

CBO's Assessment of America's Climate Security Act of 2007 (S.2191)

Presentation to EPRI Cost Modeling Workshop

Liaison Capitol Hill

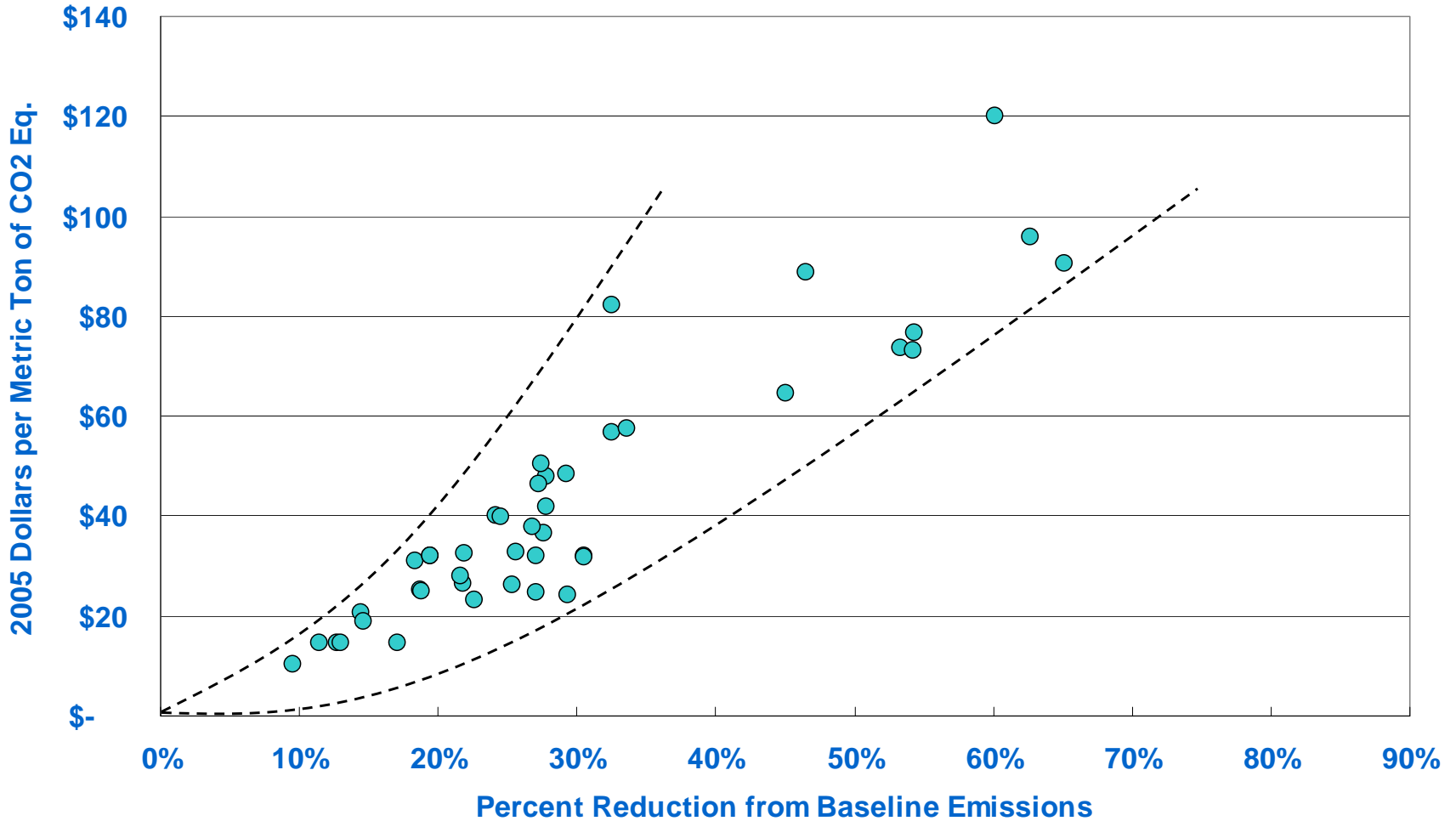
May 7, 2008

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Congressional Budget Office**

