



Connecticut Department of Energy and Environmental Protection



Green Technology as a Sector of the Connecticut Economy

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Macky McCleary, Deputy Commissioner Environmental Quality

Commission on Connecticut's Future



Connecticut Department of Energy and Environmental Protection

Green Technology has Already Emerged as an Important Economic Sector for Connecticut

- The Green Technology Sector is multi-faceted. DEEP is focused on these three facets:
 - 21st Century Materials Management- unlocking the materials economy and incentivizing innovation
 - Remediation/Cleanup Transformation and Brownfields Masterplan-Pursuing shift from a “command and control” focus toward market based approaches
 - Comprehensive Energy Strategy- planning for green energy





Waste

21st Century Materials Management- unlocking the materials economy and incentivizing innovation



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Recycling, as a Component of a Materials Economy, Benefits the CT Economy



- Recycling creates jobs through converting raw materials into products.
- Recycling builds more competitive manufacturing industries.
- Supporting the 'materials' economy could add significantly to the Connecticut economy.



Recycling and Reuse Create Jobs

Jobs Created for Every 10,000 Tons Waste Generated (annually)

<u>Activity</u>	<u># Jobs</u>
• Reuse — (wooden pallet repair to computer reuse)	28-296
• Recycling-based manufacturers	25
• MRF [IPC]	10
• Composting	4
• Landfilling and incineration	1

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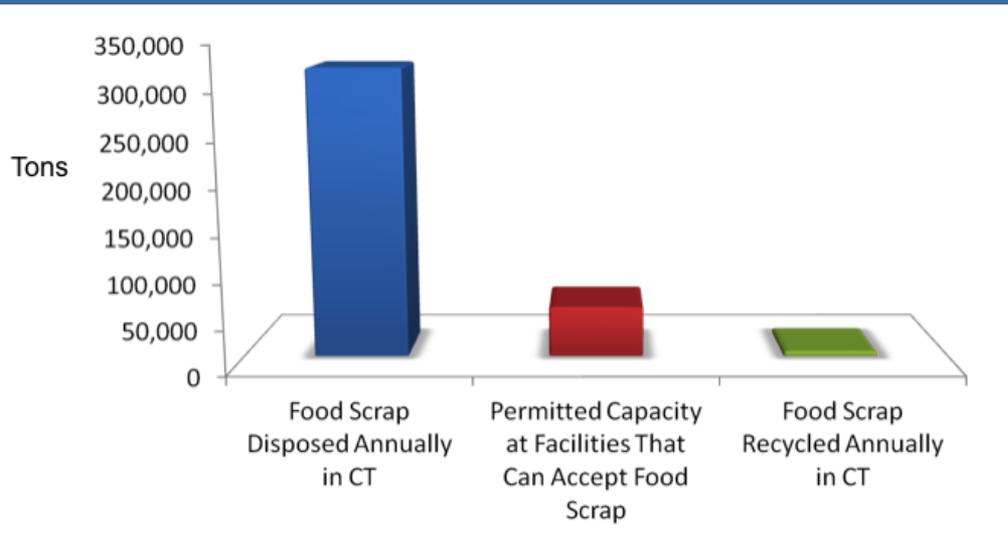
Recycling Means Business, 2006

Institute for Local Self Reliance

www.ilsr.org/recycling/recyclingmeansbusiness.html

Public Act 11-217 will Incentivize Companies to Establish Organics Recycling Facilities

CT's Food Scrap Recycling Infrastructure Gap:
Value to be Unlocked



- The law is intended to get a valuable resource out of our trash and into local commerce and made into valuable products such as compost and clean energy.
- Goals:
 - Save businesses money through avoided disposal cost savings.
 - Promote clean energy investments because it provides certainty of feedstock to clean energy businesses.
 - Encourage economic development by encouraging businesses to locate in Connecticut.
 - Move up the waste management hierarchy to higher value use.



