

EIA Renewable Energy Projections in Alternative Scenarios

EIA Energy Outlook, Modeling and Data Conference
March 28, 2007
Washington, DC

Robert K. Smith, OIAF

Annual Energy Outlook

- AEO contains mid-term projections of U.S. energy markets
 - AEO2006 and AEO2007 project through 2030
 - Reference Case represents current laws and regulations
 - Contain over 30 sensitivity cases with varying technology and market assumptions
- Reference Case is also used as a baseline to analyze the potential impacts of proposed laws and regulations at the request of Congress
- See <http://www.eia.doe.gov/oiaf/aeo/index.html>

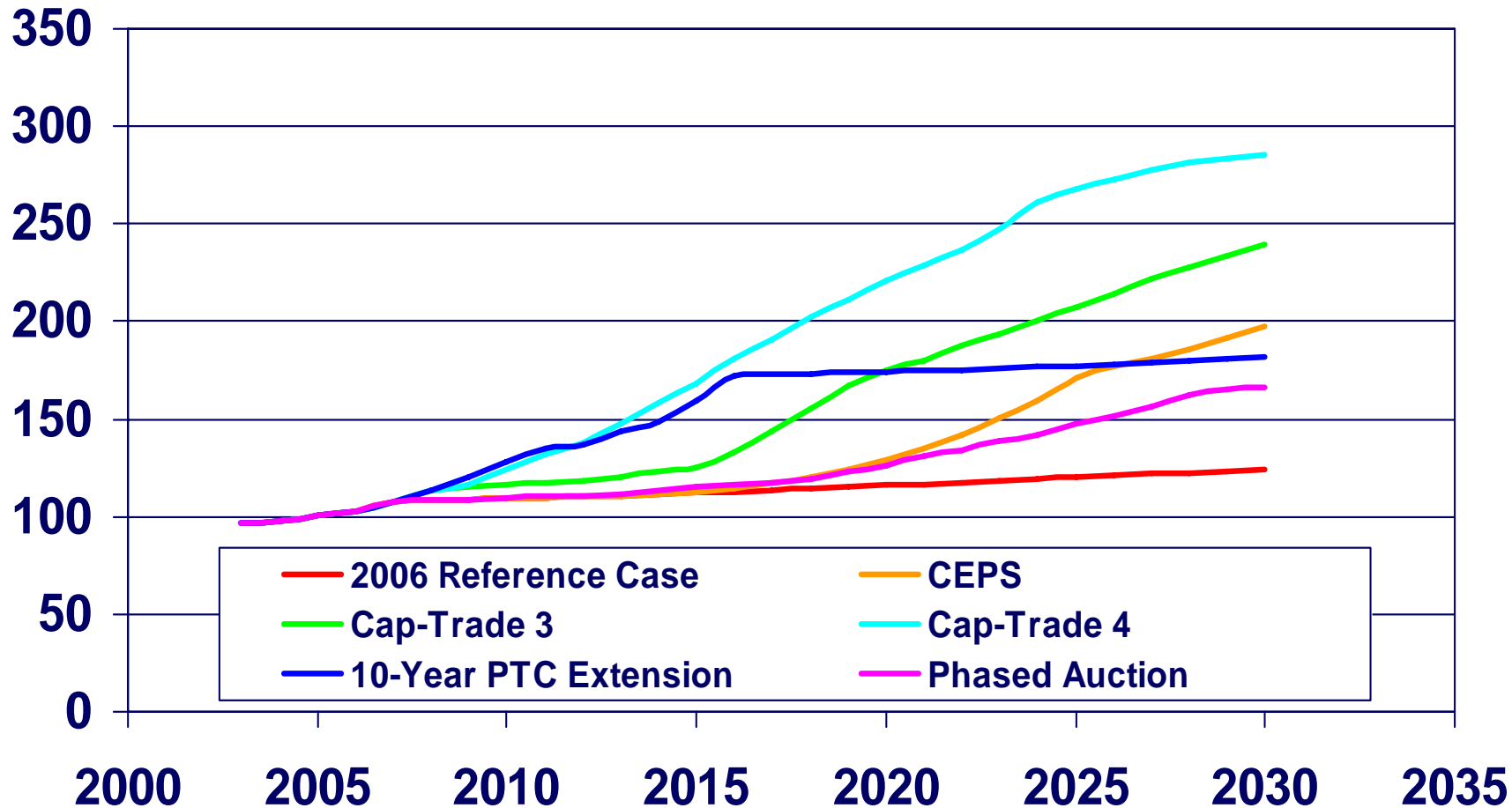
National Energy Modeling System (NEMS)

