IMPACT 2045

A climate action and equity plan for New Haven County

SCRCOG
SOUTH CENTRAL REGIONAL COUNCIL OF GOVERNMENTS

NVCOG

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Camille Barchers, AICP, Assistant Professor of Regional Planning
Tatum Thomas, Teaching Assistant, Department of Landscape Architecture and Regional Planning

Prepared by the UMass Amherst Regional Planning Studio
Leahna Agustin / Dan Deutsch / Samikshya Dhami / Janelle Franklin / Helen Harrison / Emily Hodos
Hunza Irfan / Lydia Jankowski / Joe Mega / Swetha Hiranya Venuturupalli

With support from **NARSLAB**
Jimi Oke, Assistant Professor of Civil and Environmental Engineering
Peiyao Zhao, Graduate Research Assistant, Department of Civil and Environmental Engineering

In coordination with,

SCRCOG SOUTH CENTRAL REGIONAL COUNCIL OF GOVERNMENTS
Planning for Our Region's Future

NAUGATUCK VALLEY COUNCIL of GOVERNMENTS

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I. Executive Summary

Introduction

New Haven County's Priority Climate Action Plan, Impact 2045, is led by Connecticut's South Central Regional Council of Governments, with support from the Naugatuck Valley Council of Governments.

This plan has been created under the Climate Pollution Reduction Grant program, authorized under the Inflation Reduction Act. It focuses on mitigation measures, although adaptation measures may appear as co-benefits.

The mission of Impact 2045 is to create pathways to an equitable climate future and to improve the quality of life for all in New Haven County.

The Climate Pollution Reduction Grant (CPRG) is a major federal program designed to significantly reduce greenhouse gas emissions through local actions in multiple metropolitan areas throughout the United States. The South Central Regional Council of Governments (SCRCOG) received a grant from this program to create a Priority Climate Action Plan (PCAP) for the New Haven-Milford Metropolitan Statistical Area, which encompasses New Haven County, Connecticut.

New Haven County is served by two Councils of Governments (COGs): SCRCOG, the lead agency on this project, and the Naugatuck Valley Council of Governments (NVCOG). The success of this plan will require close collaboration between the two COGs, as well as agencies and municipalities throughout the region. This PCAP will serve as a resource for municipalities, COGs, and other entities seeking grant funding to implement near-term, high-impact mitigation strategies. It will be submitted to the Environmental Protection Agency (EPA) for review in March 2024 after public feedback has been incorporated.

The Need for a Priority Climate Action Plan

Climate change is caused by the emission of greenhouse gases (GHG) from human activities such as electricity production, transportation, residential heating and cooling, industrial processes, and land-use change. These gases, such as carbon dioxide and methane, trap heat as it is reflected out of the Earth's atmosphere in a process called the greenhouse effect (IPCC, 2022). While the existence of the process is natural, its acceleration due to human activities is the major driver behind rising atmospheric temperatures (2022). In turn, this affects sea levels, extreme weather events, precipitation and temperature trends, and ecological systems (2022).

Impacts of climate change:

- Increased extreme weather events such as tropical cyclones
- Extreme and irregular precipitation patterns
- Droughts
- Extreme heat days
- Water, foodborne, and vector-borne illness
- Ocean acidification
- Biodiversity loss and altered ecosystems

Human exposure to these impacts can lead to loss of life and property, damage to infrastructure, crop loss, and general decreases in human welfare, including physical and psychological harm (IPCC, 2023). Climate change may also impact economic and political stability in certain regions (2023), straining global systems and increasing the risk of conflict. Across all impacts, people may also suffer an increased risk of internal and external displacement, spurring migration to other areas not as impacted by climate change hazards.




While climate change exists on a global scale, the importance of reducing emissions at the municipal and regional level cannot be understated. This effort will require regions to work simultaneously to reduce emissions, as in the CRPG program, to achieve the reductions that are needed to curb global warming.

Cities are at the center of climate action; they not only produce the most GHG emissions but are also home to the populations most impacted by climate change. The CPRG program equips cities and their surrounding dependent communities (i.e., Metropolitan Statistical Areas) with the ability to address this global issue by strategically planning for climate mitigation through a Priority Climate Action Plan (PCAP).

The PCAP provides a focused list of near-term, high-priority, implementation-ready measures to reduce climate pollution from GHG emissions. Additionally, the plan aims to provide 40% of the benefits of these measures to low-income and disadvantaged communities (LIDACs) under the Justice40 initiative. As required by the Environmental Protection Agency, this PCAP contains:

- A GHG Inventory
- Quantified GHG reduction measures
- Low-income and disadvantaged communities (LIDAC) benefits analysis
- A review of authority to implement

The PCAP also provides a further layer of analysis through scenario planning, uses an expanded definition of LIDACs to include more vulnerable communities, and includes a public engagement strategy for the forthcoming Comprehensive Climate Action Plan.

How to use this document

This plan outlines mitigation strategies for the following six sectors:

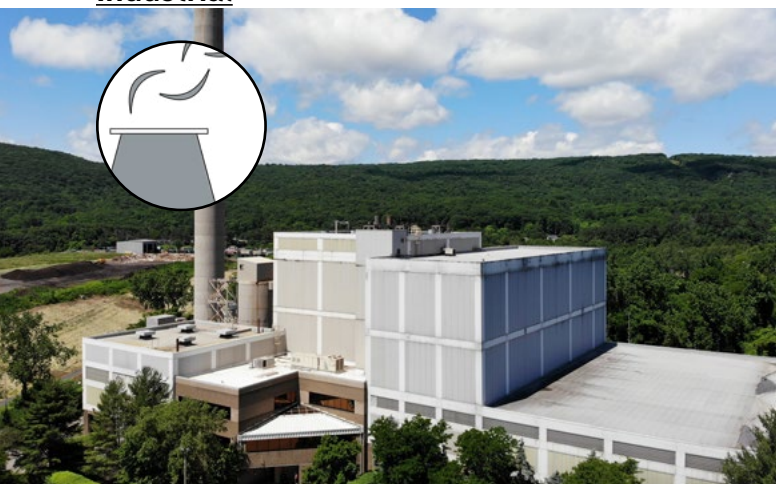
Mobility & Transportation

Electricity Production & Consumption

Energy Efficiency in Buildings

Waste Management

Industrial



Working Lands & Forestry

Each sector chapter contains a set of specific goals. These represent the different possible focus areas and approaches to achieve emission reduction targets.

Transportation	Goal 1: A clean and green municipal fleet
	Goal 2: Create a transit first approach and reduce spatial misalignment
	Goal 3: Reduce emissions from private vehicles
Electricity Production & Consumption	Goal 1: Reduce electricity consumption from fossil fuel sources in municipal buildings and services
	Goal 2: Increase renewable energy production and consumption at the local scale
	Goal 3: Prepare local economies for renewable energy transition
Energy Efficiency in Buildings	Goal 1: Ensure energy efficiency and sustainability through building codes and regulations
	Goal 2: Renewable heating access for low-income homes
	Goal 3: Energy Efficient Building Materials and retrofits
Industrial	Goal 1: Improve emissions monitoring, accounting and reporting
	Goal 2: Reduce emissions through low-carbon procurement
	Goal 3: Reduce emissions from the health care sector
Waste Management	Goal 1: Divert waste via local and regional programs
	Goal 2: Enact and expand statewide waste-reduction laws
Working Lands & Forestry	Goal 1: Preserve and support existing and potential forested lands
	Goal 2: Increase urban tree canopy and agriculture (UTC)

Table 1: List of Goals and Strategies

Each sector chapter contains a discussion of its emissions contribution, relevance, and regional context, highlighting the key issues and possible leverage points. This is followed by a complete list of recommendations. As shown in the example here, the outcomes of these recommendations were tested against different indicators to identify priority strategies.

Goal 1: Preserve and support existing and potential forested lands						
Strategy	Est. GHG reductions	Percent Change in Tree Canopy	Reduction in PM2.5	Workforce Development	Authority to Implement	Cost to Implement
L.1 Pursue afforestation and reforestation throughout county					State, Regional	$$$
L.2 Support current efforts and management strategies to maintain existing forests on both private and public property.					Local, Regional, State	$

Strong impact | Moderate impact | Positive impact | Negative impact

The priority strategies that emerged from the process mentioned above are then discussed individually. Each strategy discussion contains a table, as shown below, with expected direct benefits and co-benefits from the implementation of the recommended measure. The table, which is a part of the required LIDAC benefits analysis, also highlights the LIDAC areas that will be impacted.

Census tracts and blocks impacted: Identified LIDACs; Communities with below 40% tree cover

Direct benefits	Co-benefits
GHG emissions sequestered	Lower energy usage and associated costs
Reduction in PM2.5	Percent change in urban tree canopy
Reduced flood risk due to stormwater control	New green space and community beautification
	Improved quality of life
	Improved public health
	Increased resilience through climate change adaptation
	Reduced noise pollution due to acoustic dampening effect of trees

Testing the robustness of recommended strategies:

Priority strategies were analyzed against these three possible scenarios to test their robustness. These scenarios included

- Fossil Free Future
- Coping with the Gridlock
- The Watershed Moment

You can learn more about the process, the analysis and what each of these futures look like here.

Public engagement

Meaningful public engagement will support successful implementation of PCAP strategies. This document includes a public engagement strategy and complementary toolkit that SCRCOG and partners can deploy into the future. This plan's public engagement strategy aims to work with residents and stakeholders to identify their needs and shape mitigation strategies specific to the region and its communities, particularly low-income and disadvantaged communities.

You can learn more about the public engagement strategy here or on the website. Residents of New Haven County are also encouraged to visit the website and take the survey. Public feedback is integral to the planning process and will be utilized during multiple stages of this project.

How can you engage?

This PCAP focuses on actions at the municipal, regional, and state levels. Each sector chapter includes a list of strategies and the appropriate scale of implementation. Whether you are a concerned individual, or part of a community organization, local government, or regional planning organization, this document provides strategies you can advocate for, plan and implement. The sector chapters also highlight how these may best suit your needs and the existing resources available to implement these strategies.

You can also watch all PCAP public presentations on the website. You might have a question that may have already been answered there or you might learn something new!

We are always happy to hear from individuals and organizations looking to join us in our mission to reduce emissions. Please reach out to Stephanie Camp at smcamp@scrcog.org. We would love to hear from you!

Glossary and Acronyms

Glossary

Adaptation: Actions taken to address the impacts of climate change.

Afforestation: Introduction and planting of new trees to vacant areas, often including degraded agricultural land.

Anaerobic digester: Enclosed structure where break down of organic matter—such as animal manure, wastewater biosolids, and food wastes—takes place in the absence of oxygen.

Anchor institutions: Universities, hospitals, and other large, place-based organizations that invest in their communities as a way of doing business.

ADA compliance: Refers to the Americans with Disabilities Act Standards for Accessible Design, which states that all electronic and information technology (like websites) must be accessible to people with disabilities.

Benchmarking: The comparison of performance with respect to greenhouse gas emissions against peers.

Biogas: Gas produced by anaerobic decomposition or thermochemical conversion of biomass. It is composed mostly of methane (CH4) and carbon dioxide (CO2).

Biomass conversion: Production of heat, fuels, or electricity by the controlled combustion of, or the use of other non-combustion thermal conversion technologies on, specific materials, when separated from other solid waste.

Bulky waste: Large waste items, including but not limited to furniture, carpet, mattresses, and appliances.

Carbon sequestration: The absorption of carbon dioxide from the atmosphere with trees and soils serving as repositories for stored carbon.

Class I renewable energy: Electricity derived from various environmentally friendly sources such as solar power, wind power, fuel cells, geothermal, landfill methane gas, anaerobic digestion, biogas, ocean thermal power, wave or tidal power, low emission advanced renewable energy conversion technologies, certain run-of-the-river hydropower facilities, and biomass facilities using sustainable biomass fuel.

Class II renewable energy: Electricity derived from a trash-to-energy facility that has obtained the required permits.

Complete Streets: Streets that are designed and operated considering uses to include people of all ages and abilities, irrespective of their mode of transport such as drivers, pedestrians, bicyclists, or public transportation riders.

Coniferous forest: Vegetation composed primarily of cone-bearing needle-leaved or scale-leaved evergreen trees, found in areas that have long winters and moderate to high annual precipitation.

Electrolysis: Process of using electricity to split water into hydrogen and oxygen.

Deciduous forest: Vegetation composed primarily of broad-leaved trees that shed all their leaves during one season.

Direct solar water splitting: Process in which the solar energy is directly used to produce hydrogen from water without going through the intermediate electrolysis step.

Hydrogen fuel: Hydrogen is a clean-burning fuel, when combined with oxygen in a fuel cell, hydrogen produces heat and electricity with only water vapor as a by-product.

Global Warming Potential: A measure of how much energy the emissions of 1 ton of a gas will absorb over a given period, relative to the emissions of 1 ton of carbon dioxide CO2.

Green procurement: Purchase of goods and services that cause minimal adverse environmental impact.

Metropolitan Statistical Area (MSA): Geographic area based on a county (or group of counties) with at least one urban area of at least 50,000 people to which adjacent counties have a high level of economic and social integration with that core urban area.

Mitigation: Actions taken to reduce greenhouse gas emissions.

Millstone Power Plant: Nuclear power plant in Connecticut.

Municipal solid waste: Waste that consists of everyday items we use and then throw away, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries. This comes from our homes, schools, hospitals, and businesses.

Offshore wind turbines: Wind turbines placed in a marine environment.

Park and Ride: A system for reducing urban traffic congestion, in which drivers leave their cars in parking lots on the outskirts of a city and travel to the city center on public transportation.

Qualified Opportunity Zone (QOZ): Economically distressed community where new investments, under certain conditions, may be eligible for preferential tax treatment.

Reforestation: Planting of trees on previously forested land.

Special waste: Solid waste that requires special handling and management to protect public health or the environment.

Unit-based pricing: Pricing strategy where the cost of a product or service is determined by the quantity or units consumed, rather than a fixed or flat fee. Customers pay based on the volume, usage, or number of units they purchase, allowing for flexibility and scalability in pricing.

Walkshed: Area within a quarter mile from transit.

Waste-to-energy incinerators: Plants that burn municipal solid waste, often called garbage or trash, to produce steam in a boiler, and the steam is used to power an electric generator turbine.

Acronyms

AVERT - Avoided Emissions and Generation Tool
BRT – Bus rapid transit
C&LM - Conservation and Load Management (efficiency and demand-side investment plan)
CAP - Criteria air pollutants
CCAP - Comprehensive Climate Action Plan
CEJST - Climate and Economic Justice Screening Tool
CES - Conservation Energy Strategy
CHEAPR - Connecticut Hydrogen and Electric Automobile Purchase Rebate
COG- Council of Governments
CPRG - Climate Pollution Reduction Grant
EIS - Emissions Inventory System
EJScreen – EPA's Environmental Justice Mapping Tool
EPR – Extended Producer Responsibility laws
EV – Electric Vehicle
DEEP - Department of Energy and Environmental Protection
DOT – Department of Transportation
GHG – Greenhouse gas
GLIMPSE - Modeling and support tool
GWP – High global warming potential gases
HAP - Hazardous air pollutants
IPCC – Intergovernmental Panel on Climate Change
IRP – Integrated Resources Procurement
LID – Low-impact development
LIDAC – Low-income and disadvantaged community
LMI – Low to middle-income
MDI – Metered dose inhalers
MMTCO2e – Million metric tons of carbon dioxide equivalent
MOVES - Motor Vehicle Emissions Simulator
MOU- Memorandum of Understanding
MSA- Metropolitan Statistical Area

MTCO2e - Metric tons carbon dioxide equivalent
MW – Megawatts
NEI - National Emissions Inventory
NHMP - Natural Hazard Mitigation Plan
NVCOG - Naugatuck Valley Council of Governments
PCAP - Priority Climate Action Plan
QAPP - Quality Assurance Project Plan
RMP – Risk Management Program
RPS – Renewable Portfolio Standards (CT has mandatory RPS)
RTO – Regional Transmission Organization
RWA – Regional Waste Authority
SCRCOG - South Central Regional Council of Governments
SCC - Source classification code
TOD – Transit oriented development
WAI - Website Accessibility Initiative
YNHHS - Yale New Haven Health System

Co-pollutant acronyms
SO2 - Sulfur dioxide
VOC - Volatile organic compounds
NH3 – Ammonia
NOx - Nitrogen oxide
PM10 - Particulate matter
CO - Carbon monoxide

II. Background

The Climate Pollution Reduction Grant Program

The Climate Pollution Reduction Grant program (CPRG), authorized under the Inflation Reduction Act, is a two-phase program that provides $250 million for noncompetitive planning grants, and approximately $4.6 billion for competitive implementation grants (EPA CPRG Planning Grants Program: Formula Grants for Planning, 2023; US EPA, 2023). The grant encourages active collaboration among recipients and other entities at the state, regional, and municipal levels to plan, adopt, and implement policies and programs to reduce greenhouse gas (GHG) emissions.

The two phases of the grant, as shown in Figure 1, include three deliverables: the Priority Climate Action Plan (PCAP) due March 1, 2024, and a Comprehensive Climate Action Plan (CCAP) due in 2025, and the Status Report due in 2027.

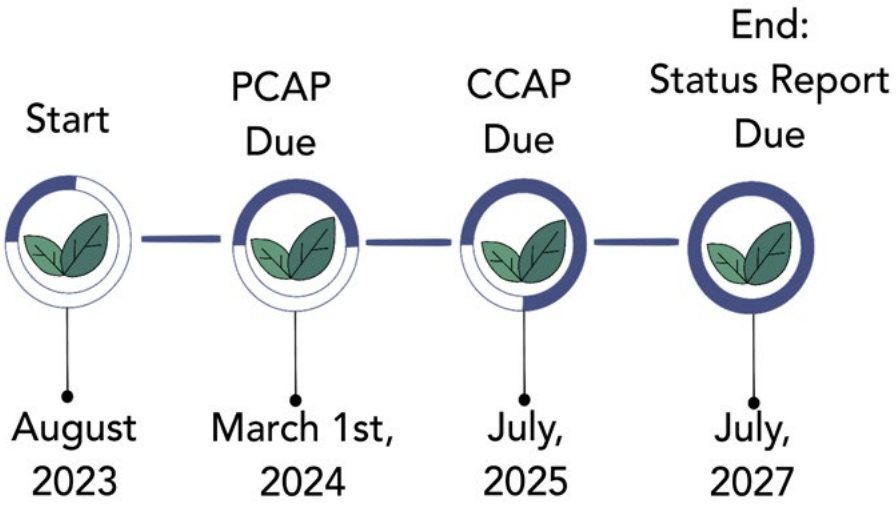


Figure 1: CPRG Timeline

This document, the PCAP, provides a focused list of near-term, high-priority, implementation-ready measures to reduce climate pollution from GHG emissions. The required components of the PCAP are:

- A GHG inventory
- Quantified GHG reduction measures
- Low-income and disadvantaged communities benefits analysis
- A review of authority to implement

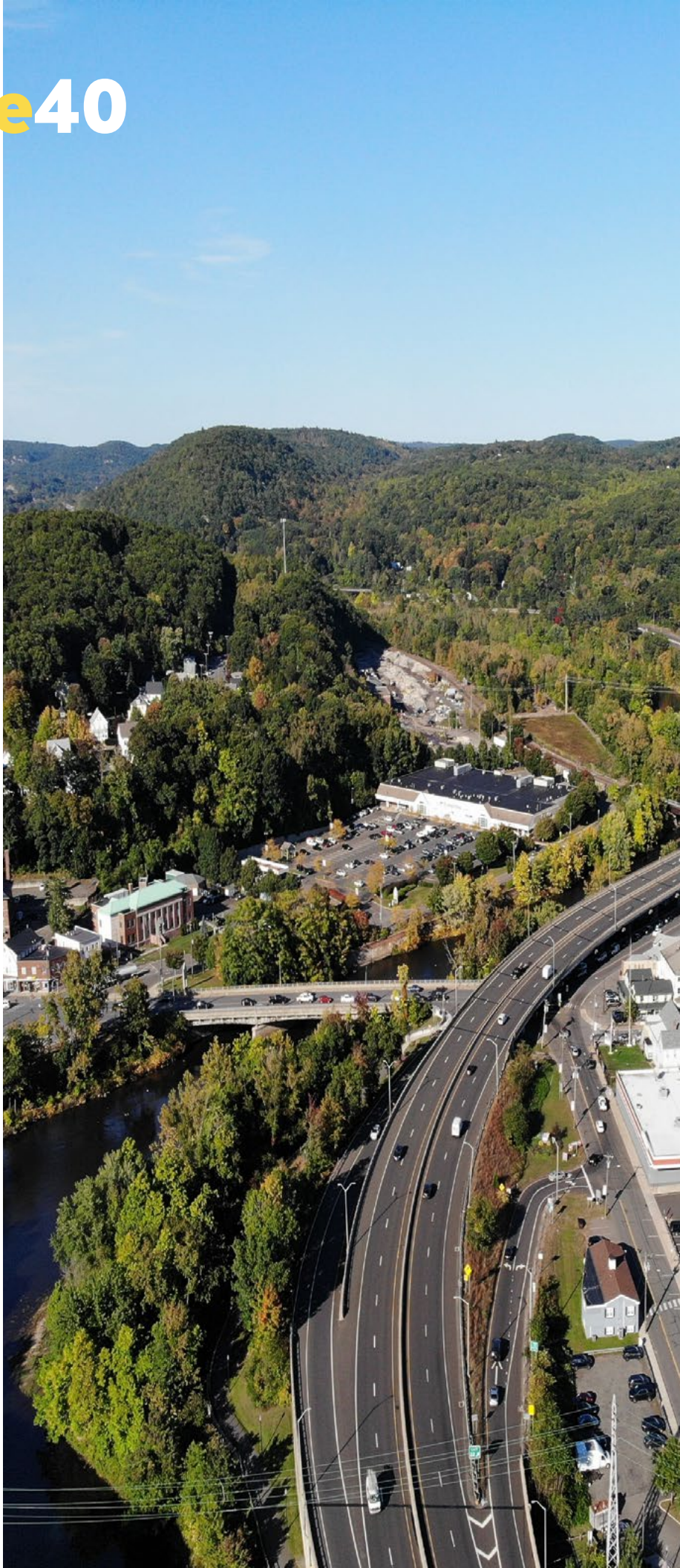
The EPA has launched two CPRG implementation grant competitions. Eligible entities, whether they received planning grants in phase 1 or not, can apply to implement measures outlined in their Priority Climate Action Plans (PCAPs) that are geographically relevant to them. Individual grants will range between $2 million and $500 million (US EPA, 2023).

The CCAP, due in July 2025, will encompass several key components, such as a comprehensive GHG inventory, projections for GHG emissions, clearly defined GHG reduction targets, specified measures for GHG reduction, and a thorough benefits analysis covering the entire geographic scope and population addressed by the plan.

Justice40

The CPRG program is a part of the Justice40 initiative. The Justice40 initiative sets a goal that 40 percent of the benefits of certain federal investments flow to disadvantaged communities that are "marginalized, underserved, and overburdened" by pollution (Justice40 Initiative, 2022). Justice40 requires meaningful collaboration with disadvantaged groups to determine program benefits (Memorandum for the Heads of Departments and Agencies, 2021).

This commitment to equity is central to this PCAP. Impact 2045 recommends robust strategies that recognize the unique needs of vulnerable communities and work to minimize any potential adverse effects. By doing so, Impact 2045 sets the stage for municipalities to successfully achieve the objectives of Justice40 when they apply for grants to implement these strategies.



Connecticut Climate Action

Connecticut and several of its municipalities have already created strong plans to combat and prepare for climate change. Here is a brief overview of recent actions and programs.

State of Connecticut Commitments to climate action

In 2018, Connecticut released a climate action plan, Building a Low Carbon Future for Connecticut, and passed an act committing the state to these legally binding greenhouse gas emissions targets (Hunt, 2018; Public Act No. 18-82, 2018):

- By 2020, a reduction of at least 10% from 1990 levels
- By 2030, a reduction of at least 45% from 2001 levels
- By 2050, a reduction of at least 80% from 2002 levels

These commitments were strengthened in 2019 with new goals and an expanded role for the Governor's Council on Climate Change (Executive Order No. 1, 2019; Executive Order No. 3, 2019). In 2020, the first emissions target in Connecticut's climate action plan was met.

In 2021, the Phase 1 Report on Connecticut's climate action plan made equity a central part of the state's climate commitments (Governor's Council on Climate Change, 2021). Governor Lamont released an executive order for 23 climate-related actions in multiple sectors, including buildings, transportation, energy use, jobs, and environmental health impacts, and establishes a Clean Economy Council, an Equity and Environmental Justice Advisory Council, and an Office of Climate and Public Health (Executive Order No. 21-3, 2021).

Transportation

According to Connecticut's Greenhouse Gas Emissions Inventory, transportation is the State's largest source of GHG emissions, with emissions holding steady since 1990 (CT DEEP, 2023). In 2022, Connecticut established mandates for electric vehicle infrastructure and rebates, and medium and heavy-duty vehicle emission standards (Public Act No. 22-25, 2022).

The State released its Carbon Reduction Strategy for transportation in November of 2023, featuring an array of existing and potential programs to reduce vehicle miles traveled and reduce emissions, including complete streets, traffic flow improvements, electric vehicle adoption, and transit improvements (CT DOT, 2023). The State has received $79.1 million in federal funding toward these efforts (CTDOT, n.d.).

Energy

In 2022, Connecticut committed to renewable energy through an Integrated Resources Procurement (IRP) Plan (CT DEEP, 2022). The IRP mandates the following: zero carbon emissions from the electricity sector by 2040 (Public Act No. 22-5, 2022); expanded access to shared community renewable energy facilities with increased benefits to low-income customers (Public Act No. 22-14, 2022); and an energy storage system pilot program proposals from energy companies (Public Act No. 22-55, 2022).

To boost industry interest in off-shore wind development, in 2023 Connecticut, Massachusetts, and Rhode Island entered into a memorandum of understanding (MOU) (MA DOER, CT DEEP and RI OER, 2023) requesting that developers submit multi-state offshore wind proposals that supply a combined total of 6,000 megawatts (MW) (CT DEEP, 2023) of wind energy.

2023 Legislation Fails to Empower DEEP

On the legislative front, progress on climate change stalled in 2023 with the failure of a bill that would have given the Department of Energy and Environmental Protection (DEEP) the authority to set and enforce greenhouse gas reduction targets in various economic sectors. Bills mandating net-zero-carbon for most new schools, expanding the state's solar programs, and tackling building emissions also failed. However, a bill allowing DEEP to deny permits for polluting facilities sited near environmental justice communities was passed.

Sustainable CT

Sustainable CT is a non-profit organization established by Connecticut municipalities in 2017 to promote sustainability and equity. The organization provides a menu of actions and technical assistance to participating communities. By completing actions, municipalities can earn Bronze, Silver, and Gold certifications. In addition, a Climate Leader designation is awarded to communities that are engaging in significant greenhouse gas mitigation and climate adaptation, while benefiting public health and building community capacity.

Twenty-two New Haven County municipalities participate in Sustainable CT. Of these, West Haven, Meriden, Waterbury, Southbury, Cheshire, and Branford have a Bronze certification, Milford, Hamden, and Guilford have a Silver certification, and New Haven has a Gold certification. New Haven and Guilford are also designated as Climate Leaders (Sustainable CT, 2023).

City of New Haven

In 2018, the City of New Haven published a Climate and Sustainability Framework (City of New Haven, 2018) and in 2019, it declared a climate emergency and established a Climate Emergency Mobilization Task Force (City of New Haven, 2019).

The Climate and Sustainability Framework notes that more frequent heat waves are increasing detimental health impacts; flash flooding from more intense precipitation is already occurring in downtown areas; and that sea level rise and storm surges threaten several areas of the coast. At the same time, CO2 emissions have slowly decreased in recent decades while the cities population continues to rise (City of New Haven, 2018).

The Framework sets goals of reducing greenhouse gas emissions by 55% of 1999 levels by 2030 and to become carbon-neutral by 2050. Steps toward those goals include ensuring that 100% of energy for city buildings is renewable; supporting community solar, microgrids, and local energy districts; promoting programs for rooftop solar and home energy efficiency; and establishing ordinances requiring green building practices.

In 2021, New Haven passed a resolution to electrify its buildings and transportation systems by the end of 2030 and to support other electrification efforts throughout the city (City of New Haven, 2021).

Regional Context – New Haven County

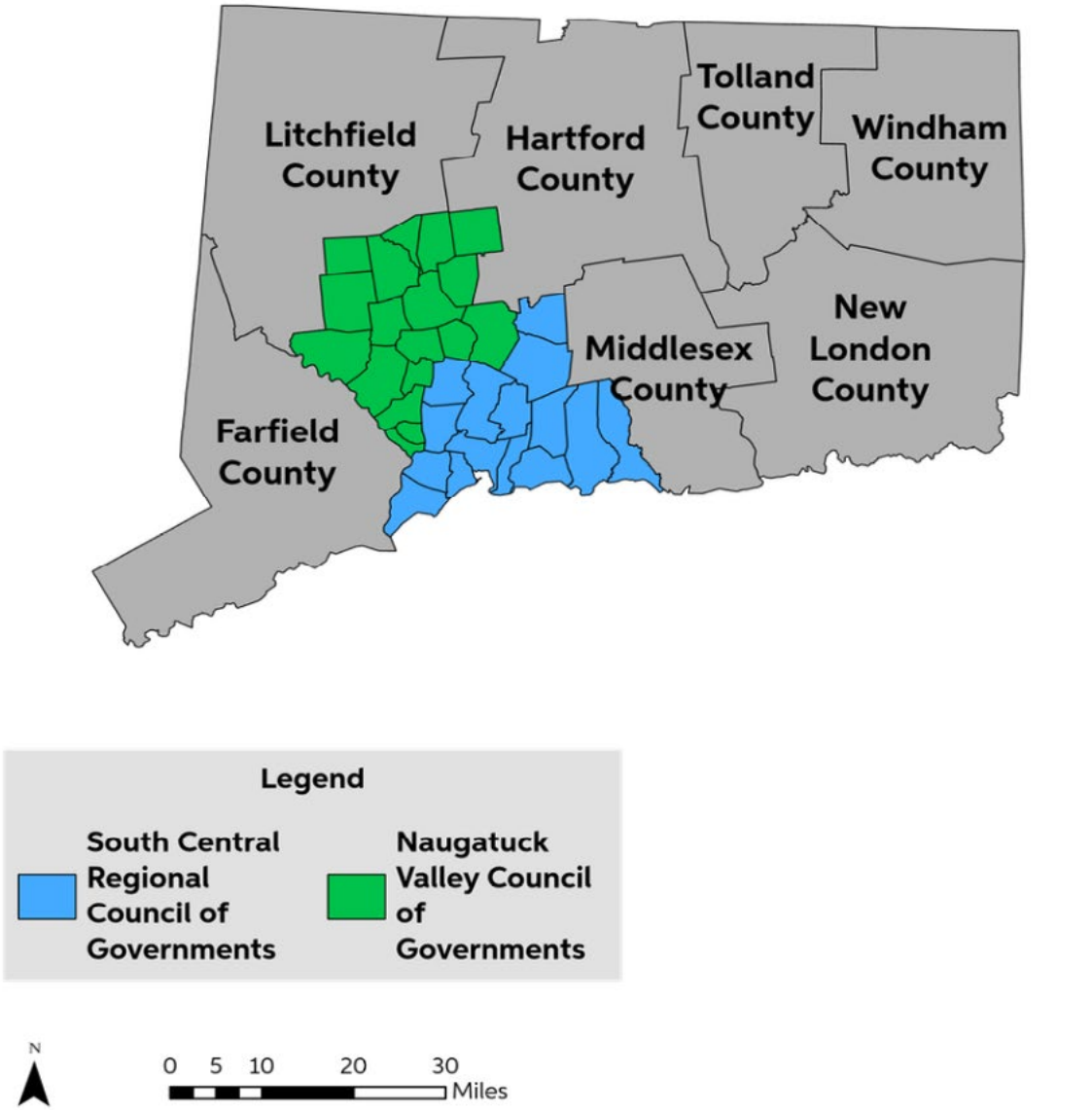
New Haven County, situated in South Central Connecticut, encompasses a collection of twenty-seven cities and towns that represent a diverse blend of urban, suburban, and rural character. The landscape is characterized by gentle low hills that span much of the region, gradually transitioning to flatter terrain in the south, where the county boundary is defined by the shores of the Long Island Sound. The areas around and including New Haven and Waterbury, both among Connecticut's largest cities, have the highest population density in the county. According to the 2020 Census, the county boasts a population of 864,835 (U.S. Census Bureau, 2020).

In 1960, Connecticut abolished county governments. As a result, the term "New Haven County" is employed primarily to denote the geographic collection of towns, and serves as a colloquial identifier for the New Haven-Milford CT Metropolitan Statistical Area (MSA). In this case, the boundaries of New Haven County align with those of the New Haven-Milford CT MSA. Since counties in Connecticut do not have any associated government structure, local governance and municipal services are the purview of individual towns.

As of 2022, the U.S. Census Bureau formally recognized Connecticut's nine councils of governments (COGs) as county equivalents. The COGs function as regional planning organizations, coordinating efforts throughout member municipalities in their jurisdiction, including pursuing grants and funding. However, COG authority is limited. New Haven County includes towns within both the South Central Regional Council of Governments (SCRCOG) and the Naugatuck Valley Council of Governments (NVCOG), which is why regional mitigation efforts under the CPRG programs will be a collaborative effort between the two agencies.

Map 1: Cities and Towns of New Haven County

Prominent employers in the county include Yale University, the Yale New Haven Health System, and the Waterbury Board of Education, each employing between 5,000 and 9,999 individuals (Connecticut Department of Labor, 2023). In addition, the county is traversed by three major interstates—I-91, I-84, and I-95—, and is serviced by north-south and east-west rail lines, facilitating transportation and connectivity within the region.



Map 2: Connecticut Counties in Relation to SCRCOG and NVCOG

Climate Change in New Haven County

While the impacts of climate change are felt globally, each region will face different adverse impacts. New Haven County is already experiencing increased flooding, more high heat events, and increased sea level rise along its coast. Below is a full list of projected climate impacts for the region.

Impacts and Future Projections (Hicke et al., 2023)

- There has been an observed increase in precipitation events in our region.
- There has been an observed increase of the proportion of hurricanes that strengthen to stronger levels, and a high confidence that observed major precipitation events from these storms is associated with human induced climate change.
- There is very high confidence that North Atlantic waters off the east coast of the United States are warming due to human activities.
- There is high confidence that human induced climate change is leading to higher mean and extreme temperatures in our region.
- There has been an increased frequency in heavy rainfall events, increased prevalence of mosquito borne illnesses such as West Nile Virus and Eastern Equine Encephalitis, and increased federal disaster proclamations within the state (Bozzi, 2020).
- There is high confidence in the continued magnification of tropical cyclone impacts in the region, specifically increased wind speeds and precipitation (Hicke et al., 2023).
- It is certain that sea level rise will continue in the region, and that ocean temperatures in the North Atlantic will continue to increase (2023).
- There is high confidence in continued and amplified warming over North America as a whole (2023).
- There is high confidence that ocean acidification will increase along the eastern seaboard (2023).

Community Profiles

Site visits and stakeholder engagement sessions held during 2023 helped in identifying these unique circumstances and further contextualize the plans recommendations. Below are community profiles for each municipality that was visited during this period. They exemplify the County's high LIDAC areas, underscoring the need for site analysis and stakeholder engagement during this phase of the planning process.

New Haven (City)

Population: 135,076 (2021 ACS, DP505 1 Year estimates)

Demographics: 12.2% of the community is 65+ years in age. 87.4% of the population is one race, of which 31.7% is White, 32.7% is Black or African American, .5% is American Indian, 5% is Asian, and the other 12.6% are Two or More Races. 30.5% of the population identifies as Hispanic or Latino. (2022 ACS 1- Year Estimates DP05 Demographic and Housing)

Median Income: $50,569 (2022 ACS S1901)

New Haven is the largest city in the County and was one of the first planned cities in the United States. It is also part of the New York City metropolitan area.

Economic Divisions

The City has one of the highest poverty rates in the county at 21%, and has a long history of economic division. For example, Yale University, one of the most prestigious academic institutions in the country, is located only a few blocks away from some of the most vulnerable neighborhoods in the County.

Transit Hub

The City is a transit hub, with high-speed rail lines like Amtrak and MTA connecting here and providing services to New York City and Hartford. New Haven is focused on upgrading bicycle, electric vehicle, and pedestrian infrastructure with the support of state funding. However, staffing limitations are a problem.

Energy Cost Burden

Many New Haven households are energy cost burdened. To address this, the City has been focused on improving energy efficiency in residential and commercial buildings. However, there are more renters in New Haven in comparison to other municipalities in the county, making it difficult for current incentive structures to reach large segments of the population. New Haven also has public housing developments managed by the New Haven Housing Authority. This agency serves over 6,000 families and owns 31 properties. Public housing serves as a promising area for distributed and rooftop solar, heat pump installations, and tree canopy initiatives.

West Haven

Population: 55,518 (2021: ACS 5-Year Estimates Data Profiles).

Demographics: 13.8% of the community is 65+ years in age. 92.6% of the population is one race, of which 57% is White, 19.5% is Black or African American, .4% is American Indian, 5.1% is Asian, .4% is Native Hawaiian, and 7.4% are two or more races. 25.3% of the population identifies as Hispanic or Latino (2022: ACS 5-Year Estimates Data Profiles DP05).

Median Income: $66,868 (S1901, 2021: ACS 5-Year Estimates Data Profiles).

West Haven is located along the shorelines of Long Island Sound. Some of the existing housing stock goes right up to the shoreline in the eastern and western ends of the municipality. With sea level rise, these properties face increased erosion and flooding risk. These hazards may also affect roads connecting West Haven to Milford and New Haven, as well as wetland areas, and beaches. In the context of this plan, areas like West Haven represent the vulnerability the County faces from climate change impacts, underscoring the need for decarbonization efforts across sectors.

Waterbury

Population: 113,820 (2021 ACS 1 Year Estimates DP05)

Demographics: 15.1% of the community is 65+ years of age. 79.6% is one race, of which 44.5% is White, 17.3% is Black or African American, 1.3% is American Indian, 3.5% is Asian, .3% is Native Hawaiian, and 20.4% are two or more races. 37.7% identifies as Hispanic or Latino. (2021 ACS 1 Year Estimates DP05)

Median Income: $48,793 (2021 ACS 1 Year Estimates S1901)

Waterbury is the second-largest city in New Haven County, and the fifth largest in the state. The City Center falls near the intersection of Interstate 84 and Route 8, adjacent to the Naugatuck River. Known as the “Brass City,” brass making once employed around 50,000 workers at the height of the City’s economic boom. Unfortunately, Waterbury has not recovered fully from the industrial decline of the late 20th century.

How are people moving around?

Commuter rail connecting Waterbury to New Haven, along with ample bus routes and stops throughout the city, are noted as highlights of the city’s transportation system. Waterbury is currently planning to make transit more accessible to outlying areas as well. Additionally, several roads with high traffic include bike lanes, although not all these lanes are separated from vehicular traffic.

Redevelopment and Rezoning Initiatives

Waterbury has been awarded a grant to repurpose public infrastructure, which they have used to increase pedestrianization of some streets. The City is also set on acquiring industrial brownfield sites for redevelopment, like the Freight Street Project.

Land-use changes are the primary strategy for redevelopment in the City. This shows up in their efforts to make zoning more amenable to denser development. Waterbury is also using rezoning measures to address flooding due to stormwater runoff. In terms of open space and recreational opportunities, there are plans to create an all-purpose greenway from South Main Street which will extend all the way to Derby.

Challenges:

Funding and staffing challenges continue to be obstacles in implementation of redevelopment and rezoning plans.

Meriden

Population: 60,790 (2021 ACS 5 Year Estimates DP05 ACS Demographic and Housing Estimates).

Demographics: 15.1% of the community is 65+ years of age. 87.4% is one race, of which 67.8% is White, 9.5% is Black or African American, .5% is American Indian, 2.6% is Asian, and 12.6% is two or more races. 35.6% of the population identifies as Hispanic or Latino. (2021 ACS 5 Year Estimates DP05 ACS Demographic and Housing Estimates).

Median Income: $59,792 (2021 ACS 5 Year Estimates S1901).

Meriden, or “The Silver City” is another municipality with a rich industrial history. Meriden is known for its many notable hills and Harbor Brook, which runs through the City Center.

Climate Action

The Municipality has a surplus of brownfield sites suitable for redevelopment. For example, Meriden Green, a 14-acre flood park, is built on a brownfield site that used to be a hub for industrial and commercial activity. During high rain events, the green serves as a flood basin, controlling runoff and reducing impacts in nearby areas. However, when dry, the space can be used for recreational purposes. While Meriden Green is an adaptation measure, it is a great example of how industrial sites can be repurposed to combat climate change.

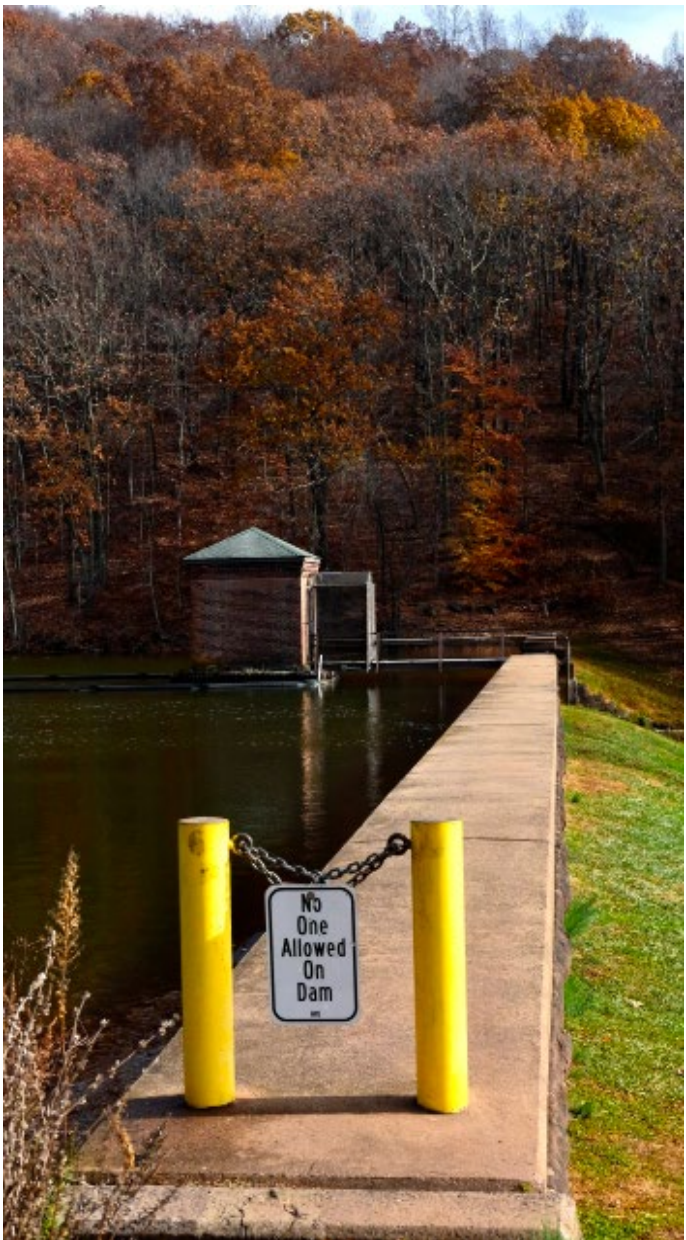
Public Spaces

Meriden prides itself on being a hub for arts and culture. Public art installations attract visitors downtown, while Hubbard Park, along with the Meriden Green, offer recreational opportunities and green spaces for the City's residents

Transit-Oriented Development (TOD)

The City Center contains a transit hub, which includes bus services and access to north-south rail lines to Hartford and New Haven. Bordering this area is ample dense building stock, including new TOD developments along State Street.

However, bike infrastructure in the City often lacks protected lanes, while some bus stops were noted to lack crosswalks for pedestrians. Even still, the City is making use of federal funding to increase TOD downtown through the redevelopment of vacant buildings. As another post-industrial city in the region, this sets an example of how previous industrial hubs can utilize their building stock to meet new housing and transit goals.



Ansonia

Population: 18,945

Demographics: 18.8% of the community is 65+ years of age. 91.9% of the population is one race, of which 67.4% is white, 13.5% is Black or African American, .1% is American Indian, 1.5% is Asian, and 8.1% are two or more races. 24.4% of the population identifies as Hispanic or Latino. (2021 ACS 5 Year Estimates DP05).

Median Income: $61,846 (2021 ACS 5 Year Estimates S1901).

Ansonia also has an industrial past and finds itself as a host to numerous brownfield sites. While there is transit access downtown, residential areas remain unconnected through transit, limiting economic opportunities. Moreover, due to size of the City's staff, Ansonia relies on partnerships to implement projects.

Housing

Housing and rental prices have been increasing in this area. However, the poverty rate remains relatively high, especially compared to adjacent municipalities. Residents who can afford to leave often choose to relocate to other areas such as Oxford and Southbury (Martinez, 2022). Ansonia also lacks large tracts of land suitable for new development (2022). However, through redevelopment plans described below, the city aims to have hundreds of units of new housing added.

Reviving the City

Ansonia's downtown has a lot of vacant spaces and former industrial buildings primed for redevelopment. One such example is Ansonia Brass and Copper. According to local stakeholders, this complex has received funding for redevelopment, along with other industrial brownfield sites within the City. Much like the Meriden green, new developments on brownfield sites offer opportunities to combat climate change.

Additionally, Ansonia has high social, heat, and flood vulnerabilities. To address some of these issues, the Municipality's director for Economic Development, Sheila O'Malley, has been working on a grant applications for a solar array through the Green Infrastructure Master Plan for a Resilient Connecticut. Ansonia is also carrying out road redevelopment projects by planting trees and narrowing streets in certain areas. The Municipality will need to ensure that these newly redeveloped areas are not at risk from flooding and urban heat island effects, and that transit remains available during extreme climate events (Resilient Ansonia, n.d).

Derby

Population: 12,387 (2021 ACS 5 Year Estimates DP05)

Demographics: 21.7% of the population is 65+ years of age. 95.1% of the population is one race, of which 76.8% is White, 11.3% is Black or African American, .1% is American Indian, 1.8% is Asian, and 4.9% are two or more races. 17.7% of the population identifies as Hispanic or Latino.

Median Income: $64,494 (2021 ACS 5 Year Estimates S1901)

Much like the other post-industrial cities in the county, Derby has a surplus of brownfield sites that could be used to address climate mitigation needs. However, unemployment and poverty rates remain high, while nearby municipalities attract residents through better housing opportunities (Martinez, 2022). Current planning efforts have focused on addressing these issues through economic development measures.

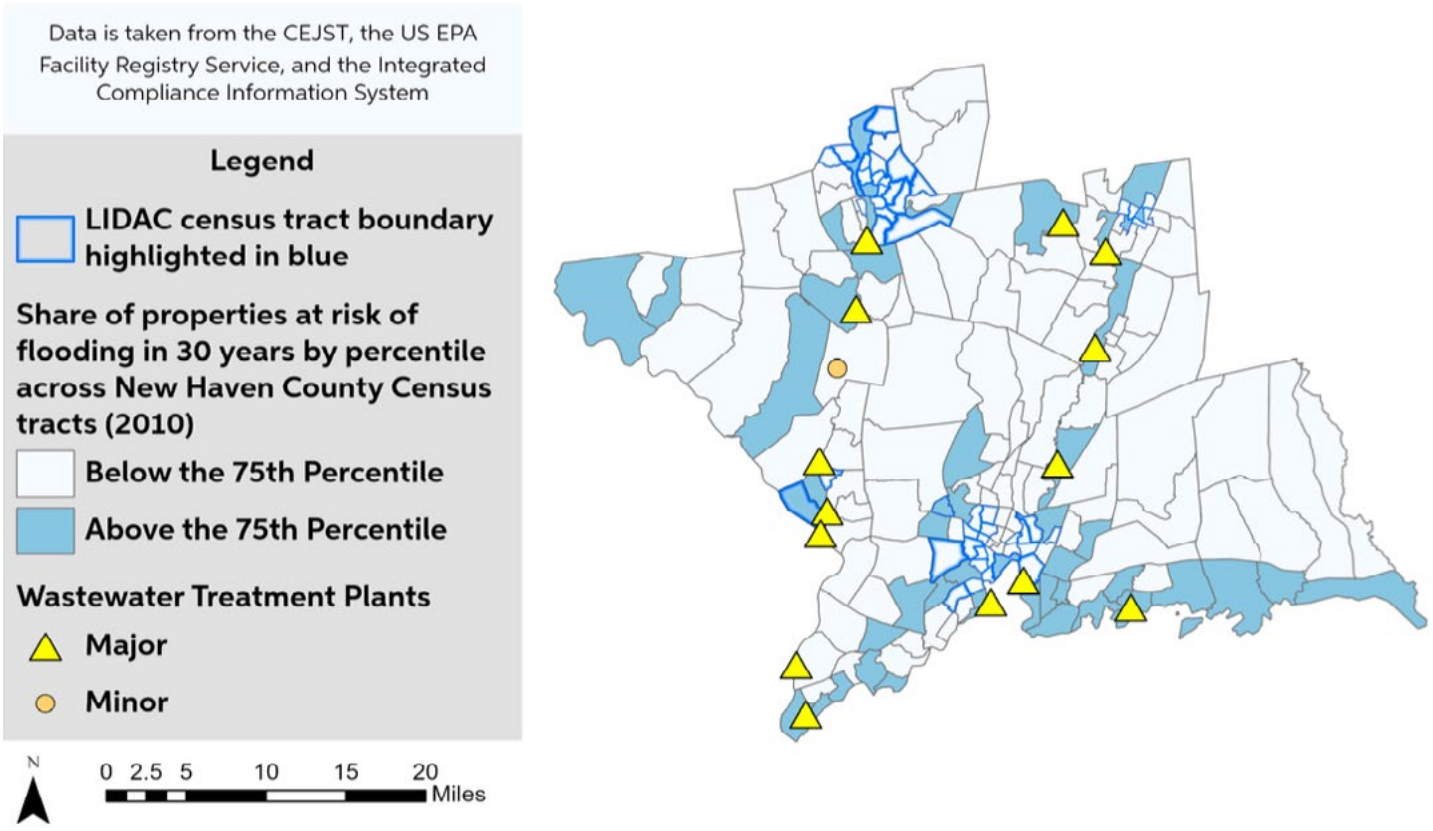
Environmental Efforts

A significant portion of Osborndale State Park is located within Derby. The Kellog Center for the Environment is housed within this park and provides abundant environmental learning opportunities for the region's residents. However, transit access to the nature centre is limited. Derby has also sited a solar field located next to their trash transfer site, once again underscoring the potential industrial sites serve in climate mitigation efforts. However, a strip of industrial sites on Water Street, including a propane distribution facility, were noted as being in close proximity to a school.

Low-income and Disadvantaged Communities (LIDACs)

Climate Change disproportionately affects communities already grappling with existing socioeconomic, health, and environmental burdens. For example, historically disadvantaged neighborhoods in the Northeast experience higher average surface temperatures and air pollution when compared to other neighborhoods, exacerbating heat related illnesses and negatively affecting public health (Hoffman et al., 2020; Whitehead et al., 2023). Other climate change impacts, such as extreme weather events, have also been shown to exacerbate existing air and water pollutant issues, which can worsen public health issues in environmental justice communities.

This can be seen in Map 3, where tracts above the 75th percentile flood risk have been shown alongside the locations of known wastewater treatment plants. Many of these facilities are located in flood zones near lower-income communities, illustrating how sea level rise and increased flooding can disproportionately impact areas with existing socioeconomic disparities (Whitehead et.al, 2023). This is not a comprehensive list of the adversities that vulnerable communities face from climate change. Rather, the effects above are examples of how historically disadvantaged communities are often more affected by climate change impacts when compared to wealthier communities. Higher-income communities are often better suited to afford staff support, emergency resources, and infrastructural changes that address climate change hazards while lower-income communities may be negatively impacted by staff shortages and budget constraints. Therefore, it is imperative that planners and relevant organizations implement GHG mitigation efforts that center disproportionately impacted communities.



Map 3: Flood risk and wastewater treatment plants across New Haven County

Where are New Haven County's LIDACs?

As part of the Justice40 Initiative, this plan offers strategies that deliver 40% of benefits to low-income and disadvantaged (LIDAC) communities. Communities using CPRG funding to write PCAPs have been tasked with identifying these LIDAC areas with the Climate and Economic Justice Screening Tool (CEJST) as a minimum requirement. The CEJST tool provides census tract-level information for environmental, economic, and social burdens. By using this tool, 50 LIDAC census tracts were identified. The New Haven County LIDAC tracts are concentrated in four areas: Waterbury, Meriden, Ansonia & Derby, and New Haven & West Haven. However, using the CEJST tool limits the areas that show up as LIDACs as it only measures at the third smallest unit for the census. To make-up for this issue, areas highlighted as LIDACS were expanded using the EPA-recommended Environmental Justice Screening and Mapping Tool (EJ Screen), which measures at the block group level. Through EJ Screen, LIDACs were expanded to areas in Milford, Naugatuck, Hamden, Wallingford, North Haven, and East Haven.

The Findings

By just using the tracts identified with the CEJST tool, it was discovered that 23% of the New Haven County's population, or 195,528 people, live in low-income and disadvantaged communities. If the identified block groups were added, this sum would likely exceed a quarter of the population. As exemplified by the figure below, there is more than a $40,000 discrepancy between the median household income of LIDAC tracts and non-LIDAC tracts (2010). Racial disparities are also evident between LIDAC and non- LIDAC tracts. For example, 28.1% of the population in LIDAC areas is Black/African American, while only making up 8.1% of the population in non-LIDAC areas (2010). Moreover, 41.7% of the LIDAC population is Hispanic and Latino, compared to just 11.3% in non-LIDAC areas (2010). It is clear that minority populations are over-represented in LIDAC tracts, underscoring the equity concerns the two tools (CEJST and EJ Screen) identify. The historical disenfranchisement of communities of color is why it is essential that benefits offered by CPRG grant funding are directed to LIDAC tracts. At a minimum, new planning initiatives should be assisting historically disadvantaged communities in achieving similar goals as their neighbors.

