Progress on Mitigation Strategies Working Group

Public Forum

Sept. 23, 2020

Overview of working group (slide 3)

Sectors

Buildings (slide 8)

Electricity (slide 23)

Transportation (slide 40)

Cross-sector (slide 53)

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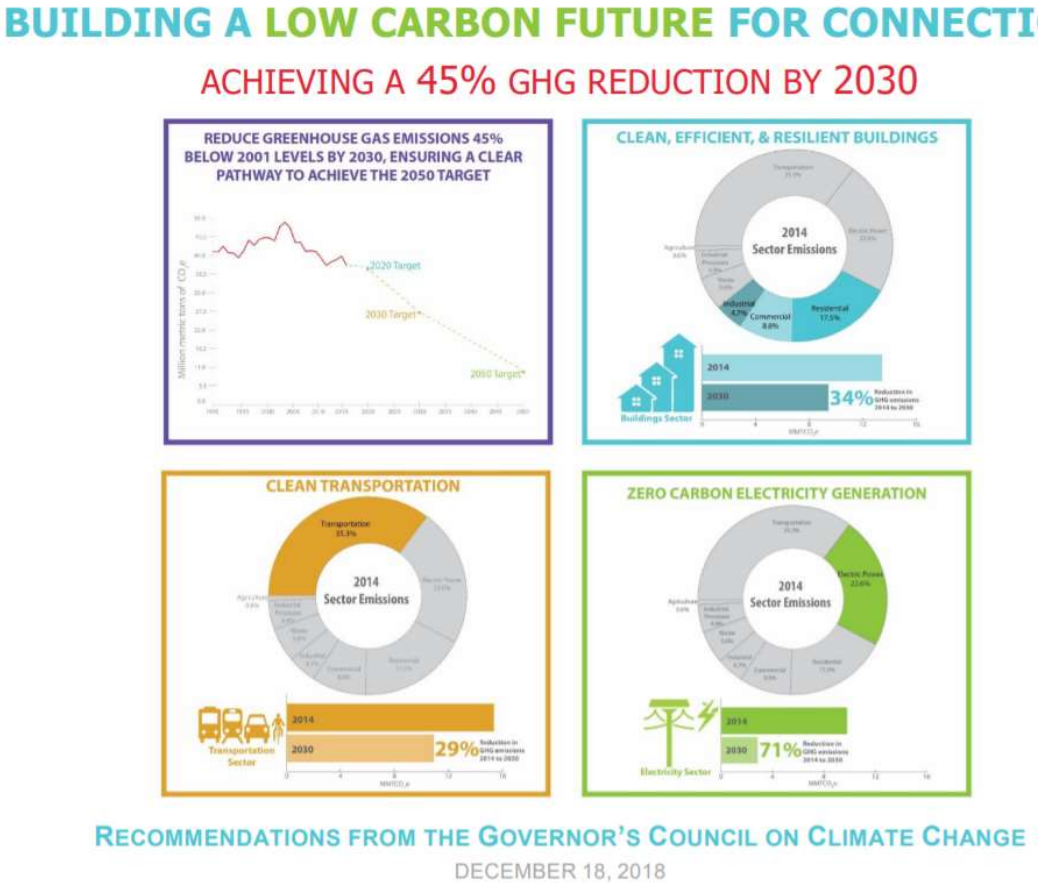
Overview of Progress on Mitigation Strategies Working Group

Sept. 23, 2020

Mission

- Assess progress in implementation of GC3's 2018 mitigation recommendations and strategies
- Identify additional strategies needed
- View through an equity and environmental justice lens
- Consider intersection of mitigation and adaptation



Members representing …

Patriquin Architects

CT Roundtable on Climate and Jobs

Transport Hartford Academy at the Center for Latino Progress

Save the Sound

Connecticut Green Bank

Stanley Black & Decker

GC3 Equity & Environmental Justice Working Group

CT Clean Water Fund / CT Energy Network

Pirie Associates

Metropolitan Council of Governments

Operation Fuel

CT Department of Transportation

Discovery Museum & Planetarium

United Illuminating

People's Action for Clean Energy

University of Connecticut

Eversource

Sierra Club

Met 6 times (February – August)

Teams

Sector	Chair	WG members	Other stakeholders	Meetings
Buildings	Bernie Pelletier, Peoples Action for Clean Energy	8	28	19
Electricity	Mike Li, DEEP Energy Bureau	5	16	5
Transportation	John Humphries/Aziz Dhekan, CT Roundtable on Climate & Jobs	7	12	9
Cross-sector	Charles Rothenberger, Save the Sound	8	14	16
Non-energy				

