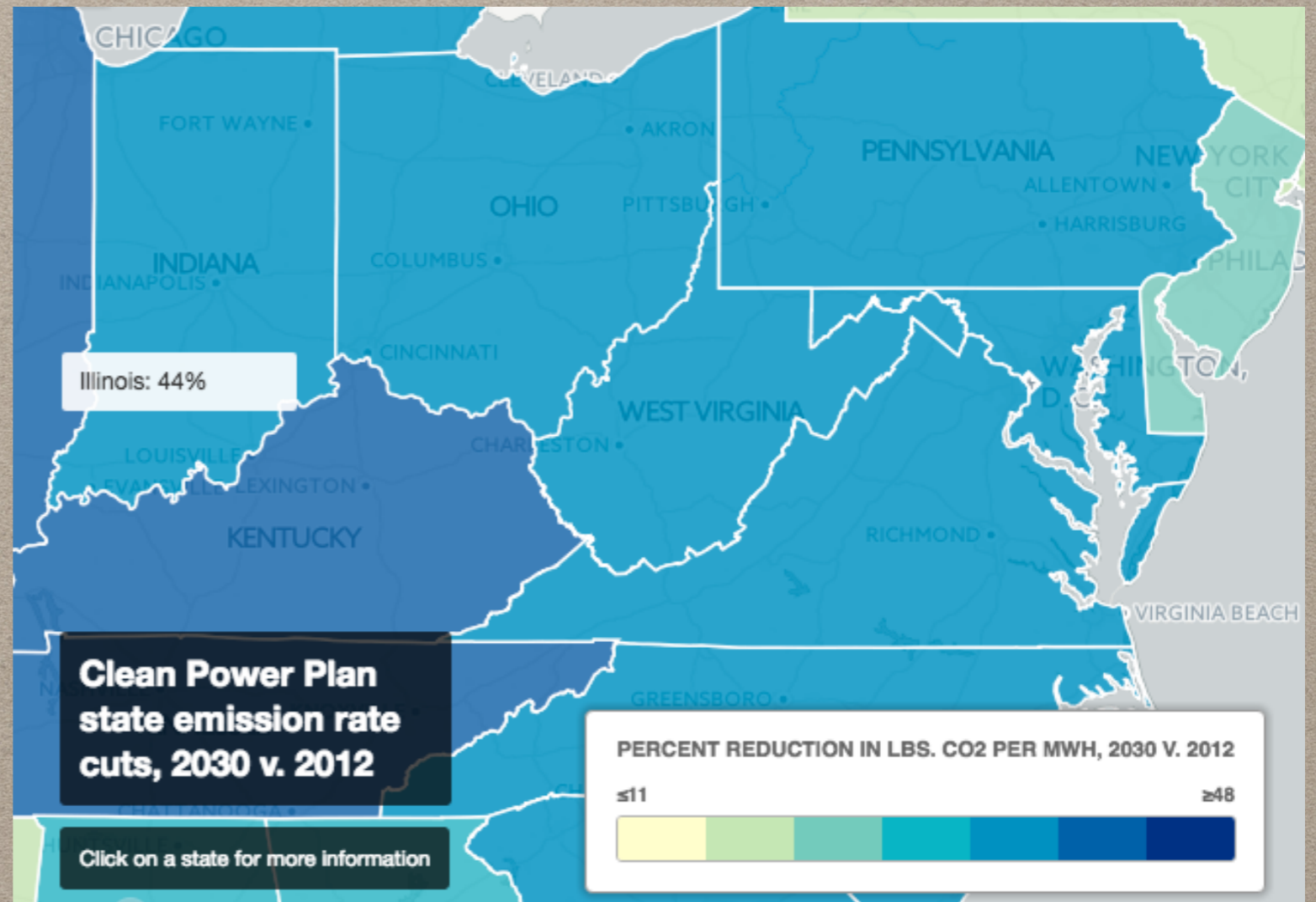
US CLIMATE AND CLEAN ENERGY TARGETS

- Paris COP21 INDC: Reduce US GHG emissions by 26-28% below 2005 levels by 2025 (1.8 Gt)
- The North American Climate, Energy, and Environment Partnership: 50% clean power across North America by 2025
- Deep Decarbonization?

