



Connecticut Department of Energy and Environmental Protection



GC3 Meeting

April 13, 2016
1:30 — 3:30 p.m.



Connecticut Department of Energy and Environmental
Protection

Agenda

1:30

Welcome & Announcements

1:35

Recap state and local climate actions discussion

1:45

REMI Building Sector Inputs and Assumptions

2:05

CT's Efficient Buildings: Capturing opportunities for emission reductions, job creation, and increased competitiveness

2:20

Building Sector Policy Discussion

4:30

Public Comments

Recap State and Local Climate Actions Discussion



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REMI Building Sector Inputs and Assumptions

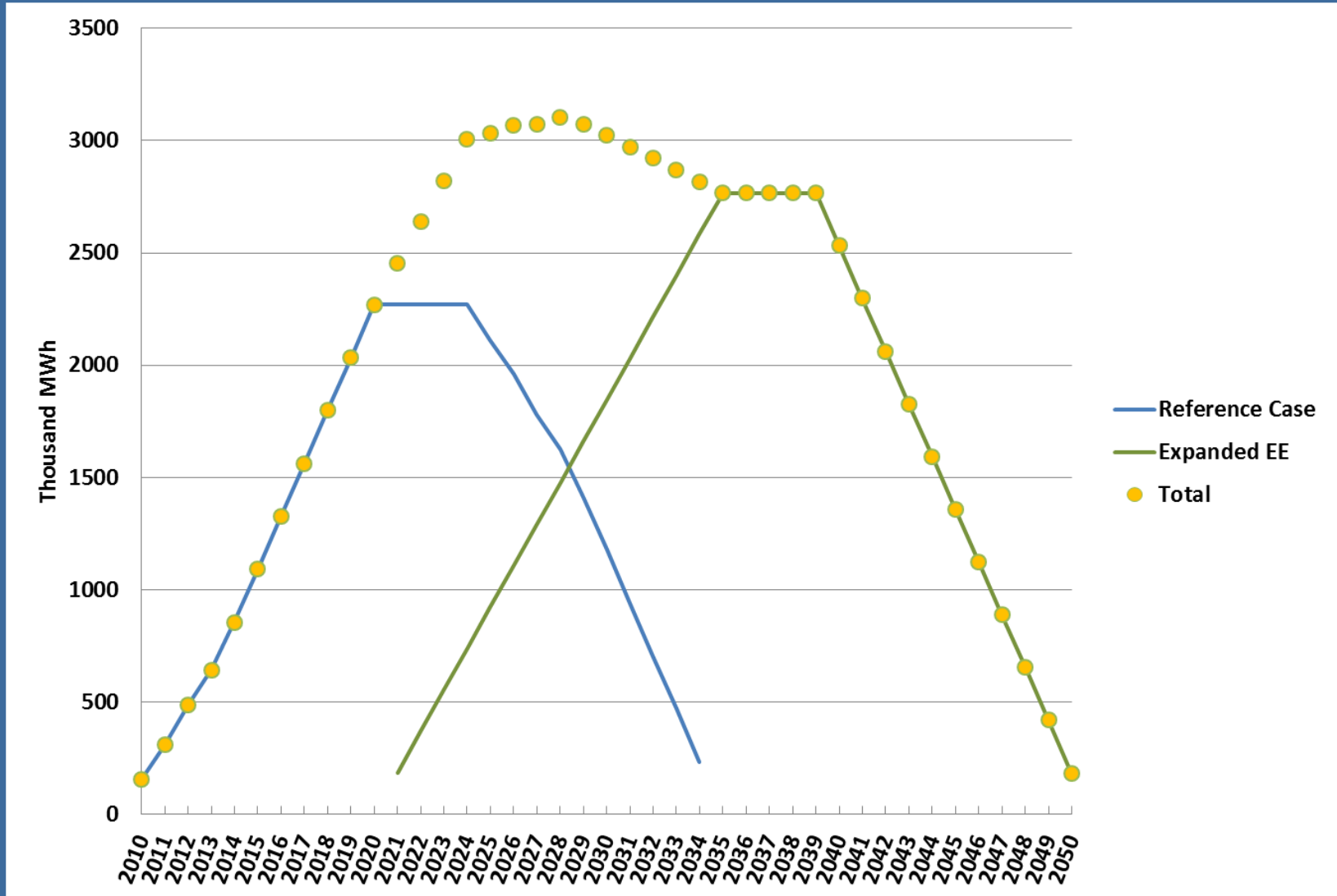


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Review energy efficiency and building technology scenarios

