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Climate Policy via the Clean Air Act: Analysis Paradox

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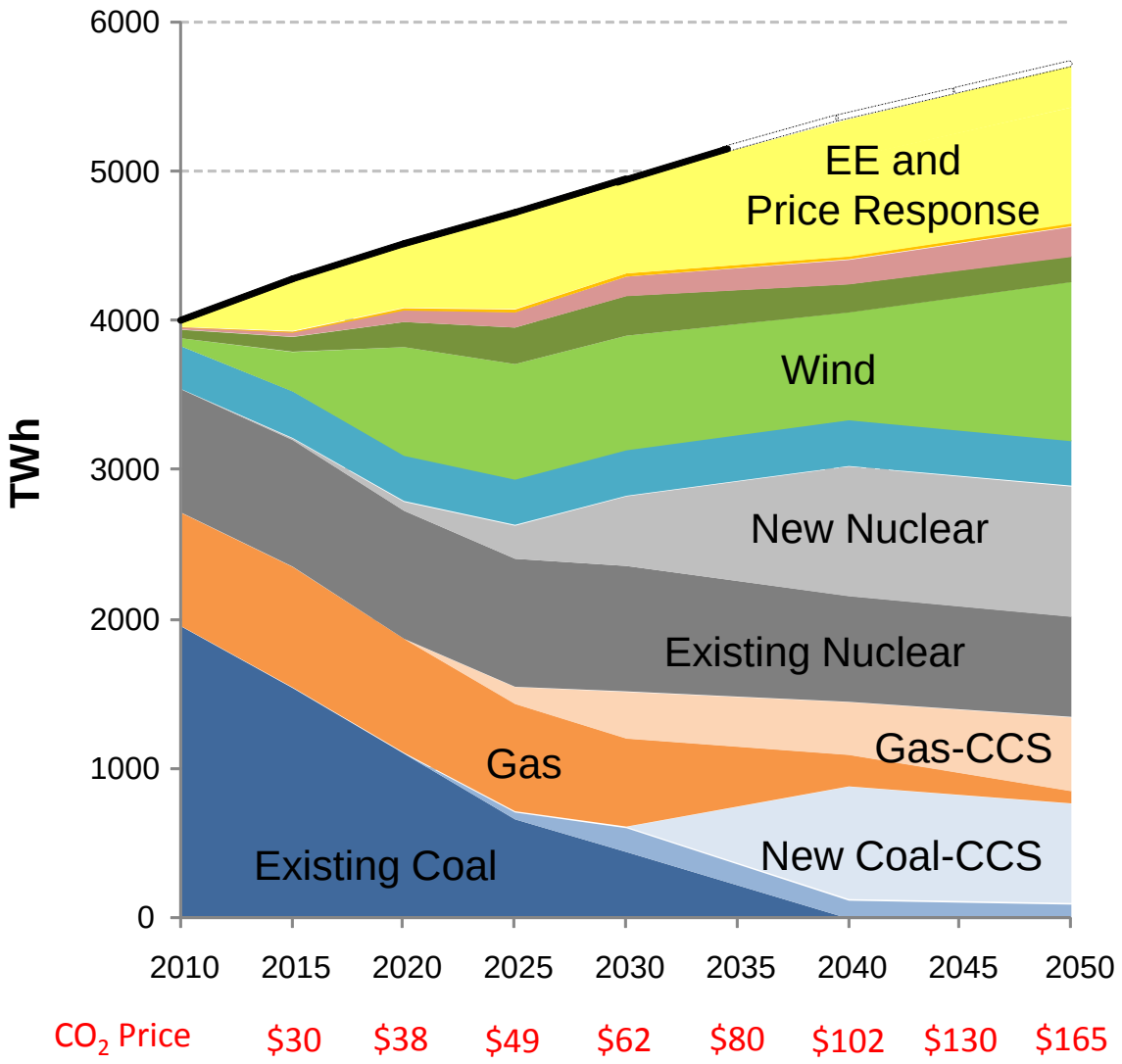
EPRI Summer Seminar 2010 Analysis: US-REGEN "Test Drive" Generation Mix



- AEO 2010 Reference Case
- Energy Efficiency*
- Solar
- Geothermal
- Biomass
- Wind
- Hydro+
- Nuclear (New)
- Nuclear (Existing)
- Gas-CCS
- Gas
- Coal-CCS (New)
- CCS Retrofit
- Coal

* Includes new programs, technology, and behavioral price response

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CO_2 New Source Performance Standards for Electric Utilities

March 27, 2012 EPA proposed new rule: “Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units.”