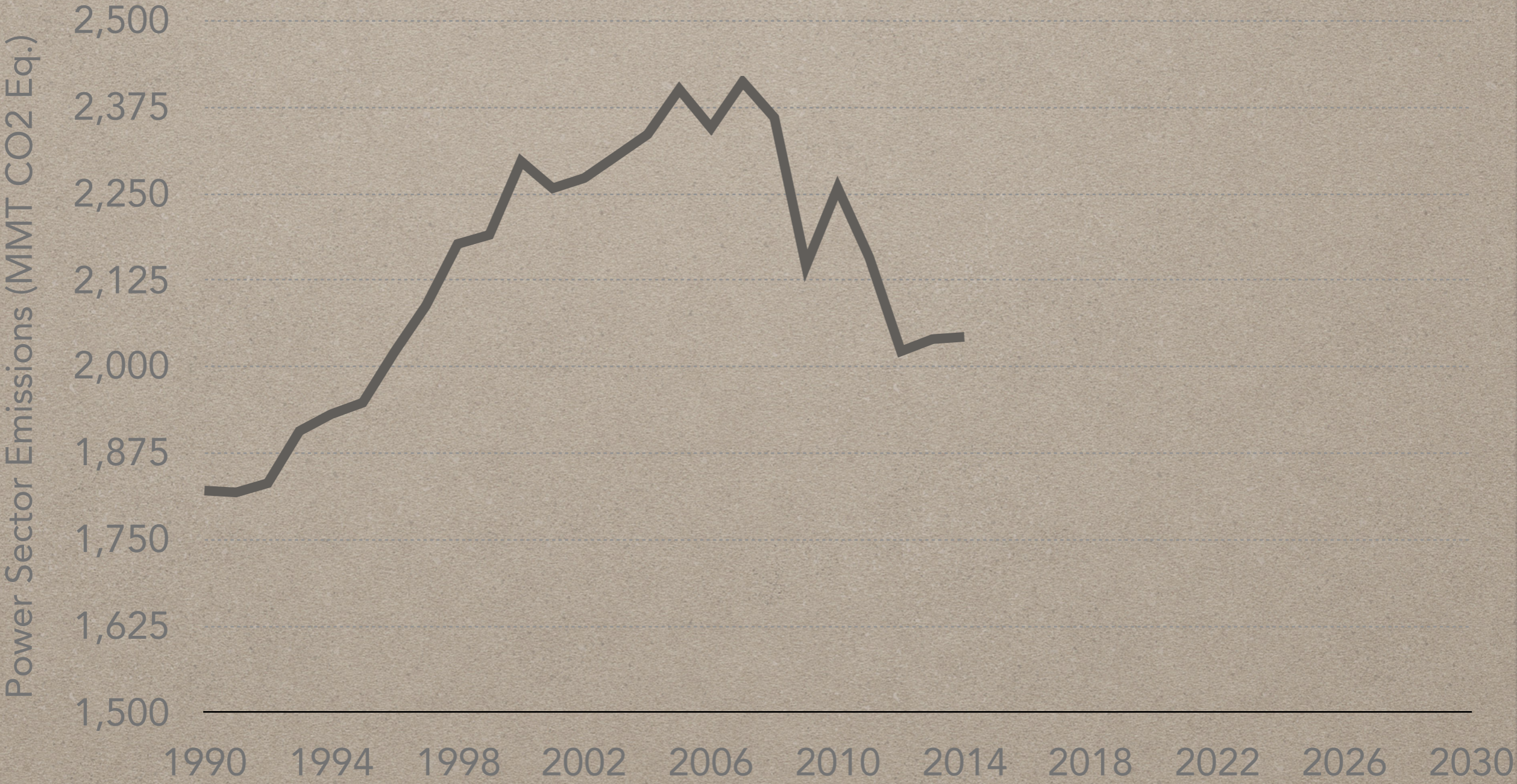


CLEAN POWER PLAN

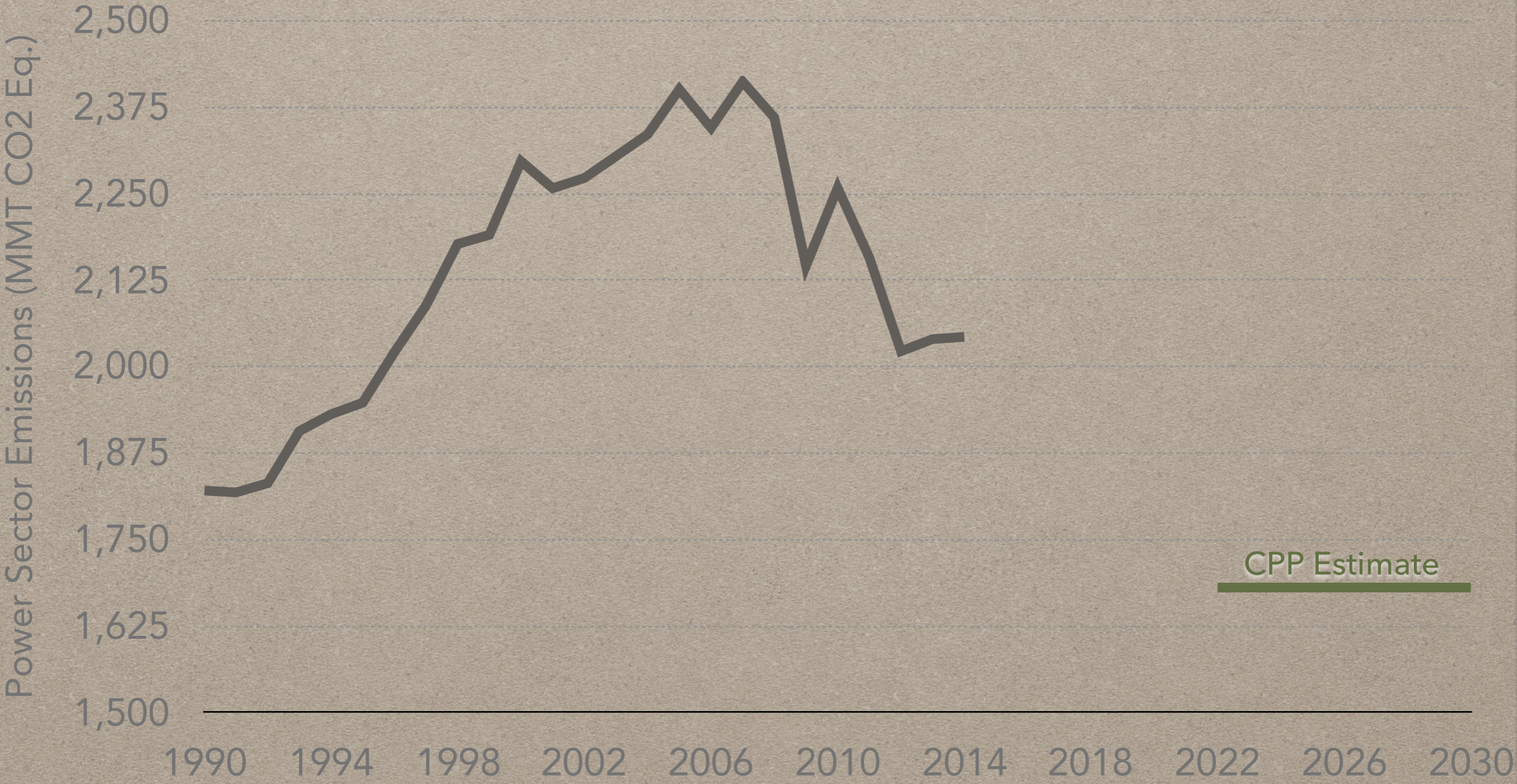
- Reduce emissions in the US Power Sector by ~30% below 2005 levels by 2030
- Mostly codifies Business-As-Usual
- Doesn't really help nuclear, but...