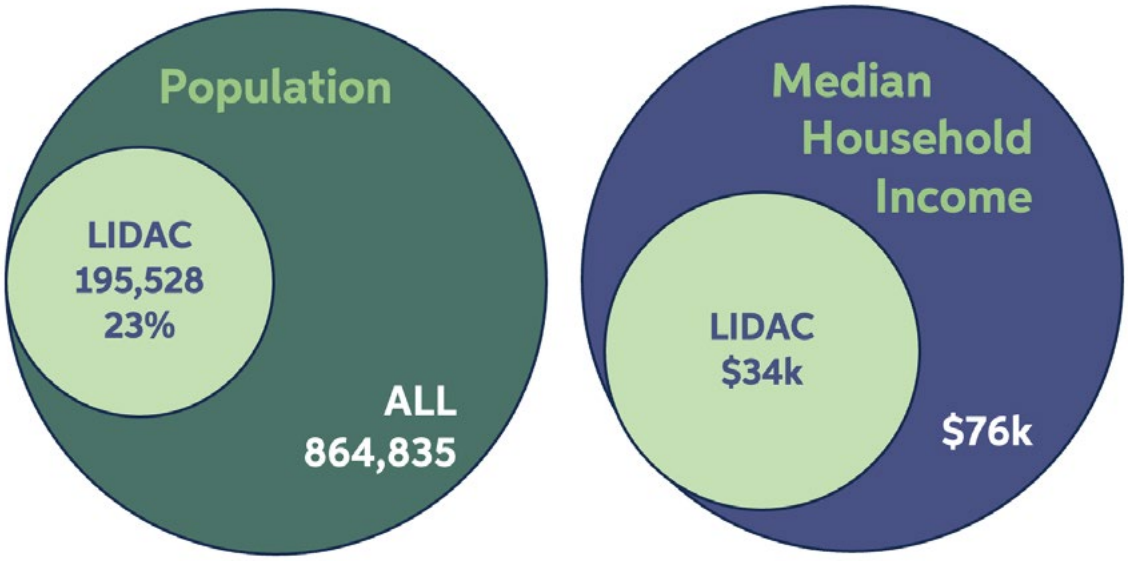


Figure 2: Population and Income data for New Haven County (CEJST)

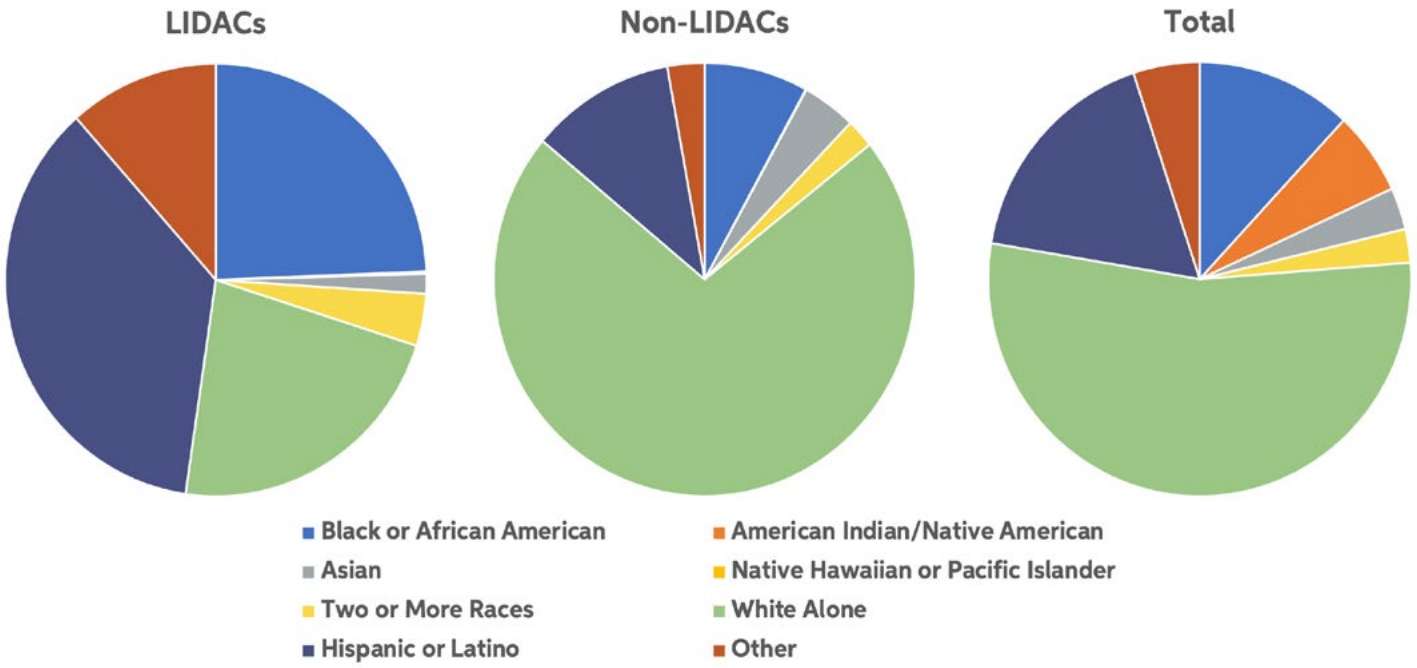


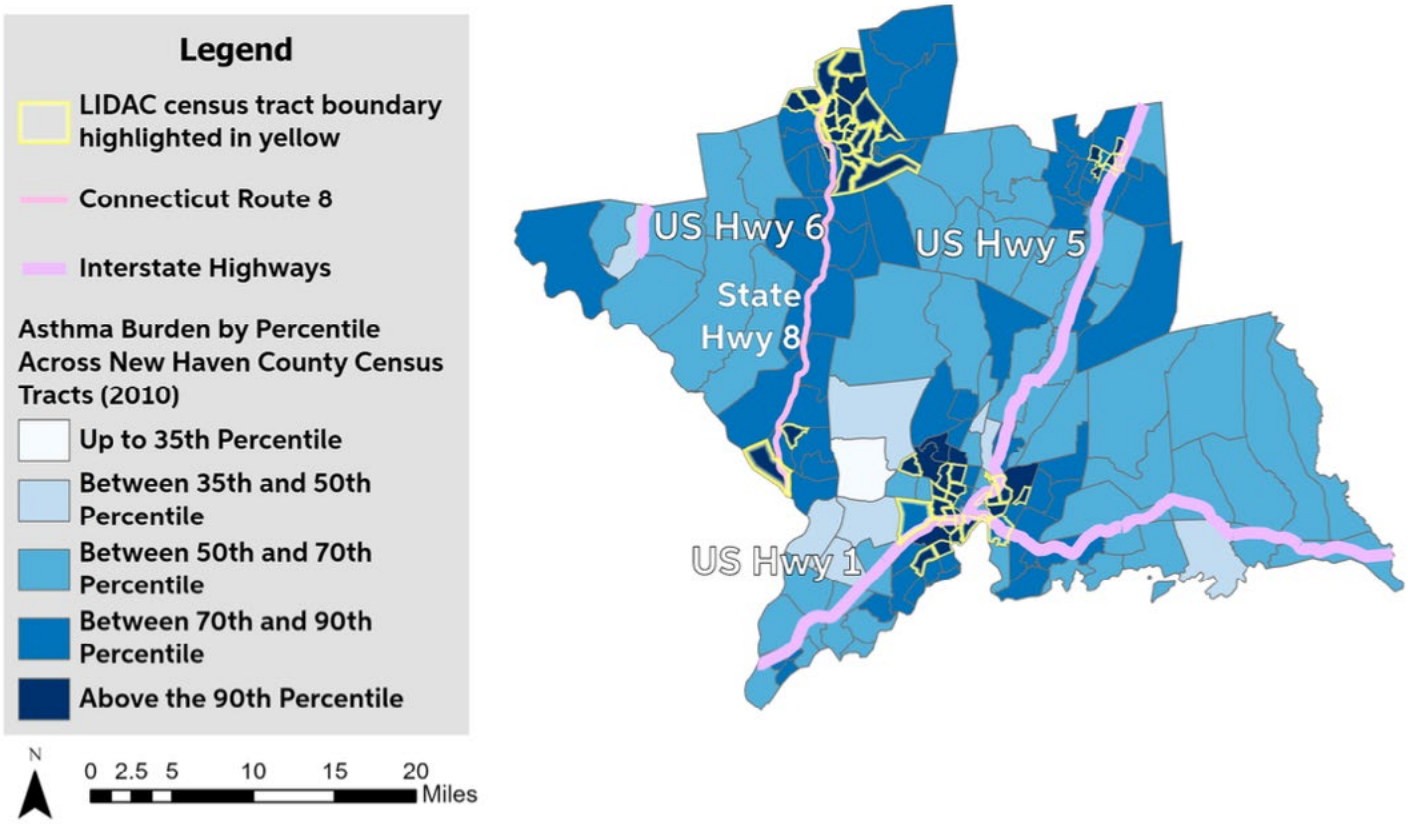
Figure 3: Racial Demographics of New Haven County (CEJST)

As mentioned previously, the CEJST tool measures environmental, economic, and social burdens. These burdens are categorized across 29 different measures which can be viewed in full in the appendix. By identifying the top five of these measures, priority strategies can better reflect the needs of LIDAC communities. To create the list of top five burdens, analysis was done on data made available by CEJST. A formula was used to rank the top five measures for each LIDAC tract. Data was then cleaned to account for ties within ranking the top five. With the cleaned data set, the frequency of each measure was measured across all LIDACs to identify the most common burdens. In doing this, it was found that New Haven County's top LIDAC burdens are asthma, housing cost, energy cost, unemployment, and linguistic isolation. The locations of these burdens can be viewed in Maps 4-8 below, while the frequency of all LIDAC burdens can be viewed in Figure 4.

Burden Experienced in the County	Frequency of Burden Appearing the Top 5 List Amongst all LIDACs
Diabetes	5
Asthma	39
Life Expectency	0
Heart Disease	3
Traffic	2
Travel	1
Diesel	0
PM2.5 in Air	0
Energy	29
Agriculture Loss	2
Building Loss	0
Flood Risk	1
Fire Risk	0
Population Loss	0
Plumbing	2
Lead Paint	8
Housing	25
Poverty	15
Language	23
Unemployment	22
Low Median Household Income	20
Wastewater	1
Leaky Storage Tanks	3
Superfund Sites	6
Risk Management Plan Facilities	3
Hazardous Waste	11

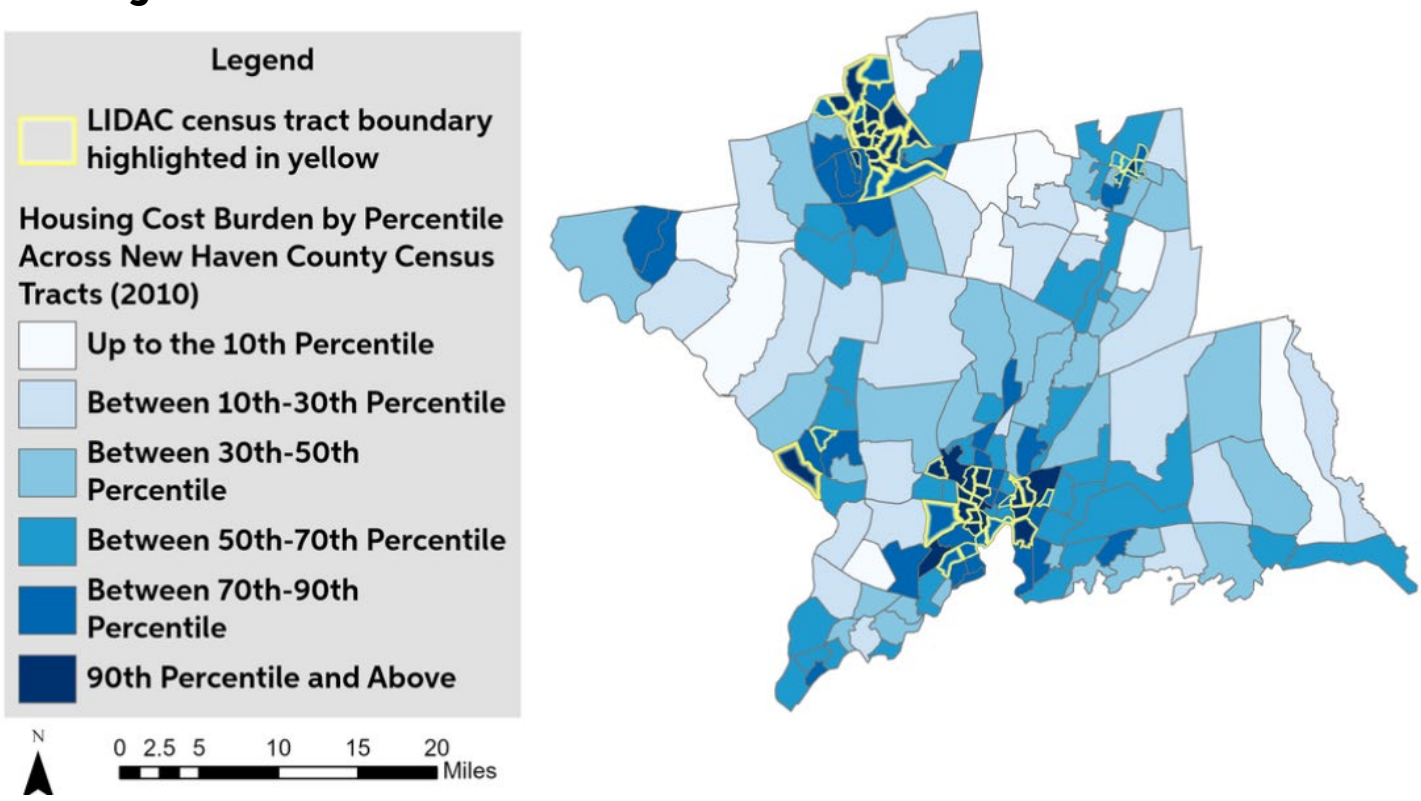
Figure 4: Frequency of CEJST burdens in New Haven County

Asthma Burden



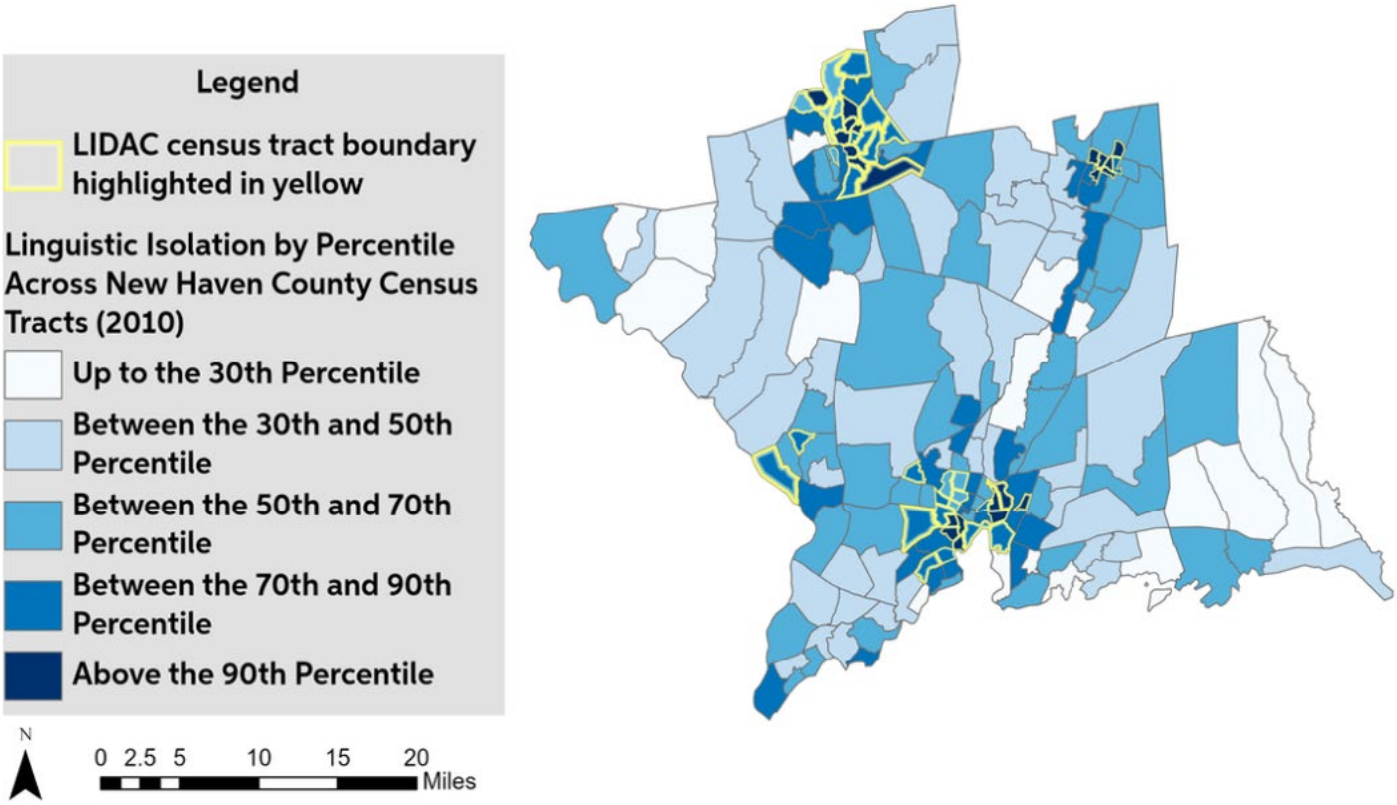
Map 4: Asthma Burden by Percentile Across New Haven County Census Tracts

Housing Cost Burden



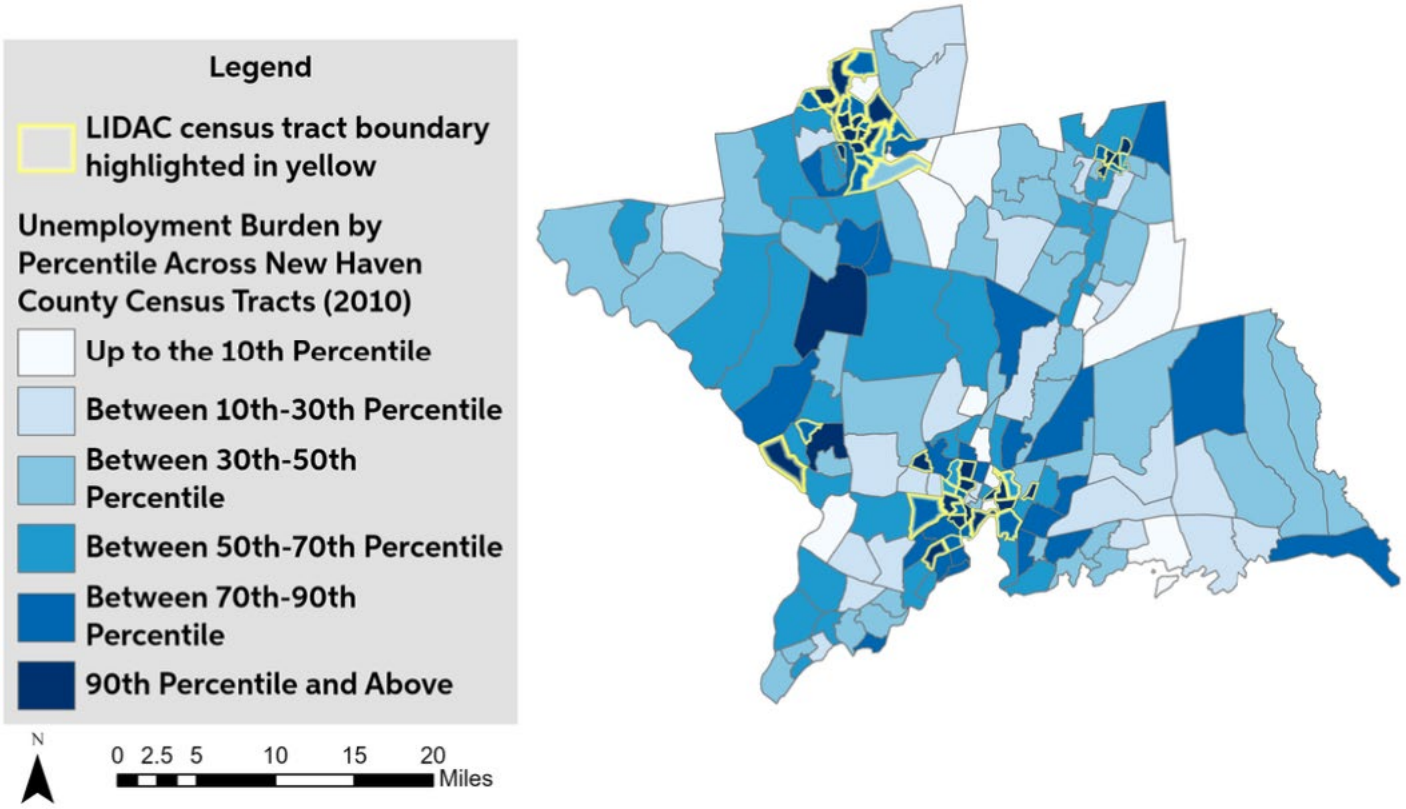
Map 5: Housing Cost Burden by Percentile Across New Haven County Census Tracts

Linguistic Isolation Burden



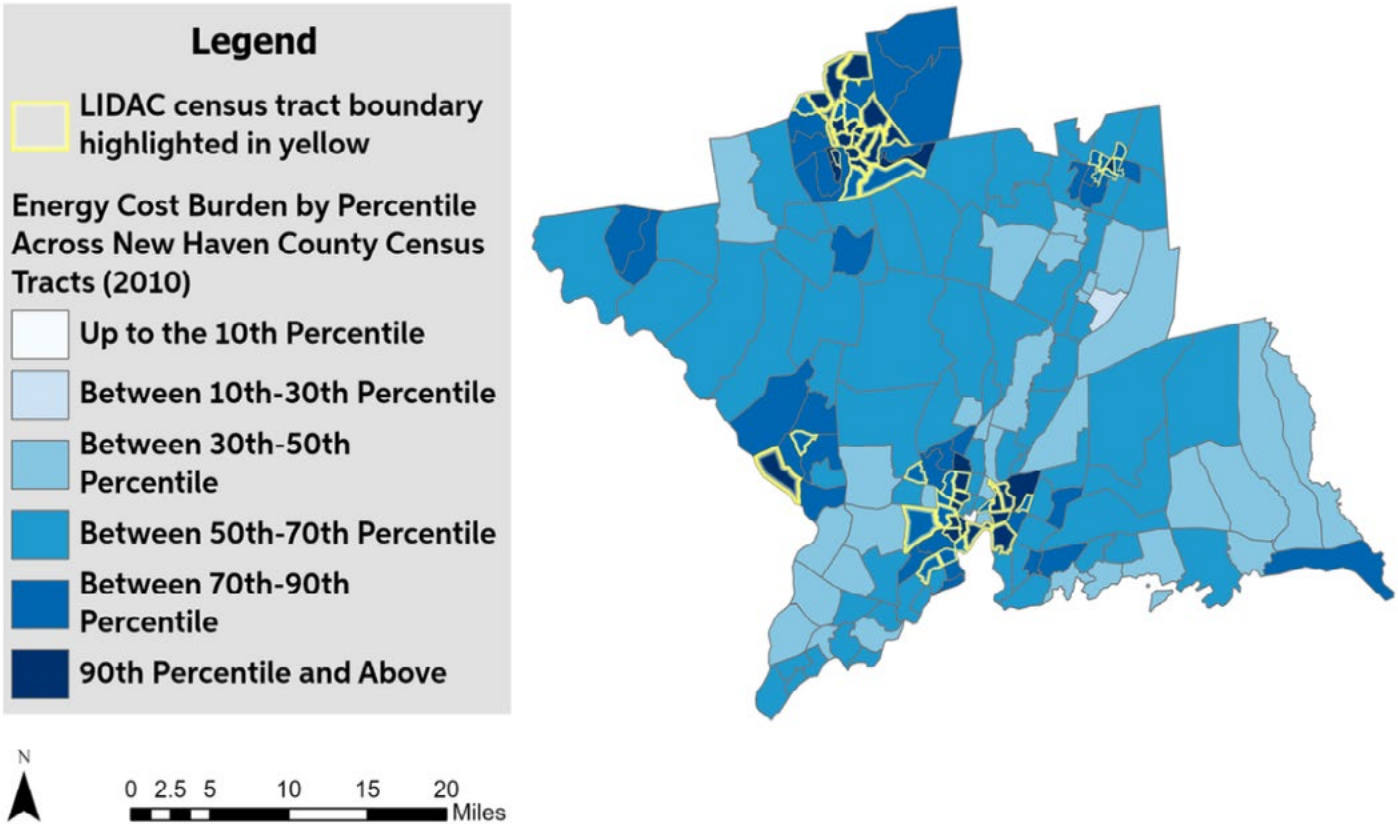
Map 6: Linguistic Isolation by Percentile Across New Haven County Census Tracts

Unemployment Burden



Map 7: Unemployment Burden by Percentile Across New Haven County Census Tracts

Energy Cost Burden



Map 8: Energy Cost Burden by Percentile Across New Haven County Census Tracts

III. Climate Action Plan

GHG Inventory

A greenhouse gas (GHG) inventory is a list of emission sources with their associated contributions to total emissions quantified using standardized methods. The GHG inventory enables us to map GHG risks of various sources and identify opportunities for reductions (EPA, 2023).

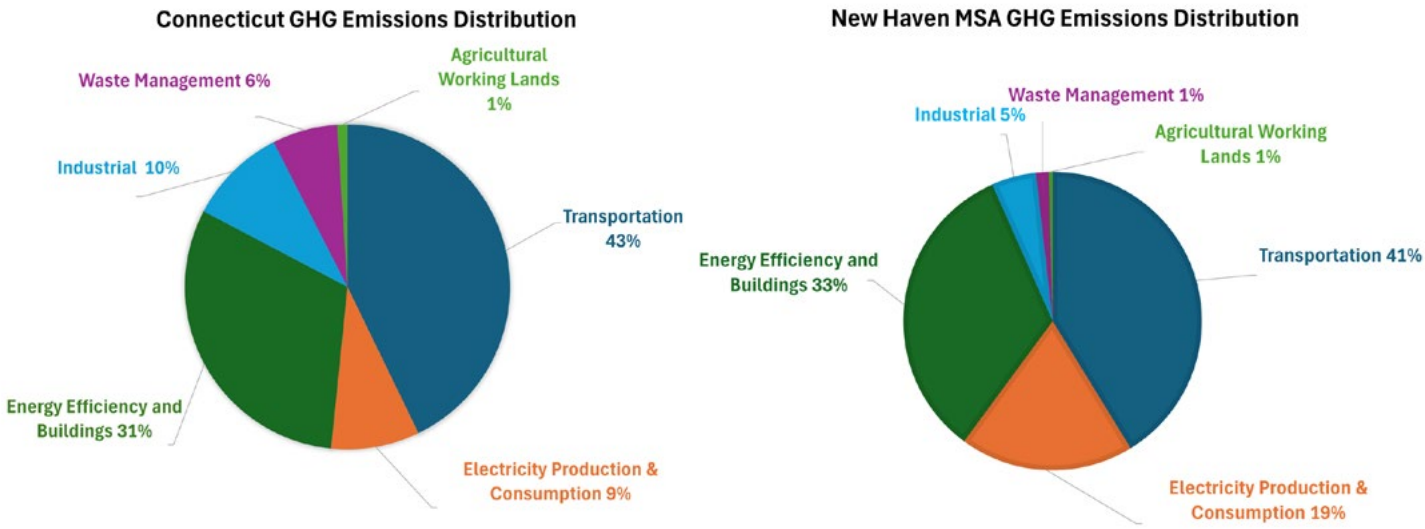


Figure 5: GHG Emissions data in Connecticut and New Haven County from NARSLAB

To develop the GHG Inventory shown in Figure 5, the following the steps were carried out:

- Examined EPA's Local Greenhouse Gas Inventory Tool (LG-GIT) and compared sector account with that of DEEP, which is based on the State Inventory Tool (SIT)
- Obtained Connecticut-wide greenhouse gas (GHG) emissions estimates from the Department of Energy and Environmental Protection (DEEP) report
- Calculated estimates for New Haven County

Through this analysis, key contributors of GHG emissions have been identified. Figure 5 shows an estimated comparison of emissions by sector on both the State and County level. Further analysis found that the County's total emissions equals 6.42 MMTCO2e (Zhao and Oke, 2024). Transportation contributes the largest percentage of GHG emissions, followed by residential and commercial buildings (2024). In this case, residential and commercial building emissions are made up of emissions from stationary combustion, including the burning of oil and natural gas for space and water heating. These two sources are addressed in the section Energy Efficiency in Buildings. Electricity consumption in buildings is captured in the electricity sector, with emissions being slightly lower at the county level than at the state level (2024). Industrial processes contribute slightly more to county emissions than state emissions, while waste, agricultural, and natural gas leakage remain similar (2024).

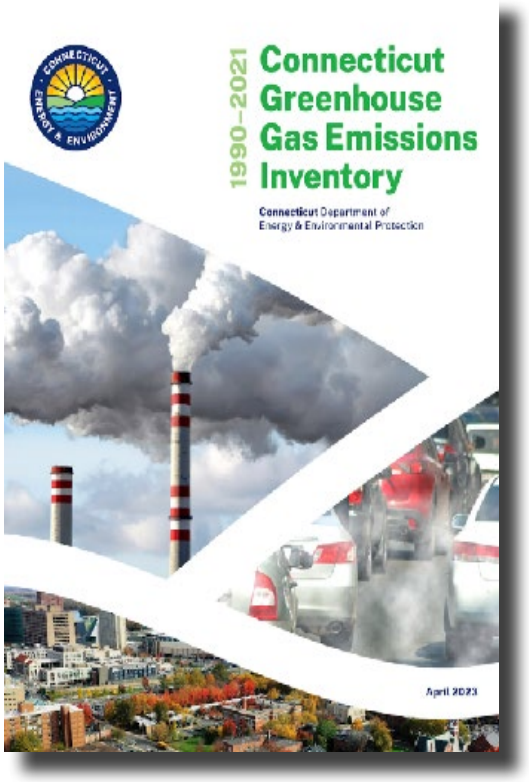


Figure 6: Connecticut Greenhouse Gas Emissions Inventory

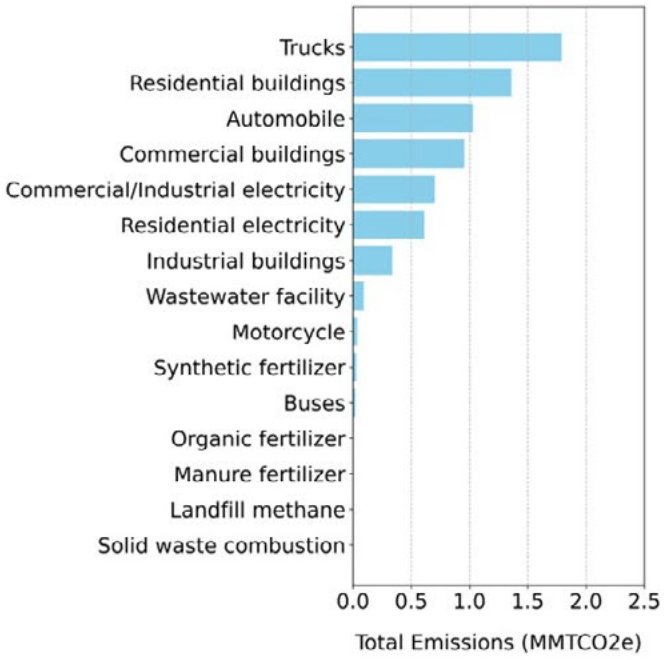


Figure 7: Emissions by source (Zhao and Oke, 2024)

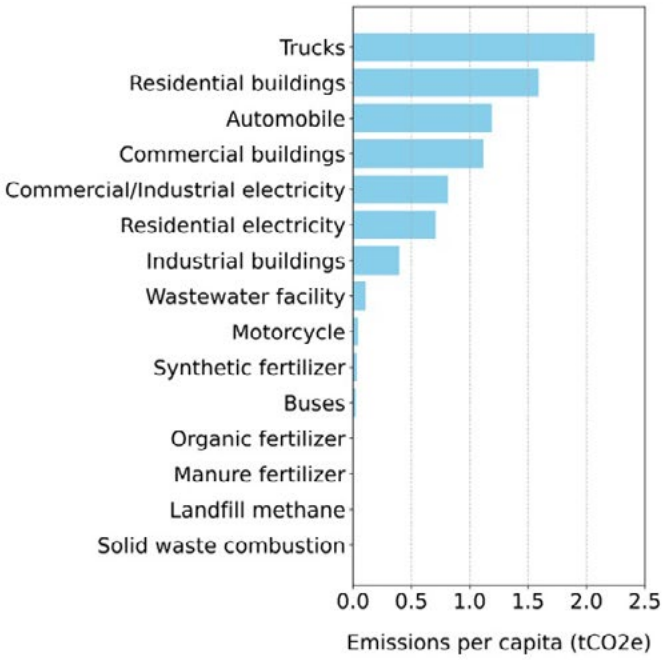


Figure 8: Emissions by source per capita (Zhao and Oke, 2024)

By source

Further GHG Inventory analysis revealed sources of regional emissions by sector. These results are discussed below and can be seen in Figures 7 and 8.

Transportation
Transportations sources, particularly trucks and automobiles, contribute the largest share of emissions within the County, with emissions from trucks alone comprising over 25% of the county's total emissions (Figure 7) (2024). Emissions from buses and mortocycles comprise a negilgible amount of the Countys total emissions (2024). At the per capita level, vehicle miles traveled (VMT) was found to be positively correlated with increasing emissions (2024). This suggests that centering policies that reduce VMT and the usage of gas and diesel powered vehicles at the individual level will be important for reducing emissions in this sector. This is further exemplified by the high levels of vehicle ownership present in the County (US Census Bureau, 2010).

Commercial and Residential Buildings
The top sources for emissions from stationary combustion at the residential level included heating oil, natural gas, and propane, although emissions from propane are negligible compared to the former two sources (Figure 7) (2024). Residential heating oil alone contibutes a little over 10% of the County's total emissions (2024). Commercial fuel, which includes all fuel types, contributes around the same amount of emissions as residential heating oil (2024). Per capita emissions shown in Figure 8 follow similar trends (2024), indicating that reduction measures in this sector will have to target both residential and commercial buildings.

Electricity Consumption
Emissions associated with commerical and Industrial electricity make up 10% of the County's total emissions, while residential electricity usage contributes slightly less to the County's total emissions (Figure 7) (2024). Per capita emissions follow a similar trend (2024), indicating the importance of addressing emissions from electricity consumption in both the residential and commerical/industrial context. Moreover, emissions from this sector can be expected to increase as other sectors electrify.

Industrial
While Industrial electricity usage is accounted for in the above sector, emissions from industrial fuel usage were calculated seperately. As seen in Figures 7 and 8, this source contributes around 5% of the County's total emissions (2024).

Waste and Agriculture
Other GHG sources make up small to negligible portions of the County's total emissions inventory (Figure 7; Figure 8) (2024). This includes emissions from landfill methane release and combustion and agricultural fertilizers (2024).

Forest Sequestration
While forested land does not add to to the County's total emissions outlined above, forests do play a vital role in capturing and storing carbon and offsetting emissions. In New Haven County, forested land sequesters around 0.60 MMTCO2e (2024). The majority of this land is categorized as decidious forest, although coniferious forest and wetlands do provide some sequestration benefits.

Conclusion
Priority areas for emissions reductions include transportation, stationary combustion in buildings (including in industrial settings), and electricicty consumption. While other sources included in sectors, such as waste, contribute far less emissions than those outlined above, reduction measures could still provide a myriad of co-benefits for the communities and should not be discounted. For a detailed description of the county's emissions, a comparison to other MSA's in the state, and a full methodology, please see the appendix.

Mitigation Strategies

Methodology: Selecting Priority Strategies

Based on the emissions inventory for New Haven County, provided by NARSLAB, major emissions contributors were identified. For each sector, best practices for mitigation practices were identified by reviewing existing climate action plans across a range of scales and geographies and other literature on sector specific mitigation measures. A review of Connecticut's existing policies and climate action was also conducted. In addition to this, site visits took place throughout New Haven County and meetings were held with different stakeholders, including planners, economic development directors, and climate policymakers. Data collected from community engagement was then used to inform a list of mitigation strategies that are grounded in the realities of the region and that can be implemented at various scales.

Strategy scorecard

To help in identifying priority climate mitigation strategies, a scorecard was created for each sector. Strategies were ranked according to sector-specific indicators and estimated greenhouse gas emissions reduction, authority to implement, and the cost to implement each strategy. Here the costs are estimations extrapolated from our review of literature and planning practices. These can differ according to the scale of the project. For *Authority to implement,* "regional" refers to the Council(s) of Governments and local refers to municipality(ies).

The strategies were measured on a –2 to +2 Likert Scale, where orange represents a negative impact and green represents a positive impact. A color gradient has been utilized to indicate whether the impact is neutral (represented by a yellow hue), positive (represented by a light green hue,) or strongly positive (represented by a dark green hue). The strategies that scored most favorably on the scale, with special attention paid to cost and local and regional authority to implement, were chosen as the priority climate mitigation strategies. Cost differences are indicated by the use of dollar ($) signs, with one dollar sign representing low cost strategies and three dollar signs representing high cost strategies. Expensive ($$$) strategies include those that contain large institutional arrangements for implementation or largescale infrastructure buildout.Within each sector chapter, you will find a written explanation of the selected priority climate mitigation strategies (highlighted in blue in the scorecard). You can view a complete list of priority and non-priority strategies in Appendix A.

Sample Scorecard

Goal 1: Preserve and support existing and potential forested lands

Strategy	Est. GHG reductions	Percent Change in Tree Canopy	Reduction in PM2.5	Workforce Development	Authority to Implement	Cost to Implement
L.1 Pursue afforestationreforestation throughout the County					State, Regional	$$$
L.2 Support current efforts and management strategies to maintain existing forests on both private and public property.					Local, Regional, State	$

Positive impact Negative impact Strong impact Moderate impact

MOBILITY AND TRANSPORTATION

With its complex system of highways, railroads, port, airport and public transit systems, New Haven County's transportation network is unique for an area of this size. Focusing on transportation and associated land-use is not only important due to high emissions from this sector, but also because of its intrinsic ties to public health, equity, and economic opportunity.

Emissions Contribution

Statewide = 43%
New Haven County = 41%

While a comparison with Bridgeport-Stamford-Norwalk MSA and Hartford-East Hartford-Middletown MSA shows that New Haven County has the lowest transportation emissions amongst the three, it still contributes around 3 MMTCO2e of emissions (Zhao and Oke, 2024). This makes this sector a priority for mitigation measures.

Automobiles and light trucks are the most common type of vehicles in the county, making up 40.6% and 56% of the total number of vehicles, respectively. As shown in Figure 9, which shows the break-down of emissions based on the vehicular source, these are also the most significant contributors of GHGs in this sector[1]

2.875 MMTCO2e is equivalent to driving around 639,775 gas-powered vehicles for one year[2].

In New Haven County, the emissions from diesel vehicles are around 30% higher than those from gasoline vehicles[3]. Buses accounted only for 0.7% and the overall contribution from public transport was only 0.24%. This data
windicates that the largest amount of emissions are from private vehicles.

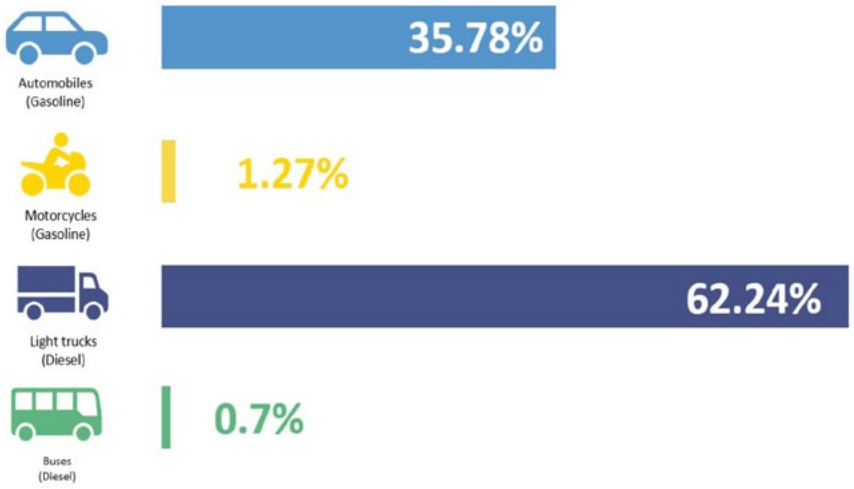


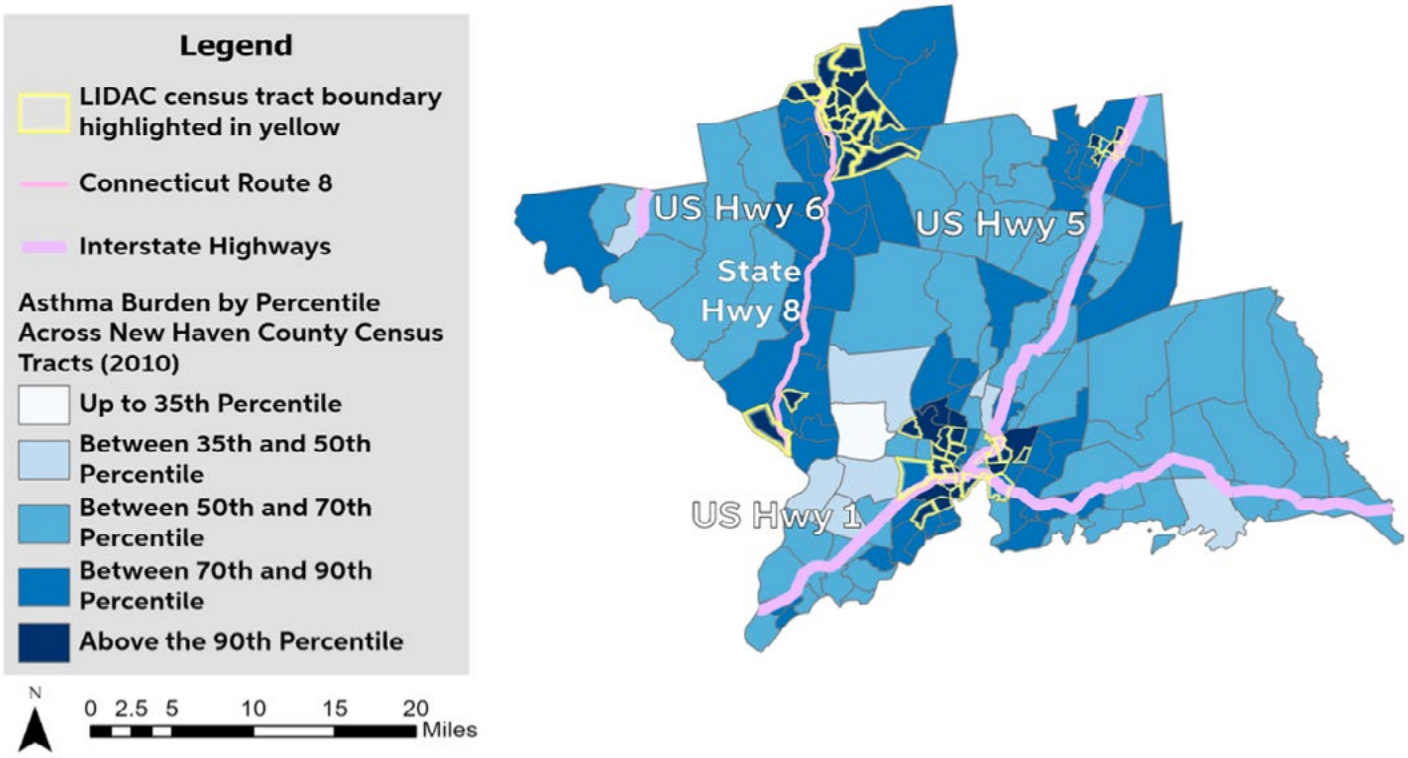
Figure 9: Contributions from each type of vehicle and associated fuel used (Data source: Zhao and Oke, 2024)

Why Mobility and Transportation matters

Traffic proximity and health

LIDAC analysis has shown that asthma burdens are present in a large number of tracts and block groups in the region. As shown in Map 9, areas that are located near major roadways and trucking routes often suffer from high asthma burdens. This is a major issue in the state as air pollution is associated with more annual deaths in Connecticut than any other state in the New England (Hartford Courant, 2016). High traffic proximity burdens are also present in the county's urban centers, further exacerbating public health issues related to vehicular air pollution.

[1]Our study assumes that all automobiles are passenger cars, trucks are light trucks and buses are heavy duty vehicles.
[2]https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results
[3]For analysis purposes, this data from NARSLAB assumes that all light trucks and buses operate on diesel, while all cars/automobiles and motorcycles use gasoline.



Map 9: Interstate highways and asthma burden

Access

Access to transportation is what connects people to economic opportunities. While none of the LIDAC tracts were in the 90th percentile or higher for travel burden[4], 8 densely populated LIDAC tracts are in the 50th-90th percentile. Moreover, non-LIDAC areas suffer from high travel burdens as well. Historically, jobs that are available in the County require one to travel by car, impacting social and economic mobility (Abraham, 2023). For example, in a 2021 survey, 14% of residents in the region said that they stayed home because they did not have reliable transportation. Access to reliable transportation also varies across race and the number of people employed in the household (Abraham, 2023).

Transportation access can also create significant barriers in accessing healthcare, impacting health equity (Abraham, 2023). In 2022, 13% of adults in urban core cities like New Haven said that they could not attend a medical appointment or visit their healthcare provider due to lack of reliable transportation (Abraham, 2023).

Regional Context

Connecticut's Department of Transportation already has a plan to reduce emissions from their fleet in Hartford, New Haven, and Stamford by 30% by 2029 and 100% by 2035 (Connecticut Department of Transportation, 2023). Recent actions include electrifying buses and the Shoreline East Commuter Rail, installing charging stations for the State fleet, and building pedestrian, cyclist, and transit centers (2023). However, some of these measures fail to address emissions from private, single occupancy vehicles.

[4]Calculations for travel burden consider travel time and travel cost

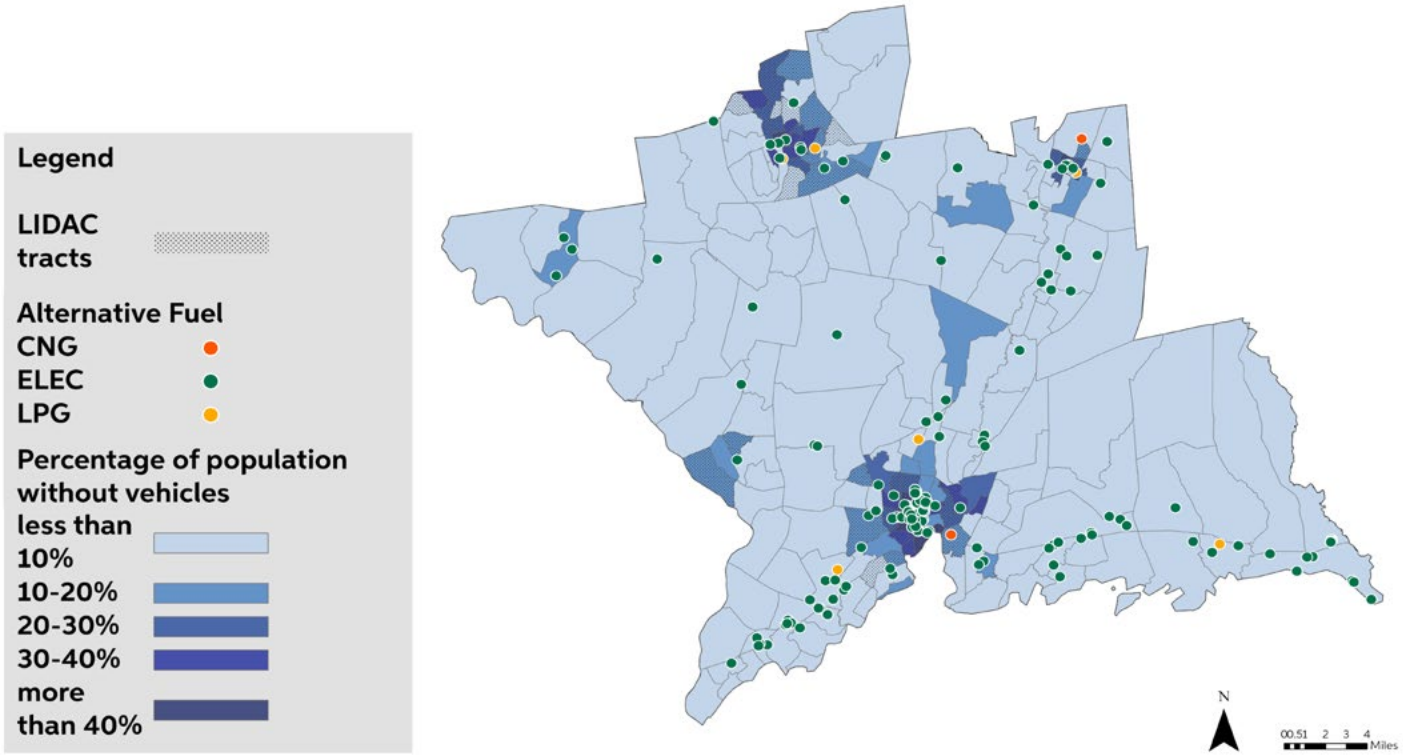
Vehicle Ownership and Electric Vehicles

As shown in Map 10, most areas of the county have a vehicle ownership rate of 90% or higher, contributing to the County's reliance on cars as a means of transportation to and from work (US Census Bureau, 2010). Moreover, the majority of private vehicles relied on gasoline or diesel as fuel, while electric vehicles make up less than 2% of the total vehicles present in the County (Martinez, 2023).

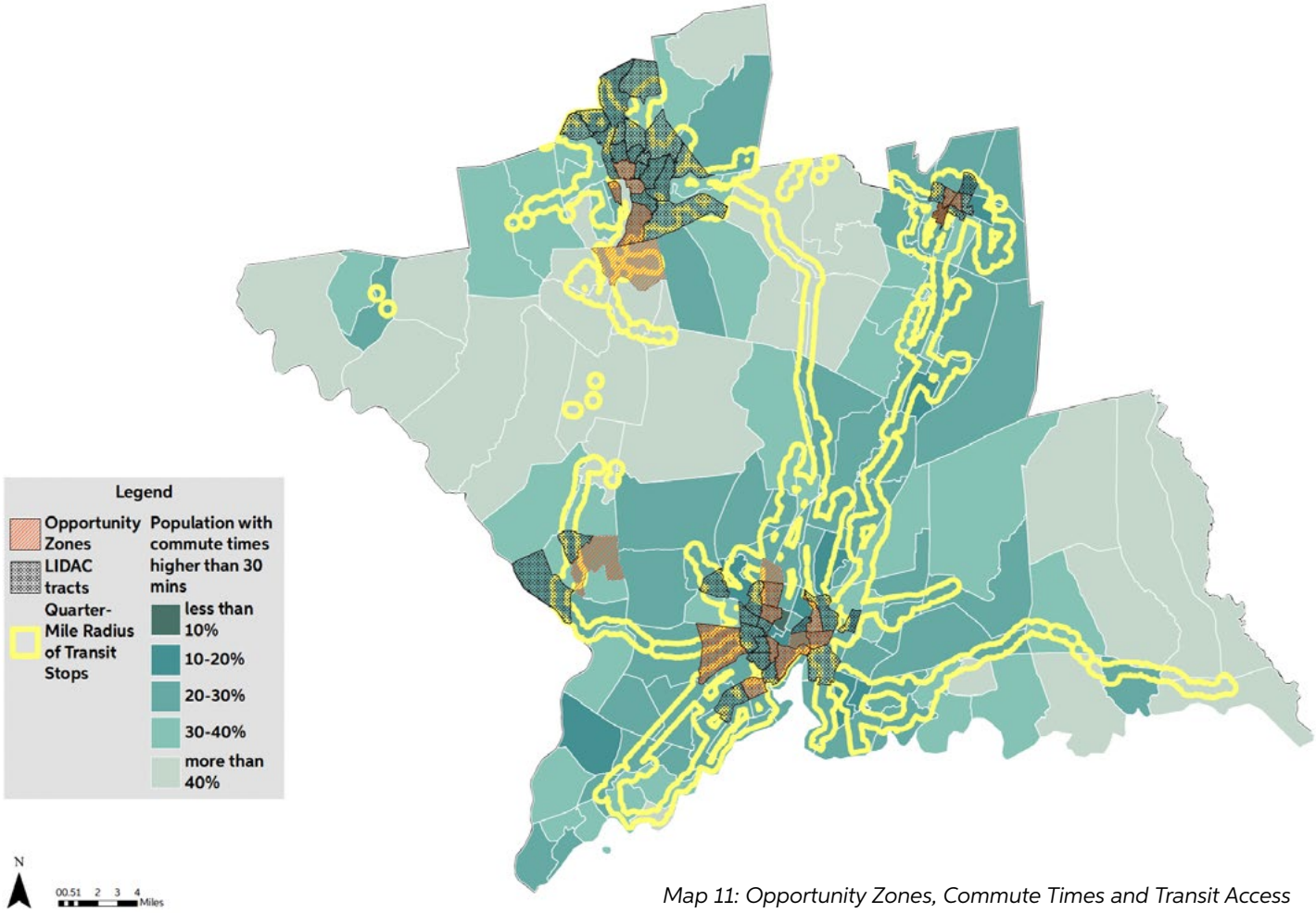
In 2022, the number of electric vehicles in Connecticut increased to 35,100, from 4800 in 2016 (Matrinez, 2023). In 2021, approximately 78,000 EVs, plug-in hybrids, or hybrid vehicles were registered in the state. These numbers are an improvement from previous years, but the County still lacks infrastructure to support EV adoption. As shown in Map 10, areas of high car ownership do not have access to alternative fuels such as LPG, hydrogen, CNG, or electric charging. At the state level, 1,500 more charging stations would have to be built in order to meet EV demand and state EV targets by 2025 (Martinez, 2023).

To support EV adoption, Connecticut has been instituting stronger-than-federal clean car standards. The state has proposed Advanced Clean Cars II (ACCII)[5] and Advanced Clean Trucks (ACT)[6] rules that would require "automakers to steadily and gradually increase their sales of new electric vehicles (Save the Sound, 2023)". However, this regulation only applies to original manufacturers, and not to dealers, distributors, or buyers (Yohe & Khuns, 2023). Electric vehicles are also expensive compared to conventional fuel vehicles. While EVs can lead to fuel savings in the long term, upfront costs are still high, making EV adoption difficult for consumers. With this barrier in mind, mitigation efforts should also focus on improving transit options and reducing commute times and vehicle miles traveled.

[5]Full regulation available at https://eregulations.ct.gov/eRegsPortal/Search/RMRView/PR2023-023
[6]Full regulation available at https://eregulations.ct.gov/eRegsPortal/Search/RMRView/PR2023-020



Map 10: Vehicle ownership and alternative fuels.



Map 11: Opportunity Zones, Commute Times and Transit Access

Transit, Commute Times, and Vehicle Miles

The people of New Haven County average a commute time of 25.6 minutes (New Haven County, CT | Data USA, n.d.) with an overwhelming majority of them traveling to work by car alone. The county's vehicle miles traveled (VMTs) annually equate to 6.9 billion miles and an estimated 8,000 miles per person. The number of vehicle miles traveled declined in 2020 due to the pandemic but has since rebounded to pre-pandemic levels (CT DEEP, 2023). Less than 40% of the population lives in transit walksheds (quarter-mile distance) and some towns have no transit connection to urban cores where employers are concentrated (Map 11).

However, the county has relatively good rail service provided by New York MTA, CT Rail, and Amtrak, with stops in or near most towns in the Greater New Haven area. Since the pandemic, with many employees working from home, rail ridership has not returned to pre-pandemic levels. However, CT transit buses have seen an increase in ridership over pre-pandemic levels (Abraham, 2023).

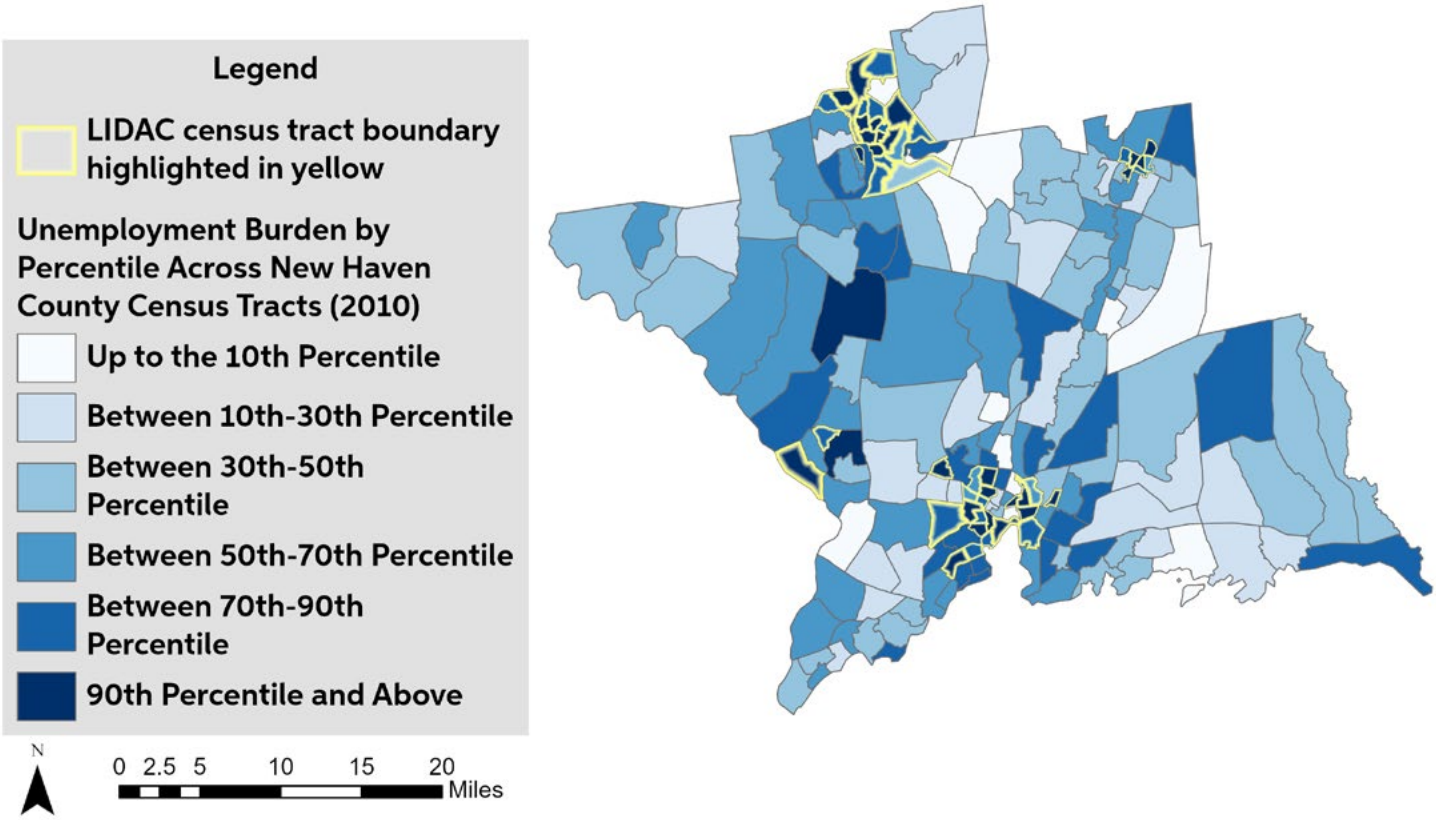
The poverty rate in the County is 11%, which is lower than the US poverty rate of 13%, but within the County rates between towns differ greatly. The region also experiences high workforce development and unemployment burdens, contributing to this issue. While opportunity zones[7] are accessible by transit, as shown in Map 11, these areas are not completely in transit walksheds, resulting in limited access, especially for people who experience travel burdens. Map 12 shows areas experiencing high unemployment burdens; notice that some of these areas lack any access to public transit (Map 11).

Improving mass transit and active transportation options can reduce reliance on motor vehicles, resulting in reductions in VMTs and better health outcomes for LIDAC communities by reducing exposure to traffic and traffic related air pollution. These options can also increase road safety, as crash-related injuries and fatalities are substantially lower on transit than for other modes of travel (Abraham , 2023).

However, transit-oriented development (TOD)[8] is not prevalent in the State. Resilient Connecticut recommends proactively planning for TOD at the state level by building more scope for local governments to contribute financially to transit and supporting quarterly meetings between cities and transit providers (Ray et al., 2021). Resilient Connecticut has also found the TOD plans within the State don't address parking issues, and while some touch upon walkability and network, almost none discuss flooding and sea level rise (2021). This would need to be addressed as the County continues to experience increasingly severe impacts of climate change.

[7]A QOZ is an economically distressed community where new investments, under certain conditions, may be eligible for preferential tax treatment. Localities qualify as QOZs if they were nominated for that designation by a state, the District of Columbia, or a U.S. territory and that nomination was certified by the Secretary of the U.S. Treasury via his delegation of authority to the Internal Revenue Service (IRS).

[8]Transit-oriented development is defined as "the development of residential, commercial, and employment centers within one-half mile of walking distance of public transportation facilities, including rail and bus rapid transit and services, that meet transit supportive standards for land uses, built environment densities, and walkable environments, in order to facilitate and encourage the use of those services." (Section 13b-79o of the Connecticut General Statutes)



Map 12: Unemployment Burden in New Haven County

Other concerns

Since LIDAC communities are mostly in dense areas with high traffic volumes, safety improvements will be needed to relieve the impacts of traffic proximity. With the advent of remote work during the pandemic, internet access can also increase opportunities for education and employment. While broadband access has increased over the past several years in the county, access still varies by income, with households who make less than $50,000 still unable to access broadband Internet (Abraham, 2023). Improving broadband access can open opportunities for employment that do not require high commute times, reducing overall car dependency and vehicle miles traveled in the county.

Recommended Strategies: Scorecard

The table on the next page represents recommended strategies and how they score across a range of indicators. Priority strategies score the highest across these indicators and support preferential goals for greenhouse gas emissions reductions in this sector. Preferential goals, priority strategies, and quantified reductions appear below the scorecard.

