

Energy Efficiency and 111(d)

2015 NASEO Energy Policy Outlook Conference

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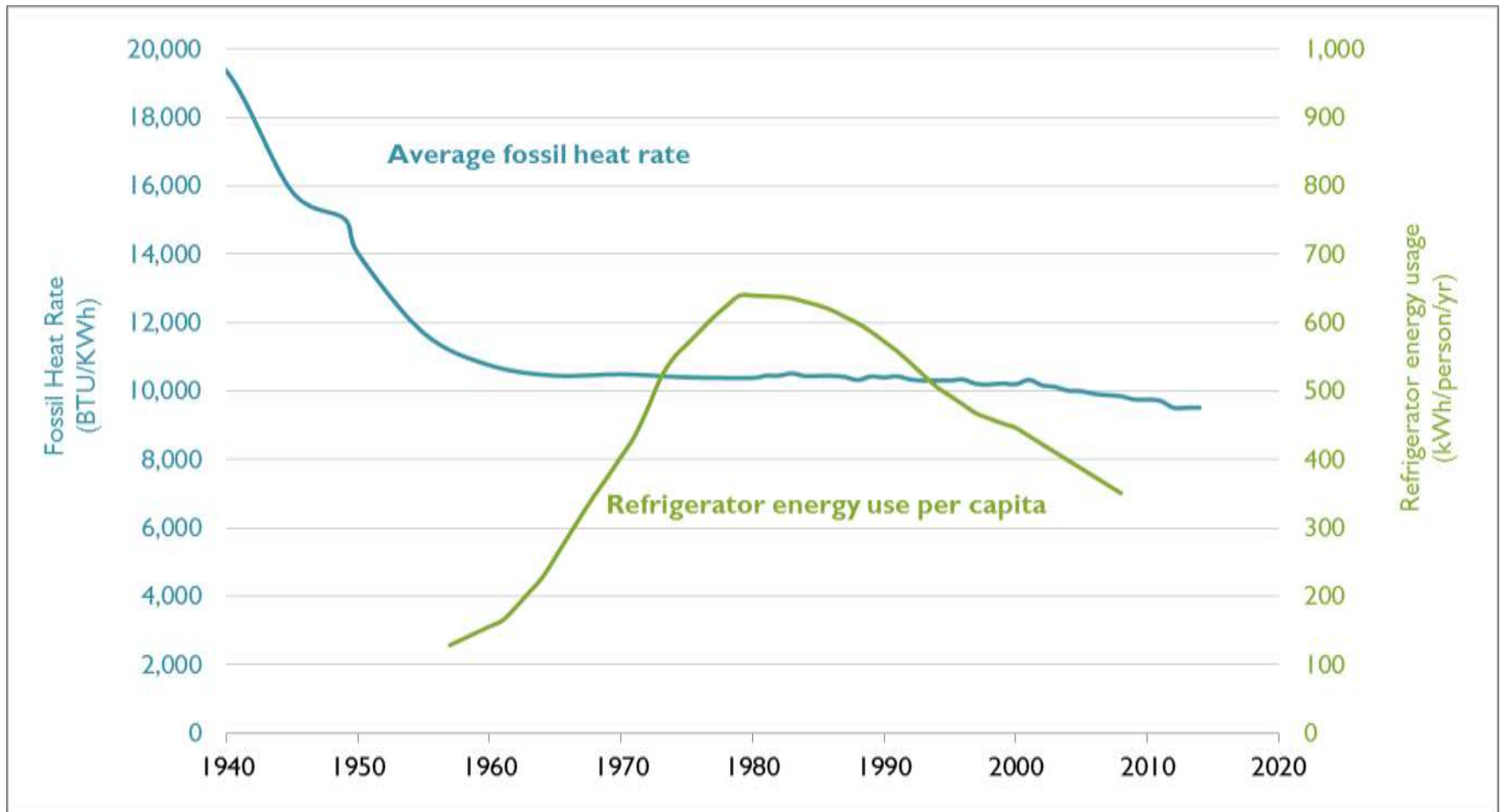
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Synapse Energy Economics

