Economic-Energy Policy Tools and Behavior

Alan Krupnick
Resources for the Future

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An economist's perspective

- There's a lot of purported energy models that leave out prices or are strictly engineering models, i.e., leave out behavior! And policy!
- Energy-economic models: top-down vs. bottom up
- Too much focus on energy quantities, GDP and jobs rather than welfare costs

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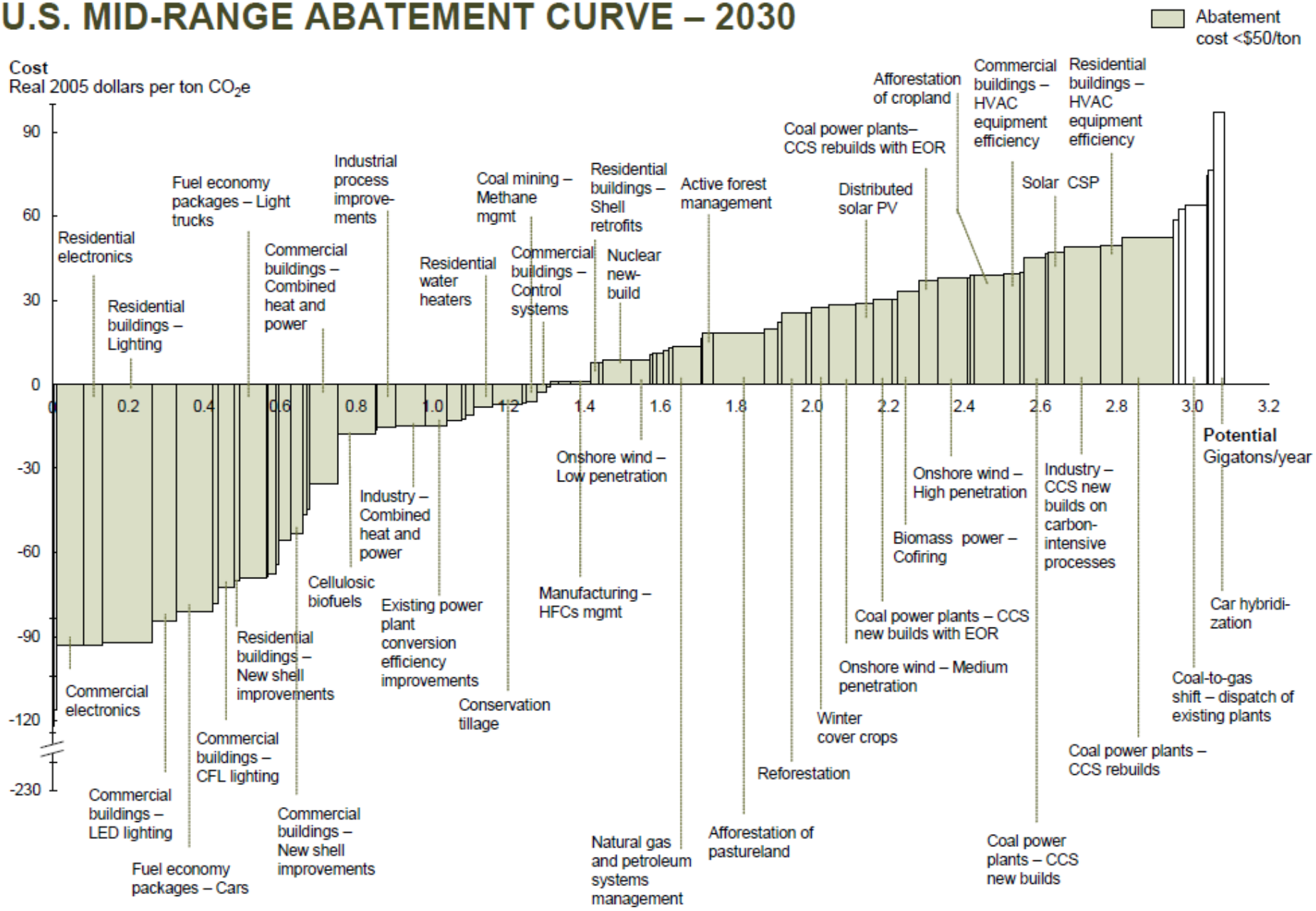
Exhibit 11