Draft Report of the Progress on Mitigation Strategies Working Group

Governor's Council on Climate Change

State of Connecticut

Link to PDF

September 2020

Buildings Team
of the
Mitigation Working Group

Draft Recommendations for
Governors Council on Climate Change

Public Forum Discussion

Discussion via Zoom
September 23, 2020 4 pm-6:30 pm

A broad-based approach

- Working group of activists, architects, utilities, academia, and the finance community. Staff support by DEEP.
- Other community members include municipal energy task force members, attorneys, builders, building scientists, neighborhood housing authorities
- Multiple perspectives and disciplines

Buildings and GHG mitigation

- Mitigation: reduce the amount of GHG from the building sector
- The first law of holes – if you find yourself in a hole, stop digging!
- Humanity produces more CO2 than it does ALL other materials combined. In 2019 the U.S. made 6.5 billion tons of "stuff" – in that same year we made 6.7 billion tons of CO2!

Outline of the report

- 4 Themes from 2018 report
  - Building efficiency
  - Consumer education
  - Renewable thermal technology
  - Workforce development
- 3 Responses to themes
  - Progress on the 2018 strategies
  - New and added strategies
  - 2020 new strategies
- 2 Lenses
  - Equity and environmental justice
  - Adaptation and resilience

Improve building efficiency

- Key recommendations:
  - Lockbox for efficiency funds
  - Deal with physical and legal barriers to EE
  - Proactive use of building codes
  - Continue "State Lead by Example"
  - Energy efficiency cost effectiveness test
  - Use a quantitative approach
  - Increase local control
  - Push hard on deeper energy retrofits

Building efficiency: Deeper dive

- Lockbox is financial and EEJ issue:
  - As the energy efficiency funds are collected they MUST be used to advance energy efficiency
- Fixing physical barriers and legal barriers to EE is crucial:
  - Now when the HES program encounters lead, mold, asbestos, vermiculite – it is limited on next steps (physical barrier)
  - Currently 1/3 of Connecticut (renters) find it difficult to use the energy efficiency programs (legal barrier)
  - Often the buildings with these problem barriers are the highest GHG producer (why EEJ makes moral and physical sense)
- Cost-effectiveness test is key to making the efficiency funds align with state policy (we need a financial chiropractor for an alignment).

Physical barriers to energy efficiency

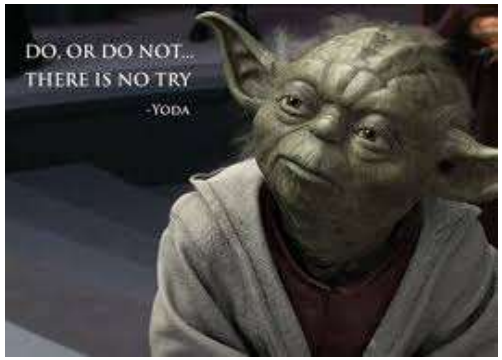
Loose asbestos prevents blower door testing

Mold signals other issues and prevents blower door testing

Improve consumer education

Key recommendations:

- Increase visibility of EnergizeCT resources
- Enhance outreach efforts
- Increase training of real estate industry on US DOE home energy Scores
- Develop a building performance office
- Create/enhance a "building concierge" function



Consumer education: Deeper dive

- Outreach efforts
  - PURA meetings and a more diverse EEB board are positive steps – but more work is needed to engage the LMI community. We must work for participation by those who need it most.
- Building Performance Office
  - A building performance office (BPO) integrates threads around EE. Currently the EEB administers utility programs – but a more holistic approach is required.
  - Electricity sector has PURA – Transportation sector has DOT – we need a central focus on buildings – "BPO"
- Building Concierge
  - Building concierge facilitates building owners efficiency progress over time. They would receive advice on incentives, tech options, efficiency options, order of operation (i.e. building shell before tech). Home Energy Solutions does some of this now but it can be expanded
  - Every investment in a home's roof – siding – windows – mechanicals - remodeling – is a chance to build back better – better health – better efficiency – better economy

Renewable Thermal Technology (RTT)

- Key recommendations:
  - Develop sustainable funding
  - New recommendation – delivered fuels (propane – oil) pay into efficiency fund
  - Engage local governments in education and outreach
  - Incentivize RTT in new construction
  - Develop a detailed plan to transition from fossil fuels (includes rec for use of biofuels)
  - Set end date for fossil fuel expansion and new installations
  - Focus on controls and interactivity with the grid

Renewable Thermal Technology – What is it?

There is a Better Way!

For thousands of years humankind has relied on fire to stay warm. Now there is a better way: Heat Pumps! These amazing devices allow us to heat in the winter and coolin the summer – something our ancestors would be jealous of.

Renewable thermal: Deeper dive

Sustainable funding:

- Heat Pump technology is widely deployed around the world. Here in CT we need to develop the market by supporting workforce training, and sustained incentive programs
- Proper deployment relies on a good thermal barrier in the building

Transition plan:

- A detailed transition plan coordinates the deployment of RTT with the build up of the electric sector (transmission and distribution) as well as greening the grid.