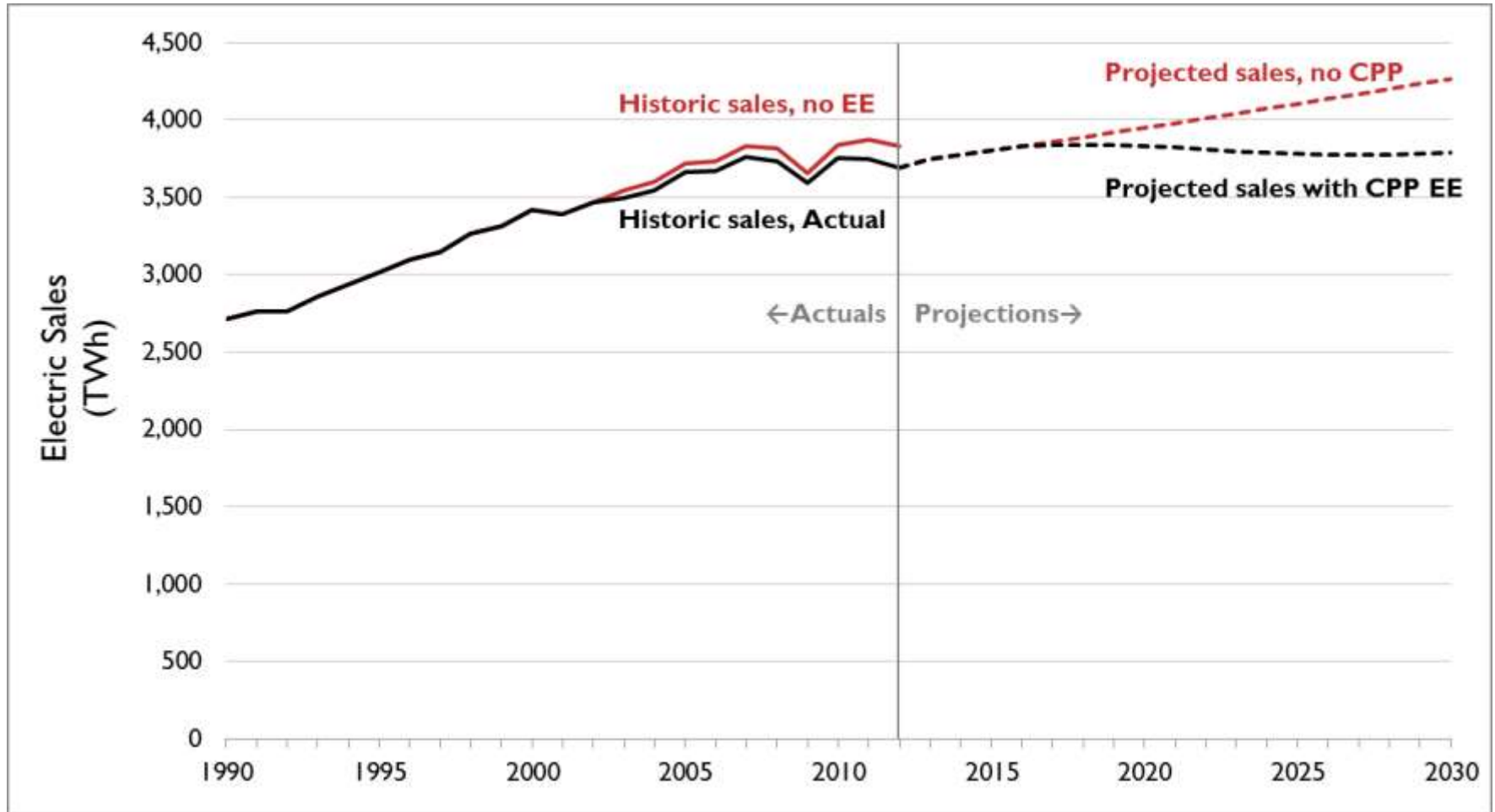
- Founded in 1996 by CEO Bruce Biewald
- Leader for public interest and government clients in providing rigorous analysis of the electric power sector
- Staff of 30 includes experts in energy and environmental economics and environmental compliance
- Developer of tools to assist in Clean Power Plan analysis, including:
 - **Clean Power Plan Planning Tool (CP3T)** – an Excel-based spreadsheet tool for performing first-pass planning of statewide compliance with EPA's Clean Power Plan.
 - **Avoided Emissions and Generation Tool (AVERT)** – an open-access tool built for the EPA by Synapse to estimate the hourly emissions and generation benefits of energy efficiency and renewable energy policies and programs.