- Used to develop AEO and policy analysis scenarios
- Integrated U.S. energy sector model with macro-economic feedback
 - Captures market feedback among different sectors (such as natural gas price response to increased share of renewable generation)
 - Electricity sector modeled at a 13 region level based on NERC sub-regions
- Updated annually
 - Key assumptions continuously revisited
 - New modeling techniques added to improve representation
- Adaptable to represent new policies or policy detail variations (for example, several different approaches to RPS structures)

Alternative Cases Impacting Renewables using AEO2006 Assumptions

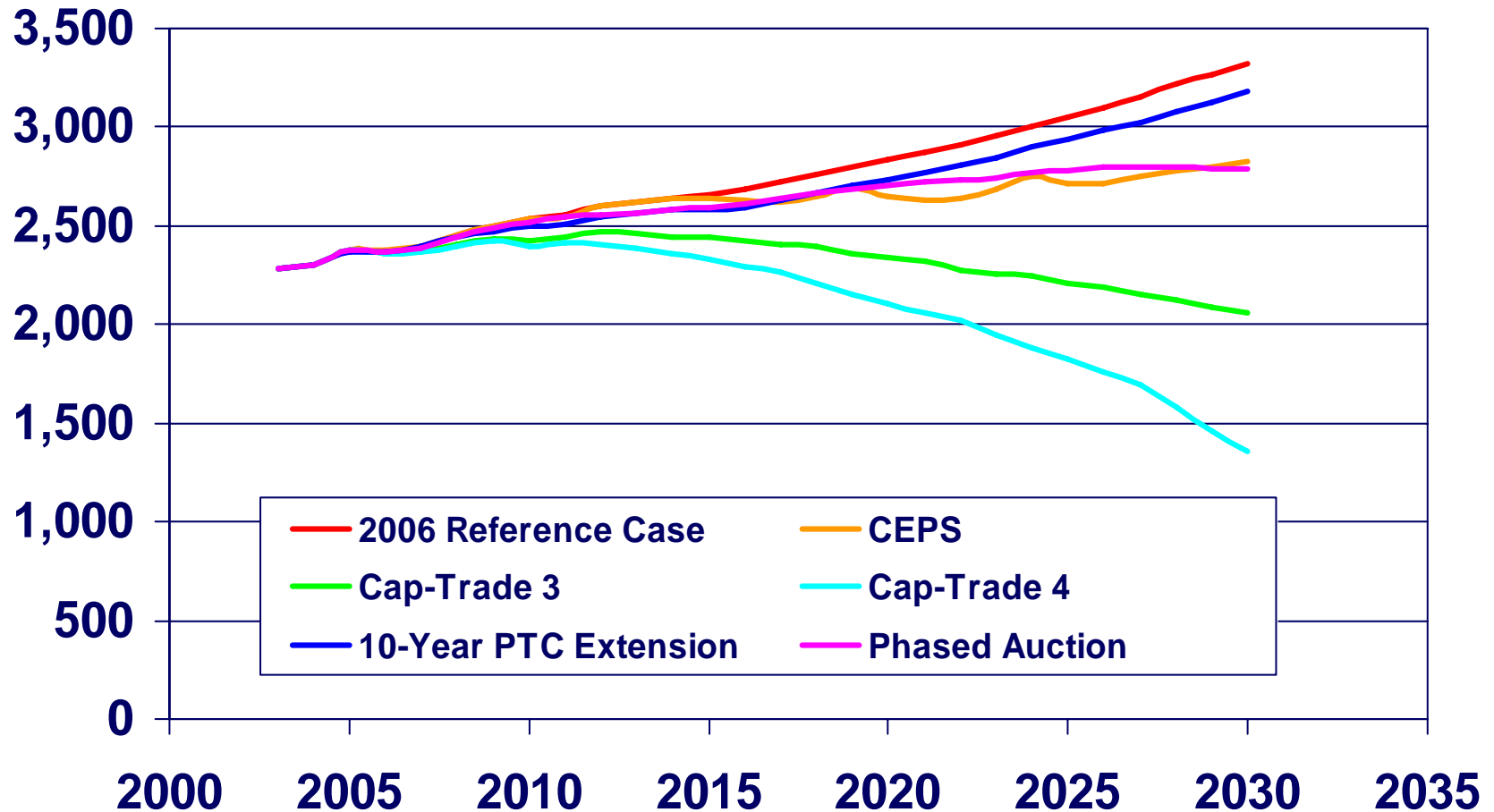
Policy	Policy Assumptions	Additional Information
<p>Clean Energy Portfolio Standard (CEPS) Requested by Senator Coleman</p>	<p>Suppliers must generate specific percentage of total sales from low-carbon energy including renewables and nuclear. Credit price is capped.</p>	<p>Follow-up on earlier analysis, reducing the credit to nuclear and increasing the required clean energy shares.</p>
<p>Alternative Greenhouse Intensity Reduction Goals Requested by Senator Salazar</p>	<p>Based on 12/2004 NCEP report, with additional GHG intensity reduction cases .</p>	<p>Range of GHG intensity reductions also include alternative safety values.</p>
<p>Ten-Year PTC Extension</p>	<p>Assumed PTC would not expire until 2016. Renewable technologies receive 1.9 cents/kWh, except biomass which receives half of the credit.</p>	<p>PTC modeled in AEO2006 and AEO2007 to expire January 1st, 2008. Has since been extended another year.</p>
<p>GHG Intensity Reductions with Cap-and-Trade Requested by Senators Bingaman, Landrieu, Murkowski, Specter, Salazar, Lugar</p>	<p>GHG emissions to be reduced through cap-and-trade. 90 percent of emission allowances are initially given away, but auction share grows over time.</p>	<p>Sensitivity cases included a full auction case.</p>