Workforce development for energy efficiency and RTT

- Key recommendations
  - Steady employment and funding is crucial (see Lockbox rec)
  - Integration with multiple programs (Department of Labor, LIHEAP, non profits) is crucial
  - At the very least we need to utilize all available Federal dollars (and not let them lapse unused)

Workforce: Deeper dive

Integration/ Coordination of multiple programs

- Home Energy Solutions (HES)
- Low Income Home Energy Assistance Program (LIHEAP)
- Weatherization Assistance Program
- Green and Healthy Homes (and other grant funded projects)

Goal: Steady Stream of work done by a steady stream of workers paid by a steady stream of funding. Key word: steady

More discussion in the breakout!

- Questions
- New ideas
- What did we get wrong?
- What did we miss?

Electricity Sector

September 23, 2020

Michael Li & Kate Donatelli, DEEP

GC3 Public Forum – Progress on Mitigation Strategies

Electricity Sector

- 21% of economy-wide greenhouse gas emissions in Connecticut
- 2018 GC3 Goal: 45% greenhouse gas reductions by 2030
- For the electricity sector, this means reducing emissions 71% below 2014 levels

What's changed since 2018?

Since 2018, several developments warranted a reexamination of the GC3 report, including:

- Executive Order No. 3 directs DEEP and PURA to "analyze pathways for achieving a 100 percent zero-carbon target for the electricity sector by 2040."
- Multiple competitive procurements for zero-carbon resources and legislation authorizing DEEP to procure up to 2,000 MW of offshore wind
- Increased electrification of the buildings and transportation sectors
- Increased focus on issues of equity and environmental justice
- Growing need to adapt and prepare the electricity sector for the stressors of climate change

Adaptation and Resilience

The electricity system is already facing stressors of climate change, including:

- Extreme weather events
- Sea level rise
- Increased strain on energy grids

Adaptation and resilience strategies:

- Securing and strengthening infrastructure: retaining walls, flood prevention techniques, underground wiring (where feasible)
- Proactive management: trimming tree limbs along transmission paths
- Grid upgrades and improvements: grid-integrated buildings, micro-grids, smart grids

Equity and Environmental Justice

DEEP is committed to ensuring an equitable and just transition to a zero-carbon future.

- LMI and minority communities are disproportionately affected by electricity generation
- These communities endure a range of negative impacts without necessarily experiencing the benefits of electrification zero carbon energy

The Electricity Working Group evaluated its recommendations and strategies from an EEJ lens and made corresponding suggestions for improvements.

Electricity Sector Recommendations

The 2018 GC3 report included three broad recommendations for the electricity sector:

1. Commit at least 50 megawatts of demand reduction per year to the ISO-New England forward capacity market.
2. Achieve at least 66% zero-carbon electricity generation by 2030.
3. Optimize grid management strategies to reduce carbon emissions.

Recommendation: Commit at least 50 megawatts of demand reduction per year to the ISO-NE forward capacity market.

- Energy efficiency measures flatten demand, relieve pressure on the grid, and minimize peak periods of carbon-intensive power generation
- Connecticut expects to eliminate growth in peak demand over the next 10 years by decreasing peak demand by 0.4% annually
- The ISO-New England Forward Capacity Market allows energy efficiency resources to be bid into annual auctions
- Forward Capacity Market payments are re-invested in Connecticut's Conservation and Load Management programs

Recommendation: Commit at least 50 megawatts of demand reduction per year to the ISO-NE forward capacity market.

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
2. Invest in electric measures that reduce peak demand such as exterior lighting, retail lighting, lighting in state buildings, and high-efficiency refrigeration
3. (New) Utilize battery storage as a peak demand reduction and load flexibility strategy

Recommendation: Commit at least 50 megawatts of demand reduction per year to the ISO-NE forward capacity market.

Progress:

- Compliance order in 2020 C&LM plan regarding replacement of electric resistance heating
- Compliance order on heat pump water heater data collection
- Increased incentives for ground and air source heat pumps
- Directives for utilities to develop strategies for increasing adoption of heat pumps, smart thermostats, etc.
- DEEP/PURA Value of Distributed Energy Resources study

Equity and Environmental Justice

- Track C&LM incentives by race/ethnicity
- DEEP Equitable Energy Efficiency proceeding

Recommendation: Achieve at least 66 percent zero-carbon electricity generation by 2030.

- Executive Order No. 3 directs DEEP, in consultation with PURA, to analyze pathways and strategies for achieving 100% zero-carbon generation by 2040
- As building and transportation sectors electrify, it is imperative that the electric supply reduce its carbon footprint
- The 2020 Integrated Resources Plan will be released in fall 2020

Recommendation: Achieve at least 66 percent zero-carbon electricity generation by 2030.