Supply Side vs. Demand Side Efficiency



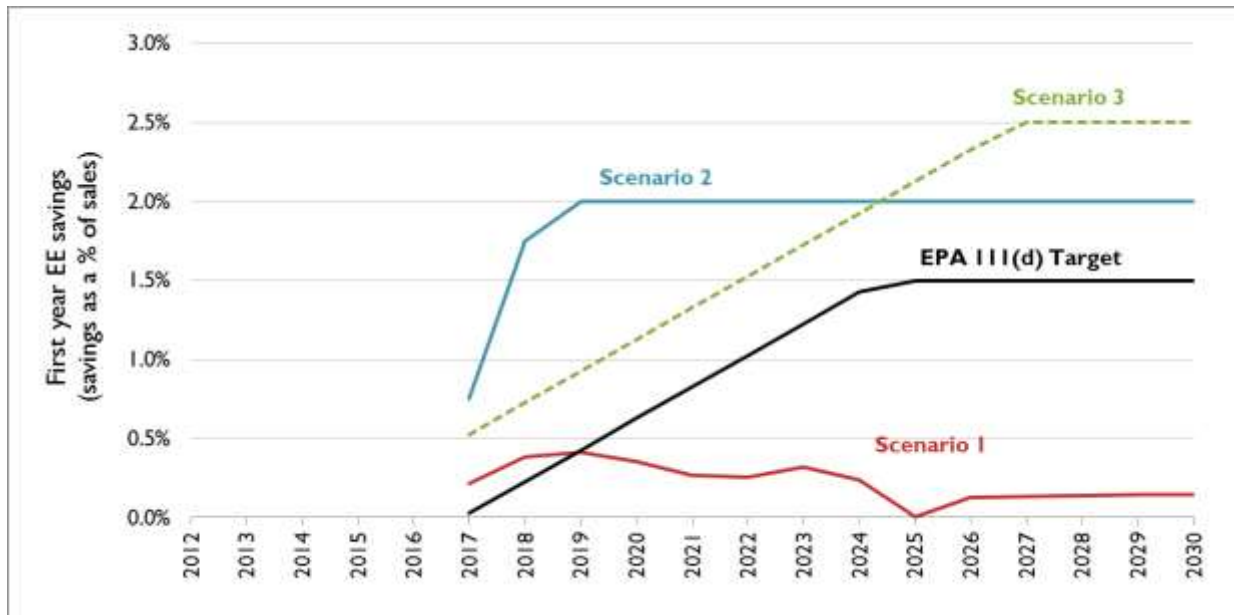
Sources: Fossil average heat rate pre-1949 from: Phillips, Jeffrey. 2012. "Coal Power Generation For The 21st Century: This Is Not Your Father's Coal Power Plant". Presentation, EPRI, Bismark Energy Conference; Post 1949: EIA.gov. 2015. "Annual Energy Review - Energy Information Administration". <http://www.eia.gov/totalenergy/data/annual> Refrigerator energy use: Deumling, R. 2004. "Thinking outside the refrigerator: Shutting down power plants with NAECA?". Available at: http://aceee.org/files/proceedings/2004/data/papers/SS04_Panel11_Paper02.pdf; and Deumling, R. 2008. "Public Policies, Private Choices: Consumer Desire And The Practice Of Energy Efficiency". Available at: http://eetd.lbl.gov/sites/all/files/deumling_lbnl_slides.5.27.08-web.pdf.

