



Connecticut Department of Energy and Environmental Protection



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

GC3 Meeting

December 13, 2018

2:00 – 4:00 p.m.



Agenda

2:00

Welcome & Announcements

Rob Klee, GC3 Chair, Commissioner of CT DEEP

2:10

2016 GHG Inventory

Keri Enright-Kato, CT DEEP

2:25

Review and finalize draft GHG mitigation recommendations report

3:30

Public Comments



2016 GHG Inventory



Tracking CT's GHG Reductions

- Provide an overview of CT's GHG emissions from 1990-2016, the most recent year for which full data are available
- The statewide GHG emission inventory is an important tool for tracking Connecticut's progress toward achieving statutory reductions set by PA-08-98 & PA-18-82

GHG emission reduction targets:

- ✓ 10% below 1990 levels by 2020
- ✓ 45% below 2001 levels by 2030
- ✓ 80% below 2001 levels by 2050



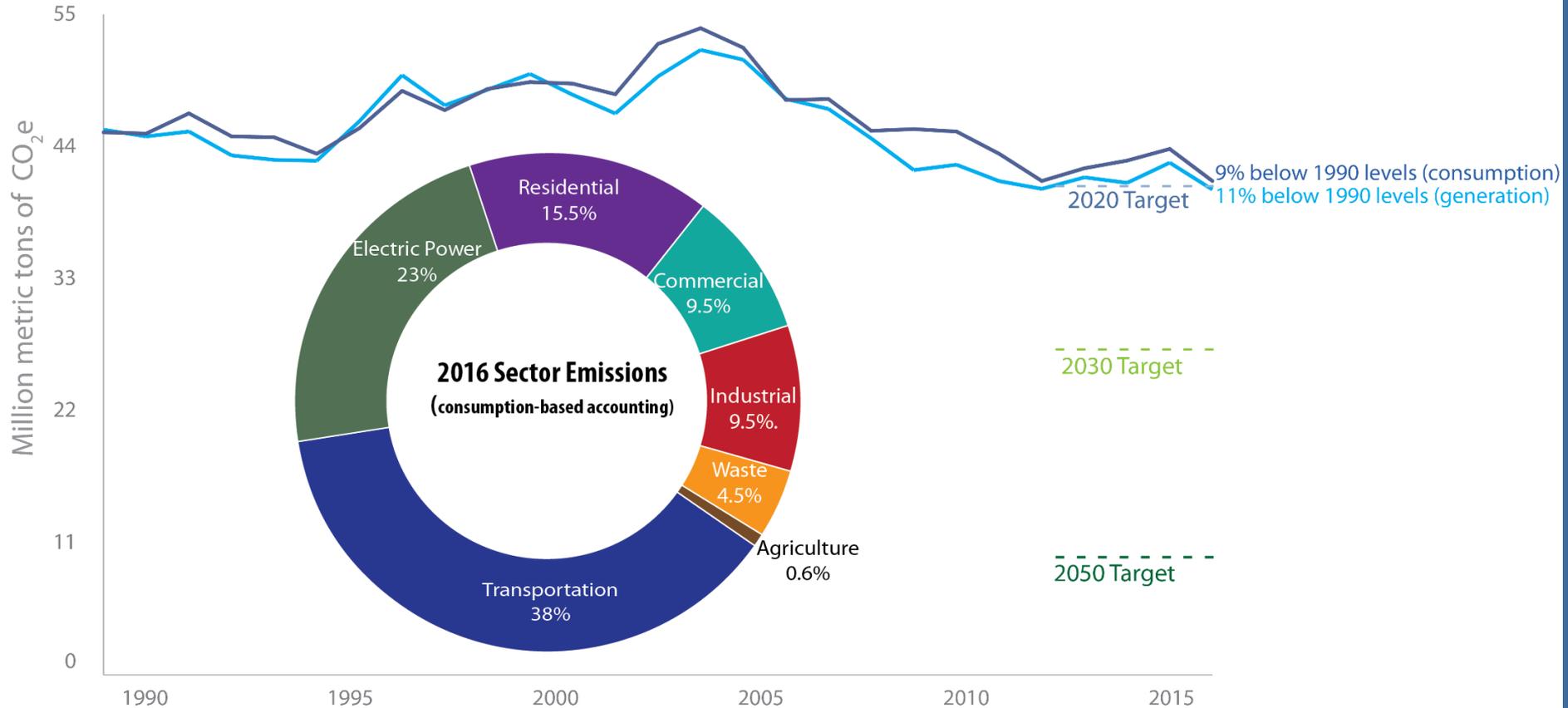
Data/Methods

- Heavily based on the U.S. Environmental Protection Agency's State Inventory Tool (SIT).
 - tool calculates sector-by-sector GHG emissions based on numerous state-level data sets
- Default data is used most sectors (transportation, electric, residential, commercial, industrial, waste and agriculture), exceptions are:
 - LULC and forestry default data not used => unreliable, questionable
 - consumption based accounting for the electricity sector based on MA DEP SGIT appendix Q-S methodology
- National statistics and state data are used when appropriate from EIA and federal sources
- State demographic & transportation data



2016 Economy-wide GHG Emissions

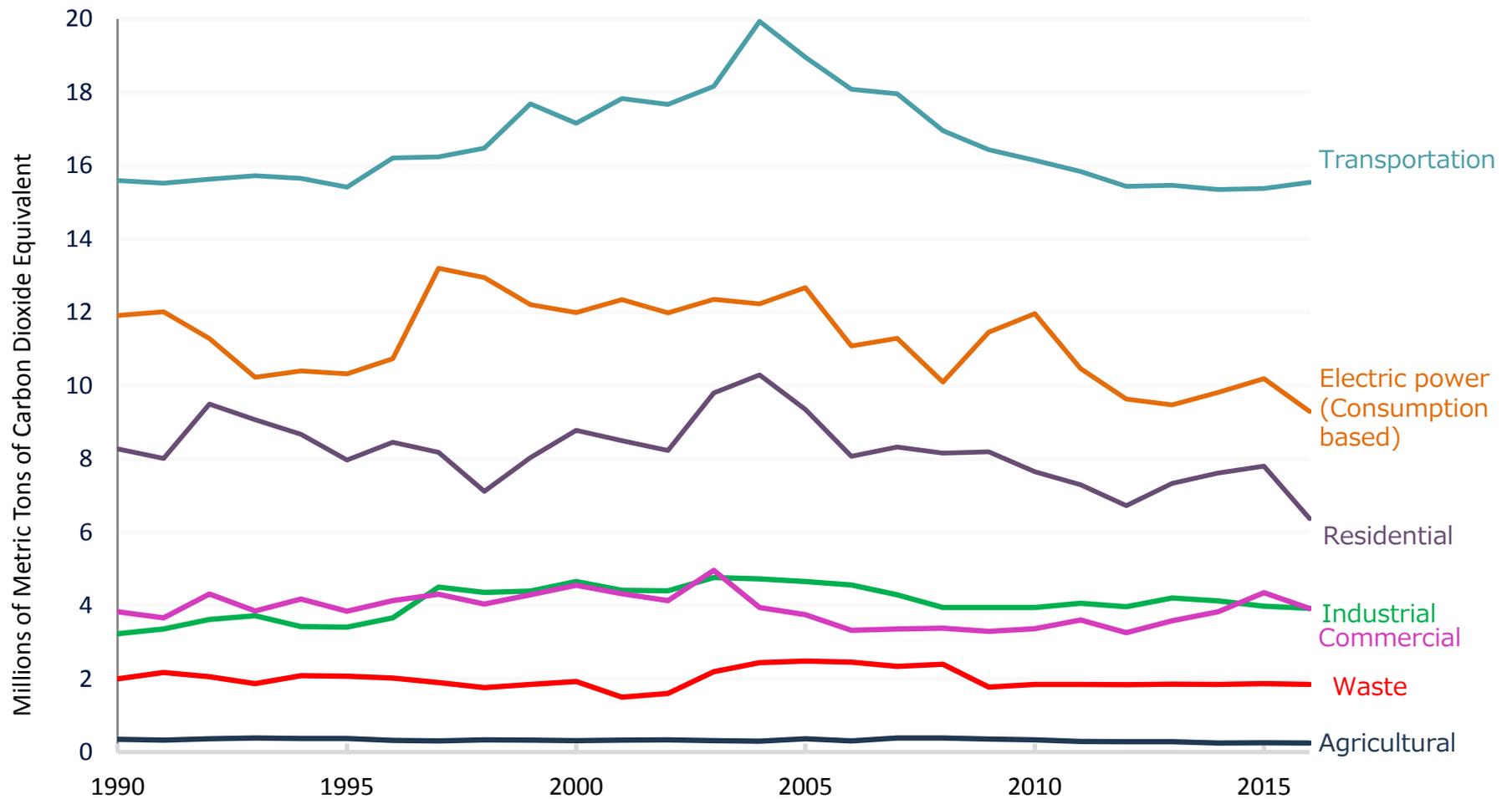
Connecticut Statewide Greenhouse Gas Emissions 1990-2016
Comparison of Electricity Sector Generation and Consumption-based Accounting



