

Sectoral Climate Policies

Exploring Multiple Sectoral Climate Policies to Achieve
Economy Wide GHG Reductions

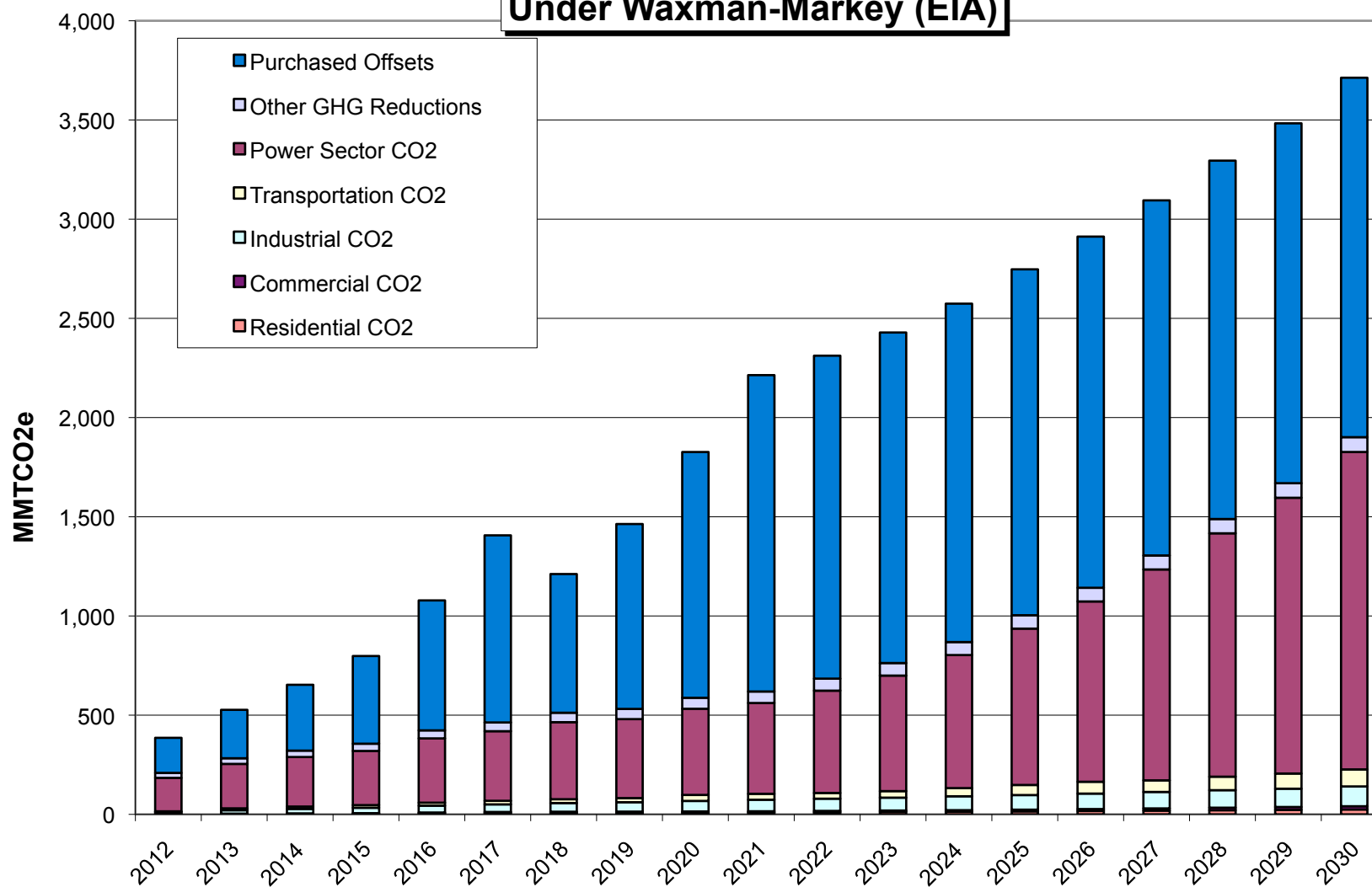
JONATHAN BANKS
FALL, 2009



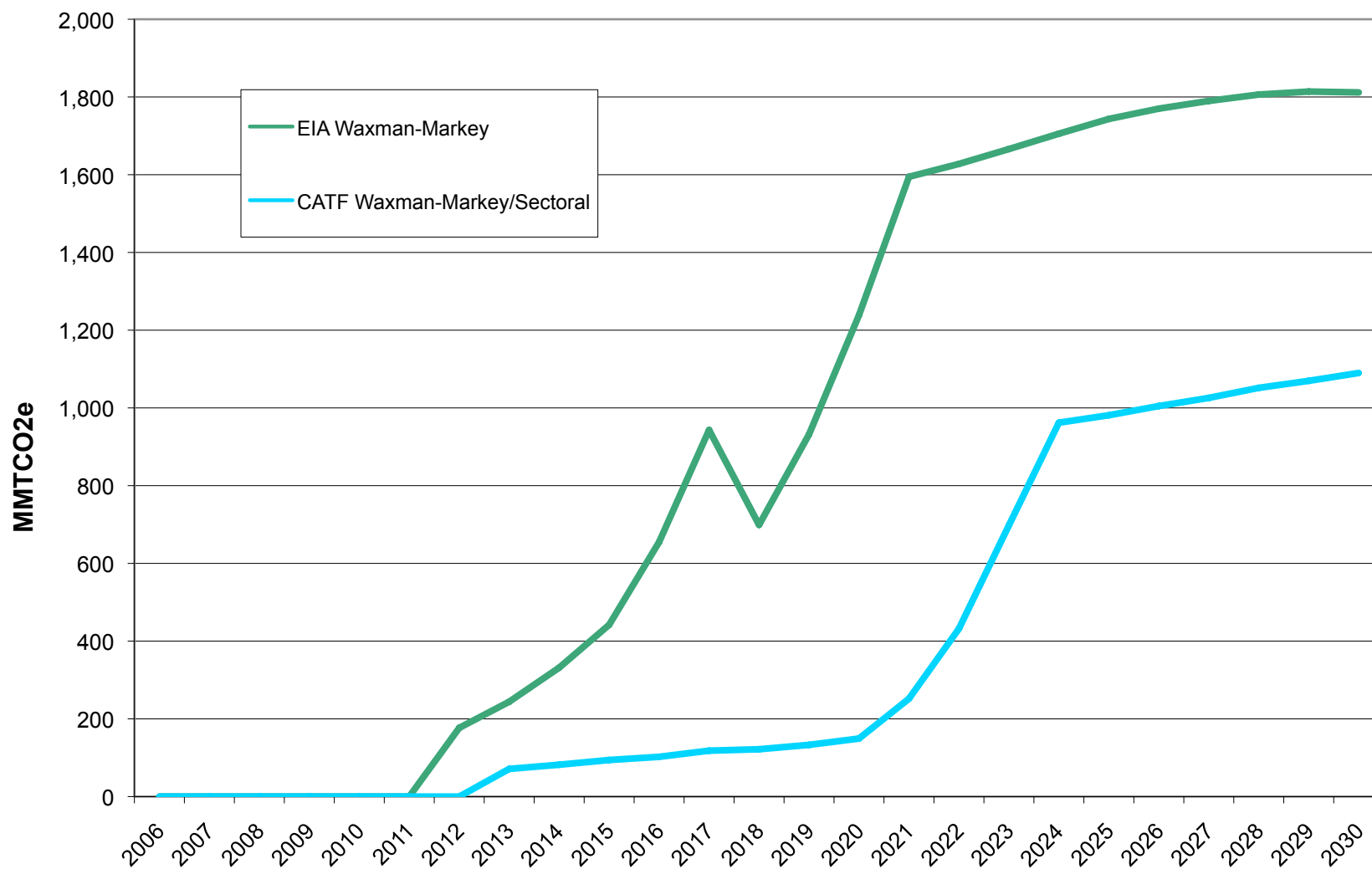
Purpose

- In late 2008, following the defeat of the Lieberman Warner bill, CATF decided to test some alternatives to economy wide climate legislation.
- We chose to analyze a combination of policies that target specific sectors, with the goal of reducing costs, creating more believable technology pathways, and maintaining environmental integrity.
- CATF conducted an initial set of modeling runs on a set of proxy policies. Since then, the economic downturn, and a number of additional changes have dramatically altered EIA's view of BAU.
- CATF has now updated our initial set of runs to reflect these changes and pegged the work to modeling EIA has performed on the Waxman-Markey legislation.
- The modeling conducted serves to test a variety of policy options but needs further refinement, development and discussion to achieve the necessary goals.
- For a more in depth discussion please see CATF's testimony before the Senate Energy and Natural Resources Committee.

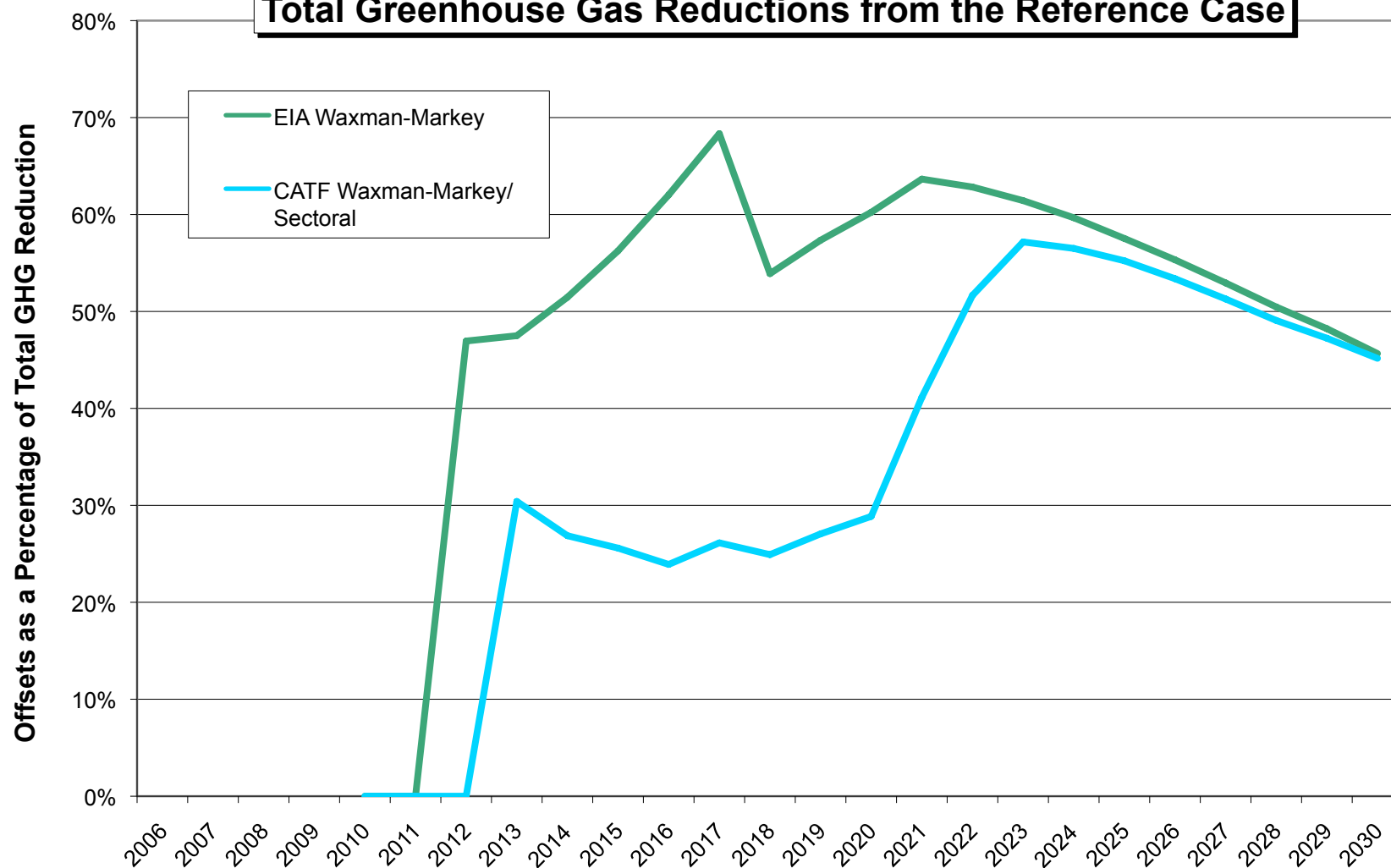
Shares of GHG Abatement Under Waxman-Markey (EIA)