Features of S.2191

- **S.2191 would cover about 88% of projected emissions in two caps (one for hydrofluorocarbons); caps would cut covered emissions by about 51% (Note: projected baseline U.S. GHG emissions from 2010 to 2050: about 376 billion MT CO2 equivalent)**
- **Caps start relatively loose and tighten over time**
- **Bill establishes a Carbon Market Efficiency Board that can implement cost-relief measures if necessary but has no explicit provision to limit allowance prices**
- **Limited borrowing and unlimited banking of allowances**
- **Domestic offsets and international offsets are limited to 15 percent each of total allowance submission in any given year**
- **Large but gradually declining share of allowances distributed to regulated or non-regulated entities, with some allowances being allocated as subsidies for promoting activities such as carbon capture and sequestration**
- **Gradually rising shares of allowances are auctioned, with revenues to be allocated to various funds for technology development and deployment as well as various types of adaptation and consumer assistance**

Mitigation Costs for Reducing U.S. Greenhouse Gas Emissions in 2030 (Not Including Offsets)



Determinants of Allowance Prices

Unit of measurement

- \$/Metric Ton of Carbon Equivalent or \$/ Metric Ton of Carbon Dioxide Equivalent
- Adjustment for inflation!

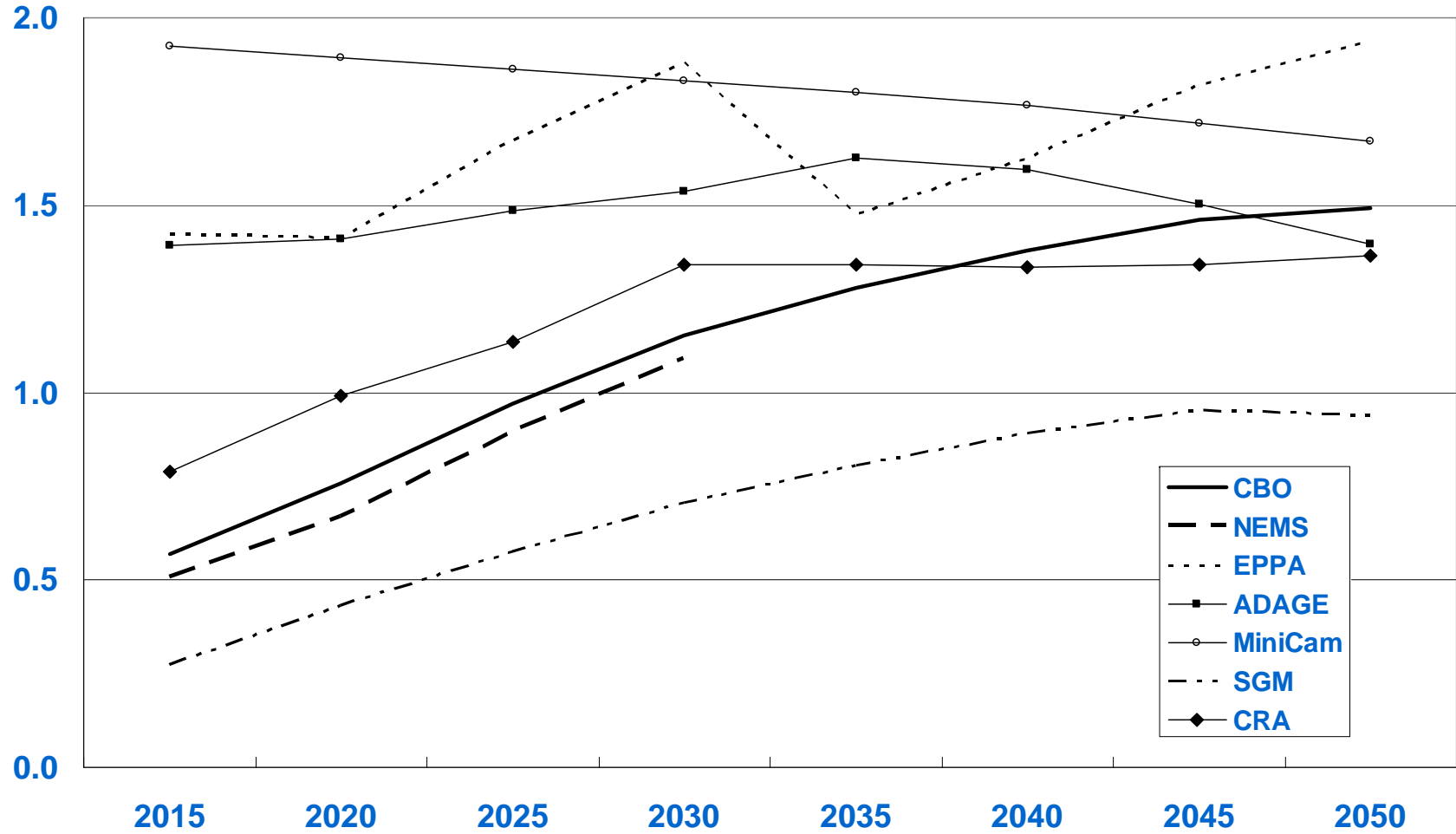
Reference projections for emissions and prices