Renewable Capacity (Gigawatts)

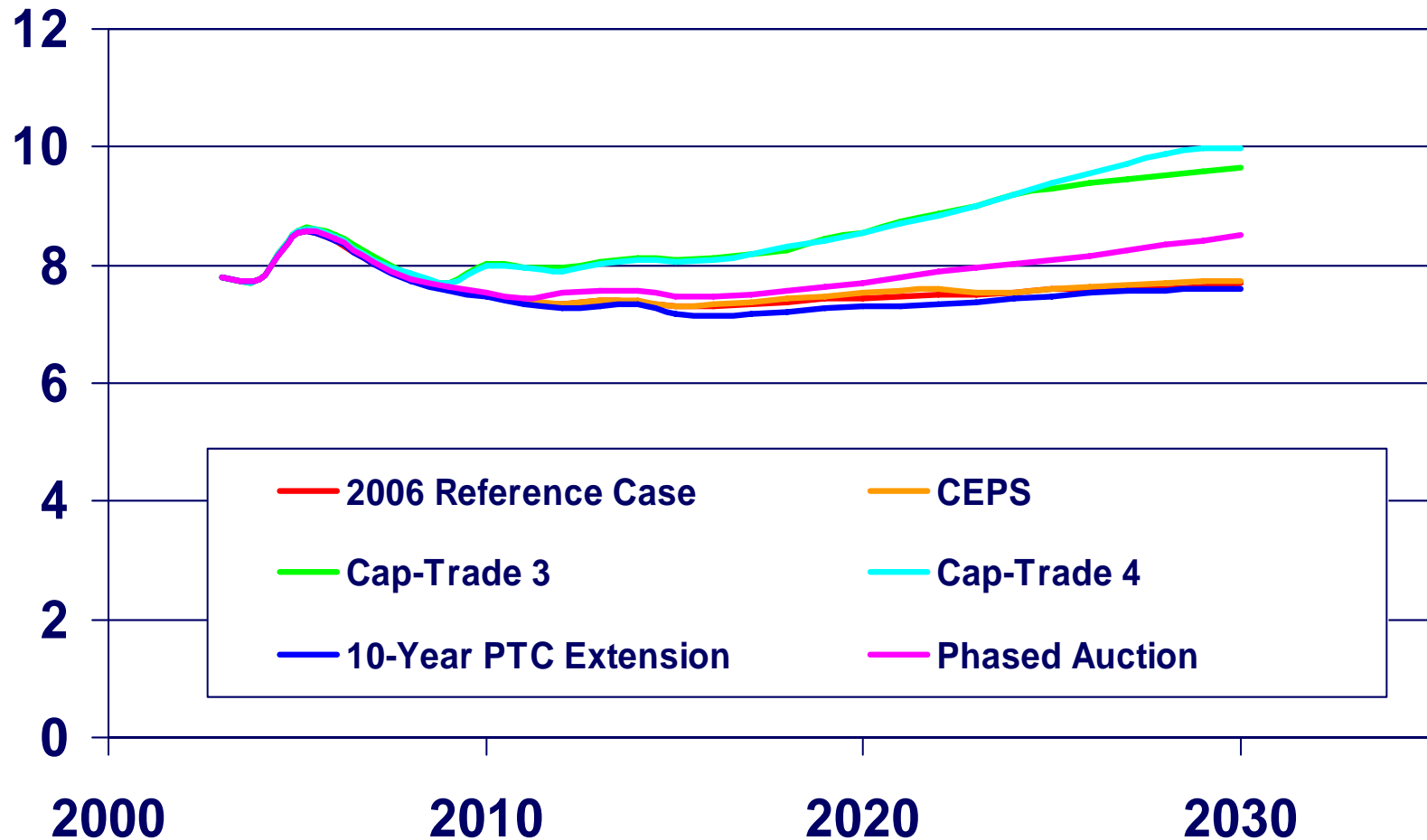