Goal 1: A clean and green municipal fleet

Strategy	Est. GHG reductions	Diesel Particulate	Asthma	Traffic Proximity	Access to Public Transit (.25 miles	Transportation cost	Reduction in VMTs	Reduction in Unemployment	Transportation Time	Authority to Implement	Cost to Implement
T.1 Accelerate and/or begin adopting EV's into the municipal fleet, including public school buses.										Local, State	$
T.2 Begin adopting alternate fuel sources such as hydrogen for medium to heavy-duty vehicles, where appropriate, if EV transition is not possible.										Local, State	$
T.3 Reduce idling in municipal fleet; work with civil engineers to adjust traffic signals and patterns to reduce idle time.										State	$$

Goal 2: Create a transit first approach and reduce spatial misalignment

Strategy	Est. GHG reductions	Diesel Particulate	Asthma	Traffic Proximity	Access to Public Transit (.25 miles	Transportation cost	Reduction in VMTs	Reduction in Unemployment	Transportation Time	Authority to Implement	Cost to Implement
T.4 Offer discounted transit fare for LIDACs.										State	$
T.5 Create a transit-first approach: a.Pilot pedestrianization, limited traffic (bus only lanes/streets) and use of active transportation downtown and in dense developments. b. Ensure opportunity areas are completely accessible by transit. c. Advocate for transit plans that incentivize new development in areas that will allow for transit, walking, and bike use										State, Local	$$$

Strategy	Est. GHG reductions	Diesel Particulate	Asthma	Traffic Proximity	Access to Public Transit (.25 miles	Transportation cost	Reduction in VMTs	Reduction in Unemployment	Transportation Time	Authority to Implement	Cost to Implement
T.6 Partner with micro-transit companies to enable cross-town trips for smaller towns nearby.										Local, State	$$
T.7 Reduce spatial misalignment through changes in land-use: a. Conduct feasibility studies for creating economic zones in areas with high commute times. b. Encourage denser housing in areas near existing economic zones.										Local, State	$
T.8 Create more park-and-ride options, and increase transit access and frequency in areas with high car ownership and high commute times to work to enable multi-modal trips.										State	$$

Goal 3: Reduce emissions from private vehicles

Strategy	Est. GHG reductions	Diesel Particulate	Asthma	Traffic Proximity	Access to Public Transit (.25 miles	Transportation cost	Reduction in VMTs	Reduction in Unemployment	Transportation Time	Authority to Implement	Cost to Implement
T.9 Increase the over all Electric Vehicle adoption and create infrastructure to support this: a. Communicate the benefits of CHEAPR to low and middle-income communities, and have limited time offers of higher Rebate+ to encourage the buying of EVs in the short-term.										Local	$$

Strategy	Est. GHG reductions	Diesel Particulate	Asthma	Traffic Proximity	Access to Public Transit (.25 miles	Transportation cost	Reduction in VMTs	Reduction in Unemployment	Transportation Time	Authority to Implement	Cost to Implement
b. Encourage car owners in rural communities to set up at home EV charging by taking advantage of Federal Tax credits. c. In high-density development areas, implement requirements for new development to include EV charging stations. d. Communicate the benefits of the eBikes incentive program and advocate for increased funding for it, especially encouraging the growth of the Voucher+ offer for LIDACs											
T.10 Incentivize EVs for shared-mobility companies (Uber/Lyft); this can even include free public parking for such vehicles										Local, State	$$
T.11 Incentivize trip reduction programs in public offices and partner with private offices for the same: this requires an increase in work-from-home oppurtunities to reduce VMT during the work commute.										Local, State	$
T.12 Improve broadband access (with at least 1GBPS) state-wide										State	$$
T.13 Pursue alternative fuel sources, such as hydrogen, where appropriate if electrification is not possible										State	$$$

Positive impact Negative impact Strong impact Moderate impact

Priority Goals and Strategies

Goal 2: Create a transit first approach and reduce spatial mis-alignment

Quantified GHG Reduction Potential for all strategies under goal 2 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
49.42-101.88	0.779%-1.606%

For all associated assumptions and quantifications, see Appendix H.

T.5 Create a transit-first approach:

- **Pilot pedestrianization, limited traffic (bus only lanes/streets) and use of active transportation downtown and in dense developments.**
- **Ensure opportunity areas are completely accessible by transit.**
- **Advocate for transit plans that incentivize new development in areas that will allow for transit, walking, and bike use**

Combining T.5 with T.7 is especially important to reduce the traffic flow through dense LIDAC areas. This will also relieve travel burdens in LIDAC areas. Regarding improving TOD in the County, Resilient Connecticut recommends using utilizing specific measures for "transit-supportive areas," including intersection density of 100+ and a link-node ratio of 1.4 or more (Ray et al., 2021). Investing in buses in such places can improve car-free or car-lite living.

Municipalities like Hamden already have plans for complete streets[9]. Communities should emulate this measure as a means of reducing VMTs and emissions from transportation. Within the County, local agents like the Safe Streets Coalition of New Haven, are also promoting a transit-first and active transportation approach (Climathon Action Guide 2.0, 2023; New Haven Safe Streets Coalition, n.d.).

Census tracts and blocks impacted: All LIDACs in New Haven County; areas near and including existing economic zones with high commute times and high unemployment burdens; LIDAC areas impacted by high asthma risk and traffic proximity; LIDACs with unemployment and linguistic isolation burdens; LIDACs at elevated flood risk.

Direct benefits	Co-benefits
GHG emissions reduced	Improved transit options
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Workforce development; increased employment through access to jobs
Reduction in PM2.5	Downtown revitalization enabling active transportation and creating health benefits
Reduction in diesel particulate	Reduced commute times
	Reduced noise pollution from traffic
	Improved health due to air pollution reduction
	Improved health due to air pollution reduction

Table 2: LIDAC Benefits for strategy T5

T.7 Reduce spatial misalignment through changes in land-use:

- **Conduct feasibility studies for creating economic zones in areas with high commute times.**
- **Encourage denser housing in areas near existing economic zones.**

[9]For more information on complete streets: https://www.transportation.gov/mission/health/complete-streets

As shown in Map 11, commute times are high in some areas. Unemployment burden remains high in these areas as well, especially in and around Beacon Falls, Bethany and Seymour. Municipalities will need to create more work opportunities where people live and create more living opportunities where people work. However, this is currently limited by land-use restrictions. Implementing this strategy will require re-zoning and making permitting processes for denser developments easier while encouraging businesses to invest in existing opportunity zones. This can also reduce traffic in-flow to dense urban areas, especially if combined with other priority strategies in this section.

Census tracts and blocks impacted: All LIDACs in New Haven County; areas near and including existing economic zones with high commute times and high unemployment burdens; LIDAC areas impacted by high asthma risk and traffic proximity; LIDACs with unemployment and linguistic isolation burdens; LIDACs at elevated flood risk.

Direct benefits	Co-benefits
GHG emissions reduced	Improved access to transportation
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Workforce development; increased employment through access to jobs
Reduction in PM2.5	Downtown revitalization enabling active transportation and creating health benefits
Reduction in diesel particulate	Reduced commute times
	Reduced noise pollution from traffic
	Improved health due to air pollution reduction

Table 3: LIDAC Benefits for strategy T7

T.8 Create more park-and-ride options, and increase transit access and frequency in areas with high car ownership and high commute times to work to enable multi-modal trips

Some areas of the County lack access to any transit options, especially those that connect to dense urban cores. Park-and-ride options can help enable multi-modal trips from these areas to places of employment. This will also reduce the inflow of private vehicles into LIDAC areas. Both transit access and frequency need to be increased to encourage public transit ridership for successful implementation of this strategy.

Census tracts and blocks impacted: All LIDACs in New Haven County; areas near and including existing economic zones with high commute times and high unemployment burdens (including non-LIDAC tracts); LIDAC areas impacted by high asthma risk and traffic proximity; LIDACs with unemployment and linguistic isolation burdens; LIDACs at elevated flood risk.

Direct benefits	Co-benefits
GHG emissions reduced	Improved transit options
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Workforce development; increased employment through access to jobs
Reduction in PM2.5	Downtown revitalization enabling active transportation and creating health benefits
Reduction in diesel particulate	Reduced commute times
	Reduced noise pollution from traffic
	Improved health due to air pollution reduction

Table 4: LIDAC Benefits for strategy T8

Goal 3: Reduce Emissions from Private Vehicle

Quantified GHG Reduction Potential for all strategies under goal 3 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
143.77-715.61	2.27%-11.30%

For all associated assumptions and quantifications, see Appendix H.

T.9 Increase the over all Electric Vehicle adoption and create infrastructure to support this:

- **Communicate the benefits of CHEAPR to low and middle-income communities, and have limited time offers of higher Rebate+ to encourage buying of EVs in the short-term.**
- **Encourage car owners in rural communities to set up at home EV charging by taking advantage of Federal Tax credits.**
- **In high-density development areas, implement requirements for new development to include EV charging stations.**
- **Communicate the benefits of the eBikes incentive program and advocate for increased funding for it, especially encouraging the growth of the Voucher+ offer for LIDACs**

Connecticut has incentive programs to help make EVs more affordable to consumers. Connecticut Hydrogen and Electric Automobile Purchase Rebate– CHEAPR – offers rebates for both new and used eligible vehicles with the vehicle type determining the maximum rebate. This program also has higher incentives for
vulnerable communities who meet one of the following criteria:

- Reside in an Environmental Justice (EJ) Community or Distressed Municipality.
- Participate in a qualifying state or federal income qualifying program.
- Have income less than 300% of the Federal Poverty Level (EVConnecticut - Incentives, 2022).

Federal tax credits are also offered for electric vehicles and home charging infrastructure[10]. DEEP also launched the eBikes incentive program in 2023 to increase electrified mobility options within the State by providing vouchers (and Voucher+ option for eligible applicants) for electric bikes that can be redeemed at participating retailers[11].

Census tracts and blocks impacted: All LIDACs in New Haven County; areas with high-car ownership (including non-LIDAC tracts); LIDAC areas impacted by high asthma risk and traffic proximity; LIDACs at elevated flood risk.

Direct benefits	Co-benefits
GHG emissions reduced	Improved affordability of EVs
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Improved access to EV charging infrastructure
Reduction in PM2.5	Improved affordability/access to at-home charging units
Reduction in diesel particulate	Improved health due to air pollution reduction

Table 5: LIDAC Benefits for strategy T9

[10]IRA tax credit 30C provides up to $1,000 for home EV chargers in eligible low-income/non-urban communities. IRA tax credit 25D provides 30% of all costs for battery (Mainer's Guide to Climate Incentives, 2023).
[11]For more details: https://portal.ct.gov/DEEP/Air/Mobile-Sources/CHEAPR/Electric-Bicycles

ELECTRICITY PRODUCTION AND CONSUMPTION

Renewable energy is the centerpiece for transforming the electricity sector. While buildings and transportation systems are electrified, the grid must be able to provide reliable and renewable electricity for these new technologies.

Emissions contribution

Statewide = 9%
New Haven County = 19%

Emissions Breakdown

Sector	Total Emissions (MMTCO2e)	Percentage
Residential	0.612	46%
Commercial/industrial	0.702	53%
Total	1.314	

Table 6: Emissions Breakdown from Zhao and Oke, 2024

1.3 MMTCO2e is equivalent to driving around 289,000 gas-powered vehicles for one year[1] .

Why electricity production and consumption matters

The electricity sector includes production facilities, such as power plants and solar fields, transmission lines, storage facilities, and end use consumption. Consumption is most often met through the production of electricity at offsite power plants. These plants increase or decrease production in correspondence with demand, transporting power to end users through transmissions lines (Lawson, 2018). In the United States, the most common sources for electricity include natural gas, coal, and nuclear fission, followed by hydropower, wind energy, and solar power (2018). While steady advances have been made in decarbonizing the grid though the use of renewables such as solar and wind, much of the grid is still powered by fossil fuel, while end use consumption is expected to increase by 2050 (2018). Moreover, efforts in other sectors aim to decarbonize through the electrification of combustion processes, increasing demand from the grid and possibly offsetting emissions onto this sector. In fact, considering current trends, greenhouse gas emissions from this sector are projected to remain steady through 2050 (2018).

While the importance of decarbonizing this sector cannot be understated, municipalities and regional agencies have limited authority to intervene in large scale electricity production and transmission. Generation sites and grids are owned and controlled by a mix of private energy companies, distribution companies, public agencies, and RTO's all operating in a market system. In New England, this market is overseen by ISO New England, a not-for-profit RTO that ensures the reliability of grid operations through market fluctuations (FERC, 2023). However, there are still ways municipalities and regional agencies can get involved. These include:

- **Economic development plans and workforce development for the energy transition:** Regional agencies and municipalities can prepare economic and workforce development plans to address unemployment and prepare the regional economy for the renewable transition (Maine Climate Council, 2022).

[1]Values calcualted using the Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator found at https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

- **Renewable electricity for municipal operations and buildings:** Regional agencies and municipalities have a high authority to implement projects that increase renewable energy usage in municipal buildings and operations. Possible opportunities include building out onsite renewable generation and microgrid systems for municipal operations (C2ES, 2023) and increased procurement of renewable power from the grid (Huxley-Reicher, 2022).

- **Siting and permitting:** The siting and building renewable energy projects at the municipal level can ground the renewable energy transition in the local context and decrease the need for costly transmission infrastructure (2022). Moreover, if reduction goals are to be met, buildout of renewable production, transmission, and storage facilities must be expediated in an equitable manner. At the local and regional level, this can be supported though inventory and prioritization of parcels that represent equitable and environmentally sound locations for renewable development (Bozuwa & Mulvaney, 2023).

- **State and federal solar incentives:** At the residential and commercial level, onsite solar provides a myriad of benefits for greenhouse gas reductions and resiliency. Regional agencies and municipal governments could take advantage of these incentives through the usage of public engagement strategies that increase uptake amongst consumers.

- **Public utilities and Housing Authorities in renewable deployment:** Public utilities and housing authorities present themselves as a unique opportunity to pursue certain renewable energy projects on a community wide scale. These include increased procurement of renewable energy through public utilities, microgrid deployment, and distributed solar projects for public housing.

Regional Context

Connecticut's current electricity mix is comprised of a mix of nuclear, trash and fossil fuel combustion, and class 1 and class 2 renewables (CT DEEP, 2019, as cited in, Zhao and Oke, 2024). The largest source of electricity is nuclear fission, while trash to energy sources have the largest emissions intensity out of any generation type (2024). Currently, the State has been shifting away from GHG emitting sources of electricity and towards class 1 renewables such as solar and offshore wind. The latter is poised to play an important role for the state's renewable energy future, as the state legislature committed to purchasing 2,000 MW of electricity from offshore wind by 2030 (Connecticut State Legislature, 2019). Other nearby states have also committed themselves to offshore wind development. In response, Connecticut signed a pact with Rhode Island and Massachusetts to purchase 6,000 MW of electricity from offshore wind by 2030 (Associated Press, 2023), reaffirming the position of all three States that offshore wind plays an important role in the energy and economic future of the region. New Haven County can ground the transformation of this sector at the local and regional scale by building up grid resiliency, providing economic opportunity, and centering smaller renewable projects that reduce emissions.

Recommended Strategies: Scorecard

This table represents recommended strategies and how they score across a range of indicators. Priority strategies score the highest across these indicators and support preferential goals for greenhouse gas emissions reductions in this sector. Preferential goals, priority strategies, and quantified reductions appear below the scorecard.

Goal 1: Reduce electricity consumption from fossil fuel sources in municipal buildings and services

Strategy	Est. GHG reductions	Energy Cost Burden	Solar capacity captured	Workforce Development	PM 2.5 Reduced	Authority to Implement	Cost to Implement
E.1 Utilize on site renewable (ie. rooftop solar) to power municipal operations.						Local	$$
E.2 Leverage powers of municipal utilities to procure renewable power, expand electricity production capabilities, and/or invest in storage capabilities within the municipality.						Local	$$$
E.3 Increase procurement of renewable energy for municipal services.						Local	$
E.4 Pursue microgrid projects that integrate onsite renewables and electricity from the grid to power municipal services.						Local, Regional	$$$
E.5 Increase efficiency of wastewater treatment facilities, utilize onsite solar, or biogas to lower emissions at these facilities.						Loca, Regional	$

Goal 2: Increase renewable energy production and consumption at the local scale.

Strategy	Est. GHG reductions	Energy Cost Burden	Solar capacity captured	Workforce Development	PM 2.5 Reduced	Authority to Implement	Cost to Implement
E.6 Set up outreach programs that communicate State and federal level financing programs that support on site renewable generation to consumers.						Local	$$

E.7 Evaluate the potential of citing renewable energy projects on vacant, underutilized land/combine with open space planning.						Local	$$$
E.8 Consider adopting clean energy zoning ordinances that would require new and/or existing buildings to meet certain clean energy milestones through the use of onsite renewables or clean energy purchasing.						Local	$
E.9 Coordinate with housing authorities to build out community and rooftop solar, battery storage, and microgrids for affordable housing and overcome barriers to solar uptake.						Local, Regional	$$

Goal 3: Prepare local economies for renewable energy transition

Strategy	Est. GHG reductions	Energy Cost Burden	Solar capacity captured	Workforce Development	PM 2.5 Reduced	Authority to Implement	Cost to Implement
E.10 Prepare economic development plans around offshore wind energy.						Local, Regional	$
E.11 Partner with local workforce development centers and union chapters to prepare workforce in key renewable energy sectors, such as offshore wind energy and solar installations.						Local, Regional	$$$

Goal 4: Cap methane emissions from hydroelectric facilities

Strategy	Est. GHG reductions	Energy Cost Burden	Solar capacity captured	Workforce Development	PM 2.5 Reduced	Authority to Implement	Cost to Implement
E.12: "develop and take actions to mitigate the future propagation and release of additional methane and greenhouse gases from two reservoirs connected to the federal hydroelectric project" (O'Neill, 2023).						Local, Regional	$$

Positive impact Negative impact Strong impact Moderate impact

Priority Goals and Strategies

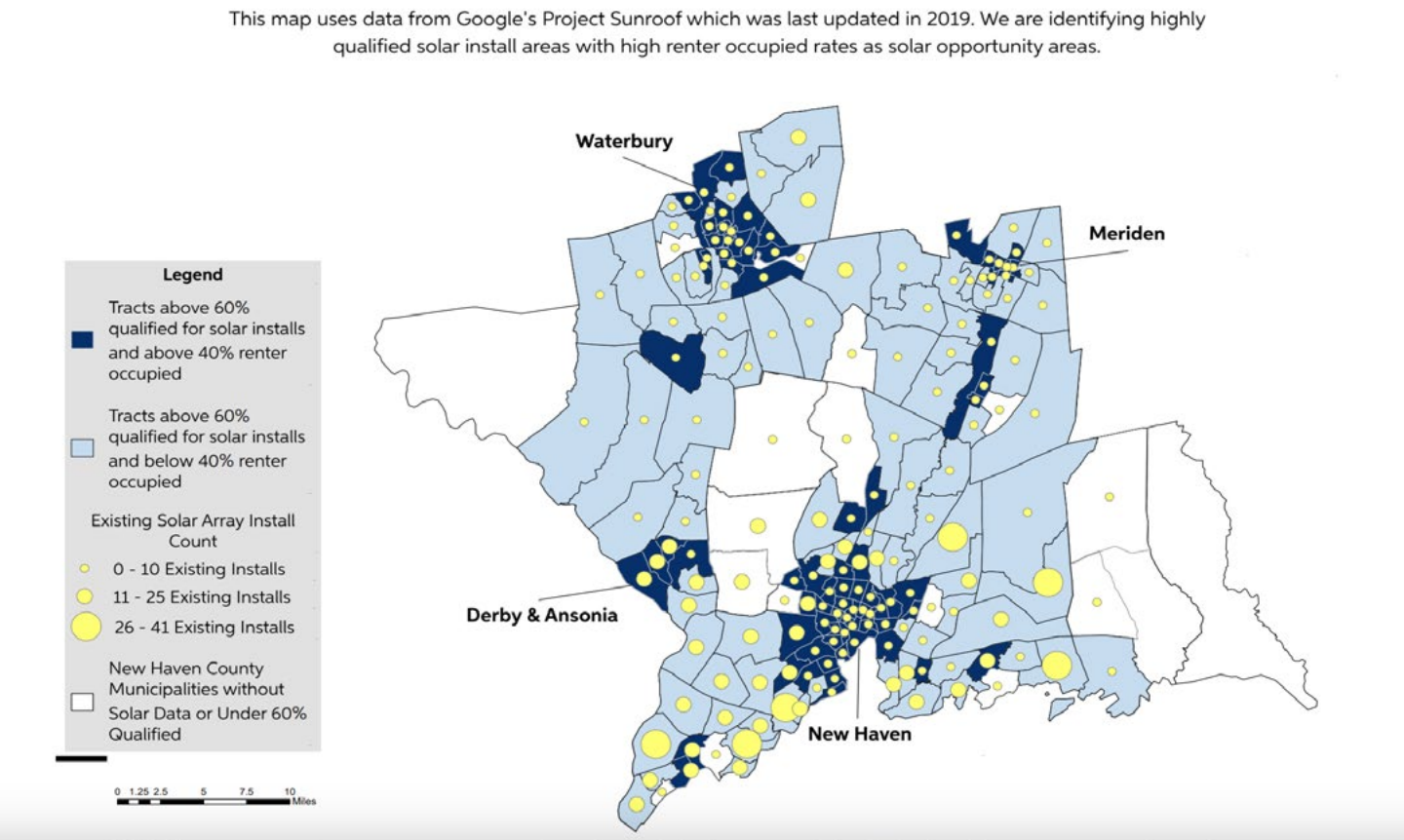
Goal 2: Increase renewable energy production and consumption at the local scale.

Decarbonizing electricity production in commercial and residential buildings is incredibly important for lowering emissions in this sector. As seen in Map 13, LIDAC areas in New Haven, Waterbury, and Meriden have low installed solar amounts and a high potential for solar installation. In response, these strategies seek to overcome issues related to solar uptake in these areas, therefore addressing LIDAC burdens while delivering emissions reductions.

Quantified GHG Reduction Potential for all strategies under goal 2 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
131.49-394.48	2.13%-6.218%

For all associated assumptions and quantifications, see Appendix H.



Map 13: Solar Opportunities Areas in New Haven County

E.6 Set up outreach programs that communicate state and federal level financing programs that support on site renewable generation for residential and commercial building owners.

CT Greenbank's Solar for All program has been highlighted as an example of incentive programs that effectively target gaps with onsite solar uptake amongst LMI households (Ramanan et al., 2021). Community engagement programs through coordination between SCRCOG and partner municipalities can highlight this program in areas with low solar uptake, increasing awareness of financial assistance for solar installations. Moreover, this program can also highlight other state and federal incentives that scale well in communities that meet threshold requirements, fueling increased decarbonization in residential and commercial buildings and supporting cross sector goals.

Implementation actions:

- Establish a regional level communication strategy that connects homeowners in LIDAC areas to CT Greenbanks Solar for All program.
- Within this framework, communicate other state and federal level incentive programs for homeowners and seek to combine EV adoption with at home renewable energy production.

Census tracts and block groups impacted: All LIDACs in New Haven County; LIDACs with high energy cost burdens; LIDACs with low installed solar; LIDACs with unemployment and linguistic isolation burdens; LIDACs at elevated flood risk

Direct benefits	Co-benefits
GHG emissions reduced	Reduced energy costs
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Workforce development
Reduction in PM2.5 from stationary combustion	Improved health due to air pollution reduction
Reduction in diesel particulate from stationary combustion	

Table 7: LIDAC Benefits for strategy E6

E.7 Evaluate the potential of citing renewable energy projects on vacant and underutilized land, such as brownfield sites, and combine planning for the renewable energy transition with open space planning.

As seen in Map 14, the region has a surplus of open space areas and brownfield sites located near LIDAC areas. Utilizing this land to build out renewable energy projects can be an effective way for communities to address emissions while grounding the renewable energy transition in the local context. Moreover, partnering with community organizations on building out community scale projects can decrease overall costs to consumers and ensure equity in the process (Heeter et al., 2021; Ramanan et al., 2021).

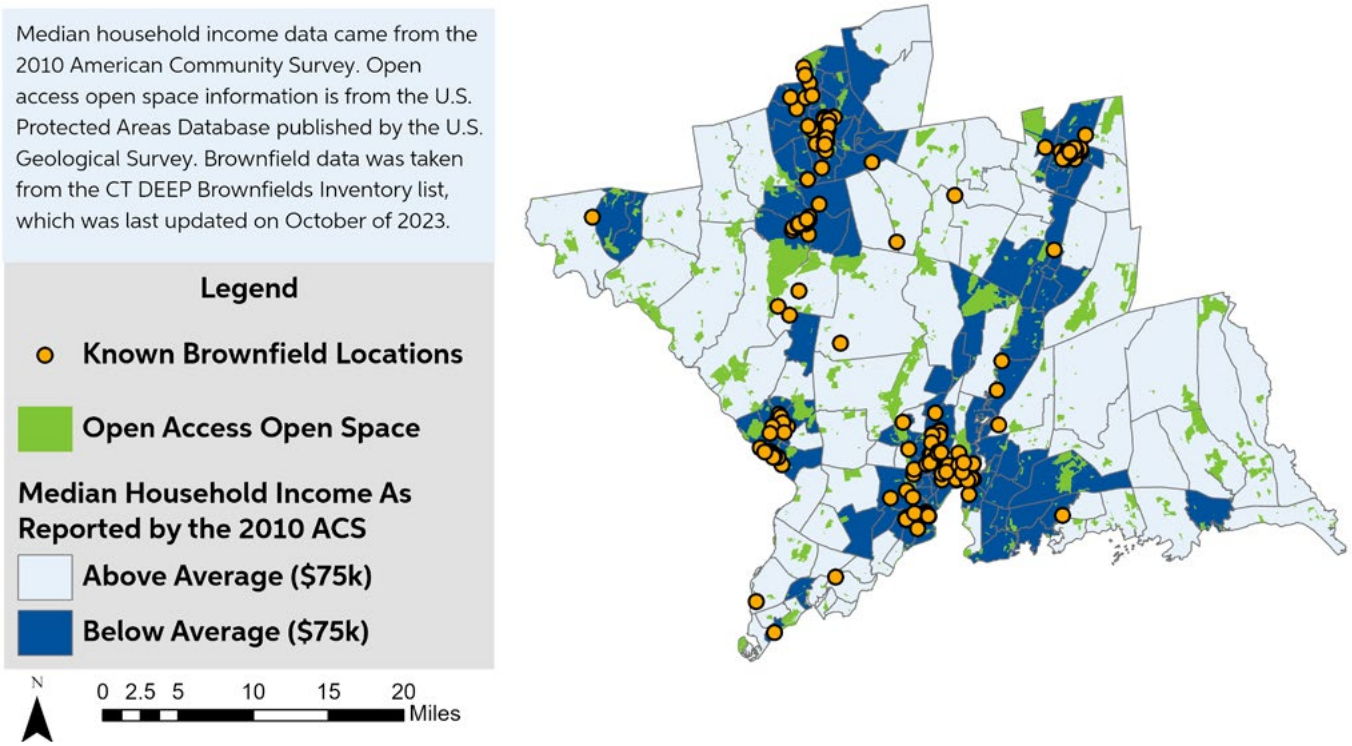
Implementation Actions:

- Partner with local Community Based Organizations to build out renewable energy projects in LIDACs (Ramanan et al., 2021).
- Prioritize brownfield sites over open space areas that provide important ecological benefits (Bozuwa & Mulvaney, 2023).

Census tracts and block groups impacted: All LIDACs in New Haven County; LIDACs with high energy cost burdens; LIDACs near brownfields sites; LIDACs with unemployment and linguistic isolation burdens; LIDACs at elevated flood risk

Direct benefits	Co-benefits
GHG emissions reduced	Reduced energy costs
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Solar capacity captured
Reduction in PM2.5 from stationary combustion	Community development through repurposing brownfields
Reduction in diesel particulate from stationary combustion	Improved health due to air pollution reduction

Table 8: LIDAC Benefits for strategy E7



Map 14: Distribution of Open Access Open Space and Brownfields Across New Haven County

E.9: Coordinate with housing authorities to build out community and rooftop solar, battery storage, and microgrids for affordable housing and overcome barriers to solar uptake.

The US Department of Housing and Urban Development (2023) outlines the possibilities solar projects and microgrids have in decarbonizing electricity use within affordable housing. As a developer of affordable housing, municipal housing authorities have authority to reduce greenhouse gas emissions while delivering benefits to LIDAC communities.

CT Greenbank offers financial support for solar installations, but caps installed potential for many properties. Affordable housing owned by housing authorities is exempt from this regulation, allowing for greater installed solar capacity and energy savings. While the potential of siting solar energy installations near or on public housing is clear, many of these installations require substantial structural and technical upgrading in order to allow for solar integration.

In order to access CT Green Bank solar programs, certain existing conditions must be present, such as a roof that is suitable for hosting solar infrastructure or an updated electrical panel. Public housing projects that could benefit from solar installations may not be eligible because of these barriers – many of which are concentrated in environmental justice communities due to older housing stocks. Grant funds can assist in removing these and other obstacles, which would allow the Green Bank to increase the amount of solar capacity they deploy.

Implementation Actions:

- Partner with housing authorities and municipal agencies engaged in public housing development to build out distributed and rooftop solar projects, battery storage, and microgrids.
- Form a coalition with other COGs with the goal of addressing technical and structural barriers on affordable housing properties.
- Utilize existing CT Green Bank funding and support mechanisms for implementation.

Census tracts and block groups impacted: All LIDACs in New Haven County; LIDACs with high energy cost burdens; LIDACs with low installed solar; LIDACs with unemployment and linguistic isolation burdens; LIDACs at elevated flood risk

Direct benefits	Co-benefits
GHG emissions reduced	Reduced energy costs
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Workforce development
	Improved health due to air pollution

Table 9: LIDAC Benefits for strategy E9

Goal 3: Prepare local economies for the renewable energy transition.

Workforce development and economic development can fuel the renewable energy transition by closing employment gaps in key industries and preparing the economy for a new industrial base.

Quantified GHG Reduction Potential for all strategies under goal 3 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
70.29-210.87	1.11%-3.32%

For all associated assumptions and quantifications, see Appendix H.

E.11 Partner with local and state level workforce development centers and trade unions to prepare workforce in key renewable energy sectors, such as offshore wind energy and solar installations.

Unemployment represents one of the highest LIDAC burdens in the region. Workforce development programs that target areas with this burden could decrease unemployment while also closing important employment gaps in the renewable energy sector.

Census tracts and block groups impacted: All LIDACs in New Haven County; LIDACs with unemployment and linguistic isolation burdens

Direct benefits	Co-benefits
Workforce Development	Improved community resiliency due to economic development

Table 10: LIDAC Benefits for strategy E11

Goal 4: Cap methane emissions from hydroelectric facilities

Quantified GHG Reduction Potential (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	0.86-5.16

For all associated assumptions and quantifications, see Appendix H.

E.12: "To develop and take actions to mitigate the future propagation and release of additional methane and greenhouse gases from two reservoirs connected to the federal hydroelectric project"

Dammed reservoirs are highlighted as a contributor to greenhouse gas emissions (Beaulieu et al., 2020). As explained by Deemer et al. (2016), dams contribute to the buildup of large amounts of organic matter, which through decomposition, release potent greenhouse gases such as methane and nitrous oxide. However, the planned removal of these structures has been cited as a potential oppor-

-tunity to inventory and address emissions in this context (International Hydropower Association, as cited by, Beaulieu et al., 2020). Kinneytown Dam, a retired hydroelectric dam located in the environmental justice communities of Ansonia and Seymour, has a large amount of decomposing organic matter behind its impoundment. As seen in the picture, the release of built-up gas was observed during recent sediment sampling. The dam is currently slated for decommissioning, underscoring the opportunity to address emissions during this project.

Figure 10: Kinneytown Dam

Census tracts impacted: LIDAC Tracts within the towns of Ansonia and Seymour

Qualitative Benefits	Co-benefits
GHG emissions reduced	New business opportunities for minority- and women-owned suppliers
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	

Table 11: LIDAC Benefits for strategy E12

ENERGY EFFICIENCY IN BUILDINGS

Energy efficiency in buildings is a keystone of sustainable development, encompassing a range of practices and technologies that optimize energy consumption. From improved insulation and high-efficiency HVAC systems to the integration of smart technologies like programmable thermostats and energy-efficient lighting, the goal here is to minimize energy waste while maintaining or enhancing the occupant's comfort.

Emissions Contributed

Statewide = 31%
New Haven County = 33%

Emissions Contributed Statewide and New Haven County
Commercial = 11% | Residential = 19%

Emissions Breakdown

Sector	Total Emissions (MMTCO2e)
Residential	1.361
Commercial/industrial	0.782
Total	2.142

Table 12a: Emissions Breakdown from Zhao and Oke for Energy Efficiency in Buildings (2024).

Heating Source	Total Emissions (MMTCO2e)
Residential oil	0.76
Residential natural gas	0.54
Residential propane	0.06
Commercial fuel	0.782
Total	2.142

Table 12b: Emissions Breakdown (by heating source) from Zhao and Oke for Energy Efficiency in Buildings (2024).

2.1 MMTCO2e is equivalent to driving around 467,314 gas-powered vehicles for one year[1].

Why does energy efficiency in buildings matter?

Buildings are the second largest source of emissions in New Haven County. Beyond environmental benefits, energy efficiency in buildings yields reduced utility bills and operating costs for owners and occupants, as well as improved living conditions. The shift towards electrification enables the integration of renewable energy sources into heating systems, aligning with global efforts to transition to clean energy. Energy efficiency saves money, increases the resilience and reliability of the electric grid, and provides environmental, community, and public health benefits (U.S. Department of Energy, Office of Energy Efficiency and

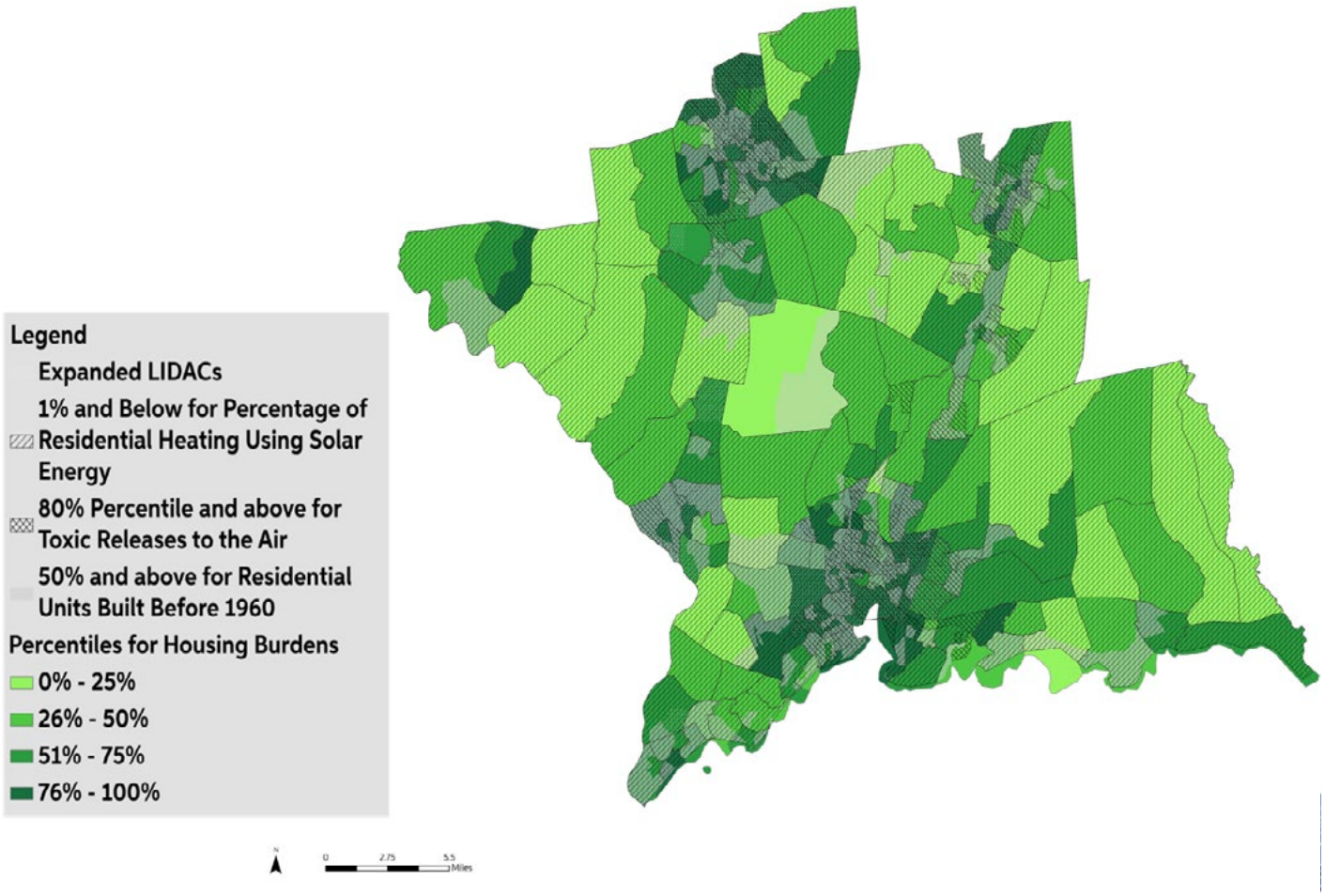
Regional context

Connecticut's commitment to addressing environmental challenges goes beyond regulatory frameworks. The state's ongoing efforts, as outlined in the 2022-2024 Conservation and Load Management (C&LM) Plan, emphasize the importance of transitioning to sustainable energy sources to mitigate climate change impacts. (CT DEEP, 2019). The incorporation of an Energy Conservation Code ensures that new construction meets strict building standards, promoting energy efficiency and reducing the overall carbon footprint of the building (CT DEEP, 2019).

[1]Values calcualted using the Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator found at https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

For cities like Waterbury, which have faced economic decline, initiatives by organizations such as the Connecticut Green Bank play a pivotal role in fostering resilience. By providing access to affordable and clean energy options, the Green Bank contributes not only to economic revitalization but also to environmental sustainability. The Green Bank also collaborates with stakeholders, engages in public private partnerships, advocates supportive policies and offers technical support to project developers. (CT Green Bank, 2017). This aligns with the state's goals of achieving a balance between economic development and environmental conservation.

The Comprehensive Energy Strategy (CES) examines future energy needs in the State and identifies opportunities to reduce costs for ratepayers, ensuring reliable energy availability, and mitigating public health and environmental impacts from building energy use, such as greenhouse gas (GHG) emissions and emissions of criteria air pollutants. The Connecticut Energy Efficiency Fund's investment in building performance helps ensure that the benefits of energy efficiency are accessible to all residents and businesses. By targeting older and inefficient buildings, which are disproportionately found in LIDACs, the Fund addresses equity, and energy affordability. (Comprehensive Energy Strategy, 2022). As can be seen in the Map below, LIDAC communities face high housing burdens while also having an aging building stock. Renewable heating sources, such as solar heating, are also more prevalent outside LIDAC areas, while the presence of acute air toxins remains high in LIDAC communities.



Map 15: Housing burden and infrastructure age

Recommended Strategies: Scorecard

This table represents recommended strategies and how they score (estimated) across a range of indicators. Priority strategies score the highest across these indicators and support priority goals for greenhouse gas emissions reductions in this sector. Quantified reductions for this sector, preferential goals, and priority strategies appear below the scorecard.

Goal 1: Ensure energy efficiency and sustainability through building codes and regulations

Strategy	Est. GHG reductions	Energy Cost Burden	PM 2.5	Diesel Particulate Matter	Workforce Development	Housing Cost Burden	Number of low and moderate income households served by energy efficiency programs	Number of rental units served by energy efficiency programs	Authority to Implement	Cost to Implement
B.1 Require building owners to annually benchmark and disclose their energy usage and efficiency ratings.									Local, State	$
B.2 Provide educational resources and support to building owners on improving energy performance in their buildings.									Local, State	$
B.3 Ensure all municipal operations rely on 100% renewable energy sources.									State	$
B.4 Advocate for strict building codes and achieve net zero energy usage.									State, Federal	$$
B.5 Offer incentives and expedited permitting for projects that achieve green building certifications.									State, Federal	$$
B.6 Support climate friendly land use.									Local	$

Goal 2: Renewable heating access for low income homes

Strategy	Est. GHG reductions	Energy Cost Burden	PM 2.5	Diesel Particulate Matter	Workforce Development	Housing Cost Burden	Number of low and moderate income households served by energy efficiency programs	Number of rental units served by energy efficiency programs	Authority to Implement	Cost to Implement
B.7 Install solar heating systems on low income housing units to provide renewable water heating for these properties.									Local, State	$
B.8 Integrate solar heating systems into community initiatives and reduce overall energy costs and reduce barriers to solar uptake.									Local, State	$$
B.9 Install energy monitoring and management systems in low-income housing to track and control energy consumption.									Local, State	$$

Goal 3: Energy efficient building materials and retrofits

Strategy	Est. GHG reductions	Energy Cost Burden	PM 2.5	Diesel Particulate Matter	Workforce Development	Housing Cost Burden	Number of low and moderate income households served by energy efficiency programs	Number of rental units served by energy efficiency programs	Authority to Implement	Cost to Implement
B.10 Support the adoption of sustainable building materials in low income housing construction and renovation.									State, Federal	$$
B.11 Establish a city-wide retrofit program focused on low income residents and municipal buildings, providing grants and low-interest loans to property owners for energy-efficiency upgrades and heat pump instatlations.									Local, State	$$

B.12 Monitor and report the energy and cost savings resulting from retrofitting and sustainable materials to demonstrate their impact and encourage further investment.									Local, State	$
B.13 Set up outreach programs at the regional or local level that target LMI households for heat pump installations and energy efficiency upgrades.									Local, Regional	$

Positive impact Negative impact Strong impact Moderate impact

Priority Goals and Strategies

Goal 1: Ensure energy efficiency and sustainability through building codes and regulations

This goal supports efforts to that use regulatory measures to lower building energy usage and increaseing sustainbility. Since 2007, Connecticut law has mandated high performance efficiency buildings. As required, DEEP has adopted high performance ("green") building construction regulations that incorporate design, construction, and operation practices that preserve the natural environment. These State construction standards are consistent with, or in some cases, have exceeded the Leadership in Energy and Environment (LEED) silver design building rating system. (U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, 2013). These efforts can be supported at the regional and local level. These can be achieved through policies that affect municipal and regionally owned buildings or through local policy mechanisms, such as zoning.

Quantified GHG Reduction Potential for all strategies under goal 1 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
96.00-680.00	1.513%-10.719%

For all associated assumptions and quantifications, see Appendix H.

B.1 Require building owners to annually benchmark and disclose their energy usage and efficiency ratings.

Implement mandatory building energy benchmarking and disclosure requirements for both existing buildings and new construction and establish a centralized platform for collecting and reporting building energy performance data. To support this, agencies should provide financial incentives and support for building owners to undertake energy efficiency improvements. There should also be efforts to ensure that landlords conduct retrofitting and building benchmarking while maintaining transparent records. This ensures the safety and quality of buildings and occupant comfort (CT DEEP, 2019).

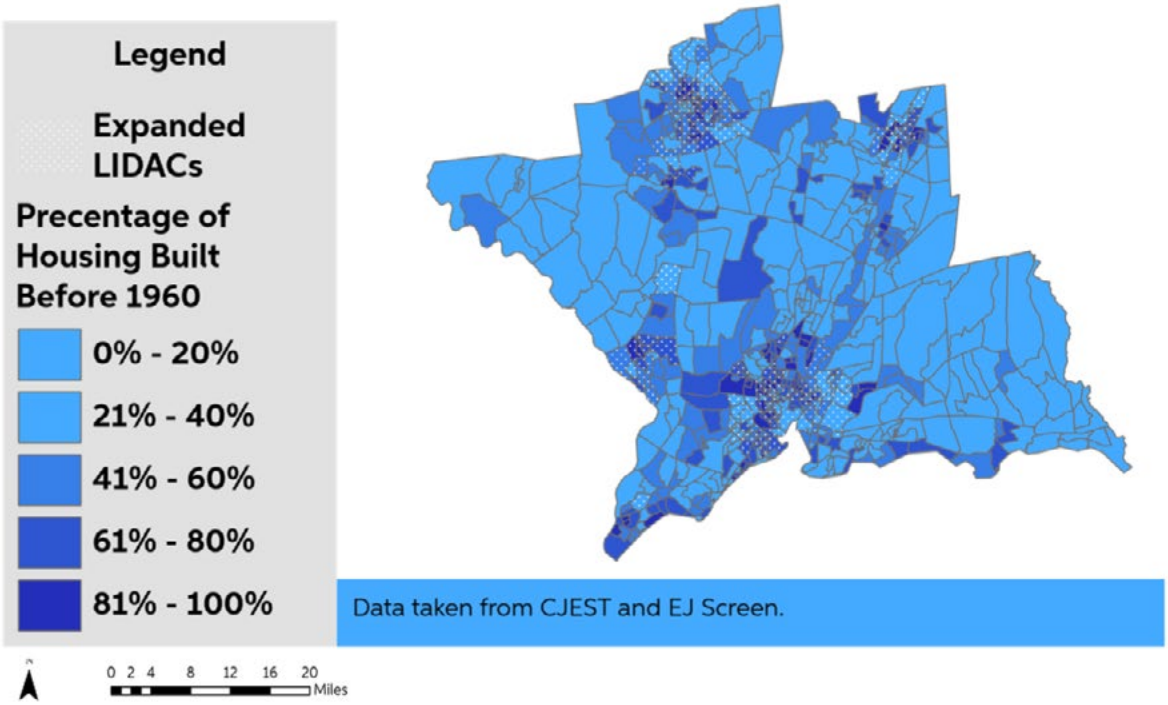
Mandatory benchmarking and disclosure of building energy usage fosters transparency, encouraging owners to invest in efficiency improvements. This benefits low-income communities by reducing utility costs, improving indoor conditions, and creating job opportunities (Better Buildings: U.S. Department of Energy, 2019).

Additionally, the strategy centers environmental justice by mitigating the impact of energy consumption on vulnerable populations through the utilization of energy efficiency programs and policies for low income communities.

Census tracts and blocks impacted: LIDAC tracts with high energy cost burdens.

Direct benefits	Co-benefits
Tons of emissions reduced	Reduced energy costs
PM 2.5 reduced	Workforce Development

Table 13: LIDAC Benefits for strategy B1



Map 16: Age of Housing Infrastructure

B.6 Support climate friendly land use

Implemtation Action: Develop robust resources to enable municipalities to implement model climate-friendly land use and zoning practices

Program benefits would include lower energy costs and tangible emissions reductions.

Census tracts and blocks impacted: Tracts with high energy cost burdens and unemployment.

Direct benefits	Co-benefits
Tons of emissions reduced	Reduced energy costs
PM 2.5 Reduced	Workforce development

Table 14: LIDAC Benefits for strategy B6

Goal 2: Renewable heating access for low-income homes

Renewable Energy Access for Low Income Homes reduces energy costs for low-income households but also narrows the energy divide, allowing everyone to benefit from clean and sustainable energy.

Quantified GHG Reduction Potential for all strategies under goal 2 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
136.00-680.00	2.144%-10.719%

For all associated assumptions and quantifications, see Appendix H.

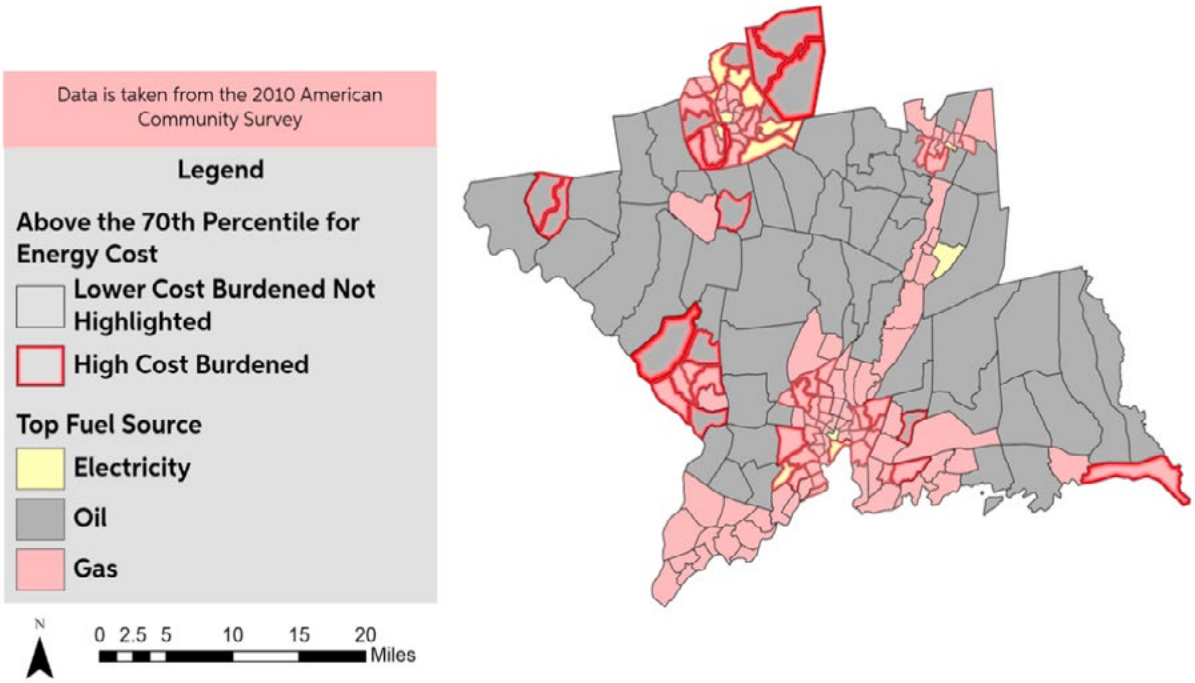
B.8 Integrate solar heating systems into community initiatives and reduce overall energy costs.

Active solar heating can help reduce the reliance on fossil fuel sources for space and water heating in buildings. This systems are scalable, can be combined with existing electric and fossil fuel heating systems, and are supported can be further supported by state and federal financial incentives (EnergizeCT, 2024). Municipalities should communicate these opportunities to consumers and highlight active solar heating systems as a means to lower emissions and optimize a building's energy efficiency. By strategically utilizing solar for heating, these buildings contribute to sustainability while creating comfortable indoor environments.

Census tracts and blocks impacted: Tracts with high energy cost burdens and low installed solar.

Direct benefits	Co-benefits
Tons of emissions reduced	Reduced energy costs
Solar capacity captured	Workforce development
PM 2.5 Reduced	

Table 15: LIDAC Benefits for strategy B8



Map 17: Top Fuel Sources Across New Haven County with High Energy Cost Burdened Tracts Highlighted

Goal 3: Energy-efficient Building Materials and Retrofits

Energy Efficient Building Materials and Retrofits seek to transform the landscape of buildings, making them greener, more energy efficient and environmentally responsible. This includes upgrading building insolation and replacing heating and cooling systems with more efficient and environmentally friendly options, such as heat pumps. As these changes take shape, people's daily lives will be enriched by improved indoor environments and lower operating costs, all while contributing to the broader goal of reducing emissions. Retrofitting is especially important considering the high percentage of energy burdens in the county and the presence of old buildings that utilize gas- and oil-powered heating systems.

Quantified GHG Reduction Potential for all strategies under goal 3 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
136.00-680.00	2.144%-10.719%

For all associated assumptions and quantifications, see Appendix H.

B.11 Establish a city-wide retrofit program focused on low-income residents and municipal buildings, providing grants and low-interest loans to property owners for energy-efficient upgrades and heat pump installations.

Implementation actions:

- Pursue public private partnerships to facilitate access to expertise, resources and technologies that promote sustainable building practices and energy efficiency.
- Emphasize the use of recycling and using eco-friendly materials that reduce the environmental impact of construction.
- Replace existing oil and gas fueled heating systems with heat pumps. This should include utilizing heat pumps for space heating and cooling and water heating.

Low-income households often spend a higher percentage of their income on energy. Retrofit programs ensure that these communities have equitable access to energy saving technologies and the resulting cost savings (Giandomenico et al., 2022). Retrofit programs can also generate employment opportunities for communities, particularly in construction, energy auditing and related sectors (Ungar et al., 2021).

Census tracts and blocks impacted: tracts with high energy cost burdens

Direct benefits	Co-benefits
Tons of emissions reduced	Energy Cost Burden
PM2.5 reduced	Workforce Development

Table 16: LIDAC Benefits for strategy B11

B.13 Set up outreach programs at the regional or local level that target LMI households for heat pump installations and energy efficiency upgrades.

Implementation Actions:

- Highlight the benefits of HEATsmart programs to increase heat pump uptake in LIDAC communities.
- Partner with social service and community based agencies for assistance on outreach into LIDAC areas.
- Highlight the benefits of other state and federal incentives for heat pump installation and energy efficiency upgrades, such as HES-IE through EnergizeCT.

Program benefits would include lower energy costs in LIDAC areas and tangible emissions reductions due to efficiency upgrades and heat pump installations.

Census tracts and blocks impacted: tracts with high energy cost burdens

Direct benefits	Co-benefits
Tons of emissions reduced	Energy Cost Burden
PM2.5 reduced	Workforce Development

Table 17: LIDAC Benefits for strategy B13

Types of solar energy

Solar energy includes a range of different technolgies. Within this plan, two types have been discussed thus far; Solar photovoltaics and active solar heating.

- Solar photovoltaics: These systems capture thermal energy from the sun and convert it directly to electricity (SEIA, 2024). This can then be used to power building appliances, including electric space and water heating systems, to charge electric vehicles, and to provide electricity for other needs.
- Active solar heating: While they still use sunlight as a form of energy, active solar heating systems take this energy and stores or distributes it throughout the system in order to provide space and water heating (2024). Unlike solar photovoltaic systems, thermal energy is not converted to electricity. Rather, active solar heating systems capture thermal energy by using a liquid solution that is held within collector panels (EnergizeCT, 2024). This solution is then transported to a storage tank or heat exchanger and used for space and water heating (EnergizeCT, 2024; United States Department of Energy, 2024). These systems can also be combined with electrical or fossil fuel heating systems (EnergizeCT, 2024).

Both of photovoltaic and active solar heating systems can be built on a variety of scales, from large commercial installations, to community wide systems that distribute power or heating to a neighborhood, to small rooftop installations that provide electricity or heating for one building. In the context of this plan, strategies utilizing solar photovoltaic systems can be found within the Electricity Production and Consumption sector, while those that use active solar heating systems can be found in the Energy Efficiency in Buidlings sector.

Passive solar heating: While not brought up directly in this plan, passive solar heating refers to design techniques that allow buildings to capture thermal energy from the sun to heat internal spaces. These techniques do not require solar panels and can be utilized in strategies that focus on building materials and design, such as B.9 and B.10.

WASTE MANAGEMENT

Waste management has become a pressing issue for Connecticut with the recent closure of a major waste-to-energy plant. Connecticut now ships 40% of its garbage to other states at significant cost (CT DEEP, 2023a). To address this problem, Connecticut has awarded grants to 19 municipalities to pilot unit-based pricing with food scrap diversion programs (Weymouth, 2023). Improved management of organic waste offers near-term greenhouse gas reduction opportunities that can be implemented on the local and regional levels.

Emissions contribution

Statewide = 6%
New Haven County = 1%

Source	Total emissions (MMTCO2e)
Distillate Fuel Oil No. 2, Natural Gas, Propane	0.0
Landfill methane	0.0
Total	0.0

Table 18: Emissions Breakdown from Zhao and Oke for Waste Management (2024)

Connecticut does not have active landfills for municipal solid waste. Landfills are used for bulky waste and special waste (CT DEEP, 2023a). While there are no emissions from landfills in New Haven County (Zhao and Oke, 2024), the County does produce solid waste, but its emissions from this sector are primarily attributed to landfill emissions in receiving states and to waste-to-energy incinerators, most of which are located outside of the County. Therefore, New Haven County's waste emissions are negligible. Measures in this sector seek to address solid waste production in the County that contributes to emissions in other states and counties.

Why waste management matters

While waste is a relatively small contributor to greenhouse gas emissions, it's an area in which residents and municipalities can make a significant impact. In addition, reductions in the waste stream have environmental, economic, and public health benefits beyond greenhouse gas reductions. These include lowering pollution from nitrogen, plastics, and various toxins, and encouraging reductions in waste at all areas of the supply chain. Repairing, reusing, and reclaiming materials offer areas for economic opportunity as well. Reducing food waste in particular has a myriad of benfits. The Environmental Protection Agency (EPA) estimates that 58% of landfill emissions come from food waste (US EPA, 2023a). Waste-focused emissions reduction strategies can also play an important role in addressing waste management capacity and cost concerns. In addition, such strategies will reduce air pollution from incinerators and carbon emissions produced by transporting waste to other parts of

Regional Context

The waste crisis

Connecticut sends about 60% of its municipal solid waste to in-state incinerators, all of which are in or near environmental justice communities (NVCOG, 2023). These facilities are also slated to be phased out as as they age (CT DEEP, 2023a). After the closing of a major incinerator in 2022, about 40% of municipal solid waste is now being shipped to Pennsylvania, Ohio and other state landfills (CT DEEP, 2023a). In response, this has raised tip fees for municipalities. As landfill space becomes scarcer nationally, these costs are projected to increase five-fold by 2050 (WasteZero, 2020).

Connecticut is committed to becoming self-sufficient in its waste management, and diverting materials from landfills and incinerators is crucial to that goal (CT DEEP, 2023a). Currently, about 35% percent of Connecticut's waste is diverted: 28% is recycled, and 7% is composted. The remainder - about 260 million tons per year – enters Connecticut's municipal solid waste (MSW) stream (2023a). Compostable organics make up 41.4%, of this and is comprised primarily of food waste (22.3% of total MSW) and other organics, such as yard waste (11.1% of total MSW) (CT DEEP, 2016a).

See the Naugatuck Regional Council of Governments' StoryMap on Connecticut's Waste Crisis.

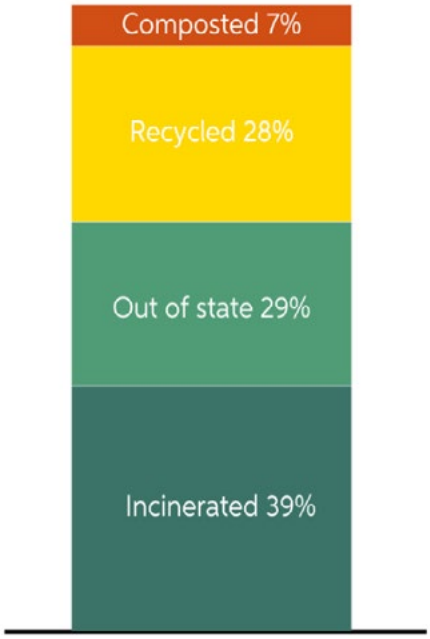


Figure 11: The fate of municipal waste in Connecticut (CT DEEP, 2023a)

Unit-based pricing with food scrap collection

Connecticut's Department of Energy and Environmental Protection (DEEP) has identified unit-based pricing as the most effective strategy for reducing municipal solid waste. In unit-based pricing, residents pay an up-front fee for waste they dispose, while there is no fee for recycling or composting (CT DEEP, 2023). This incentivizes residents to reuse, donate, recycle and compost a larger portion of their waste (2023).

