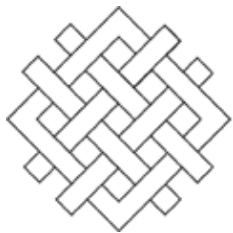


Wisconsin Global Warming Task Force

Insight from analyses of cap and trade proposals



**WORLD
RESOURCES
INSTITUTE**

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Topics to cover

- Factors underlying cap and trade analyses
- Examples from analyses of federal proposals
- Examples of other proposals
- Conclude

Limitations of modeling

- Assume only today's technologies are available (with some exceptions)
- Assume only today's laws are in effect
- Models differ in how they plan for the future
- Models differ in how the economy reacts to GHG constraints
- Models present the economically optimal outcome assuming completely rational decision making

Critical assumptions underlying modeling of GHG reduction policies

- GDP projections
- Population projections
- Fuel prices (and differential across fuels)
- Cost, availability and performance of technology

Policy design decisions that influence cap and trade modeling results

- Scope and coverage (sectors, gases)
- Cap stringency
- Abatement/compliance options
 - Offsets
 - Safety valve
 - Geographic scope
 - Banking
 - Leakage
- Allowance distribution

On modeling cap and trade

“Long-term cost projections are at best speculative, and should be viewed with attentive skepticism.”

– Larry Parker and Brent Yacobucci –
Congressional Research Service, May 2008

The Acid Rain Program: an example of modeled and actual costs

Table 3. Representative Sample of 1990 Estimates of Annual Compliance Cost for SO₂ Cap-and-Trade Program
(billions, 2005 dollars)

| | 2000 | 2010 |
|--|--------------------------------|--------------|
| EPA-ICF | \$2.7-\$3.6 | \$3.4-\$8.0 |
| NCAC-Pechan | \$4.4-\$4.6 (for 2000-2009) | no estimate |
| EEI-TBS ^a | \$7.1-\$8.7 | \$7.9-\$11.2 |
| Estimated Actual Costs 2000-2007: Ellerman, et al. 2010: EPA | \$1.9 (for 2000-2007) | \$2.2 |

*Source: Congressional Research Service, 2008.
Report RL34489*

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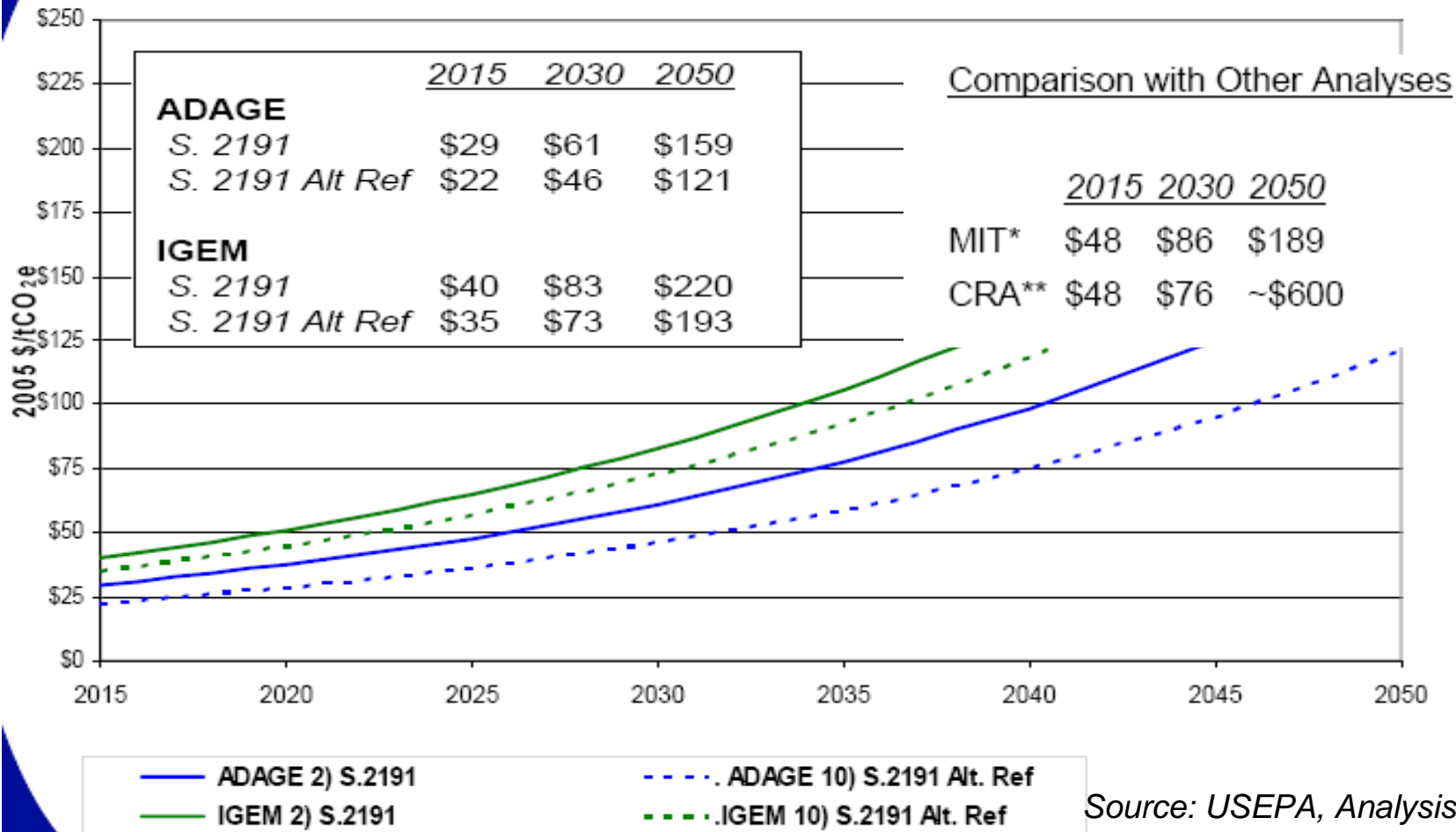
Lieberman Warner