* Targets shown in this graph utilize the consumption-based approach 1990 baseline of 45.2 MMT CO₂e. The generation-based approach 1990 baseline is 45.4 MMT CO₂e.

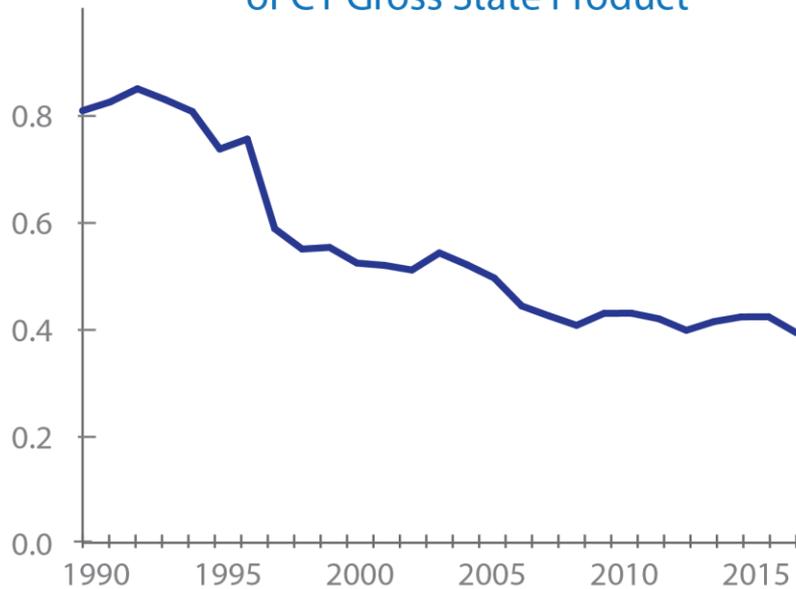


Sector Emissions 1990 - 2016

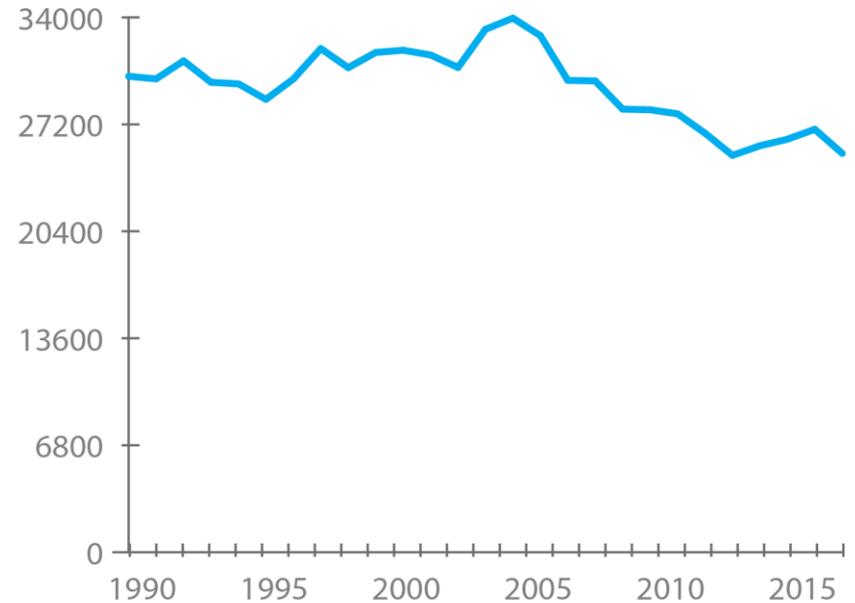


Emissions per GDP and Capita

Pounds of CO₂e per real \$ (2009)
of CT Gross State Product



Pounds of CO₂e Per Capita

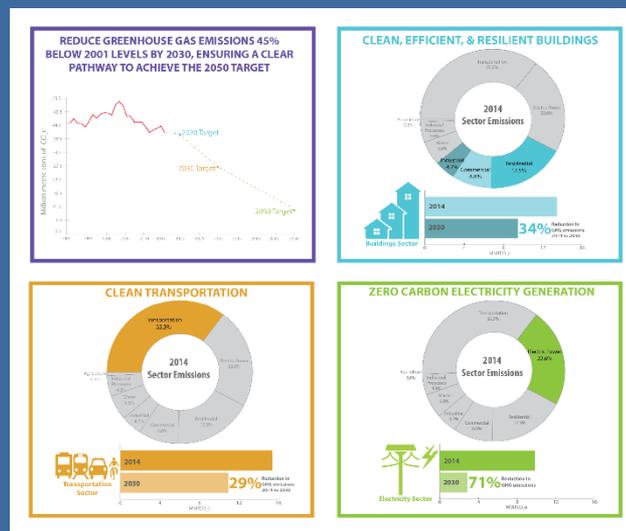


Review and finalize draft GHG mitigation recommendations report



Summary of Draft Report Updates

- ✓ Incorporated redline edits
- ✓ Updated the GHG inventory to include 2016 data
- ✓ Included a reference US Climate Impact Assessment report
- ✓ Updated cross-sector recommendations to include resiliency and adaptation, and education and outreach
- ✓ Updated VMT growth rate recommendation



CROSS SECTOR

| | | |
|---|---|--|
| Put a price on Carbon | Suite of Strategies | |
| | 1. Implement an economy-wide carbon fee that assesses the carbon content of fossil fuels and sets a price per ton of carbon emitted. | |
| | Emissions Reduction Impact | Implementation Entities |
| | HIGH | Governor, General Assembly, DRS, DEEP, OPM |