Programs in which residents purchase bags for waste are by far the most effective way to achieve reductions. The average cost for bags is $71 per year per household. Curbside pick-up programs that collect separately bagged trash and food scrap bags in the same receptacle, known as co-collection, do the most to encourage food scrap separation. Municipalities that implement unit-based pricing almost universally see an immediate and lasting 40-60% reduction in waste, while combining food-scrap collection with unit-based pricing boost diversion rates (WasteZero, 2020).

Meriden diverted 13 tons of food scraps by Implementing a Sustainable Materials Managment Pilot.

Through the sustainable materials management grant program, 19 Connecticut municipalities, including nine in New Haven County, are participating in pilot programs to test out unit-based pricing and food scrap diversion programs (Weymouth, 2023). One participating city was Meriden, in which 1,000 households diverted 13 tons of food scraps over the course of four months. These food scraps were sent to Southington's Quantum Biopower anaerobic digester. (CT DEEP, 2023a)

Food scrap waste

Food waste prevention and diversion starts at the farm, and continues at every stage thereafter. The EPA (2023b) has developed a hierarchy of preferred ways to prevent and manage food waste: First, intervening at the highest level possible to make sure that as much food as possible serves its ed purpose of feeding humans and animals (2023b). After that, composting and anaerobic digestion for biogas are preferred (2023b). The least desirable destinations for food waste are landfills, incinerators and wastewater treatment facilities (2023b).

When food waste reaches these endpoints, it creates the highest methane emissions (landfill or wastewater treatment) or particulate pollution (incinerators), while the value of the food for nutrition, soil amendments, and renewable energy has been lost (US EPA, 2023b).

To facilitate diversion to composting and anaerobic digesters, CT DEEP states, "The biggest challenge is providing access to convenient, affordable food scrap collection, and incenting residents and businesses to participate in collection programs at scale" (CT DEEP, 2023, p. 28).

To manage all its waste in-state, Connecticut will need to develop more anaerobic digesters (CT DEEP, 2023a). As anaerobic digesters break down organic materials, they create methane, which is captured as biogas. Biogas, which can replace methane from other sources, is considered a Class I renewable energy source in Connecticut and can be used to produce electricity or turned into compressed and liquified natural gas (CT DEEP, 2016b). Currently, there is only one non-agricultural anaerobic digester in the State. The lack of guaranteed supply of organic materials to feed these digesters has discouraged the development of more facilities. Having large-scale food scrap collection programs in place would be needed to attract investment for further projects (CT DEEP, 2023a).

Other waste reduction opportunities

- The Connecticut Department of Energy and Environmental Protection's Sustainable Materials Management Grant Program has extended funding to launch a grant program for COGs to explore establishing or expanding Regional Waste Authorities (RWA) (CT DEEP, 2023b). RWAs can create economies of scale for trash hauling, infrastructure, administration, and sorting, including unit-based pricing and food scrap collection, as well as public education. RWAs would help create sufficient supply of diverted organic waste for additional anaerobic digesters. (CT DEEP, 2023a) The South-Central Regional Council of Governments (SCRCOG) has received one of these grants.
- About 12% of landfilled food waste from municipalities is from institutions. Connecticut's Commercial Organics Recycling Law requires certain institutions to divert their food waste; an expansion of this law to include more types and locations of institutions would divert an additional 60,000 tons of waste per year (CT DEEP, 2023a).
- Institutional and commercial food waste can also be reduced with programs such as the Center for Eco-Technology's technical support program for businesses, schools, and institutions (CT DEEP, 2023a). Reducing food loss and waste at different stages of the food chain can also potentially be supported by a UDSA Community Food Projects (CFP) Competitive Grant (USDA, 2023).
- Expanding on Connecticut's existing Extended Producer Responsibility (EPR) laws to include an EPR for packaging would reduce municipal solid waste by 190,000 tons per year (CT DEEP, 2023a).

Recommended Strategies: Scorecard

This table represents recommended strategies and how they score (estimated) across a range of indicators. Priority strategies score the highest across these indicators and support preferential goals for greenhouse gas emissions reductions in this sector. Quantified reductions for this sector, preferential goals, and priority strategies appear below the scorecard.

Goal 1: Divert waste with local and regional programs

Strategy	Est. GHG reductions	Pounds organic waste diverted	Cost savings to municipalities	Workforce development	Authority to Implement	Cost to Implement
W.1 Establish a county-wide unit-based pricing program with food-scrap collection and public education.					Local, Regional	$
W.2 Establish a regional waste management authority in New Haven County; implement waste diversion infrastructure and programs.					Local, Regional	$$
W.3 Expand and continue community-based food waste reduction programs, such as CET's assistance for food waste reduction in businesses, schools, and institutions.					Regional	$

Goal 2: Enact and expand statewide waste reduction laws

Strategy	Est. GHG reductions	Pounds organic waste diverted	Cost savings to municipalities	Workforce development	Authority to Implement	Cost to Implement
W.4 Advocate for the expansion of Connecticut's Commercial Organics Law to include a wider array of organizations and more geographic locations.					State	$
W.5 Advocate for extended producer responsibility (EPR) program for packaging to reduce waste by 190,000 tons per year, saving municipalites $50 million per year.						

Positive impact Negative impact Strong impact Moderate impact

Priority Goal and Strategies

Quantified GHG Reduction Potential for all goals and strategies in this sector (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
262.99	4.27%

For all associated assumptions and quantifications, see Appendix H.

Goal 1: Divert waste with local and regional programs.

W.1 Establish a county-wide unit-based pricing program with food-scrap collection, expanded municipal composting, and public education on waste reduction.

This program would lead to a 40-60% reduction in municipal solid waste, saving municipalities money, reducing greenhouse gas emissions from organic waste, and helping Connecticut achieve its goal of self-sufficiency in waste management.

Implementation actions:

- A regional organization, such as SCRCOG or NVCOG, should coordinate the start-up of unit-based pricing program with food-scrap collection in New Haven County municipalities.
- Coordinators will be hired to work with municipalities on establishing or expanding programs, including managing co-collection for curbside and transfer station programs, public outreach, and choosing and purchasing needed materials, such as bags and other receptables.
- Coordinators will also engage in public education on reducing waste of all kinds, from purchase decisions, to food storage, use, and home composting.
- Coordinators will also work with towns to establish or expand on textile, toy, and book donation programs, reuse programs, and municipal composting.
- The first 40% of outreach, services, and supplies will go to low-to-moderate income households, with a focus on multi-unit housing developments. This will include working with landlords and housing authorities on successful implementation of unit-based pricing with food scrap collection on their properties, including proper receptables and public education.
- Low-cost or free bags should be made available to low-income households to enable participation.

Census tracts and blocks impacted: All LIDACs in New Haven County; LIDACs with unemployment and linguistic isolation burdens; LIDACs with elevated flood risk

Direct benefits	Workforce development
GHG emissions reduced	Community capacity building through public engagement
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Reduced waste disposal costs for municipalities and consumers
	Reduced food costs due to reduced household food waste

Table 19: LIDAC Benefits for strategy W1

W.2: Establish a regional waste management authority in New Haven County; implement waste diversion infrastructure and programs.

A Regional Waste Authority can achieve an economy of scale for waste reduction and food scrap diversion, saving municipalities money and ensuring sufficient organics collection to support the build out of anaerobic digester facilities. By increasing the materials diverted to recycling, reuse, composting, and anaerobic digesters, an RWA can also lead to workforce development in waste management and biogas facility construction and operations.

Implementation actions:

- A regional organization, such as SCRCOG or NVCOG, should work with municipalities to establish a Regional Waste Authority in New Haven County.
- The RWA will implement a unit-based pricing with food scrap collection, waste reduction and public education program as described in Waste Strategy 2 (above). This program will be centrally managed, serving multiple New Haven County municipalities.
- The RWA will seek funding from CT DEEP and other sources to establish necessary infrastructure.

Census tracts and blocks impacted: All LIDACs in New Haven County; LIDACs with unemployment and linguistic isolation burdens; LIDACs with elevated flood risk

Direct benefits	Co-benefits
GHG emissions reduced	Workforce development
Reduced climate change impacts	Community capacity building through public engagement
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	Reduced waste disposal costs for municipalities and consumers
	Reduced food costs due to reduced household food waste

Table 20: LIDAC Benefits for strategy W2

Waste Sector Challenges

Community engagement surrounding this Plan has made it abundantly clear that waste issues are important to New Haven County. Through written public comments and verbal feedback at brainstorming meetings, community members have urged an increased focus on food diversion, more and cleaner waste infrastructure, and eliminating the need to ship trash out of state. Designing solutions to these identified issues that fall within the authority of a COG resulted in somewhat narrow strategies expressed in the scorecard. Legal limitations make it difficult to plan for the bold, transformative action that is necessary to address the waste crisis and reduce greenhouse gas emissions in this sector. This is not to say that solutions are impossible – just that they fall outside the scope of what COGs and this PCAP can accomplish. The Connecticut Coalition for Sustainable Materials Management (CCSMM) – a group of over 90 municipalities and CT DEEP – published a "Menu of Options" in 2020 containing a variety of recommendations to reduce disposal tonnage, generate environmental benefits, and save money for Connecticut communities. The takeaway is that some of the most effective, sustainable waste reforms must come legislative requirements at the state level. Examples include:

- Statewide unit-based pricing (UBP) mandate: UBP or pay-as-you-throw involves charging households for the amount of waste they produce, rather than a flat fee in their property tax. Connecting the amount of waste a household makes to the amount they pay creates a strong price signal that changes behavior at the point of generation. Although UBP can be (and has been) adopted on a town-by-town basis, a statewide mandate will have the highest impact on waste reduction. CCSMM states that "Participation in curbside food waste collections programs, EPR programs, and recycling programs is higher in communities with UBP and therefore should be prioritized as a first step for optimizing diversion from disposal". States like Vermont and Minnesota require UBP in all their municipalities.

- Statewide food diversion mandate: With food scraps accounting for 22% of the residential waste stream, a requirement to send organic waste to a compost facility or anaerobic digestor will result in significant diversion. CCSMM recommends flexible legislation that allows municipalities to choose between transfer station drop-off, curbside pickup, or backyard composting programs.

- Extended producer responsibility (EPR) programs: EPR is a mandatory type of product stewardship that makes the manufacturer of a product responsible for its post-consumer management. CT already has EPR programs for paint, mattresses, mercury products, certain electronics, gas cylinders, and tires – but broader programs like EPR for packaging could yield far more waste reduction. CCSMM states that "These programs require legislation to establish a level playing field for manufacturers and to secure long-term success of the programs".

- Bans on certain materials: CCSMM recommends "Adopt[ing] legislation to eliminate certain plastics and expanded polystyrene", just as was done with plastic bags, that are ubiquitous in our trash cans and could be replaced by reusable alternatives.

- Recycled content requirements: CCSMM advocates for laws that establish "recycled content standards for consumer goods sold in Connecticut". This would make recyclables more valuable and therefore less expensive to get rid of, while preventing the extraction of virgin materials to make new products.

Because the solutions listed above fall outside the scope of COG authority, resources are better spent at the state level to implement these mandates than for COGs to pilot weaker, voluntary versions of them.

INDUSTRIAL

The industrial sector consists of emissions from facilities such as power plants, natural gas, petroleum systems, and other major industries such as healthcare, retail, manufacturing, and universities. While not the biggest emitting sector, this sector holds immense potential for emissions reduction, especially concerning the release of highly potent gases with a global warming potential[1] surpassing that of carbon dioxide.

Emissions contribution

Statewide = 10%
New Haven County = 5%

	Total emissions (MMTCO2e)
Stationary Combustion	0.341
Electricity Consumption[2]	0.703
Total	1.044

Table 21: Emissions Breakdown from Zhao and Oke for Industry (2024)

1.04 MMTCO2e is equivalent to driving around 232,322 gas-powered vehicles for one year[3] .

Why does industry matter?

Industrial processes are carbon intensive and often release potent emissions with a global warming potential significantly surpassing that of carbon dioxide (US EPA, 2015). The industrial sector is also a notable producer of short-lived climate pollutants including methane and hydrofluorocarbons (HFCs) (From SLCP Challenge to Action, 2018). In contrast to carbon dioxide that lingers in the atmosphere for centuries, short-lived climate pollutants remain in the atmosphere for less time while having a substantial impact on near-term global warming (From SLCP Challenge to Action, 2018). Strategies to reduce the emissions of these highly potent gases can have significant benefits for climate change mitigation.

The industrial sector also plays a pivotal role as a major employer in the region. Implementing strategies to reduce emissions in this sector will also enable a transition to greener jobs, yielding significant benefits for workforce development. DEEP reports that at the state level, the construction industry has had the largest gain in green jobs, followed by wholesale trade and professional and technical services sectors (The Governor's Council on Climate Change, 2018).

Regional context

New Haven County's industrial sector includes diverse sub-industries such as retail trade, health care and social assistance, accommodation and food services, construction, and professional and technical services (US Census Bureau, 2021). Health Care and Social Assistance is the largest industry with the highest number of establishments and the highest number of employees in the county, as shown in Figure 12 (US Census Bureau, 2021). Retail trade and educational services are the next biggest employer in the County.

[1]Global Warming Potential is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO2)
[2]Table 19 shows the quantified emissions in New Haven County from stationary combustion and electricity consumption in the industrial sector. The mitigation strategies do not directly target these sources but recommend partnerships with private industries that will spur changes towards reduction of emissions from above sources.
[3]Values calcualted using the Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator found at https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

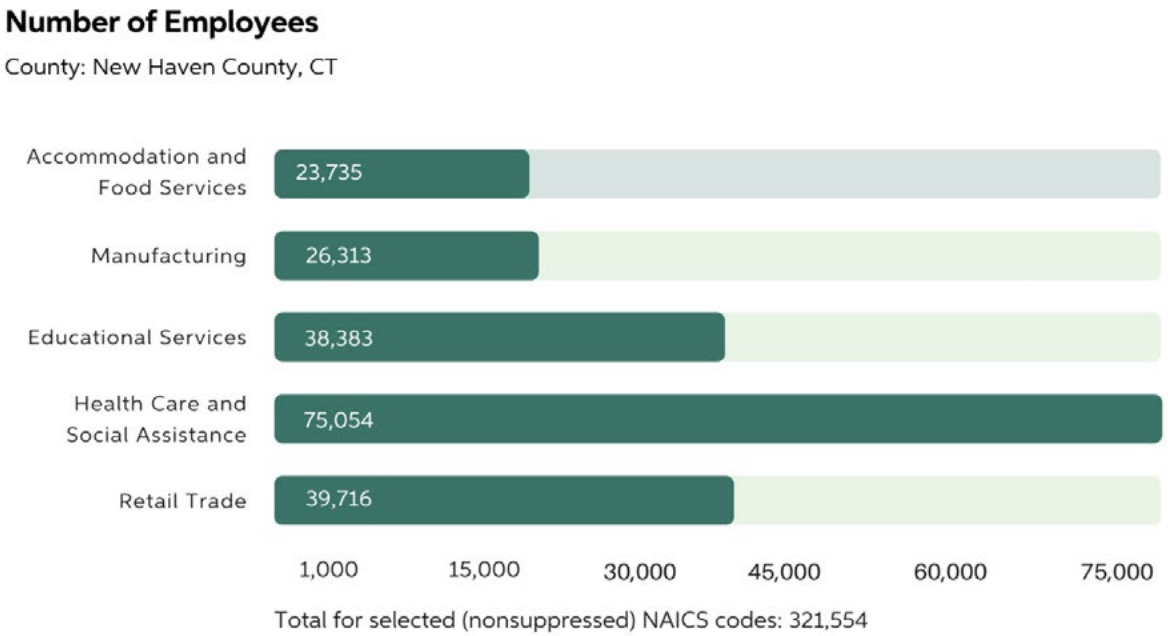


Figure 12: Total number of employees by industry in New Haven County (US Census Bureau, 2021)

Despite the significance of the emissions from the industrial sector, one of the major challenges for emissions reduction is the lack of robust reporting requirements for private sector establishments. Studies, such as (Tomar, 2023) and (Yang et al., 2021), find a considerable reduction in emissions, up to 7.9% and 7% respectively, when facilities disclose their greenhouse gas emissions through the EPA's Greenhouse Gas Reporting Program. However, in New Haven County, no industrial sector establishments currently report under the EPA's Greenhouse Gas Reporting Program as their emissions do not meet thresholds set by the program (US EPA, 2014). States like California (California SB 253, 2023) and Oregon (Oregon Secretary of State Administrative Rules, n.d.) have successfully lowered reporting thresholds, which could serve as a model for the State of Connecticut.

While addressing the challenges posed by absence of a standard reporting mechanism, it is also essential for mitigation strategies to build upon and enhance efforts that are already underway in the region. For example, at the State level, the "Buy Clean" policy, which would enact procurement guidelines that require using building and construction materials with a smaller carbon footprint, is already underway. In the healthcare industry, the Yale New Haven Health System has implemented various sustainability initiatives and, most recently, inaugurated the Center for Sustainable Healthcare (A Greener YNHHS, n.d.). Their endeavors to assess organizational practices and adopt strategies for reducing carbon footprint have gained national acclaim for mitigating the environmental impacts of their operations. The recommended strategies build on this existing momentum in the industrial sector.

Shifts towards decarbonization of the industrial sector call for a close partnership with the public sector at the federal, state and local levels. Policies to reduce emissions from the industrial sector fall into four general categories: market-based policies, emissions standards and mandates and incentives, procurement, and other public investments to support emissions reduction measures to promote low-carbon technologies. Moreover, the strategies suggested in the PCAP will encourage public-private partnerships and span across three categories of major industries in New Haven County.

Recommended Strategies: Scorecard

As mentioned previously, partnering with major industries is essential to achieving the goal of greenhouse gas reduction in this section. Though it is not included as a strategy, it is important to note that regional agencies and municipalities can encourage partnerships between local research institutions, private enterprises, and other government agencies to collaborate to develop and implement low-carbon technologies. With the presence of Yale University and other leading research institutions, municipalities, agencies and planning organizations in New Haven County are uniquely positioned to foster collaboration.

To avoid duplication, the strategies in this sector will not focus on building efficiency and electricity consumption, which are discussed elsewhere in the plan (See Electricity Production and Consumption and Energy Efficiency in Buildings).

This table represents recommended strategies and how they score (estimated) across a range of indicators. Priority strategies score the highest across these indicators and support preferential goals for greenhouse gas emissions reductions in this sector. Quantified reductions for this sector, preferential goals, and priority strategies appear below the scorecard.

Goal 1: Improve Emissions Monitoring, Accounting and Reporting

Strategy	Est. GHG reductions	Authority to Implement	Cost to Implement
I.1 - Require utility companies, gas suppliers, and health care establishments to report emissions data		State	$

Goal 2: Reduce emissions through low-carbon procurement

Strategy	Est. GHG reductions	Authority to Implement	Cost to Implement
I.2 Embed a purchasing criterion in public projects that states a preference for suppliers or service providers who have a transparent and standardized GHG inventory.		State, Local	$$

Goal 3: Reduce emissions from the health care sector through public-private partnership

Strategy	Est. GHG reductions	Authority to Implement	Cost to Implement
I.3 Collaborate with the healthcare sector to offer financial grants or subsidies to healthcare facilities that are committed to adopting low-emission practices in specific medical areas. Partner with major healthcare providers to establish a preferential purchasing system, prioritizing suppliers or service providers who disclose their carbon footprint and have clear decarbonization objectives.		Local, State, Regional	$$

Moderate impact | Strong impact

Negative impact | Positive impact

Priority Goals and Strategies

Quantified GHG Reduction Potential for all goals and strategies in this sector (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
33.94-101.82	0.53%-1.61%

For all associated assumptions and quantifications, see Appendix H.

Goal 2: Reduce emissions through low-carbon procurement

I.2 Embed a purchasing criterion in public projects that states a preference for suppliers or service providers who have a transparent and standardized GHG inventory.

Public agencies can drive change in the private sector by expressing a preference for products with lower emissions and incentivizing disclosure of greenhouse gas emissions. Policies encouraging suppliers to report emissions through standardized inventories, as shown in studies like Tomar (2023) and Yang et al. (2021) can lead to substantial reductions. Government procurement policies can also accelerate the diffusion of new environmental standards, including encouraging the private-sector adoption of environmental-friendly standards like LEED and investments in green building expertise by local suppliers (Simcoe & Toffel, 2014).

Local governments have various options to establish sustainable procurement policies, such as local laws, ordinances, and resolutions, executive orders from mayors or county executives, and administrative directives or guidance documents (Culver et al., 2016). Laws and ordinances provide permanence but can be challenging to update. Resolutions, while signalling support, may lack enforceability. Administrative directives offer stability within procurement guidance, but integrating sustainability into a broader policy may make it less accessible for employees (Culver et al., 2016).

There are several pathways toward green procurement. The Buy Clean California Act sets minimum global warming potential (GWP) standards for selected building materials such as structural steel, concrete reinforcing steel, flat glass, and mineral wood board insulation used in public projects (Buy Clean California Act, n.d.). Another pathway is to offer discounts on bid prices[4] for public work projects if bidders opt for building materials with low GWP. Moreover, guidelines for procurement should prioritize accounting for life cycle emissions whenever possible (New York State Climate Action Council, 2022).

Collaboration needs

Specific strategies for supporting the procurement of low-carbon products should be established through collaborative efforts among government stakeholders. Essential to this process is the development of organizational capacity (Dimand, 2022). Smaller municipalities, as has been mentioned during stakeholder meetings, have limited capacity in terms of staff and resources. Municipal employees must be equipped with necessary information and tools to implement green procurement policies to ensure successful implementation. To ensure the success of this strategy, technical support

[4]Bid discounts involve applying a specified percentage reduction to the original bid amount for the purpose of assessing and determining the lowest responsive bid. The discounted bid amount is considered during the evaluation process to identify the low, responsive, and responsible bidder. Ultimately, the original bid amount serves as the basis for the contract award. For example, if a bid is $100,000 with a 5% bid discount, it would be evaluated at $95,000; however, the successful bidder would be paid the full $100,000.

must be provided to towns with limited staff capacity. Collaboration with other municipalities, research institutions and larger regional and state agencies can be particularly effective in ensuring that these towns have increased capacity for implementation.

Challenges

The implications on cost, in the short term, may be a hindrance to the adoption of this policy. Generally, procurement decisions are made based on the cost to the supplier or by choosing the most competitive bid. Adding criteria for GHG emissions may increase the cost of projects. However, several studies point that there will be savings in the long run (Jabbour et al., 2023). Insufficient information, commitment, and demand, alongside inconsistent policies, regulations, incentives, and leadership commitment are other barriers. Ambiguity in definition and diverse interpretations of the procurement standards may further contribute to the challenge.

Impact on minority- and women-owned businesses

Changes in procurement standards must be cognizant of their impact on minority owned businesses. The Department of Administrative Services recently announced new state provisions that expand opportunities for small, women-owned and minority-owned suppliers to do business with the State of Connecticut (Larson, 2023). Introducing new criteria for businesses to comply with poses the risk of negatively harming small, women-owned and minority-owned suppliers. To avoid this, the implementation of this policy must include technical grants to increase the capacity of suppliers to monitor and report GHG emissions associated with their products. This proactive approach ensures that businesses, especially small and minority-owned, can navigate the procurement process successfully without compromising their ability to do business with local, regional, and State governments.

Implementation Actions:

- Collaborate with the Department of Administrative Services (DAS), Office of Supplier Diversity, and biggest suppliers in the private sector to curate a list of products and services that are eligible for preferential treatment.
- Work with manufacturers, trade associations, and other like-minded states or federal agencies to establish new standards or adopt existing ones for evaluating the global warming potential of products and services.
- Provide financial and technical assistance to potential suppliers.

Census tracts and blocks impacted: All LIDACs in New Haven County; LIDACs with elevated flood risk

Direct benefits	Co-benefits
GHG emissions reduced	New business opportunities for minority- and women-owned suppliers
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	

Table 22: LIDAC Benefits for strategy I2

Goal 3: Reduce emissions from the health care sector through public-private partnership

I.3 Collaborate with the healthcare sector to offer financial grants or subsidies to healthcare facilities that are committed to adopting low-emission practices in specific medical areas. Partner with major healthcare providers to establish a preferential purchasing system, prioritizing suppliers or service providers who disclose their carbon footprint and have clear decarbonization objectives.

Developments in the health sector indicate significant opportunities for partnerships that ensure GHG emission reduction is a goal in the built environment and practices. The Yale New Haven Health System's Center for Sustainable Healthcare has already implemented comprehensive measures targeting GHG reduction across various sectors, including energy, building infrastructure, supply chain, and transportation (A Greener YNHHS, n.d.). Yale New Haven is currently in the process of acquiring Waterbury Health and the Eastern Connecticut Health Network hospitals, investing $435 million in the acquisition (Altimari & Carlesso, 2023). Additionally, significant construction funds are being allocated to enhance the West Haven VA facility, amounting to $3.01 billion for 10 medical facilities (Kime, 2023).

The healthcare sector contains a unique set of emissions sources, most notably anaesthetic gasses and metered dose inhalers (MDIs) (Designing a Net Zero Roadmap for Healthcare, 2022). Hospitals can use their purchasing power to phase out MDI inhalers and anaesthesia such as desflurane. Anaesthetics gases and propellants in MDIs carry a high global warming potential and have a significant impact on the environment.

In response, Municipalities can foster and facilitate transformative partnerships between the government and healthcare facilities. Promoting the exchange of best practices among healthcare providers, suppliers, States, and nations is an important aspect of these partnership (Balbus et al., 2022). Moreover, municipalities should recognize healthcare facilities as anchor institutions[5], and that changes in their operations impact areas beyond municipal lines. For example, the adoption of green procurement within the healthcare industry would have a regional impact. Leveraging purchasing power can also be a strategic signal to the private sector, encouraging the adoption of measures to reduce GHG emissions in their processes and products. While municipalities retain the autonomy to shape partnerships as they see fit, adhering to a set of general steps can ensure a cohesive approach.

Implementation Actions:

- Establish a standard reporting mechanism for GHG emissions for the healthcare sector.
- Develop a governing body that includes major healthcare providers in the region to steer the partnership effectively.
- Create targets for emissions reductions from buildings, physical waste and single-use plastics, food services, and transportation.
- Reduce use of and seek low- or no-emissions alternatives to GHG sources unique to the healthcare sector, such as metered-dose inhalers and certain anaesthetic gases.

Census tracts and blocks impacted: All LIDACs in New Haven County; LIDACs with elevated flood risk

Direct benefits	Co-benefits
GHG emissions reduced	
Reduced risks of climate change impacts, including extreme heat, flooding, and extreme weather events	

Table 23: LIDAC Benefits for strategy I3

[5]Anchor institutions are universities, hospitals and other enduring organizations that play a vital role in their local communities and economies.

Phasing out MDI Inhalers

In 2020, three-quarters of inhalers used in the US were metered-dose inhalers (MDIs), contributing to an emissions equivalent of driving half a million cars (Rabin & Furie, 2023). The high carbon footprint of MDIs is attributed to the use of hydrofluoroalkanes (HFAs), the active propellant in MDIs. While HFAs are an improvement over chlorofluorocarbons (CFCs), they still possess a global warming potential (GWP) more than 1,000 times that of carbon dioxide (Designing a Net Zero Roadmap for Healthcare, 2022). Despite not affecting the ozone layer, anaesthetic gasses and MDIs in healthcare contribute to emissions with a high GWP, posing challenges in calculating national or regional healthcare emissions.

The specific propellants, HFC-134a and HFC-227ea, used in MDIs have GWPs of 1430 and 3220, respectively, making them potent contributors to climate change (ICF, 2021). In 2020, about 75% of inhaler sales were HFC-134a MDIs, with a lesser percentage of sales made up of HFC-227ea MDIs (13%) (ICF, 2021). However, there are promising alternatives that could replace high-GWP propellants. For example, Dry Powder Inhalers, with 95% fewer carbon emissions compared to MDIs, present a more environmentally friendly option (Huffman & Hough, 2023).

Measures to reduce the demand of MDIs can be an effective strategy to reduce the GHG emissions from the health sector. However, challenges to the adoption of alternative propellants can be compounded by the uncertainties around the response of pharmaceutical companies and insurers to this change, especially given their patent control over inhaler technologies and their history of maximizing profits during transitions.

Desflurane

Reduction of greenhouse gas emissions can be achieved through environmentally conscious anaesthetic practices and by incorporating sustainable practices at both an individual and organizational level. One measure for emission reductions involves minimizing the use of desflurane by either removing or limiting desflurane vaporizers in specific clinical scenarios. The "20-year global warming potential (GWP20)" is a standardized unit for comparing the climate impact of different molecules, with higher numbers indicating a greater potential to capture energy and a more significant impact on the climate. Carbon dioxide serves as the benchmark with a GWP20 value of 1, while sevoflurane, isoflurane, and desflurane have GWP20 values of 349, 1401, and 3714, respectively (Meyer, 2020).

However, the shift away from desflurane can results in savings for the healthcare facilities. For example, at Wake Forest Baptist Health in North Carolina, an education program around volatile anaesthetics such as desflurane resulted in a decrease of its use (Miller et al., 2016). This spurred a savings totalling over $1.8 million or approximately $1000 per day for the health institution (2016). Moreover, in New Haven County, Yale New Haven Hospital eliminated desflurane in 2013, resulting in annual savings of more than $1 million dollars (Sampath et al., 2022).

The NHS Sustainable Development Unit estimates that a single hour of anaesthesia, especially using carbon-intensive volatile anaesthetics like desflurane, is equivalent to the emissions from driving 230 miles in a car (Meyer, 2020).

WORKING LANDS AND FORESTRY

Working lands and forests play a pivotal role in addressing emissions through effective carbon sequestration and storage measures. While this sector may not be a major emissions contributor, healthy, productive forests can help offset carbon and offer a multitude of ecological, economic, and social benefits.

Emissions reduced

	Total carbon sequestration (MMTCO2e)
Deciduous forest sequestration	0.547
Coniferous forest sequestration	0.043
Forested wetland sequestration	0.038
Total	0.628

Table 24: Emissions Breakdown from Zhao and Oke for Working Lands and Forestry (2024)

0.627 MMTCO2e is equivalent to driving around 140,000 gas-powered vehicles for one year[1].

Why working lands and forestry matter

Green space and trees play a crucial role in reducing greenhouse gas emissions and enhancing ecosystem resilience. Forests and terrestrial ecosystems actively participate in climate regulation through the vital processes of carbon sequestration and storage (Evans & Perschel, 2009). Carbon sequestration involves the absorption of carbon dioxide from the atmosphere, with trees and soils serving as repositories for stored carbon. The term, carbon storage, refers to the cumulative amount of carbon held within biomass, such as woody vegetation. Collectively, forests and associated soils store approximately 45% of all terrestrial carbon (McGarvey et al., 2015). The size and health of a forest directly impacts its carbon storage capacity, making the preservation of forests crucial for reducing greenhouse gas emissions and preventing detrimental land uses.

Figure 13: LIDAC Tree Cover

[1]Values calcualted using the Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator found at https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

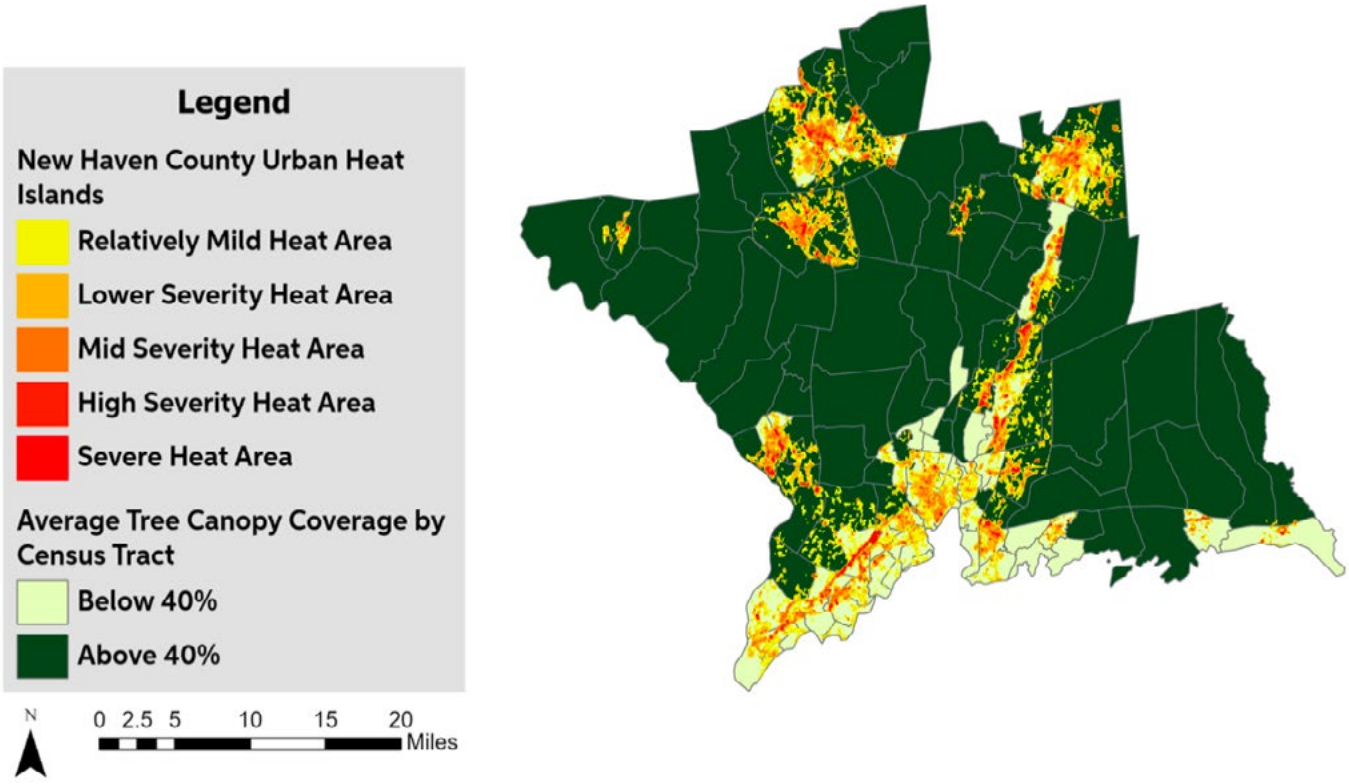
Effective management of forests, through practices like reforestation and afforestation, are imperative for maximizing carbon sequestration and storage (Fargione et al., 2018; Rhemtulla et al., 2009). This also yields co-benefits such as increased wildlife habitat, water quality protection, biodiversity, recreational opportunities, and overall ecosystem resilience (Fargione et al., 2018).

While urban trees may have less biomass compared to those in expansive forests, they still make contributions to carbon sequestration. Additionally, trees in urban areas indirectly aid in reducing carbon emissions by regulating building temperatures, consequently lowering energy consumption. Recognizing the multifaceted benefits of trees and forests underscores their importance in mitigating climate change and fostering sustainable, resilient ecosystems.

Regional Context

Connecticut, the fourth most densely populated state in the country, faces a delicate balance between accommodating its people and preserving its abundant forests, which make up 60% of its land (Peracchio, 2020). Compounding this challenge is the fact that nearly 72% of Connecticut's forests are privately owned, necessitating collaborative efforts among private landowners, coalitions, agencies, and the state to address forest fragmentation and ensure the ongoing health of these wooded areas (2020). In New Haven County, about 189,752 acres are covered by deciduous, coniferous, and forested wetlands (Zhao and Oke, 2024).

With approximately 38% of Connecticut classified as urban land—a figure projected to climb to over 65% by 2060—the state boasts one of the country's highest urban tree cover percentages, hovering around 62% (Nowak & Greenfield, 2018). Given the substantial presence of urban areas and their associated tree cover, it is crucial to assess the role of urban forests in carbon sequestration efforts. Initiatives and practices must be implemented to safeguard existing urban tree cover, with a particular emphasis on expanding tree cover in LIDAC communities.



Map 18: Map of overall tree coverage in county with urban heat islands

The 2020 Connecticut Forest Action Plan[2] lays out a comprehensive strategy for the future of Connecticut's forests, encompassing programs like the Forest Legacy Program, Community Forest Program, Forest Stewardship, and Urban and Community Forestry. These initiatives are designed to protect and promote the preservation of privately-owned forests, urban and community forests, and publicly managed forests throughout the county. Aligning carbon sequestration efforts with the broader goal of balancing the needs of a growing population is imperative to sustaining Connecticut and New Haven County's diverse landscapes and forests.

Recommended Strategies Scorecard

This table represents recommended strategies and how they score (estimated) across a range of indicators. Priority strategies score the highest across these indicators and support preferential goals for greenhouse gas emissions reductions in this sector. Quantified reductions, preferential goals, and priority strategies appear below the scorecard.

Goal 1: Preserve and support existing and potential forested lands

Strategy	Est. GHG reductions	Percent Change in Tree Canopy	Reduction in PM2.5	Workforce Development	Authority to Implement	Cost to Implement
L.1 Pursue afforestation reforestation throughout county.					State, Regional	$$$
L.2 Support current efforts and management strategies to maintain existing forests on both private and public property.					Local, Regional, State	$

Goal 2: Increase urban tree canopy and agriculture (UTC)

Strategy	Est. GHG reductions	Percent Change in Tree Canopy	Reduction in PM2.5	Workforce Development	Authority to Implement	Cost to Implement
L.3 Increase urban tree canopy in low-income disadvantaged communities.					Local	$$
L.4 Support farming intiatives across urban, rural and suburban typologies.					Local, regional, and state	$

Positive impact Negative impact Strong impact Moderate impact

[2]To view the entire 2020 Connecticut Forest Action Plan see https://portal.ct.gov/-/media/DEEP/forestry/2020-Approved-CT-Forest-Action-Plan.pdf

Priority Goal and Strategies

Goal 2: Increase Urban Tree Canopy (UTC) and agriculture.

L.3 Increase urban tree canopy in low-income disadvantaged communities.

Quantified GHG Reduction Potential for this strategy (Zhao and Oke, 2024):

Emissions reduction (TMTCO2e)	Percentage of total net emissions
62.79-125.58	0.99%-1.98%

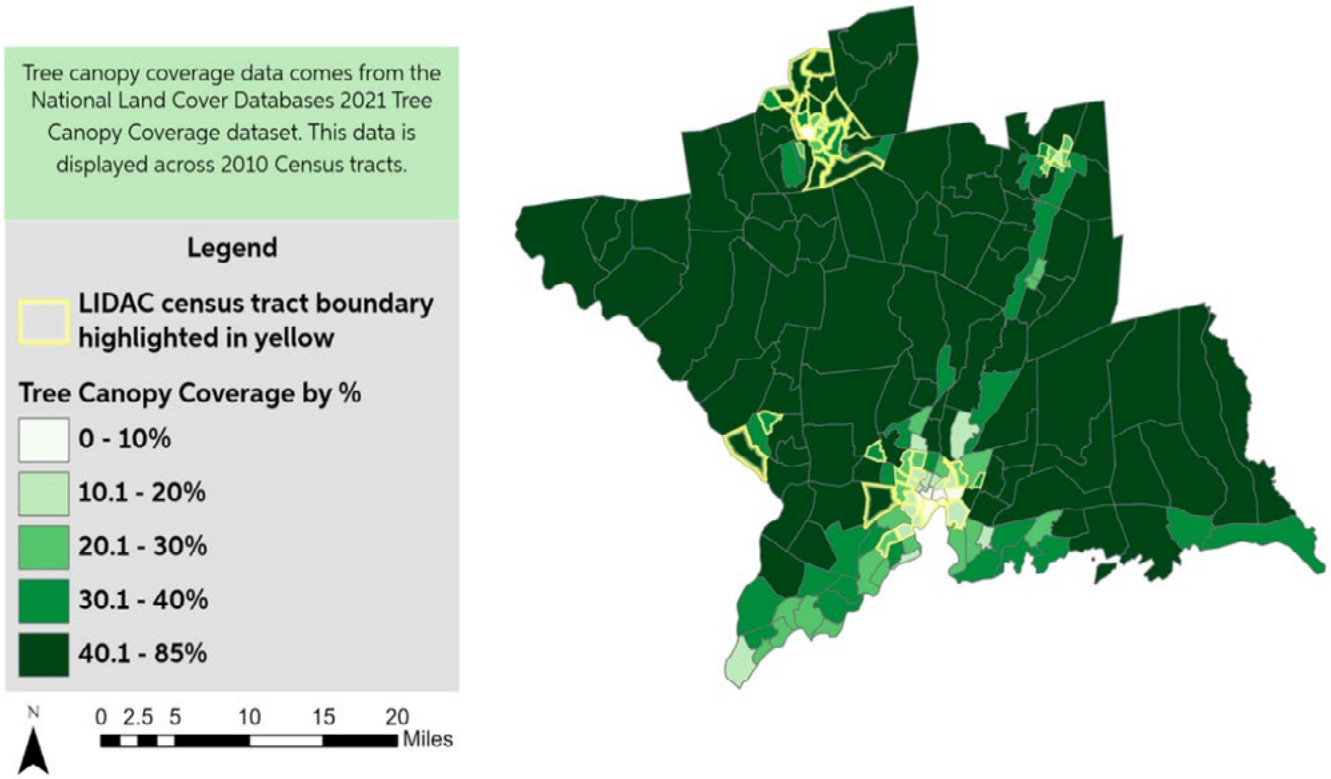
For all associated assumptions and quantifications, see Appendix H.

While Connecticut has one of the highest percentage urban tree cover in the nation, studies have shown that low-income communities can have up to 30% less tree cover then higher-income communities (Locke et al., 2021; McDonald et al., 2021). As shown in Map 19, areas with lower tree-cover in New Haven County correlate with identified low-income disadvantaged communities (LIDACs). Research has shown that in order to see significant benefits relating to lowering urban heat island effects and increasing carbon sequestration, there needs to be more than 40% tree cover (Drescher, 2019). However, some census tracts in identified LIDAC areas have as low as 2% tree cover (Map 19).

Increasing and sustaining the urban tree canopy in LIDACs can support carbon sequestration while also helping improve air quality, ecosystem resilience, and community identity. In the context of the changing climate, increased urban tree cover also provides buiding energy regulation benefits and reduction in the urban heat island effect (Knight et al., 2021).

LIDAC Community	Average Percent Tree Cover
Meriden	22.2%
New Haven	20.2%
Derby/Ansonia	37.5%
Waterbury	36%

Table 25: Average Percentage Tree Cover for LIDAC Communities



Map 19: Tree Canopy Coverage Across New Haven County

These benefits ares particularly important in the context of disadvantaged communities who are disproportionately exposed to the urban heat island effect (Hsu et al., 2021; Drescher, 2019) and face economic vulnerability in relation to increasing energy prices. However, low-income residents are more likely to rent their dwelling and may not be able to plant trees without landloard consent (Drescher, 2019). For this reason, housing authorities should be a prioirty area for tree planting intiatives given their authority to implement.

Census tracts an blocks impacted: All LIDACs in New Haven County; LIDACs below 40% tree cover (see Map 18); LIDACs at elevated flood risk.

Direct benefits	Co-benefits
GHG emissions sequestered	Lower energy usage and associated costs
Reduction in PM2.5	Percent change in urban tree canopy
Reduced flood risk due to stormwater control	New green space and community beautification
	Improved quality of life
	Improved public health
	Increased resilience through climate change adaptation
	Reduced noise pollution due to acoustic dampening effect of trees

Table 26: LIDAC Benefits for strategy L4

L.4 Support farming initiatives across urban, suburban, and rural typologies.

Quantified GHG Reduction Potential for this strategy (Zhao and Oke, 2024):

Emissions reduction (TMTCO2e)	Percentage of total net emissions
5.85	0.092%

For all associated assumptions and quantifications, see Appendix H.

Implementation Actions:

- Work with agricultural stakeholders including rural and urban farmers to design programs that reduce emissions, with a focus on co-benefits like food security, waste reduction, and sustainability.
- Build off of and support New Haven's Urban Agricultural Master Plan.

Census tracts an blocks impacted: All LIDACs in New Haven County; LIDACs with high agricultural loss rates; LIDACs at elevated flood risk.

Direct benefits	Co-benefits
GHG emissions sequestered	New green space and community beautification
	Improved quality of life
	Improved public health
	Increased resilience through climate change adaptation
	Increased food security
	Waste reduction

Table 27: LIDAC Benefits for strategy L4

Scenario Planning

Exploratory Scenario Planning

While the plan has already outlined a list of near-term, high-impact mitigation strategies, an additional layer of analysis known as exploratory scenario planning was applied in order to test the robustness of these strategies.

What is scenario planning?

Exploratory scenario planning helps planners, policymakers, stakeholders, and community members account for uncertainty across various possible futures. Scenarios are descriptive narrative structures that illustrate future unknowns. Exploratory scenario planning is not used to predict the future. Rather, a sound scenario planning process should lead to an outcome in which aspects of different scenarios reflect the actual future. By using this approach, further analysis can be completed in a manner that engages the public in climate change planning.

The Scenario Planning Process

The exploratory scenario planning process began by accounting for the regional context of New Haven County. While this process was ongoing during the drafting of the PCAP, preliminary investigations into existing climate actions, the political environment, and demography at the regional and state level helped ground the scenario planning process in current trends. Moreover, further analysis of best practices for potential mitigation strategies highlighted certain clusters of solutions that could be successful given future uncertainties. Current literature on scenario planning, including Avin (2007), Goodspeed (2019), Finn and Miller (2022), and Carpenter et al. (2015) was also reviewed.

The next phase focused on the development of external drivers and outcomes. External Drivers refer to outside forces that affect New Haven County's ability to plan effectively for climate change. Brainstorming sessions were held in order to identify potential external driving factors and their varying degrees of impact and certainty. From this, a list of six main drivers impacting the region's ability to carry out climate mitigation measures was constructed. These six drivers are **Legislation and Funding, Economic Changes, Climate Change Impacts, Public Opinion, Technology Shifts, and Demographic Shifts.**

At this point, outcomes from each driver were derived from further discussion amongst discussions within SCRCOG. Outcomes included the impact each driver would have on the region's political, economic, social, and ecological future, and how these outcomes would affect certain mitigation measures. The intensity and direction of each driver were also refined during this process.

Next, the drivers and outcomes were ready to be turned into narratives. As scenario planning is meant to be an interactive process, it became apparent that these scenario narratives had to be test run in a public engagement setting. Through this, certain values based on scenarios became apparent, such as the difference in actions a community may take depending on political situations at the national and state level. With that, final narratives began to take form.

Exploratory scenario planning is not used to predict the future. Rather, the scenarios below represent a collection of possible futures for New Haven County. No single scenario will be completely true in outcome. It is more likely that aspects of all three scenarios below will occur within New Haven County.

Our Scenarios

Fossil Free Future

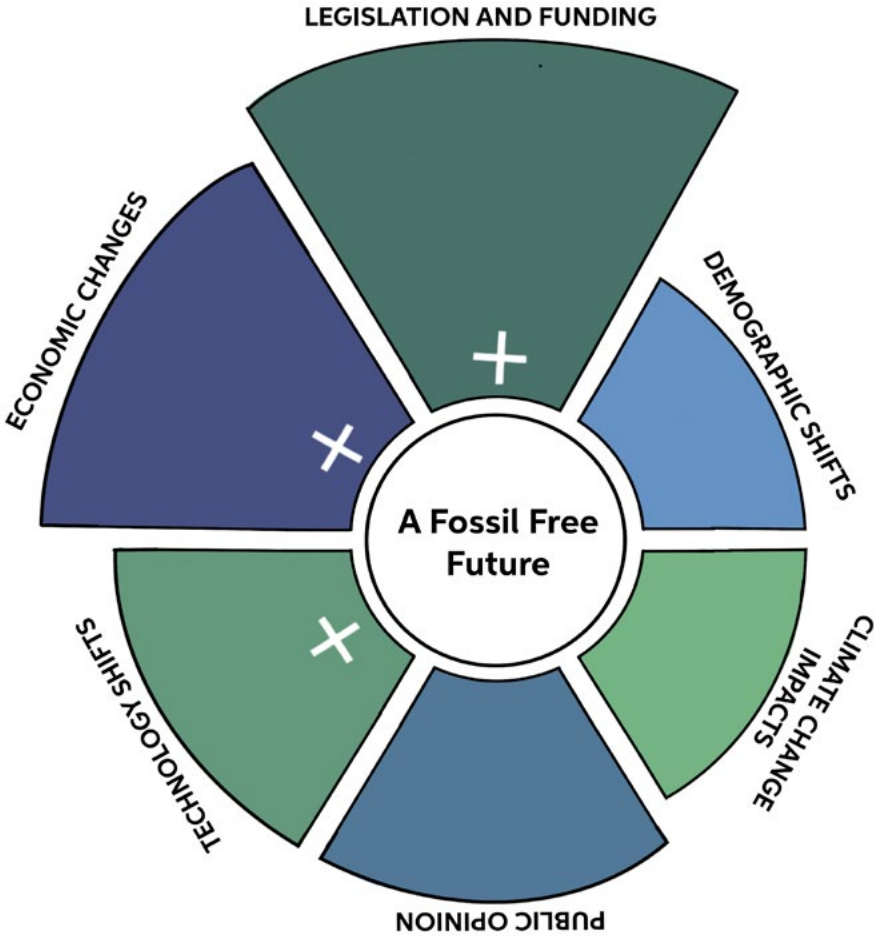


Figure 14: Heat Map for Fossil Free Future

The energy future of Connecticut looks bright. Barriers to offshore wind development during the early 2020s, such as high interest rates, inflation, and political backlash (Wasser, 2023) have receded as more favorable conditions to offshore wind deployment have taken form. Coinciding with this is the success of the Three State Wind Agreement, a joint project between Rhode Island, Massachusetts, and Connecticut that aims to secure 6,000 megawatts of power from offshore wind (CT DEEP, 2023). With demand for power locked in via the Three State Agreement, developers overcome prior funding concerns. As a result of these developments, Connecticut has achieved its goal of procuring 2,000 MW of power from offshore wind by 2030 (Public Act No. 19-71, 2019) while the grid moves towards an even split between offshore wind and nuclear energy from Millstone Power Plant. New industry based around the development of offshore wind fuels employment growth in New Haven County, particularly in precision engineering services (Connecticut Department of Economic and Community Development, 2023). As a result, collaboration between workforce apprenticeship programs and the offshore wind industry have become the norm (Public Act No. 19-71, 2019).

Moreover, technological advancements have made certain unattainable solutions now feasible, while costs continue to decrease for renewable technologies. Among these is hydrogen fuel, which becomes more commonly used as production of hydrogen shifts away from fossil fuels and towards processes such as electrolysis, direct solar water splitting, and biomass conversion (IEA, 2019; United States Department of Energy, 2023). This supports further decarbonization efforts in the transwportation sector, as carbon free hydrogen fuel for heavy duty vehicles becomes a legitimate fuel source. Other renewable technologies, such as heat pumps, on site solar, and electric vehicles become more attractive to consumers as technology advances and incentives overcome equity hurdles, lowering

costs (Heeter et al., 2021; OECD & International Energy Agency, 2022; Ramanan et al., 2021). Much like offshore wind, employment within the region increases around these advances. The pendulum of the green economy is now in full swing.

However, underlying public opinion fails to shift away from certain consumption, transportation, and land use preferences. For example, waste issues persist at the residential and commercial levels as consumption remains high. Home and business energy use also remains high, despite gains in efficiency. Moreover, rural and urban disparities in transit access persist. Existing north/south and east/west rail continue to connect in New Haven, while bus service continues to mostly serve existing dense areas. In New Haven, bus rapid transit (BRT) along certain routes increases frequency and reliability (City of New Haven, 2019), while other aspects of the region's current transit planning approach are supported and continue. However, outlying suburban and rural areas with low density and high travel times continue to prefer personal vehicles for transportation.

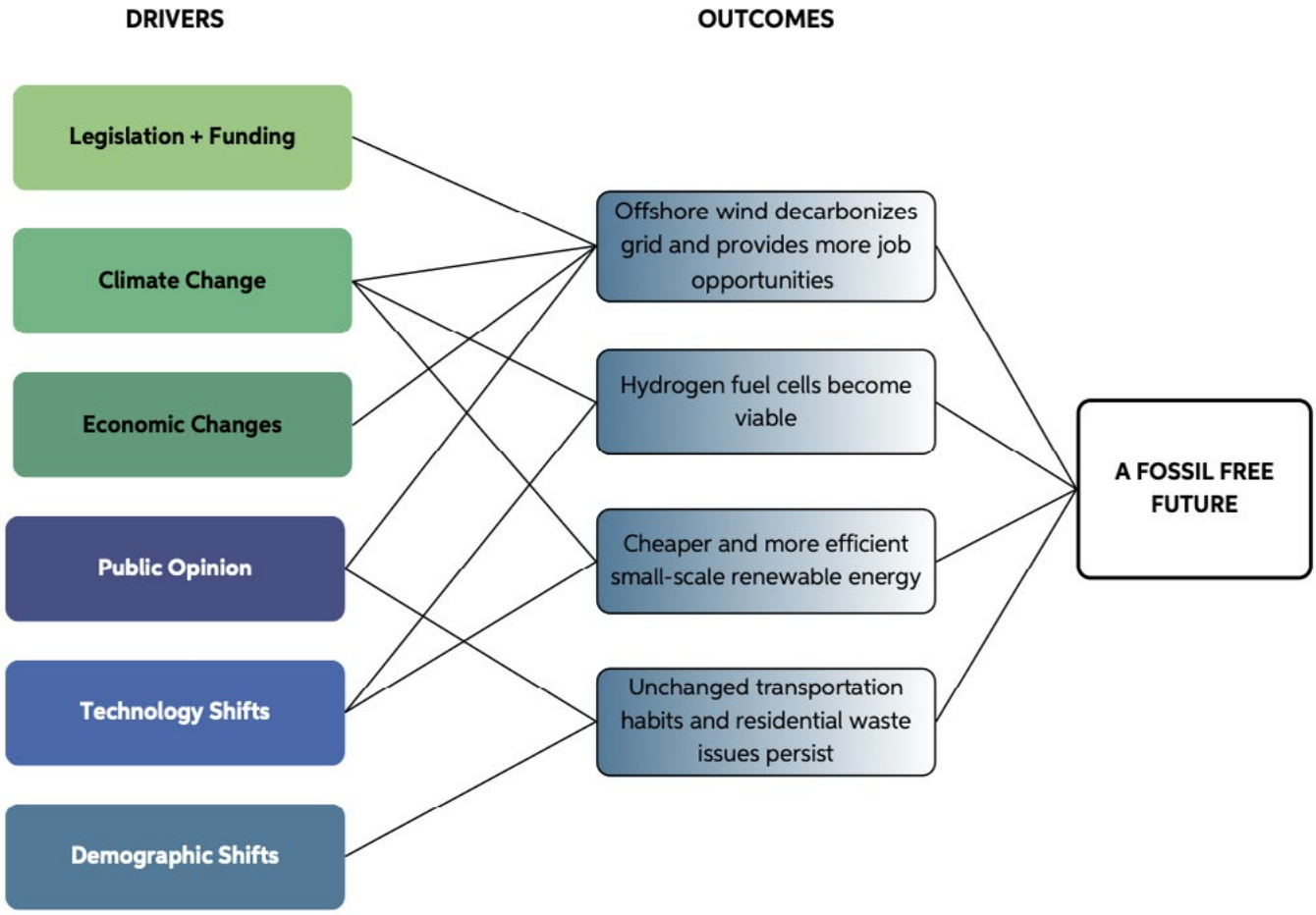


Figure 15: External Drivers for Fossil Free Future

In conclusion, the scenario represents a future with transformed infrastructure, where legislation and technology support the growth of a green grid and green industries, but underlying habits related to consumption and transportation remain embedded in the status quo.

Coping with Gridlock

While general trends towards carbon-free technologies continue, important legislative and funding initiatives do not materialize. For example, the Three State Wind Agreement does not lead to positive growth in the industry and Connecticut fails to meet certain clean energy goals (Associated Press, 2023). Current equity issues with efficiency and renewable incentives continue, with programs aimed at decarbonizing the building and electricity sectors not meeting the needs of renters and low and moderate-income homeowners (Heeter et al., 2021; Ramanan et al., 2021). In the State Capital, the legislature fails to take certain policy measures that give DEEP the authority to tackle important climate measures, such as setting enforceable goals for GHG emissions (Spiegel, 2023a). Additionally, the issue of food waste continues to be handed off to COGs and municipalities (Spiegel, 2023b).

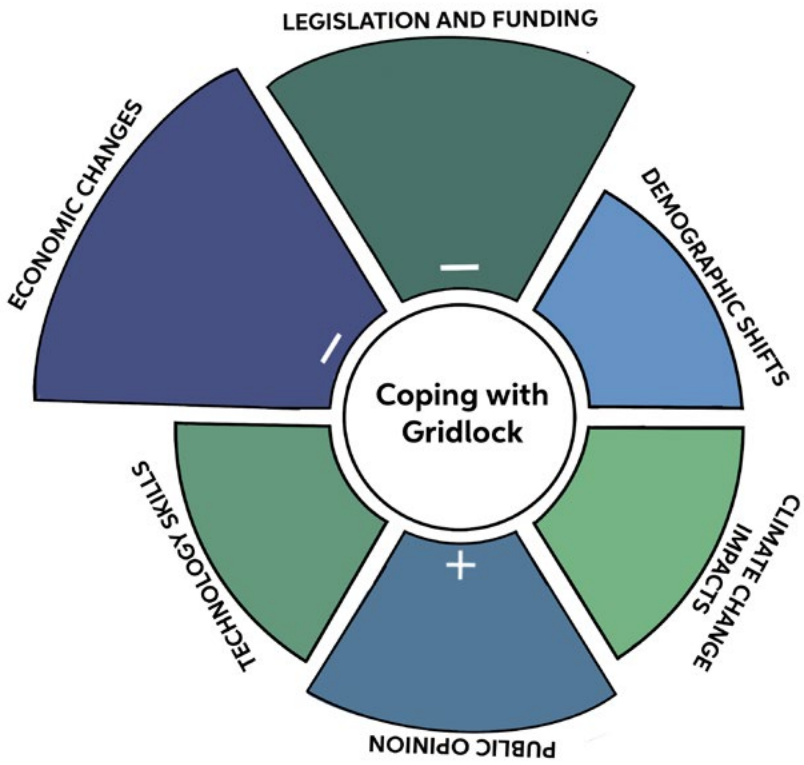


Figure 16: Heat Map for Coping with Gridlock

As the State falters on these efforts, so does Washington. Political gridlock worsens as climate change remains a wedge issue between the country's main political parties (Astor, 2023). Funding opportunities dry up as Congress fails to build upon the successes of the two back-to-back infrastructure bills (Carbon Brief Staff, 2022). Federal involvement in wind energy also decreases, as successive presidential offices fail to approve much needed projects along the eastern seaboard. Moreover, high interest rates continue to slow the buildout of projects in this sector (Wasser, 2023). The future of Connecticut's grid is uncertain.