National sales avoided through EE



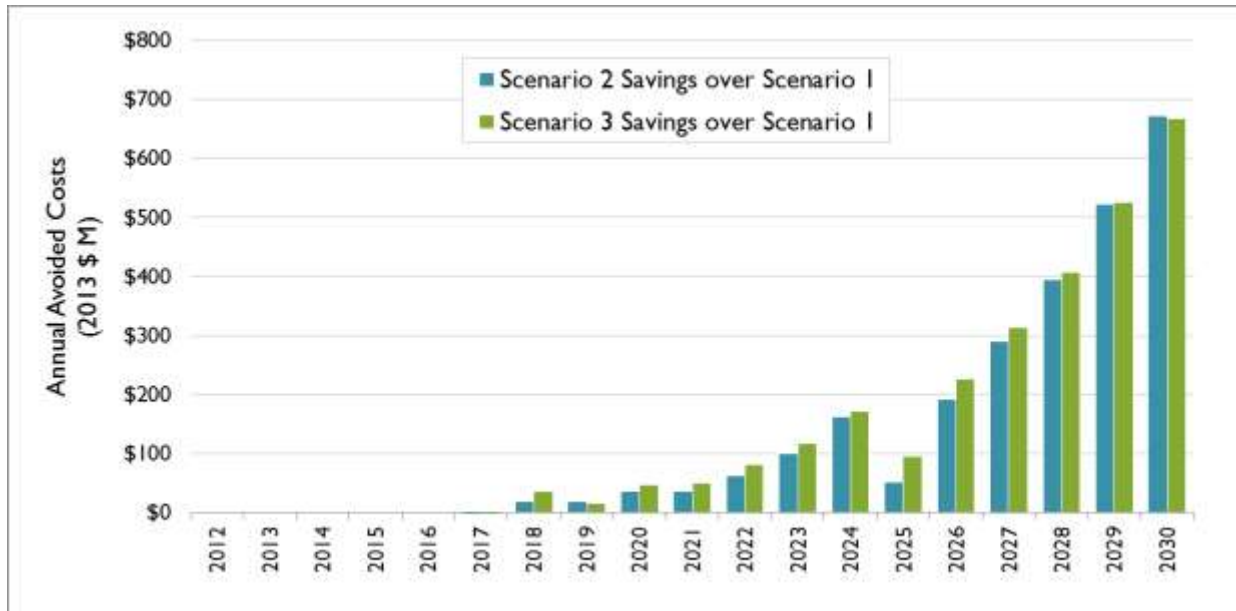
Source: EPA Technical Support document data file: GHG Abatement – Scenario 1; EIA retail sales data 1990-2012; EIA Form 861 2003-2012.

CP3T analysis: Impact of EE on 111(d) compliance



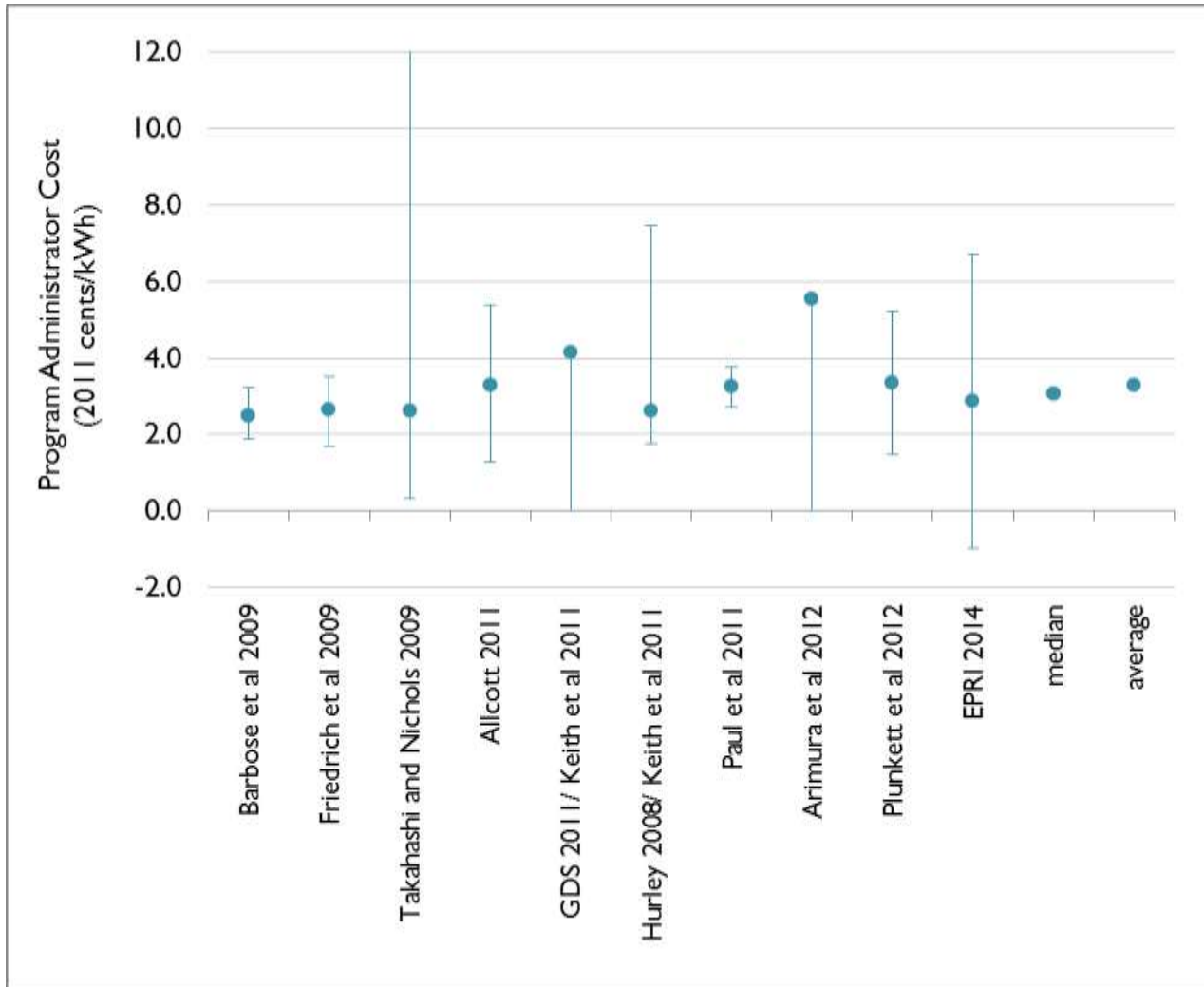
Source: EPA Technical Support document data file: GHG Abatement – Scenario 1; Synapse webinar on scenario analysis of 111(d) compliance in Virginia.2014.