| Expand consumer education and awareness efforts to increase the uptake of zero- and low-carbon technology and resiliency measures | 2. Implement an economy-wide cap-and-invest program that sets a limit on carbon emissions and allows the market to determine a carbon price based on least-cost reduction measures. | |
| | Emissions Reduction Impact | Implementation Entities |
| | HIGH | Governor, General Assembly, DEEP |
| | 1. Increase visibility of EnergizeCT resources. | |
| | Emissions Reduction Impact | Implementation Entities |
| | LOW | DEEP, CT Green Bank, utilities administering C&LM Plan, CT Energy Efficiency Board |
| | 2. Enhance outreach efforts by using social media campaigns, webinars, case studies, testimonials, and the utilities' customer-engagement platforms. | |
| | Emissions Reduction Impact | Implementation Entities |
| | LOW | DEEP, CT Green Bank, utilities administering C&LM Plan, CT Energy Efficiency Board |
| | 3. Increase training of real-estate industry professionals on integrating U.S. DOE Home Energy Scores and information on energy efficiency, renewables, and resiliency into real-estate transactions processes. | |
| Emissions Reduction Impact | Implementation Entities | |
| LOW | DEEP, CT Green Bank, Multiple Listing Services, Real Estate Trade Organizations, utilities administering C&LM Plan, CT Energy Efficiency Board | |