In response to these changes, the onus of climate change mitigation falls onto the towns and cities of New Haven County. Limited funding and current climate planning paradigms perpetuate regional inequities related to mitigation efforts (Balta-Ozkan et al., 2015). Private efforts to address climate change fail to address equity issues, while important burdens such as energy costs continue. Local power is entrenched and competition for funding is an ever-present reality in New Haven County. However, Sustainable CT does increase its support of communities looking to implement mitigation measures (SustainableCT, 2023a). For example, the City of New Haven continues to serve as a gold certified community in the County (SustainableCT, 2023b). These efforts are supported through private and philanthropic investment, which capitalize on the energy transition and lack of state and federal guidance on the matter. These take on an increasingly technocratic approach, as the usage of technologies such as smart grid systems becomes more common.

Local organizing has also become more engaged with mitigation efforts in the region. The people are frustrated with the lack of state and federal support and the popularity of innovative, small scale mitigation solutions increases. While this is important, the cost of these efforts remains a concern for many. However, costs related to fossil fuels have risen as well, as global efforts to divest from the fossil fuel industry have increased costs for energy (Black, 2023). The costs of renewable technology may still be a concern, but the cost of fossil fuels is simply too great for many in the county.

In conclusion, this scenario represents a future where legislative efforts at the state and federal level fail to deliver on important measures that would support mitigation efforts if New Haven County, while businesses, non-profits, and citizens become more active in the fight against climate change.

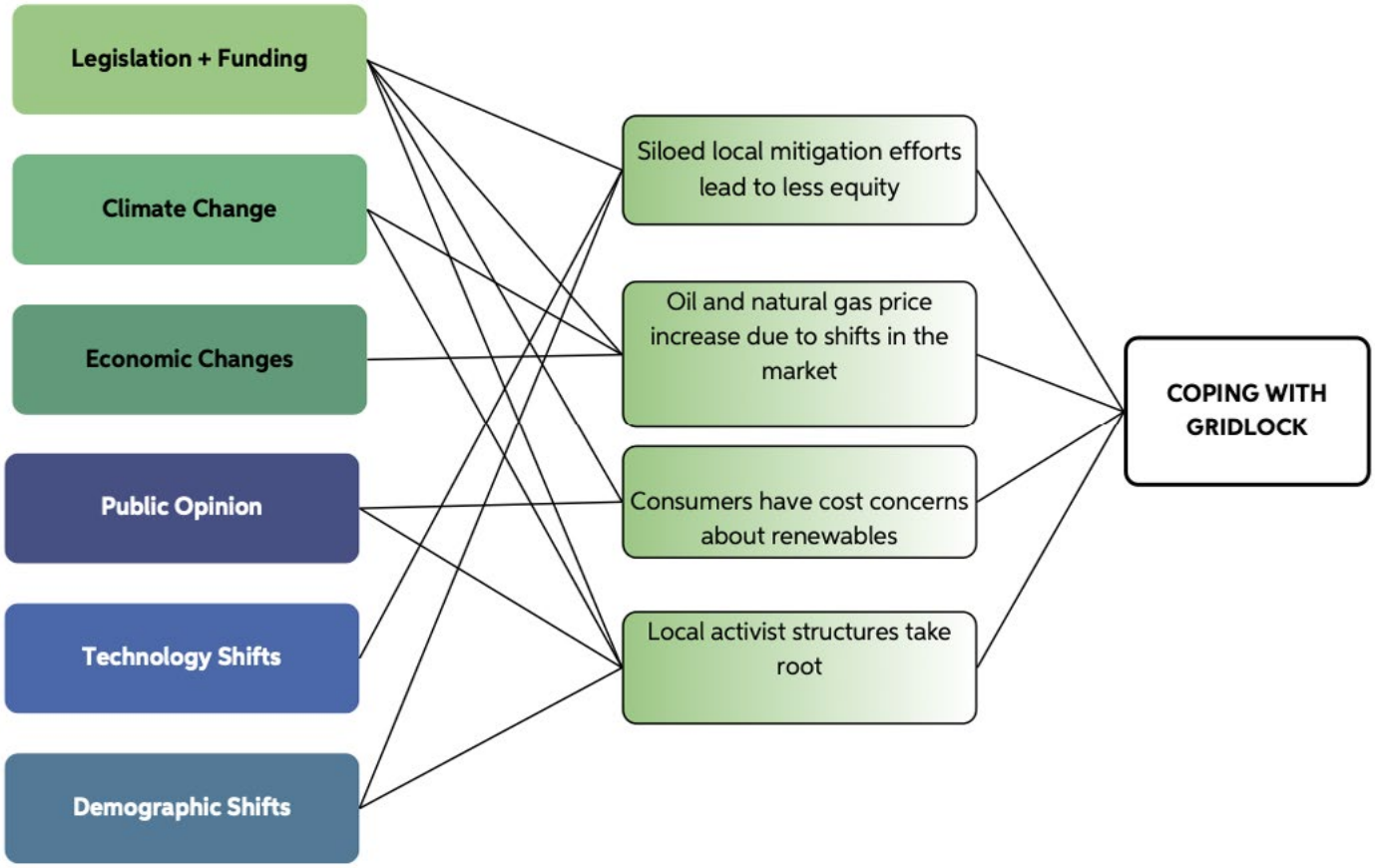


Figure 17: External Drivers for Coping with Gridlock

The Watershed Moment

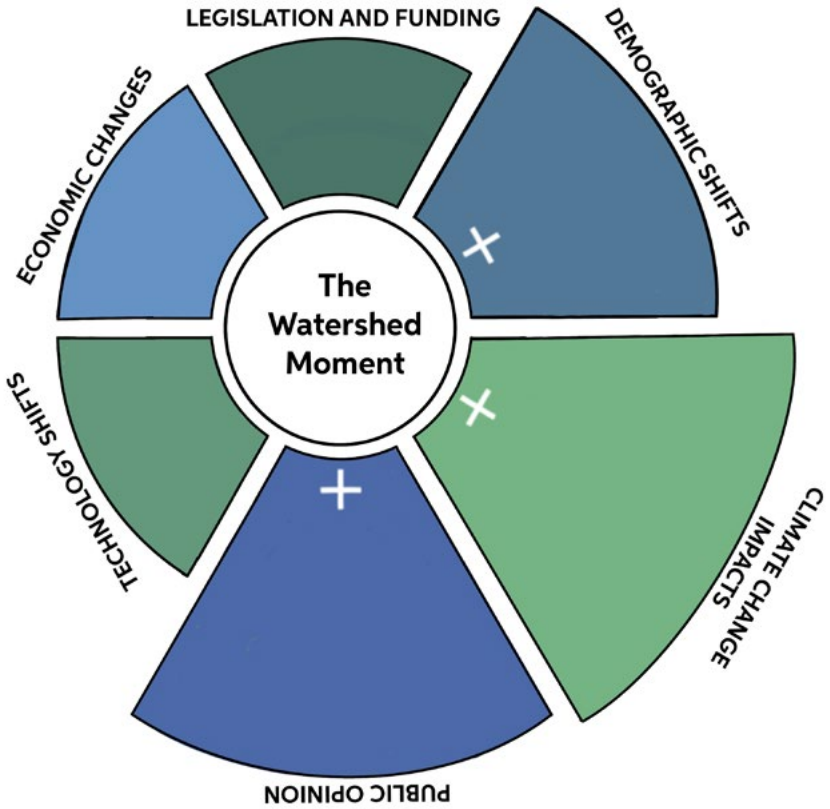


Figure 18: Heat Map for The Watershed Moment

While carbon-free technologies continue to be adopted, current trends fueling climate change do not shift through the year 2045. As a result, the world is on track for medium to high greenhouse gas concentrations outlined by the IPCC (Hausfather, 2019). Therefore, warming is predicted to possibly exceed 3.8 degrees Celsius by 2100 (Hausfather, 2018), making IPCC goals of limiting warming to 1.5 degrees Celsius and 2.0 Celsius unattainable. As a result, significant climate change impacts are being felt throughout New Haven County. Areas along the coast are suffering the effects of an additional one foot of sea level rise over 2020 levels, while inland areas along the Quinnipiac, Naugatuck, and West Rivers become inundated (National Oceanic and Atmospheric Association, 2023). This compounds the increased frequency of tropical cyclone impacts, which continue to threaten the County at an ever-increasing rate (Hicke et al., 2023).

The region also begins to experience rapid shifts in temperature and precipitation patterns. The average temperature has increased, as has the likelihood of extreme heat events (2023). As a result, urban heat island effect and heat-related health impacts in the region increase, especially in areas with low levels of tree canopy and aging buildings with little insulation and cooling technologies. Moreover, precipitation increases along with the risk of extreme weather events. This heavily impacts human development along waterways, as aging culvert systems are unable to handle the frequency and intensity of rain events (Spiegel, 2023c). Areas covered in impervious surfaces also suffer, and the City of New Haven faces the dual reality of flooding from the sea and upland sources. Effects range from losses to property and business operations to loss of life. In this scenario, patterns of development in the County shift, as coastal retreat northward to inland areas becomes the norm and urban heat island effects become critical across many at-risk areas. Summers increasingly bring a hazy orange reminder of the effects climate change is having across the continent, as wildfires in Canada and along the west coast of the United States carry smoke into the northeast region, effecting air quality (Tandon, 2023). As a result, the cumulative impacts of this new normal begin to affect the opinions of the residents of New Haven County.

Millennials and Gen Z age and carry forth their belief in the importance of tackling climate change through aggressive mitigation efforts (Tyson et al., 2023). At the same time, these beliefs become more broadly shared across generations. With this, a more regional approach to climate change planning develops, as solutions that once had little political and social support become more common. These include changes in consumption patterns, increased buildout of on-site renewables and energy co-ops, as well as general shifts in attitudes towards current governing structures. Moreover, younger generations continue to shift towards less carbon-intensive forms of transportation, such as public transit and biking (Krueger et al., 2020), while modes of land use that prioritize density replace traditional single family, large lot development as the dominant growth pattern in the region. The rural, suburban, and urban divide lessens as connectivity between communities increases. This is supported by coastal retreat as well as increased climate migration into the region from outside areas (Fleming et al., 2019; Hauer et al., 2016). While this changes the development patterns and demographics of the region, housing supply struggles to keep pace with population increases and coastal retreat, leading to increased prices and lower levels of homeownership.

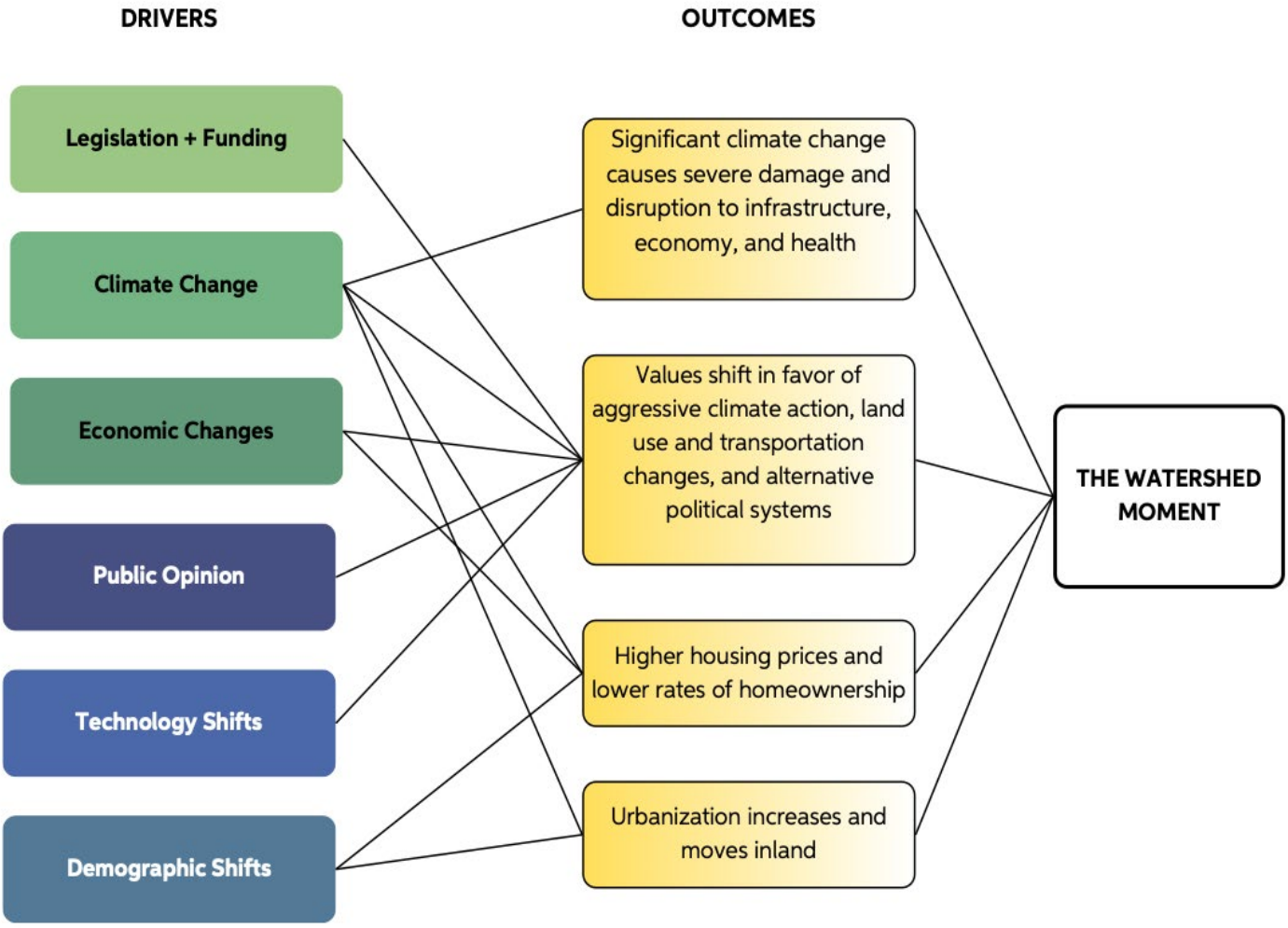


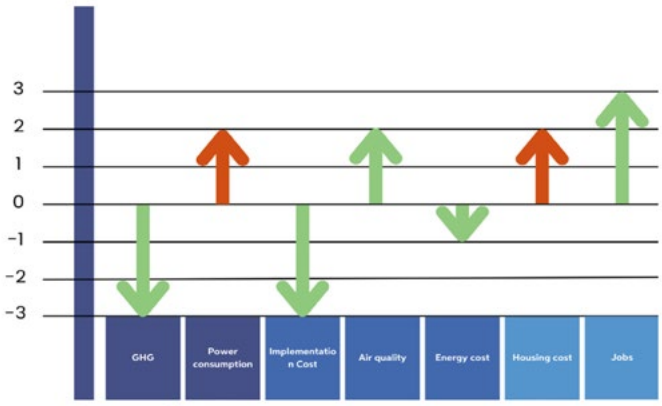
Figure 19: External Drivers for The Watershed Moment

In conclusion, this scenario represents a future where climate change drastically changes the physical, social, political, and economic landscape of New Haven County.

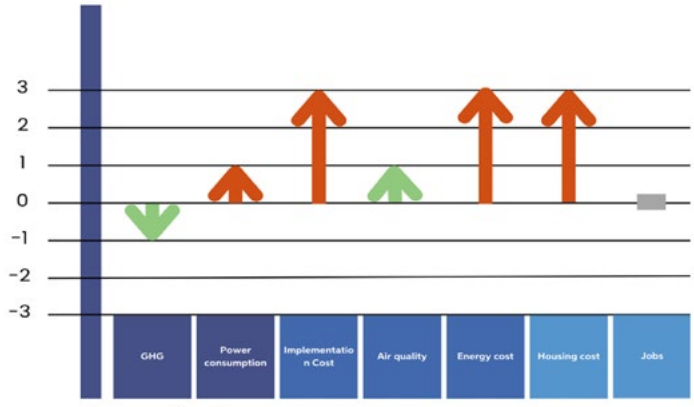
Analyzing the scenarios

To analyze how each scenario affected outcomes important to Impact 2045, indicators were used to "score" scenarios. Indicators included greenhouse gas emissions, energy consumption, cost of implementation to municipalities, and indicators related to the key LIDAC burdens identified as significant in New Haven County. Linguistic isolation and unemployment were represented as workforce development needs; the need to address asthma was captured in the category of air quality, and energy costs and housing costs were considered as their own standalone indicators.

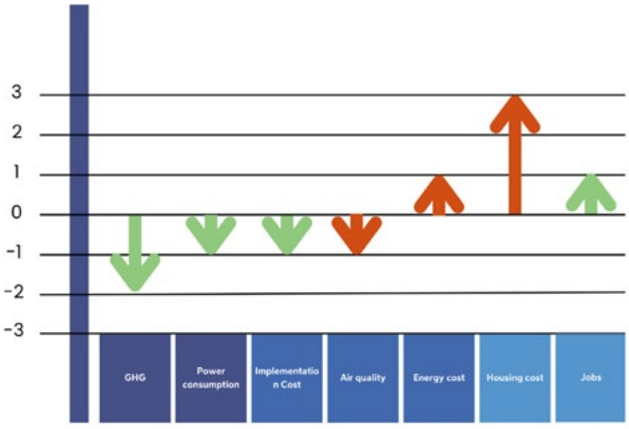
On a scale of -3 to +3, each scenario was ranked across these indicators to capture the outcomes present under different conditions. The arrows in the charts below show whether an indicator increases or decreases in a scenario, and the color indicates whether the change is beneficial (green) or harmful (red). This analysis helped center the needs and challenges of each scenario in relation to mitigation strategies.



Scenario 1



Scenario 2



Scenario 3

Priority mitigation strategies were then scored across different scenarios in order to test their robustness in the face of uncertainty. Robustness refers to the effectiveness and impact of each strategy across different scenarios. Effectiveness relates to the feasibility of the strategy given the scenario and impact relates to the overall need for the strategy given future developments. Through this, strategies that performed positively in all three scenarios were identified as robust.

These strategies include:

T.1 Reducing the spatial misalignment between housing and jobs through changes in land use.

Municipalities can direct land use (through zoning and other mechanisms) toward locating new housing near opportunity zones and other employers, and locating employers near dense population centers, particularly LIDACs. This strategy was chosen because changes in land use are feasible across all scenarios and do not require funding or approval from the state or federal level. However, attracting developers and new employers may be challenging.

E.7 Siting renewable energy on vacant land, particularly brownfields.

This strategy is robust across all scenarios as it can be done at the municipal level. Solar arrays can be developed on a site-by-site basis, while smaller-scale distributed projects are easier to finance than rooftop solar installation. Brownfields are often located in or near LIDACs as well. Therefore, this strategy can provide community solar arrays that benefit disadvantaged communities.

E.11 Workforce development programs for jobs in renewable energy.

A workforce trained in manufacturing, constructing, operating, and maintaining renewable energy would benefit the County in all scenarios. A skilled workforce would attract developers, enabling renewable energy infrastructure development in offshore wind, rooftop solar, community solar, microgrids, geothermal, building retrofitting and potentially green hydrogen. This strategy could also provide good job opportunities, particularly in areas with high unemployment burdens.

B.10 An energy efficiency retrofit program for low-income housing and municipal buildings.

This can be done in stages on the municipal level using existing state energy efficiency programs. Funding also may be available from federal sources. While this funding source makes this strategy precarious in scenario 2, it is considered robust across all scenarios as it decreases energy demand, increasing grid resilience and decreasing emissions from a non-renewable grid.

I.4 Partnering with healthcare facilities to reduce greenhouse gas emissions from anesthetics, refrigerants, and other sources.

Yale's healthcare facilities have already taken action on some of these measures and can serve as a model for other healthcare facilities in the region. This strategy does not rely on any state or federal funding or legislation and it can be done by municipalities or COGs working in partnership with healthcare institutions, making it robust across scenarios.

W.2 Creating a regional waste authority to implement waste diversion infrastructure and programs.

This strategy can be done independently of any state or federal program by COGs or other multi-municipality organizations, making it robust across scenarios. Moreover, the economies of scale in hauling, processing, and composting could save municipalities money and create jobs across all scenarios.

Many of these strategies are relatively low cost, flexible, and can be done in stages by different municipal or regional agencies. Many also feature workforce development as a direct or co-benefit.

During this process, it became apparent that shifts in public opinion made as big a difference as any other external driver. For example, underlying shifts in public opinion in The Watershed Moment allowed for greater robustness across strategies, especially when compared to Coping with Gridlock. Therefore, the importance of public opinion and buy-in should not be discounted, especially in light of legislation and funding concerns at the state and federal level. As a result, the next section of the plan aims to expand on this by introducing a public engagement strategy that has already been utilized and can be carried forth into the CCAP phase.

PUBLIC ENGAGEMENT

Introduction

What is meaningful engagement?

Meaningful public engagement is central to SCRCOG's mission. It begins with building relationships and continues with maintaining them. It is not just about working for the community – it is about working with communities to identify which strategies are most in line with their needs and values. Public engagement is also about building the local networks and enthusiasm needed for implementing planning efforts, with a shared desired future in mind. Public engagement should be transparent, inclusive, equitable, and accessible. To achieve this requires shifting typical power dynamics to make sure communities can hold those in power accountable for achieving these outcomes.

This sections lays out a plan that ensures that meaningful public engagement is at the core of local and regional actions in the near and distant future.

Overview

This section covers what SCRCOG has done already, and what needs to be done in the short term (before submitting this report in March 2024), and the long term (after March 2024, through Summer 2027). For public participation that is both broad and meaningful, it will be important to give people easy ways to engage (ex. surveys, petitions, social media) as well as opportunities to go more in depth (workshops, stakeholder meetings, informational sessions). The strategy below will outline both.

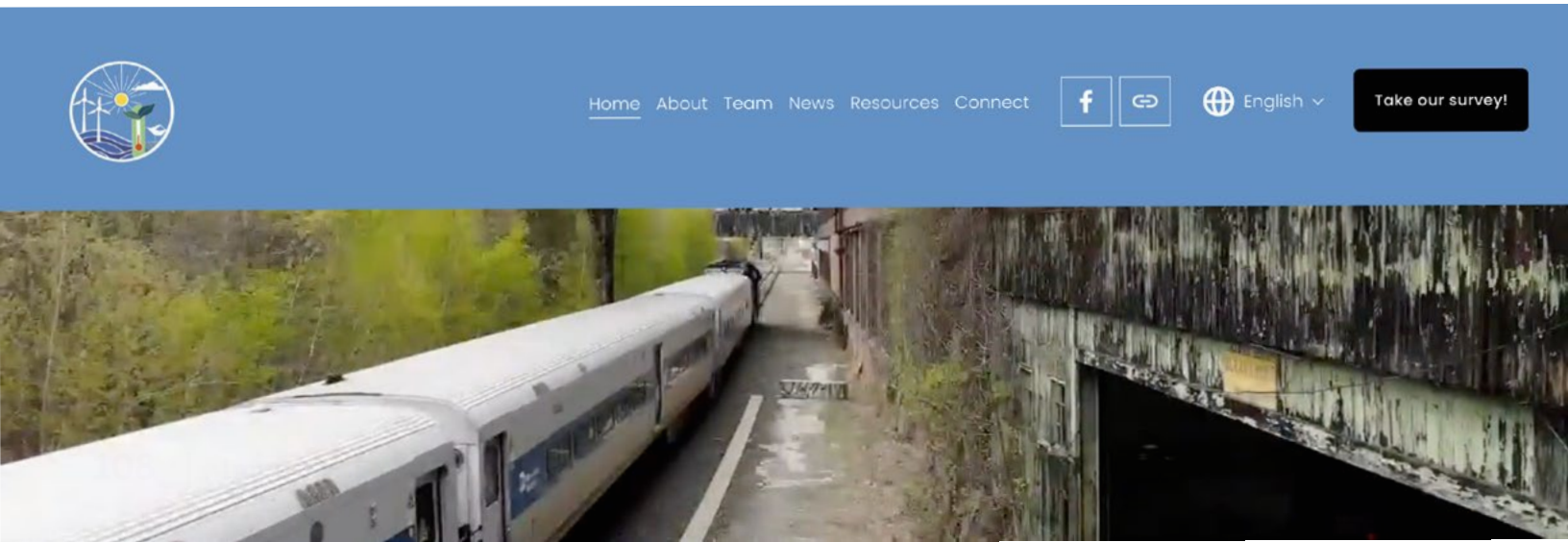
This section offers several tools and roadmaps created for Impact 2045, covered in the following sections: Website, Survey, Workshops, Tabling and Materials, Media Strategy, and Strategic Partnerships.

Figure 20: Impact2045 public engagement to date

Website

Work to date

The Impact 2045 website serves as the central source of information for anyone from New Haven County and beyond to learn more about the CPRG program and the Priority Climate Action Plan. Planners, other COGs, municipal leaders, climate action and advocacy groups, groups in other regions doing climate mitigation work, and community members in the region are encouraged to use the website. The homepage presents a project summary and different ways visitors can engage, including a survey and a regional climate change mini quiz. The "About" page explains the CPRG funding sources, grant objectives, and outlines what is in the PCAP report. The "Who We Are" page presents the UMass Amherst partnership while the "News" page is a holding space for all media



mentions of Impact 2045. Finally, the "Connect" page provides a variety of ways website visitors can interact with the project. The website also contains an events calendar, links to resources, and contact information.

Long-term strategy

As the CCAP phase begins, maps and a GHG inventory dashboard provided by NARSLAB at UMass Amherst will be added to the website. Information on the planning and implementation of the plan will be kept here throughout the project for community members. This will provide a space for feedback when the report is published for public review, as is standard practice for municipal reports.

By March 1, 2024, the website should have a full calendar of events, connection to SCRCOG social media, dynamic webpages and video content, enhanced capacity for translation, and be in ADA Compliance. ADA compliance goes well beyond clear images and text descriptions; it also addresses needs like color-blindness and closed captioning on video content (U.S. Department of Justice, 2023). Both the American Disabilities Act (ADA) and American Planning Association (APA) websites point to the Website Accessibility Initiative (WAI) when following best practices for accessibility. WAI provides an in-depth set of guidelines for long-term use (w3.org, n.d), but it is also recommended that Siteimprove, an automated application that scans pages according to the same Web Content Accessibility Guidelines that WAI uses (Siteimprove.com, n.d.), is used.

Survey

Work to date

To help ground current and future planning efforts in local perspectives and values, an online survey was created to gather input from people who live in New Haven County about their current experience with climate change impacts and the kinds of changes they would like to see in their community. The survey asks participants to reflect on their transportation mode choices, energy usage, home efficiency, and waste disposal, concluding with an assessment of the participant's interest in being involved with climate action in their community. The survey takes approximately 10-15 minutes to complete, and participants are given the option to enter a raffle for a $25 Visa gift card at completion. As of December 2023, the survey has been distributed during a tabling event at a local farmer's market in New Haven and through email distribution by SCRCOG and NVCOG. New Haven County residents can access the survey through a link on CPRGCT.org. Survey results will be analyzed and integrated into the PCAP in the weeks prior to its submissions on the March 1st deadline

Short-term strategy (CCAP)

The survey will run through December 2024. During the creation of the CCAP, extensive survey distribution, response collection, and data analysis is recommended as a main priority. It will be important to focus on recruitment in low-income and disadvantaged communities to make sure the most diverse range of perspectives are being heard and to ensure that data is not skewed towards a particular demographic. To reach a broad range of respondents, the survey will be publicized through social media, traditional media, and flyers posted on community bulletin boards; via emails sent by partner organizations to their constituents; through tabling at a variety of community events; and by partnering with community and faith-based organizations to administer the survey on-site, with staff or volunteers helping members complete it via tablets or laptops. During the development of the CCAP, survey response data will be used to guide recommended mitigation strategies.

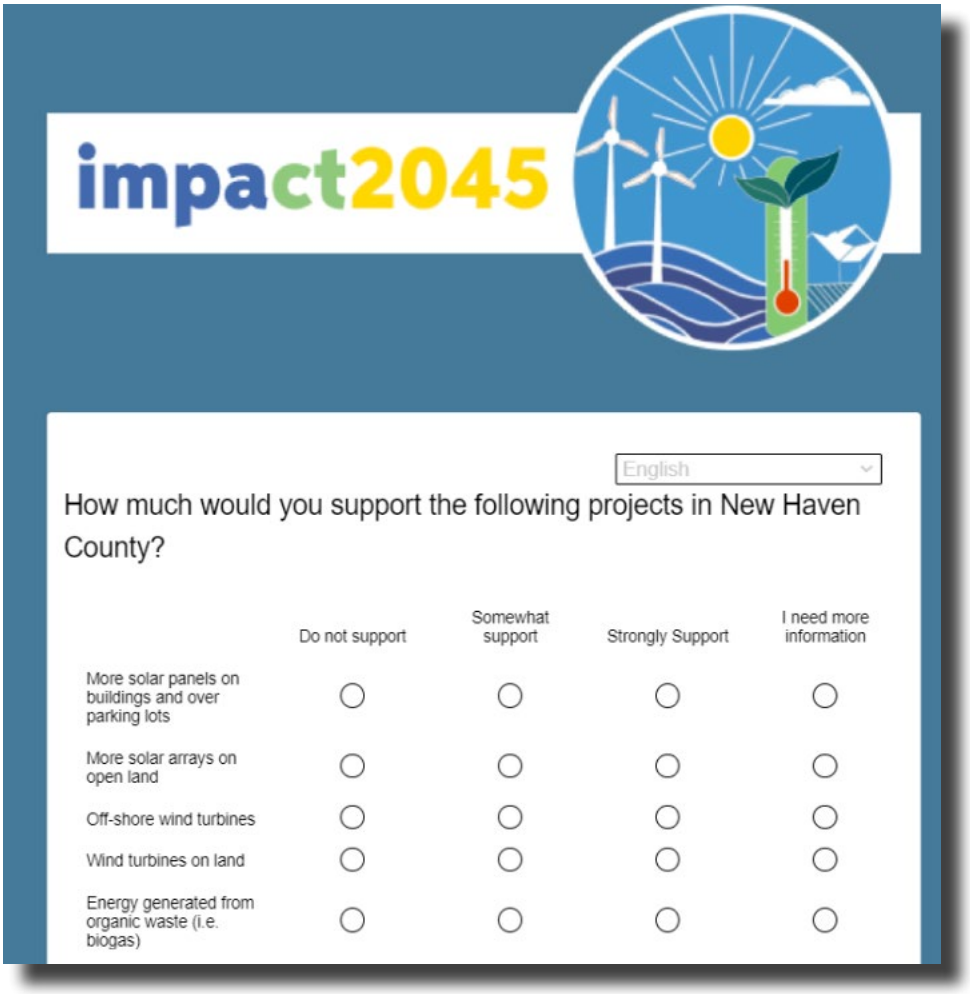


Figure 21: Impact2045 Survey

Long-term strategy (beyond CCAP)

While survey response collection will end in December 2024, further analysis of the data can help guide decision making beyond the development of the CCAP to help inform further local and regional climate action.

Game Design

Work to date

An interactive game called Emissions (Im)possible has been developed to bring issues involved with local greenhouse gas mitigation strategies to life. In this game, players make difficult decisions about how to reduce GHG emissions for their rural, urban, or suburban communities in the context of three possible scenarios. The game's first iteration was developed with teenagers in mind, as the first workshop was for a group of 50 students from a local high school. Feedback from this workshop helpe facilitate a second game round with 50 undergraduate students from UMass Amherst's Sustainable Community Development course, Transforming Your World: Introduction to Community Engagement. The final product can be played by all ages in a variety of settings. A description of the game and the game-design process can be viewed in Appendix D. The purpose of game development during this stage was to set the groundwork for deeper engagement during the CCAP phase of the project.

Tabling and Materials

What Has Been Done

Tabling and other brief engagements at farmers markets and other community events took place over the summer and fall, led by SCRCOG and NVCOG, with some participation from UMass Regional Planning students. Tabling materials included:

- Large posters with information on what the CPRG is and how to get involved with a QR code for the survey and a sign up for email updates.
- Trivia questions to ask passers-by.
- Impact 2045 stickers.

Stickers and coasters, both with a link to the project website, were created to aid in public engagement. Distribution of the stickers began in various spots across New Haven County, with particular attention paid to LIDAC areas. These coasters can be distributed at future community events and through supporting community organizations. Other distribution sites include public and commercial venues such as cafes, restaurants, and breweries. Each coaster has one of three questions about climate change issues in order to foster conversation amongst residents. In addition, these coasters have been printed in both English and Spanish.

Figure 22: Front and back coaster design

Short and long-term strategy

Based on the work completed to date, there are a few additional measures that have been idenitified in order to increase participation at tabling events and with materials.

- Expand on the trivia question concept by creating a game such as “spin the wheel” to select a question and receive a prize for the spin.
- Have a QR code readily available for people to access the online trivia game.
- Set up QR code in an easier format to direct people to online assets.
- Develop a game format based on the pilot design built out this fall that is adapted for brief engagement with community members.
- Create and distribute additional promotional materials (e.g. bookmarks, stickers, buttons, patches).

In addition to farmers markets, ideal locations for tabling events include planned community events, especially those that draw in local residents of low-income and disadvantaged neighborhoods, and pop-up tabling at locations such as libraries, cafes, breweries and tasting rooms. There also may be retail businesses focused on sustainable practices that would be interested in promoting the survey and providing community members with information about Impact 2045, the grant, and associated local climate mitigation efforts. In addition to consideration of venue, there may be opportunities to table alongside similarly focused climate change advocacy groups for greater community engagement and alignment with different stakeholders.

Media strategy

While it is good practice to have multiple outlets for outreach, it is important for small organizations to be intentional about which ones they use. This section lays out ideas for outreach and engaging New Haven County in climate action through traditional and new media.

Traditional media

Traditional media usually entails forming relationships with journalists, bloggers, news anchors, and advertising managers to build a media relations database for pitching stories or marketing products. In the case of Impact 2045, SCRCOG is building a policy plan informed by community input and we will use this plan to compete for implementation funding. Print and online publications could also be leveraged as a potential way to foster engagement with PCAP and CCAP related materials and events. The following is a list of local print and online publications in New Haven County that could assist in this endeavor: New Haven Register (New Haven), Record-Journal (Meriden), Republican-American (Waterbury), The Cheshire Herald (Cheshire), North Haven Citizen (North Haven) – part of Record-Journal, Shoreline Times (Guilford) – part of CT Insider, and Voices/Voices Weekender (Southbury). Statewide publications include Hartford Courant, CTMirror, and CTNewsJunkie. Broadcast media is another way agencies of all sizes can support their engagement and communication strategies. For example, SCRCOG in collaboration with other agencies working on climate action plans could create a joint advertising budget as an interagency collaboration initiative. At community events, with local media (such as WTNH) could also assist in securing interviews with municipal officials, agency staff, and community members.

New Media

Social media and podcasts are incredibly effective at reaching communities across generations, giving agencies and organizations room for a lot of creativity in outreach. It is important to be intentional about which social media to use, because once content creation and promotion begins on any given platform, maintenance becomes key for not losing followers to the algorithm. There are three platforms outlined for community engagement:

- Facebook's user base spans generations, and many people tend to get their news from this platform.
- Instagram can be used to promote appearances and activities at upcoming community events, recap and thank partners through slideshow posts and video reels, and to collaborate with partner agencies and organizations on cross-promotions reach to wider audiences.
- TikTok can be useful for sharing information in an engaging way, especially to younger generations. Forming promotional partnerships with groups doing similar work will not only help the agency reach a wider audience, but it will also diversify interagency collaboration efforts.

To support this, a part-time staff member, intern, or consultant who specializes in communications could be hired to coordinate a social media campaign.

Strategic Partnerships

With community, not for community

Meaningful public engagement not only includes working with communities from the beginning of the planning process, but it also requires the establishment of continuous feedback loops where constituents can voice their recommendations or concerns. The survey and the required public review process are the main components fulfilling this goal for the PCAP.

Facilitating feedback: As there will be an online-friendly version of the PCAP in addition to the downloadable report, it would be prudent to provide digital form where readers can give instant feedback. A feedback button linked to a form on each webpage of the report would allow people to give input on specific items as well as general thoughts. Keeping the survey open through the CCAP phase will also allow planning efforts to match the region's values over time. As time passes, it may become necessary to re-work questions to fit the community's needs. After strengthening partnerships with both municipal agencies and grassroots organizations, these relationships can be leveraged to distribute both the survey and the PCAP throughout the region.

Making engagement events accessible: Workshops and other community events are essential to public engagement, and it is vital to make them accessible to the widest audience. This could mean budgeting participant support costs as a stipend for childcare, hosting events at different times of the day, enabling virtual participation, hiring outside facilitators, or utilizing a variety of different media formats for outreach. However public events are managed, it is crucial to keep the lines of communication open. The more accountable we our to the community, the more room there is for trust to grow and relationships to strengthen.

Strategic partnerships and Interagency collaboration

Developing and maintaining ongoing strategic partnerships and interagency collaboration is essential to the success of regional climate mitigation efforts, especially in an area like New Haven County. In this region, authority to implement is complicated by the fact that the implementation of policy can only happen at the state or municipal level, rather than at the regional level. This can lead to statewide decisions that lack specificity and effectiveness for the needs of the New Haven County region or, conversely, to hyper-localized decisions that have limited impact if they stop at the border between two municipalities. The emissions of greenhouse gases is not dictated by municipal lines. Rather, reduction measures require consistent solutions with a large enough scope in order to make an impact.

For this plan to have the highest potential for reductions, it is vital that standards, structures, and goals are established to ensure implementation serves communities across all of New Haven County. It is particularly important to create avenues for members of vulnerable groups not just to share their opinions, but to be central figures in carving the path for determining what mitigation efforts will best serve their communities (Nel, 2018). This is not only in alignment with the PCAP and Justice40 requirements, but it is necessary for ensuring effective and equitable outcomes for the future. While many mitigation efforts may be driven by scientific measurements, the most impactful results are those that consider human behavior, needs, and concerns (Oke, 2023). In this proposed public engagement strategy, vulnerable communities are not seen as only beneficiaries of climate mitigation efforts, but as leaders driving the priorities for climate change

Aligning with Impact 2045's commitment to an equitable climate future, four measures are outlined based on the work already done by the Equity & Environmental Justice Working Group of the Governor's Council on Climate Change.

To engage those in leadership and decision-making roles along with those who live in vulnerable communities, SCRCOG has identified the importanace of taking a holistic, dynamic and collaborative approach that merge traditional paths of decision-making with community-led leadership. This could include the following groups and partners:

1. Councils of Governments (COGs) across Connecticut who have received CPRG funds.

2. Connecticut state government agencies and the municipal governments of New Haven County.

- CT state departments such as: DEEP, DOT, public health, housing.
- Municipal departments such as: transportation, housing, planning and zoning, utilities, equity, climate, and waste and water management.

> "A commitment to equity starts by recognizing that disparities in health outcomes, inequities in living conditions, and lack of political power place many communities of color, including Black, Indigenous, Latinx, Americans, immigrants, other People of Color...low-income communities, people with disabilities, and other historically disadvantaged people at greater risk and limit the capacity of their communities to adapt to climate change" (Governor's Council on Climate Change, 2021).

3. Community-Engaged Leadership with grassroots and other community organizations throughout New Haven County, including private citizens that can engage the full community and serve on a Climate and Equity Advisory Board to guide decision-making.

- This is key to understanding which mitigation measures are most in line with community needs a values throughout New Haven County, and building local networks and enthusiasm for implementing them with a shared desired future in mind.

4. Public-Private Partnerships with utility companies, health and educational institutions, private businesses, and labor organizations.

- Some of the most impactful change will need to come from the private sector – whether it is adopting mitigation measures or developing new workforce opportunities, especially for vulnerable community members.

The role of SCRCOG, along with NVCOG, is multilayered. As COGs, we are positioned to serve as conduits between the wide-ranging stakeholder groups, navigating the priorities and recommendations identified to lead to recommendations and decisions based on consideration of all the engaged groups.

What Has Been Done

As part of an assessment phase of public engagement, interview-format meetings have taken place with municipal-level staff to gain a better understanding of the needs and priorities as seen by municipal leaders (See appendix E for interview questions). Implementation grant meetings were also held for municipal leaders across New Haven County. From these processes, it became clear that there is significant interest in working collaboratively in order to strengthen institutional capacity and better position applicants for competitive grants.

Short-Term Strategies (CCAP phase)

Due to the urgency of input from vulnerable communities in advance of finalization and submission of the CPRG Implementation Grant proposal, it is vital to promote, distribute, and collect responses to the survey and for PCAP feedback. This is more effectively done through existing municipal-level engagement with community and faith-based groups. As time allows, SCRCOG believes it would be beneficial to host community workshops, information sessions, and tabling at indoor events throughout winter and early Spring 2024. This could include:

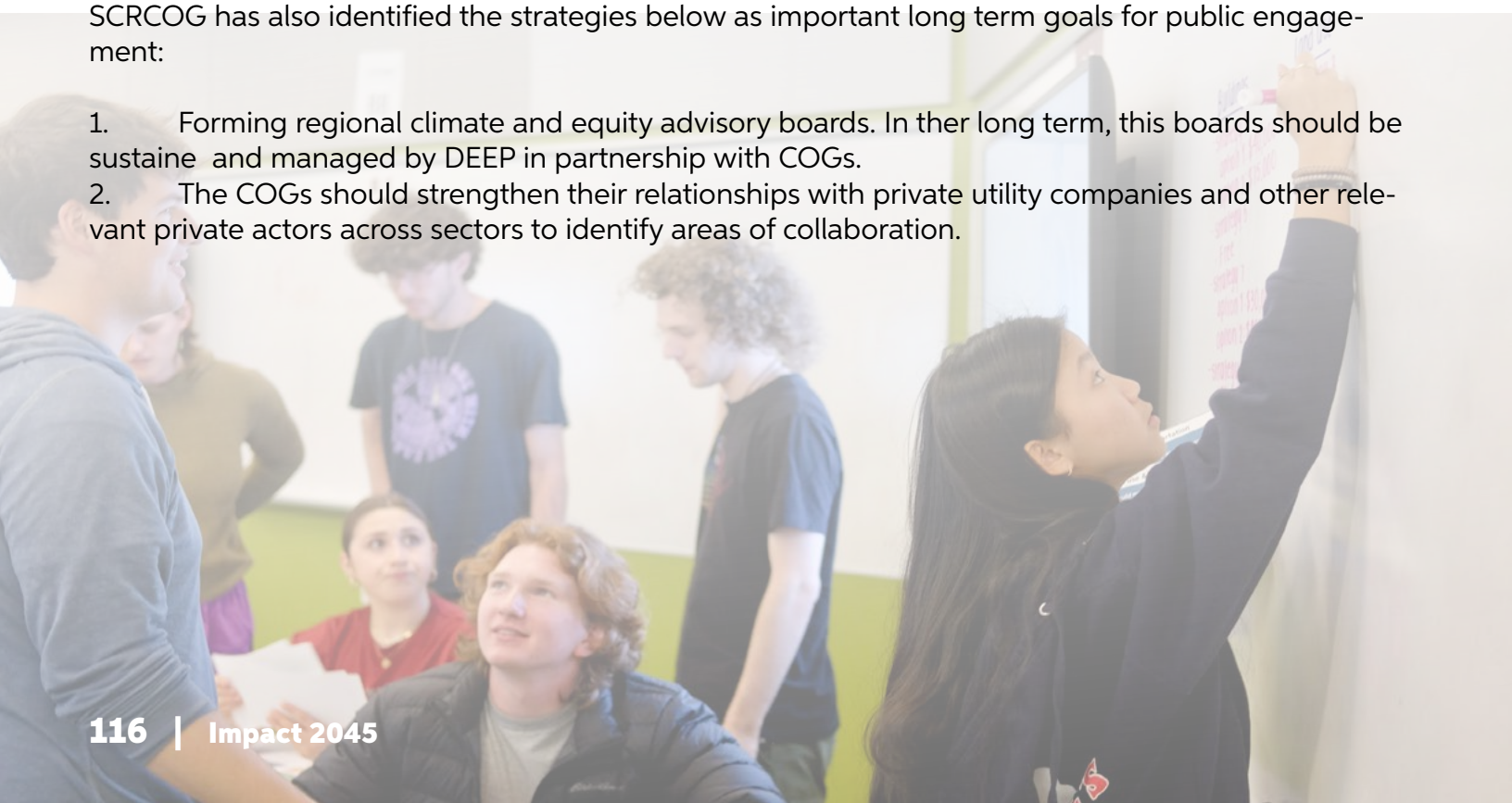
1. Continuing interagency meetings between COGs of New Haven County
2. Identifying priority prospective partnerships
- Researching potential stakeholders in public-private partnerships.
- Hosting meetings with COGs, municipal leaders, advisory board, etc.
- Identifying business leaders who grew up in vulnerable communities in the region to serve as key partners, linking bottom-up and top-down approach.
- Developing relationships with schools, libraries, and other educational institutions.

3. Increasing engagement with prospective and currently engaged partners.
- Sector-specific groups.
- Continuing municipal stakeholder interviews

Long-Term Strategies (Beyond CCAP)

SCRCOG has also identified the strategies below as important long term goals for public engagement:

1. Forming regional climate and equity advisory boards. In ther long term, this boards should be sustaine and managed by DEEP in partnership with COGs.
2. The COGs should strengthen their relationships with private utility companies and other relevant private actors across sectors to identify areas of collaboration.



Conclusion

In addition to robust greenhouse gas reduction plans, this plan identifies essential tools to facilitate public engagement in the upcoming stages of the project. As the project evolves and progresses towards its next phase, an invitation is extended for those looking to take part in active participation and engagement with this work, as well as other related climate change mitigation efforts in the region. The community at large is invited to read and comment on the PCAP and regularly visit the website for important updates. Beyond this work, there are opportunities for involvement at the local level, such as volunteering, attending community meetings, and engaging with local climate initiatives. Those in the public sector are also invited to delve into the PCAP and the upcoming Comprehensive Climate Action Plan and to consider collaborating with other public agencies on mitigation projects. It is encouraged that those in the private sector to stay informed through resources like the PCAP, foster collaboration within and across sectors, and invest in climate change mitigation efforts. Meaningful contributions like these play a crucial role in enhancing the collective resilience of New Haven County.

IV. Appendices

Appendix A: All Quantified Reduction Measures

Sector: Mobility and Transportation

Goal 1: A clean and green municipal fleet

T.1 - Accelerate or begin adopting EV's into the municipal fleet, including public school buses.

Quantified Reduction Potential for strategy T1 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
2.02	0.032%

T.2 - Begin adopting alternate fuel sources such as hydrogen for medium to heavy-duty vehicles, where appropriate, if EV transition is not possible.

Quantified Reduction Potential for strategy T2 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
89.48	1.41%

T.3 - Reduce idling in the municipal fleet; work with civil engineers to adjust traffic signals and patterns to reduce idle time.

Quantified Reduction Potential for strategy T3 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
16.07	0.253%

Goal 2: Create a transit first approach and reduce spatial misalignment

T.4 - Offer discounted transit fare for LIDACs.

T.5 - Create a transit first approach:

- Ensure that opportunity zones are completely accessible via public transit.
- Advocate for transit plans that incentivize new development to be transit-oriented and walkable.
- Pilot pedestrianization, limited traffic (bus only lanes/streets) and active transportation in dense developments.

T.6 - Partner with micro-transit companies to enable cross-town trips for smaller towns nearby.

T.7 - Reduce spatial misalignment:

- conduct feasibility studies to re-zone areas to create economic zones
- make permitting processes for dense housing development easier especially near existing economic zones.

T.8 - Create more park-and-ride options and increase transit access and frequency in areas with high car ownership and high commute times to work to enable multi-modal trips.

Quantified GHG Reduction Potential for all strategies under goal 2 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
49.42-101.88	0.779%-1.606%

Goal 3: Reduce emissions from private vehicles

T.9 - Increase the overall Electric Vehicle adoption and create infrastructure to support this:

- Communicate the benefits of CHEAPR to low and middle-income communities, and have limited time offers of higher Rebate+ to encourage buying of EVs in the short-term
- Encourage car owners in rural communities to set up at home EV charging by taking advantage of Federal Tax credits.
- In high-density development areas, implement requirements for new development to include EV charging stations.
- Communicate the benefits of the eBikes incentive program and advocate for increased funding for it, especially encouraging the growth of the Voucher+ offer for LIDACs

T.10 - Incentivize EVs for shared-mobility companies (Uber/Lyft). This could include free public parking for such vehicles.

T.11 - Incentivize trip reduction programs in public offices and partner with private offices for the same.

T.12 - Improve broadband access (with at least 1GBPS) state-wide.

Quantified GHG Reduction Potential for strategies T9 to T12 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
143.77-715.61	2.266%-11.30%

T.13 - Pursue alternative fuel sources, such as hydrogen, where appropriate, if EV transition is not possible.

Quantified Reduction Potential for strategy T13 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
287.54	4.532%

Goal 1: Reduce electricity consumption from fossil fuel sources in municipal buildings and services

E.1 - Utilize on site renewables (i.e. rooftop solar) to power municipal operations.

E.2 - If possible, leverage the powers of municipal utilities to procure renewable power for consumers, expand electricity production capabilities, and/or invest in storage capabilities within the municipality.

E.3 - Increase procurement of renewable energy for municipal services.

E.4 - Pursue microgrid projects that integrate onsite renewables and electricity from the grid to power municipal services.

E.5 - Increase the efficiency of wastewater treatment facilities and utilize onsite solar or biogas to lower emissions from operations.

Goal 2: Increase renewable energy production and consumption at the local scale

E.6 - Set up outreach programs that communicate state and federal level financing programs such as CT Greenbank's Solar for All programs, that support on site renewable generation to consumers.

E.7 - Evaluate the potential of citing renewable energy projects on vacant, underutilized land such as brownfield sites and combine planning for the renewable energy transition with open space planning.

E.8 - Consider adopting clean energy zoning ordinances that would require new and/or existing buildings to meet certain clean energy milestones through the use of onsite renewables or clean energy purchasing.

E.9 - Coordinate with housing authorities to build out community and rooftop solar, battery storage, and microgrids for affordable housing and overcome barriers to solar uptake.

Quantified GHG Reduction Potential for all strategies under goals 1 and 2 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
37.14-394.48	0.585%-6.218%

Goal 3: Prepare local economies for renewable energy transition

E.10 - Prepare economic development plans around offshore wind energy.

E.11 - Partner with local workforce development centers, technical schools, and trade unions to prepare workforce in key renewable energy sectors, such as offshore wind energy and solar installations.

Quantified GHG Reduction Potential for all strategies under goal 3 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
70.29-210.87	1.11%-3.32%

Goal 4: Cap methane emissions from hydroelectric facilities

E.12 - "Develop and take actions to mitigate the future propagation and release of additional methane and greenhouse gases from the two reservoirs" (O'Neill, 2023).

Quantified GHG Reduction Potential (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	0.86-5.16

Sector: Energy Efficiency in Buildings

Goal 1: Ensure energy efficiency and sustainability through building codes and regulations

B.1 - Require building owners to annually benchmark and disclose their energy usage and efficiency ratings.

B.2 - Provide educational resources and support to building owners on improving energy performance in their buildings.

B.3 - Ensure all municipal operations rely on 100% renewable energy sources.

B.4 - Advocate for strict building codes and achieve net zero energy usage.

B.5 - Offer incentives and expedited permitting for projects that achieve green building certifications.

B.6 - Support climate friendly land use.

Goal 2: Renewable heating access for low-income homes.

B.7 - Install solar heating on low-income housing units to provide renewable water heating for these properties.

B.8 - Integrate solar heating systems into community initiatives and reduce overall energy costs.

B.9 - Install energy monitoring and management systems in low-income housing to track and control energy consumption.

Goal 3: Energy efficient building materials and retrofits

B.10 - Support the adoption of sustainable building materials in low-income housing construction and renovation.

B.11 - Establish a city-wide retrofit program focused on low income residents and municipal buildings, providing grants and low-interest loans to property owners for energy-efficiency upgrades and heat pump isnstallations.

B.12 - Monitor and report the energy and cost savings resulting from retrofitting and sustainable materials to demonstrate their impact and encourage further investment.

B.13 - Set up outreach programs at the regional or local level that target LMI households for heat pump installations and energy efficiency upgrades.

Quantified GHG Reduction Potential for all goals and strategies in this sector (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
96.00-680	1.513- 10.719%

Sector: Waste Management

Goal 1: Divert waste via local and regional programs

W.1 - Establish a county-wide unit-based pricing program with food-scrap collection and public education.

W.2 - Establish a regional waste management authority in New Haven County; implement waste diversion infrastructure and programs.

W.3 - Expand and continue community-based food waste reduction programs, such as Center for Eco-Technology's technical assistance for food waste reduction in businesses, schools, and institutions.

Goal 2: Enact and expand statewide waste-reduction laws

W.4 - Advocate for the expansion of Connecticut's Commercial Organics Law to include a wider array of orgzations and more geographic locations.

W.5 - Advocate for an extended producer responsibility (EPR) program for packaging to reduce waste by 190,000 tons per year, saving municipalities $50 million per year.

Quantified GHG Reduction Potential for all goals and strategies in this sector (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
262.99	4.27%

Sector: Industrial

Goal 1: Improve Emissions Monitoring, Accounting and Reporting

I.1 - Require utility companies, gas suppliers, and health care facilities to report emissions data.

Goal 2: Reduce emissions through low-carbon procurement

I.2 - Embed a purchasing criterion in public projects that states a preference for suppliers or service providers who have a transparent and standardized GHG inventory.

Goal 3: Reduce emissions from the health care sector

I.3 - Collaborate with the healthcare sector to offer financial grants or subsidies to healthcare facilities that are committed to adopting low-emission practices in specific medical areas. Partner with major healthcare providers to establish a preferential purchasing system, prioritizing suppliers or service providers who disclose their carbon footprint and have clear decarbonization objectives.

Quantified GHG Reduction Potential for all goals and strategies in this sector (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
33.94-101.82	0.53%-1.61%

Sector: Working Lands and Forestry

Goal 1: Preserve and support existing and potential forested lands

L.1 - Pursue afforestation and reforestation throughout New Haven County.

L.2 - Support current efforts and management strategies to maintain existing forests on both private and public property.

Goal 2: Increase urban tree canopy (UTC) and agriculture.

L.3 - Increase urban tree canopy in low-income and disadvantaged communities.

Quantified GHG Reduction Potential for strategies L1 to L3 (Zhao and Oke, 2024)

Sequestration (TMTCO2e)	Percentage of total net emissions
62.79-125.58	0.99%-1.98%

L.4 - Support farming initiatives across urban, suburban, and rural typologies.

Quantified GHG Reduction Potential for strategy L4 (Zhao and Oke, 2024)

Emissions reduction (TMTCO2e)	Percentage of total net emissions
5.85	0.09%

For a list of quantification assumptions broken down by goal and strategy, please see appendix H.

Appendix B: CEJST Measures

Burden Category	Indicators	Measures
Climate Change	Tracts are considered burdened if they are at or above the 90th percentile for any of the five climate change measures AND are at or above the 65th percentile for low income.	1. Expected agriculture loss rate 2. Expected building loss rate 3. Expected population loss rate 4. Projected flood risk 5. Projected wildfire risk
Energy	Tracts are considered burdened if they are at or above the 90th percentile for either of the energy measures AND are at or above the 65th percentile for low income.	6. Energy cost 7. PM2.5 in the air
Health	Tracts are considered burdened if they are at or above the 90th percentile for any of the four health measures AND are at or above the 65th percentile for low income.	8. Asthma 9. Diabetes 10. Heart disease 11. Low life expectancy
Housing	Tracts are considered burdened if they have at least one abandoned mine land or formerly used defense site OR are at or above the 90th percentile for any of the three legacy pollution measures AND are at or above the 65th percentile for low income.	12. Housing cost 13. Lack of green space 14. Lack of indoor plumbing 15. Lead paint
Legacy Pollution	Tracts are considered burdened if they have at least one abandoned mine land or formerly used defense site OR are at or above the 90th percentile for any of the three legacy pollution measures AND are at or above the 65th percentile for low income.	16. Abandoned Mine Land 17. Formerly Used Defense Sites 18. Proximity to hazardous waste facilities 19. Proximity to Superfund sites (National Priorities List (NPL)) 20. Proximity to Risk Management Plan (RMP) facilities

Burden Category	Indicators	Measures
Transportation	Tracts are considered burdened if they are at or above the 90th percentile for any of the three transportation measures AND are at or above the 65th percentile for low income.	21. Diesel particulate matter exposure 22. Transportation barriers 23. Traffic proximity and volume
Water and Wastewater	Tracts are considered burdened if they are at or above the 90th percentile for any of the three water and wastewater measures AND are at or above the 65th percentile for low income.	24. Underground storage tanks and releases 25. Wastewater discharge
Workforce Development	Tracts are considered burdened if they are at or above the 90th percentile for any of the four workforce development measures AND more than 10% of people ages 25 and older have a high school education less than a high school diploma.	26. Linguistic isolation 27. Low median income 28. Poverty 29. Unemployment

Table 28: List of Burdens, Indicators and Measures

Appendix C: Stakeholder Summary and Survey Report

Overview

From August of 2023 through February of 2024, SCRCOG and NVCOG have worked together to engage their respective communities within the New Haven-Milford MSA. The compressed timeline of the CPRG program, as well as the limited capacity of the COGs, resulted in a condensed public engagement process.