What's covered: 86 percent of U.S. GHG emissions

- Targets:
 - 15 percent below 2005 by 2020
 - 70 percent below 2005 by 2050
- National coverage
- 30 percent limit on offsets
- Unlimited banking, borrowing with interest
- Hybrid free/auction allowance distribution with some revenue going to energy efficiency and technology deployment

Allowances price rise as the cap gets tighter.

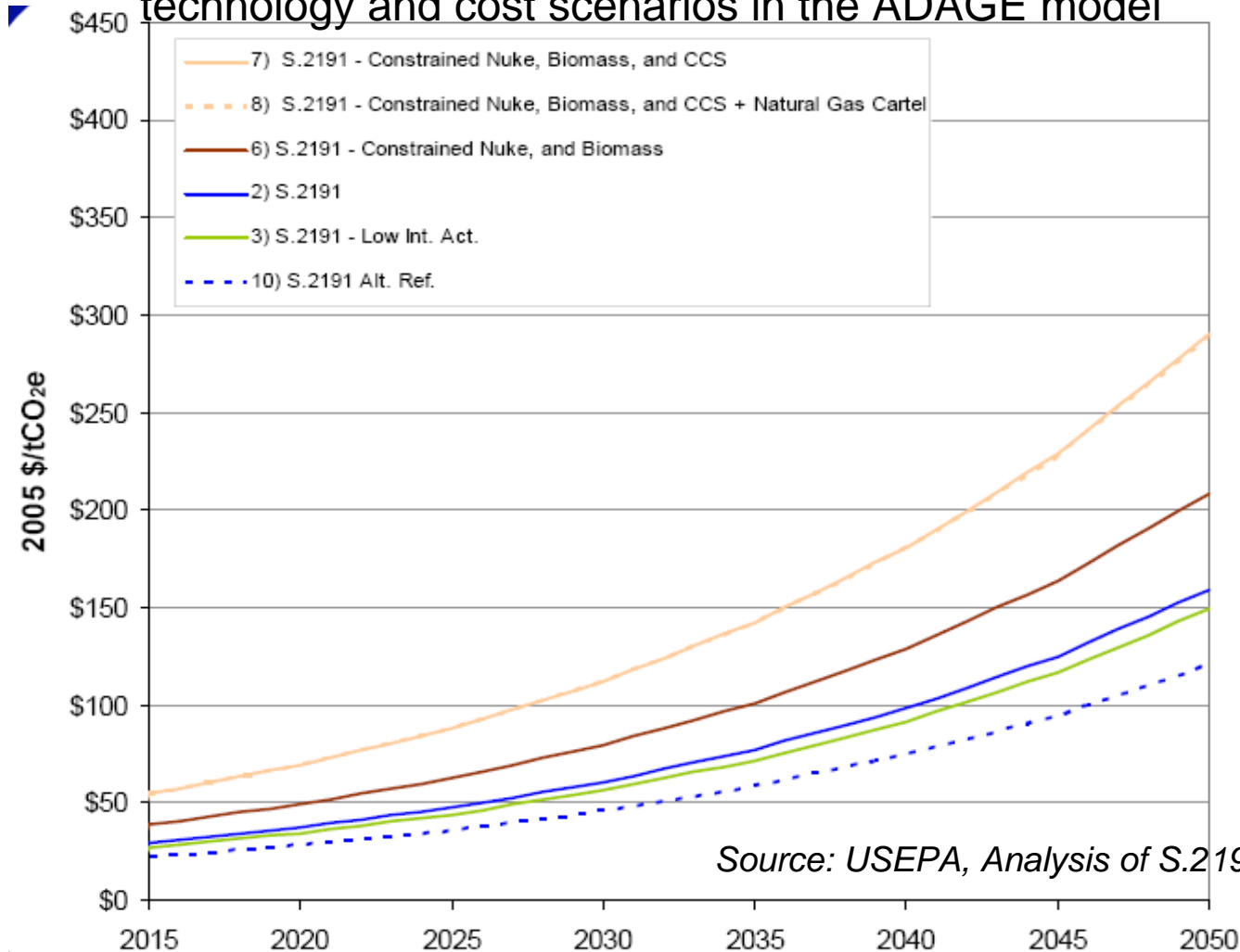
Projected allowance prices under S.2191 from various models