- Residential & Commercial Renewable Thermal
 - Air Source Heat Pumps ~ 90%
 - Ground Source Heat Pumps ~ 10%
- Expanded electric & gas energy efficiency
 - Based on continuing current EE investments out to 2035

Energy Efficiency Measure Savings



Direct Costs From LEAP Used in REMI Modeling

- Changes in energy expenditures
 - Increased electricity spending
 - Reduced spending on fossil fuels
- Changes in total investment spending on residential & commercial heating and cooling equipment
 - Broken out into labor, capital and materials
- Incremental spending on efficiency measures
 - Broken out into labor, capital, materials and other local industries involved in EE deployment

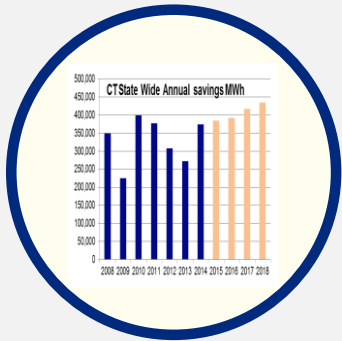
CT's Efficient Buildings:

Capturing opportunities for
emission reductions, job creation,
and increased competitiveness

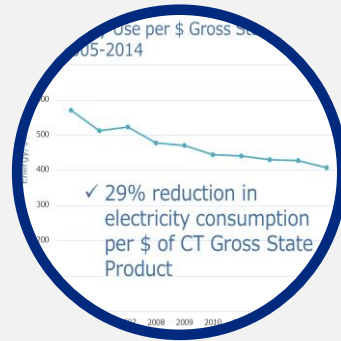


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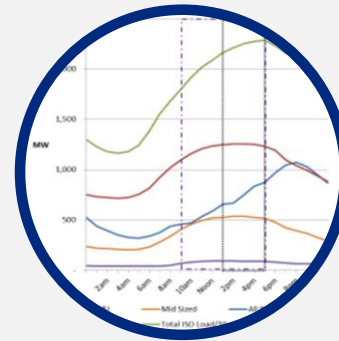
Key Strategies for Better Buildings



Prioritize energy savings as a financing resource and as an energy resource



Improve energy performance of existing buildings; Increase productivity of processes