Engagement Opportunities and Feedback

- Hybrid - Stakeholder Workshop on 8/29/23 in North Haven and online via Zoom
- Regional Energy Task Force meeting 9/20/23 in North Haven
- Tabling at CitySeed Farmers Market in New Haven 10/18/23
- Tabling at NEST Waterbury Housing Expo in Waterbury 10/22/23
- Tabling at CitySeed Farmers Market in New Haven 11/4/23
- Virtual - CCM webinar on 11/14/23
- Hybrid - Grants Workshop on 11/30/23 in North Haven and online via Zoom
- Virtual - participation in 12/18/23 CT public meeting
- Hybrid - Designing a Regional Application for CPRG Implementation in New Haven County 12/19/23 in North Haven and online via Zoom
- Virtual – Engagement with Connecticut's Equity and Environmental Justice Advisory Council (CEEJAC) on 12/19/23
- Virtual – A feedback session on the draft PCAP with the public on 2/6/24 in addition to a 30-day open written public comment period

Regional Priorities Identified

- Energy efficiency upgrades to town hall building(s)
- Replace HVAC systems in aging town buildings and other town owned facilities
- Subsidize residents moving their water heating from oil, gas, and electric resistance heating to high efficiency electric heat pumps
- Regional food waste recycling/composting facilities/infrastructure
- Electrification of heavy duty vehicles
- Revolving loan fund for building efficiency upgrades for property owners and developers

Statewide Priorities Identified

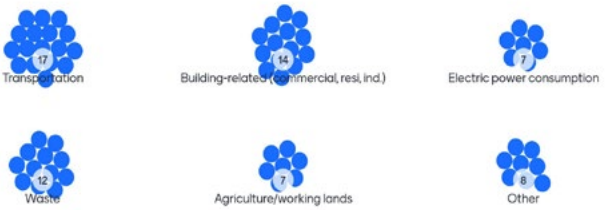
- Waste management & reduction
- Incentives for municipal building upgrades
- Decarbonization of schools
- Incentives for heat pump installations
- Increased financial incentives for the purchase of electric vehicles and electric bicycles for income-eligible residents
- Increased bus and rail service
- Legislation to require municipalities to allow for higher density construction near transit

Mentimeter

Does climate change impact your mission or activities?

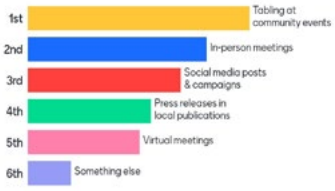
Mentimeter

Do your activities fall within any of the following sectors? Check all that apply:



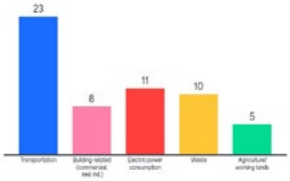
Mentimeter

What is the best way to engage the community in our CPRG efforts, especially low-income and disadvantaged populations?



Mentimeter

Which of the sectors listed above do you think holds the most potential for greenhouse gas emissions reductions?



Mentimeter

What is the name of the group you are representing?
26 responses

Mentimeter

In one or two words, what is the most effective way to reduce climate pollution?
41 responses

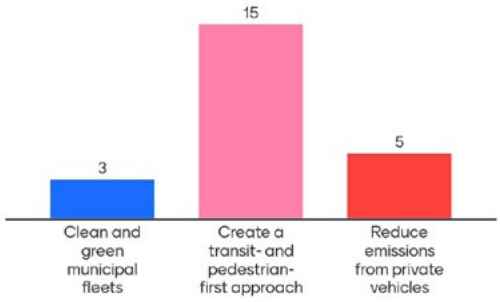
Mentimeter

Which climate impact (heat, flooding, storms) threatens your community the most?
45 responses

Mentimeter results from brainstorming session on 19th December, 2023 : Designing a Regional Application for CPRG Implementation in New Haven County

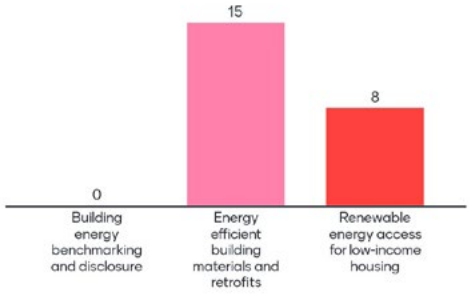
Mentimeter

For TRANSPORTATION, which strategy is most appealing?



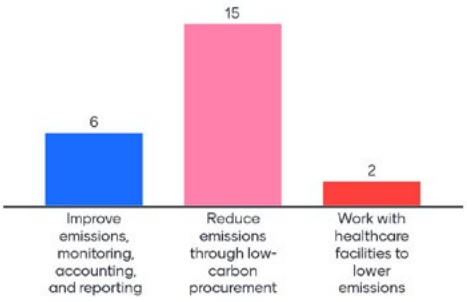
Mentimeter

For BUILDINGS, which strategy is most appealing?



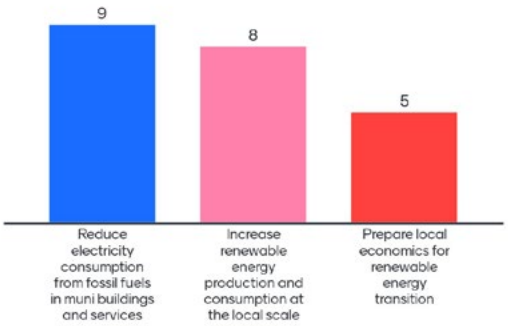
Mentimeter

For INDUSTRIAL, which strategy is most appealing?



Mentimeter

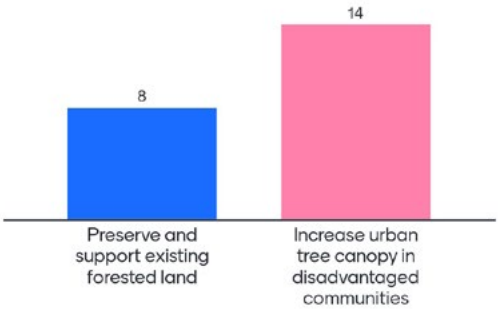
For ELECTRICITY, which strategy is most appealing?



22

Mentimeter

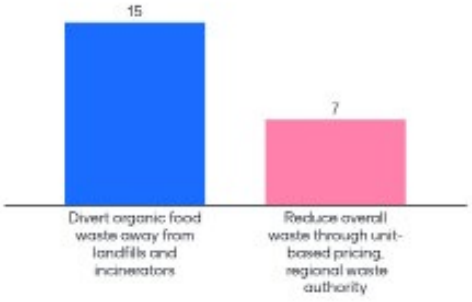
For WORKING LANDS & FORESTS, which strategy is most appealing?



22

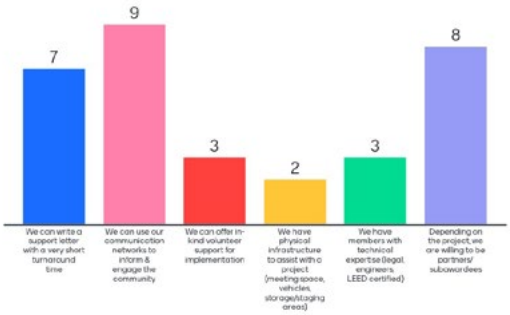
Mentimeter

For WASTE, which strategy is most appealing?



Mentimeter

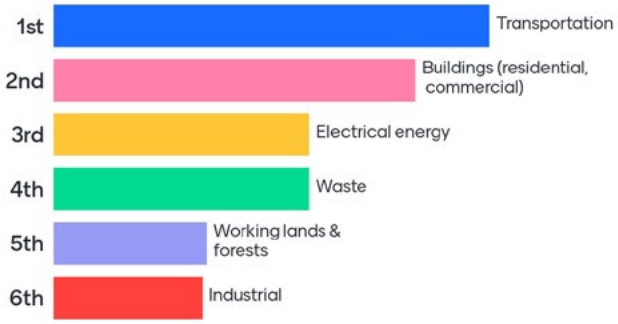
What can your group do to support our project?

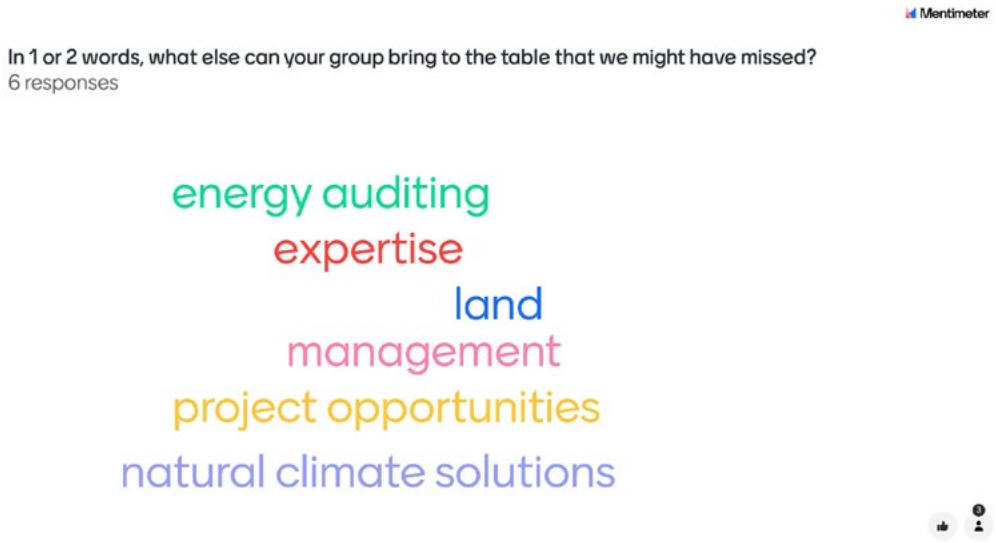


Mentimeter

What group do you represent?
21 responses

Rank each sector based on its suitability for a regional implemenation app.





Direct Feedback from Municipal Chief Elected Officials (CEOs)

We distributed a feedback form to all CEOs in the New Haven County region and received feedback from 8 municipalities, including: Ansonia, Beacon Falls, Bethany, Cheshire, Hamden, New Haven, North Haven, and Wolcott. The following questions were asked in the feedback form. Some municipalities had more than one answer per question.

1. What projects and efforts are currently underway in your municipality that seek to reduce GHG emissions and lower your overall footprint? Examples could include: Building additional bike/ped connections, installing energy efficiency upgrades to town owned buildings, offering food waste diversion projects, strengthening existing building energy codes, funding public EV charging infrastructure upgrades, installing LED streetlight upgrades.
    a. We are in the process of getting ready to do some much-needed upgrades/renovations to our town hall building and to install energy efficient upgrades as well, and we are reassessing our msw (municipal solid waste) and recycling services to the town.
    b. We have retrofitted all of our street lights with LED. We have entered into a performance contract with Johnson Controls adding energy efficient equipment in our town buildings, we have sponsored over 2000 home audits with our residents and we have built a solar park which helps offset energy usage at our Water Pollution Control Authority. We have also added EV charging stations.
    c. The City is working to electrify City-owned buildings and vehicles, with more than 40 light duty electric vehicles purchased this year and heat pumps replacing legacy heating and cooling systems in police substations, firehouse living quarters, and other small and medium-sized municipal facilities.
    d. The City's first electric refuse vehicle is due to arrive at the end of this year - electrifying the entire fleet with eliminate asthma-causing air pollution, lower operating costs, cut carbon pollution, and also provide grid-level energy storage. y Task Force meeting 9/20/23 in North Haven.
    e. The City is currently working with solar developer Greenskies to install solar on two school parking lots, two City buildings, and the City landfill. While the City is not able to change the state building code, through zoning the City has incentivized all-electric, energy efficient, and sustainable construction practices in two of its zones.
    f. The City is building out a network of protected bicycle lanes and has identified priority areas for pedestrian improvements through its safe routes for all active transportation master plan.

g. The City's parking authority is re-launching the New Haven bike share program and the City is exploring piloting an electric scooter share program to provide additional transportation options. CTDOT recently awarded the City a grant to launch a microtransit ride sharing program on the west side of New Haven in partnership with Via transportation. City staff have helped to publicize the state's electric bicycle and electric vehicle rebates. The City has applied for funding for 6 publicly accessible electric vehicle charging stations.
h. The City has provided financial support to Neighborhood Housing Service's I Heart My Home home energy counseling programs and City staff have led canvasses to enroll residents in environmental justice census tracts into this program to improve the energy efficiency and lower the carbon emissions of their homes.
i. The City has posted a position for a part-time recycling educator to help educate residents about recycling and composting. The City is exploring how to implement some form of unit-based pricing and co-collection of organics. The City has partnered with Collective Oyster Recycling and Restoration to begin shellfish shell recycling in restaurants selling shellfish."
j. LED Street Lighting and energy efficiency upgrades to our Town Hall and 2 Schools.
k. Completing another leg of our greenway, food waste program, EV chargers installed, LED streetlights installed.
l. HVAC upgrades at our public schools, retained the services of Energia consulting for school and municipal building energy efficiency review. Designing our two new elementary schools with potential geothermal non fossil fuel energy systems.
m. Upgrade my EV charging station. Energy upgrades to town owned buildings.
n. Building efficiency updates. Exterior renovations to Hamden Government Center and the Keefe Community Center. HVAC replacement at Hamden Government Center.
o. Transportation improvements to promote multi-modal transit; sidewalk repair/replace, installation of bike lanes, complete street policy implementation, regional bus rapid transit project along Dixwell Avenue Corridor, and bus shelter/stop renovations.
p. Solar panel installations at various Town owned facilities (Primarily BOE property).
q. Green infrastructure implementation at various locations on town owned property and within the right of way.

2. Imagine you have a blank check to spend on GHG reducing projects from the EPA, what emissions lowering projects and efforts would you pursue in your municipality? Examples: Convert fleet to EVs, support transit-focused growth, incentivize efficiency upgrades, transition to zero emission buses, develop and implement a comprehensive sustainability and GHG education program for municipal employees, etc.
   a. A blank check would be nice, but we would still need to look at what we have and where we want to go.
   b. Continue to work in greater depth regarding updating the boilers in all of our town buildings and all of our schools.
   c. The City would prioritize subsidizing residents moving their water heating from oil, gas, and electric resistance heating to high efficiency electric heat pumps. Our analysis of switching to heat pump water heating from our citywide emissions inventory shows that this strategy can help cut the amount of carbon emissions by 60% compared with electric resistance, 68% compared with gas, and 74% compared with oil water heating. The cost of the intervention is an order of magnitude lower than switching space heating to heat pumps and the complexity is much reduced - it is much more standardized and "plug and play"" that space heating, which is more customized.
   d. The City would also prioritize regional investments in infrastructure to recycle food scraps, which would enable municipalities to turn food scraps into nutrient-rich compost at a greatly reduced tipping fee as compared with municipal solid waste. Equipment to sort color-coded

bags of co-collected organic material, remove the organic material from bags, decontaminate the organic material, and aerate the organic material in an aerated static pile are necessary investments to make this possible.

e. The City would also prioritize the electrification of heavy duty vehicle fleets, in particular those fleets that spend much of their time circulating in and polluting our environmental justice neighborhoods. These vehicles have a disproportionate impact on local air quality. Replacing them with electric vehicles with large batteries offers an opportunity to provide valuable grid services to our electric grid, including peak shaving in periods of high afternoon demand.
f. Incentivize efficiency upgrades.
g. With all the new construction in the City of Ansonia it is important for us to be able to incentivize property owners and developers to lower emissions through building upgrades. If there were a revolving loan fund or grant to administer to qualified owners, that would greatly improve our housing/commercial development projects.
h. Replace HVAC systems at our aging High School, Middle and singular district elementary school that has not been renovated. Explore energy efficiency projects at our Town owned facilities.
i. Fleet upgrades.
j. Support transit-oriented development. Implement energy efficiency upgrades to Town owned buildings. Convert vehicle fleet (cars, light duty trucks) to EV and build out EV charging infrastructure.

3. What can the state do to help support your local efforts towards reducing GHG emissions? Examples: Provide municipalities with financial incentives to upgrade facilities, improve waste management options, Transition the grid to 100% renewables, etc.
   a. I think your examples sort of cover the main points.
   b. Help improve our waste management options which is a huge problem right now.
   c. “The state should change its 2050 greenhouse gas reduction commitment from an 80% reduction to a 100% reduction and create subsector plans for emissions reductions.
   d. The state should create a program for funding school decarbonization retrofits - these retrofits are far beyond the budgets of most municipalities.
   e. The state should increase funding for energy efficiency programs to at least a level where the current amount of efficiency work can continue - this would require $40-50 million in funding. To speed heat pump adoption, the state should increase incentives for heat pump adoption for space heating to the level that Massachusetts provides. The should set a date after which all heating system retrofits must use heat pumps.
   f. The state should enable municipalities to adopt a “stretch”” building code which would allow them to require all-electric, energy efficient construction of new buildings. The state should increase financial incentives for income-eligible residents to purchase electric vehicles and electric bicycles - current incentives are too low for many low-income residents to make the switch and demand for electric bicycle rebates far outstripped supply in the summer’s bike rebate program.
   g. The state should continue investments in improved bus and rail service and require municipalities to allow for higher density construction near transit.
   h. Improve Waste Management Options
   i. Financial incentives for municipalities are always welcome. They help us prepare for any potential mandates in the future.
   j. Focus on Waste Management reduction in our landfills. Incentivize municipalities to upgrade municipal buildings with aging systems.
   k. Help with zero emission upgrades, offer waste management options.

l. Continue to provide substantial investment in meaningful public transit projects like the Bus Rapid Transit system in the Greater New Haven area. Expand service for the BRT project to Hamden's core area near the Hamden Plaza. Reduce administrative burden for public funding. Continue to provide funding resources for transportation infrastructure.

4. Here is a space for you to provide us with any other comments, suggestions or feedback.
   a. Remember - every municipality has different needs. Rural is quite different than city.
   b. We have done a great deal here in North Haven but we know we can do more and hopefully there will be incentives to do so.
   c. Thank you for your efforts in helping with the challenges we all are dealing with, I hope we are successful in receiving the funds we need.
   d. Focus toward open space acquisition funding to balance development with retention of natural resources within our communities to ensure greenspace to assist with pollution reduction.

Survey Report

Introduction

During the fall of 2023, SCRCOG and NVCOG, in partnership with the UMass Amherst Department of Landscape Architecture and Regional Planning, released a survey with plans to collect responses through December of 2024. The purpose of the survey is to gauge the attitudes that New Haven County residents have about climate change, climate change planning, and issues within sectors relevant to this plan. The responses from the plan will inform planning decisions during the CPRG grant applications and during the drafting of CCAP.

Survey distribution and demographic characteristics

As of February 6th, 2024, the survey has recorded 72 responses, although this number drops into the 30s after the completion of the consent form and demographic questions. The distribution of responses by age range has been relatively even, with 19% of responses coming from the age brackets 25-34, 55-64, and 65-74 each (Figure 23).

Distribution between male and female residents was also relatively even. At this point, survey responses skew white and higher income, indicating the need for further engagement with New Haven County residents across a range of demographic characteristics. A larger amount of respondents also recorded that they are homeowners rather than renters, compounding the need for more engagement across the County. Of these respondents, the majority live in single family homes.

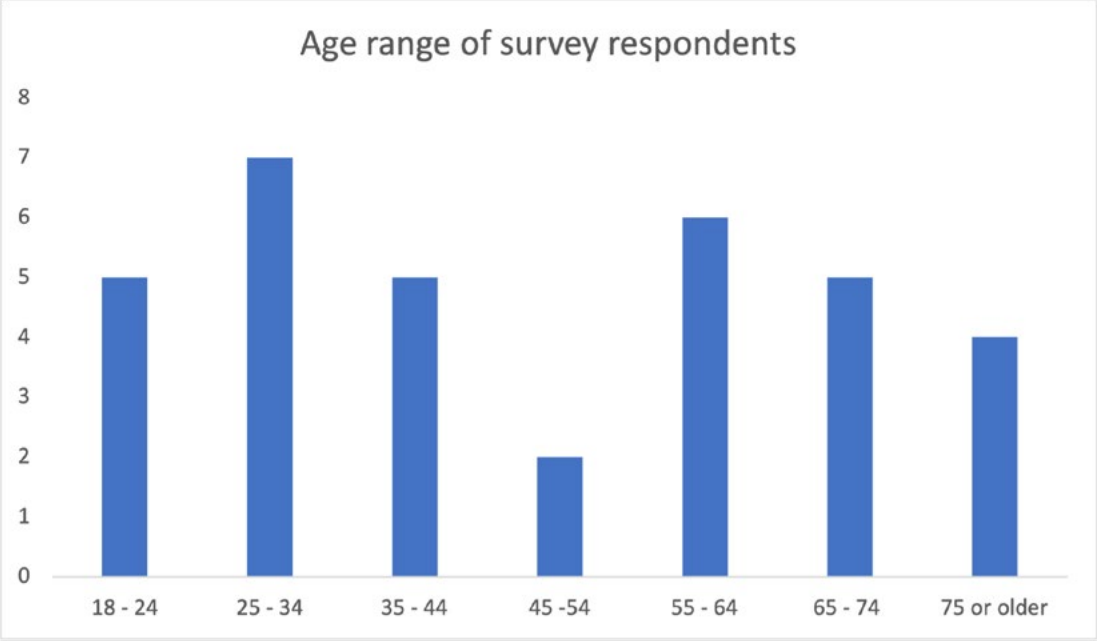


Figure 23: Age range of survey respndents

Results

Climate Change Impacts

Frequently cited climate change impacts in the County include hotter summers, warmer winters, early springs and later falls, more flooding, and bigger storms. Of these, warmer winters was noted at the highest rate (94% of responses). Street flooding was also the most cited example of flooding by respondents. 39% of survey respondents indicated experiencing no health impacts from heat, while those who did experience heat related health impacts citing fatigue, dizziness or lightheadedness, dehydration, difficulty concentrating, and hand and feet swelling as the most common symptoms.

Transportation

Figure 24 shows the importance of five transportation changes that can be utilized to lower GHG emissions in this sector. All strategies are ranked as very important to survey respondents. However, improving and expanding bus and train service and making walking a biking easier were cited as the very important by many respondents. The only change that received more moderately important votes than very important votes was installing more EV charging stations (Figure 24).

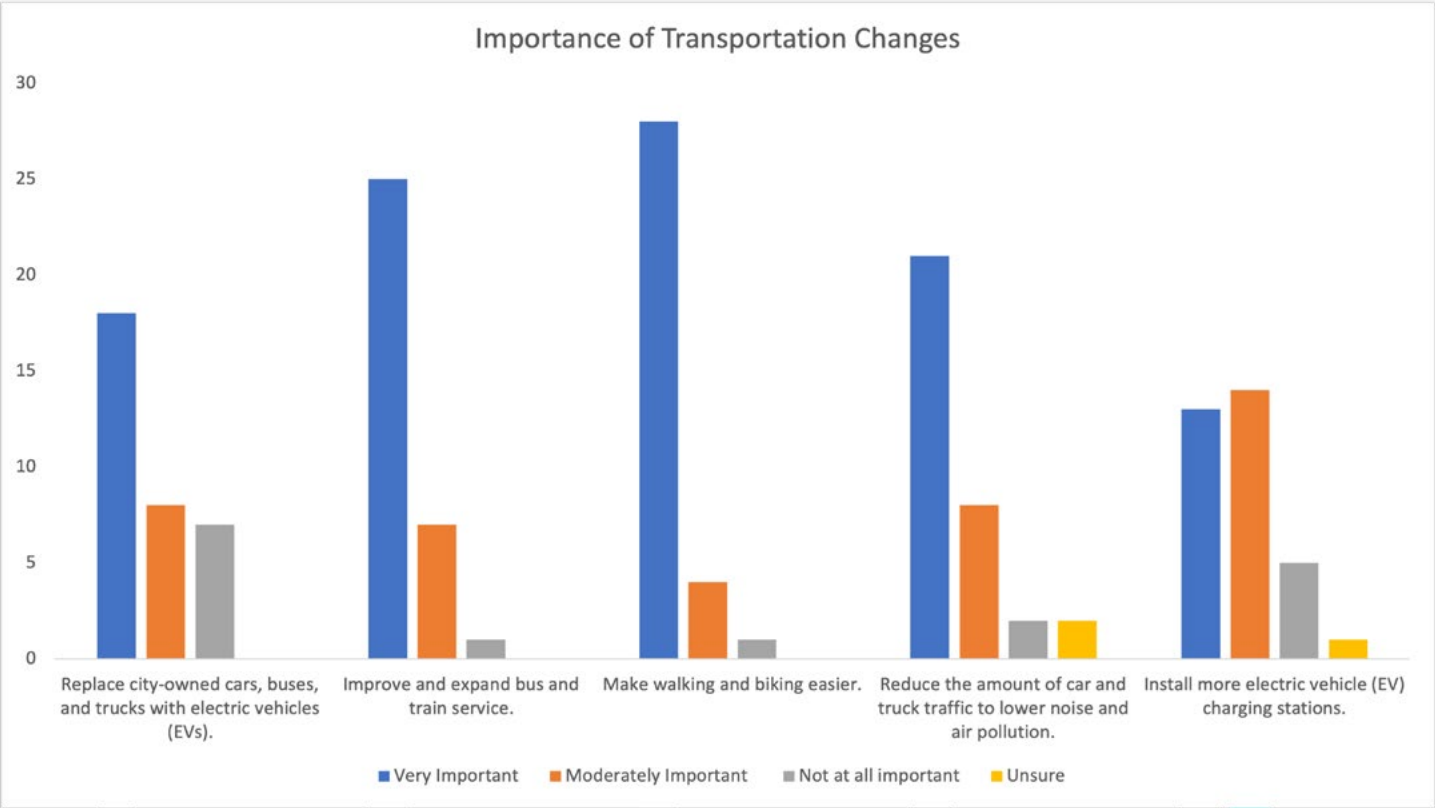


Figure 24: Importance of transportation changes

The most popular modes of transportation according to respondents used to travel were cars, followed by walking, biking, and buses. Few respondents indicated that they currently take the train to work or school. For many respondents, multiple modes of transportation were chosen as their preferred method of getting to and from places they wanted to go, possibly indicating that multi modal trips are being taken. Respondents said that they were unsatisfied with public transit in the area, although engagement was low for this question (<10 responses). The Figure below shows the popularity of policies based on their ability to increase satisfaction with public transit. Policies that increase frequency and speed, alter schedules to be more convenient, and build out transit in areas that people live or visit are particularly popular amongst respondents.

Figure 25: Popularity of policies that increase transit satisfaction

Overall, the survey indicates that residents of New Haven County are car dependent. Car ownership skews towards traditional gas powered vehicles (Figure 26), while the high costs associated with car use are embedded or considered negligible within survey respondents attitudes (Figure 27). While it appears that survey respondents consider public transit as less burdensome on the basis of cost, survey engagement with this question was low (<10 responses).

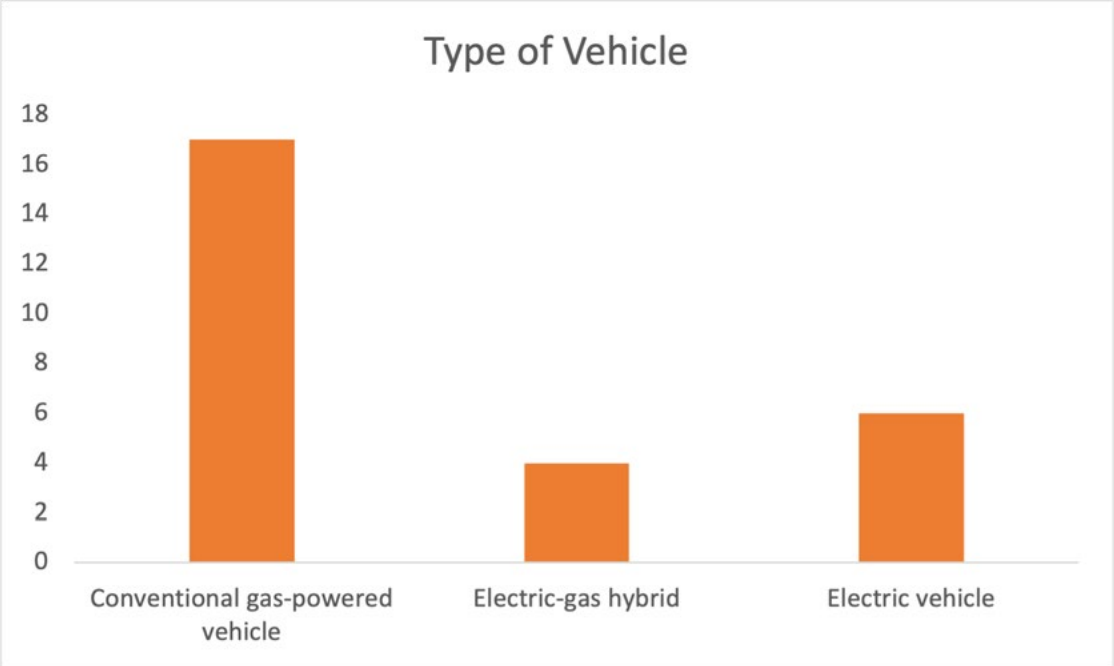


Figure 26: Type of vehicle

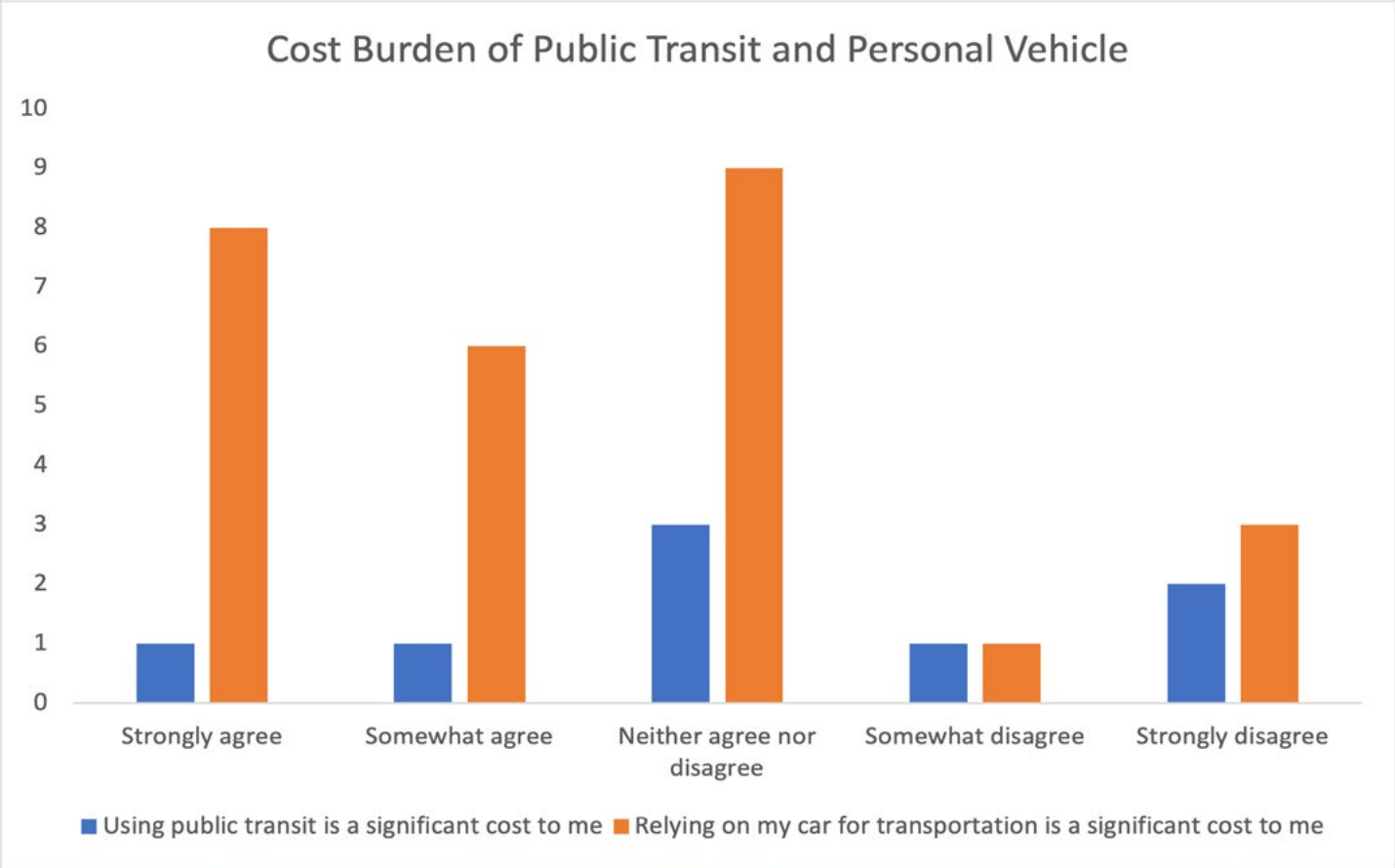


Figure 27: Cost burden of public transit and personal vehicles

However, a number of survey respondents indicated that having more public transportation options was at the very least moderately, if not extremely important to them (Figure 28).

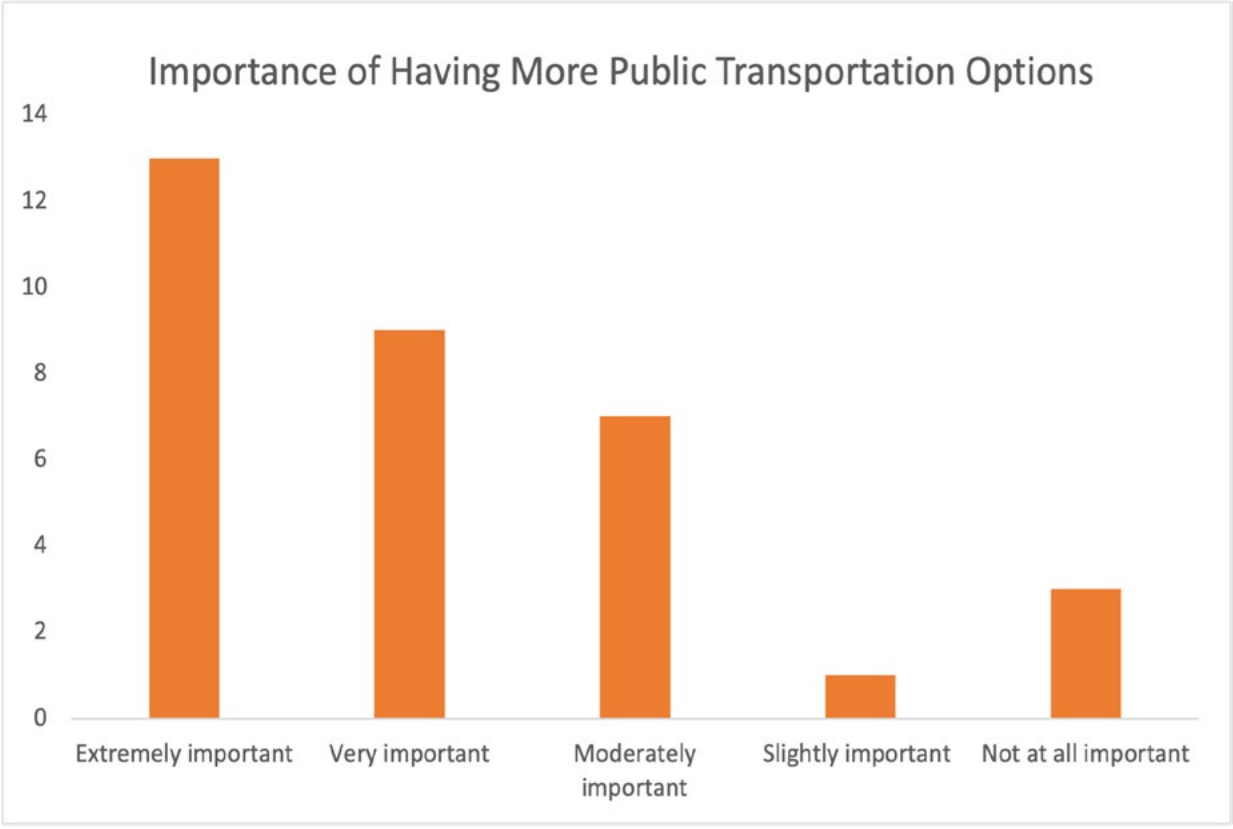


Figure 28: Importance of having more public transportation options

Walking and biking was also considered in the survey. Respondents indicated that they the sometimes chose to walk or bike to places they needed to go, although walking was considerably more popular than biking (Figure 29).

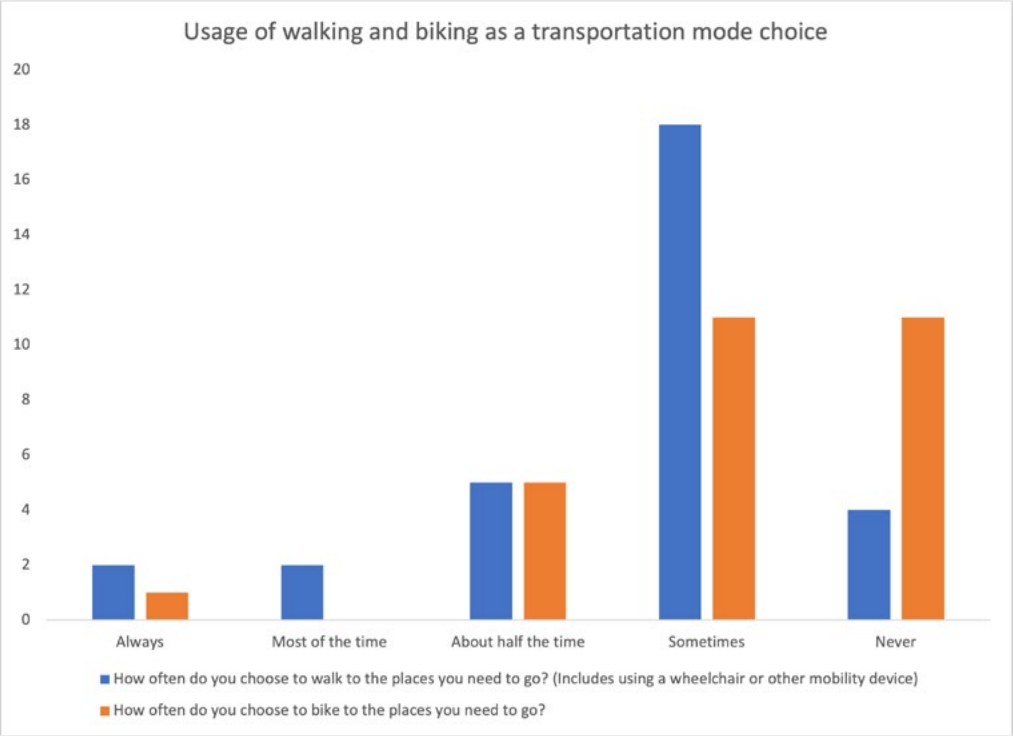


Figure 29: Usage of walking and biking as a transportation mode choice

In order to increase the usage of these transportation mode choices, safety and convenience can be increased in high usage areas. Respondents indicated that this would increase the likelihood that they would engage in biking or walking as a means of getting to and from where they need to go (Figure 30).

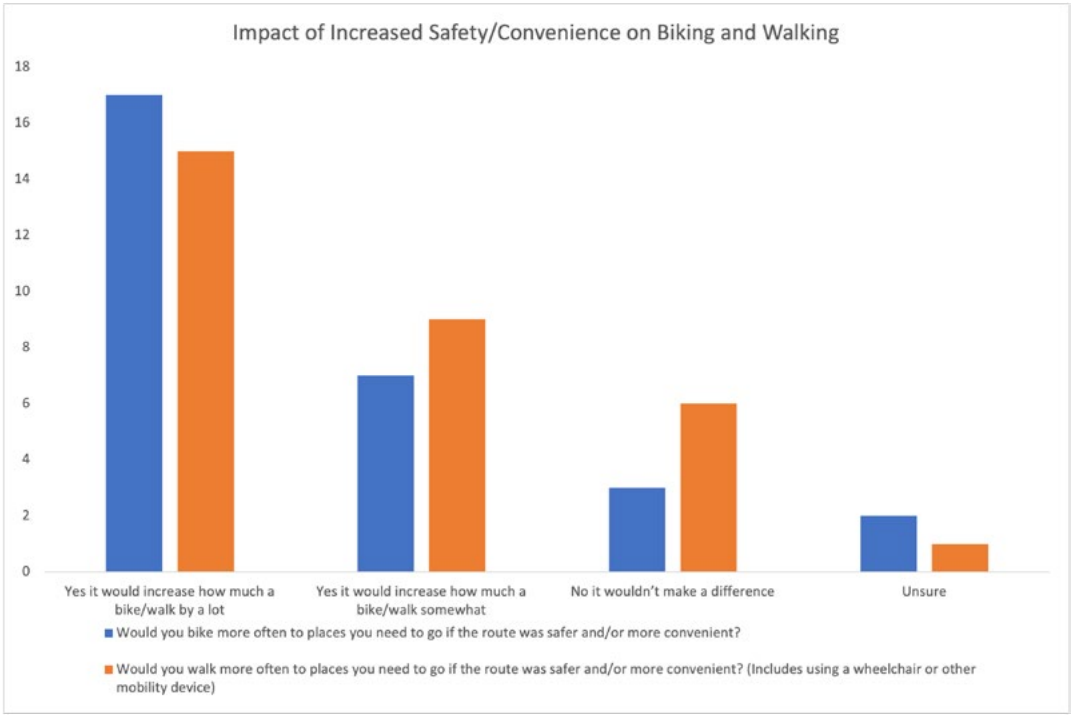


Figure 30: Impact of increased safety/convenience on biking/walking

Household Energy Usage

Survey respondents indicated that they mostly rely on natural gas and oil to heat their homes. This was followed by heat pumps, electric sources, and wood pellets. Propane was rarely used. Forms of cooling most cited by respondents included central AC and window AC units, followed by fans, and ductless minisplits. Other cooling methods included ducted heat pumps and tree shading. Survey respondents were also asked how interested they would be in a variety of strategies that could lower their household energy bills. Many of these strategies also lower energy usage or directly replace fossil fuel sources of energy with renewable energy. Of these, programs that assist homeowners in weatherizing their homes and replacing old appliances performed well amongst respondents (Figure 31). There was also considerable support for programs that assist homeowners in installing solar arrays and retrofitting heating and cooling systems with mini splits (Figure 31). There was less support for programs that target renters (Figure 31), although renter engagement with the survey was considerably lower than homeowner engagement. Survey respondents also indicated interest in connecting to community solar arrays (Figure 31).

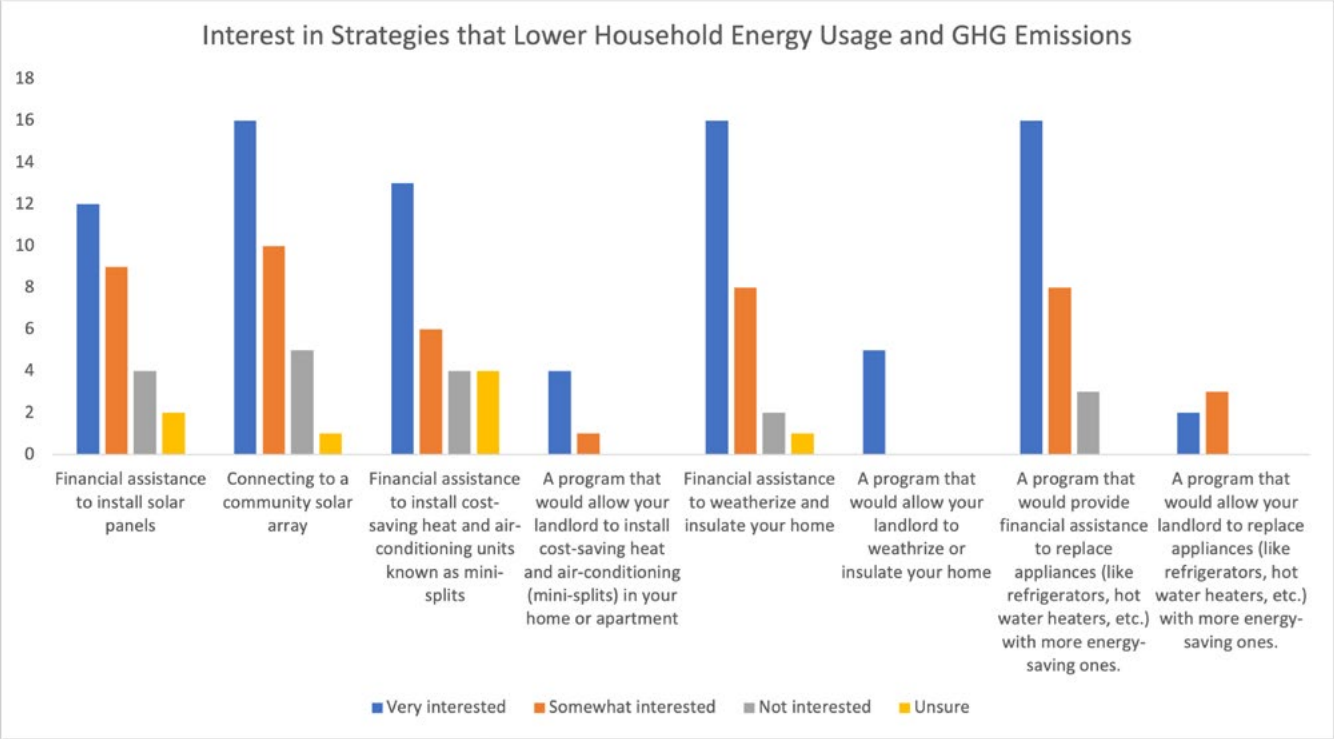


Figure 31: Interest in strategies that lower household energy usage and GHG emissions

Programs that increase household and community solar options could also have a large impact on emissions from the electricity sector.

The Electrical Grid

Respondents were also asked about their attitudes towards policies that aim to expand electrical grid capabilities and replace fossil fuel sources of electricity with renewables. As it currently stands, major grid expansion (i.e. building out high voltage transmission lines) will have to occur in order to support the introduction of renewable technologies and the added strain of EV adoption and electric heating usage. As seen in Figure 32, respondents indicated that, given this reality, they believe it would be extremely or very important to make improvements to the electrical grid.

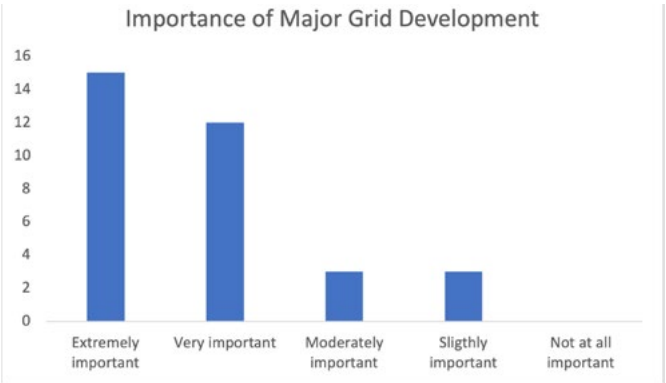


Figure 32: Importance of major grid development

Respondents were also asked which renewable energy solutions they found most appealing in this sector. There was greater support for solar implementation over buildings and parking lots than on open land (Figure 33). Respondents also indicated that offshore wind was more favorable than on land wind production, although support for both was high (Figure 33). Support for biogas usage was also apparent, although more outreach may be needed given the amount of respondents indicating that they needed more information (Figure 33).

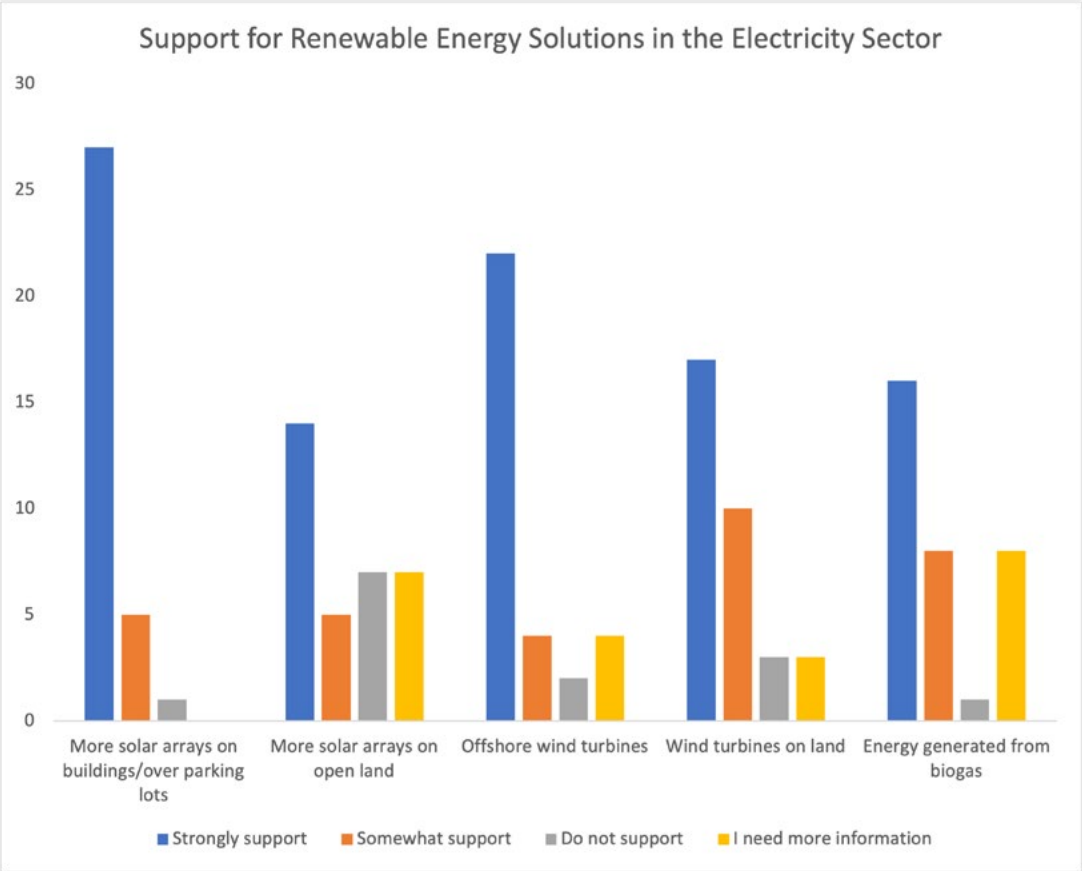


Figure 33: Support for renewable energy solutions in the electricity sector

Waste Management

38% of respondents said they always compost their food scraps, while 21% said they sometimes do and 32% said they never do. 6% of respondents indicated that they compost their food scraps most of the time and 3% indicated that they compost around half of the time. Support for participating in a citywide municipal composting or waste diversion program was high (Figure 34), although support for waste sorting programs funded by higher local taxation was considerably lower (Figure 35).

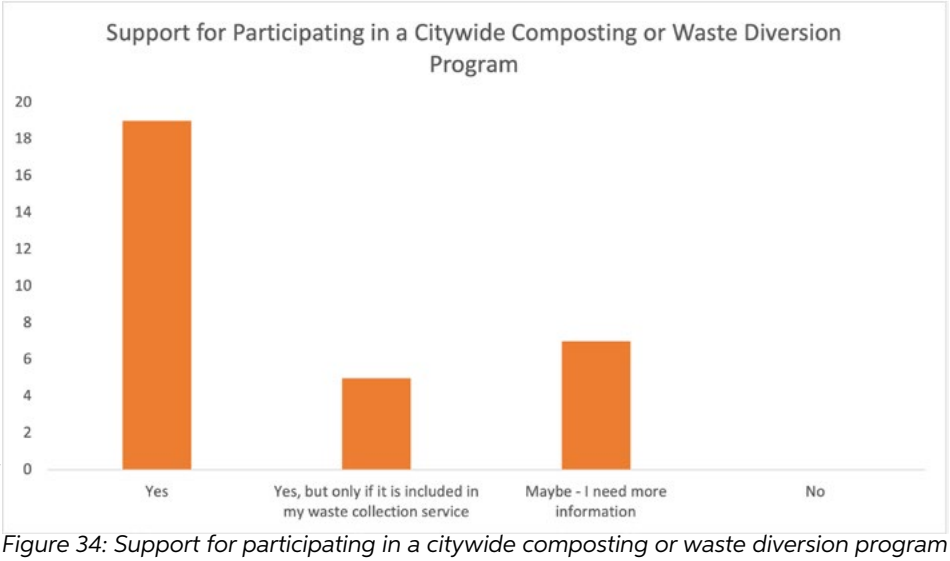


Figure 34: Support for participating in a citywide composting or waste diversion program

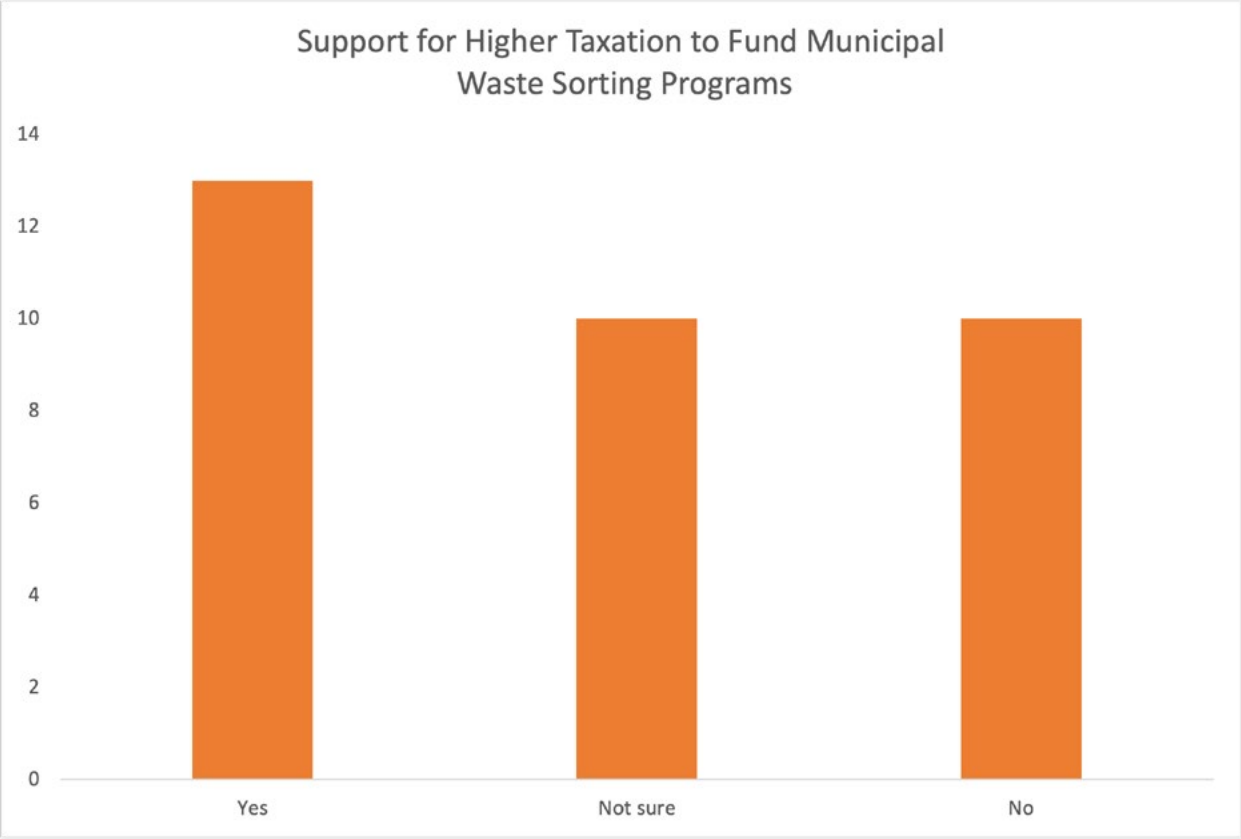


Figure 35: Support for higher taxation to fund municipal waste sorting programs

Overall, survey respondents indicated that they already participate in some sort of waste reduction behaviors (Figure 36). Support for programs that incentivize further behavioral change was relatively evenly distributed, although larger recycling bins garnered the most support from survey respondents (Figure 36).

Figure 36: Effectiveness in motivating behavorial change by strategy

General
Figure 37 shows various climate actions ranked by importance. Increasing public transit options and transitioning to renewable energy were cited as the most important actions by survey respondents.

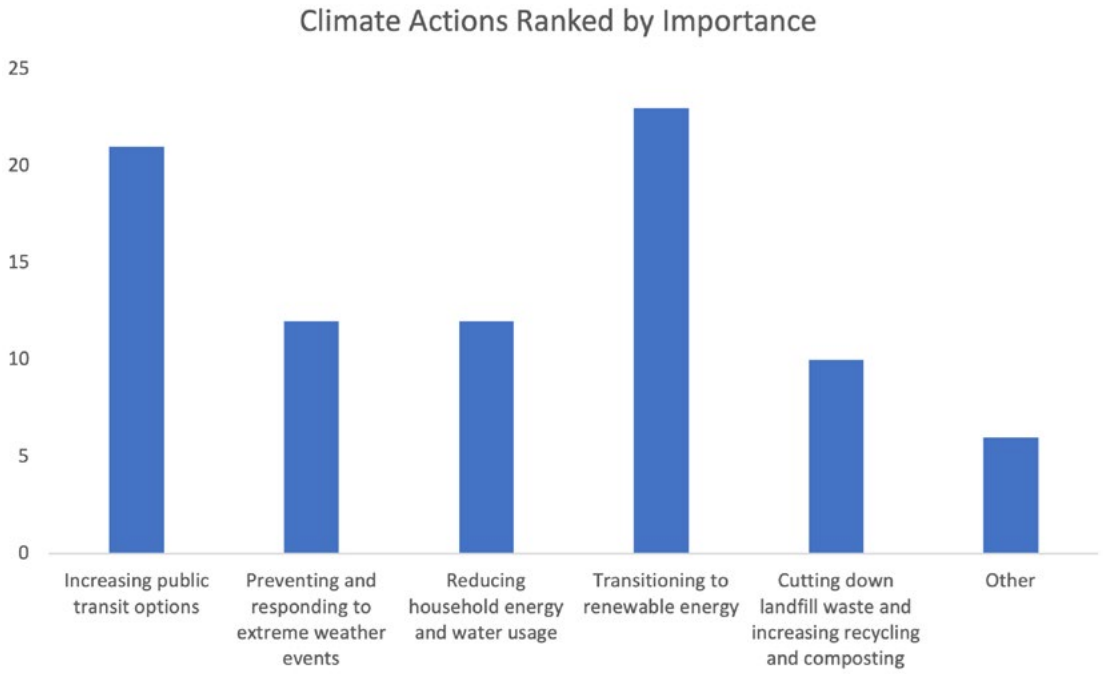


Figure 37: Climate actions ranked by importance

Current limitations
Current limitations with survey data are due to sample size and demographic distribution. While seventy-two responses have been recorded thus far (as of February 6th), responses drop drastically after the consent form and demographic questions. Current responses to questions encountered towards the middle of the survey are in the mid-thirties. While this is by no means surprising considering the expediated timeline that this plan was drafted under, further engagement with the residents of New Haven County will need two take place in order to increase survey engagement. This will be increasingly important as the CCAP planning process begins.