Power Sector CO₂ Emissions

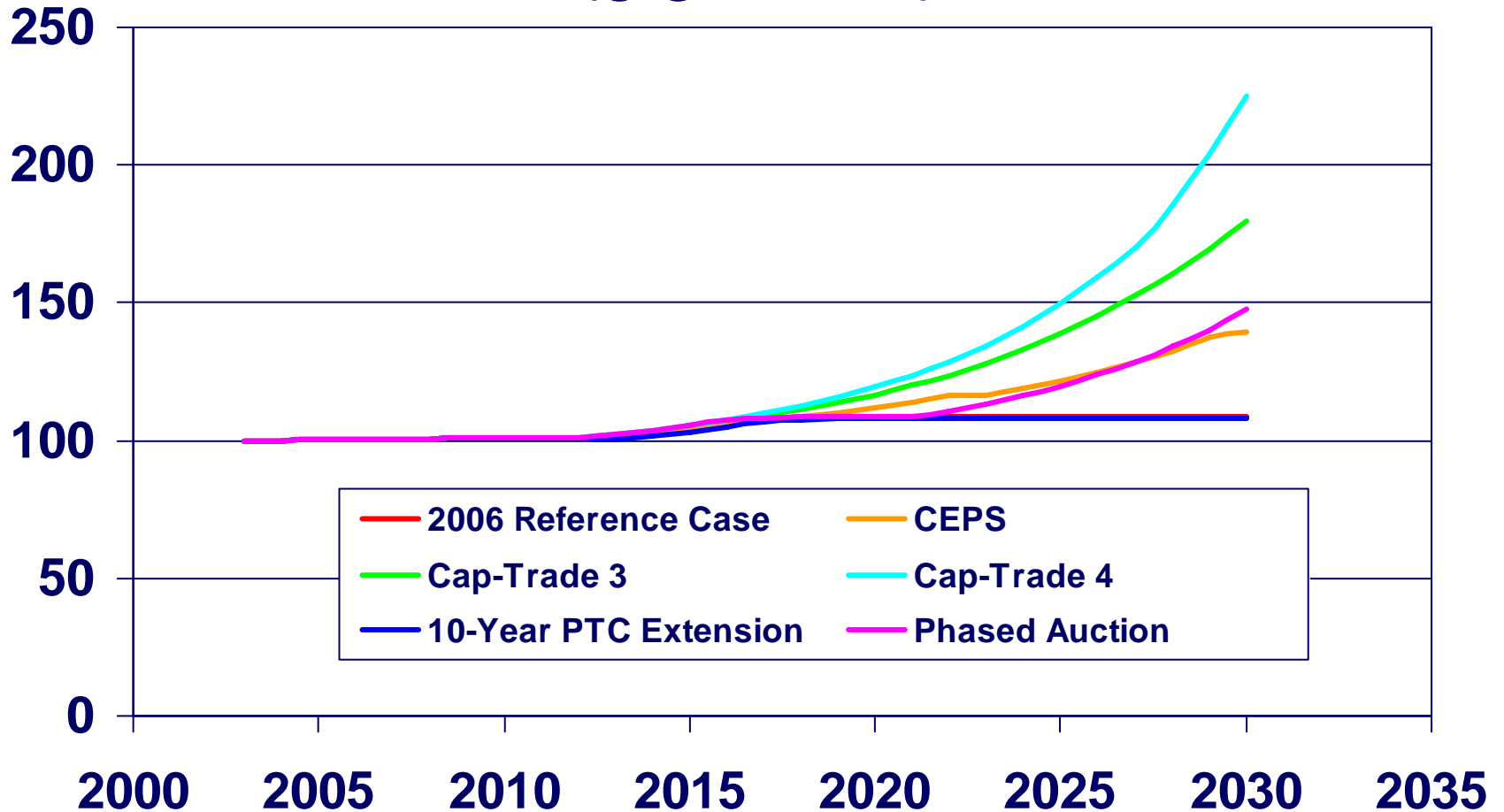
(million metric tons)