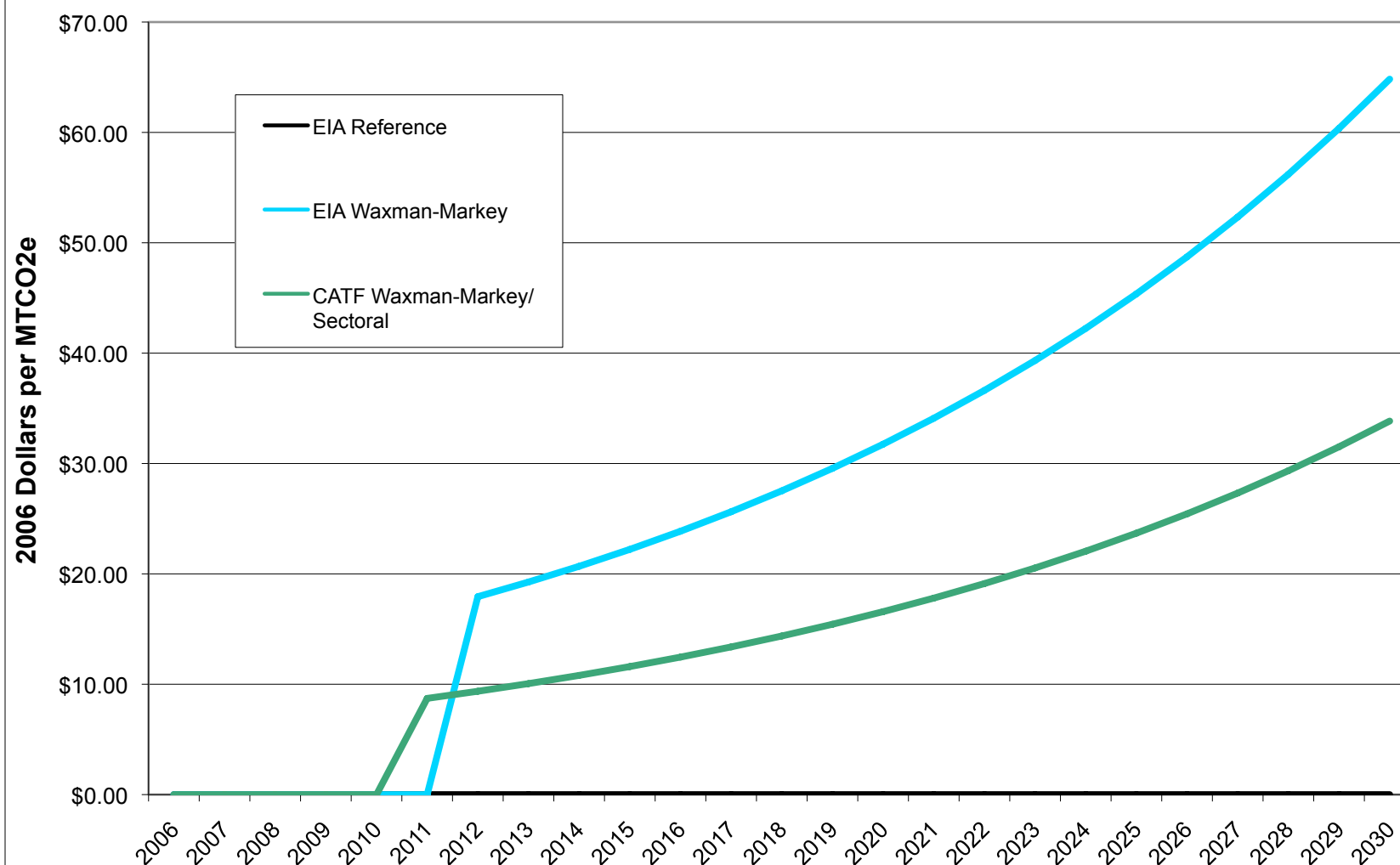
Purchased Offsets



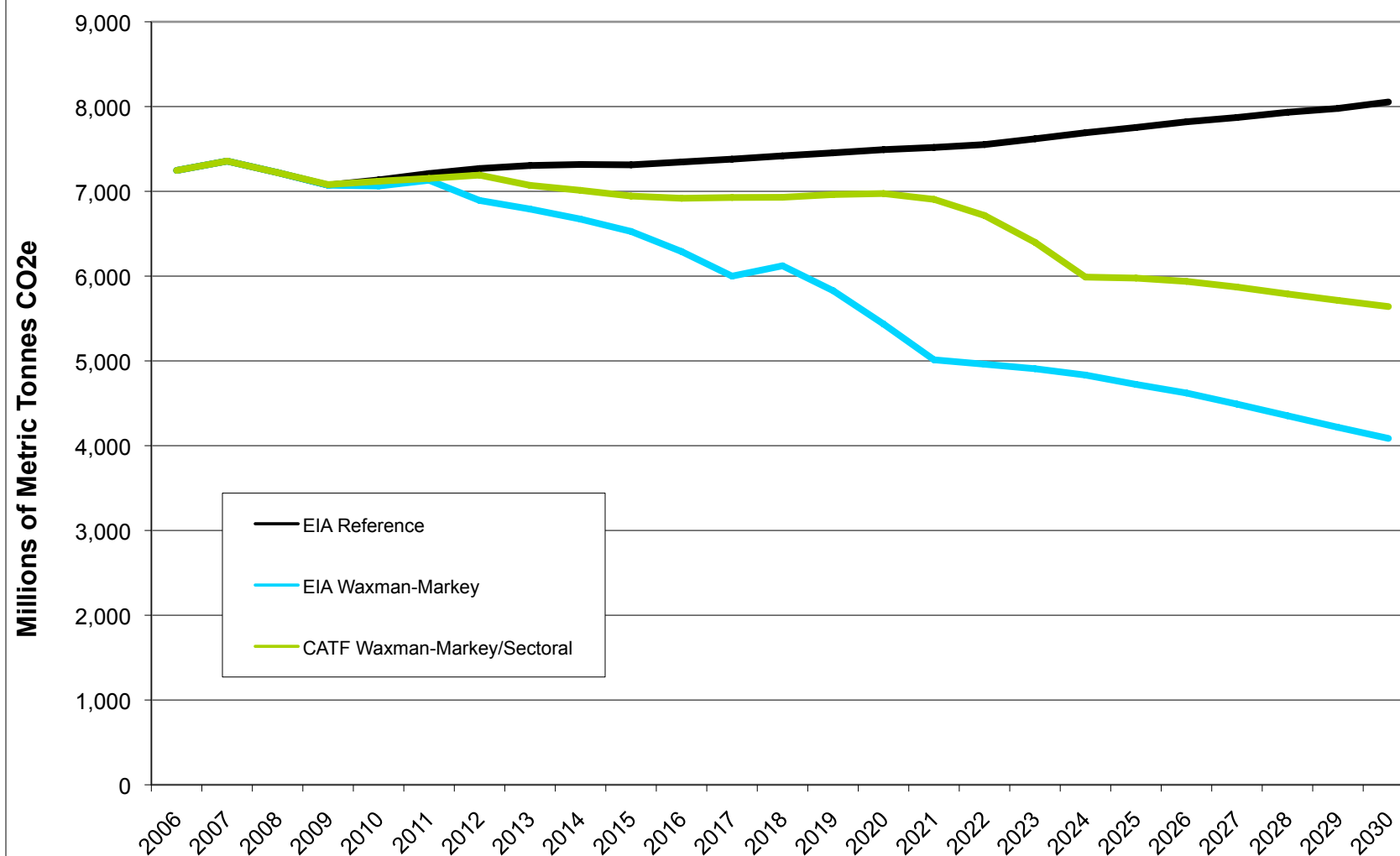
Purchased Offsets as a Fraction of Total Greenhouse Gas Reductions from the Reference Case