Demographic responses also suggest limitations with the data collected up to this point. The majority of respondents have indicated that they identify as white and are from relatively high-income brackets. This underscores the need for further survey distribution and engagement with the residents of New Haven County. For survey results to be robust and indicative of the planning needs in the County, sampling must accurately reflect the population of New Haven County. Moreover, the Justice40 initiative, of which this plan and the CCAP are a part of, states that 40% of policy benefits must flow to LIDAC communities. If survey results are to inform planning initiatives during the CCAP phase, they must reflect the needs of residents across a range of sociodemographic characteristics, especially those that are a part of LIDACs.

Public comment period

SCRCOG also solicited public comments from stakeholders and New Haven County residents after the plan was posted in January 2024. Written public comment and comments submitted through the website are available for viewing in PDF format.

Appendix D: Game Design

Emissions (Im)possible

We developed a game prototype to demonstrate the impact of climate change planning and help us engage the community in a fun and informative way. The following section details how the we incorporated feedback and plan to implement the game in actual public engagement settings.

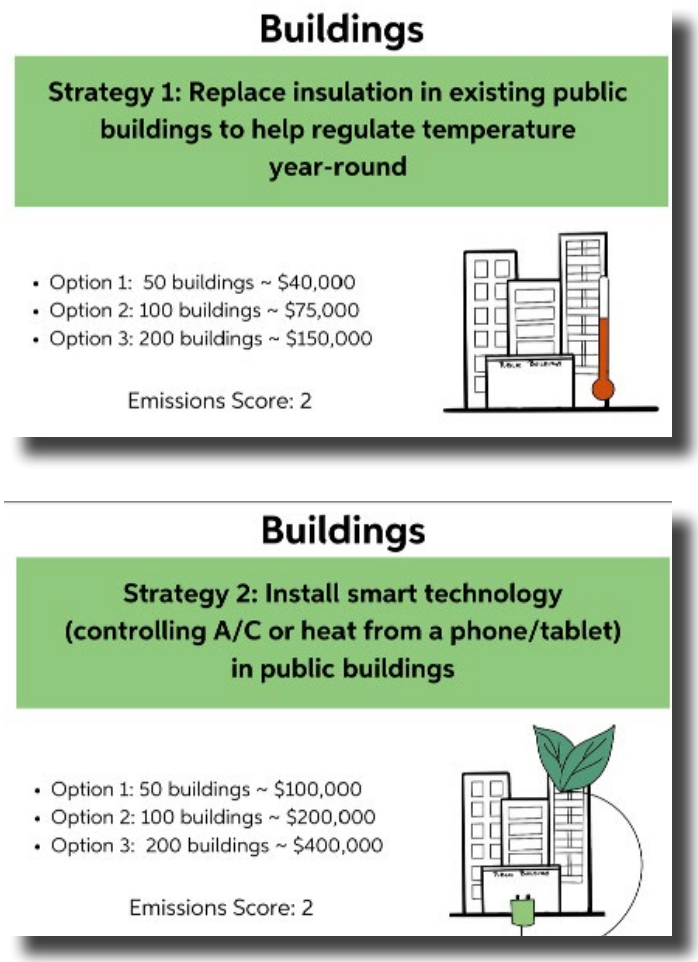


Figure 38: Sample strategy card

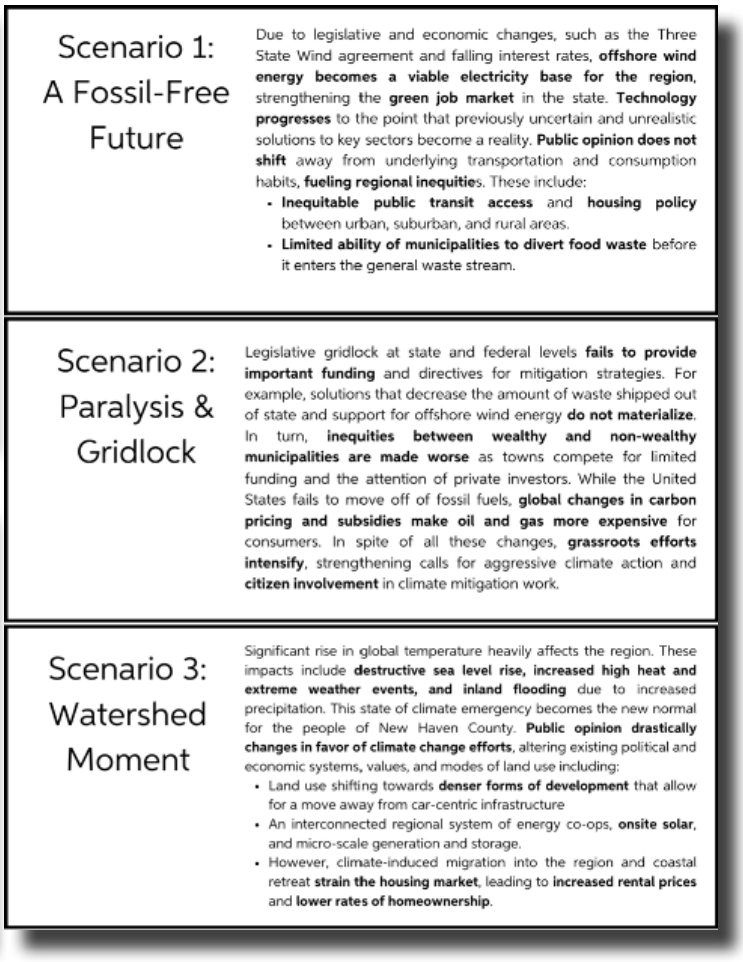
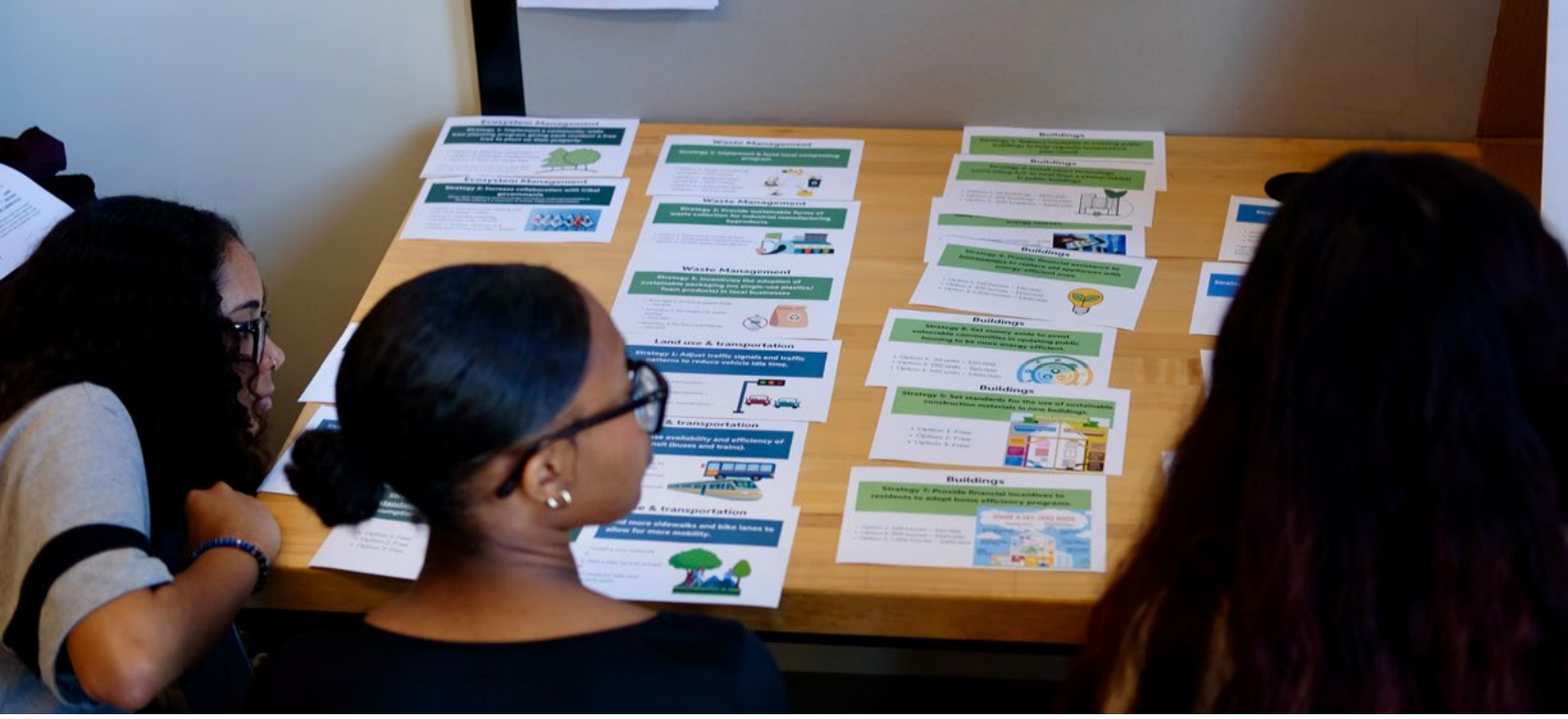


Figure 39: Scenario cards

The first round of prototype testing for this game was held on October 26, 2023, with almost 50 high school students from Springfield Honors Academy in Springfield, MA. Students were split into smaller groups, each belonging to a different typology (rural, suburban, urban), and were given a different starting budget. Given these circumstances, participants had to figure out how to select the most effective mitigation strategies for their locale. The students were then directed to use the flipchart, fake money, strategy cards, and worksheets provided to solve the issue at hand. This included considering how to best distribute the given budget amongst mitigation policies and the potential cost of each strategy. After the small groups deliberated, the large group came back together to reflect on what strategies and sectors were prioritized over other strategies and sectors. For example, the "City" group with a low budget prioritized all-encompassing programs that would help the most people instead of incentives for landlords to build renewable energy into their projects. In contrast, another group spent most of their money on buildings and infrastructure but very little on waste management.



Springfield Honors Academy students playing Emissions (Im)possible

This was a valuable exercise for many reasons:

- It built on the students' existing knowledge of climate mitigation issues and strategies.
- It applied their existing/new knowledge to potentially challenging situations.
- It outlined what this age group may value in the coming years, such as how much their own use of fossil fuels impacts the environmentn and the importance of consensus in the decision-making process.

This generation will face significant impacts from climate change, which is why they are currently poised to make drastic, necessary changes in how we deal with the climate crisis. When asked how each group's budget impacted their decision-making, a variety of responses were heard:

- Intentional saving for a rainy day fund is good practice, as well as investing in community engagement.
- It is better to test out strategies on a small scale to evaluate effectiveness.
- One group's "city can't run without energy" mindset guided their investment, prioritizing big ticket energy items and choosing more affordable strategies in other sectors.

The most important feedback related to the overall challenge of the activity. Not only did participants want to know specific emissions outputs and policy impacts, but they requested less money to work with, as that is more reflective of the reality for most municipalities. They also wanted to have a conversation about why certain places had more money, integrate more social issues into the game, and posed questions about how the game might work if certain strategies were given to certain groups, rather than every group starting on a level playing field.

The Studio team developed a second iteration of Emissions (Im)possible to facilitate a group of 50 students enrolled in Transforming Your World: Introduction to Community Engagement, a course offered by the Landscape Architecture and Regional Planning department at UMass Amherst. This iteration took place on November 7, 2023, and incorporated feedback from the first workshop. Each group was given different typology and scenario from the exploratory scenario planning process. They were also given less money to work and multiple roles for gameplay. All the groups worked to solve the same issue of policy investment. Without prompting, one group focused on strengthening grassroots efforts and community engagement. By spending all but $1,000, this group implemented community tree-planting, sustainable packaging, local composting, and EV stations. They made sure to target wealth inequity, by hitting all strategy sectors, turning a political and economic crisis into an opportunity. The feedback was again essential to the game design:

- Given the short amount of time, it was difficult to inhabit roles within the group.
- One student who had acted as city planner in their group reported that they thought more about how decisions might affect others, beyond their usual perspectives of how strategies could impact them personally.
- The typology impacted decision-making more than the various contexts of the scenarios, resulting in groups prioritizing collective values over individual values.

Long-term recommendations

Through our rounds of testing and feedback, we have developed a third iteration of Emissions (Im) possible that we are offering as part of our public engagement strategy. This can be adapted for community members across the various typologies of New Haven County. The primary revisions to the game are:

- No role-playing. While the roles and typologies were helpful to provide basic context to those outside of New Haven County, the roles no longer make sense if this game is being played within New Haven County.
- Emissions scores for each strategy. Quantifying these reduction measures in turn will raise questions within each group surrounding equity. For example, the strategy of burning waste has a negative impact on low income and disadvantaged communities. How will the players of this game cope with this reality? This addresses the title of the game.
- In further addressing feedback from both workshops, not every typology will receive the same set of strategies to more closely reflect the different municipal identities that make up the region.

UMass Amherst students playing Emissions (Im)possible

Instilling a sense of competition will add an element of urgency, so the new iteration of the game will require groups to collaborate to win, with an incentive to resolve internal conflict. In All Work and No Play? Facilitating Serious Games and Gamified Applications in Participatory Urban Planning and Governance, Ampatzidou et al. (2018) found that semi-collaborative games work well in public participation. For example, "A balance between collaboration and competition appears to be a preferable game setting for media and tools that are used in participatory approaches" (Ampatzidou et al., 2018). One way of creating the sense of conflict is for the facilitator to have a "hidden" scorecard to evaluate the group's policy decisions at the end. While the groups know that one of them will eventually win, keeping scoring metrics hidden until the end of the game could educate players about why certain trade-offs may be inescapable. Even though roles may not make sense in a community event setting, there can be a place for them in a version of the activity geared towards municipal leaders. Moreover, it will be important to form partnerships with schools around New Haven County where agency staff and/or volunteer facilitators can lead classroom versions of this activity and more, engaging community members across age groups.

Appendix E: Stakeholder Meeting

Stakeholders Meeting Agenda + Notes

IN ATTENDANCE		DATE	Nov 13, 2023 10:00 AM
Stakeholders COG Staff	Studio Members	FACILITATOR	
		NOTETAKER	
		TIMEKEEPER	

AGENDA/QUESTIONS

Summary

	Topic	Lead/ Participants	Time
	<u>Introductions</u> ● Welcome and thank stakeholders for taking the time to participate ● Confirm everyone is ok for session to be recorded ● Provide overview of session & purpose of meeting ● Have everyone introduce themselves		
Q1	What mitigation strategies does your community currently use or plan to use to reduce greenhouse gas emissions?		
Q2	What are ways that the state could support your local climate mitigation efforts?		
Q3	Do you anticipate the projected impacts of climate change to affect economic development and housing? If so, how? Over what time period?		
Q4	If you had a blank check and you could do anything to address climate mitigation, what would you do at the state level? What about at the local level?		
Q5	Is there anything we didn't ask you about that you think is important and relevant to mitigation strategies?		
IF THERE IS TIME, ANY OF THE QUESTIONS BELOW CAN BE ASKED			

Q6	What are the strengths and challenges that come to mind when you think of your community?		
Q7	How do you currently define vulnerable communities and identify where they live? Do you consider vulnerable communities when implementing strategies related to climate impact? How might they be better involved in the planning process?		
Q8	How do you envision effective interagency collaboration over the next twenty years? Which partners are the most important for the successful implementation of mitigation strategies? Is this realistic based on capacity and political will?		

Discussion Notes

Q	Responses to questions (identify contributor)
Sample	EH: answer to sample Q RT: answer to sample Q
Q1	
Q2	
Q3	
Q4	
Q5	
Q6	

***ADDITIONAL NOTES** (if any)*

Table 29: Stakeholder Meeting Agenda Notes

Appendix F: Census Tracts and Blocks of Low-Income and Disadvantaged Communities (LIDACs)

LIDAC tracts identified by CEJST

All LIDAC Tracts:

1403, 1710, 1701, 1703, 1709, 3513, 1407, 1254, 1402, 1415, 1416, 1541, 1546, 1406, 1408, 3502, 3509, 3503, 3510, 3523, 3501, 3512, 3526, 1409, 3505, 3511, 3514, 1405, 1414, 3515, 1702, 1715, 1404, 1421, 1423, 1202, 1412, 1424, 1545, 3504, 3508, 3517, 1426, 3528, 3522, 3521, 1427, 3524, 1714, 1425

LIDAC Tracts above the 90th Percentile for Asthma:

1403, 1701, 1703, 1709, 1407, 1254, 1402, 1415, 1416, 1406, 1408, 3502, 3503, 3523, 3501, 3512, 3526, 1409, 3505, 3511, 3514, 1405, 3515, 1715, 1404, 1421, 1423, 1202, 1412, 1424, 3504, 3508, 3517, 1426, 3528, 3522, 3521, 3524, 1425

LIDAC Tracts above the 90th Percentile for Unemployment:

1403, 1701, 1709, 1402, 1415, 1416, 1546, 1408, 3502, 3523, 3501, 3512, 3505, 3511, 1405, 1702, 1715, 1421, 1423, 1202, 1424, 3504, 3508, 3517, 1426, 3522

LIDAC Tracts above the 90th Percentile for Energy Cost:

1403, 1701, 1407, 1402, 1415, 1416, 1406, 3502, 3503, 3523, 3501, 3512, 3526, 3505, 3511, 3514, 1405, 1423, 1202, 1424, 3504, 3508, 3517, 3522, 1427, 3524, 1425

LIDAC Tracts above the 90th Percentile for Housing Cost:

1403, 1701, 1407, 1415, 1416, 1406, 1408, 3502, 3503, 3523, 3501, 3512, 3526, 1409, 3505, 3511, 3514, 1405, 1423, 1202, 1412, 1424, 3504, 3508, 3517, 3522, 1427, 1425

LIDAC Tracts above the 90th Percentile for Language Isolation:

1403, 1710, 1701, 1703, 1709, 1406, 3502, 3503, 3510, 3501, 3505, 3514, 1405, 1702, 1715, 1404, 1423, 1424, 1426, 3528, 3522, 1425

LIDAC Tracts above the 75th Percentile for Flood Risk

Appendix G: Strategy Robustness by Scenario

Working Lands and Forestry

Strategy	Fossil Free Future	Coping with Gridlock	The Watershed Moment
L.4 Increase urban tree canopy in low-income disadvantaged communities			

Waste Management

Strategy	Fossil Free Future	Coping with Gridlock	The Watershed Moment
WM 1.1: Establish a county-wide unit-based pricing program with food-scrap collection. Dedicate 40% of resources to coordination and outreach to low-income residential developments, including rental multi-unit dwellings.			
WM 1.2: Establish a regional waste management authority in New Haven County. With assistance from DEEP, form a regional authority to realize economies of scale and establish infrastructure for unit-based pricing and food scrap diversion.			

Electricity Production and Consumption

Strategy	Fossil Free Future	Coping with Gridlock	The Watershed Moment
E.9 -Coordinate with housing authorities to build out community and rooftop solar, battery storage, and microgrids for affordable housing and overcome barriers to solar			
E.6 Set up outreach programs that communicate state and federal level financing programs that support on site renewable generation to consumers.			
E. 7 Evaluate the potential of siting renewable energy projects on vacant, underutilized land/combine with open space planning			

Strategy	Fossil Free Future	Coping with Gridlock	The Watershed Moment
E.11 Partner with local workforce development centers, vocational schools, and union chapters to prepare workforce in key renewable energy sectors, such as offshore wind energy and solar installations			

Energy Efficiency and Buildings

Strategy	Fossil Free Future	Coping with Gridlock	The Watershed Moment
B.2 Implement strict building codes and achieve net zero energy usage.			
B.8 **Integrate solar heating systems into community initiatives and**			
B.3 Ensure all municipal operations rely on 100% renewable heating sources.			
B.11 Establish a city-wide retrofit program focused on low income residents and municipal buildings, providing grants and low-interest loans to property owners for energy-efficiency upgrades and heat			

Industrial

Strategy	Fossil Free Future	Coping with Gridlock	The Watershed Moment
I.6 - Embed a purchasing criterion in public projects that states a preference for suppliers or service providers who have a transparent and standardized GHG inventory			
I.8- Partner with healthcare facilities to assess emission sources. Provide financial grants or subsidies to healthcare facilities that invest in and transition to low-emission impact products and medical practices including anesthetic choices and use of refrigerants.			

Strategy	Fossil Free Future	Coping with Gridlock	The Watershed Moment
T.5 Create a transit-first approach: a. Pilot pedestrianization, limited traffic (bus only lanes/streets) and use of active transportation downtown and in dense developments. b. Ensure opportunity areas are completely accessible by transit. c. Advocate for transit plans that incentivize new development in areas that will allow for transit, walking, and bike use			
T.7 Reduce spatial misalignment through changes in land-use: Conduct feasibility studies for creating economic zones in areas with high commute times. Encourage denser housing in areas near existing economic zones.			
T.8 Create more park-and-ride options, and increase transit access and frequency in areas with high car ownership and high commute times to work to enable multi-modal trips.			
T9 Increase the over all Electric Vehicle adoption and create infrastructure to support this: a. Communicate the benefits of CHEAPR to low and middle-income communities, and have limited time offers of higher Rebate+ to encourage the buying of EVs in the short-term.			

Strategy	Fossil Free Future	Coping with Gridlock	The Watershed Moment
b. Encourage car owners in rural communities to set up at home EV charging by taking advantage of Federal Tax credits.			
c. In high-density development areas, implement requirements for new development to include EV charging stations.			
d. Communicate the benefits of the eBikes incentive program and advocate for increased funding for it, especially encouraging the growth of the Voucher+ offer for LIDACs			

Table 30: List of Goals and Stratergies Against the three Scenarios

Appendix H: Quantification Assumptions

Labels:
TEmi: total greenhouse gas emissions
CEmi: carbon dioxide emissions
EEmi: emissions from electricity consumption

Transportation

Goal	Strategies	Assumptions	GHG Reduction (TMTCO2e)	Percentage of reduction %	Calculation Method
1	T.1	10% of total buses in New Haven are school buses, all the school buses are switched to EVs	2.02	0.032	0.1*TEmi_buses-1000000000*0.1*VMT_buses/(3000*2204.62*1000000)
	T.2	5% trucks are in municipal fleet and adopting the hydrogen as the fuel sources; all hydrogen powered car are fuel cell electric cars, zero tailpipe emissions	89.48	1.410	0.05*Temi_trucks
	T.3	Idling reduces the MPG by 10 percent for any types of vehicles (most influence the carbon dioxide emissions) ; 5% percent of the passenger cars, and 5% of the trucks and all buses are from municipal fleet	16.07	0.253	(0.05*(CEmi_automobile+CEmi_trucks)+CEmi_buses)*0.1
2	T.4-T.8	10% increase in bus mileage and 5% decrease in passenger car mileage	49.42	0.779	0.05*TEmi_automobile-0.1*TEmi_buses
	T.4-T.8	5% increase in bus mileage and 10% decrease in passenger car mileage	101.88	1.606	0.1*TEmi_automobile-0.05*TEmi_buses
	T.4-T.8	5% increase in bus mileage and 5% decrease in passenger car mileage	50.43	0.795	0.05*(TEmi_automobile-TEmi_buses)
	T.4-T.8	10% increase in bus mileage and 10% decrease in passenger car mileage	100.87	1.590	0.1*(TEmi_automobile-TEmi_buses)
	T.4-T.8	20% increase in bus mileage and 10% decrease in passenger car mileage	98.84	1.558	0.1*TEmi_automobile-0.2*TEmi_buses
3	T.9-T.12	20% passenger cars are replaced by electric vehicles	205.69	3.242	0.2*TEmi_automobile-1000000000*(0.2*VMT_automobile)/(3000*2204.62*1000000)
	T.9-T.12	40% trucks are replaced by electric vehicles	715.61	11.280	0.4*TEmi_truck-1000000000*(0.4*VMT_truck)/(3000*2204.62*1000000)
	T.11	5% reduction in the total vehicle emissions due to remote working schedule	143.77	2.266	0.05*(TEmi_automobile+TEmi_truck+TEmi_buses+TEmi_motorcycle)
	T.9-T.12	40% passenger cars are replaced by electric vehicles	411.39	6.485	0.4*TEmi_automobile-1000000000*(0.4*VMT_automobile)/(3000*2204.62*1000000)
	T.13	10% reduction in the total vehicle emissions due to the adoption of renewable energy sources	287.54	4.532	0.1*(TEmi_automobile+TEmi_truck+TEmi_buses+TEmi_motorcycle)

Electricity Consumption and Production

Goal	Strategies	Assumptions	GHG Reduction (TMTCO2e)	Percentage of reduction %	Calculation Method
1 and 2	E.1-E.4, E.6-E.10	10% reduction in the regional emissions factors	131.49	2.073	0.1*(EEmi_residential+EEmi_industrial/commercial)
1 and 2	E.1-E.4, E.6-E.10	15% reduction in the regional emissions factors	197.24	3.109	0.15*(EEmi_residential+EEmi_industrial/commercial)
1 and 2	E.1-E.4, E.6-E.10	20% reduction in the regional emissions factors	262.99	4.146	0.2*(EEmi_residential+EEmi_industrial/commercial)
1 and 2	E.1-E.4, E.6-E.10	30% reduction in the regional emissions factors	394.48	6.218	0.3*(EEmi_residential+EEmi_industrial/commercial)
1	E.5	40% reduction in wastewater emissions	37.14	0.585	0.4*Temi_wastewater
3	E.10, E.11	10% reduction in the industrial electricity emissions	70.29	1.108	0.1*EEmi_industrial/commercial
3	E.10, E.11	30% reduction in the industrial electricity emissions	210.87	3.324	0.3*EEmi_industrial/commercial
4	E.12	10% reduction in methane EF (5% Electricity)	0.86		
	E.12	30% reduction in methane EF (10% Electricity)	2.58		
	E.12	10% reduction in methane EF (5% Electricity)	1.72		
	E.12	30% reduction in methane EF (10% Electricity)	5.16		

Energy Efficiency in Buildings

Goal	Strategies	Assumptions	GHG Reduction (TMTCO2e)	Percentage of reduction %	Calculation Method
1,2, and 3	B.1, B.2, B.4, B.5, B.6-B.13	consumption of all fossil fuel in residential building reduces by 10%	136.00	2.144	0.1*(TEmi_stationary_oil+TEmi_stationary_natural_gas+TEmi_stationary_propane)
1,2, and 4	B.1, B.2, B.4, B.5, B.6-B.13	consumption of all fossil fuel in residential building reduces by 20%	272.00	4.288	0.2*(TEmi_stationary_oil+TEmi_stationary_natural_gas+TEmi_stationary_propane)
1	B.3, B.6	residential and commercial emissions reduced by 20%	272.00	4.288	0.2*(Temi_residential+Temi_commercial)
1,2, and 3	B.1, B.2, B.4, B.5, B.6-B.13	consumption of all fossil fuel in residential building reduces by 30%	408.00	6.431	0.3*(TEmi_stationary_oil+TEmi_stationary_natural_gas+TEmi_stationary_propane)
1,2, and 3	B.1, B.2, B.4, B.5, B.6-B.13	consumption of all fossil fuel in residential building reduces by 40%	544.00	8.575	0.4*(TEmi_stationary_oil+TEmi_stationary_natural_gas+TEmi_stationary_propane)
1,2, and 3	B.1, B.2, B.4, B.5, B.6-B.13	consumption of all fossil fuel in residential building reduces by 50%	680.00	10.719	0.5*(TEmi_stationary_oil+TEmi_stationary_natural_gas+TEmi_stationary_propane)
1	B.3, B.6	commerical buidling emissions reduce by 10%	96.00	1.513	0.1*Temi_commercial_building
1	B.3, B.6	commerical buidling emissions reduce by 20%	192.00	3.027	0.2*Temi_commercial_building
1	B.3, B.6	commerical buidling emissions reduce by 30%	192.00	3.027	0.3*Temi_commercial_building
3	B.13	50% reduction in the regional electricity emissions factors	657.47	10.364	0.5*(EEmi_residential+EEmi_industrial/commercial)

Industrial

Goal	Strategies	Assumptions	GHG Reduction (TMTCO2e)	Percentage of reduction %	Calculation Method
1,2, and 3	I.1-I.3	10% reduction in healthcare emissions.	33.94	0.535	0.1*TEmi_stationary_industrial
1,2, and 3	I.1-I.3	20% reduction in healthcare emissions.	67.88	1.070	0.2*TEmi_stationary_industrial
1,2, and 3	I.1-I.3	30% reduction in healthcare emissions.	101.82	1.605	0.3*TEmi_stationary_industrial

Waste Management

Goal	Strategies	Assumptions	GHG Reduction (TMTCO2e)	Percentage of reduction %	Calculation Method
1 and 3	W.1-W.5	Electricity production through the biogas from the landfills can reduce the eGRID emissions factor by 20%	262.99	4.270	

Working Lands and Forestry

Goal	Strategies	Assumptions	GHG Reduction (TMTCO2e)	Percentage of reduction %	Calculation Method
1 and 2	L.1-L.3	20% increase in forest land area	-125.58	-1.979	0.2*(Seq_forest)
1 and 2	L.1-L.3	10% increase in forest land area	-62.79	-0.990	0.1*(Seq_forest)
2	L.4	20% reduction in agricultural emissions	5.85	0.092	0.2*TEmi_agricultural

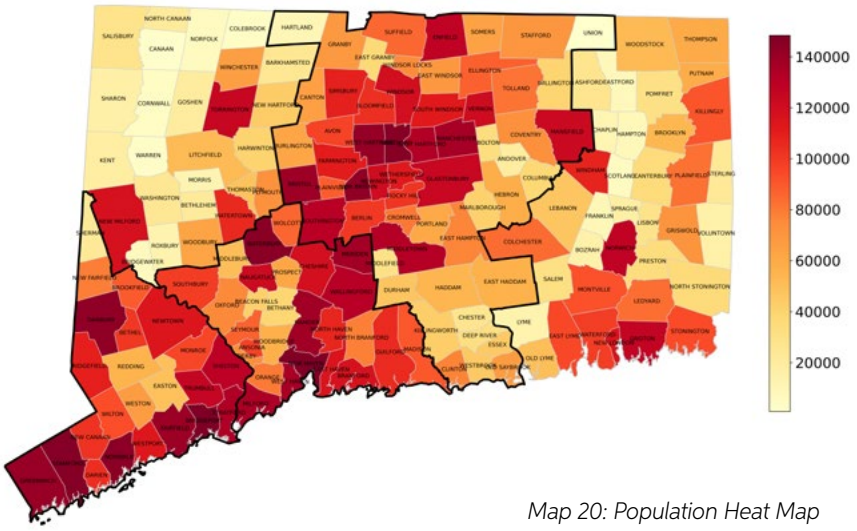
Appendix I: GHG Inventory Methodology

"Peiyao Zhao, Jimi Oke (2024). Tracking Regional Emissions for Climate Action. Technical Report. https://github.com/narslab/tracking-msa-ghg/blob/main/docs/ghg-inventory-report.pdf "

Study area

Connecticut is in the Northeastern region of the United States, with a total population of 3,611,317 and total housing units of 1,531,332 in 2022 (US Census Bureau, 2024). The inventory was prepared for three metropolitan statistical areas (MSAs) in Connecticut, namely New Haven-Milford (New Haven area), Hartford-east Hartford-Middletown (Hartford area), and Bridgeport-Stamford-Norwalk (Bridgeport area).

Map 20 displays a heat map illustrating the population distribution of each town in the state. The black lines delineate the boundaries of each MSA. The Bridgeport area is situated in the southwestern part of Connecticut. It encompasses cities such as Bridgeport, Stamford, and Norwalk, and is situated along the Long Island Sound coastline. The Hartford area is in the central and central-northern part. It includes cities such as Hartford, East Hartford, and Middletown, situated within the broader region of central Connecticut. The New Haven area (county) includes the city of New Haven and surrounding areas, and the south of it is also positioned along the Long Island Sound. The New Haven area is known for its cultural and educational institutions, including Yale University, and it serves as an important economic and cultural hub in the state (Yale University, 2024). The table below lists the total population, total housing units, and the average income of the three areas and Connecticut state.



Map 20: Population Heat Map

MSA	Total Population	Total Housing Units	Median Household Income
Bridgeport	958,371	378,045	107,351
Hartford	1,215,703	521,773	89,371
New Haven	866,377	371,281	81,544
Statewide	3,611,317	1,531,332	90,213

Table 31: Comparison of Geograohic Information Across 3 MSA's

Data Collection

Emissions-related data was gathered for the seven sectors defined by the EPA and shown in Table 32. Corresponding data sources are also shown.

Table of Data Sources

Sector	Activity data	Source
Mobile Combustion	Vehicle miles traveled	Requested from CTDOT
	Statewide vehicle type distribution	FHWA, DOT
	vehicle fuel efficiency	LIGGIT Mobile Combustion Section
Electricity Consumption	Electricity consumption	Energize CT
Solid Waste (Landfills)	Landfill methane emissions	FLIGHT
	Fuel combustion	FLIGHT
Stationary Combustion	Household heating fuel consumption	EIA
	Household heating fuel type	ACS
	OSMnx package for comm. building footprint	OSMnx
	Statewide commercial emissions	DEEP
	Large industrial facility emissions	FLIGHT
Agricultural and Land Managment	Area of land using specific fertilizer	USDA
	N lose and content by fertilizer	LGGIT
	Statewide ag. emissions data	DEEP
Wastewater Treatment	Number of wastewater treatment facilities	Conn. NPDES Permits
	Statewide wastewater emissions data	DEEP
Forestry	Forestry area	2015 Land cover numbers and charts (UConn)
	Carbon sequestration factor	LGGIT

Table 32: Data Sources

Calculation Methods

Where possible, bottom-up approaches were used to estimate emissions for a given sector. Generally, for a given activity (e.g. miles driven by a certain vehicle powertrain type, or amount of electricity consumed), the relevant emissions factor (EF) was multiplied to obtain the greenhouse gas emissions estimate. In cases where low-level activity data were not available, statewide emissions were downscaled for that sector using a relevant proportion of an indicator in the area relative to the state (e.g. fertilizer-treated land, number of wastewater treatment facilities).

Mobile Combustion

Mobile combustion emissions were calculated from activity data—vehicle-miles traveled (VMT)—of each vehicle type, the number of each vehicle type, and fuel economy (in miles per gallon) of each vehicle type, and emissions factors. Table 30 shows the VMT for each MSA, while Table 31 shows the statewide vehicle (automobiles, trucks, buses, motorcycle) distribution. Mobile combustion was computed based on the following assumptions:

- All automobiles are passenger cars, trucks are light trucks, buses are heavy duty.
- Automobiles and motorcycles consume gasoline, trucks and buses consume diesel.

VMT and MPG was used to compute the fuel consumption and applied the fuel specific EFs to calculate the CO2 emissions ECO2 as follows:

$$E_{CO_2} = \frac{VMT}{eco} \times \frac{f_{CO_2}}{1000}$$

where:

- VMT: vehicle miles traveled (miles)
- f_{CO_2}: emissions factor for carbon dioxide ($kgCO_2$/gallon)
- eco: fuel economy (miles per gallon)

CH4 and N2O emissions by VMT and vehicle specific EFs were computed using the following equa-

$$E_{CH_4} = VMT \times \frac{f_{CH_4}}{1\times10^6}$$

$$E_{N_2O} = VMT \times \frac{f_{N_2O}}{1\times10^6}$$

where fCH4 and fN2O , both in g/mile, are the emissions factors for methane (CH4) and nitrogen dioxide (N2O), respectively.

After computing the emissions of each greenhouse gases, CH4 and N2O emissions were converted into carbon dioxide equivalent according to the global warming potential (GWP) for CH4, and N2O1, which were 25 and 298, respectively:

$$E_{total} = E_{CO_2} \times 1 + E_{CH_4} \times 25 + E_{N_2O} \times 298$$

Vehicle miles traveled in each county and MSA

MSA	County	VMT in Billion Miles
Bridgeport area	Fairfield	7.1
Hartford area	Hartford	7.3
	Middlesex	1.8
	Tolland	1.3
New Haven area	New Haven	6.9

Table 33: Vehicle miles traveled in each county and MSA

Statewide vehicle distribution type

Type	Vehicle total	Proportion of total (%)
Automobiles	1,199,2781	40.6
Trucks	1,543,765	56.0
Buses	10,222	0.4
Motorcycles	83,220	3.0

Table 34: Statewide vehicle distribution type

The fuel specific and vehicle specific EFs are obtained from the sheet "Factors – FormulaText" of the LGGIT.

Electricity Consumption

The GHG emissions from electric power consumption are calculated via the electricity consumption at residential and industrial/commercial sectors and regional EFs for CO2, CH4 and N2O obtained from LGGIT. Table 35 shows electricity consumption in residential and commercial/industrial obtained from Energize CT website. The following equation describes the calculation details:

$$E_g = \frac{e \times f_{e,g}}{2{,}204.62}$$

$$E_{total} = E_{CO_2} \times 1 + E_{CH_4} \times 25 + E_{N_2O} \times 298$$

where

- e: amount of electricity consumed (MWh)
- $f_{e,g}$: emissions factors for the greenhouse gas in eGRID (lbs/MWh)
- $g \in CO2, CH4, N2O$

Electricity Consumption (TWh) in each subsector of the MSA

Subsector	New Haven	Hartford	Bridgeport	Statewide
Residential	2.48	3.55	3.38	11.33
Comm./Indust.	2.85	3.71	3.39	13.04
Total	5.33	7.26	6.78	24.37

Table 35: Electricity Consumption (TWh) in each subsector of the MSA

Solid Waste (Landfills)

Data on GHG emissions from Landfills was obtained from the FLIGHT website, which includes the emissions from landfills methane release and fuel combustions. There are no active landfills that accept municipal solid waste; however, methane is emitted from the existing trash. There are two municipal waste landfills in the state reporting GHG emissions to GHGRP and both are in the Hartford area. No landfills report GHG emissions to the GHGRP in New Haven and Bridgeport area. One of them is Manchester landfill, whose emissions include stationary fuel combustion emissions and methane generation. Another one is Windsor Bloomfield landfill, whose emissions only include methane generation.

Other Sources

Stationary Combustion

Stationary combustion includes emissions from equipment that provide heating and kinetic energy for residential, commercial, and industrial sectors through the combustion of fuels. In the residential sector, the detailed data collected mainly includes household fuel consumption distribution, the statewide fuel consumption, emissions factors for each fuel type (natural gas, propane, heating oil). To calculate the consumption of each heating fuel at each MSA, the ratio of households utilizing a specific fuel type was applied to the total number of households and the statewide fuel consumption. Thus:

$$Q_{f,M} = \frac{H_{f,M}}{H_{f,S}} \times Q_{f,S}$$

Where
f: type of fuel consumed (natural gas, propane, heating oil)
M: metropolitan statistical area
S: statewide
Q : amount of fuel consumed, [gallons]
H : number of households using a certain type of fuels

Table 36 and table 37 show the number of households using a particular fuel and the amount of heating fuel consumed for residential heating at each MSA, respectively. After obtaining the fuel consumption at each MSA, emissions from EFs and the amount of fuel consumed were computed, as detailed in the following equation:

$$E_g = \frac{Q_{fuel,MSA} \times f_{e,g}}{1000}$$

$f_{e,g}$: emissions factors for the greenhouse gas of each heating fuel (kg /gallo

$g \in CO2, CH4, N2O$

The total emissions are then obtained from the summation of all the greenhouse gases converted to carbon dioxide equivalent:

$$E_{total} = E_{CO_2} \times 1 + E_{CH_4} \times 25 + E_{N_2O} \times 298$$

Number of households using a particular fuel type in each MSA

MSA	Natural gas	Propane	Fuel oil
Bridgeport area	140,147	15,254	125,962
Hartford area	190,541	21,596	178,163
New Haven area	134,167	11,823	119,116
Statewide	495,646	64,356	551,817

Table 36: Number of households using a particular fuel type in each MSA

Total Consumption of residential heating fuels in each MSA

MSA	Natural gas (million ef)	Propane (million gal)	Fuel oil (millian gal)
Bridgeport area	10,434	13	79
Hartford area	14,185	18	112
New Haven area	9,989	10	75
Statewide	36,900	54.3	345.7

Table 37: Total Consumption of residential heating fuels in each MSA

In the commercial sector, emissions were computed by scaling down statewide commercial building emissions based on the proportion of the commercial building footprint in each MSA compared to the statewide total. The distribution of commercial building types at each MSA was obtained from a python package called OSMnx. The following equations show the detailed computation:

$$E = \frac{FP_M}{FP_s} \times E_s$$

where

- M: metropolitan statistical area
- S: statewide
- E_s : statewide greenhouse gas emissions ($MMTCO_2e$)
- FP : footprint of commercial building, (sq ft)

In the industrial sector, emissions were obtained directly from FLIGHT. Table 34 shows the emissions from large industrial facilities reported to GHGRP.

Greenhouse gas emissions (MMTCO2e) from large industrial facilities in each MSA.

Subsector	Bridgeport area	Hartford Area	New Haven Area
Petroleum and Nat. gas	0.05	0.16	0.14
Other	0.05	0.18	0.19
Pulp and paper	0	0.02	0

Table 38: Greenhouse gas emissions (MMTCO2e) from large industrial facilities in each MSA.

Agricultural and Land Management

One of the main sources of NH3 and N2O emissions is the agricultural sector. Data used includes the land area treated by different fertilizers (organic, manure, and synthetic), as illustrated in table 36, and the statewide agricultural emissions data, which were both used to calculate emissions based on the following assumptions:

- The agricultural emissions at each MSA are directly proportional to the area of land under fertilizer treatment.
- Only fertilizer emissions are considered.

First, effectiveness (Ff) is defined by the proportion of nitrogen loss in one type of fertilizer to the nitrogen loss in all types of fertilizer.

$$F_f = \frac{N_{c,f} \times N_{l,f}}{\sum_f N_{c,f} \times N_{l,f}}$$

- $N_{c,f}$: $percent\ of\ Nitrogen\ in\ the\ fertilizer$
- $N_{l,f}$: percent of nitrogen lost in due to volatilization in the fertilizer.
- f : {manure, organic, synthetic fertilizer}

Then, agricultural land emissions were computed by downscaling the statewide emissions with percentage of effective land area (effectiveness times the land area) treated by fertilizer at each MSA.

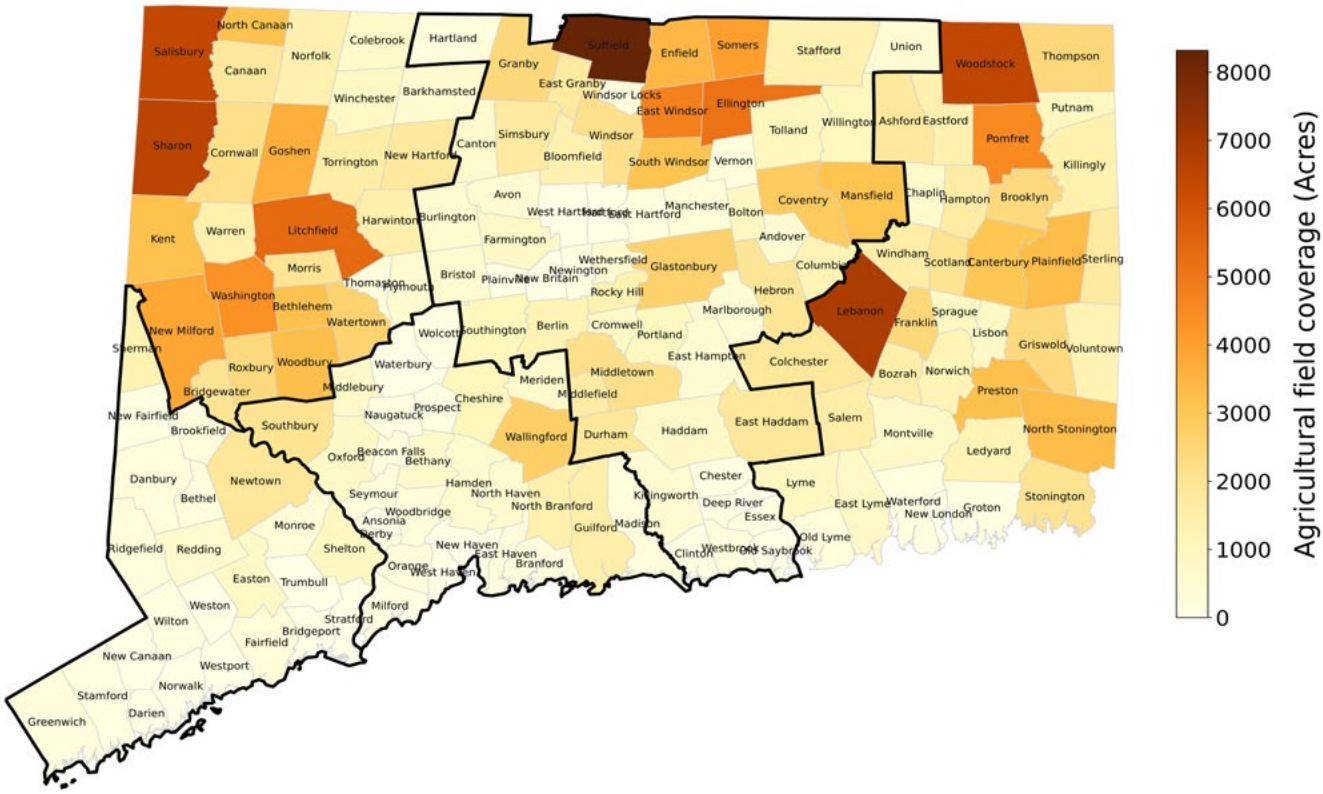
$$E_M = \frac{\sum_f Q_{M,f} \times F_f}{\sum_f Q_{S,f} \times F_f} \times E_S$$

- M: metropolitan statistical area
- S: statewide
- Q : $the\ area\ of\ land\ covered\ by\ a\ type\ of\ fertilizer,\ [acres]$
- E_S: statewide agricultural land greenhouse gas emissions, [MMTCO2e]

The area of land that is treated by different fertilizers in each MSA.

MSA	County	Manure fertilizer acres	Organic fertilizer acres	Synthetic fertilizer acres
Bridgeport area	Fairfield	288	188	1,793
Hartford area	Hartford	1,436	459	14,262
	Middlesex	949	79	2,314
	Tolland	5,882	54	4,921
New Haven area	New Haven	1,125	173	3,764

Table 39: The area of land that is treated by different fertilizers in each MSA.



Map 21: Agricultural land heat map

Waste Water Treatment

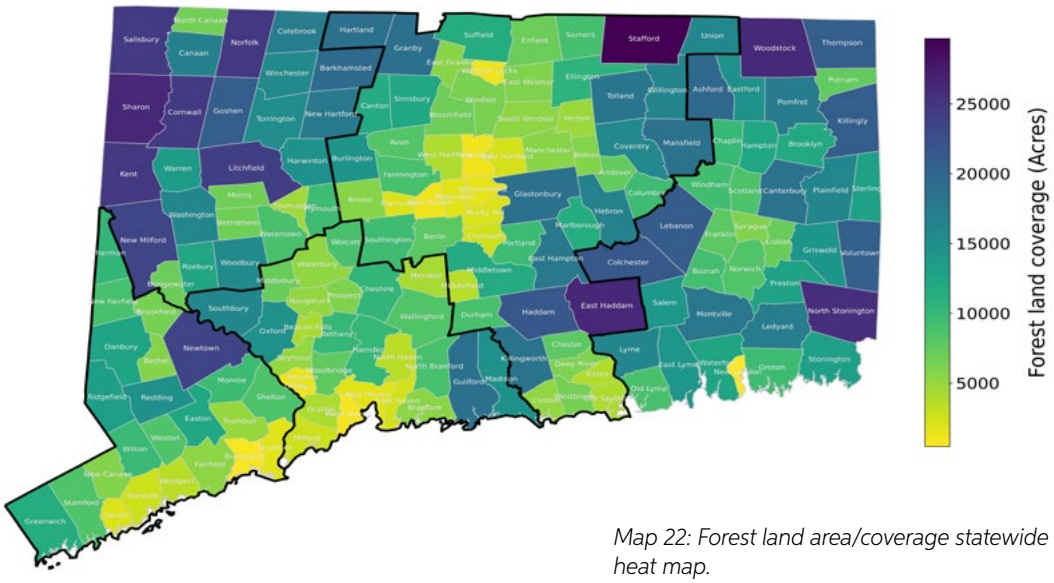
Wastewater treatment emissions, EM, were calculated by downscaling the statewide wastewater emissions by the proportion of facilities at each MSA with respect to the state total. Thus:

$$E_M = \frac{N_M}{N_S} \times E_S$$

where

- N: number of wastewater treatment facilities
- E_S: wastewater treatment GHG emissions, [MMTCO2e]
- M: metropolitan statistical area
- S: statewide

The Connecticut forests cover around 60% of the total land area and can sequester between 4 and 40 tons of carbon dioxide every year per hectare2. Figure 39 describes the forest land coverage at each MSA. Map 22 depicts the heat map of forest land coverage in the entire Connecticut.



Map 22: Forest land area/coverage statewide heat map.

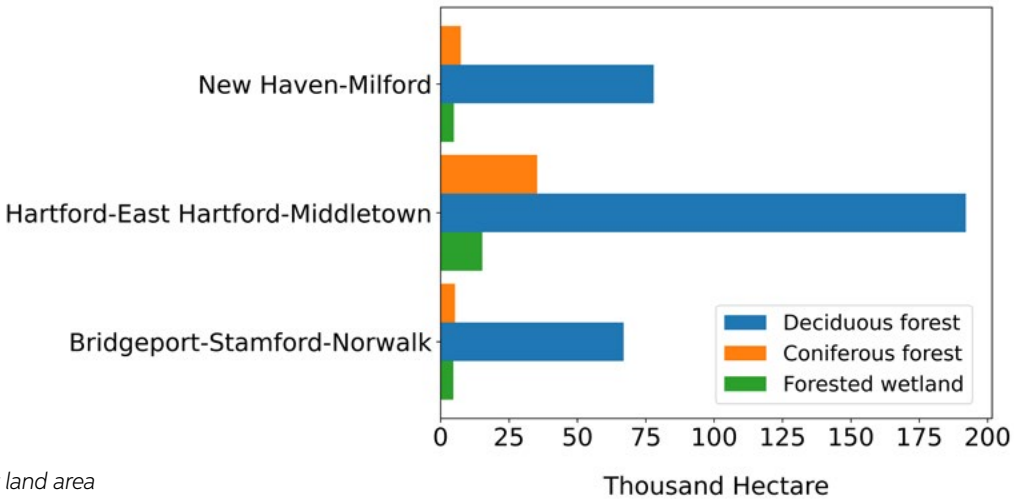


Figure 39: Forest land area

The amount of carbon sequestrated is calculated by the following equation:

$$M_C = A_{forest,\,M} \times R_c \times C$$

where

- M_C : the amount of carbon dioxide sequestrated ($MTCO_2$)
- R_c : equals 2.23, carbon sequestration factor ($MTCO_2$ /hectare)
- $A_{forest,\,M}$: total area of the forest at each MSA (hectare)
- $C = 3.67$ is the ratio of carbon dioxide to carbon.

Appendix J: Full Inventory Results

"Peiyao Zhao, Jimi Oke (2024). Tracking Regional Emissions for Climate Action. Technical Report. https://github.com/narslab/tracking-msa-ghg/blob/main/docs/ghg-inventory-report.pdf"

Figure 40 and Figure 41 show the total emissions of 6.42, 8.45, and 6.21 MMTCO2e for NHM, HEM, and BSN, respectively. Mobile emissions are highest in each MSA, constituting 52%, 47%, and 48% of total emissions in HEM, NHM, BSN, respectively, followed by stationary combustion and electric power emissions. Emissions from solid waste, wastewater, and agricultural are nearly negligible.

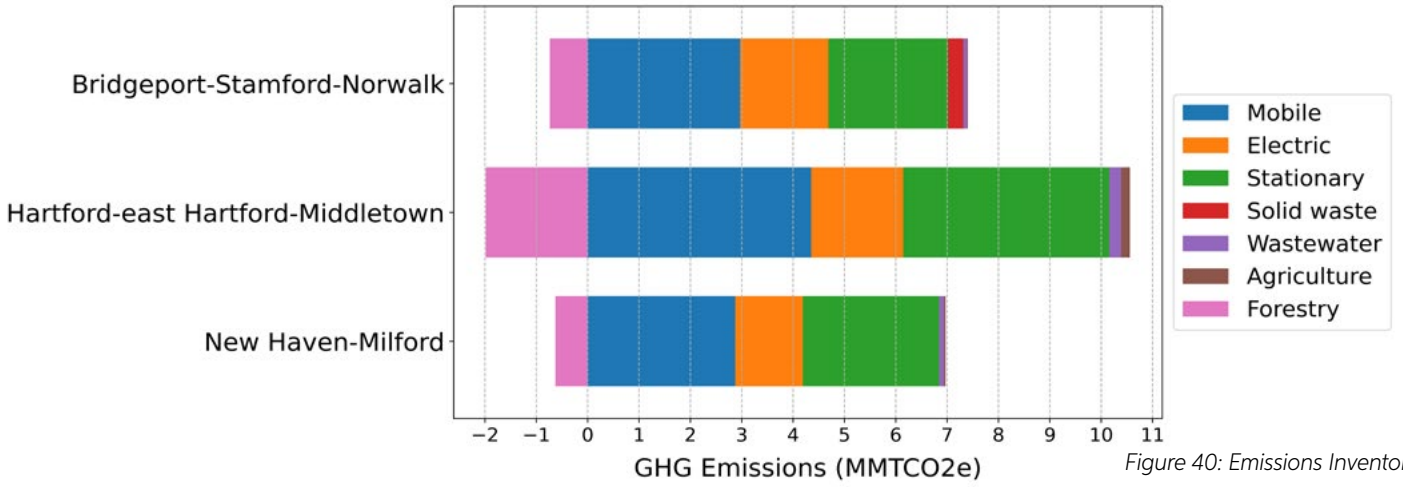


Figure 40: Emissions Inventory

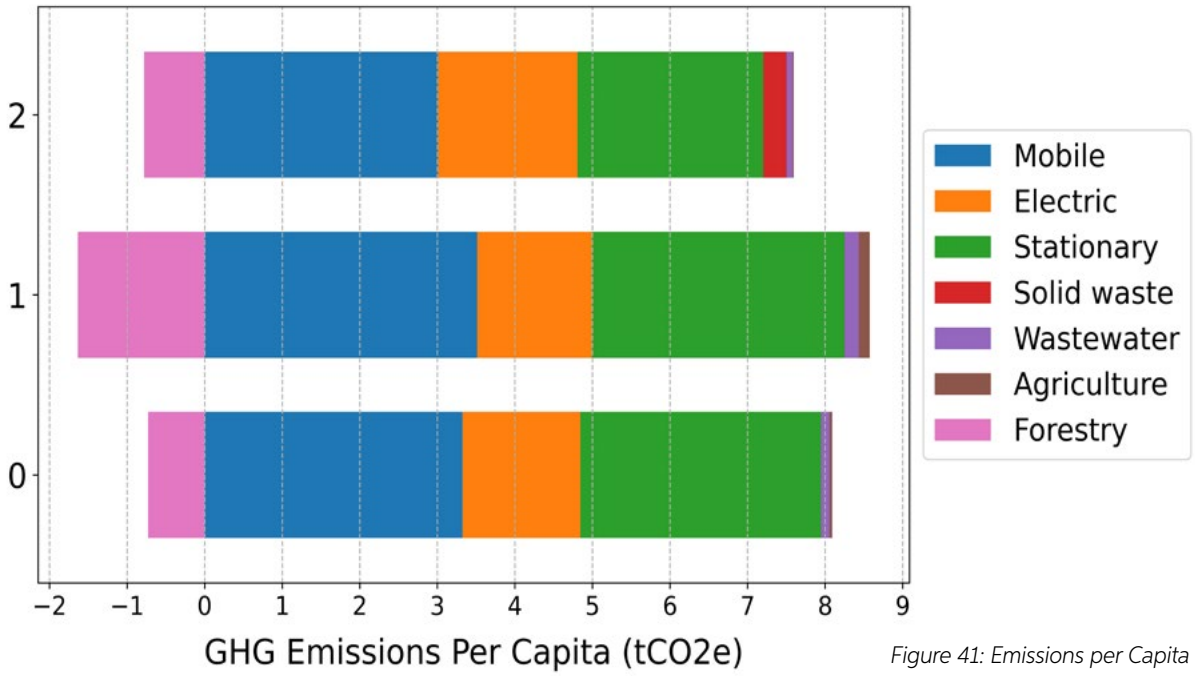


Figure 41: Emissions per Capita

Mobile Combustion

Emissions from diesel vehicles are consistently greater than those from gasoline vehicles. According to Figure 42, diesel emissions are around 30% higher than gasoline emissions in all MSAs, which indicates that prioritizing electrification of diesel vehicles may yield greater emissions reductions. Figure 43 suggests that Emissions per capita are positively correlated with the VMT per capita.