Integrate efficiency, storage, rates, and renewables to reduce peak demand

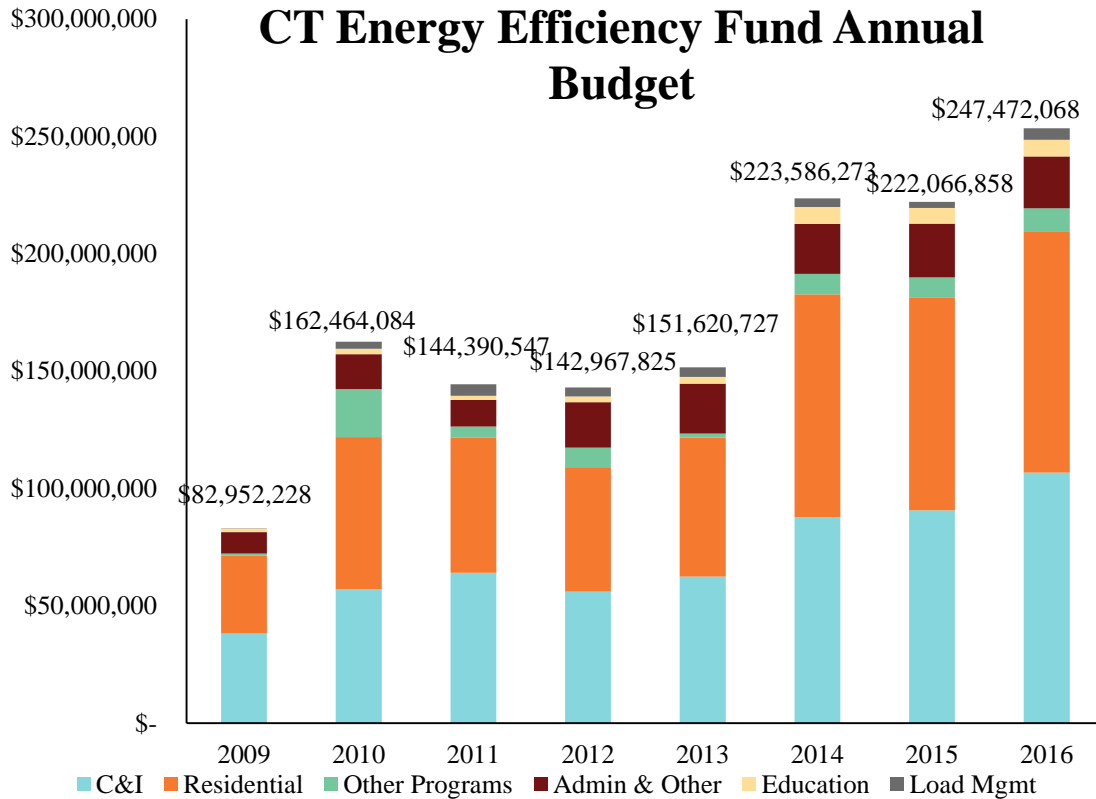


Ensure interoperability of demand response communications between grid and buildings



Connecticut's Current Investment and Progress

CT Energy Efficiency Fund Annual Budget

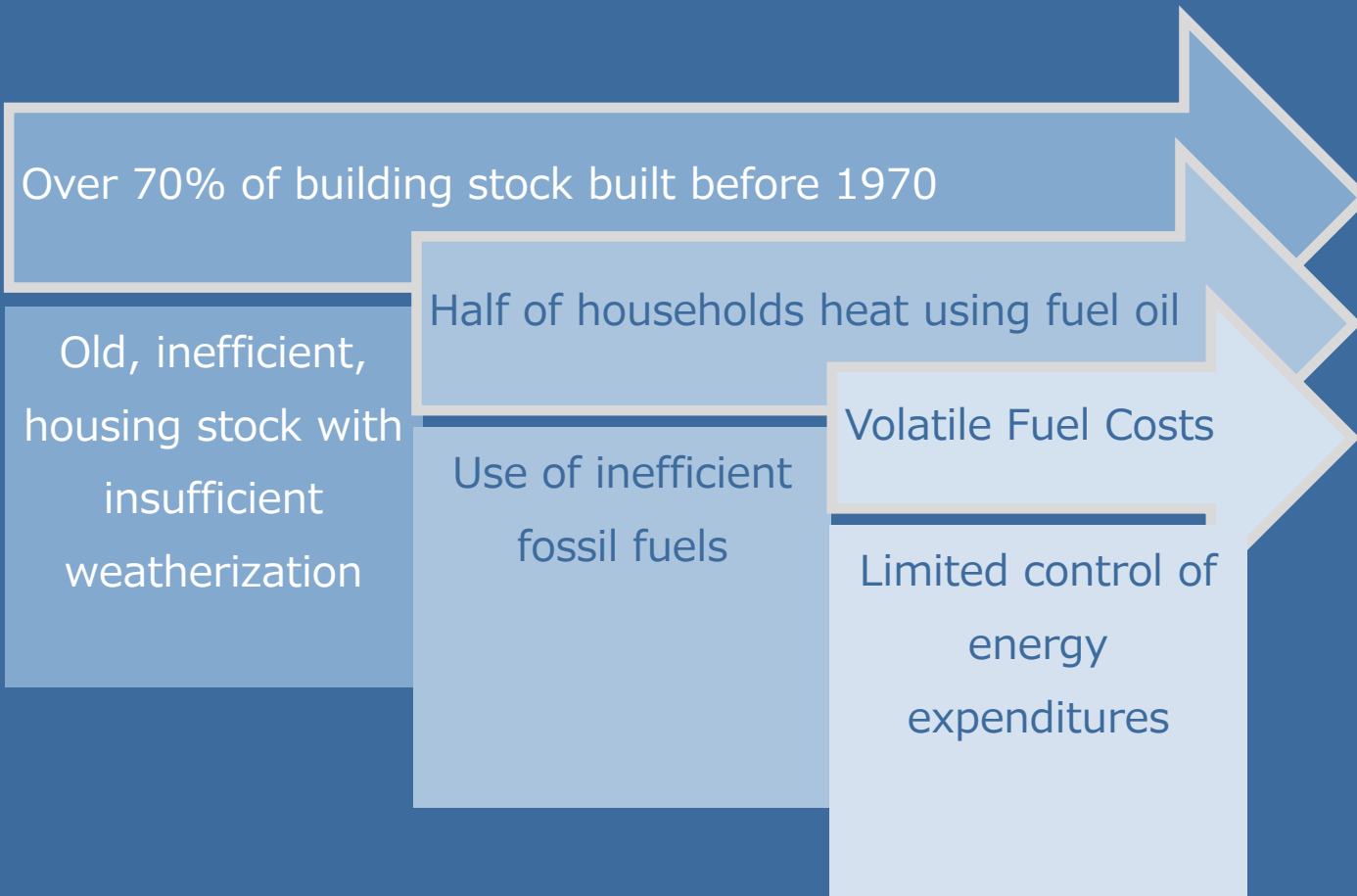


Highlights of 2016-2018 C&LM Plan Targets:

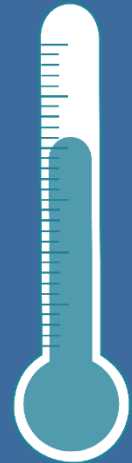
- \$700M portfolio for customers
- 129k residential homes weatherized
- 9.7 M residential products distributed
- All 169 communities actively engaged
- 28k businesses more efficient
- Energy as a resource: Energy savings equivalent to the output of a 262 MW power plant

Source: 2016-2018 Conservation and Load Management Plan

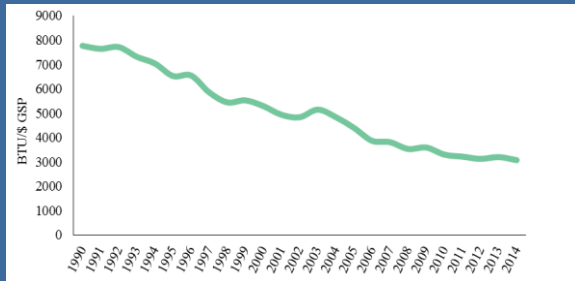
CT Building Stock: Emissions Reduction Opportunity



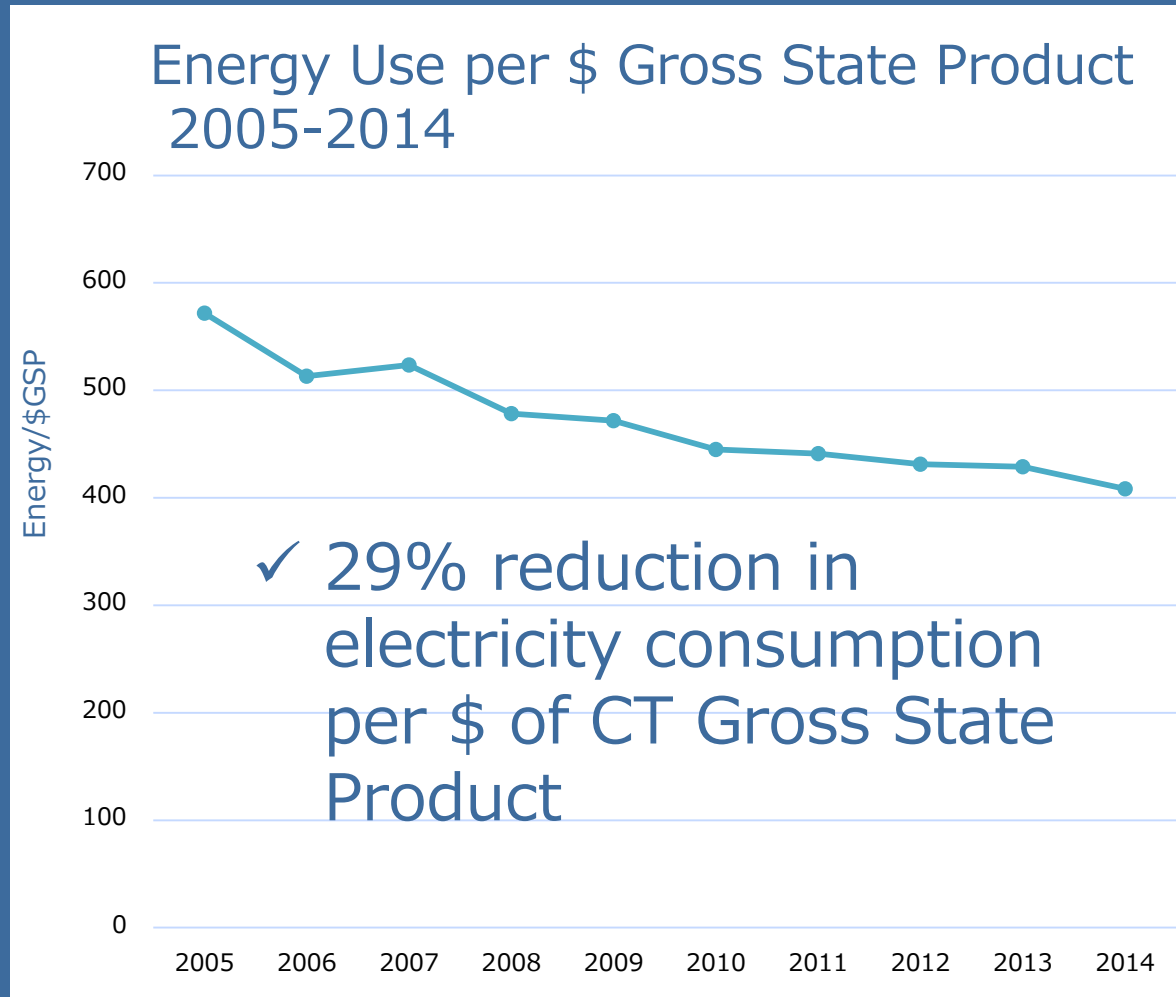
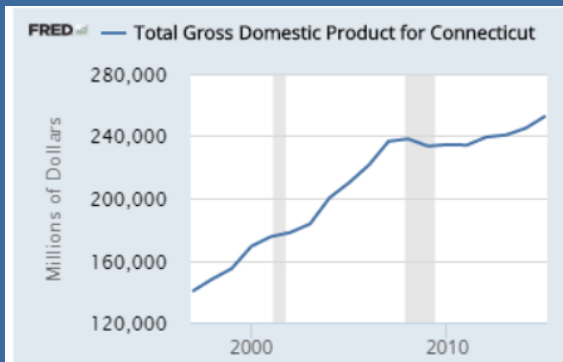
Focus
Investment
on Thermal
Efficiency