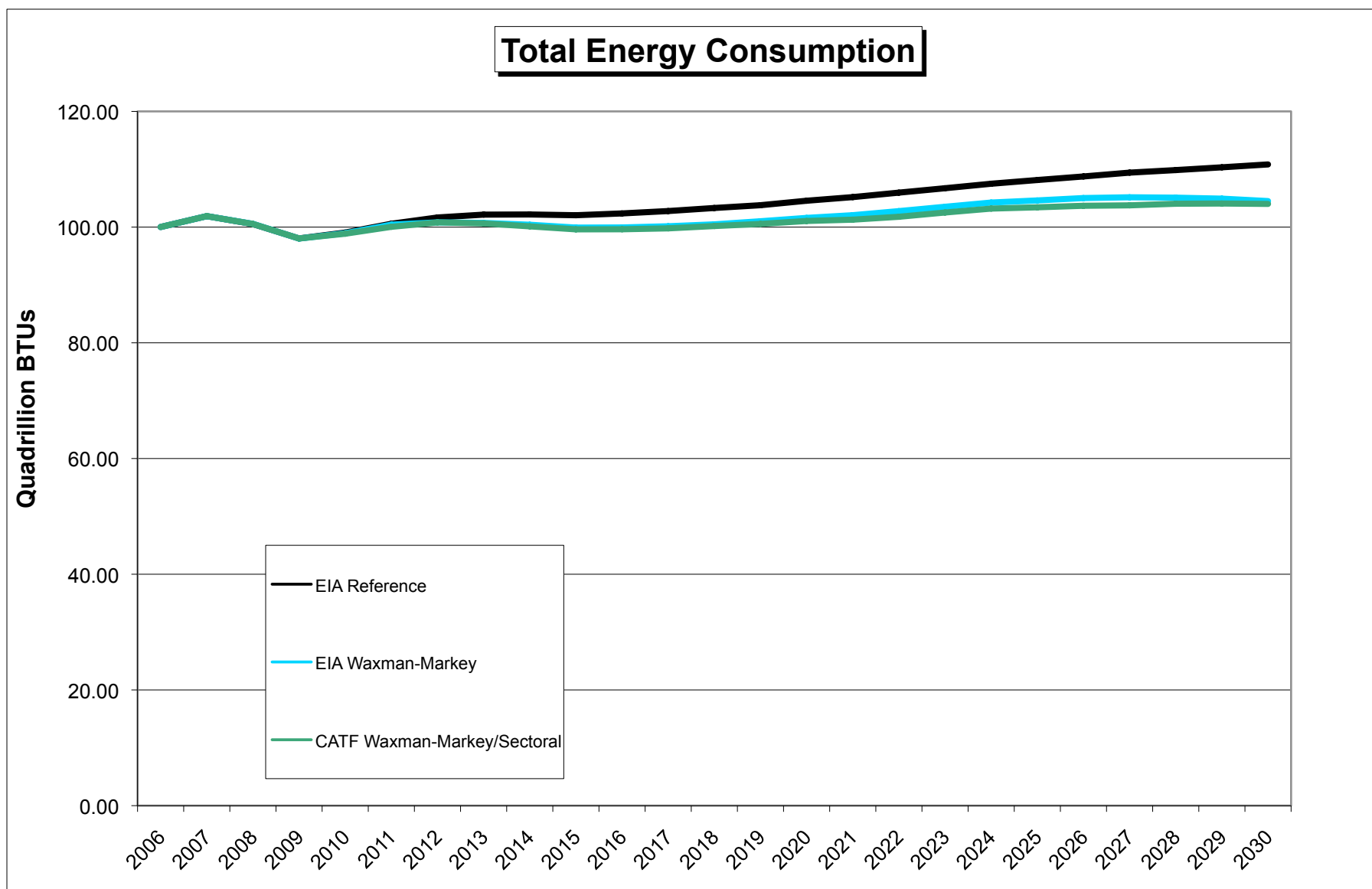


Greenhouse Gas Allowance Prices

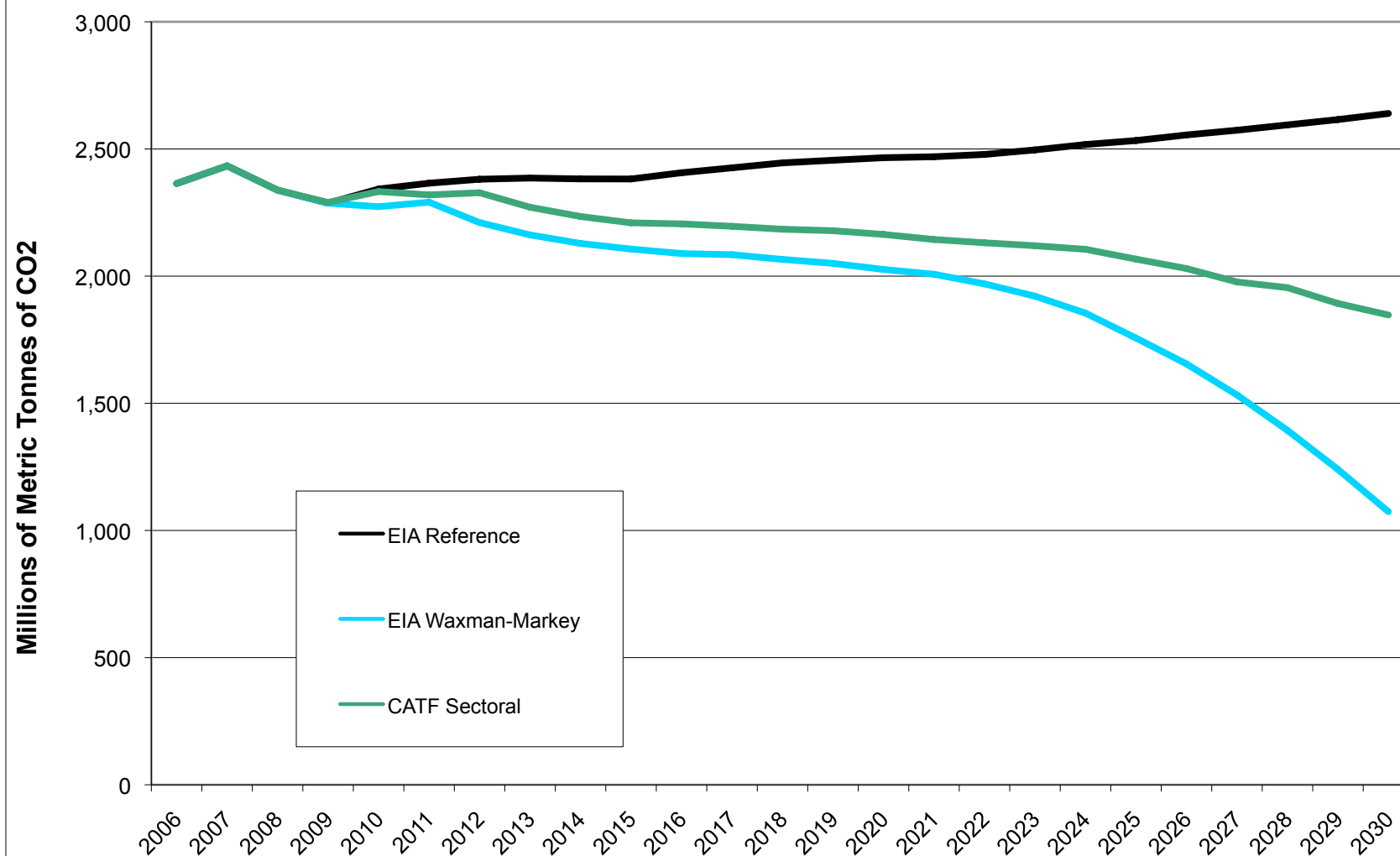


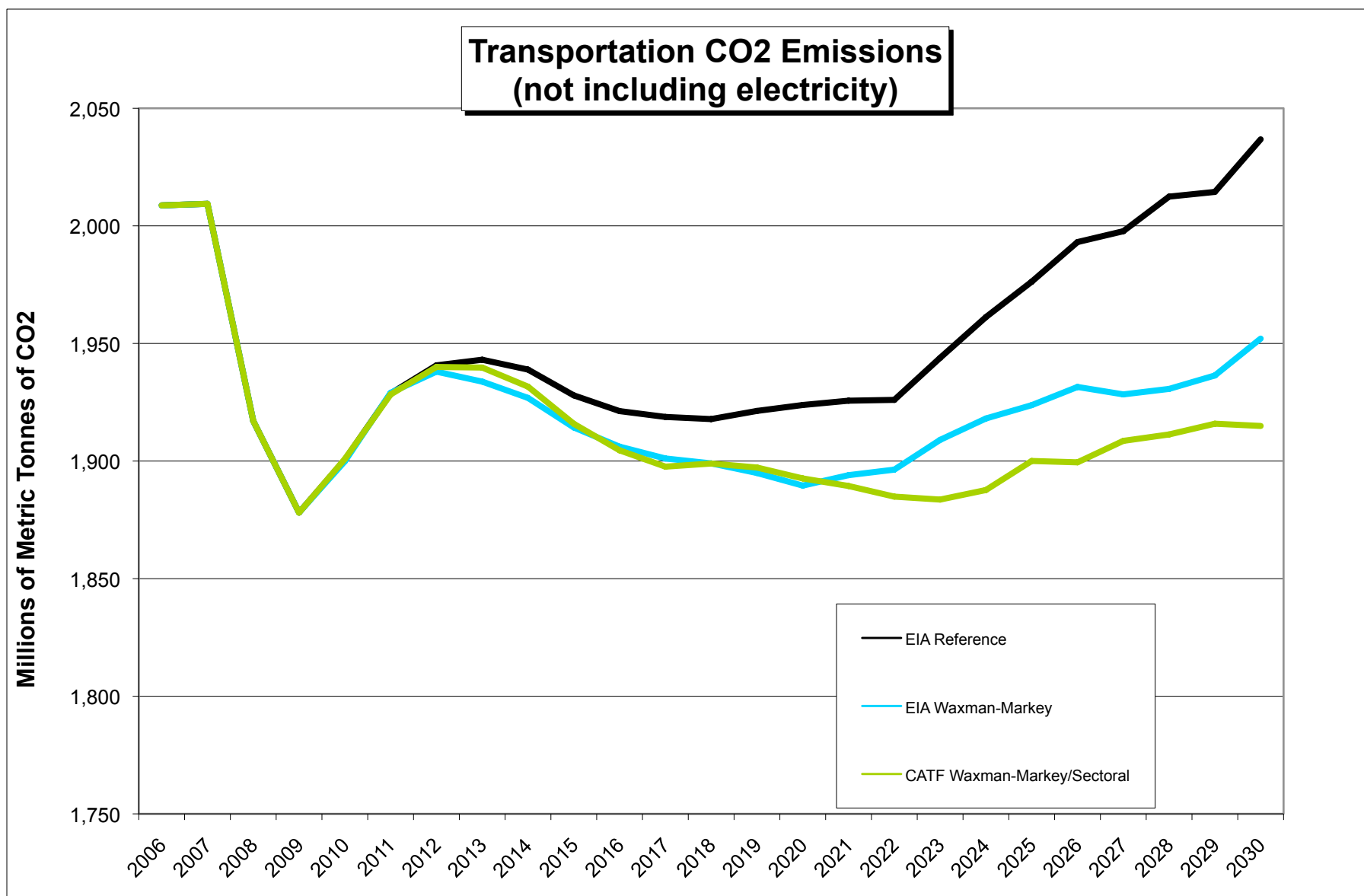
Greenhouse Gas Emissions Less Offsets