Strategies:

1. Meet the RPS target of 40 percent Class I renewable energy sources by 2030, with an aim to reduce the carbon intensity of the RPS
2. Ensure a transparent and predictable compensation framework to maintain at least the historical annual average 40-90 megawatts of residential behind-the-meter renewable energy resources
3. Deploy at least 50 megawatts per year of larger distributed solar and 10 megawatts per year of distributed fuel cells, with optimum utilization of available siting locations.
4. Maintain in-state zero-carbon nuclear generation and develop a long-term zero-carbon replacement strategy equivalent to 2100 megawatts

Recommendation: Achieve at least 66 percent zero-carbon electricity generation by 2030.

Strategies (continued):

5. Implement a shared clean energy program deploying at least 25 megawatts per year, with a focus on low- and moderate-income customers
6. Exercise procurement authority for zero-carbon energy through competitive bidding processes that drive down prices
7. (New) Establish clear targets for off-shore wind procurement – in concert with IRP recommendations and in balance with other renewable energy sources – to foster its significant potential to help meet zero-carbon goals
8. (New) Address the role of new transmission or transmission constraints

Recommendation: Achieve at least 66 percent zero-carbon electricity generation by 2030.

Progress:

- 2020 Integrated Resources Plan will evaluate pathways to meet and exceed this target
- Connecticut is on track to meet the 2030 RPS goal of 40% Class I renewables
- PURA initiated successor tariff proceeding in July 2020
- Public Act 19-35 extended net metering and the Residential Solar Incentive Program (RSIP) and extended LREC/ZREC Program by $8 million per year through 2021
- Public Act 18-50 created new auction opportunity for larger distributed generation
- PURA approved the Shared Clean Energy Facilities Program (SCEF) in 2019 with enrollment requirements for low-income customers
- Connecticut procured three offshore wind projects totaling 1,108 MW (19% of state EDC load)
- Public Act 19-71 mandates the procurement of offshore wind projects up to 2,000 MW by 2030

Recommendation: Achieve at least 66 percent zero-carbon electricity generation by 2030.

Equity and Environmental Justice:

- Ensure equitable deployment of successor tariff
- Address financial, legal, and logistical barriers to distributed energy resources
- Use SCEF subscribership goals to deploy resources in the areas of greatest need
- Offshore wind and development and supply chains offer economic development opportunity for port cities like New London and Bridgeport
- Develop a long-term economic development and job creation plan for offshore wind that benefits local workers

Recommendation: Optimize grid management strategies to reduce carbon emissions

Strategies:

1. Increase adoption of smart-management technologies to optimize flexibility of distributed energy resources
2. Over the next 2-5 years, research and identify opportunities to integrate battery storage and distributed renewable energy technologies to reduce and displace carbon emissions
3. (New) Reduce petroleum use by power plants needed to serve winter peak demand
4. (New) Identify ways to increase local involvement in energy decision-making such as targeting energy efficiency dollars based on local priorities and increasing local governments' ability to procure zero-carbon energy

Recommendation: Optimize grid management strategies to reduce carbon emissions

Progress:

- PURA is in phase three of its investigation into Distribution System Planning of the Electric Distribution Companies (Docket 17-12-03)
- Increased demand and technological improvements have reduced the cost of battery storage by 87% from 2010-2019
- 2019-2021 Conservation and Load Management Plan allows utilities to incentivize storage in demand response programs
- PURA Docket 17-12-03 includes RFPs for statewide storage incentive programs
- H.B. 5351 (2020) would establish a 1,000 MW target for behind-the-meter storage by 2030
- PURA recently launched a Community Choice Aggregation (CCA) study

Equity and Environmental Justice:

- Fossil fuel power plants disproportionately burden low-income communities and people of color
- Grid management strategies can reduce reliance on more polluting “peaker” power plants
- Adress the financial and logistical barriers to accessing battery technology
- CCAs would remove the need for customers to host a renewable energy resource on site

Questions?

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GC3 Mitigation Working Group

Transportation Sector Team

Presented by:

A. Cherolis, Transport Hartford Coordinator at the Center for Latino Progress

Presentation for/Discussion with:

Public Forum Reviewing DRAFT Mitigation Report

September 23rd, 2020

Equity & EJ Overview

- Communities bearing greatest public health impact from emissions must be prioritized for benefits from a clean transportation system
- Low- and moderate-income (LMI) households spend a greater share of income on transportation. Many cannot afford vehicle ownership.
- An equitable approach to emissions reduction must look beyond electric cars

Equity & EJ Overview (cont.)