CP3T analysis: Savings resulting from increased EE



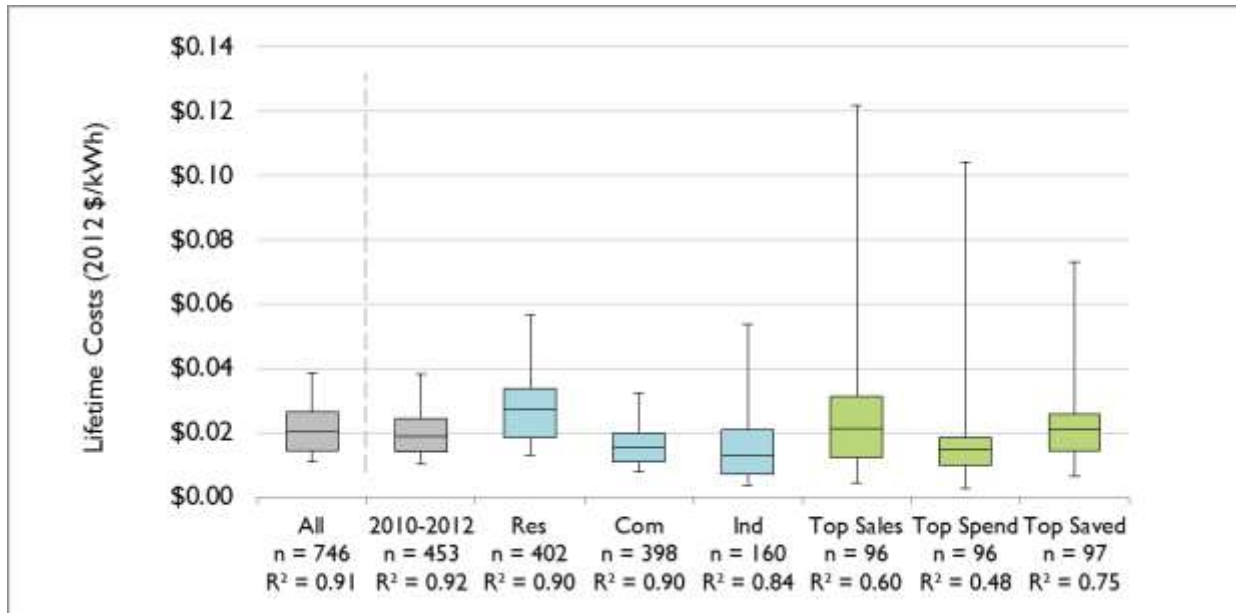
- Both **Scenario 2** and **Scenario 3** see annual savings over Scenario 1 of \$0.03 billion in 2020, rising to \$0.7 billion by 2030.
- **Scenario 2** has cumulative savings through 2030 over Scenario 1 of \$2.5 billion.
- **Scenario 3** has cumulative savings through 2030 over Scenario 1 of \$2.7 billion.