DEEP Encourages Recycling and Reuse Businesses

- Meetings, communication and presentations with DECD, CDA, CERC, CCAT, UCONN and more for the last couple of years
- Strengthening connections between all agencies and groups to streamline external communication
- DRAFT document “A Plan to Support and Promote Industries Transporting, Processing and Using Recycled Material” – DECD Feb 2008
- Recycling Means Jobs Webpage
- DEEP intern researched most of the recycling market development programs created as a result of EPA’s Jobs Through Recycling program in the 1990’s –Sept 2011
- Market development: Recycled Asphalt Shingles (RAS) - DOT Spec - pilot 6/2012
- Commissioners Roundtable- Recognize economic value of the materials in waste stream



How Does CT Best Support Reuse and Recycling Industries?

- Do these industries need their own program or individualized assistance in CT?
 - Incentives for business development?
 - Support with market development?
 - Product development – how can we encourage use of recycled-content/raw materials from our facilities?
- What programs exist now that could help reuse and recycling businesses – sustain or expand?
- Loan programs for equipment or other technology needs?
- Regionalizing – Do we want to/need to continue this conversation?





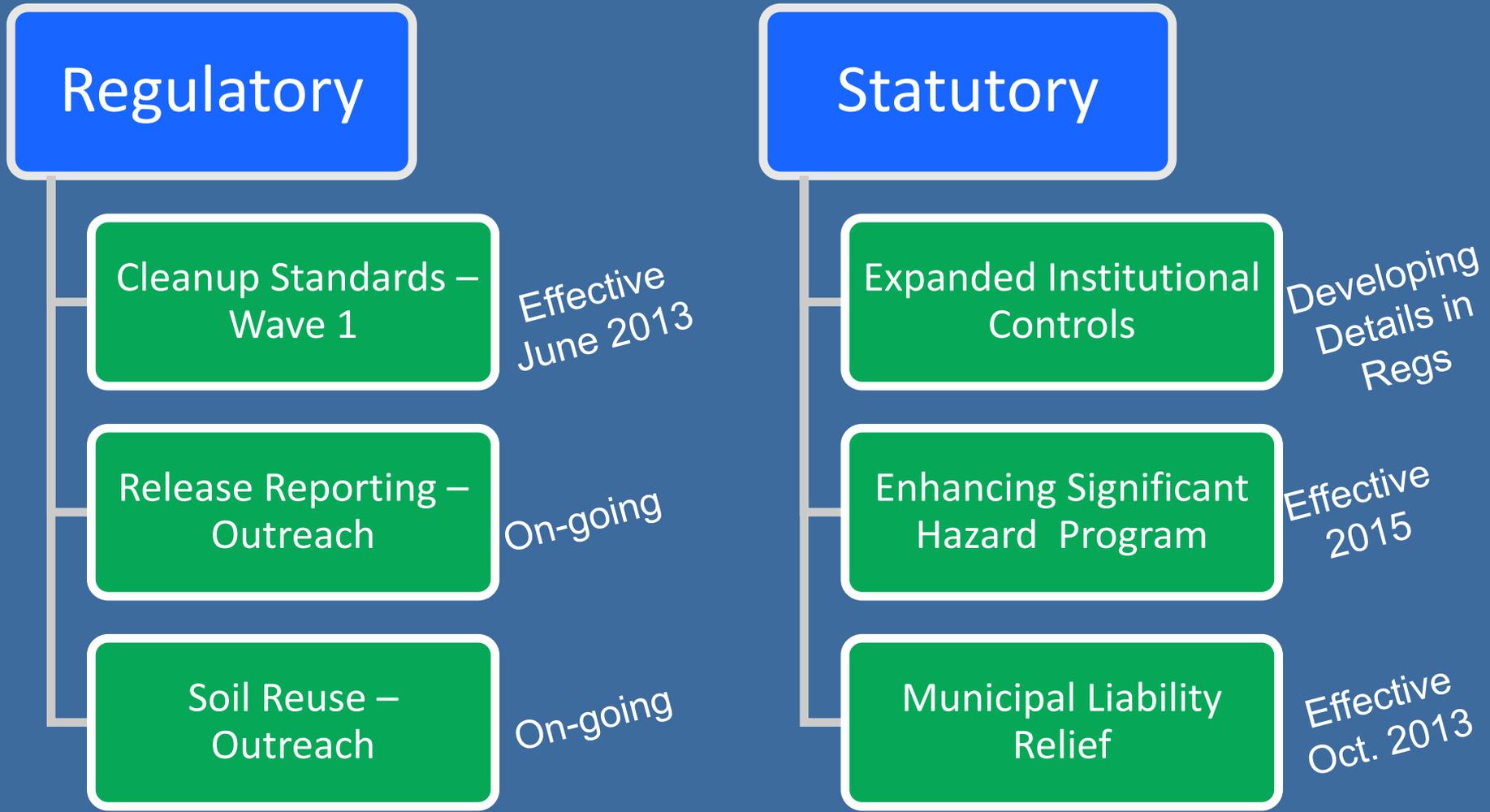
Remediation/Cleanup Transformation

*Pursuing shift from a “command and control” focus
toward market based approaches*