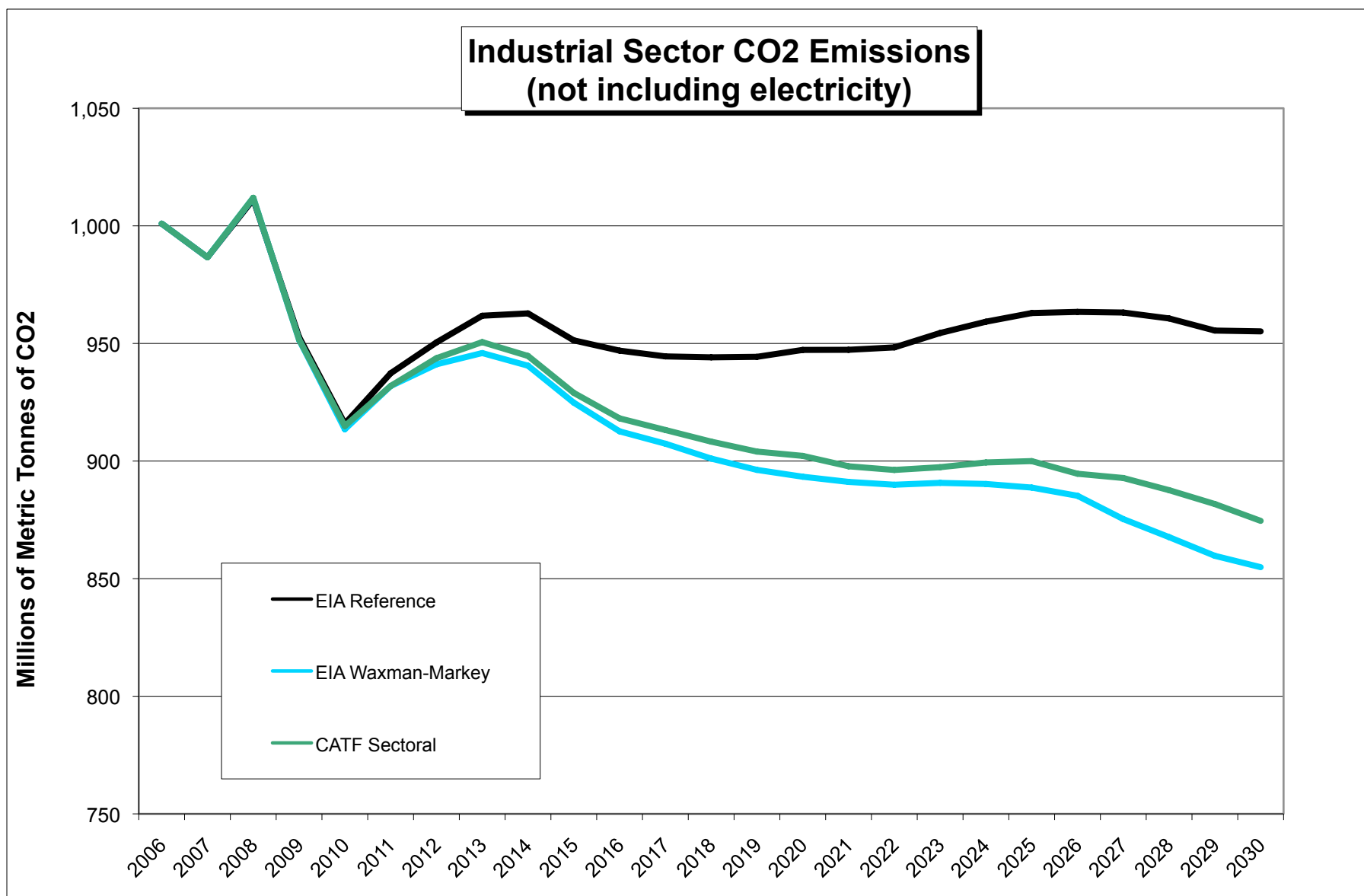




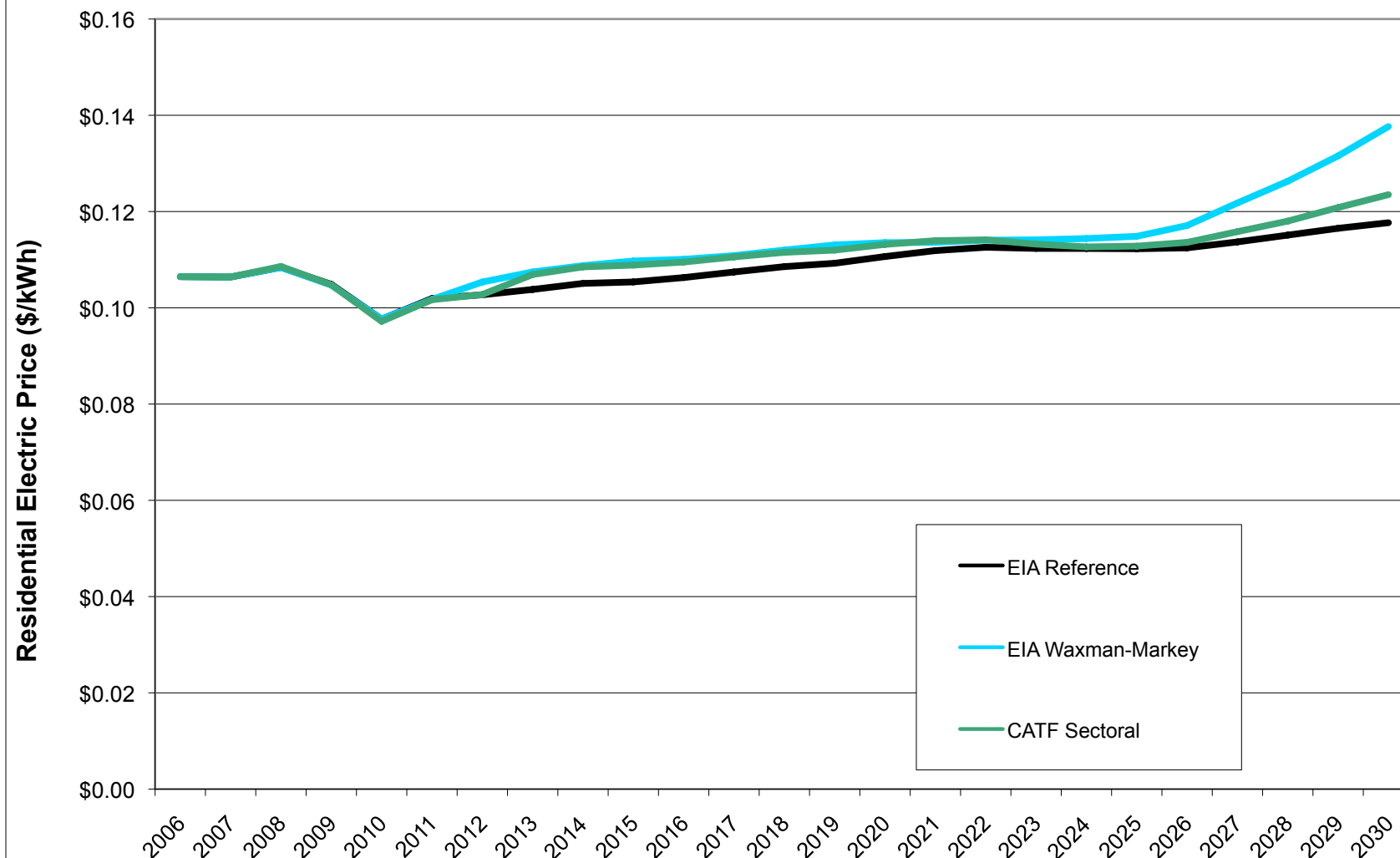
Power Sector CO2 Emissions



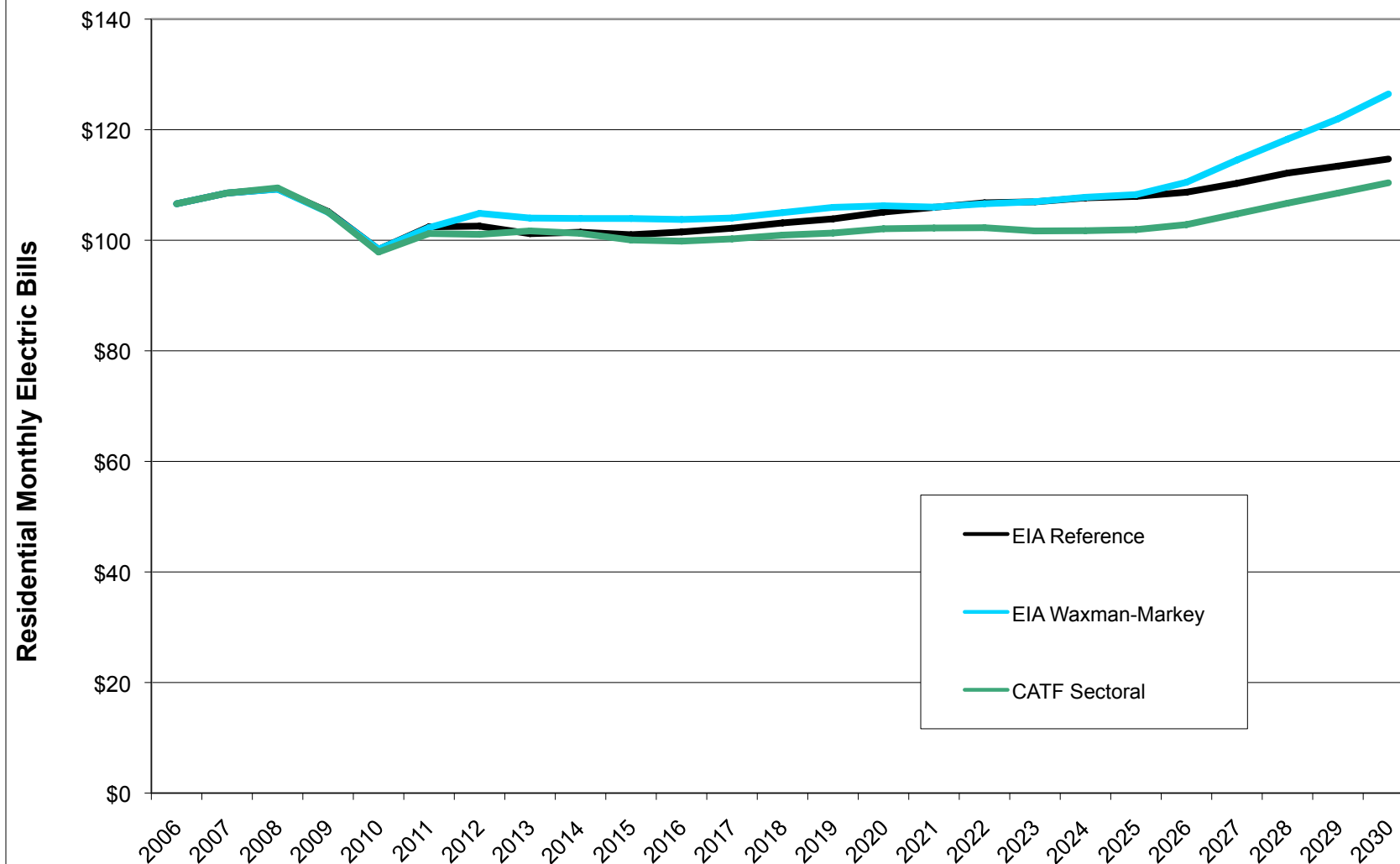




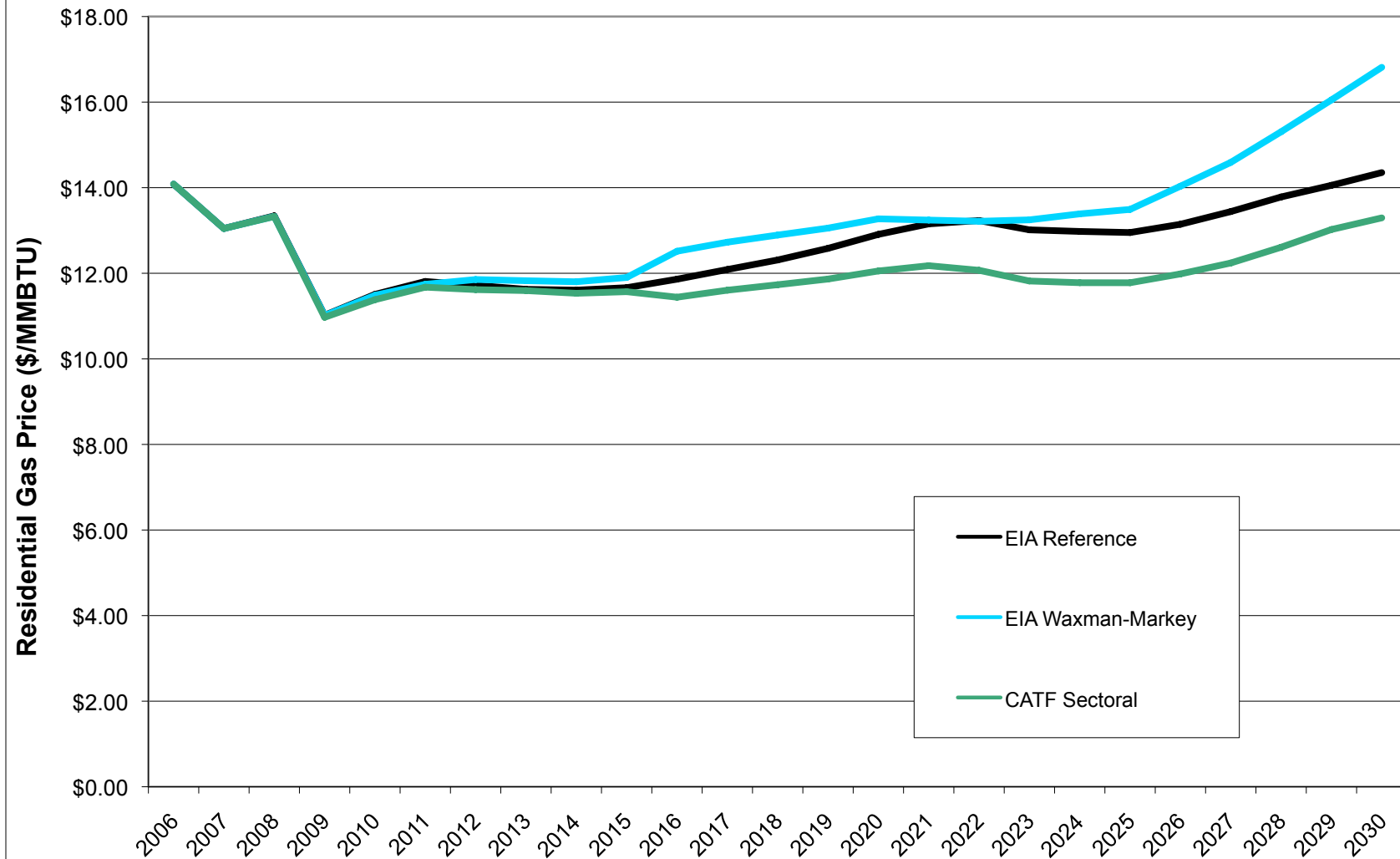
Residential Electricity Prices