Efficiency Improves CT Productivity



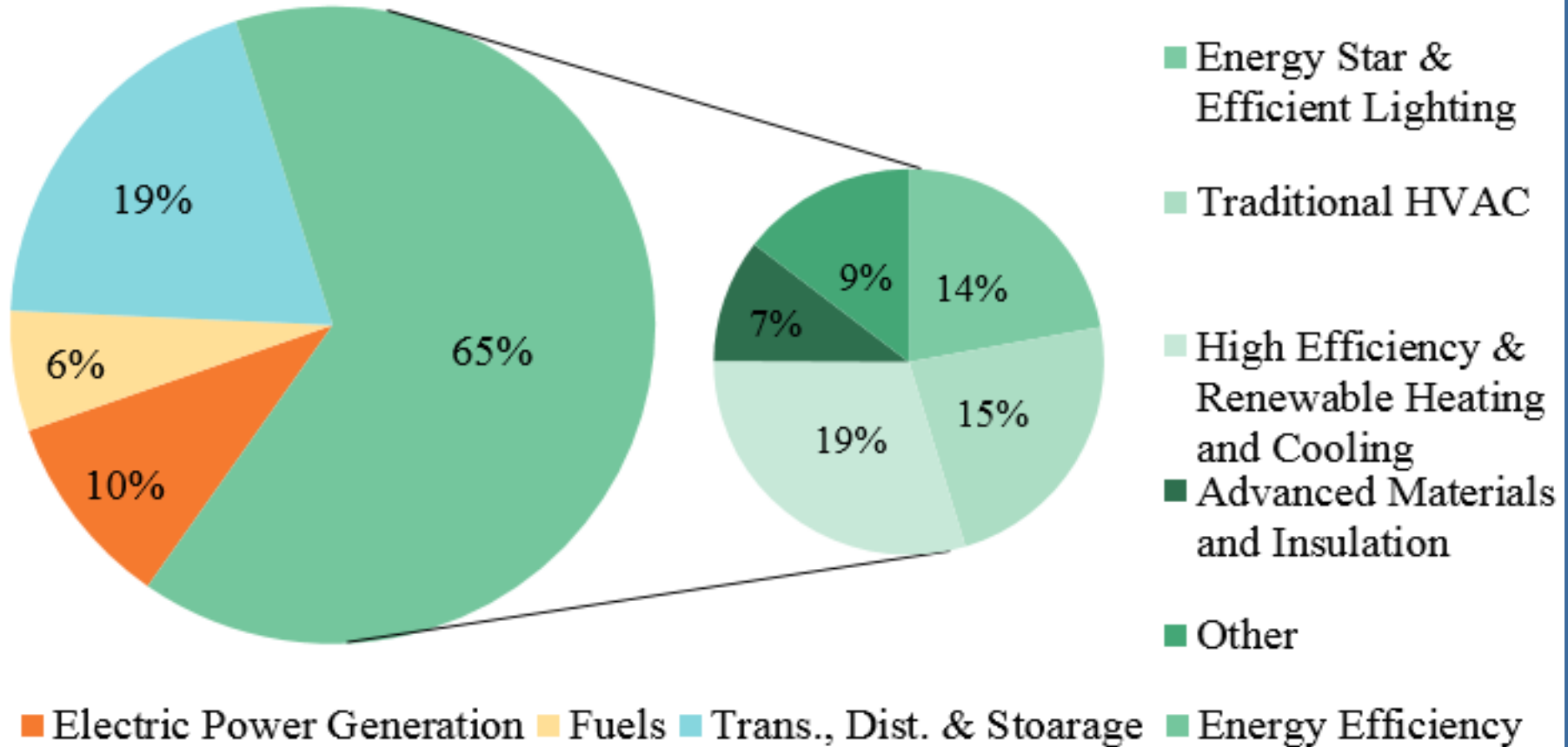
Connecticut's businesses are using less electricity to produce an increasing quantity of goods and services