Source: USEPA, Analysis of S.2191

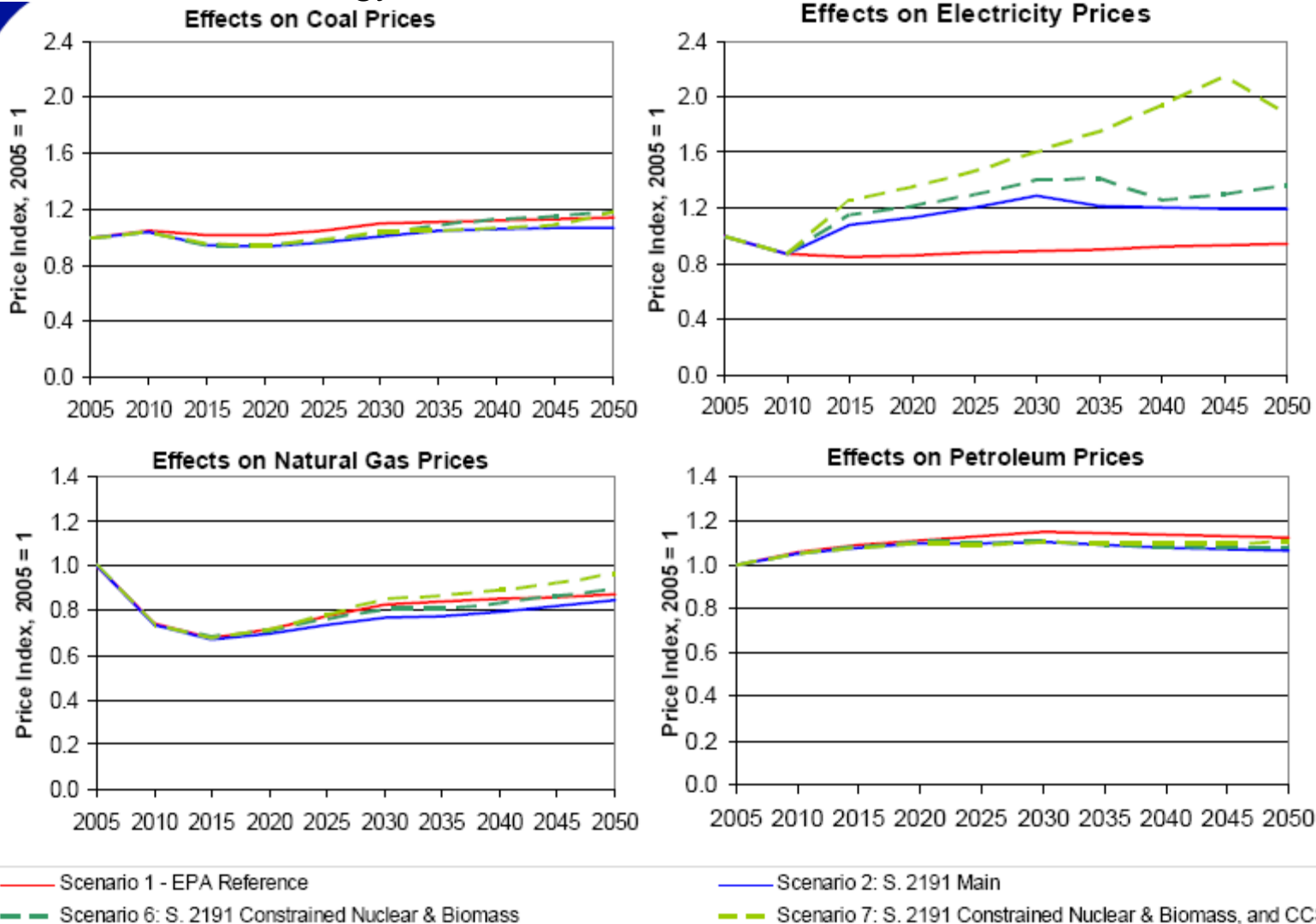
Allowance prices change based on technology and fuel costs