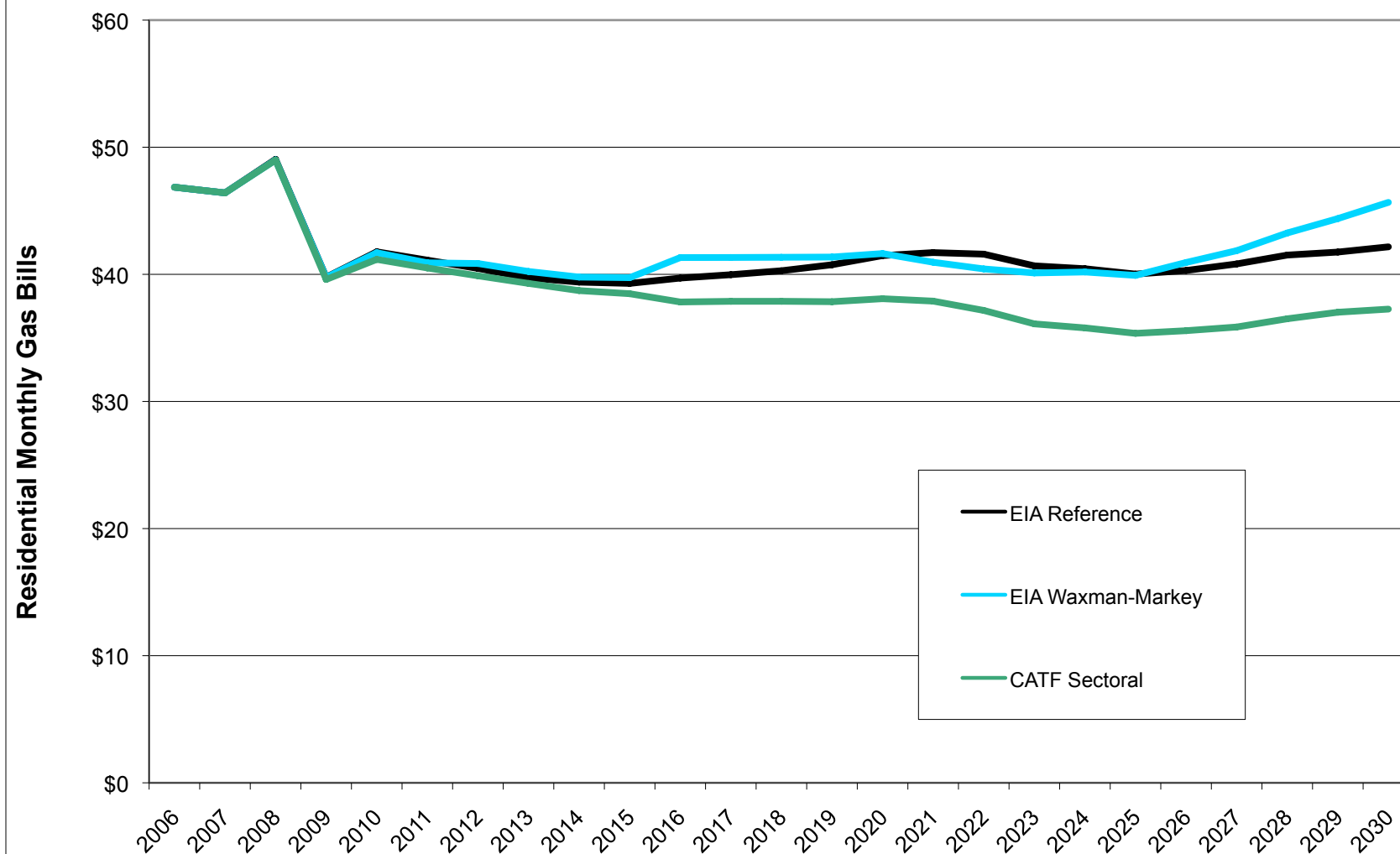
Residential Monthly Electric Bills



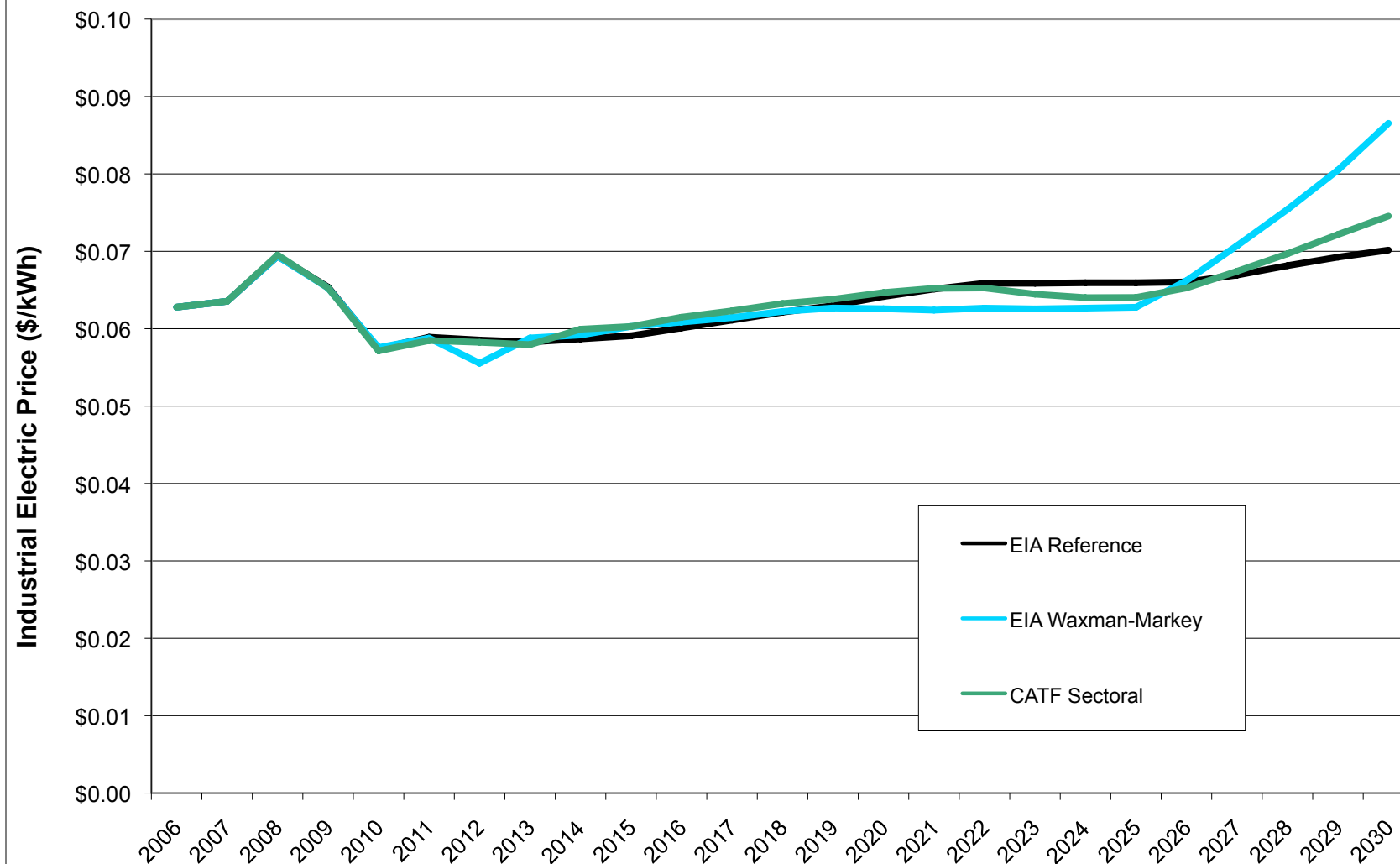
Residential Natural Gas Prices



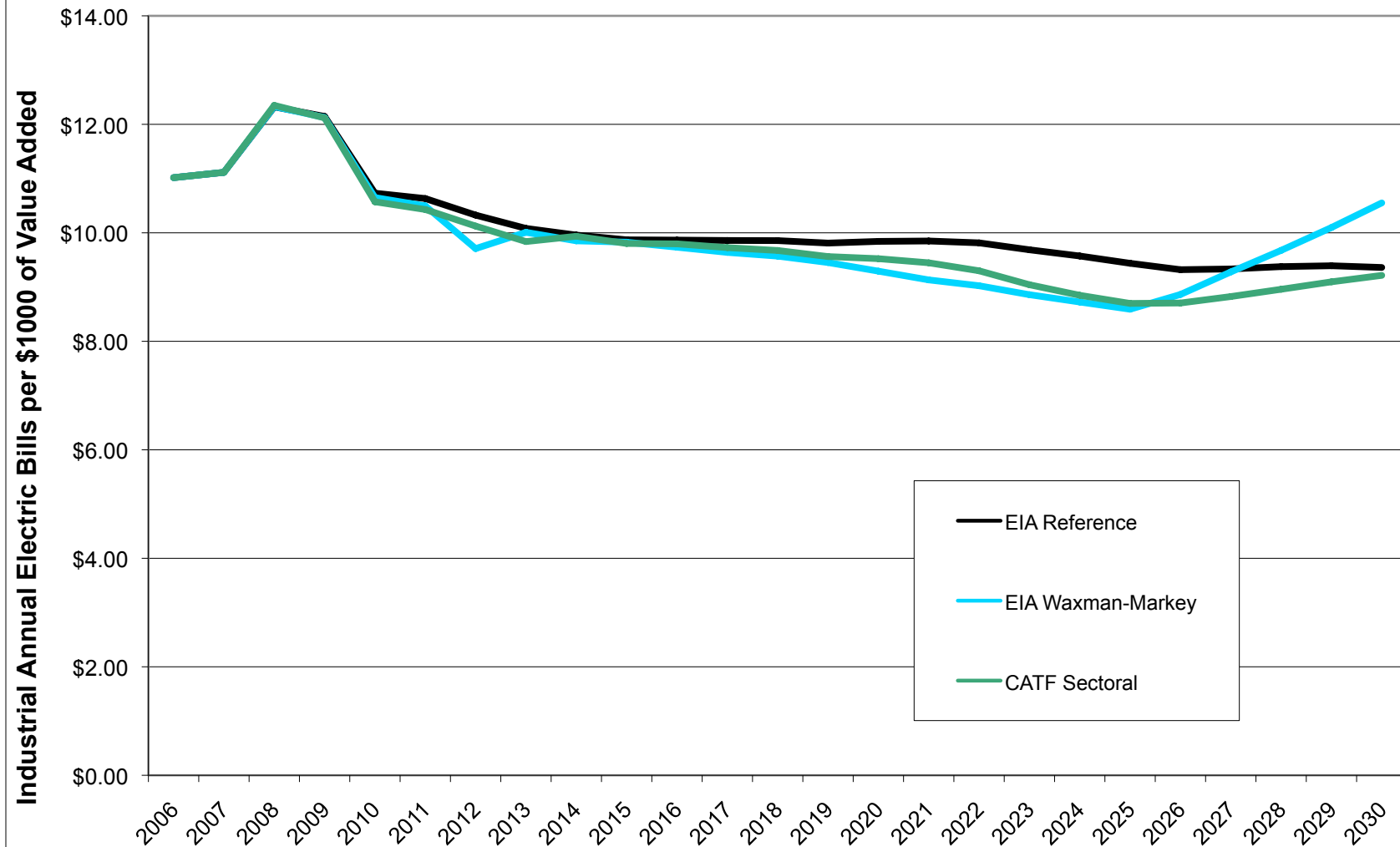