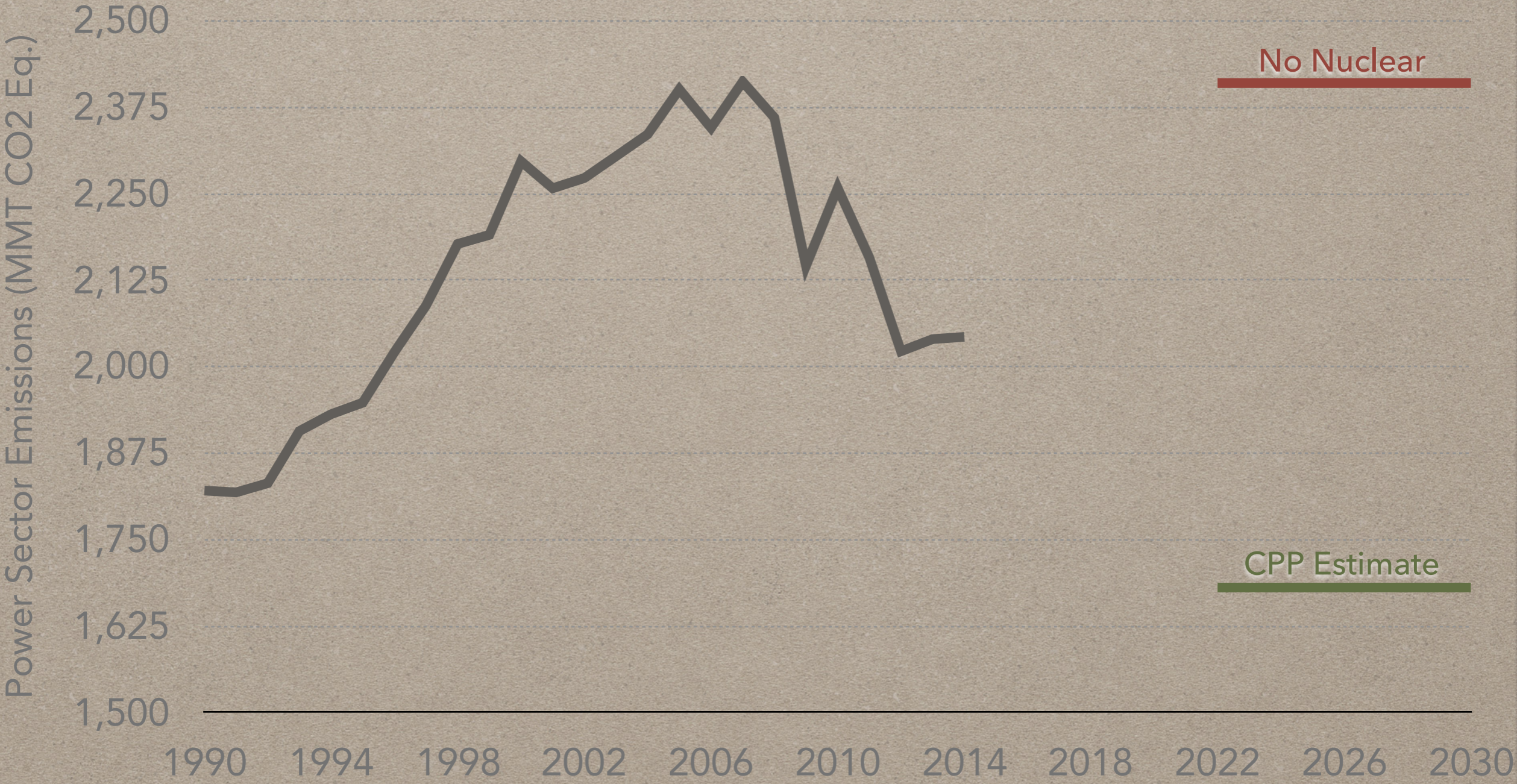
US NUCLEAR UNDER CLEAN POWER PLAN