- New sources (units) must emit no more than 1,000 lb CO_2/MWh (gross basis) measured on a 12 month rolling average.
- 30 year averaging rule for coal plants allows for plants to emit no more than 1,800 lb/MWh in the first 10 years, then no more than 600 lb/MWh for the following 20 years to obtain an average of 1,000 lb/MWh per year across the 30 years.
- Above restrictions apply only to ‘covered units’, which the EPA defines as ‘any fossil-fuel fired combustion unit that supplies more than one third of its potential annual electric output and at least 25MWe’
- No averaging or emissions trading among affected sources is allowed

CO_2 New Source Performance Standards for Electric Utilities (2)

Alternative Rule Proposals

- The only major alternative proposal suggested is to implement the NSPS as above without the 30 year averaging rule.
- Various alternative ways of implementing the 30 year averaging rule are discussed. EPA suggests that a plant could submit a 'trajectory', i.e. a 30 year, year-by-year emissions schedule to meet the 1000 target in lieu of the trajectory suggested in point above.

EPA Fact Sheet Information

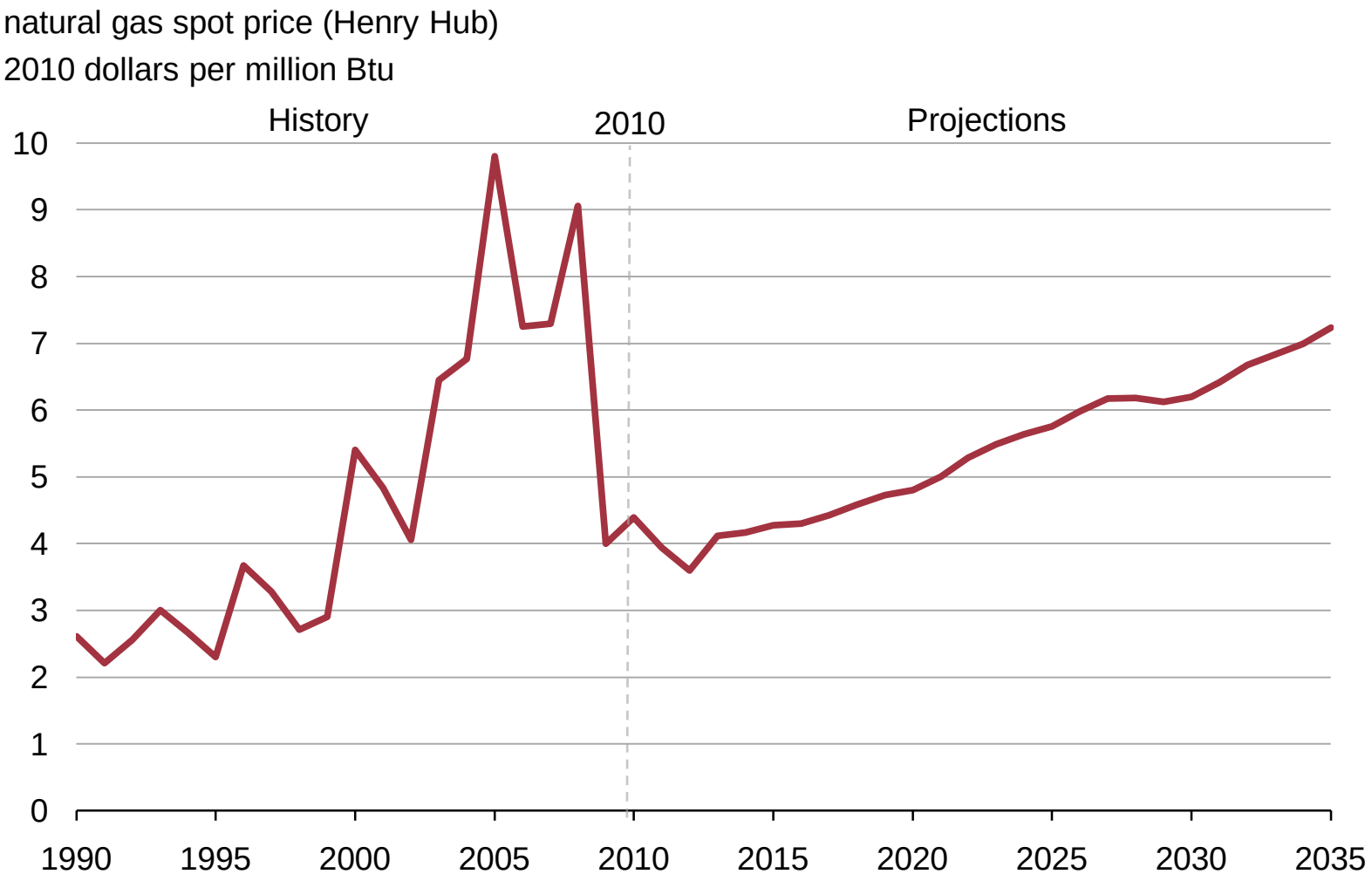
- “EPA’s proposed standard reflects the ongoing trend in the power sector to build cleaner plants, including new, clean-burning, efficient natural gas generation, which is already the technology of choice for new and planned power plants”.
- “EPA, DOE, and industry projections indicate that, due to the economics of coal and natural gas among other factors, new power plants that are built in over the next decade or more would be expected to meet this proposed standard even in the absence of the rule.”
- “Because this standard is in line with current industry investment patterns, this proposed standard is not expected to have notable costs and is not projected to impact electricity prices or reliability.”