- Prioritize investments in active transportation (walking and biking) and transit
- Address safety concerns for pedestrians, bicyclists, and other vulnerable users
- Expanding access to zero emission vehicles in LMI communities will require intentional policies (car share, ride share, e-bikes)

Four “Themes” from 2018

1. Increasing fuel economy standards
2. Increase zero emission vehicles as a percentage of fleet (>20% by 2030)
3. Eliminate annual growth of vehicle miles traveled (VMT) by 2030
4. Sustainable funding for electrification and transit infrastructure

(1) Increasing Fuel Economy Standards

Status - Progress on light-duty vehicles hindered by concerted federal action to roll back policies; CT has joined other states in formal opposition to the changes

New 2020 Recommendation:

- Establish emissions standards for medium- and heavy-duty vehicles, including school buses.

(2) Increase ZEV penetration rate

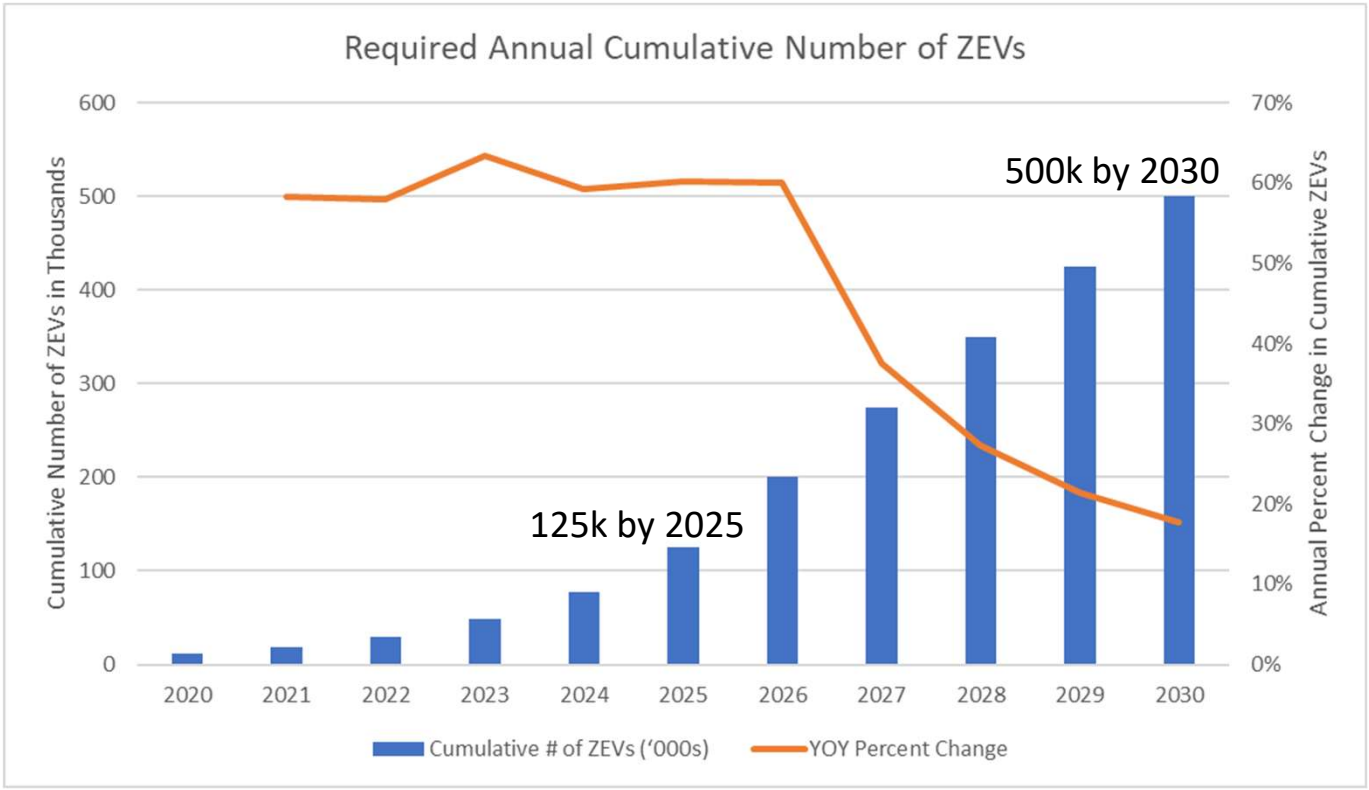

Chart from the 2018 GC3 Report

(2) Increase ZEV penetration rate: Equity Considerations

- **Starting 1st Quarter 2021 –** Increased EV rebate level for LMI households and an LMI rebate on the purchase of a used EV
- **New incentives proposed:** private fleets, e-motorcycles, e-bikes, e-scooters
- **Lead by Example program:** Increasing the ZEVs in the state fleet should prioritize fleet vehicles that operate in LMI and EJ communities

(2) Increase the Percentage of ZEVs: Equity Considerations

Establish statewide goals for zero-emission medium- and heavy-duty trucks and for school transportation