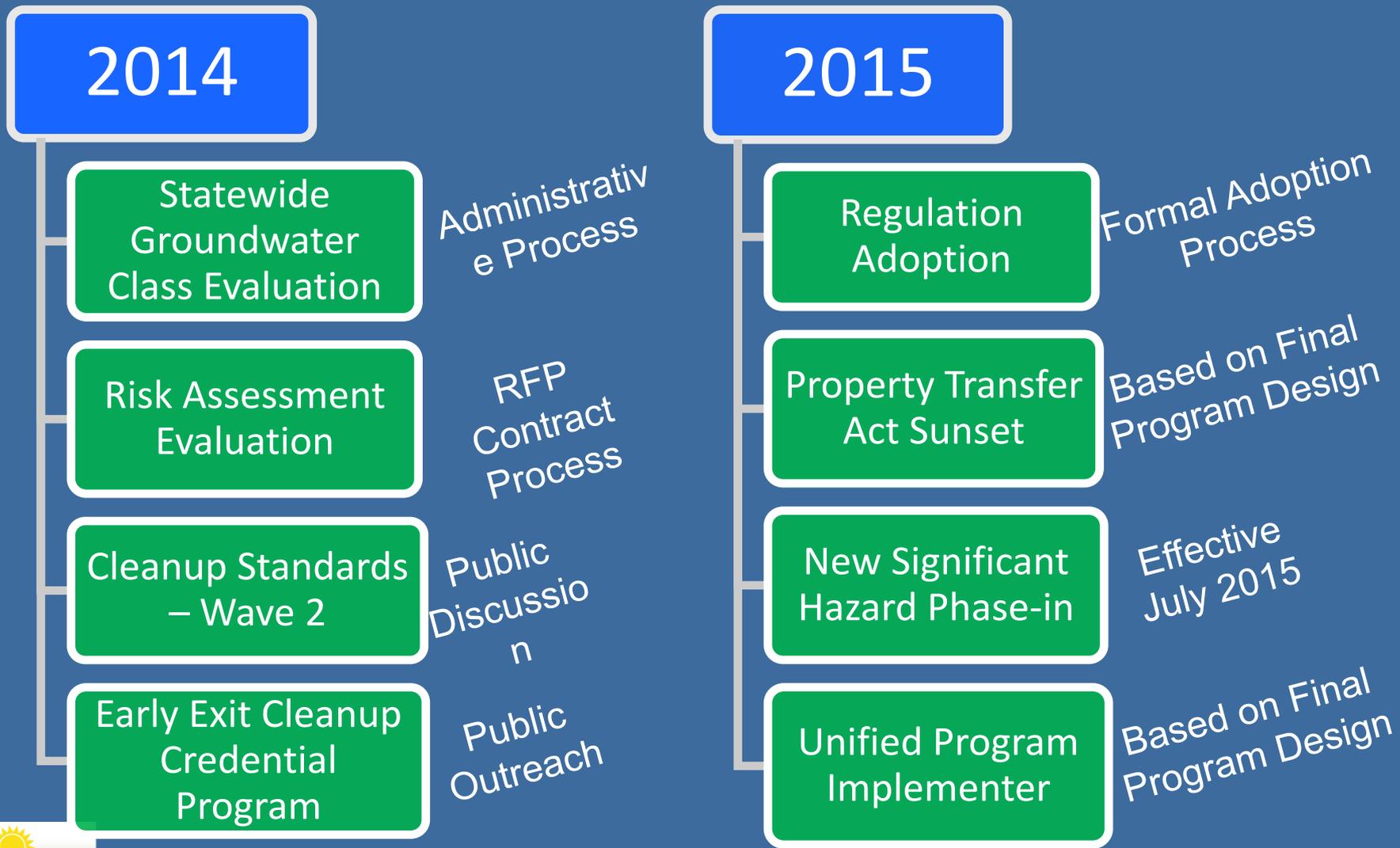


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The Cleanup Transformation has Resulted in Statute and Regulation Changes



The Cleanup Transformation will be Fully Implemented by 2015



DEEP will Lead the Creation of a State-Wide, Master Brownfield Redevelopment and Cleanup Plan for State Agencies and Municipalities

1. Educate state agencies and municipalities on the brownfield redevelopment process, and
2. Provide the tools necessary to develop sound and sustainable redevelopment approaches.



DEEP will Encourage Green Remediation which will Incorporate Options to Minimize the Costs and Environmental Footprint of Cleanup Actions

- What is considered a green remediation strategy for one site may not be a green strategy for another
- Continuous optimization of processes—increased efficiency = decreased costs
- Green Remediation Strategies Include:
 - Using renewable energy
 - Recycle waste streams and water
 - Use local labor / contractors
 - Minimize heavy equipment impacts
 - Using Renewable fuels (e.g. bio-diesel)
 - Minimize waste and recycle
 - Minimize traffic, noise, odors, excess lighting
 - Reuse of equipment at another site
- Green Remediation Firm Example: VeruTek





Energy

Comprehensive Energy Strategy- planning for green energy