EPA Regulatory Impact Analysis

Key Findings of Economic Analysis

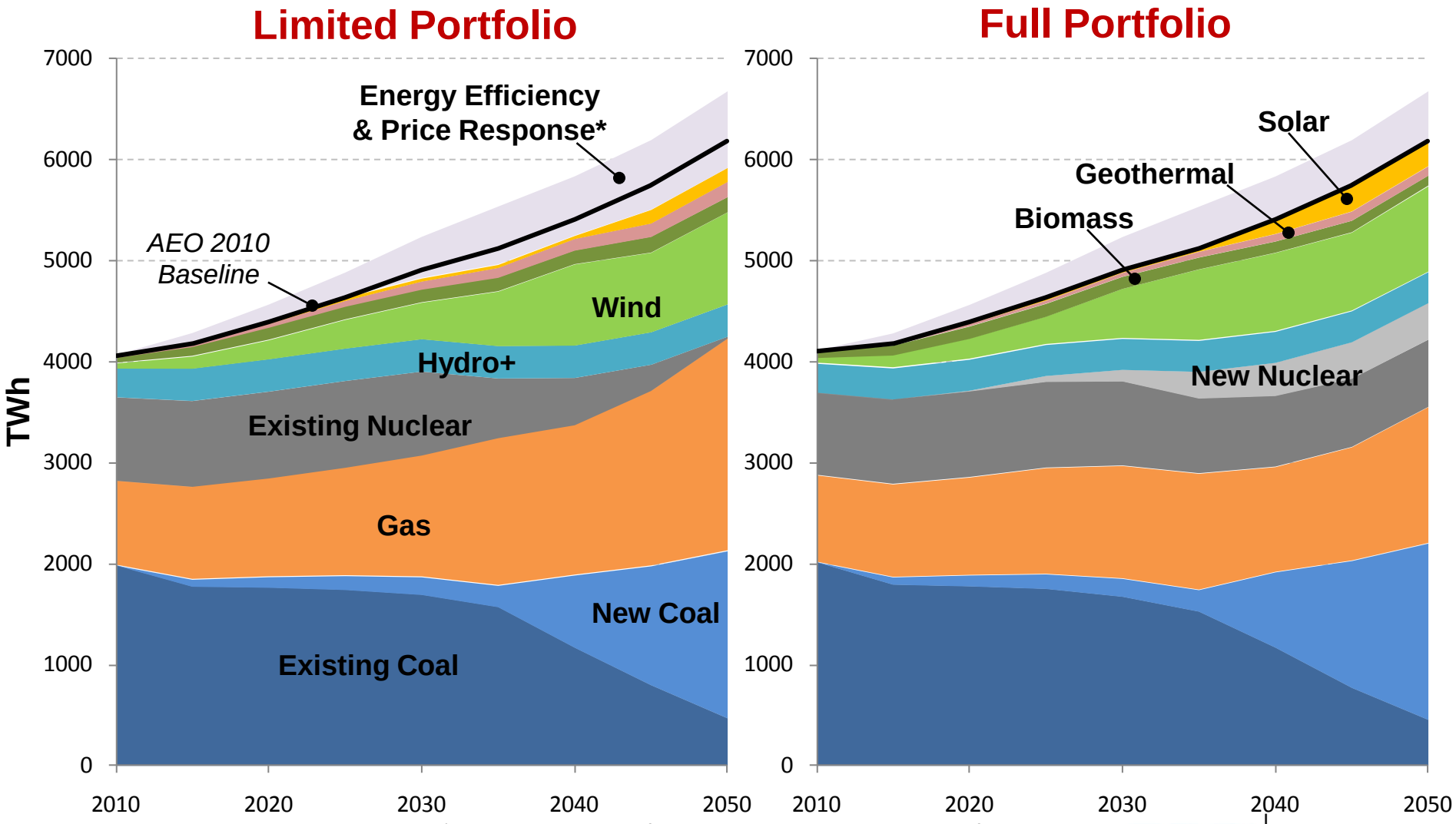
- "…energy market data and projections support the conclusion that, even in the absence of this rule, existing and anticipated economic conditions in the marketplace will lead electricity generators to choose technologies that meet the proposed standards."
- "EPA anticipates that the proposed EGU GHG NSPS will result in negligible CO_2 emission changes, energy impacts, quantified benefits, costs, and economic impacts by 2020.
- "EPA also does not anticipate this rule will have any impacts on the price of electricity, employment or labor markets, or the US economy".