Projected allowance prices due to S.2191 under different technology and cost scenarios in the ADAGE model



Similar assumptions affect fuel prices...

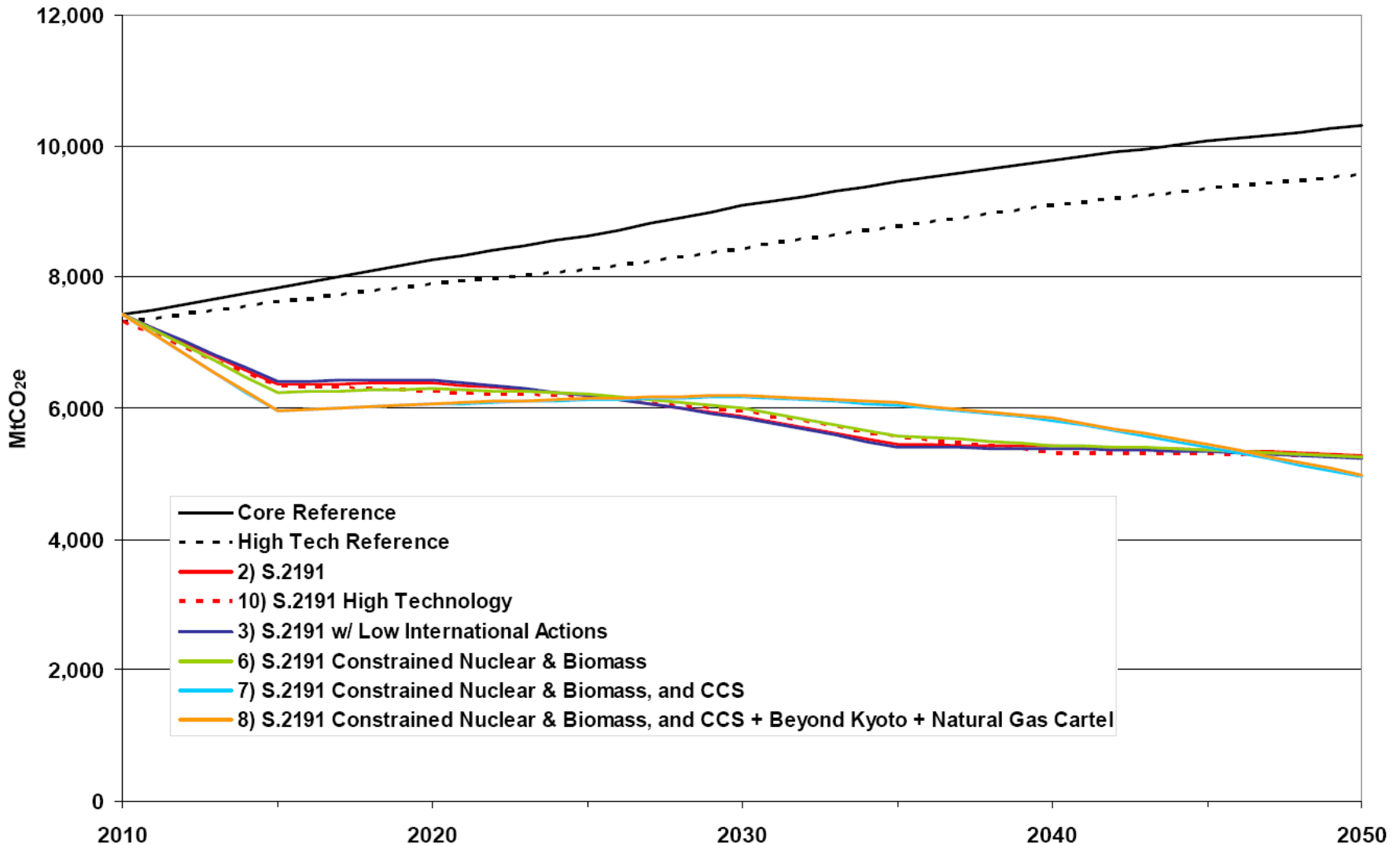
Projected producer fuel prices due to S.2191 under different technology and cost scenarios in the ADAGE model