CROSS SECTOR

Pursuing an integrated approach to GHG mitigation, adaptation, and resiliency

1. Prioritize opportunities for achieving synergies among actions that cut carbon pollution and prepare for the impacts of climate change.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--------------------------|
| HIGH | OPM, DEEP, DOT, DAS, DOI |

2. Ensure that state building codes and performance standards are coordinated to incorporate Insurance Institute for Business and Home Safety best practices for resiliency.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|----------------------------------|
| HIGH | Governor, General Assembly, DEEP |



ELECTRICITY SECTOR

Commit at least 50 megawatts of demand reduction per year to the ISO New England forward-capacity market

Suite of Strategies

1. Reduce electricity consumption by 1-2 million megawatt hours by replacing existing inefficient electric-resistance space- and water-heating equipment with high-efficiency renewable thermal technology (RTT). This reduction should be implemented through the Conservation and Load Management Plan and other efficiency-procurement strategies.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| HIGH | DEEP, utilities administering C&LM Plan, CT Energy Efficiency Board, CT Green Bank, installers |

2. Invest in electric measures that reduce peak demand such as exterior lighting, retail lighting, lighting in state buildings, and high efficiency refrigeration. These type of reductions should be implemented through the C&LM Plan and other efficiency-procurement strategies.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| HIGH | DEEP, utilities administering C&LM Plan, CT Energy Efficiency Board, CT Green Bank, installers |

1. Meet the RPS target of 40% by 2030, with an aim to reduce the carbon intensity of the RPS.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| HIGH | DEEP, renewable energy developers, CT Green Bank, PURA |

2. Ensure a transparent and predictable compensation framework to maintain at least the historical average deployment of 40-90 megawatts of additional residential behind-the-meter renewable energy resources per year.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| HIGH | DEEP, CT Green Bank, PURA, renewable energy developers |

3. Deploy at least 50 megawatts per year commercial distributed solar and 10 megawatts per year of fuel cells.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| HIGH | EDCs, DEEP, CT Green Bank, PURA, renewable energy developers |

Achieve at least 66% zero-carbon energy generation by 2030



ELECTRICITY SECTOR

Achieve at least 66% zero-carbon energy generation by 2030

4. Implement a shared clean energy program deploying at least 25 megawatts per year, with a focus on low- and moderate-income customers.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|---|
| HIGH | EDCs, DEEP, CT Green Bank, PURA, advocates, renewable energy developers |

5. Maintain in-state zero-carbon nuclear generation and develop a long-term zero-carbon replacement strategy equivalent to 2,100 megawatts.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|----------------------------------|
| HIGH | Governor, General Assembly, DEEP |

6. Exercise procurement authority for zero-carbon energy through competitive bidding processes that drive down prices.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|-------------------------|
| HIGH | DEEP, PURA |

Optimize grid-management strategies to reduce carbon emissions

1. Increase adoption of smart-management technologies to optimize flexibility of distributed energy resources.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|-------------------------|
| HIGH | PURA, EDCs |

2. Over the next 2-5 years, research and identify opportunities to integrate battery storage and distributed renewable energy technologies to displace carbon emissions.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|---------------------------------|
| HIGH | DEEP, PURA, CT Green Bank, EDCs |



TRANSPORTATION SECTOR

Maintain increasing fuel economy and low- and zero-emissions standards

Suite of Strategies

1. Maintain adherence to Corporate Average Fuel Economy (CAFE) and GHG emission standards mid-term review 2016 final determination.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| HIGH | Federal government, California Air Resources Board, DEEP |

2. Maintain adherence to California low- and zero-emission vehicle requirements.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| HIGH | Federal government, California Air Resources Board, DEEP |

Increase light-duty ZEV penetration rate to at least 20% by 2030

1. Implement price signals to incentivize EV adoption and reduce electric system impacts.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|-------------------------|
| HIGH | PURA, EDCs |