EIA's natural gas price projections are slightly lower than in *AEO2011*, consistent with recent market developments



Sources: EIA, Annual Energy Outlook 2012 Early Release and EIA, Annual Energy Outlook 2011

EPRI Summer Seminar 2011 Analysis: National Generation Mix in Reference Scenario



* Above the black line reflects embedded EE in the AEO 2010 Reference Case

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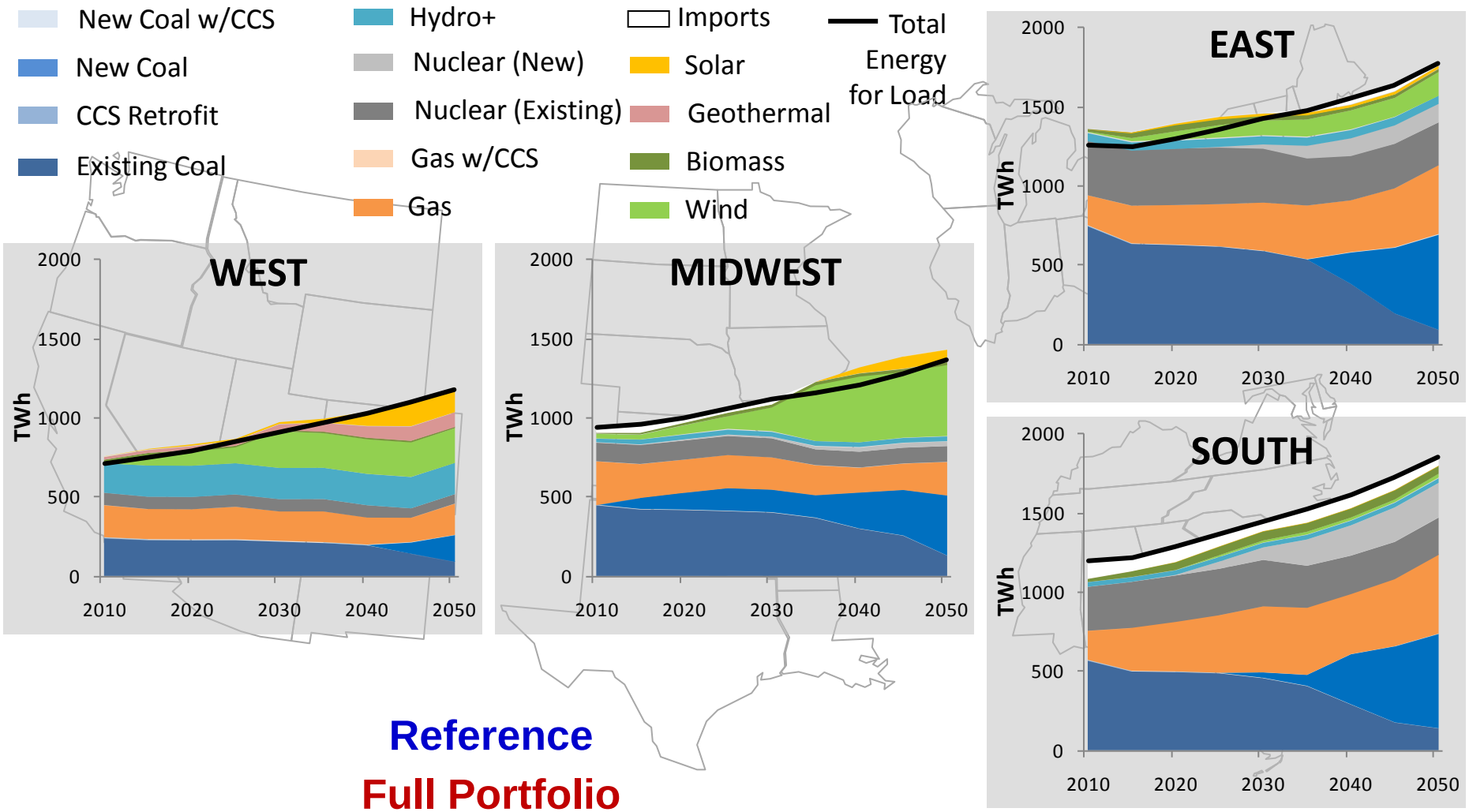
EPRI Summer Seminar 2011 Analysis: Regional Generation Mix in Reference Scenario



Reference

Full Portfolio

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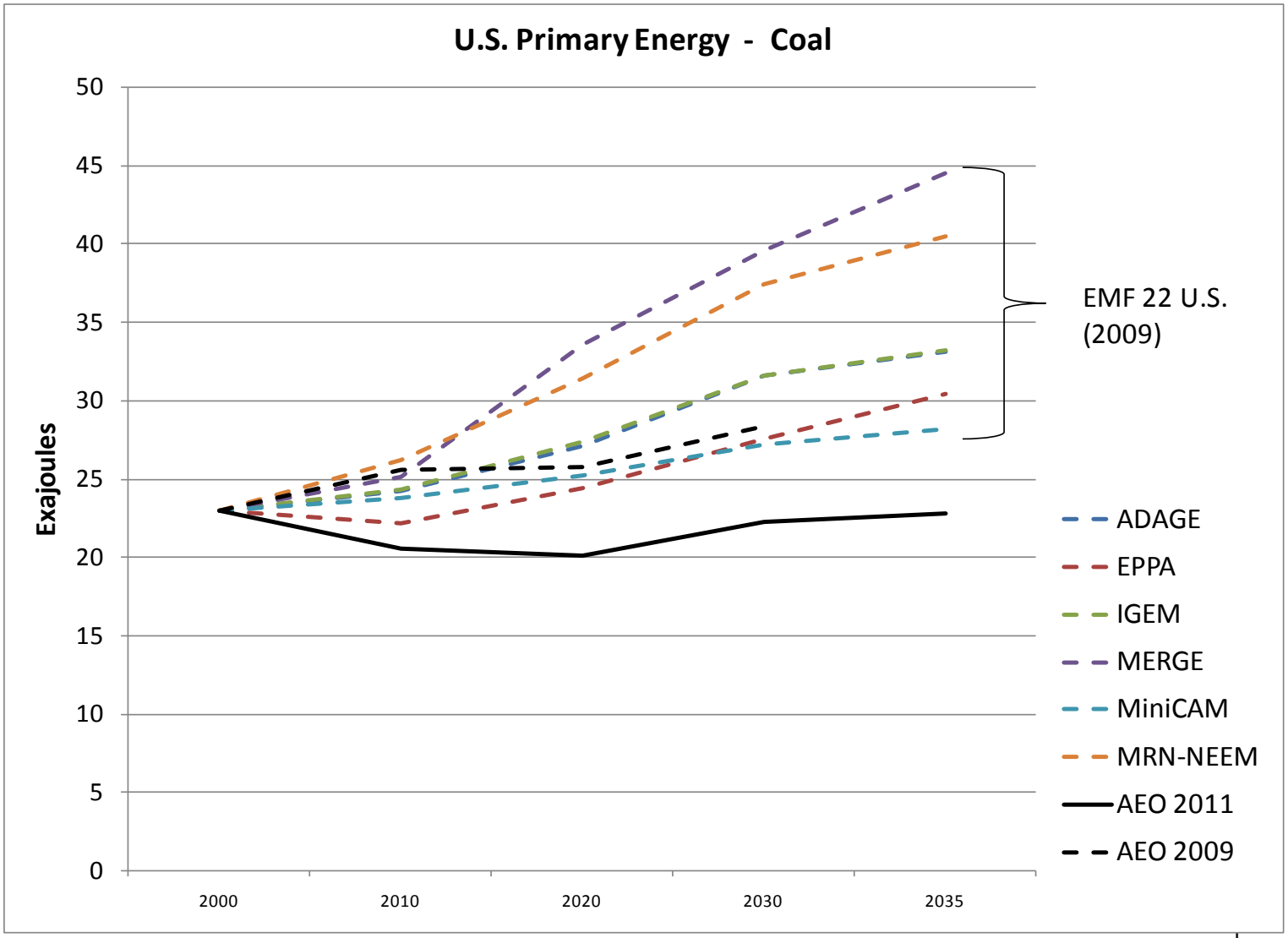
Uncertainty in projections