Residential Monthly Natural Gas Bills



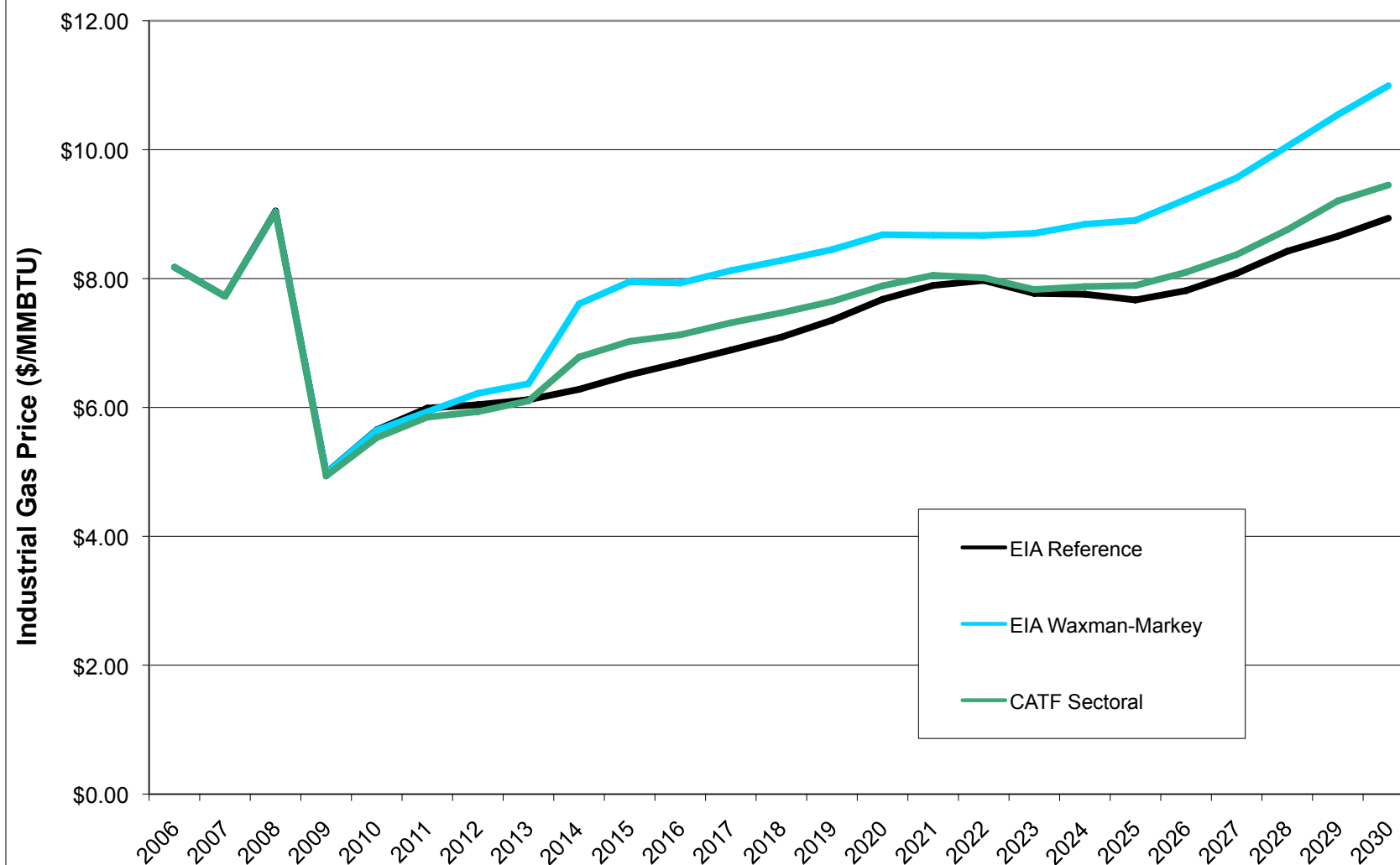
Industrial Electricity Prices



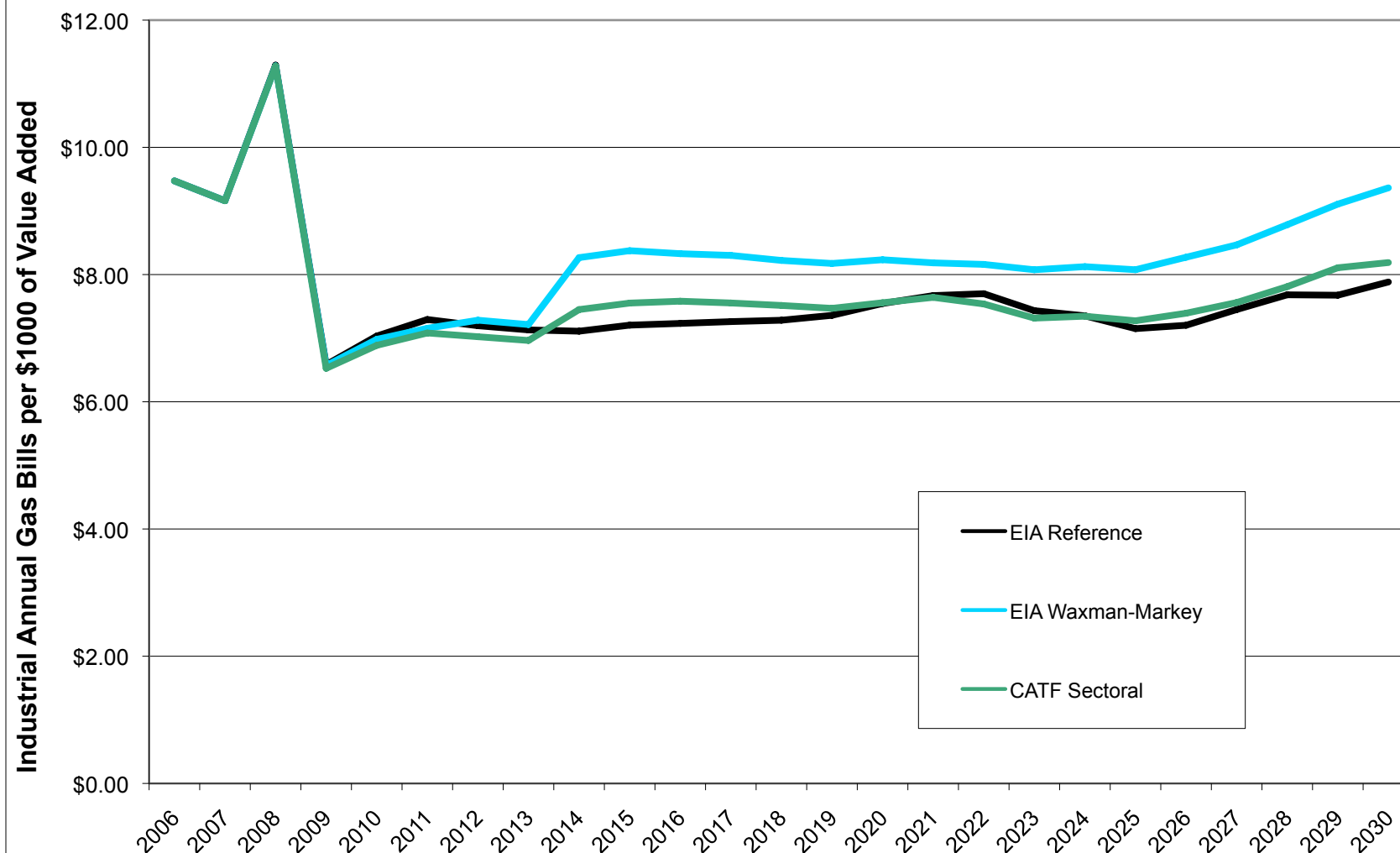
Industrial Annual Electric Bills per \$1000 of Value Added