2. Expand EV charging network to ensure consumer confidence, reduce range anxiety, and ensure equitable access.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|----------------------------------|
| MEDIUM | DEEP, PURA, EDCs, private sector |

3. Develop a state fleet transportation Lead by Example program that sets annual emission reduction targets and enables increasing adoption of zero-emission vehicles.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|-------------------------|
| MEDIUM | DAS, DEEP, OPM |



TRANSPORTATION SECTOR

Advance initiatives that eliminate the rate of annual VMT growth by 2030

1. Implement transit-oriented development projects and adopt state policies and local zoning regulations that support walkable, mixed-use, and sustainable urban and suburban development in areas served by transit.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--------------------------------|
| MEDIUM | DOT, OPM, DECD, municipalities |

2. Encourage, incentivize, and support alternative modes and active transportation that reduce single-occupant vehicle driving.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--------------------------|
| LOW | DOT, OPM, municipalities |

Develop sustainable funding for transportation electrification and transportation infrastructure

1. Implement a multi-state cap-and-invest program that sets a limit on transportation sector emissions and reinvests program proceeds in measures that drive down emissions, provide benefits to citizens, protect existing transportation funding, generate sufficient additional funding to support transportation infrastructure and operation, and mitigate costs to consumers.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|----------------------------------|
| HIGH | Governor, General Assembly, DEEP |

2. Implement user-based transportation fees — market mechanisms to reduce traffic congestion and improve efficiency of travel for all drivers.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--------------------------------------|
| MEDIUM | Governor, General Assembly, DOT, OPM |



BUILDING SECTOR

Accelerate adoption of building thermal energy conservation improvements such as weatherization, insulation, efficient windows, and efficient HVAC

Suite of Strategies

1. Prioritize building envelope improvements and expand access to thermal energy-efficiency measures through innovative financing options for all income levels.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| HIGH | DEEP, utilities administering C&LM Plan, CT Energy Efficiency Board, CT Green Bank, Capital for Change, CHFA, DOH, DECD, DAS |

2. Ensure building codes are continuously aligned with the most recent International Energy Conservation Code standards.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|-------------------------|
| HIGH | FDAS, DEEP |

3. Track and reduce energy consumption and associated GHG emissions in state and municipal buildings, including setting Lead by Example targets for 2030.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|--|
| MEDIUM | DEEP, utilities administering C&LM Plan, CT Energy Efficiency Board, CT Green Bank, OPM, DAS, Sustainable CT, municipalities |

4. Review consistency of energy efficiency cost-effectiveness testing with public policy goals.

| Emissions Reduction Impact | Implementation Entities |
|----------------------------|---|
| MEDIUM | DEEP, CT Energy Efficiency Board, utilities administering C&LM Plan |



BUILDING SECTOR

Transition building fossil fuel thermal loads to efficient renewable thermal technologies

| 1. Develop sustainable funding mechanisms to incentivize replacement of fossil-fuel space and water heating with efficient RTTs. | |
|--|---|
| Emissions Reduction Impact | Implementation Entities |
| HIGH | Governor, General Assembly, DEEP, OPM, CT Green Bank |
| 2. Incentivize installation of RTTs in new construction. | |
| Emissions Reduction Impact | Implementation Entities |
| MEDIUM | DEEP, utilities administering C&LM Plan, CT Energy Efficiency Board, CT Green Bank, Housing Authorities |

Improve training and technical capacity of workforce

| 1. Expand training programs to include RTT installations and standards. | |
|---|---|
| Emissions Reduction Impact | Implementation Entities |
| MEDIUM | Industry trade organizations, utilities administering C&LM Plan, state colleges and universities, Department of Education/Technical High School System, manufacturers, NEEP |



Public Comments



Focus Public Comments On:

1. Which strategies do you feel should be prioritized?
2. Who are the key actors for implementation of this plan?
3. What is the best way to engage you and other stakeholders as we move to the implementation phase?