CO_2 (GHG) Limits under the Clean Air Act: How did we get here?

- April 2007, in *Massachusetts v. EPA (*549 U.S. 497) the Supreme Court found that GHGs are air pollutants covered by the CAA: EPA was required to determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which could endanger public health or welfare.

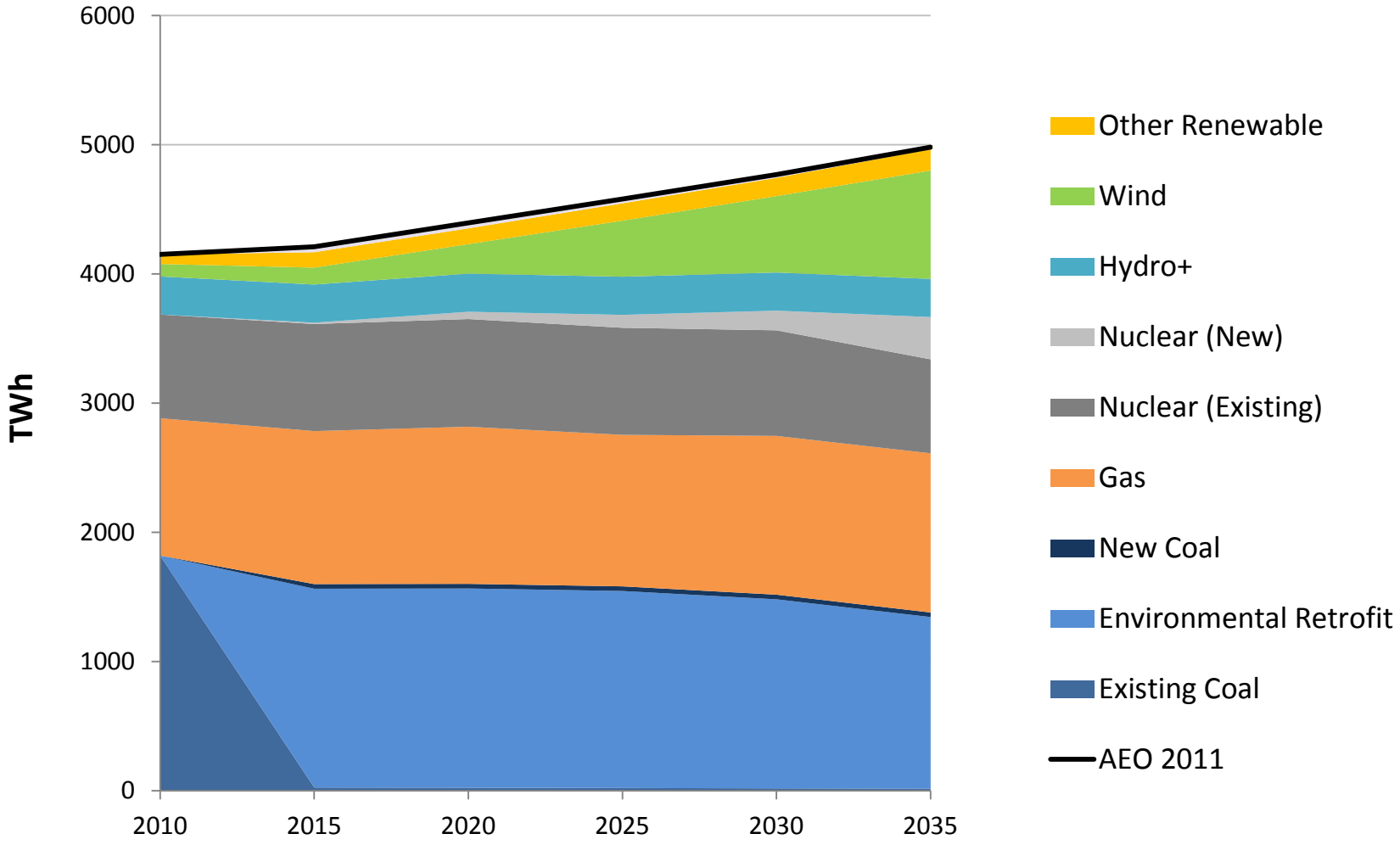
- December 2009, EPA Administrator issued two findings on GHGs:
  - Endangerment Finding – GHGs threaten the public health and welfare of current and future generations.
  - Cause or Contribute Finding – GHG emissions from new motor vehicles contribute to GHG pollution, which threatens public health and welfare

- May 2010, EPA published the Light-Duty Vehicle Rule (LDVR) establishing standards for GHGs emitted by new light duty motor vehicles starting with 2012 model vehicles (beginning on January 2011). GHG emissions become "regulated pollutants" as of Jan 2011 and stationary source are covered under the Prevention of Significant Deterioration (PSD) Permit Program"

CO_2 (GHG) Limits under the Clean Air Act: How did we get here? (2)

- On May 13, 2010, EPA issued the final GHG Tailoring Rule to raised the thresholds for GHG emissions for PSD and Title V Operating Permit programs for new and existing industrial facilities (mainly power plants, refineries, and cement production plants):
  - Starting Jan 2011, large industrial facilities already seeking permits for non-GHGs must also include GHG requirements if newly constructed or modified and have the potential to emit or increase 75,000 tpy CO_2e.
  - Starting July 2011, in addition to above, all new facilities emitting GHGs in excess of 100,000 ypy CO_2e and modified with an increase of least 75,000 tpy CO_2e are required to obtain permits.
  - Sources less than 50,000 tons of GHGs per year on a CO_2e basis will not be required to obtain permits for GHGs before 2016.
  - Permits, issued by states, require facilities to apply Best Available Control Technology, which is determined on a case-by-case basis taking into account, among other factors, the cost and effectiveness of the control.

US-REGEN Analysis (2012) of Current and Pending Environmental Controls: U.S. Electric Generation (Ref)



Recommendations for modeling impacts of CO_2 limits on industrial sources

- Respect the uncertainty in natural gas projections, that is, conduct sensitivity cases (See Vic's presentation)
- Do not impose limits on fossil fuel additions, in a baseline, as a proxy for climate mitigation policies or associated uncertainty
- Be clear in assumptions on existing coal (what about possible Existing Source Performance Standards?)
- Model over sufficiently long time frame given the lifetimes of industrial facilities and coal plants, e.g., 75 yrs

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