- **Existing target:** 30% of transit buses ZEV by 2030

New 2020 Recommendations

- New MOU on trucks (30% sales by 2030; 100% by 2050)
- ZEV school buses (50% by 2030)

(3) Eliminate VMT Growth by 2030

Status / Progress

- Transit Oriented Development and Land Use Policy Reform
- Investments in frequent and convenient transit and commuter rail

New 2020 Recommendations

- Set a statewide goal to REDUCE Vehicle Miles Traveled at least 5% by 2030
- Transit Benefit, Parking Cash-Out and Telecommuting for State and Municipal Employees
- Expand U-Pass to private colleges and universities, and beyond that to employers and institutions
- COVID-19 recovery plans to revitalize transit and transit ridership

(4) Funding for Electrification, Transit, and Active Transportation Infrastructure

- Multi-state cap-and-invest program: **Transportation and Climate Initiative**

New 2020 Recommendation

- 100% of greenhouse gas reduction consumer fees should go to emissions reduction
- Remove the legislative prohibition on exploring a mileage-based user fee

Reduce the number of vehicles on the road

New 2020 Recommendation (with equity benefit)

- Explore car-share options for municipal and state fleets that are rentable evenings, weekends, and holidays by residents
- Expand ZEV rebate programs beyond resource intensive and expensive EV cars

Equity Impact – Four cities in Connecticut have a high percentage of zero-car households. Expanded car-share provides additional mobility options for those households, reducing the need for individual car ownership.

Reduce Emissions from Freight and Shipping

New 2020 Recommendations

- Previously mentioned medium and heavy-duty zero emission vehicle MOU
- Reduce shipping tonnage from the waste sector (increase local composting and reduce packaging waste)
- Seek opportunities to shift freight from trucks to rail and ports

Want to get into the details, ask questions, and share your thoughts?

Join the Transportation Break Out Session

Cross-Sector

September 23, 2020

Policy Themes

2018 Report Themes

1. Carbon Pricing
2. Education & Outreach
3. Integrating GHG Mitigation, Adaptation & Resiliency

2020 Theme

4. Increasing Consideration of GHG Reduction Goals in State Decision-Making

Theme 1: Carbon Pricing

Recommendations From 2018 Report:

- Economy-Wide Carbon Fee
- Economy-Wide Cap & Invest Program

Progress/Status:

- No Economy-Wide Program in the U.S.
- Regional Greenhouse Gas Initiative (RGGI)
- Transportation & Climate Initiative (TCI)

Enhancements:

- Explore establishing a uniform economy-wide carbon pricing system
- Address Building Sector GHGs Through a Carbon-Based Fee

EEJ Factors – Carbon Pricing

- Regardless of whether a jurisdiction adopts a straight carbon fee or a cap-and-trade system, both approaches have the opportunity to exacerbate or ameliorate impacts on low and moderate income communities.

- Ensure that the revenues generated are invested in programs that reduce the pollution burden on low and moderate income communities and address any potential adverse economic impacts of the program.

Theme 2: Education & Outreach

Recommendations From 2018 Report:

- Enhance outreach efforts by using social media campaigns, webinars, case studies, testimonials, and customer engagement platforms.

Progress/Status:

- COVID-19 pandemic has necessitated a focus on remote work and meetings and many organizations have ramped up on-line webinars and educational efforts.
- DEEP has hosted new broad stakeholder meetings, as well as moving long-standing regular meeting to these online platforms (including the GC3).

Enhancements: Conduct Outreach on Climate Action – Next Slide

Theme 2: Education & Outreach

Enhancements: Conduct Outreach on Climate Action Plan

- Conduct Outreach on Climate Action Plan
  - Public participation should be focused on the selection of criteria important to the community and coordinated with the definition of an environmental justice (EJ) index proposed by the Equity and EJ workgroup.
  - These criteria should then be incorporated into any regulatory or agency decision process that requires a cost benefit analysis to ensure adequate consideration of co- benefits relevant to equity and EJ priorities.

- Create a DEEP staff position to help coordinate an outreach effort with key non- profit and neighborhood organizations to develop an effective communication plan to clearly link climate actions to the quality of life issues important to disadvantaged and EJ communities.

- CT DEEP should partner with the Department of Economic and Community Development (DECD) to build a civic infrastructure in priority EJ communities to enable the residents to more effectively advocate for their interests.

EEJ Factors – Education & Outreach

- Communication needs to be a discussion with communities and stakeholders – not a lecture.
- Take the time to ask about local problems and concerns in order to identify what polices will be most meaningful to a particular community.
- Do a better of job of communicating local and immediate benefits that communities could enjoy from the implementation of specific climate policies.
- Tailor outreach efforts to the needs of the community with respect to the medium used.
- Once social distancing requirements are relaxed, it may be that in some circumstances in-person meetings may be more effective if there are barriers to access on-line meeting platforms.