- Nearly everyone relies on reference (and sometimes high-technology) baselines from EIA (reference energy-related CO₂ emissions in 2030 have fallen ~13% in one year and ~21% in three years)

Assumed responsiveness of households and firms to changes in prices of goods and services associated with emissions

- Can vary considerably by scenario for any given model
- Tends to be dominated by fuel switching and technology shifts in electricity generation
- For non- CO₂ emissions and for biological sequestration, essentially all analyses draw on two EPA studies that mainly quantify engineering costs

"Typical" Aggregate Responsiveness of CO2 Emissions to Allowance Prices



Determinants of Allowance Prices

Discount rate that allowance holders are assumed to apply to decisions about banking allowances

- A lower discount tends to raise the estimated allowance price in early years but lower it in later years (inflection point is an artifact function of period of analysis)
- Assumptions range from 4 percent (low-risk rate) to 8 percent (return to corporate equity)
- CBO uses expected long-run non-financial rate of return to corporate debt plus equity—a reasonable measure of risk-adjusted opportunity cost

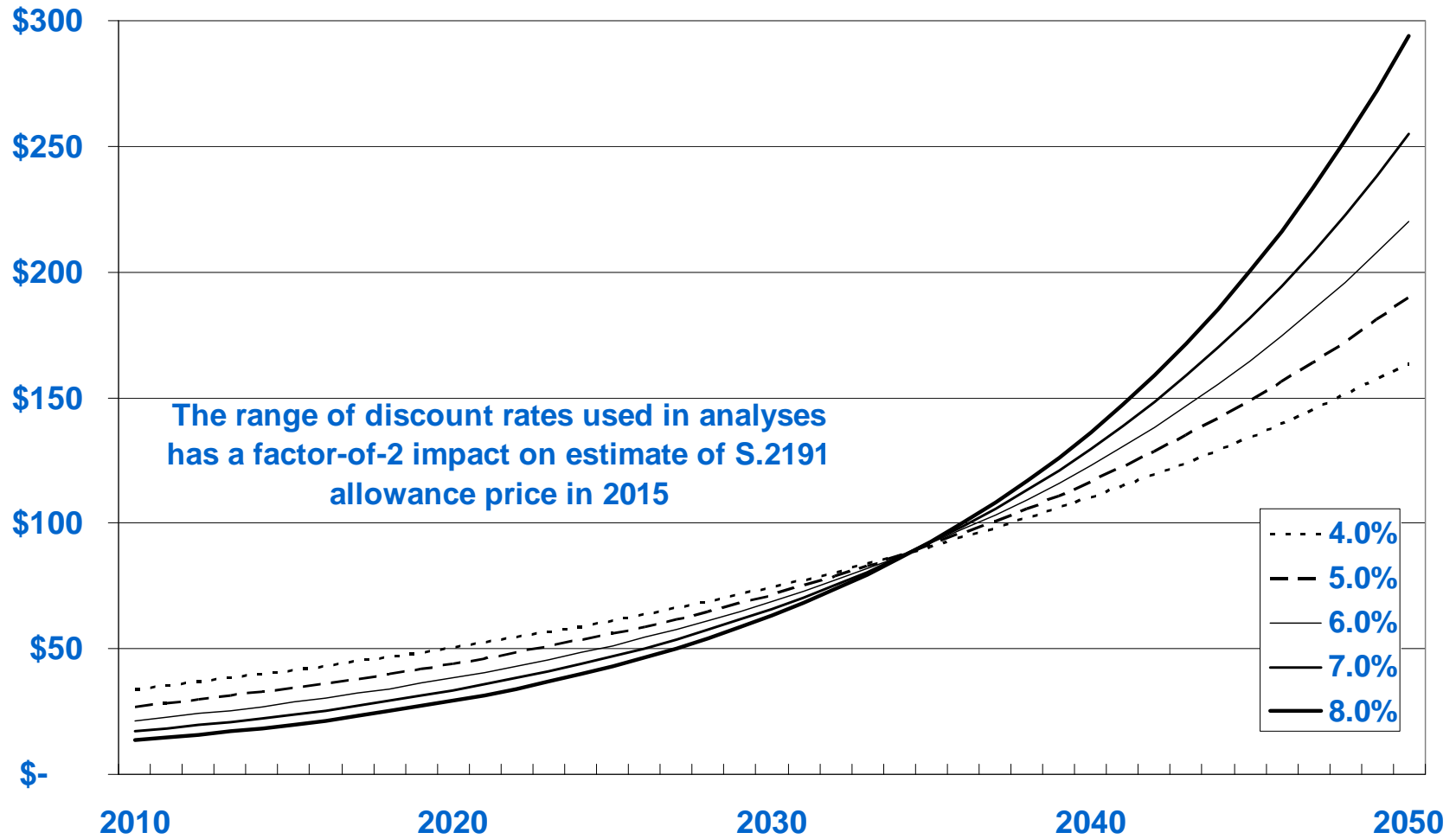
Availability of offsets

- Criteria for coordination with other countries' programs (“comparable stringency”) rather vague
- In CBO's analysis of S.2191, moving from no offsets to full domestic and international offsets reduces allowance price in 2015 by roughly 44 percent