U.S. MID-RANGE ABATEMENT CURVE – 2030



Source: McKinsey analysis

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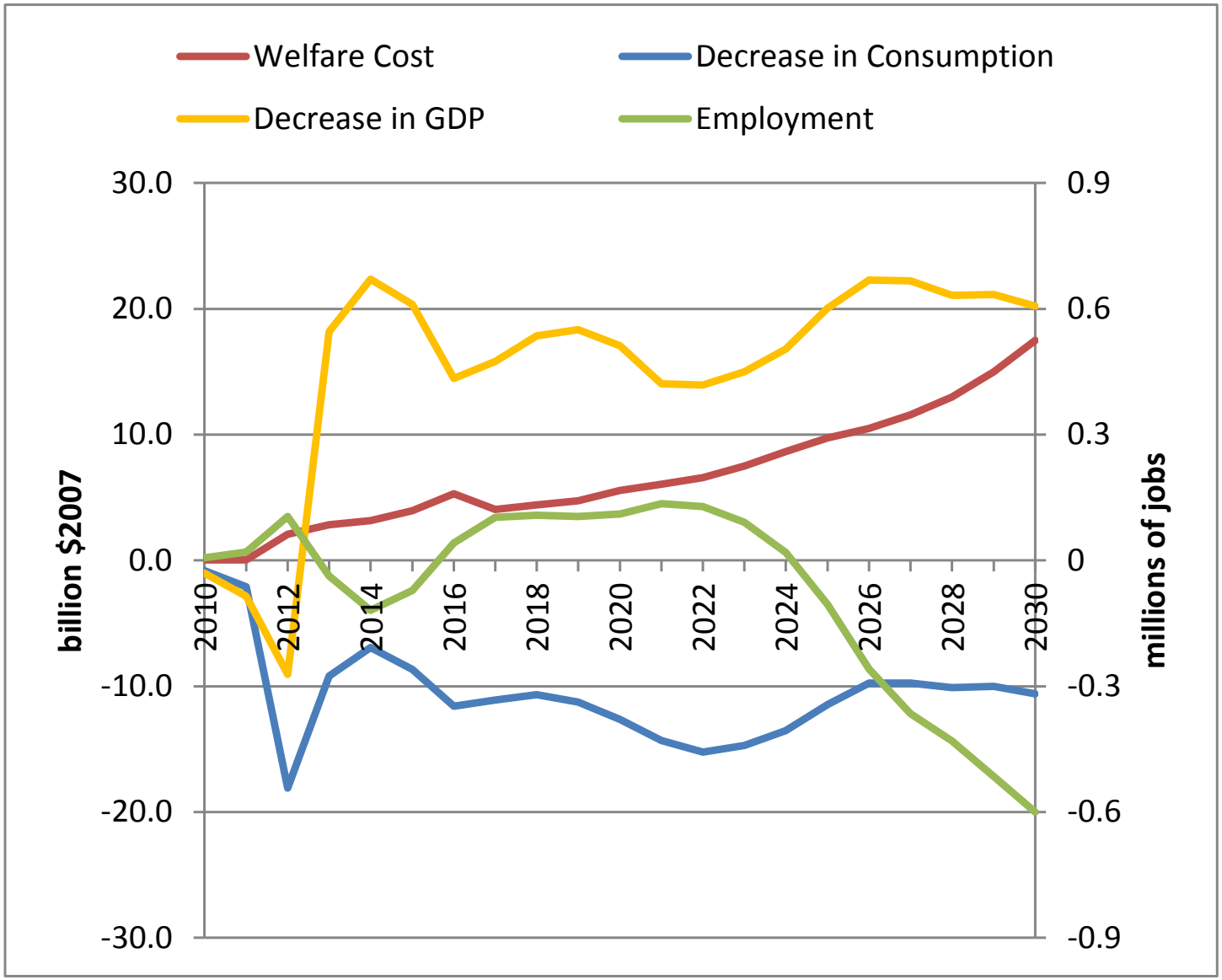

Figure 5.1 Central C&T Macroeconomic Time Profile relative to Reference Case

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Inclusion of Behavior

- At best, models limited by what's in the literature
  - Poor data (fracking, natural gas vehicles)
  - Complex problems: capital decisions, innovation
  - "Normal" academic disputes: gasoline demand elasticities (Spiller: -0.3 to -0.62)