Cost of Saved Energy – Utility Programs



Source: Ongoing Synapse research.

Cost of Saved Energy – Utility Programs

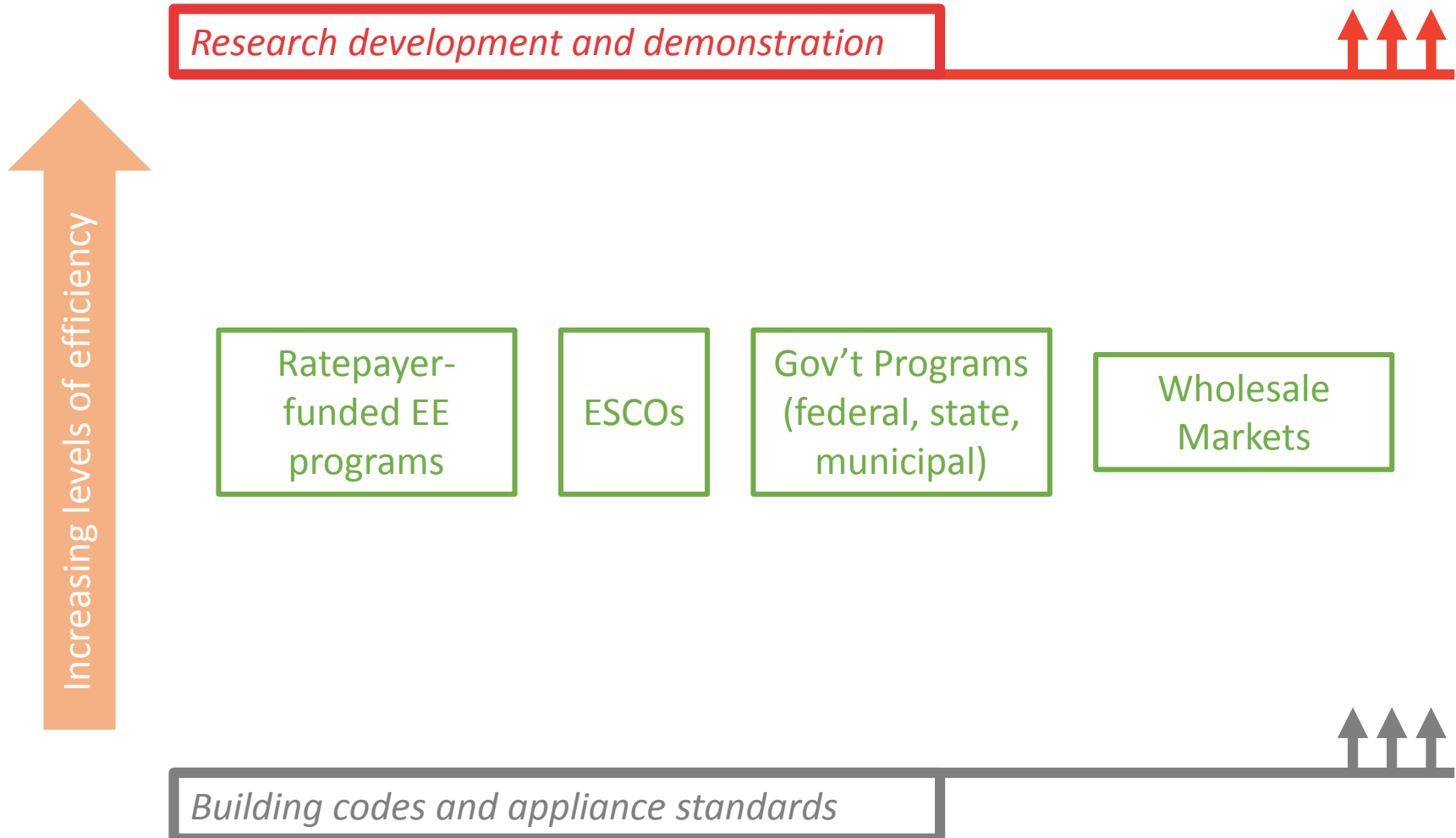


Source: Ongoing Synapse analysis of EIA Form 861 data, 2003-2012.