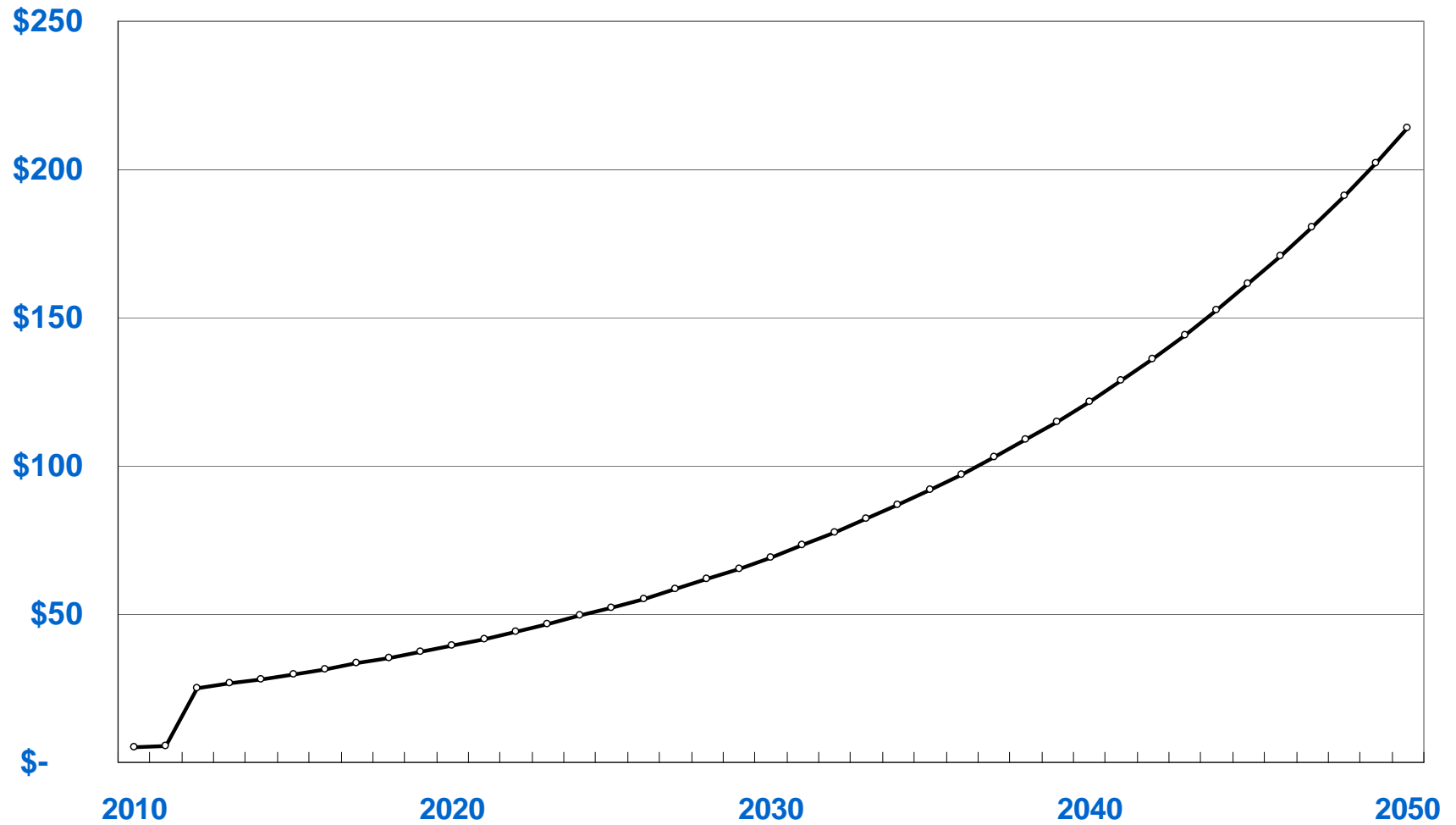
Availability of technologies

- Assumed rapid development/deployment of alternative technologies tends to lower the price; most modelers find modest response of allowance prices to technology subsidies