Sources: EIA SEDS data, US Bureau of Economic Analysis, Federal Reserve Economic Data

Efficiency employs 34,000 in CT

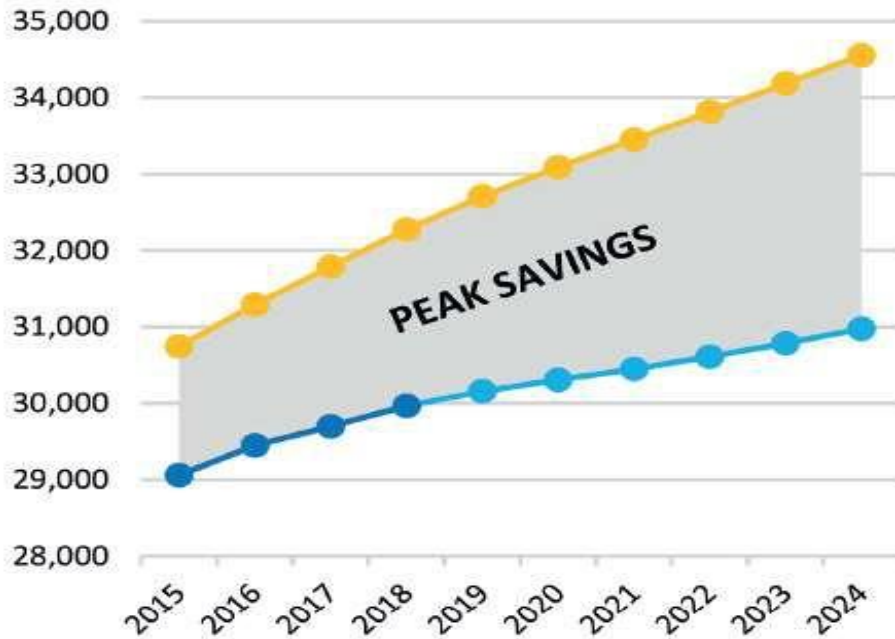
Connecticut Energy Employment by Major Technology