Source: USEPA, Analysis of S.2191

...and emissions

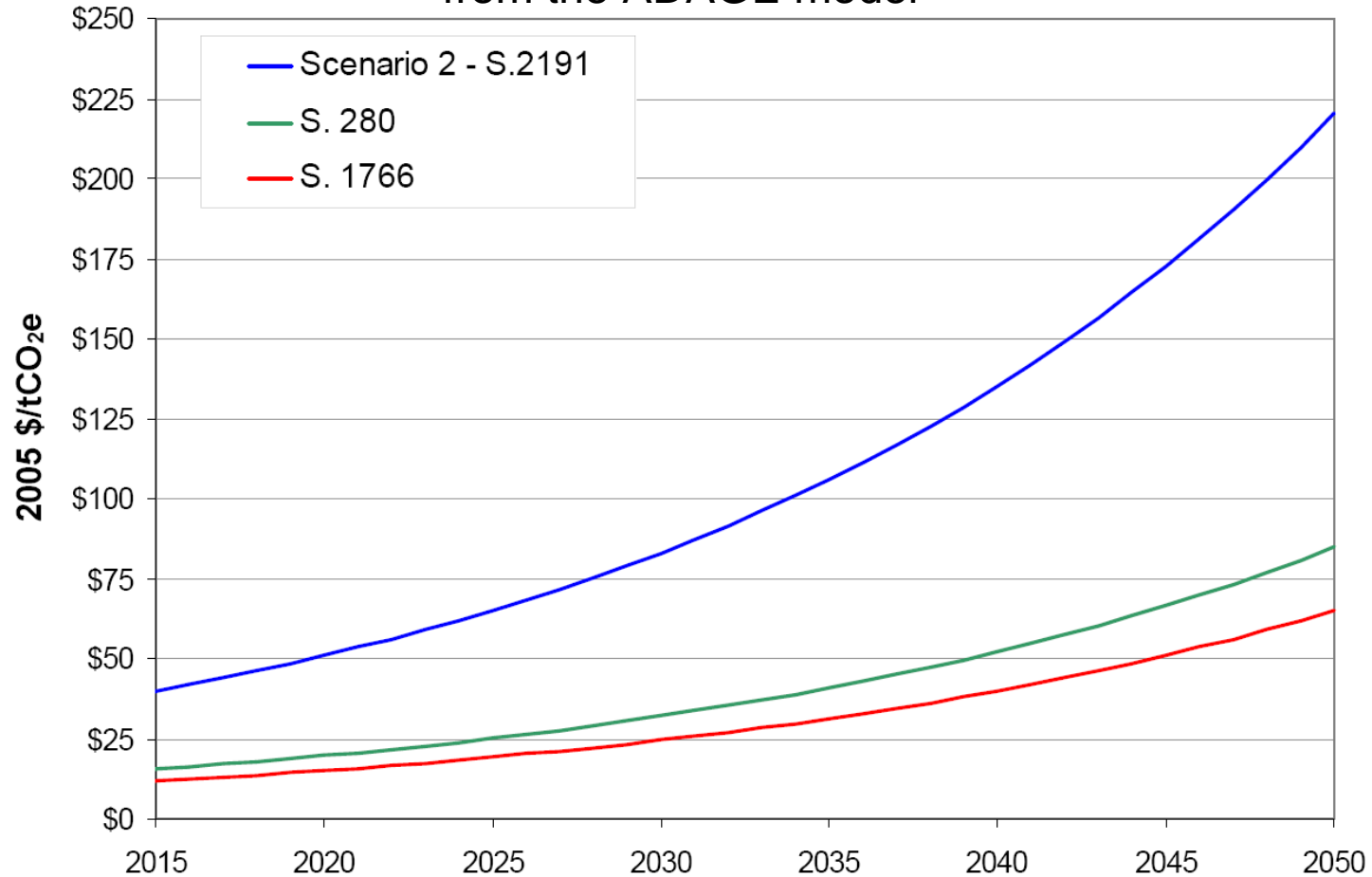
Projected total U.S. emissions due to S.2191 under different scenarios