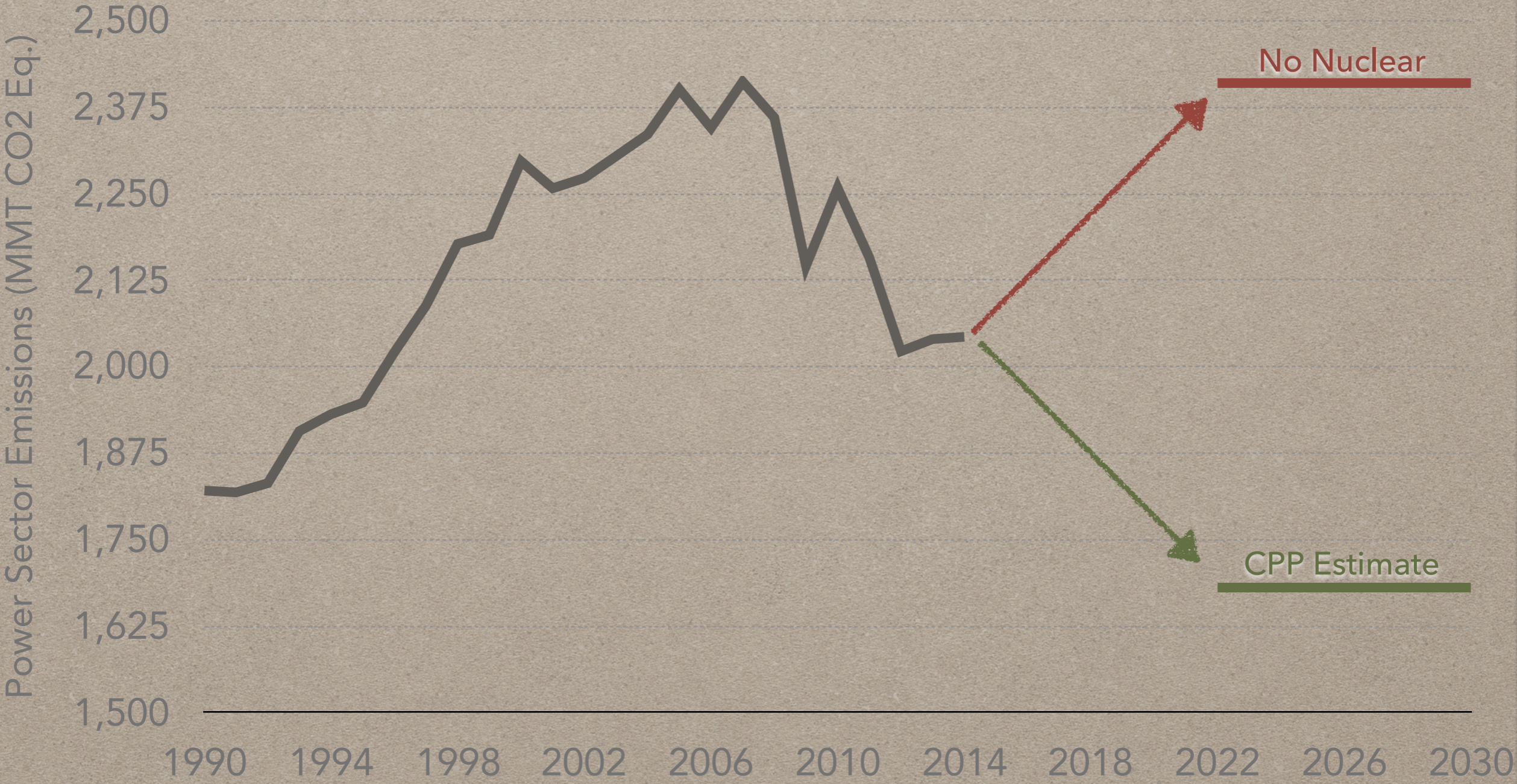
US NUCLEAR UNDER CLEAN POWER PLAN