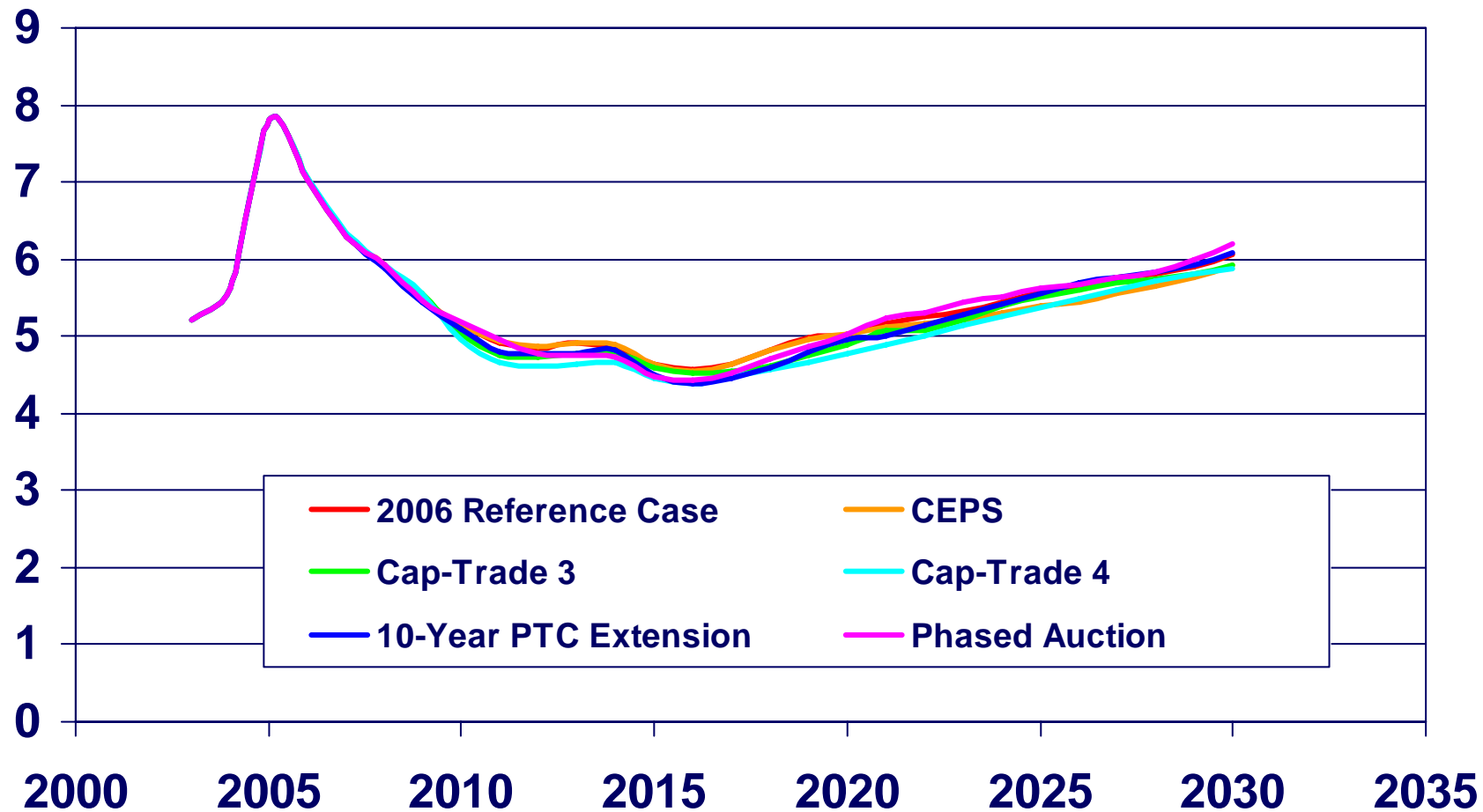
Average End Use Electricity Prices (2005 cents per kilowatthour)



Nuclear Capacity (gigawatts)



Natural Gas Wellhead Prices (2005 dollars per thousand cubic feet)