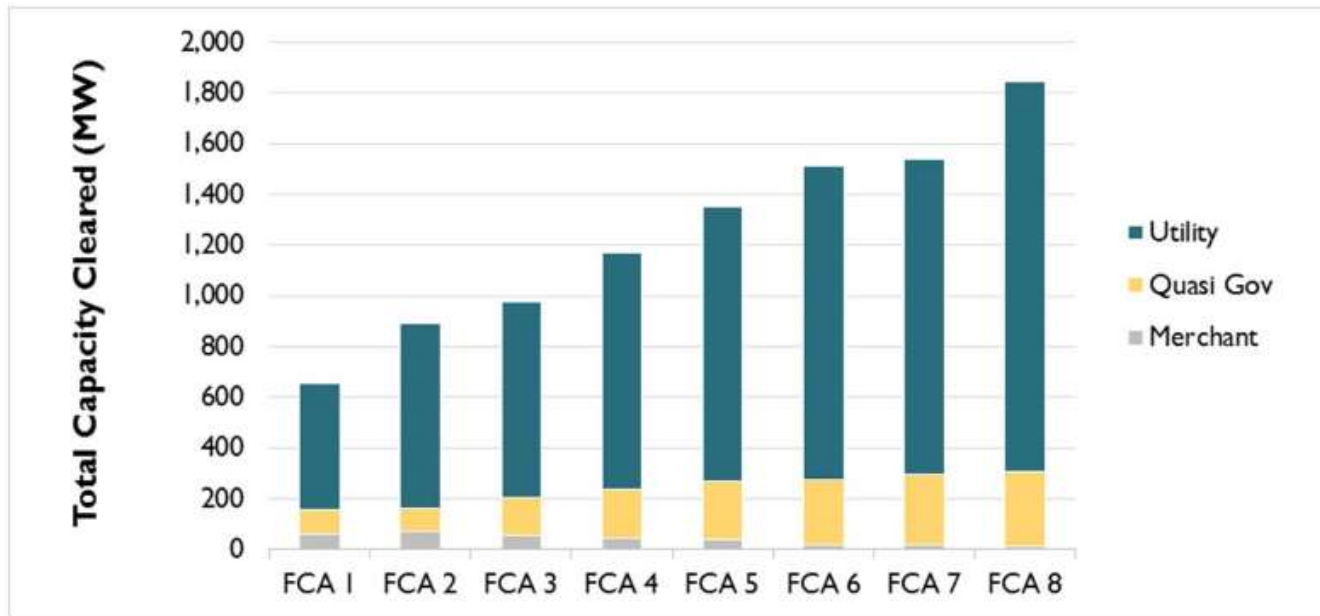
Energy Efficiency Activities

- Building Codes and Appliance Standards
- Ratepayer-funded EE programs (e.g., audits, technical assistance, rebates and financing, EM&V, R&D)
- Private markets
 - ESCO markets
 - Attractive loans for energy efficiency projects
- Government programs
 - R&D
 - Building labels (e.g., Massachusetts' Home MPG pilot)
 - Appliance labels (e.g., ENERGY STAR products)
 - Lead by example
 - ARRA funding and tax credits
 - PACE (Property Assessed Clean Energy) bond
- Wholesale markets
- Research development and demonstration

Relationships Between Efficiency Mechanisms



Energy efficiency capacity cleared by participant type in New England's FCM



Source: Knight, Patrick et al. 2014. "Energy Efficiency In U.S. Capacity Markets". Synapse Energy Economics.

What is AVERT?

- AVERT – “Avoided Emissions and Generation Tool”
- AVERT began development in 2012 as EPA began to search for a tool that could provide users with the capability to estimate the changes in generation and emissions at particular generating units due to new renewable energy (RE) and energy efficiency (EE) projects
- AVERT is now an EPA-approved tool used to translate the energy impacts of EE/RE policies and programs into emission reductions (NO_x, SO₂, CO₂)



What is AVERT?

- AVERT was built to be:
 - user friendly
 - transparent
 - credible
- AVERT has been thoroughly reviewed, well-documented and tested. EPA has:
 - Conducted external and internal peer reviews
 - Benchmarked AVERT against industry-standard electric power sector model (PROSYM)
 - Worked with states to beta-test the tool for functionality, appropriate uses, and user manual clarity

Tools and Further information

Where can I get AVERT?

On the EPA website: epa.gov/avert/

On the Synapse website: <http://www.synapse-energy.com/tools/avoided-emissions-and-generation-tool-avert>

Where can I get CP3T?

On the Synapse website: www.synapse-energy.com/cp3t

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