Theme 3: Integrating GHG Mitigation, Adaptation & Resiliency (MAR)

Recommendations From 2018 Report:

- Prioritize Opportunities for Achieving Synergies Among Actions that Cut Carbon Pollution and Prepare for the Impacts of Climate Change.

Progress/Status:

- Dedicated Adaptation & Resiliency Working Group.
- Established a framework for coordination between the Mitigation WG and the Adaptation Planning and Implementation WG.

Enhancements:

- In developing mitigation recommendations, policymakers should recognize ways in which mitigation and adaptation interact – both synergistically and antagonistically – in the short- and medium-term.
  - Prioritize mitigation options that materially enhance adaptation.
  - When feasible, steer away from mitigation options that run counter to the needs of adaptation.
  - Improve awareness of unavoidable tensions between mitigation and adaptation.

EEJ Factors - MAR

- The impacts of climate change on health and health inequities are moderated by individual and community vulnerability and resilience.
- Interventions that improve the social determinants of health and population health and reduce health inequities can significantly reduce vulnerability and increase resilience to climate change, at the individual and community-levels.
- Increasing resilience to climate change will require investing significantly in the public sphere, including in social determinants of health and in public health infrastructure.
- Many climate actions bring significant health co-benefits, but some may have adverse health consequences and/or increase health inequities.
  - Some health interventions also have climate co-benefits.
  - Thoughtful implementation of actions to reduce greenhouse gas emissions and adapt to climate impacts will help maximize co-benefits and minimize co-harms.

• Theme 4: Increasing Consideration of GHG Reduction Goals in State Decision-Making

Policies:

- Require that all state action be evaluated for consistency with meeting the greenhouse gas reduction targets set forth in the Global Warming Solutions Act (Conn. Gen. Stat. Sec. 22a-200a et seq.) and Governor Lamont's Executive Order No. 3.

- Ensure that Regulatory Programs Include Accounting for the Health and Social Cost Impacts, Including Co-Benefits Associated with Non-CO2 Pollutants.

- Where Appropriate, Adopt Supplemental Lifecycle GHG Accounting Metrics.

- Encourage and Facilitate Energy-Focused Partnerships Among our Regional Councils of Government and Their Member Municipalities, Sustainable CT and Other NGOs to Enable and Align the Quantitative Measurement Of Progress Around the Reduction Of GHG Emissions, Using a State-Wide Standard Tool.

• EEJ - GHG Decision-Making

- As we ramp up the investment in zero-carbon technologies, we must ensure that appropriate metrics are being applied that value the full range of societal benefits delivered by such technologies, including environmental and health benefits, in addition to those direct benefits that may be ascribed to the energy system itself, such as improved resilience.

- Accounting for the public health, environmental, and economic benefits of reducing these non-CO2 pollutants should be a factor in regulatory decision-making.

- New ways to measure and report on work that improves the environmental protection and environmental justice that are inherent in our work to reduce GHG emissions at the local level would facilitate the state's ability to measure actual progress in a more granular and timely way.

Non-energy

September 23, 2020

Policy Themes

2018 Report Themes

1. Implementing U.S. Climate Alliance SLCP Strategies
2. Natural & Working Lands

2020 Themes

3. Planning & Development
4. Waste Management

• Theme 1: Implementing U.S. Climate Alliance SLCP Strategies

Key recommendations From 2018 Report:

- Develop Regulations to Reduce Methane Emissions in the Gas Sector.
- Reduce Methane Emission from the Agriculture.
- Develop Regulations for Hydrofluorocarbons .

Progress/Status:

- CT is a member of the US Climate Alliance and has accepted the Roadmap Challenge to address SLCPs.
- The administration has advanced legislation regarding the schedule for repair and replacement of gas infrastructure, for anaerobic digestion facilities that produce biogas of a quality suitable for injection into the natural gas distribution system, and has promulgated regulations enhancing identification of environmentally significant leaks.

Enhancements:

- Cap Fugitive Emissions from Natural Gas Distribution and establish a declining emissions limit.

• Regulations for Hydroflourocarbons

Recommendations:

- Adopt state level requirements prohibiting the sale of specific HFCs when a low/no GWP alternative becomes available on the market and is applicable to the HFCs' refrigeration and air conditioning equipment and use.
- Develop state or utility incentive programs that encourage the adoption of lower GWP HFC replacements.
- Include requirements for the acquisition of low/no GWP refrigeration systems in state procurement rules governing new and replacement refrigeration and air conditioning systems.
- Leverage the success of our utility-based energy efficiency technical support programs, and make available to Connecticut businesses and residents information about HFC replacement and management.