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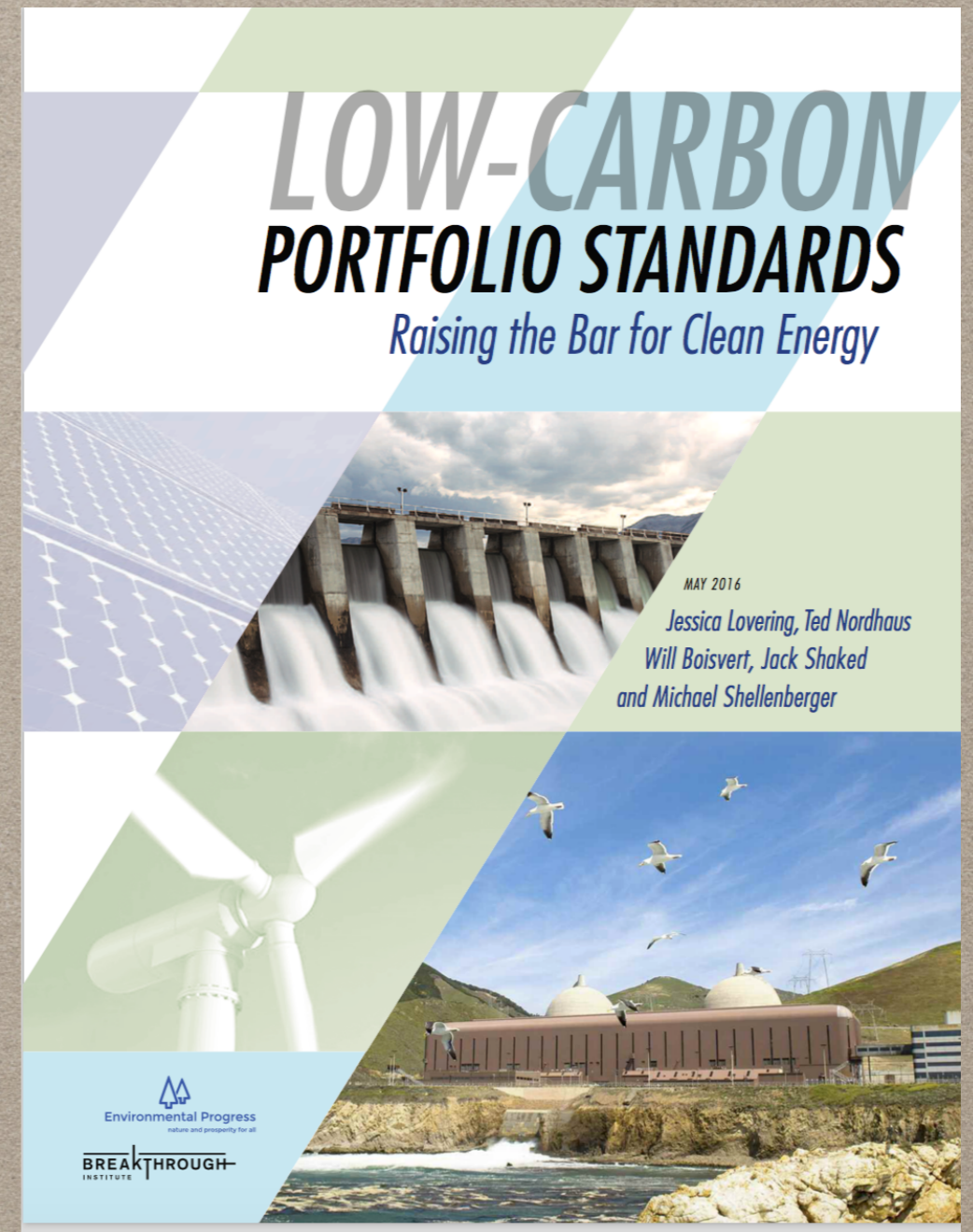