Source: USEPA, Analysis of S.2191

Stringency also affects allowances prices

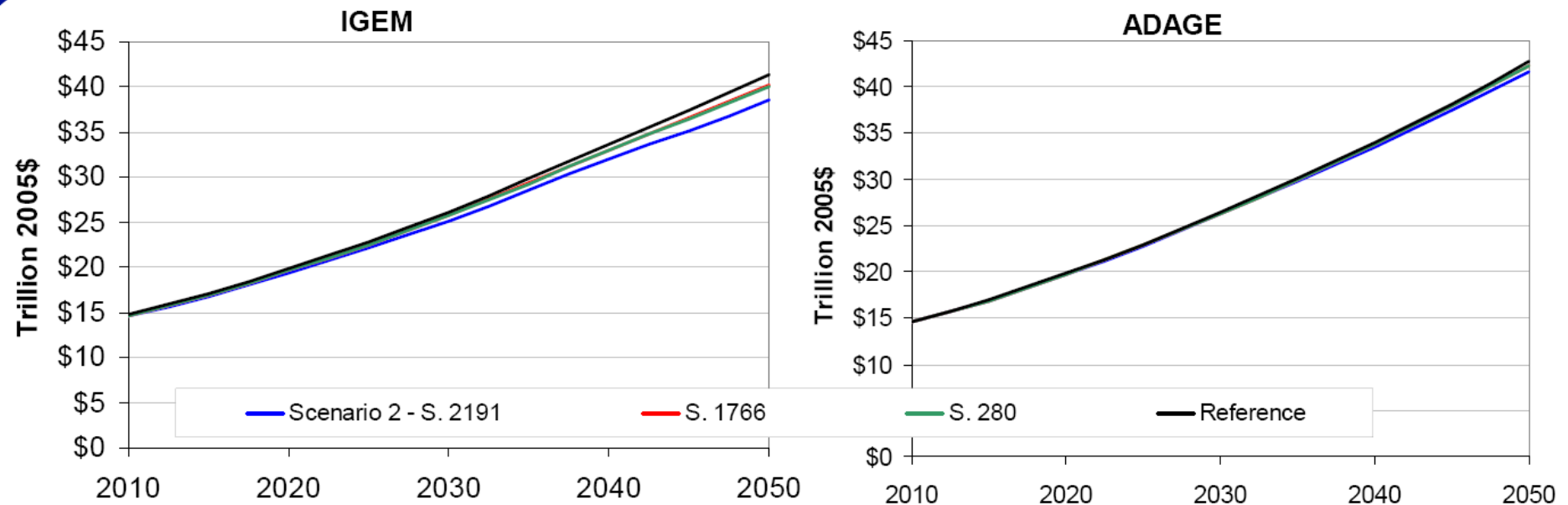
Projected allowance prices under different legislative proposals from the ADAGE model



Source: USEPA, Analysis of S.2191

Change in economic output can also vary depending on model and proposal

Projections of economic growth due to various legislative proposals in the IGEM and ADAGE models