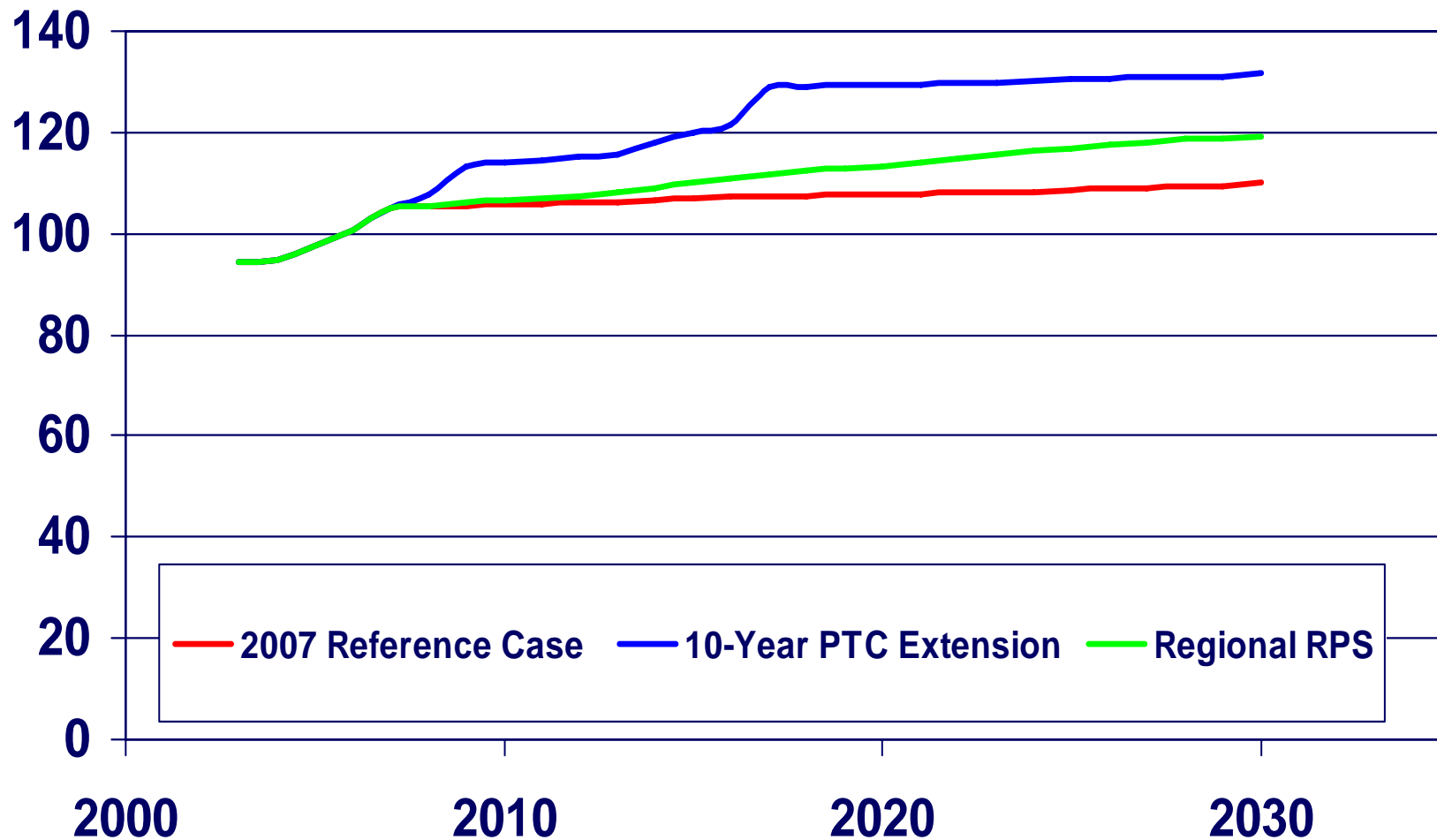


AEO2007 Renewable Technology Modifications and Alternate Cases

- Wind performance assumptions changed to better reflect recent performance
- Geothermal costs and resource potential updated from recent studies.

Case	Assumptions	Additional Information
Ten-Year PTC Extension	PTC expiration delayed until 2017. Renewable technologies receive 1.9 cents/kWh, except biomass which receives half of the credit	Same tax credit assumptions as in AEO2006, however different results due to revised renewable technology assumptions.
Regional RPS Case	Assumes most states with RPS provisions meet their targets.	Aggregates state requirements up to NEMS regions. Does not assume interregional qualifying generation.

Renewable Capacity (gigawatts)



Summary

- Portfolio standards, extended tax credits and GHG cap-and-trade program cases examined by EIA all stimulated increased renewable capacity additions and generation.
- All cases also showed reduced GHG emissions, but the impacts were much larger in the GHG cap-and-trade cases.
- With the exception of the extended tax credit cases, all cases led to higher electricity prices, with GHG cap and trade cases having the largest impacts.

Contact Information

Energy Information Administration

www.eia.doe.gov

Robert K. Smith

robert.smith@eia.doe.gov

202-586-9413