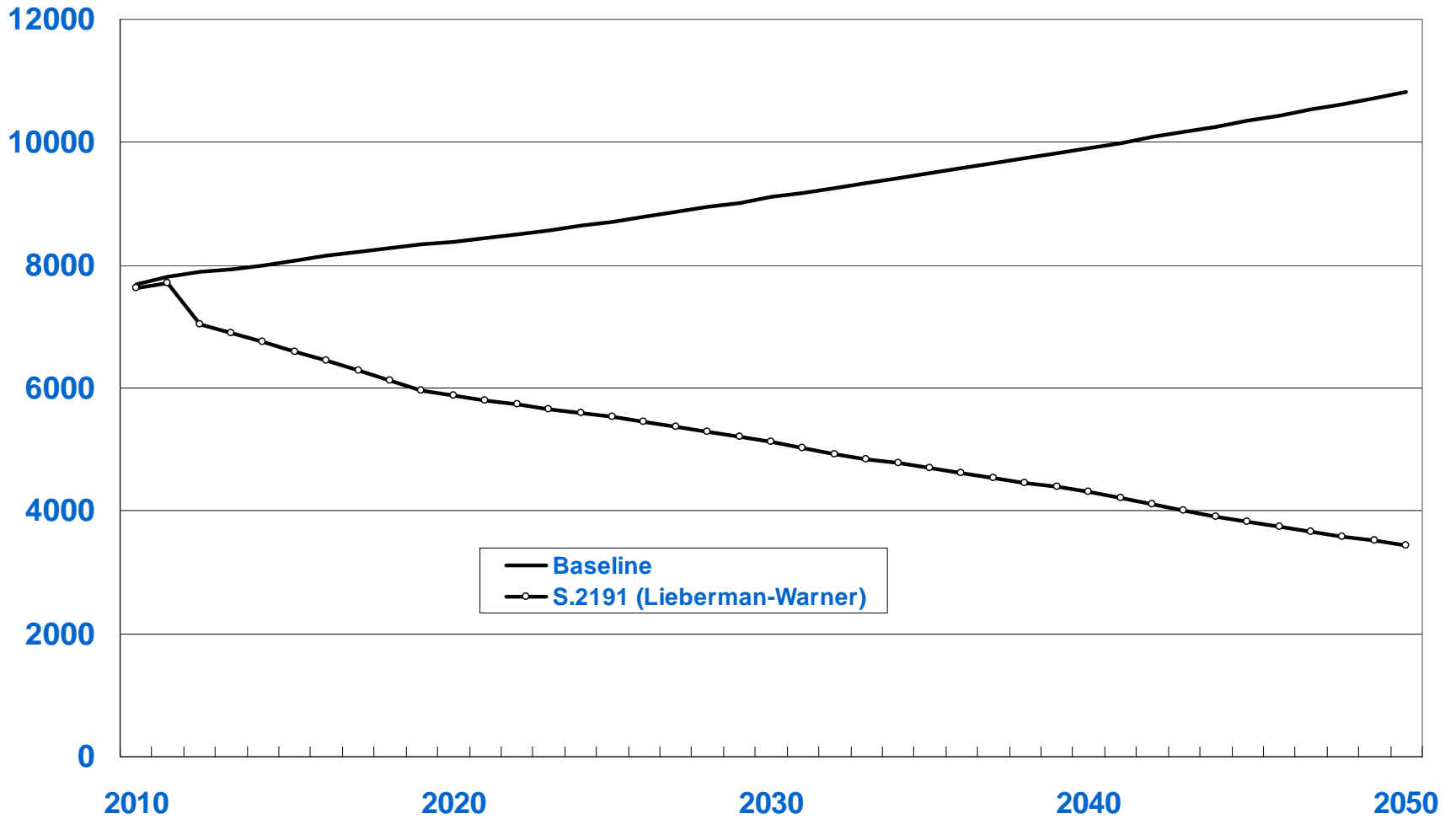
Effect of Discount Rate Assumption on Allowance Price Estimate (\$2006 Per Metric Ton of Carbon Dioxide Equivalent)



S.2191 Emission Allowance Price (Group I Gases) (\$2006 Per Metric Ton of Carbon Dioxide Equivalent)



Total Greenhouse Gas Emissions (Millions of Metric Tons of Carbon Dioxide Equivalent)



Comparison of Estimates

MIT's recent estimate of allowance price in 2015 is about 65% higher than CBO's

- EPPA model's has greater price responsiveness but:
- Higher baseline emissions
- Much lower discount rate
- Fewer offsets

CRA's MRN-NEEM model yields an estimate about 70% higher than CBO's for 2015

- Mainly due to a much lower discount rate

EPA's analysis using IGEM and ADAGE yields estimates ranging from 38% to 266% of CBO's for 2015

- Depends on model, baseline, technologies, and offsets
- One model is more responsive than CBO's analysis; the other less so

CATF's estimate for 2015 using NEMS model is 56% of CBO's

- Much higher discount rate
- International offsets