HOW CAN STATES HELP NUCLEAR UNDER CPP

- ❖ State plans can be designed to protect existing zero-emissions nuclear generation.
 - ❖ Choose a mass-based goal
 - ❖ Choose to regulate emissions from new sources
 - ❖ Distribute allowances based on real 2012 generation (not just among fossil generation)
 - ❖ Meet target with uprates or **new nuclear**

CLEAN ENERGY STANDARDS

State	RPS	Nuclear	LCPS
Illinois	25%	48%	73%
Maryland	20%	38%	58%
Michigan	10%	29%	39%
New Jersey	25%	46%	71%
North Carolina	12%	32%	44%
Ohio	13%	13%	25%
Pennsylvania	18%	36%	54%



OTHER REGIONAL AND STATE POLICIES

- Capacity Markets
- Long-term Capacity Planning
- Contract-for-Difference (Ohio), Feed-in-tariff
- Cap-and-trade (California)
- Power Purchase Agreements, Municipalization

POTENTIAL FEDERAL ACTIONS

- Federal LCPS or ZECs
- Extension of PTC for new plants
- Emergency PTC for existing plants
- ITC (including upgrades and fuel expenditures)
- FERC Reform, pricing strategy
- Federal Procurement

NEW BUILDS

- Not many plans in the short-term, but...
- Early Site Permits:
 - Clinton ESP Site, Exelon Generation Company, LLC
 - Grand Gulf ESP Site, System Energy Resources Inc.
 - North Anna ESP Site, Dominion Nuclear North Anna, LLC
 - Vogtle ESP Site, Southern Nuclear Operating Company
 - PSEG Site, PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG)
 - Clinch River Nuclear Site, Tennessee Valley Authority (Under Review)

COMBINED OPERATING LICENSE APPLICATIONS

Proposed New Reactor(s)	Design	Applicant	Status
Bell Bend Nuclear Power Plant	U.S. EPR	PPL Bell Bend, LLC	Suspended
Bellefonte Nuclear Station, Units 3 and 4	AP1000	Tennessee Valley Authority (TVA)	Suspended
Callaway Plant, Unit 2	U.S. EPR	AmerenUE	Withdrawn
Calvert Cliffs, Unit 3	U.S. EPR	Calvert Cliffs 3 Nuclear Project, LLC	Withdrawn
Comanche Peak, Units 3 and 4	US-APWR	Luminant Generation Company, LLC (Luminant)	Suspended
Fermi, Unit 3	ESBWR	Detroit Edison Company	Issued
Grand Gulf, Unit 3	ESBWR	Entergy Operations, Inc. (EOI)	Withdrawn
Levy County, Units 1 and 2	AP1000	Duke Energy Florida (DEF)	Under Review
Nine Mile Point, Unit 3	U.S. EPR	Nine Mile Point 3 Nuclear Project, LLC	Withdrawn
North Anna, Unit 3	ESBWR	Dominion Virginia Power (Dominion)	Under Review
River Bend Station, Unit 3	ESBWR	Entergy Operations, Inc. (EOI)	Withdrawn
Shearon Harris, Units 2 and 3	AP1000	Progress Energy Carolinas, Inc. (PEC)	Suspended
South Texas Project, Units 3 and 4	ABWR	Nuclear Innovation North America, LLC (NINA)	Issued
Turkey Point, Units 6 and 7	AP1000	Florida Power and Light Company (FPL)	Under Review
Victoria County Station, Units 1 and 2	ESBWR	Exelon Nuclear Texas Holdings, LLC (Exelon)	Withdrawn
Virgil C. Summer, Units 2 and 3	AP1000	South Carolina Electric & Gas (SCE&G)	Issued
Vogtle, Units 3 and 4	AP1000	Southern Nuclear Operating Company (SNC)	Issued
William States Lee III, Units 1 and 2	AP1000	Duke Energy	Under Review

Thank You!

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