Big Modeling Issues

- Improving top-down and bottom-up models
  - Simplicity vs. complexity
  - Aggregation vs. disaggregation
  - More detail for top-down; better calibration with data for bottom-up
- Modeling policies - usually assume perfect compliance/enforcement
- Models may not be adapted to lessons of behavioral economics: e.g., policy as information provision: peer information can raise energy efficient investments and conservation.
- Energy efficiency paradox

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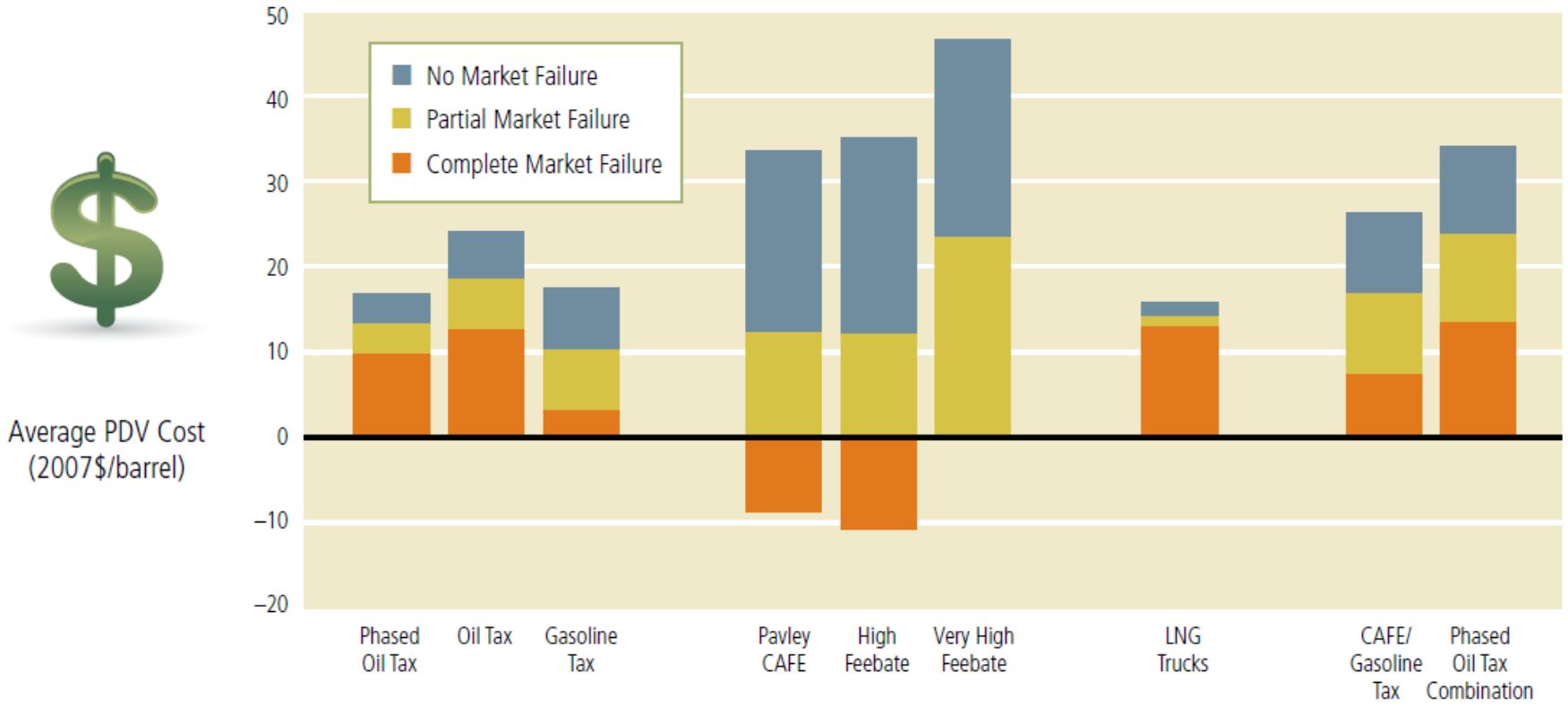
Figure 5.11(a): Cost-Effectiveness: Cost per Barrel for Reducing Oil Use, 2010–2030