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CT's First Comprehensive Energy Strategy (CES) will Guide Policymaking toward the Governor's Vision of Cheaper, Cleaner and a more Reliable Energy Future

- All fuels, all sectors, planning out to 2050
- Five “chapters”:
 - Electricity
 - Buildings
 - Industry
 - Transportation
 - Natural Gas



The CES Contains a Number of Action Items to Achieve the Governor's Vision, Including Ones Specifically Focused on the CT Business Sector

- Lower electric rates
 - Budget gimmicks (e.g., Competitive Transition Assessment) eliminated
 - Congestion charges reduced – better transmission planning
 - Capacity payments coming down
 - Better procurement (no “laddering”)
- Emphasize energy efficiency to help all ratepayers reduce their energy bills
- Make Connecticut businesses more competitive and profitable through efficiency, combined heat and power, and targeted support for renewable power
- Broaden energy efficiency engagement through better marketing including unified branding of outreach initiatives through “Energize CT”
- Strengthen programs aimed at low-income communities
- Position Connecticut to attract jobs in the growing clean energy sector
- Launch a Clean Energy Innovation Hub
- Build out CEFA’s Clean Energy Competitiveness Fund for DECD’s economic development



Electricity will Become Cheaper, Cleaner and More Resilient as a Result of the Actions in the CES