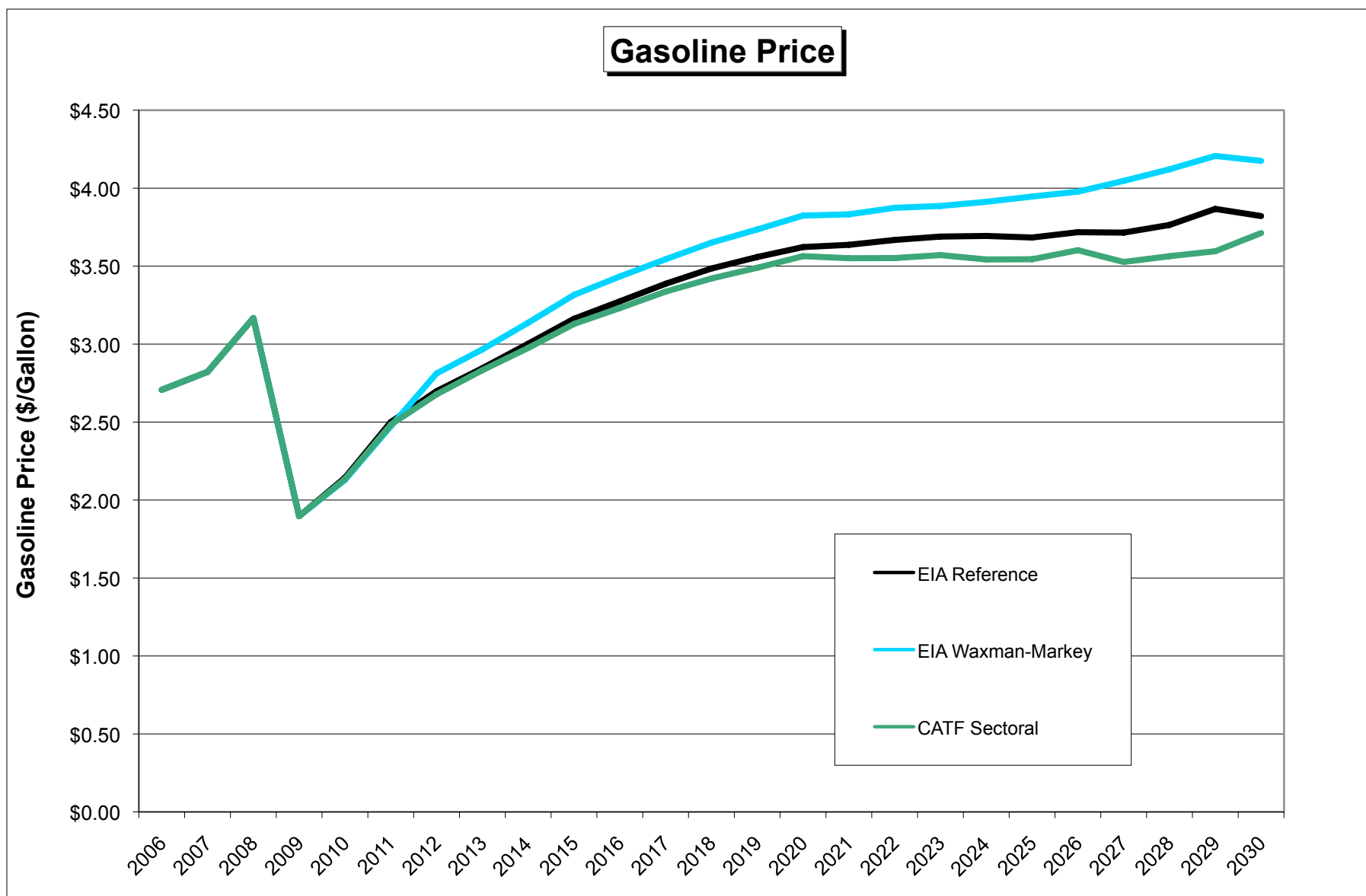


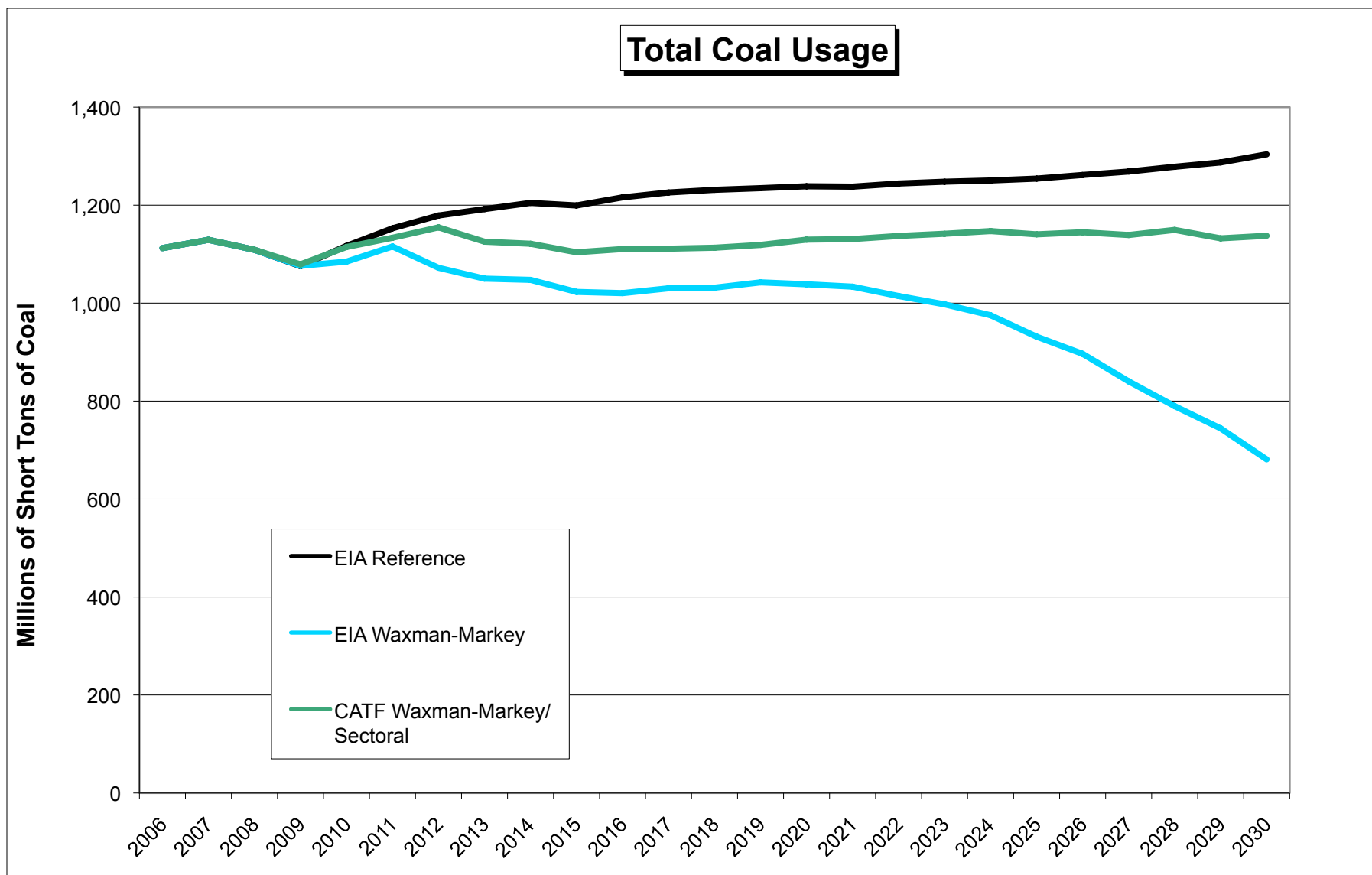
Industrial Natural Gas Prices



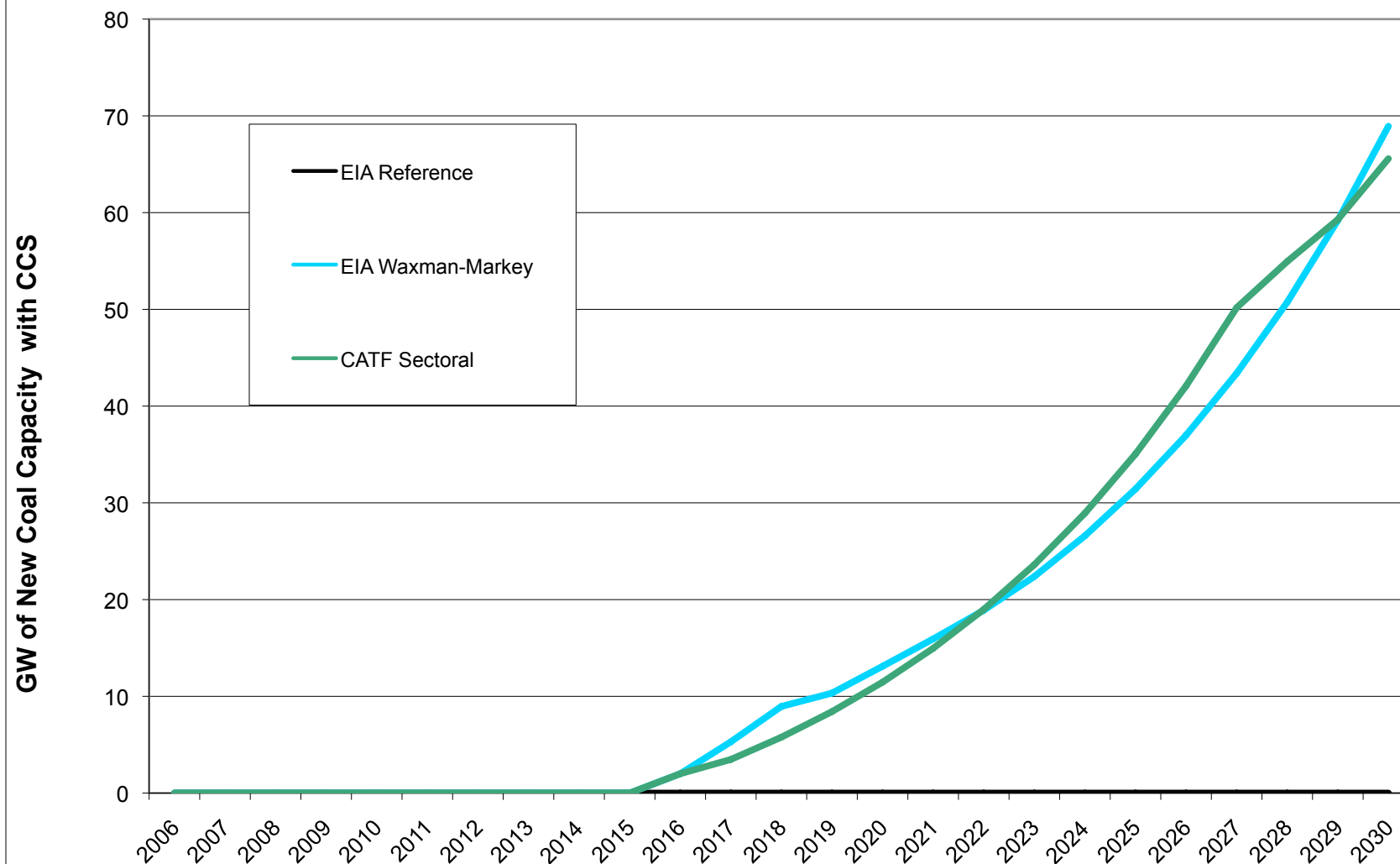
Industrial Annual Natural Gas Bills per \$1000 of Value Added



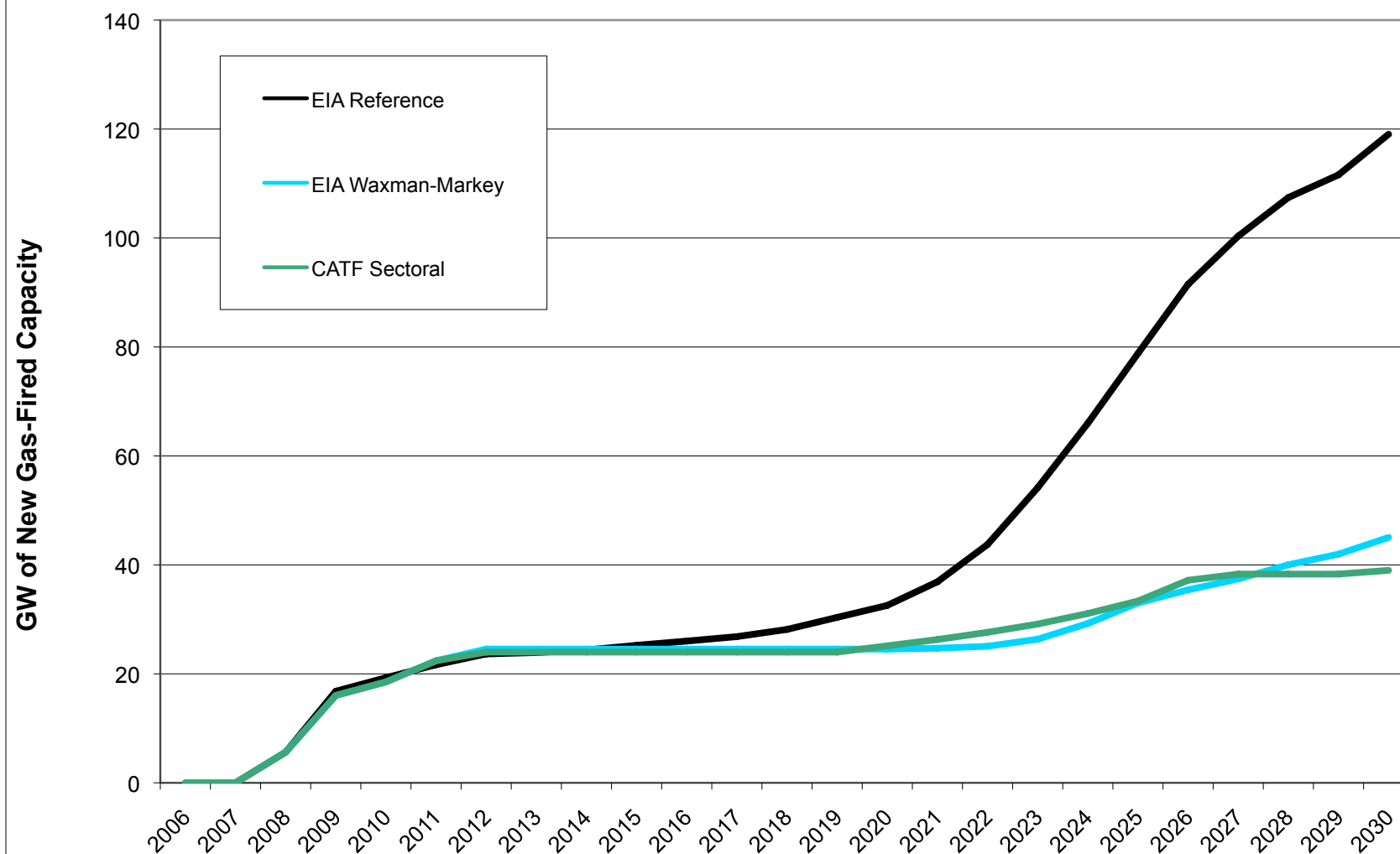




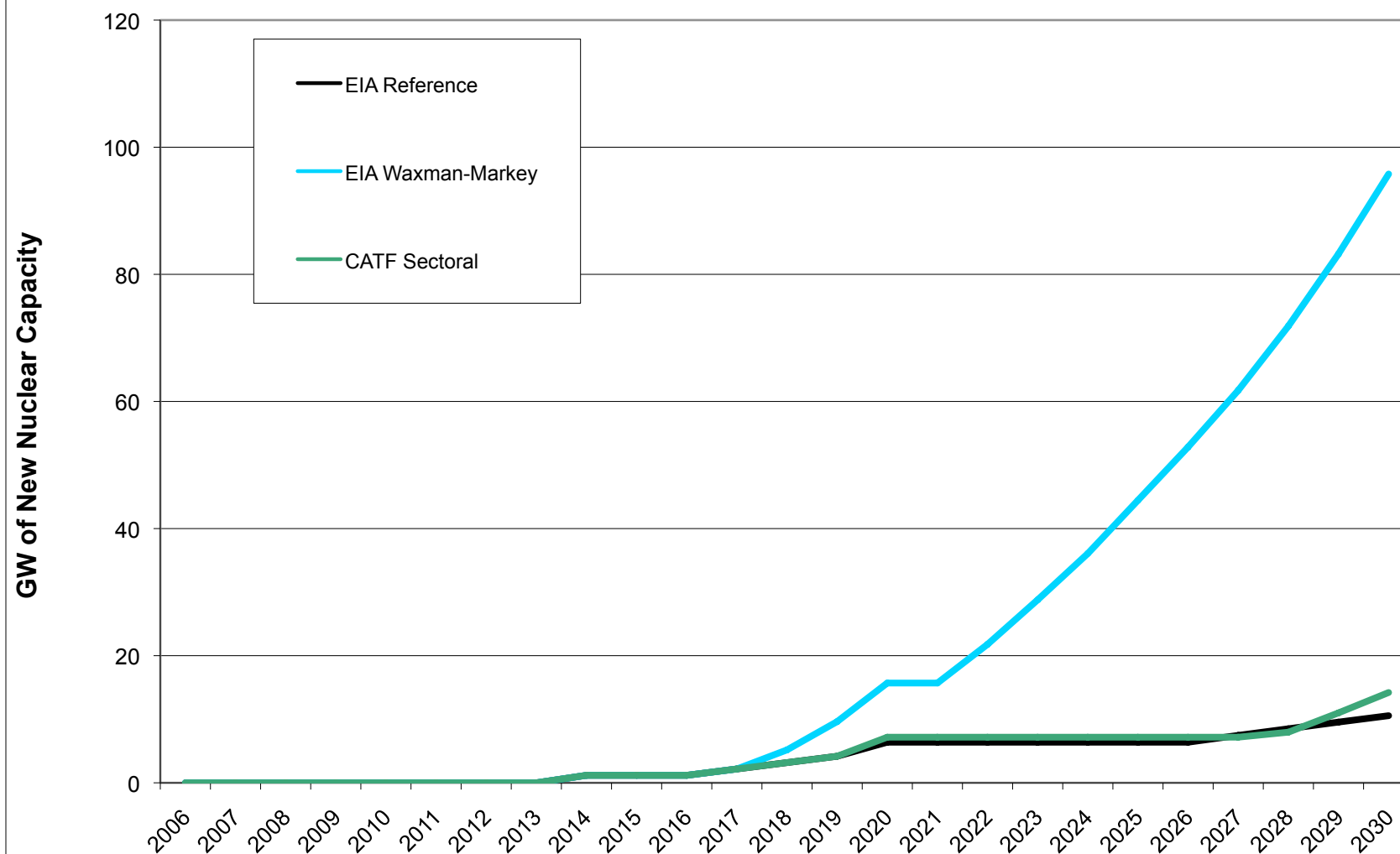
Coal Capacity Additions with Carbon Sequestration