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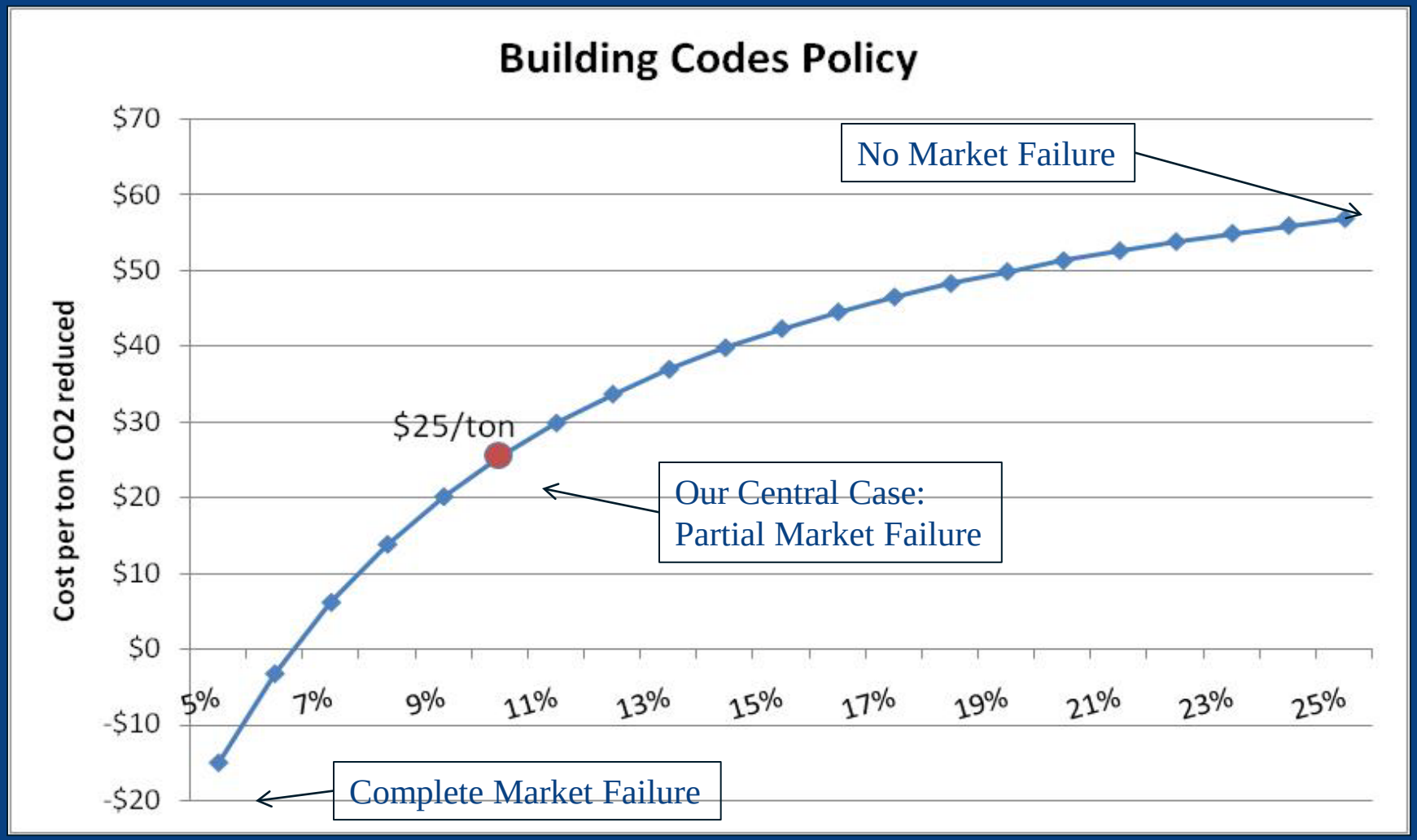
Importance of the Discount Rate



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Other thoughts

- Perhaps there's too much reliance on detailed models
  - False precision
  - Conceptual models clear away the clutter to focus on fundamentals → pricing!
- Easy for models to get out of date. Tough to get paid for model development!
- How models are used and results interpreted can be improved: apples to apples comparisons

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CES Generation Mix in 2035 (TWh)