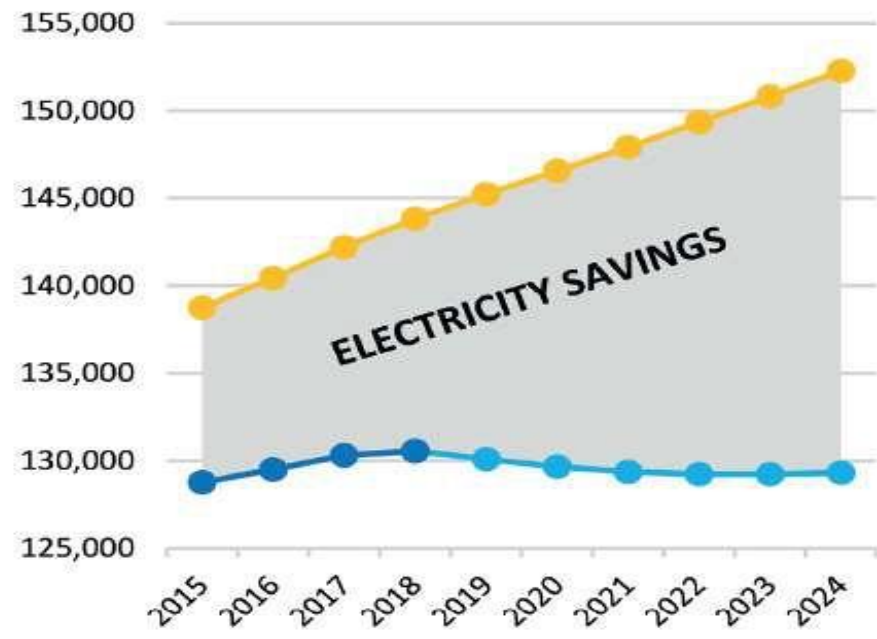
Source: (United States Department of Energy, 2017)


Check Growth & Reduce Peak


Summer Peak (MW)




Annual Energy (GWh)



 The gross forecast of peak demand and energy use

 The forecast minus the impact of EE participating in the Forward Capacity Market (FCM) to date

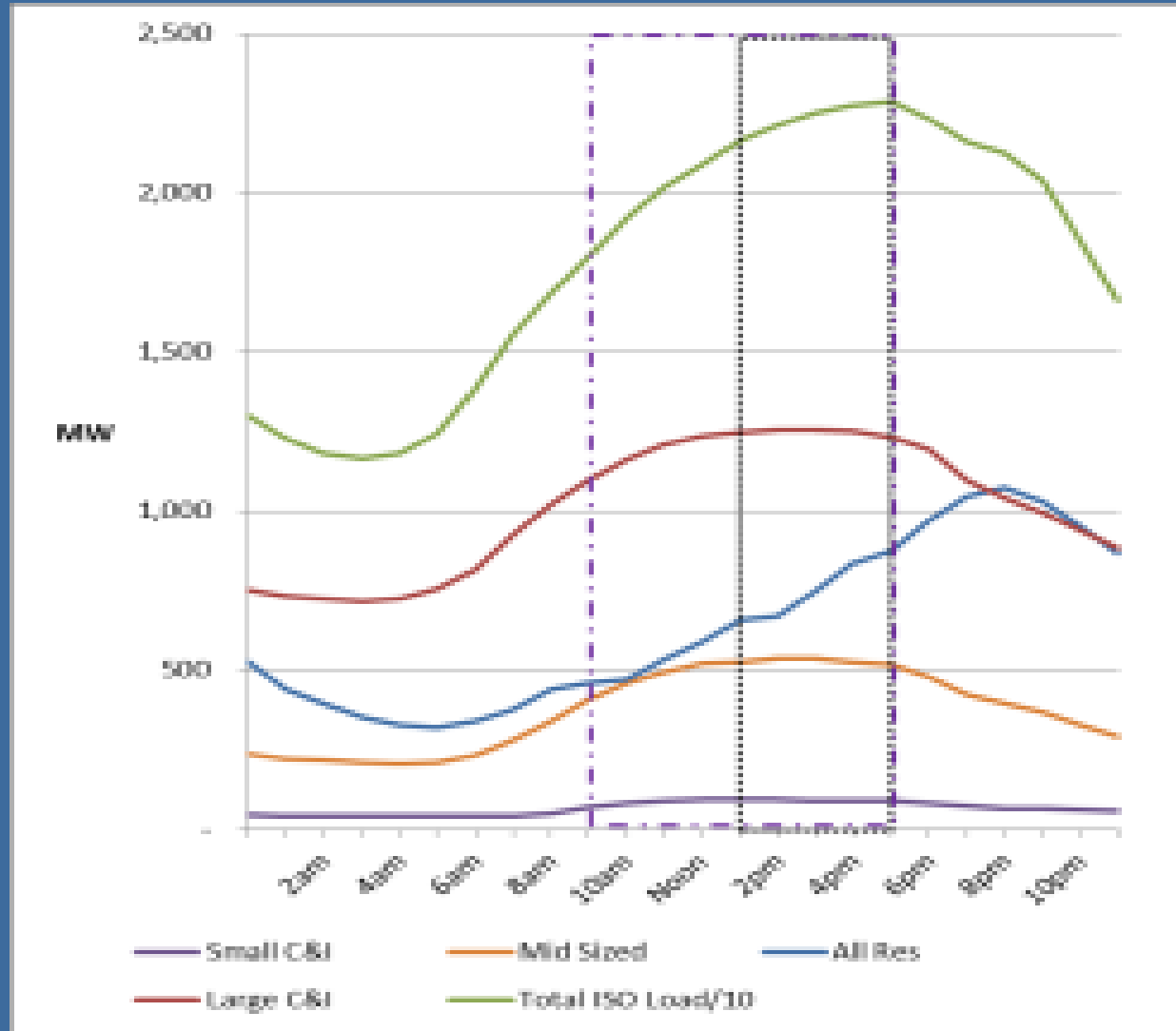
 The forecast minus anticipated EE growth beyond FCM years