- More systematic policymaking building on 2012 Integrated Resources Plan (IRP)
- Advance strategies to drive down rates further:
 - Peak-load shaving
 - Dynamic pricing
 - Systems efficiency through expanded use of information technology – smart grid, smart meters, smart appliances
- Ensure progress on resiliency
 - Tree-trimming
 - Infrastructure hardening – wires, poles, transformers
 - Microgrids and distributed generation
- Strengthen Connecticut’s Renewable Portfolio Standard (RPS) to maximize development of low-cost in-state renewable energy as well as low-cost out-of-state renewable energy



Policy and Incentives will Reduce the Cost of Clean Energy Through Reverse Auctions, Low-Cost Financing, and Other Policy Innovations

- Reverse Auctions
 - Zero Emissions Renewable Energy Credit
 - Low Emissions Renewable Energy Credit
 - Large-scale clean energy procurement
- “Green Bank” will offer low-cost financing
- Commercial Property Assessed Clean Energy (C-PACE) Program
- Declining incentive programs
 - “Race to the Rooftop”
- Renewable Portfolio Standard (RPS) study



Clean Energy Jobs will Continue to Increase as a Result of the Actions in the CES

- Renewable energy and energy efficiency companies are rapidly-growing small businesses
- DEEP informal survey has identified hundreds of new clean energy jobs in the state, with the potential for ~400-700 additional positions in the next year
- Survey revealed that these companies are mostly small businesses, with an average of ~20 employees per company



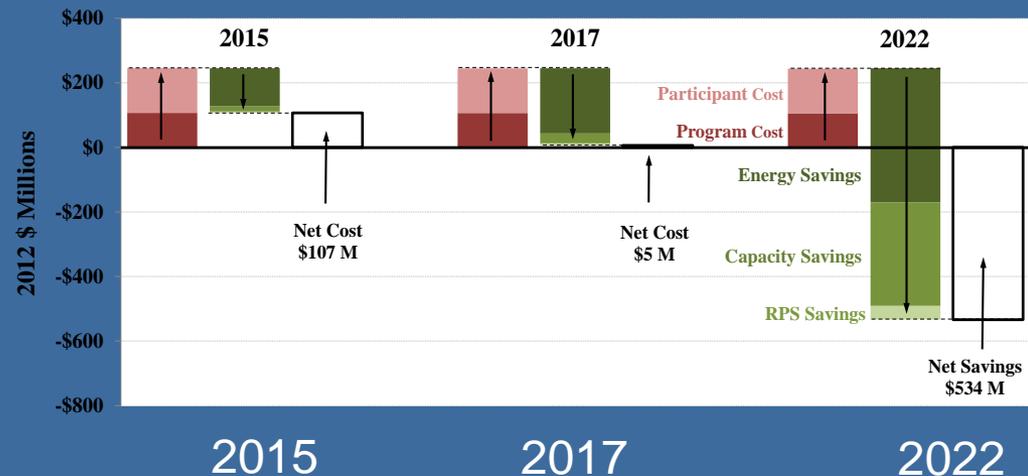
Energy Efficiency is the Best Strategy to Lower Cost of Energy and the Focus will be on Building Energy Consumption, Including Commercial and Industrial

- We propose to reduce statewide energy consumption by 2.1% in FY 2013, 2.3% in FY 2014, and 2.5% in FY 2015

- To achieve these goals, the state needs a major commitment to energy efficiency with new incentives:

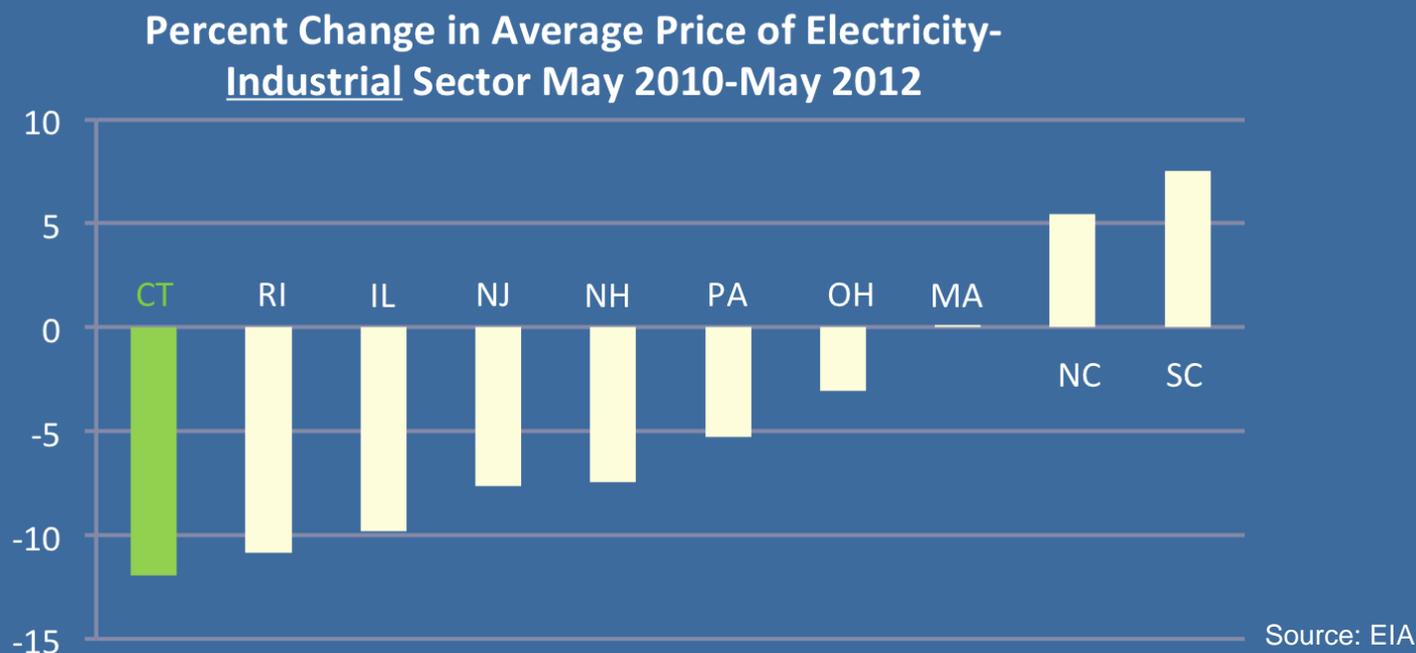
- Commercial Property Assessed Clean Energy (C-PACE)
- On-bill financing
- Decoupling— ensuring utilities are held harmless for efficiency activities
- Decoupling “plus” —creating incentives for utility investment in energy efficiency
- Time of use electricity pricing
- Efficiency audit benchmarking and disclosure

Funding all cost-effective energy efficiency at \$216 million per year requires upfront investment, but yields net savings of \$534 million annually by 2022



CES will Offer Ways to Help Connecticut Businesses Increase their Competitiveness by Lowering their Energy Costs

- Two major ways of achieving this goal:
 - Increase industrial efficiency, especially in under-targeted “process efficiency” market
 - Encourage fuel-switching to lower cost (and cleaner) natural gas
- Deploy a “Connecticut Energy Competitiveness Fund” to support DECD economic development efforts
- Create Clean Energy Innovation Hub to support clean technology development



One of the Specific Industrial CES Actions, Promoting Combined Heat and Power, will Lower Operating Costs



Combined Heat and Power Plant



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CES Transportation Actions will Deepen the Integration of Energy, Environment, and Economic Development to Deliver Higher Quality of Life

TODAY

-  Growing shortfall in federal transportation funding
-  Long commutes, congestion
- Limited transportation options
- Inefficient vehicle stock
-  Dominant fuel choice—oil
- Oil supply risks