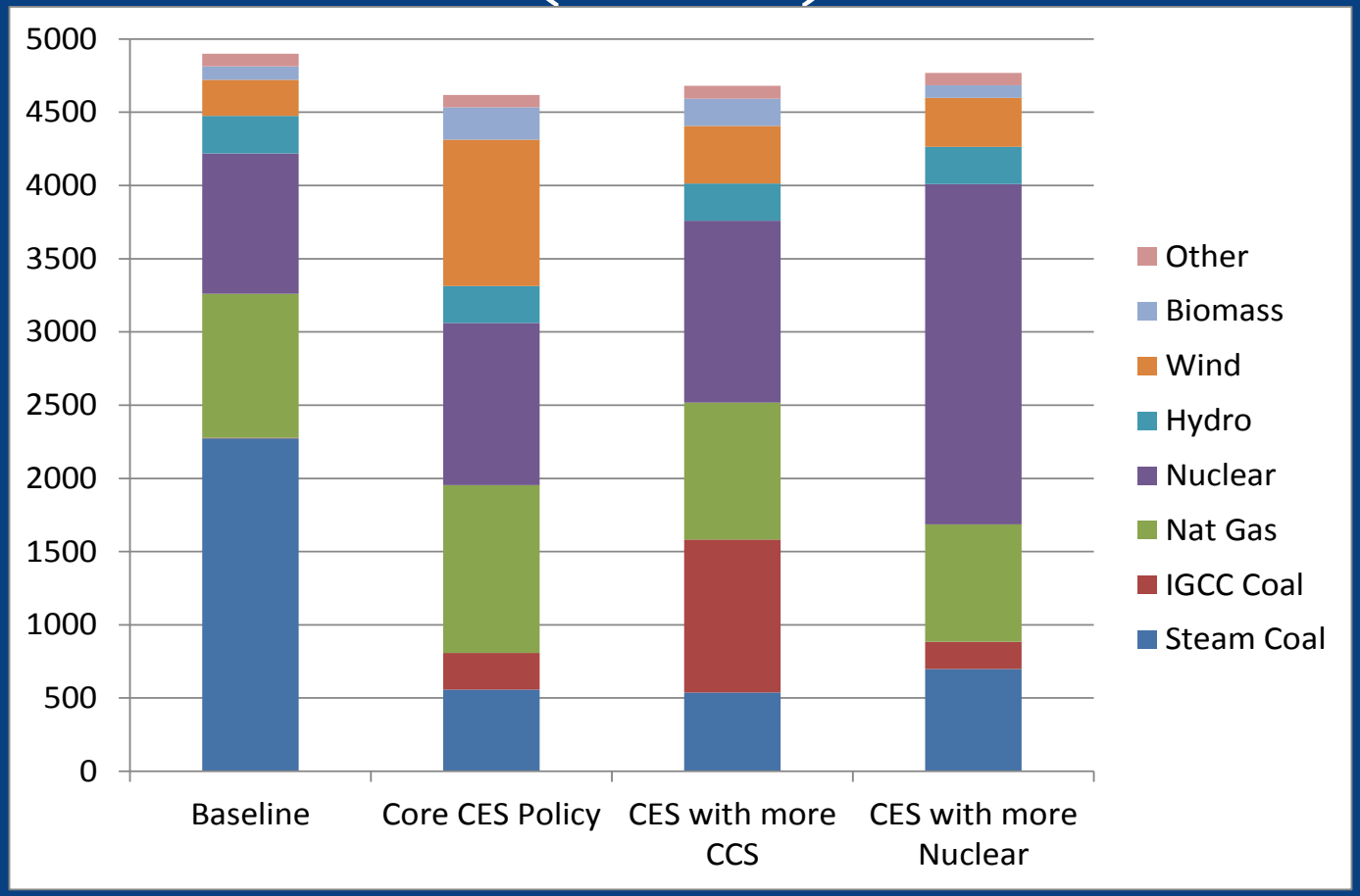

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Figure 10.2: Effectiveness and Cost-Effectiveness in Reducing CO_2 Emissions, 2010–2030

This figure combines effectiveness and cost-effectiveness of each policy. Bar height indicates effectiveness in reducing CO_2 emissions; bar color indicates the cost/ton reduced. Cost-effectiveness is calculated at the Partial Market Failure rate.

CO_2 Reductions (mmtons)