Source: USEPA, Analysis of S.2191

Topics to cover

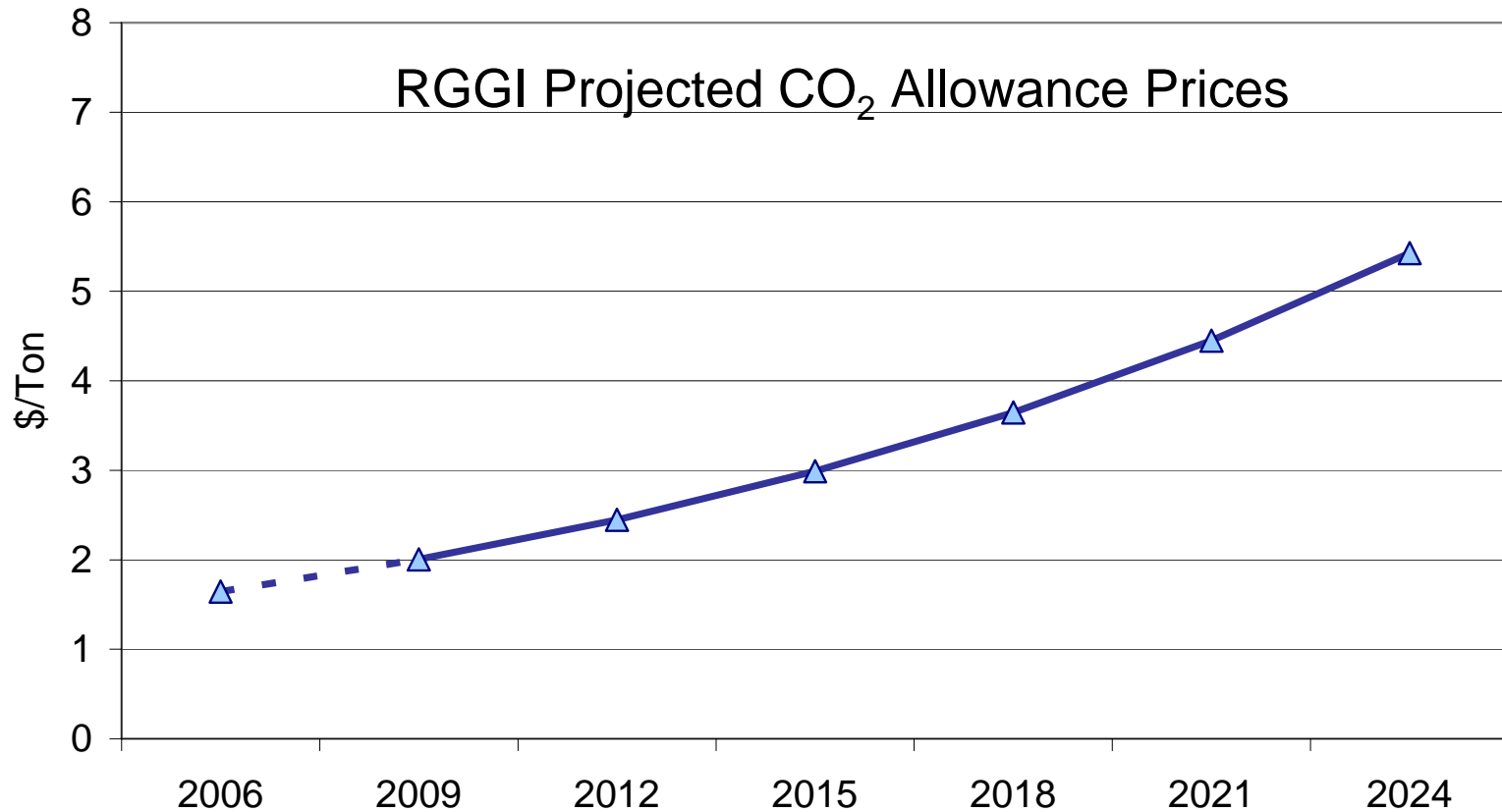
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The Regional Greenhouse Gas Initiative (RGGI)

- **Scope:** to fossil fuel-fired electric generators 25 megawatts (MW) and larger in 10 states
- **Emissions Coverage:** ~22% of regional emissions
- **Targets and timetables:** 10% below current levels by 2019
- **Unlimited banking, 3 year compliance period**
- **Primarily 100% auction**