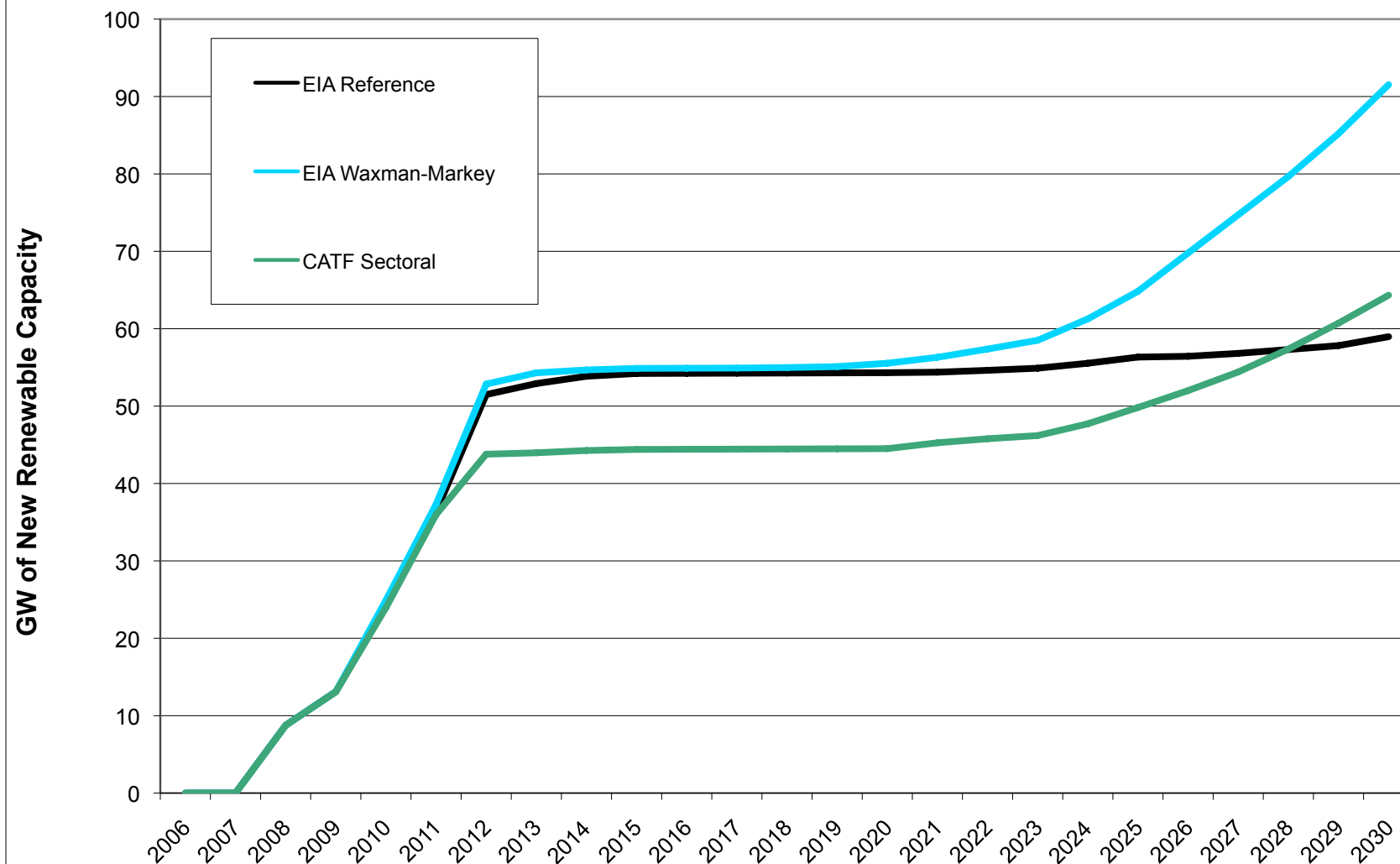
Natural Gas Capacity Additions



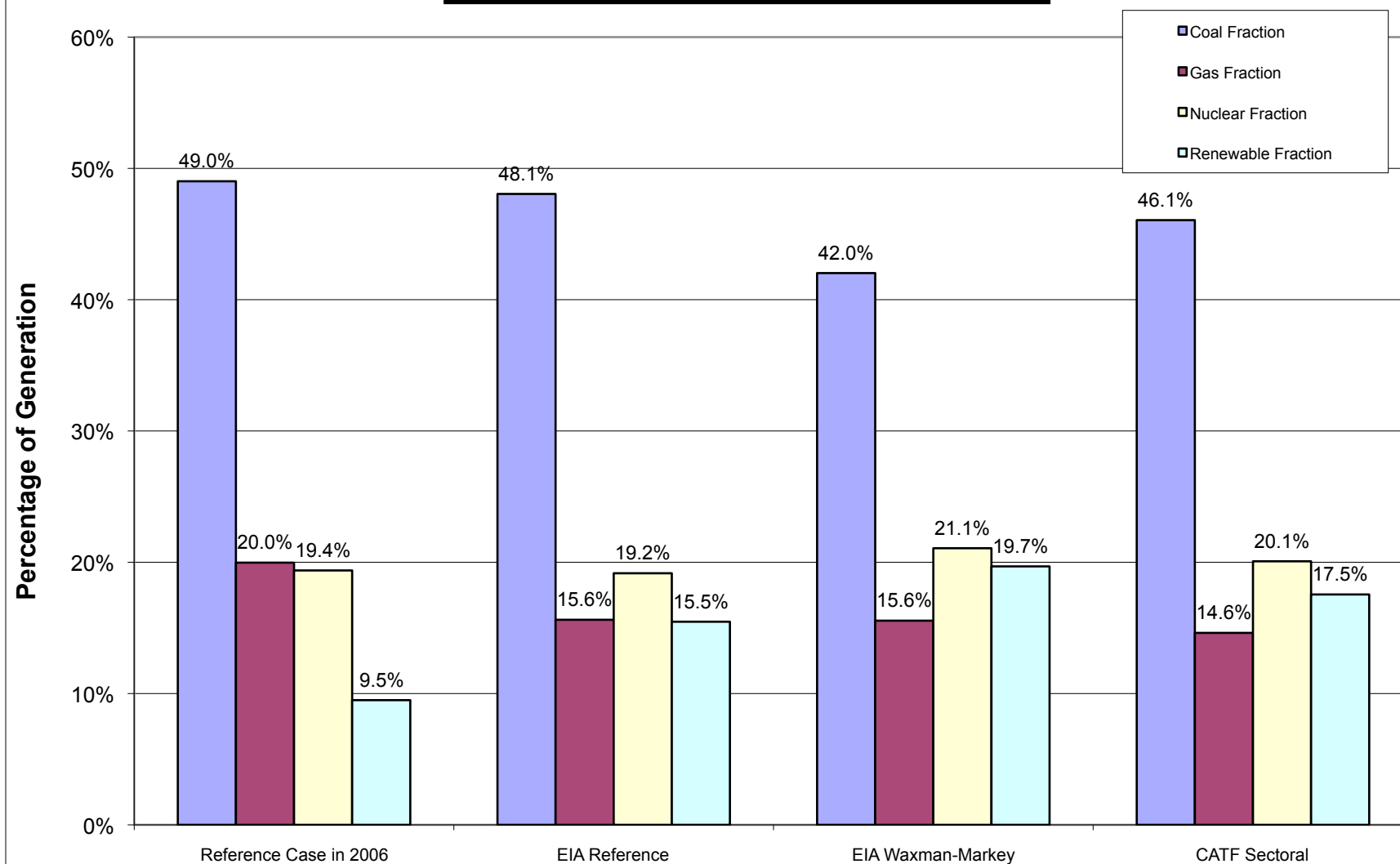
Nuclear Capacity Additions



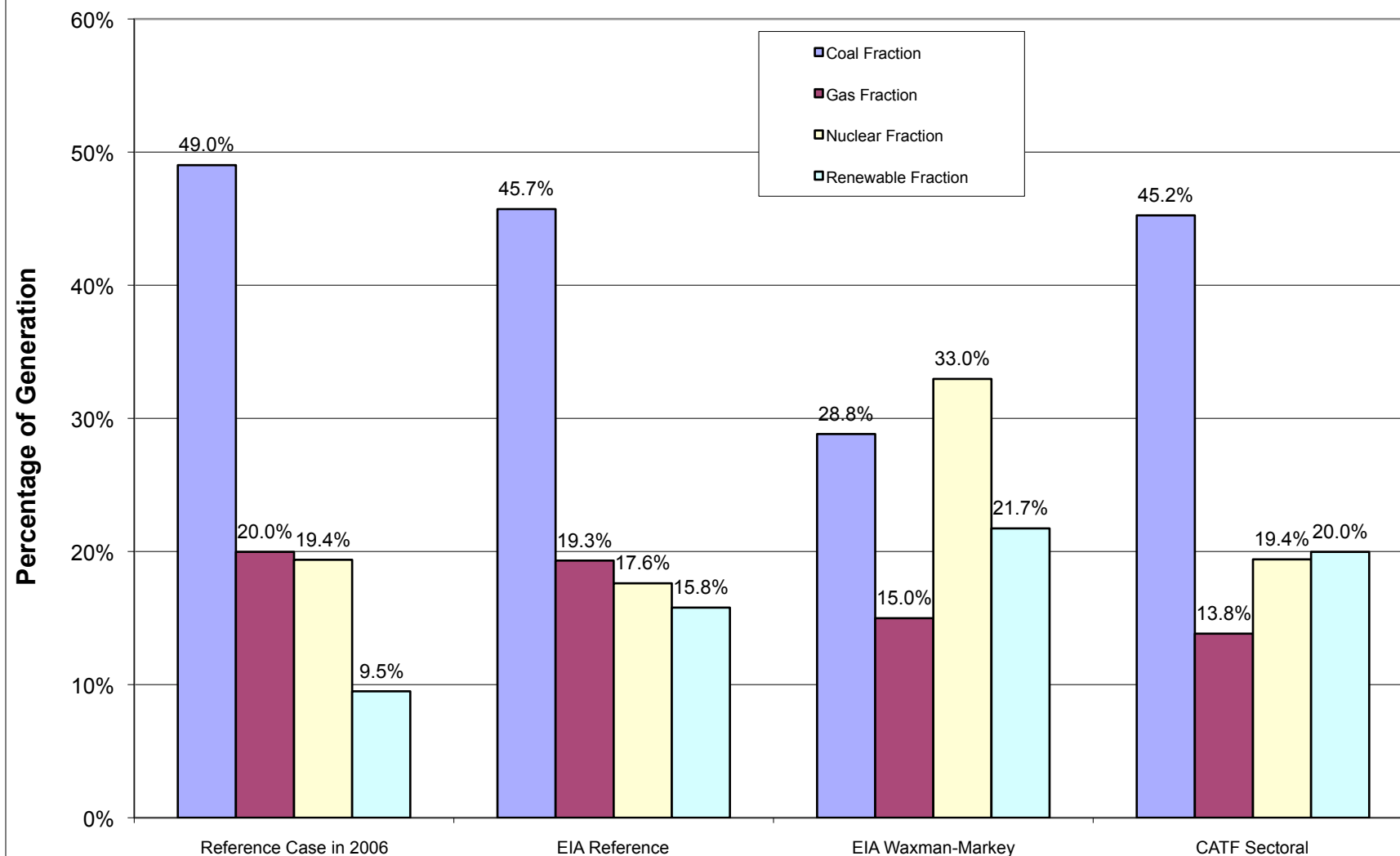
Renewable Capacity Additions



Power Generation Fractions in 2020



Power Generation Fractions in 2030



Caveats on Modeling

- Models are useful tools, but do not reliably predict the future with great accuracy – in part because:
 - They rely on a great many assumptions including long-range fuel price forecasts.
 - Energy technology performance and cost assumptions typically do not range far from current conditions in the model.
 - They necessarily simplify reality – for example, the complex power system consisting of several thousand different generating units is reduced in NEMS to about 200 “model” power plants that attempt to statistically reflect reality.
- Models will not capture the potentially significant psychological changes that might occur with enactment of climate policy – “we are really moving into a carbon constrained world” – that could materially impact investor behavior.
- Models cannot capture political opposition to certain technologies.
- Models are “technology stagnant”. Modeling can only employ technologies that at least exist today and must assume a cost curve and performance curve that may not reflect the real world.
- While models produce “exact” numbers, care should be taken to focus on the trends and the directionality of the model results.
- And finally, models have a hard time keeping up with major economic changes such as the recent global collapse. The current version of NEMS still does not reflect the full impact of this collapse.