IMPACTS

- Degrading infrastructure
- Major contribution to air emissions
- High gasoline costs
- Congestion costs

CORE STRATEGIC ELEMENTS

- Sustainable funding**
- Enhanced Mobility**
- Efficient technologies and fuels**
- System efficiencies**

THE FUTURE



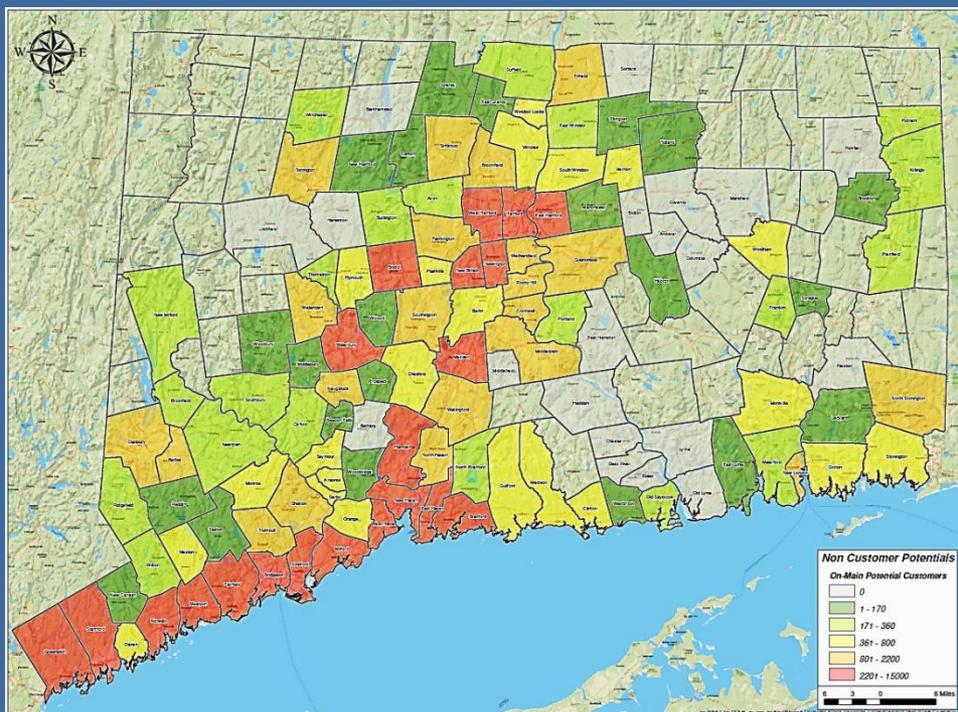
- New funding models that advance transportation, energy, and environmental goals
- Improved quality of life, livability
- Economic development
- Shorter commutes, less congestion, fewer trips, more options
- Multiple fuel options—natural gas, electric, hydrogen fuel cell, etc.
- Highly efficient vehicles
- Cost-effective efficiency measures
- Freight and port infrastructure maintenance and optimization



CES Supports Increased Natural Gas Access as a Cleaner, Cheaper Fuel

- Conversion to natural gas offers about 50% heating cost savings in all sectors, creates jobs, and reduces emissions
- Burning natural gas instead of “dirtier” fossil fuels such as fuel oil (for heating), gasoline, or diesel (for transportation) can reduce emissions of nitrogen oxides (NO_x) by 20-50%, sulfur oxides (SO_x) by up to 99%, and carbon dioxide (CO₂) by 25-30%
- Multiple “tiers” of opportunity with different cost structures:
 - ~220,000 residents and businesses are “on-main” and have easily financed conversion options
 - Additional ~90,000 have potential for cost-saving conversion
 - “Anchor loads” (schools, hospitals, factories, apartment buildings) that could be cost-effective if seen as an economic development strategy

Customer Conversion Potential



Questions?

Macky McCleary

Deputy Commissioner, Environmental Quality

Macky.McCleary@ct.gov

www.ct.gov/deep



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