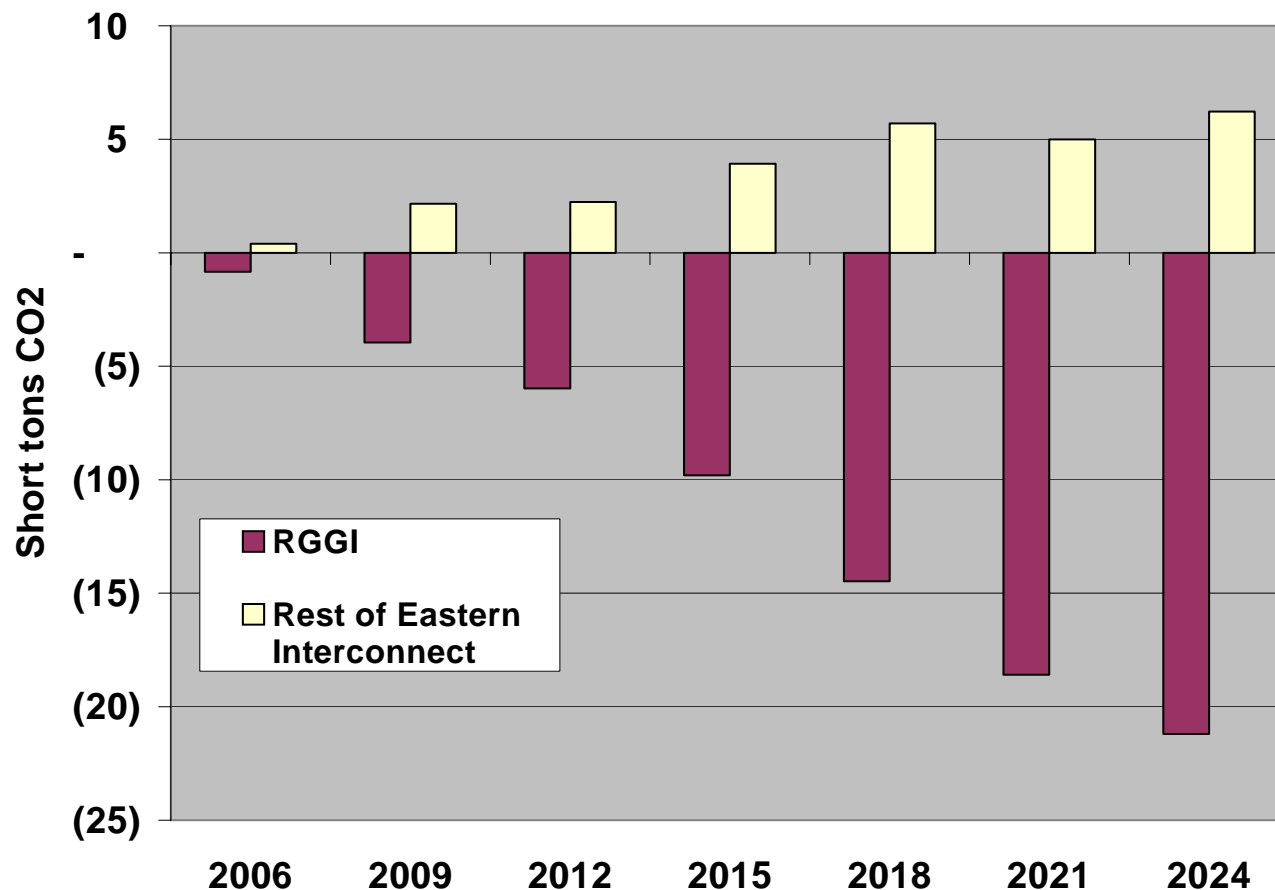
Example of stringency and scope: RGGI



Source: ICF consulting

Lower allowance prices in RGGI partially due to expected leakage

Change in CO2 emissions from reference case under RGGI policy inside and outside program region, 2006-2024



Source: IPM Model Outputs, ICF Analysis of RGGI Final Policy Package, 2006

Economic impacts of RGGI largely positive

RGGI – Region Macro Impacts (%) *rel. Std REF*¹

| Impacts on 9-State Region | | 2009 | 2015 | 2021 |
|---------------------------|--------------------------------|--------|-------|-------|
| Package | Total GRP (Bil Fixed 96\$) | 0.01% | 0.01% | 0.01% |
| | Real Pers Inc (Bil Fixed 96\$) | 0.00% | 0.01% | 0.02% |
| | Private Sector Jobs | 0.01% | 0.02% | 0.02% |
| | | | | |
| Package w/ 2 x Efficiency | Total GRP (Bil Fixed 96\$) | 0.04% | 0.05% | 0.06% |
| | Real Pers Inc (Bil Fixed 96\$) | 0.01% | 0.05% | 0.09% |
| | Private Sector Jobs | 0.05% | 0.06% | 0.08% |
| | | | | |
| Package + CN-FED Policies | Total GRP (Bil Fixed 96\$) | -0.04% | 0.07% | 0.08% |
| | Real Pers Inc (Bil Fixed 96\$) | -0.07% | 0.12% | 0.13% |
| | Private Sector Jobs | -0.04% | 0.10% | 0.09% |

Economic impacts of RGGI policies are small & generally positive – roughly one-hundredth to one-tenth of 1 percent.

The reported impact is the *change* in the growth that would have otherwise occurred in the “do nothing” forecast. *Source: REMI*



Comments & Questions