• Theme 2: Natural & Working Lands

Key recommendations From 2018 Report:

- Develop Markets for Beneficial Use of [Wood and] Woody Waste.
- Work with Land Trusts, Forest Owners, and Working Lands Managers to Help Adopt Carbon Accounting Methodologies That Further Support Sustainable Land-Use Practices.

Progress/Status:

- Connecticut's forest products and forest recreation industries produce an annual gross output of $3.38 billion and almost 13,000 jobs.

Enhancements:

- CT's Green Plan should place a higher priority on protecting properties that provide maximum opportunities for CO2 sequestration and storage.
- Updating Connecticut's land protection priorities will allow Connecticut to invest, through the Open Space and Watershed Land Acquisition (OSWA) program, in properties that will have the highest impact on mitigating GHG emissions.

EEJ Factors – Natural & Working Lands

Trees in urban areas can improve air and water quality, mitigate the heat island effect, and help alleviate noise. Residential and urban trees and forests also shade and cool buildings in summer and insulate them in winter, which significantly reduces energy use (and costs) of air conditioning and heating. And, generally, forests provide excellent recreational opportunities for all of Connecticut's residents.

Urban community gardens can provide youth engagement and educational opportunities, as well as providing a source of nutritious natural foods in communities where access may otherwise be limited.

New Non-Energy Policies

Theme 3: Planning & Development

- Establish Plans of Conservation & Development as Sustainability Plans.
- Urban and Suburban Tree Planting.

• Establish Plans of Conservation & Development as Sustainability Plans

- Build on POCD Growth Management Principle #6 (integrated planning across levels of government).
- Revise the statutes to establish a new 7th growth principle devoted exclusively to climate change and health and safety.
- Establish a standardized format for reporting inconsistencies between local plans and the regional plan.
- Enhance performance indicators for measuring progress. Data-tracking that shows how well the goals of sustainable development are being met should be added and highlighted in a town-by-town format..
- Consideration should also be given to aligning these measures with the EJ index proposed by the Equity and EJ workgroup.
- Establish a statewide working group to develop better templates and actionable recommendations for sustainable development, and to create succinct guidelines for state-of-the-art energy management for regional and municipal POCDs. These should be incorporated into the state's POCD.

• Urban & Suburban Tree planting

- Connecticut is a heavily urbanized state. 36.4 % of the land area of the state is urban (1.13 million acres), with 87.7% of the population, nearly 3 million people, living in these urban areas.
- Despite the high population concentration in these areas, these same lands have a fairly high degree of tree cover, with tree canopy cover estimated at nearly 50%.
- Because of higher light levels and reduced competition from other trees, edge forests and residential and urban treescapes typically contain larger trees, on average, and therefore store more carbon per tree or area of forest than do interior forests and trees.
- Hence their climate mitigation value is disproportionately large and should be reflected in the level of protection that they are afforded.
- Residential and urban trees and forests also shade and cool buildings in summer and insulate them in winter, which significantly reduces energy levels of air conditioning and heating fuel and associated carbon emissions.

New Non-Energy Policies

Theme 4: Waste Management:

- Develop a long-term plan for sustainable materials management should address the full life cycle and a broad range of environmental concerns.

• Develop Long-Term Waste Management Plan

- Proposed construction, modification, or expansion of any solid/sewage waste disposal facility should be required to conduct a cost- benefit analysis that includes all relevant social, environmental, and economic aspects. The project should include host community benefits that are commensurate with the uncompensated social and environmental costs.
- Waste management goals should be set to minimize the residues sent for final disposal rather than based on diversion rates.
- The waste hierarchy should be modified to drive efforts to first reduce the amount generated, recover useful materials, recover fuels in solid, liquid or gaseous form, recover heat, and finally as last resort combust to generate electricity or landfill.
- A disposal tax based on an estimate of the GHG emissions of the final disposal process should be imposed to fund incentives for a more sustainable waste management system.
- The CT Academy of Science and Engineering should be commissioned to study the materials imports and exports and develop options for a more circular economy in CT.
- CT should conduct a study of alternative waste disposal solutions. Any evaluation of technology options should be conducted by an independent third-party entity.

EEJ Factors – Non-Energy Policies

- Aligning sustainable development goals with the Environmental Justice Index proposed by the EEJ WG.

- Urban trees and other natural systems provide a range of physical health benefits, including improving air and water quality, mitigating the heat island effect, and helping alleviate noise.
  - Trees can shield people from ultraviolet (UV) radiation, the cause or contributing factor for three types of skin cancer.
  - Trees also help reduce flooding by slowing rainwater runoff.

- Over the past few years, there has been little progress in reducing the amount of waste generated or recovery of materials for recycling.

- Waste facilities present significant environmental justice issues and the health impacts of other pollutants can be of greater concern than future climate impacts to communities.

  - For example, the large incinerators in Bridgeport and Hartford impose significant environmental damage and health impacts on poor urban communities of color.