ISO-NE: Investment in energy efficiency will decrease overall load growth, but peak demand continues to grow, spreading costs over fewer units.

Managing Peak Demand is Key

Managing peak demand means customizing solutions for different customer classes. Why?

Because solutions require understanding varied energy profiles at the ISO level, distribution level, and customer level.



Source: Eversource

Advance Controls and Two-Way Communications

- Empowering individuals and businesses to recognize the opportunity and receive value of demand response, distributed generation, and energy storage



Benefits:

- Reduces capacity needs
- Reduces transmission & distribution investments
- Contributes to a more resilient electrical grid



Mainstreaming Energy Efficiency

- ✓ Externalized costs of other energy sources make efficiency resource appear costly
 - requiring need for optimized mix of actions to correct market imperfections
 - incentives, simple financing, codes, standards
- ✓ Increase automated controls and automated and standardized monitoring and verification tools
- ✓ Improve consumer awareness and standardize valuation of savings opportunity through Energy Star, Home Energy Score
- ✓ Better target segment-specific barriers
 - Improve access to capital in some sectors
 - Compete better against other investment opportunities
 - Ready homes for weatherization

Example strategies to reduce GHG emissions

Procure energy efficiency as a resource	Increase performance of new and existing buildings	Reduce peak demand (electric efficiency)	Increase thermal efficiency (renewable thermal technologies)
<p>Procure efficiency as a resource</p> <ul style="list-style-type: none"> Replicate recent procurement per PA 15-107 of a 34 MW energy efficiency commitment to displace other generation sources Invest portion of federal energy assistance funds in efficiency to sustainably close affordability gap <p>Catalyze avoided costs as a financing resource</p> <ul style="list-style-type: none"> to repurpose savings to invest in building infrastructure <p>Better measure policy benefits of efficiency</p> <ul style="list-style-type: none"> to adapt as market transforms <p>Maintain consistent utility administered investments</p> <ul style="list-style-type: none"> to stabilize industry 	<p>Reduce waste</p> <ul style="list-style-type: none"> Increase application of combined heat and power Improve voltage regulation/optimization Integrate water conservation; increase efficiency of treatment Assess applicability of district heating/thermal loops <p>Lock in efficiency</p> <ul style="list-style-type: none"> Provide simple life cycle analyses to account for both operating and installation costs Train for and reward installation of higher efficiency equipment <p>Lead by Example</p> <ul style="list-style-type: none"> Insulate and upgrade HVAC in public buildings Promote insurance discounts for well insulated buildings <p>Be prepared</p> <ul style="list-style-type: none"> Integrate pre-weatherization costs into financing and include this work in projects 	<p>Economic Signals and Incentives</p> <ul style="list-style-type: none"> Time of Use Rates Peak Time Rebates Home Energy Score <p>Increase and standardize two-way communication</p> <ul style="list-style-type: none"> Deploy advanced meters or comparable data acquisition equipment Promote use of standards to provide a common basis to manage and communicate about electrical energy consumptions and forecasts, such as ANSI/ASHRAE/NEMA Standard 201-2016, Facility Smart Grid Information Model 	<p>Advance simple financing and upstream incentives</p> <ul style="list-style-type: none"> for insulation, HVAC, and water heating to mainstream availability of most efficient equipment <p>Heat Pump & Solar Water Heaters</p> <ul style="list-style-type: none"> Incentivized for most customers Subsidized for low income customers Upstream availability to mainstream <p>Heat Pumps for heating and cooling/conditioning</p> <ul style="list-style-type: none"> Target electric homes with marketing and assessments to replace electric resistance heat in near term Replace fossil fuel heating equipment in longer term

Building Sector Policy Discussion



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Public Comments



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