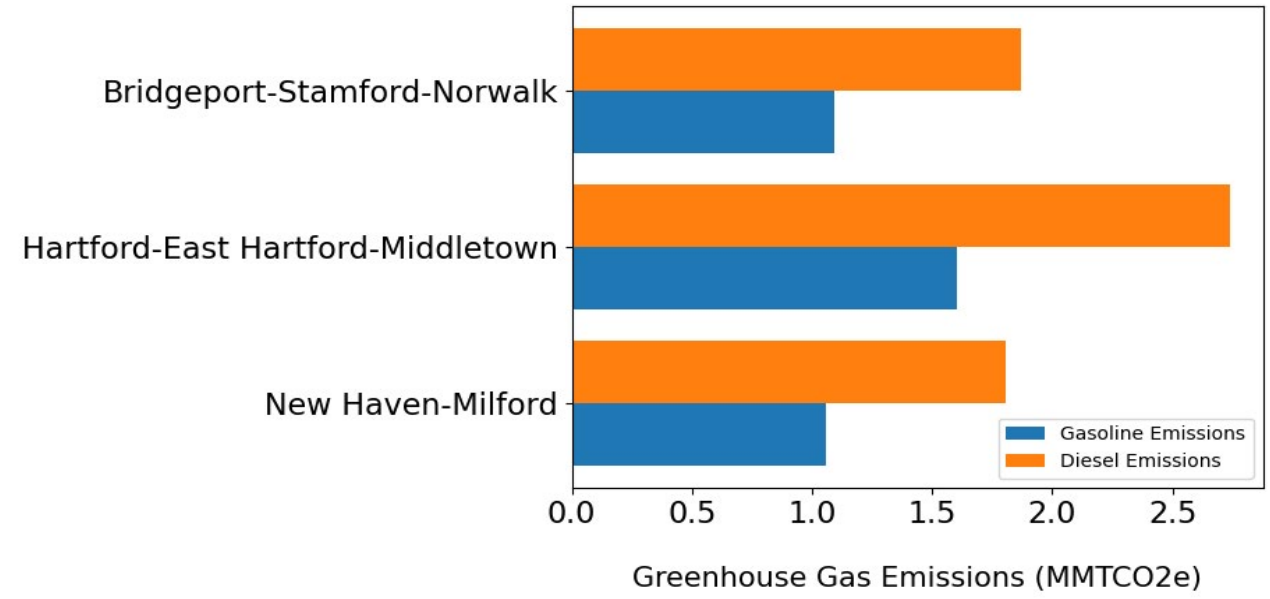


Figure 42: Emissions by Fuel Source

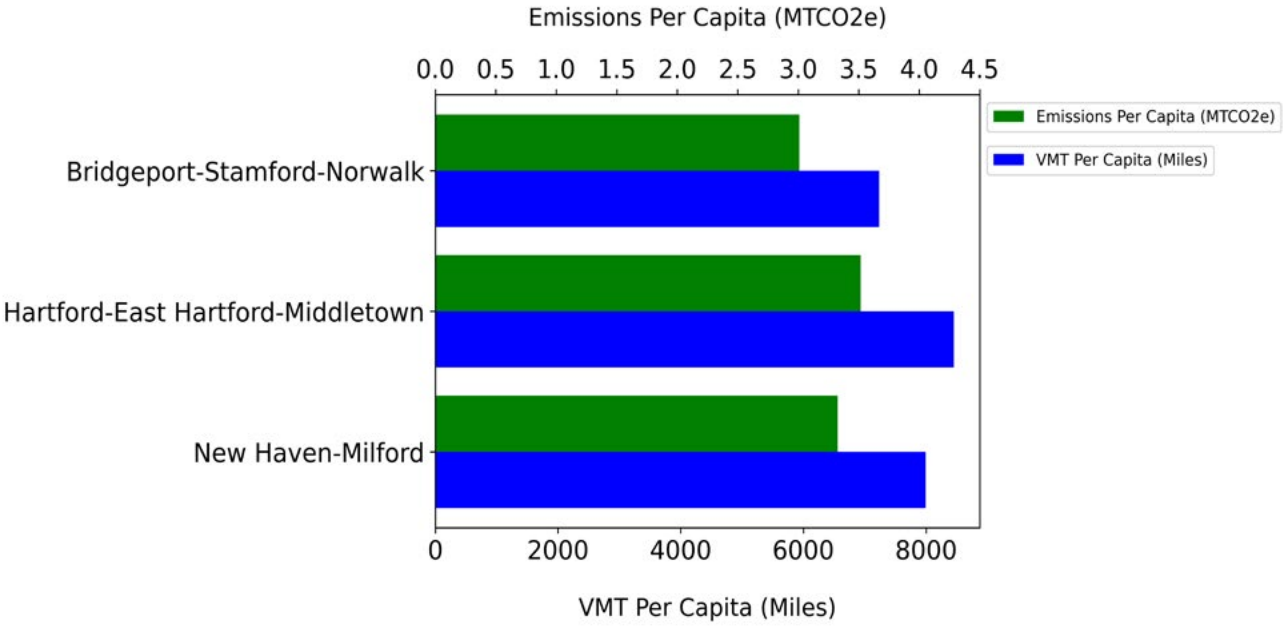


Figure 43: Emissions by Fuel Source per Capita

Electricity Consumption

Emissions from electricity consumption in the Hartford area is slightly higher than in the Bridgeport area and around 30% higher than in the New Haven area. Each MSA shares the same emissions intensity. As for emissions per capita, the Bridgeport area is the highest while New Haven and Hartford area share similar emissions per capita

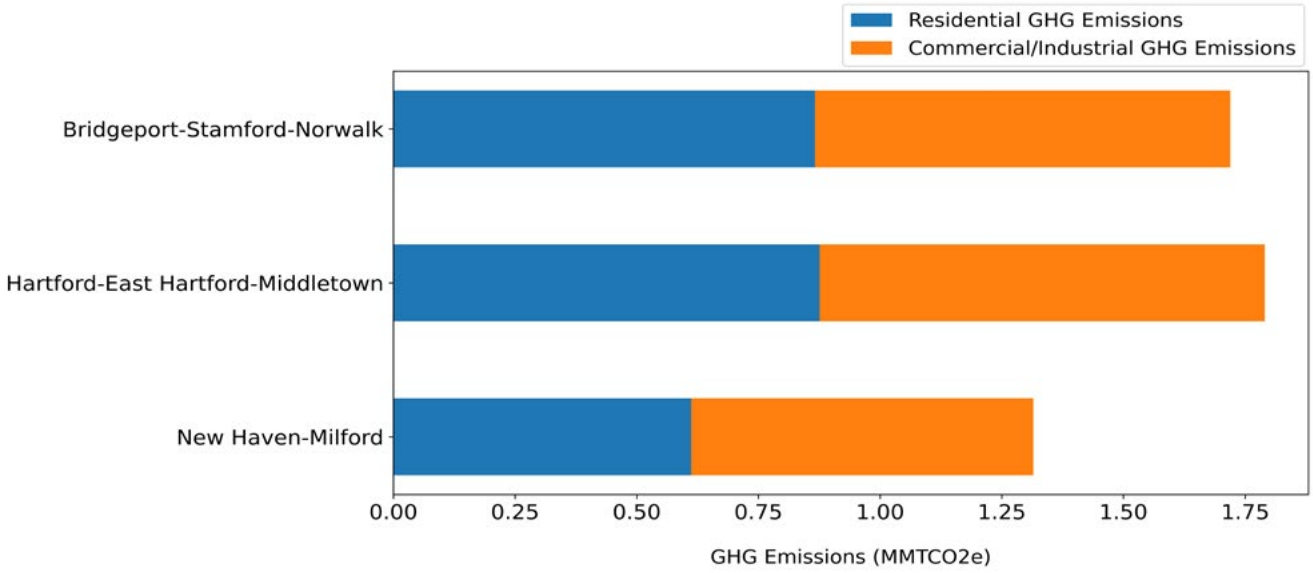


Figure 44: Emissions by Building Sector

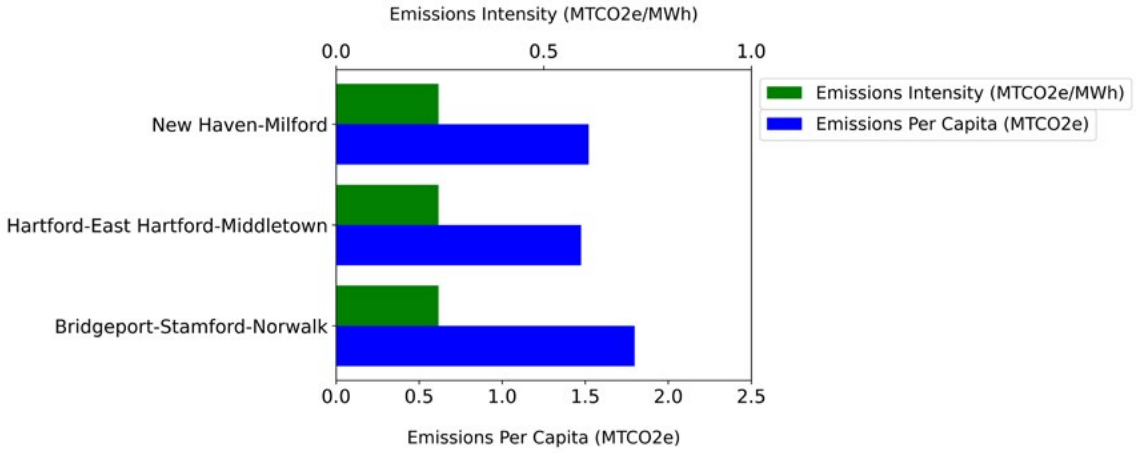


Figure 45: Emissions per Capita and Emissions Intensity

Solid Waste (Landfills)

Table 40 shows the total GHG emissions from the landfills in the Hartford area over the past seven years.

Year	GHG Emissions (MTCO2e)
2022	94,667
2021	88,101
2020	87,285
2019	108,171
2018	86,122
2017	91,993

Table 40: Landfill emissions in the Hartford Area

Stationary Combustion

Residential

Among all the residential heating fuel sources, fuel oil is the largest emitter for residential heating, followed by natural gas and propane.

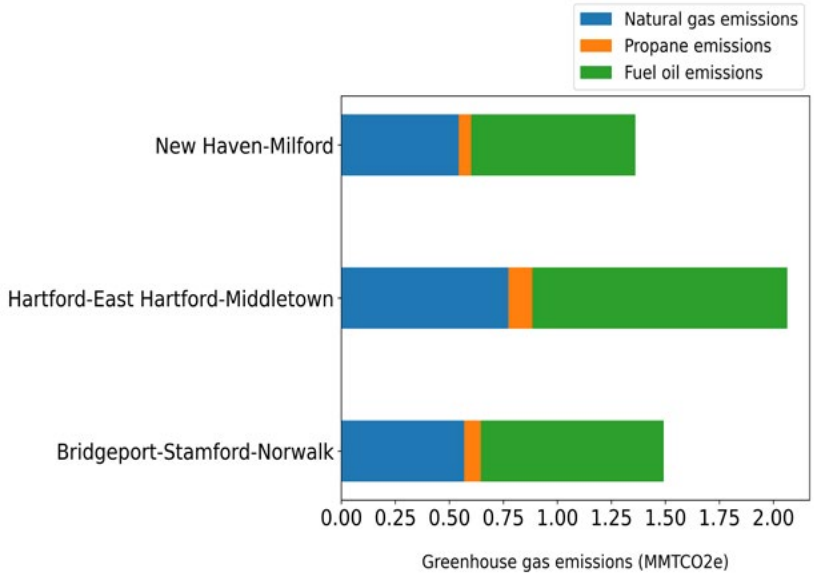


Figure 46: Emissions from residential heating fuel sources at each MSA.

Commericial

Commercial building emissions in the Hartford area are twice as large as those in New Haven area.

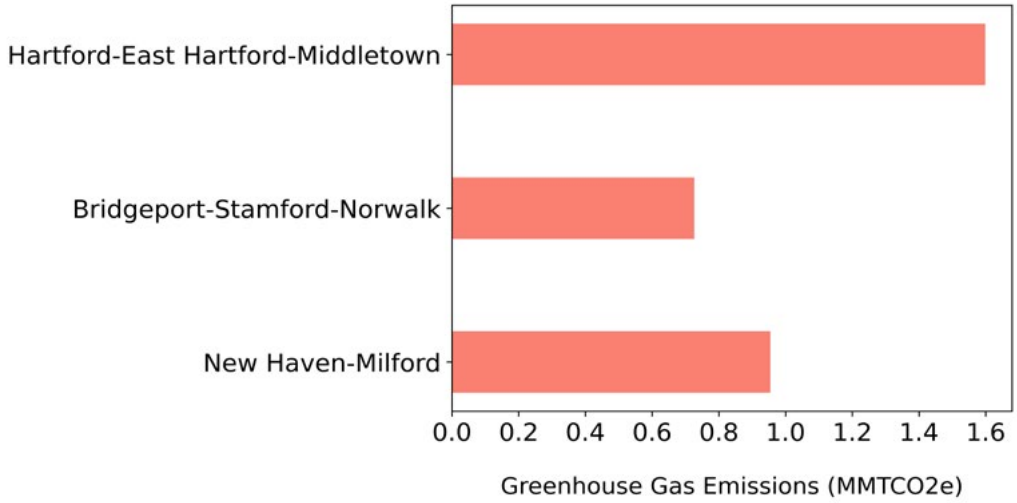


Figure 47: Emissions from Commercial Buildings in each MSA

Industrial

The New Haven area has similar industrial emissions to the Hartford area.

Figure 48: Emissions from Industrial Buildings in each MSA

Agricultural and Land Managment

Agricultural emissions in the Hartford area are 74% higher than the two MSAs combined (Figure 49). Figure 50 shows that the emissions per acre are almost the same at all the MSAs.

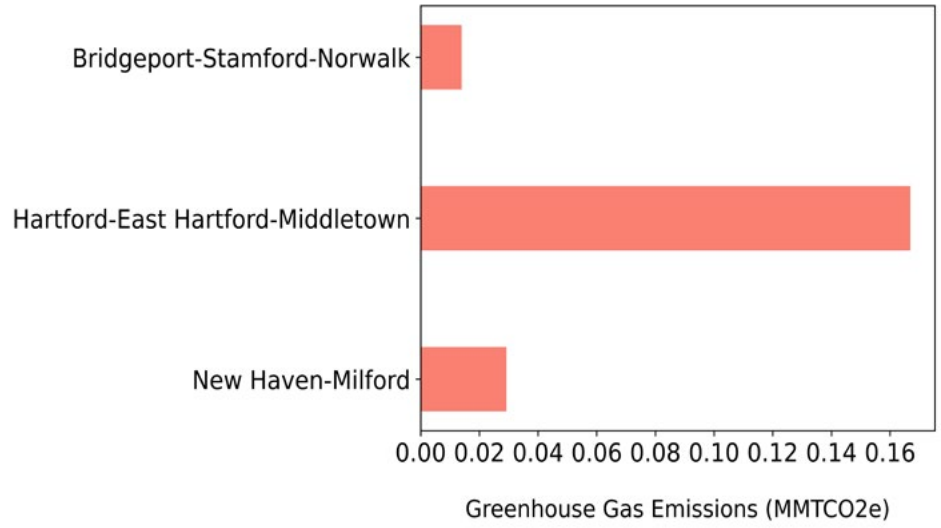


Figure 49: Emissions from Agricultural land in each MSA

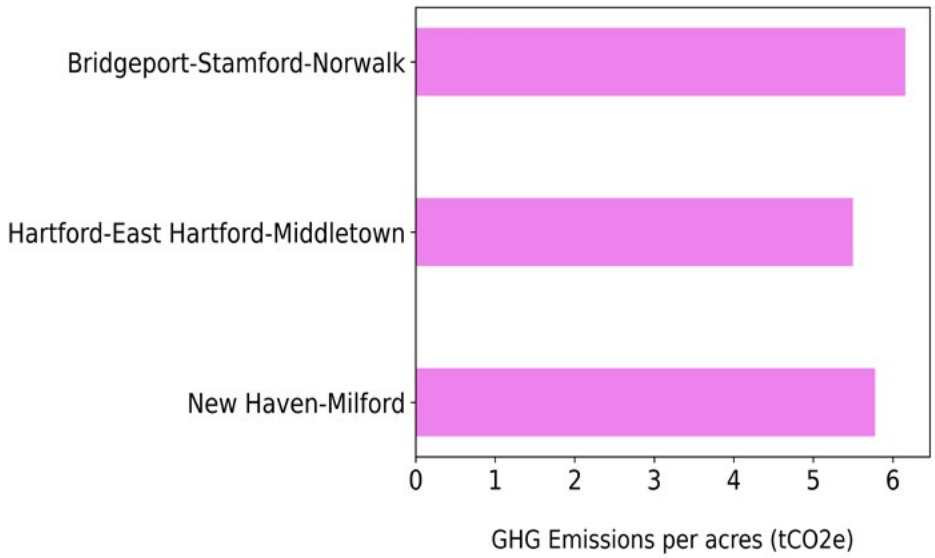


Figure 50: Emissions per acre

Wastewater Treatment

Figure 51 shows wastewater emissions in each MSA, indicating emissions in Hartford area are 25% higher than the other two MSAs combined.

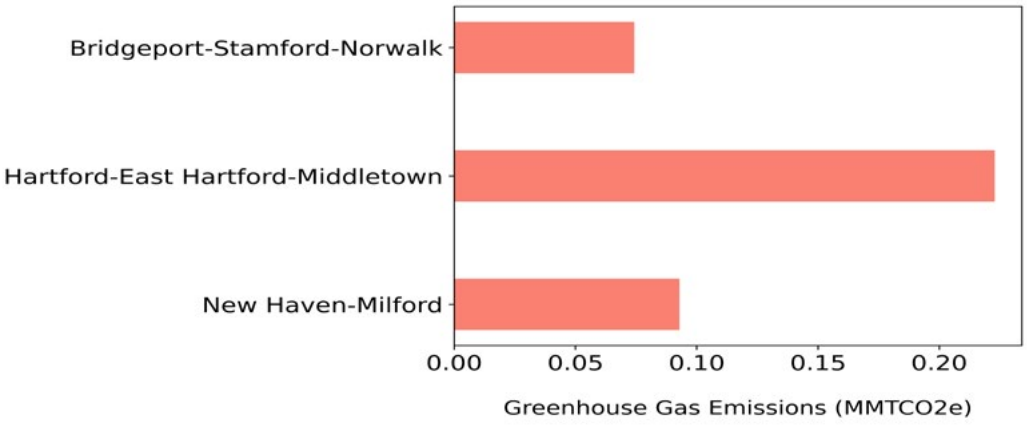


Figure 51: Emissions from Wastewater Treatment in each MSA

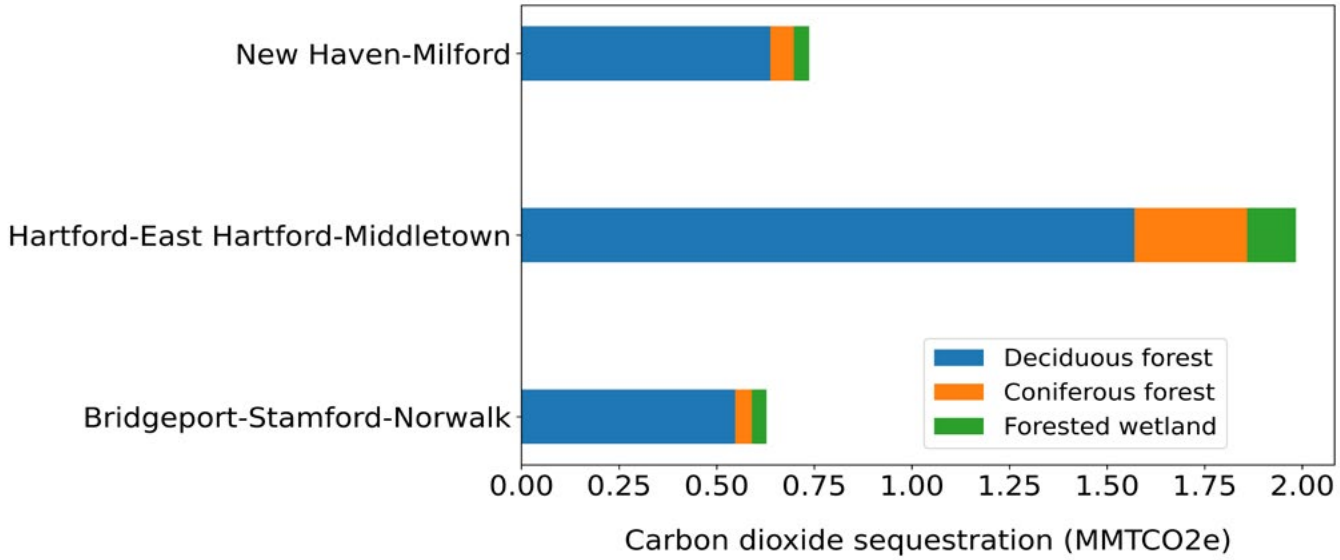


Figure 52: Carbon dioxide sequestrated by forested land in each MSA

Appendix K: Written Public Feedback

Comments re: PCAP draft

Kenny Foscue <kfosc@snet.net>
Fri 2/2/2024 3:42 PM

To:Stephanie Camp <smcamp@scrcog.org>
Cc:Daniel Rabin <rabinkux@sbcglobal.net>;Bernard Pelletier <bernard.pelletier@comcast.net>;Carl Amento <camento@scrcog.org>;Amos Smith <asmith@caanh.net>

1 attachments (19 KB)
04 SCRCOG PCAP comments dr bp kf 1.29.24.docx;

Hi Stephanie -

Thank you for all your hard work on developing the PCAP draft re: the Climate Pollution Reduction Grant.

Attached is a document with comments and suggestions from Dan, Bernie and I on the present draft.

If possible, we would like to meet with you (in person or on Zoom) to discuss our suggestions, possibly before next week's Feedback Session.

Thank you for your time, and hope to hear from you soon -

Kenny Foscue
North Haven Clean Energy Task Force

Dan Rabin
Branford Clean Energy Task Force

Bernie Pelletier
PACE

Draft of letter to Stephanie Camp re: SCRCOG PCAP public comment

Dear Stephanie,

Thank you for sharing the 1.16.24 draft PCAP document. It obviously took a lot of work to generate.

General comment: The report mixes long term and short-term actions. Based on the requirements of the grant we recommend that the PCAP focus on a series of short term "shovel ready" projects. Based on the outreach to the towns that has been conducted in flight projects or projects delayed because of funding would be ideal candidates.

We have several comments about Energy Efficiency in Buildings starting on page 65 through page 67 :

- The three goals under the general project of increasing energy efficiency in residential and commercial buildings. The benchmarking and all the individual goals should fall under this category. Existing benchmarking studies by DEEP, the utilities, and PACE should be included and a focused expansion should be cited. The study proposed in Goal 1 will take many years to execute and will never be complete. What are the indicators for success and how will achieving this goal help reduce GHGs? Some specific comments:
    - B1 is a requirement to benchmark – it isn't clear how a grant would help
    - B2 as written doesn't sound focused. The proposal that we have made would make it clear that, with funds, community outreach in priority communities could accelerate the adoption of energy efficiency
    - B3 as written doesn't specify how grant dollars would make this happen
    - B4 advocating for building codes is outside the purview of the COG and we'd recommend removing
    - B5 – can we point to specific systems and programs?
    - B6 – we probably meant to say photovoltaic panels?
    - B7 – point to specific initiatives
    - B8 – this could be a good grant project – are there specifics we can point to?
    - B9 – sounds very general – and unless there is a specific ask -we'd recommend removing
    - B10 – this is a wonderful goal but how would grant dollars be made to implement this?
    - B11 – How would grant dollars be put to this task?
- The EPA wants us to estimate the GHG savings for each of the goals, thus enabling them to prioritize the highest impact projects. These estimates are not apparent in the PCAP, except in the color-coded tables. What are the assumptions and how do our actions translate into GHG savings? For example, how many CT homes have been weatherized to date (about 20%), what is our goal (pick a number, eg, 75% in 5 years) and how will achieving this goal quantitatively impact GHG production? Same calculation for solar heaters, PV solar, and heat pumps.
    - The colored tables are great for an overview but the underlying data should be included as an appendix.
    - The buildings scorecard (p 65-67) is underwhelming. The text box on p. 67 suggests that funding and executing these programs will lead to an overall ~1% GHG reduction. This will not be funded.

- Given the weatherization, electrification, and solar goals outlined above, we think the PCAP should have more focus and detail on how dollars will make the goals happen. We must start with community outreach and education which will include specifics about weatherization, heat pumps and solar; and end with tangible benefit to disadvantaged communities and GHG reduction. Though lacking in the PCAP this is a strength of our application. We think that making the points below will strengthen the PCAP:
    - HeatSmart has been implemented in multiple towns, organized by PACE. This outreach program focuses on Home Energy Solutions and heat pumps.
    - Solarize campaigns have been conducted in multiple towns.
    - Social service agencies and Community Action Agencies have the infrastructure to identify and communicate with LMI constituents.
    - HES-IE is a major focus of Energize CT's Community Partnership Initiative.
- Because of this experience and the collaboration of the towns, PACE, and Community Action Agencies this outreach campaign ***is shovel-ready***. This should be stressed. Given funding, we will be successful.
- The goal for strict building codes is a state lobbying matter. The CT code (https://portal.ct.gov/DAS/Office-of-State-Building-Inspector/Connecticut-State-Building-Code) was updated in 2022. Although this is a laudable goal it's not clear how IRA funds will satisfy it.
- As noted above - please distinguish between solar heating achieved with circulating liquid or gas and photovoltaic solar panels used for electricity generation.
- Heat pumps are not mentioned in the PCAP but they play a major role in decarbonizing our heating infrastructure. Heat pump incentives are in the IRA because EPA knows they will change the landscape of heating and contribute significantly to GHG reduction.

We must review our own application as if we were at the EPA, reading it for the first time: How much will each goal contribute to GHG reduction? Can the applicant execute the project in a reasonable time and how does it compare to other projects on the table?

Thank you for considering our suggestions. We would welcome a meeting to discuss the details and see how we can contribute to the process.

Best regards,

Kenny Foscue
Bernie Pelletier
Dan Rabin

Draft Climate Action Plan - Comments

Laura Cahn <laurasline@sbcglobal.net>
Tue 2/6/2024 11:35 AM
To:Stephanie Camp <smcamp@scrcog.org>

Hi Stephanie,

Thank you so much for sharing the PCAP draft plan again with the reminder about this evening's public feedback Zoom session.

I hope I'll have time to write official public comment, but in the meantime I've listed a few comments and some typos and suggestions below. I haven't read the whole document yet; I scanned the first 80 pages quickly, so I'm sure I missed things.

Greenly,

Laura

Comments:

1. A bit disappointed the New Haven Environmental Advisory Council was not included on pg 18 in the description of New Haven's sustainability efforts. We've been meeting 8 times a year since late 2016 and spent a year beforehand working on getting the city to let us have such a council.

2. Same for the Office of Climate and Sustainability, which many of us advocated for while we were asking for the EAC and kept asking until it was established.

3. Recommendations for lessening GHG emissions by trucks:
a. put more freight on trains
b. charge truck tolls on CT roads

4. Recommendations for minimizing methane emissions from natural gas transmission: make sure CT gas companies are following EPA gas leak protection guidelines
https://www.epa.gov/sites/default/files/2014-02/documents/ldarguide.pdf
and adopt proposed new DoT pipeline safety and leaf detection and repair regulations https://www.federalregister.gov/documents/2023/05/18/2023-09918/pipeline-safety-gas-pipeline-leak-detection-and-repair

5. Page 46 - Can eco-friendly hydrogen fuel manufacture be specified? I understand not all hydrogen fuel manufacturing is eco-friendly.

6. Page 55 - Specify limiting grass irrigation since pumping water uses electricity.

7. Recommendation for reducing waste:
a. ban nips (mini one-shot liquor bottles)
b. do away with single-stream recycling and mandate separating glass, metal, paper, and cardboard

8. New Haven already has a Waste & Recycling Authority. Will a regional waste authority supersede it so New Haveners don't pay for two?

9. Ban pesticides for use on lawns and gardens (herbicides, insecticides, fungicides, etc>). Vehicles transporting pesticides at every stage emit toxins, and the pesticides poison air, soil, and water.

Typos and suggestions:

pg 41 - skip "one to" before "travel by car"

pg 55 - E-5 - "local" is missing the second "l"

pg 57 - E-6- "on site" would be clearer with a hyphen, "on-site

pg 58 - E-7 "citing" should read "siting"

pg 67 - B-1 - maybe switch "annually" and "benchmark"

pg 72 - New Haven County 6% - % sign is missing

###

On Feb 5, 2024, at 1:02 PM, Stephanie Camp <smcamp@scrcog.org> wrote:

Good Afternoon,

This is a reminder that SCRCOG and NVCOG are holding a virtual public feedback session on the draft Priority Climate Action Plan **tomorrow evening, February 6th, at 6:00 PM**. Participants must register at bit.ly/3u1eOXi.

The PCAP, available for review at cprgct.org, outlines goals and recommendations to reduce greenhouse gas emissions across 27 communities, which includes all 15 South Central Regional COG municipalities (Bethany, Branford, East Haven, Guilford, Hamden, Madison, Meriden, Milford, New Haven, North Branford, North Haven, Orange, Wallingford, West Haven, and Woodbridge) and 12 municipalities in the Naugatuck Valley COG region (Ansonia, Beacon Falls, Cheshire, Derby, Middlebury, Naugatuck, Oxford, Prospect, Seymour, Southbury, Waterbury, and Wolcott.)

We will be giving a short presentation at the beginning of the session and will reserve the remainder of the time for the public to give us feedback on the draft PCAP. Public comments on the PCAP can also be submitted through a questionnaire accessible at https://forms.office.com/r/h0BW88ar8v, or by sending an email to smcamp@scrcog.org. We've also extended the comment period an additional week, and will be **accepting comments until February 15th at 11:59 p.m.** More information on New Haven County's CPRG project is available at https://www.cprgct.org/.

Thank you,
Stephanie

Stephanie Camp
Senior Regional Planner
South Central Regional Council of Governments
127 Washington Avenue, 4th Floor West
North Haven, CT 06473
(203) 466-8626

<Outlook-r5tywhbh.png>

From: Stephanie Camp
Sent: Tuesday, January 23, 2024 2:31 PM
To: Christine O'Neill <coneill@nvcogct.gov>; Laura Francis <lfrancis@scrcog.org>; Carl Amento <camento@scrcog.org>
Subject: Register: Virtual Public Feedback Session for Draft Climate Action Plan

Good Afternoon,

The Southern Central Regional Council of Governments (SCRCOG) and the Naugatuck Valley Council of Governments (NVCOG) invite professionals and residents in New Haven County to participate in a public feedback session on the draft Priority Climate Action Plan (PCAP). The public feedback session is scheduled for February 6, 2023, from 6:00 pm to 7:00 pm on Zoom. Participants must register at bit.ly/3u1eOXi.

The PCAP, available for review at cprgct.org, outlines goals and recommendations to reduce greenhouse gas emissions across 27 communities, which includes all 15 South Central Regional COG municipalities (Bethany, Branford, East Haven, Guilford, Hamden, Madison, Meriden, Milford, New Haven, North Branford, North Haven, Orange, Wallingford, West Haven, and Woodbridge) and 12 municipalities in the Naugatuck Valley COG region (Ansonia, Beacon Falls, Cheshire, Derby, Middlebury, Naugatuck, Oxford, Prospect, Seymour, Southbury, Waterbury, and Wolcott.)

Public comments on the PCAP can either be submitted through a questionnaire accessible at https://forms.office.com/r/h0BW88ar8v, or by sending an email to smcamp@scrcog.org. The comment period closes February 8th at 11:59 p.m. More information on New Haven County's CPRG project is available athttps://www.cprgct.org/.

Thank you,
Stephanie

Stephanie Camp
Regional Planner
South Central Regional Council of Governments
127 Washington Avenue, 4th Floor West
North Haven, CT 06473
(203) 466-8626

<Outlook-4c5onnzb.png>

Comments from OPM on Draft PCAP

Dahl, Rebecca <Rebecca.Dahl@ct.gov>

Thu 2/8/2024 5:36 PM

To:Stephanie Camp <smcamp@scrcog.org>;Christine O'Neill <coneill@nvcogct.gov>
Cc:Wozniak-Brown, Joanna <Joanna.Wozniak-Brown@ct.gov>;Augur, Rebecca <Rebecca.Augur@ct.gov>

Good Evening, Stephanie and Christine,

I've been working with Joanna Wozniak-Brown here at OPM, to review each region's draft PCAPs.

Please find our comments below and do not hesitate to reach out to us if you have any further questions.

Thank you for the opportunity to submit feedback!
Becca

Comments from CT Office of Policy and Management:

- One item to get clarity on: on the *Recommended Strategies: Scorecard* within the *Authority to Implement* portion of the table, it would be helpful to understand more clearly if "Regional" means that it's something regional by nature (ex: regional water authorities) or if it's something the COGs are interested in taking on and/or feel they can implement effectively.

- Strategies E4 and E9 both reference the implementation of microgrid projects, for municipal services and for public housing, respectively. While these are both listed with local authority to implement, I think there's a worthwhile coordination effort that could be coordinated by the COGs to develop regional plans, guidelines and/or projects for microgrid projects in vulnerable communities. This would tie in well with the regional NHMPs and may be something worth pursuing through this grant opportunity or via FEMA BRIC grants.

- Strategies W1-W3 all pertain to waste reduction. Within the region there are several pilot projects taking place at the municipal scale, some state-sponsored pilot programs, and grassroots efforts (ex: composting services run by Gather New Haven, supporting business activities for local young adults).

    - For Strategies W1 & W3: There are several ways this could be piloted and scaled. Perhaps funding could aid in funding regional recycling coordinators (possibly by subcontracting municipal recycling coordinators or expanding their roles) and giving towns an opportunity to opt in. It's feasible to see how this could be replicated throughout the state and in other states, so may be compelling as a project for EPA from that standpoint. Further, there is the compelling narrative around the fact that CT and many other NE states have to send their solid waste across multiple state lines. Not only could this model aid all 169 municipalities in CT but could also serve as an example for neighboring states.

    - For Strategy W2: COGs have existing shared services models and existing regional services models. These could be used to aid in creating the architecture of a Regional Waste Management Authority. There are also opportunities for this initiative to start small and scale up. Within Appendix F – this initiative scores well.

- Strategies 2.3(a)-(b) under Mobility and Transportation: This kind of land use planning and spatial alignment assessment is a perfect role for the COGs to collaborate on in this region. This could also be replicable throughout the state and elsewhere, making it more compelling, in addition to scoring well within Appendix F.

Thinking about which projects would (1) be more immediately implementable (2) provide an opportunity for scalability – and to some extent – not require the buy-in of *every* municipality to provide a level of impact (3) enhance previous investments at the state, regional and/or local level, and (4) provide a unique narrative / compelling project for selectivity:

Strategies W1-W3 look most compelling from an implementation grant perspective. Followed by Strategies 2.3(a) and 2.3(b), and then Strategies E4 and E9 (would link these together for an application)

Rebecca (Becca) Dahl *(she/her)*
Planning Analyst, Office of Responsible Growth
Intergovernmental Policy and Planning Division
Office of Policy and Management
450 Capitol Avenue MS# 540RG
Hartford CT 06106-1379
Office: **860.418.6412**

Office of Responsible Growth (ct.gov)
Intergovernmental Policy and Planning Division (ct.gov)

Public Comment on the Draft Priority Climate Action Plan

Raelyn Princeton <raelyn@perpetualuse.org>
Wed 2/14/2024 1:55 PM

To:Stephanie Camp <smcamp@scrcog.org>
Cc:Julia Marsh <julia@perpetualuse.org>;Rich Grousset <rich@perpetualuse.org>

1 attachments (53 KB)
Public Input Response - New Haven, CT.pdf;

Hi Stephanie,

I hope this email finds you well. Please see attached for our public comment on how we propose reuse be included in the waste diversion section of your region's PCAP.

I'm a consultant with Perpetual, a non-profit organization focused on supporting the transition from single-use to reusable systems in the food and beverage sector. I am reaching out because we have received grant funding to support EPA Climate Pollution Reduction Grant (CPRG) planning grantees interested in building reuse programs into their Priority Climate Action Plans.

To be clear, we are offering modeling tools, impact and financial data, templates, and expert advice at **no cost** thanks to our funders. But we can only support a limited number of planning grantees between now and April. Therefore, if you are interested, I hope you will respond and schedule a meeting with us as soon as possible. You can email me directly with any further questions and with your availability the week of the 19th at raelyn@perpetualuse.org or reach out to one of my CCed colleagues.

All the best,
Raelyn

Raelyn Kaye Princeton
Consultant
raelyn@perpetualuse.org

www.perpetualuse.org

PERPETUAL

Thank you for the opportunity to submit comments on the Draft Priority Climate Action Plan for New Haven County.

We are writing to propose the inclusion of community-scale reuse systems, specifically for foodware, in the Plan. Reuse is a transformative climate solution fit for Priority Climate Action Plans and Implementation Grants, and Perpetual can help write the implementation grant for interested entities.

A reusable foodware system would replace current single-use food and beverage containers with reusable ones, providing 'foodware as a service' to restaurants and customers. A service provider would supply restaurants with reusable foodware for a low per-use fee, similar to the disposable supply model. Restaurant customers receive food and drinks in reusable containers and return them in one of many conveniently placed reuse bins. Containers are collected, cleaned, and inspected before being redistributed. This model can easily be expanded and adapted to provide reusable wares to other institutions, such as public schools, workplace cafeterias, venues, etc.

Reusable foodware systems provide environmental and community benefits. They result in reductions in GHG emissions, offer a better and healthier eating and drinking experience, and reduce air pollution and waste. They deliver economic benefits, including for low-income and disadvantaged communities, by creating good local jobs and keeping more money in the local economy.

The CPRG program is an opportunity to receive government funds to overcome the financial barriers to implementing community-scale reuse systems.

Reuse of foodware, included as a strategy under Waste Management Goal 1: Divert waste with local and regional programs, would drastically contribute to reducing the amount of waste material sent to landfills, especially single-use plastic items, and would result in significant cumulative GHG emissions reductions by 2030 and beyond. In particular, reuse could be included as a community-scale program to be implemented by the regional waste management authority, it could be paired with composting and food waste reduction programs, including in settings like schools and institutions, and it could be a requirement for government events or buildings.

Reusables can result in **2 to 10 times less lifecycle GHG emissions than disposable alternatives.** Reusable foodware systems reduce GHGs not only by reducing the amount of disposable foodware entering the waste stream, but also by reducing the quantity of disposable products manufactured. **Replacing single-use disposable**

products used in New Haven County with reusables could reduce GHG emissions in the area by more than 12,500 metric tons of CO2e per year.

Reuse systems drastically decrease waste and pollution, especially from plastic, which has compounding climate impacts that are not reflected in current LCAs. Disposable packaging and foodware are among the most littered items and release GHGs as they degrade. **Replacing single-use disposable products used in New Haven County with reusables could eliminate nearly 4,000 metric tons of waste per year, of which more than half is plastic.**

The avoided manufacture, transportation, use, and disposal of single-use products is associated with reduced health impacts from exposure to toxic chemicals and other co-pollutants. This has particular significance for vulnerable communities, which tend to be most affected by the health consequences of manufacturing, disposal, pollution, and climate change.

Reuse systems have economic benefits, from the avoided costs and productivity losses associated with health impacts to economic savings for local governments and taxpayers from reduced waste and litter management. Reuse also expands local economic opportunity, creating an estimated 200 to 330 jobs per 10,000 metric tons of single-use waste avoided (Upstream 2021, Perpetual analysis).

Reuse is aligned with the objectives of the CPRG program and implementation grants. It is an ambitious measure that will achieve significant cumulative GHG reductions by 2030 and beyond, it is innovative and replicable, community engagement is a core element of program design and implementation, and, once scaled, reuse systems are economically self-sustaining.

Perpetual is a nonprofit working to implement community-scale reuse systems that replace single-use disposables, starting with foodware, and is currently working with four US cities to design and deploy reuse systems that will be launching starting this fall. Perpetual is making its full process, tools, and materials used to establish these systems publicly available and has resources to assist interested entities with writing CPRG implementation grants to take advantage of this significant opportunity to fund reuse. We can also help identify jurisdictions interested in pursuing implementation grants for reuse.

We would be happy to discuss further or provide additional details or suggestions. Thank you for your time and consideration of our comment on this draft plan.

City of New Haven comments on the draft SCRCOG PCAP

Esther Rose-Wilen <ERoseWilen@newhavenct.gov>

Fri 2/16/2024 11:55 AM

To:Stephanie Camp <smcamp@scrcog.org>
Cc:Laura E. Brown <lebrown@newhavenct.gov>;Fatima Cecunjanin <FCecunjanin@newhavenct.gov>;Latha Swamy <LSwamy@newhavenct.gov>;Kimberly Acosta <KAcosta@newhavenct.gov>;Steven Winter <SWinter@newhavenct.gov>;Max Teirstein <MTeirstein@newhavenct.gov>;Christine O'Neill <coneill@nvcogct.gov>;Laura Francis <lfrancis@scrcog.org>;Carl Amento <camento@scrcog.org>

1 attachments (315 KB)

CoNH Comments on SCRCOG Draft Priority Climate Action Plan 2.15.2024.doc;

Good morning, Stephanie,

We have consolidated comments from New Haven's Food System Policy Division (FSPD), Office of Climate and Sustainability (OCS), and City Plan Department on the SCRCOG PCAP in the attached memo. The majority of recommendations come directly from FSPD and OSC, whose staff have considerable expertise and have been providing recommendations throughout the planning process. There are some key mitigation strategies flagged as needing to be included, clarified, or expanded upon and we thank your team in advance for your consideration and incorporation of these recommendations. As you know, our staff have been very engaged with SCRCOG in recent years and we look forward to continued collaboration on this plan and future projects.

Very best,

Esther Rose-Wilen *(she/her)*
Assistant Director of Comprehensive Planning
City Plan Department, City of New Haven
165 Church Street, 5th Floor New Haven, CT, 06510
erosewilen@newhavenct.gov
Office: 203.946.3029 Mobile: 203.901.7785

NEW HAVEN CITY PLAN DEPARTMENT
165 CHURCH STREET, NEW HAVEN, CT 06510
TEL (203) 946-6378 newhavenct.gov/cityplan

MEMO

Re: SCRCOG Draft Priority Climate Action Plan
By: Kimberly Acosta – Food Policy Analyst; Latha Swamy – Director of Food System Policy; Esther Rose-Wilen – Assistant Director of Comprehensive Planning; Steven Winter – Director of Climate and Sustainability; Max Teirstein – Sustainability Policy Analyst & Engagement Coordinator

Date: February 16, 2024

This memo consolidates comments on the SCRCOG Draft Priority Climate Action Plan from New Haven's City Plan Department, Office of Climate and Sustainability, and Food System Policy Division. These departments met on February 8, 2024, to discuss the draft plan and compare comments. Comments submitted in this memo have the full support of these three city departments. The Food System Policy Division and Office of Climate and Sustainability are leaders on cutting-edge local strategies for climate change action, championing strategies that prioritize our low-income residents and others at disproportionate risk, to advance climate justice for New Haven and the region.

In summary, City of New Haven staff felt that the community outreach component of the process was severely lacking, and that several important mitigation strategies were missing from or underemphasized in the document, jeopardizing the ability for municipalities to apply for funds for projects falling under those categories/strategies. Examples include *all* mitigation strategies related to agriculture/natural and working lands, electrification of heavy-duty vehicles, ebikes, solar on small multi-families, and community choice aggregation.

City of New Haven engagement in development of the plan

The Office of Climate and Sustainability was involved in planning meetings while the plan was developed. The Food System Policy Division was involved in early conversations related to the plan, including connecting SCRCOG with ICLEI-Local Governments for Sustainability and the ICF Climate Center but were not consulted past spring 2023. The City Plan Department was not involved with the development of the plan.

Comments on the SCRCOG PCAP Process

Specific comments on PCAP Measures are included in following sections. In addition to comments on the mitigation strategies, a large part of our staff's discussion was on the planning process. Concerns were raised about the extent of community engagement and the diversity of residents reached with engagement tactics. For example, tabling at the Wooster Square Farmer's Market is not an effective way to reach a racially, geographically, and socio-economically diverse array of New Haven residents. This Plan is part of the Justice40 Initiative, *Justice40 requires meaningful collaboration with disadvantaged groups to determine program benefits* (Impact 2045 p16). Language accessibility in accessing services and providing feedback for Limited English Proficiency residents, opportunities for solar on multi-family houses, and opportunities related to community and urban agriculture are some examples of gaps in the plan and process raised by our staff, that point toward serious misalignment with Justice40 principles. These gaps will have a ripple effect into implementation, impacting how

grant applications are framed and failing to hold implementation programs to high standards of community engagement and equity. We recommend that moving forward, SCRCOG consult more closely with regional leaders in equitable engagement around environmental justice issues and take advantage of resources offered by organizations like ICLEI and the ICF to conduct more robust, representative engagement.

Comments from City of New Haven, Food System Policy Division on SCRCOG PCAP Measures

- A complete omission throughout the *entire* report of acknowledging, recognizing, and incorporating **agriculture/natural and working lands** as outlined by EPA as an important pathway for decarbonization. Excluding this leaves millions of dollars of future funding on the table for our region.
- The report seems to conflate/reduce separate sector categories outlined by EPA as follows:
    - **agriculture/natural and working lands** and **waste and materials management** as one. Though I understand that GHG emissions from these sectors may be "negligible" for CT, the real and lived impacts shared and voiced by community members, especially environmental justice communities, necessarily should prioritize strategies around supporting rural and urban working lands and related livelihoods as they relate to any amount of GHG reductions and improving community and climate resilience.
    - **working lands** as only to mean "forestry." This is an egregious reduction of the term working lands, which includes primarily the rangelands (not so relevant to CT), farms, and forestlands used to support livelihoods. Within our MSA, working landowners, farmers, and farmworkers are an important set of interest-holders.
- We feel there are several impactful, community-identified and -driven strategies that are outright missing from this report. We are not, however, surprised that these would be missing given that outreach and engagement in creating this has not met the standards set out by the original CPRG NOFO:
    - As outlined clearly by the Justice40 Initiative, under which this program sits, "meaningful engagement is key to the success of Justice40" which mandates that "at least 40% of the benefits of certain federal investments must flow to disadvantaged communities." We are not aware of how such engagement was carried out in New Haven and are therefore unclear how robustly the strategies in the report reflect such engagement, if any.
- In summary:
    - As it relates to agriculture and working lands, this report disappointingly leaves millions of dollars of implementation funding on the table for these very communities.
    - Agriculture and working lands are a viable pathway to reduce community burdens identified by the Climate and Economic Justice Screening Tool (CEJST).
    - A key example of meaningful and relevant work happening in New Haven to this regard is the development of New Haven's first Urban Agricultural Master Plan led by the City's Food System Policy Division alongside disinvested community members.

Comments from City of New Haven, Office of Climate & Sustainability on SCRCOG PCAP Measures

The City of New Haven's Office of Climate & Sustainability is tasked with implementing climate mitigation and adaptation solutions that intersect with and address the immediate challenges facing our residents, from finding safe and affordable housing, to accessing quality employment opportunities, to improving air quality and respiratory health. By centering our approach on residents' immediate concerns, we can advance sustainability policies and programs that have broad community buy-in and provide greatest benefits to our historically underserved residents. In the list below, we highlight

climate mitigation and adaptation measures that are absent from the draft PCAP and are necessary to meet the air quality, transportation, and clean energy needs of these communities.

- *T2 Begin adopting alternate fuel sources such as hydrogen for medium to heavy-duty vehicles where EV transition is not possible.*

  This measure implies that EV transition is not possible for medium to heavy-duty vehicles, and instead emphasizes hydrogen fuel as an alternative. However, electrification for medium to heavy-duty vehicles is possible, especially in municipal applications with well-defined routes and duty cycles. Refuse vehicles and street sweepers are good examples of vehicles with predictable routes that can be electrified with existing battery technology and no new hydrogen research and development. New Haven is receiving its first all-electric refuse vehicle this year through the state's Diesel Emissions Reduction Act grant program. Vehicle electrification is a high priority for the Office of Climate & Sustainability, as electric vehicles eliminate tailpipe emissions, providing both carbon reduction and air quality benefits, and can be connected to the grid. Hydrogen, on the other hand, is a relatively new fuel source with little existing infrastructure in our community, and about 60% of hydrogen is still generated through the combustion of fossil fuels. Hydrogen-powered refuse vehicles are therefore more expensive and less effective in reducing carbon pollution than electric medium and heavy-duty vehicles. This measure should be rewritten to emphasize electrification of refuse fleets and other medium to heavy-duty vehicles, either removing mention of hydrogen entirely or emphasizing the fuel as a last resort.

- eBikes

  This summer, the state launched its CHEAPR eBike rebate program, which received 6,394 applications within ten days of its launch and exhausted its $1.5 million in funding almost immediately. A plurality of the applications for the rebates came from New Haven, as residents of the City could qualify for an expanded $1,500 rebate. New Haven's high density and extensive bike infrastructure make eBike an ideal alternative transportation method with zero tailpipe emissions, but as the average American drives less than 37 miles a day, eBikes are a zero-carbon alternative to cars from which most residents can benefit. However, the draft PCAP has no mention of eBikes. The PCAP should include a measure encouraging subsidies for eBikes so that cities like New Haven can assist residents in purchasing eBikes as the state works to allocate additional funding to the CHEAPR eBike program.

  Note: the PCAP includes the measure "*T7 Partner with micro-mobility companies to enable cross-town trips for smaller towns nearby.*" Micromobility refers to alternative transportation methods like bicycles, eBikes, scooters, and skateboards. This measure is likely referring to micro*transit*.

- Solar on small multifamilies

  Currently, large multifamily buildings in Connecticut are eligible for solar agreements in which landlords pay for the installation of rooftop panels, tenants receive a credit on their electric bills, and landlords sell the electricity back to the utility to recoup the costs of the panels. However, there are not currently regulations for tenants of smaller homes (1-4 family) to benefit from this kind of solar agreement. The PCAP should include a measure calling on the state and localities to support benefit-sharing for tenants of small multifamily homes.

- Community Choice Aggregation

  From EPA: *CCA—also known as municipal aggregation—programs allow local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative supplier while still receiving transmission and distribution service from their existing utility provider.*

  Currently, UI customers interested in reducing the net carbon emissions of their electricity consumption must opt-in to a new electric supplier that offsets electricity consumption using renewable energy certificates. However, under a CCA, cities like New Haven would be able to set a greener default supplier for all residents, allowing residents to opt-out of that supplier if they would like to go back to UI or a different provider. Alternative suppliers can also be as much as 20% cheaper for consumers than the default, so this measure could reduce energy burden in CT, if CCAs were included as a measure in the PCAP,

Thank you for your consideration and incorporation of these comments,

City Plan Department
Food System Policy Division
Office of Climate and Sustainability

City of New Haven

Appendix L: Microsoft Form Written Responses

2/29/24, 4:37 PM Public Comment: New Haven County's Priority Climate Action Plan (PCAP)

View results

Respondent

1 Anonymous

06:26
Time to complete

1. Please list your first and last name. *

catherine conniff

2. What municipality do you live in? *

- Ansonia
- Beacon Falls
- Bethany
- Branford
- Cheshire
- Derby
- East Haven
- Guilford
- Hamden
- Madison
- Meriden
- Middlebury
- Milford
- Naugatuck
- New Haven
- North Branford
- North Haven
- Orange
- Oxford
- Prospect
- Seymour
- Southbury
- Wallingford
- Waterbury
- West Haven
- Wolcott
- Woodbridge

- ○ Other

3. Are you representing an organization? If yes, please tell us which organization you are representing. If no, please write "N/A" or "No." *

west haven municipality

Comment on the Greenhouse Gas (GHG) reduction measures

Please note that the following sector categories were selected by the EPA.

4. Mobility & Transportation

Our research found that transportation is the largest contributing sector for GHG emissions in both the State (39%) and the County (41%), with private vehicles and light trucks (diesel vehicles) making up the majority of those emissions. Our research also found that asthma burdens are present in a large number of tracts in our region due to proximity to major roadways and trucking routes.

Please refer to pages 39-51 to review the goals and greenhouse gas reduction measures in the PCAP.

5. Electricity Production and Consumption

This sector was broken down by the residential and commercial/industrial subgroups, accounting for 9% of New Haven County's total GHG emissions.

Please refer to pages 52-61 to review the goals and greenhouse gas reduction measures in the draft PCAP.

At the state level, 1,500 more charging stations would have to
be built in order to meet EV demand and state EV targets by 2025 (Martinez, 2023)

The problem with the charging stations is that they are doing advertisement on them, that make the area they are located unpleasant to the eye. Example (scrolling flashing light pollution) These charging stations are making a negative impact on the downtown areas.

6. Energy Efficiency and Buildings

This sector was also broken down by the residential and commercial/industrial subgroups, accounting for 30% of New Haven County's total GHG emissions, which makes it the 2nd largest emitting sector. Beyond environmental benefits, energy efficiency in buildings yields reduced utility bills and operating costs for
owners and occupants, as well as improved living conditions.

Please refer to pages 62-70 to review the goals and greenhouse gas reduction measures in the draft PCAP.

7. Waste Management

This sector has become a pressing issue for Connecticut as a whole with the recent closure of a major waste-to-energy plant. Since the plant's closure, CT now ships 40% of its garbage to other states at a significant cost - both financially and environmentally. While this sector only accounts for a small percentage of both the State and County's total GHG emissions, the shipment of garbage across state lines produces emissions accounted for in other sectors, such as transportation.

Please refer to pages 71-77 to review the goals and GHG reduction measures in the draft PCAP.

8. Industrial

This sector is broken down into two subgroups: stationary combustion and electricity consumption. It accounts for 13% of New Haven County's total GHG emissions, which is 5% higher than the State of Connecticut's industrial sector emissions.

Please refer to pages 78-85 to review the goals and GHG reduction measures in the draft PCAP.

9. Working Lands and Forestry

Unlike the other sectors, the working lands and forestry sector actually has potential to remove GHG emissions from the atmosphere through effective carbon sequestration an storage measures.

Please refer to pages 86-91 to review the goals and GHG reduction measures in the draft PCAP.

Open comment

Please use this space to leave us a comment about any part of the plan that wasn't sector specific.

10. Let us know what you think of the draft PCAP below.

11. Is there an organization we should reach out to as we move into the Comprehensive Climate Action Plan phase of this grant program?

View results

Respondent

2 Anonymous

38:24
Time to complete

1. Please list your first and last name. *

Melissa Parker

2. What municipality do you live in? *

- Ansonia
- Beacon Falls
- Bethany
- Branford
- Cheshire
- Derby
- East Haven
- Guilford
- Hamden
- Madison
- Meriden
- Middlebury
- Milford
- Naugatuck
- New Haven
- North Branford
- North Haven
- Orange
- Oxford
- Prospect
- Seymour
- Southbury
- Wallingford
- Waterbury
- West Haven
- Wolcott
- Woodbridge

- ○ Other

3. Are you representing an organization? If yes, please tell us which organization you are representing. If no, please write "N/A" or "No." *

No

Comment on the Greenhouse Gas (GHG) reduction measures

Please note that the following sector categories were selected by the EPA.

4. Mobility & Transportation

Our research found that transportation is the largest contributing sector for GHG emissions in both the State (39%) and the County (41%), with private vehicles and light trucks (diesel vehicles) making up the majority of those emissions. Our research also found that asthma burdens are present in a large number of tracts in our region due to proximity to major roadways and trucking routes.

Please refer to pages 39-51 to review the goals and greenhouse gas reduction measures in the PCAP.

Leave transportation alone. The current emissions inspection system works just fine. People don't want to be told how to spend their hard earned money.

5. Electricity Production and Consumption

This sector was broken down by the residential and commercial/industrial subgroups, accounting for 9% of New Haven County's total GHG emissions.

Please refer to pages 52-61 to review the goals and greenhouse gas reduction measures in the draft PCAP.

We had a bad experience with heat pump installation where one large expensive unit had to be replaced before the end of the energy loan we took out. And was not covered by contractor or manufacturer despite we did our homework. Not interested in paying higher electricity bills. Leave the people alone. Let the investors go some place else to make money. Leave the people alone.

6. Energy Efficiency and Buildings

This sector was also broken down by the residential and commercial/industrial subgroups, accounting for 30% of New Haven County's total GHG emissions, which makes it the 2nd largest emitting sector. Beyond environmental benefits, energy efficiency in buildings yields reduced utility bills and operating costs for
owners and occupants, as well as improved living conditions.

Please refer to pages 62-70 to review the goals and greenhouse gas reduction measures in the draft PCAP.

Stop building new buildings. Utilize what there is.

7. Waste Management

This sector has become a pressing issue for Connecticut as a whole with the recent closure of a major waste-to-energy plant. Since the plant's closure, CT now ships 40% of its garbage to other states at a significant cost - both financially and environmentally. While this sector only accounts for a small percentage of both the State and County's total GHG emissions, the shipment of garbage across state lines produces emissions accounted for in other sectors, such as transportation.

Please refer to pages 71-77 to review the goals and GHG reduction measures in the draft PCAP.

Decrease the amount of waste by half that is sent out to decrease cost and taxpayer money.

8. Industrial

This sector is broken down into two subgroups: stationary combustion and electricity consumption. It accounts for 13% of New Haven County's total GHG emissions, which is 5% higher than the State of Connecticut's industrial sector emissions.

Please refer to pages 78-85 to review the goals and GHG reduction measures in the draft PCAP.

Stop building new buildings.

9. Working Lands and Forestry

Unlike the other sectors, the working lands and forestry sector actually has potential to remove GHG emissions from the atmosphere through effective carbon sequestration an storage measures.

Please refer to pages 86-91 to review the goals and GHG reduction measures in the draft PCAP.

Stop building new buildings so there is not an impact on the environment. People just want to live their lives. This whole climate issue is a hoax, even the top climatology experts have stayed this in their reports.

Open comment

Please use this space to leave us a comment about any part of the plan that wasn't sector specific.

10. Let us know what you think of the draft PCAP below.

This is a complete waste of time, energy and resources to present a 169 page document to review in a very short period of time. People are more important than some PCAP plan think tank baloney....I'm sure the people who thought this up drive big expensive vehicles or three brand new cars, have airplanes, and huge carbon footprint homes. Are you going to tell them to go live in a container home? Or tell them where to spend their 80k for their children to go to college? The simple answer is No! Then why should the general population be told where and how to spend our money! Why is the general population paying 3x the taxes? For this nonsense? Really? This is not the feudal system folks. Get a real life, go bake your neighbors some cookies. Go do some volunteer work that doesn't involve trafficking.....you all should be ashamed of yourselves. Have a relationship with Jesus. Ask Him all of these questions here.

11. Is there an organization we should reach out to as we move into the Comprehensive Climate Action Plan phase of this grant program?

Leave things alone. No.

View results

Respondent

3 Anonymous

25:02
Time to complete

1. Please list your first and last name. *

Lynne Bonnett

2. What municipality do you live in? *

- Ansonia
- Beacon Falls
- Bethany
- Branford
- Cheshire
- Derby
- East Haven
- Guilford
- Hamden
- Madison
- Meriden
- Middlebury
- Milford
- Naugatuck
- New Haven
- North Branford
- North Haven
- Orange
- Oxford
- Prospect
- Seymour
- Southbury
- Wallingford
- Waterbury
- West Haven
- Wolcott
- Woodbridge

- ○ Other

3. Are you representing an organization? If yes, please tell us which organization you are representing. If no, please write "N/A" or "No." *

no

Comment on the Greenhouse Gas (GHG) reduction measures

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Our research found that transportation is the largest contributing sector for GHG emissions in both the State (39%) and the County (41%), with private vehicles and light trucks (diesel vehicles) making up the majority of those emissions. Our research also found that asthma burdens are present in a large number of tracts in our region due to proximity to major roadways and trucking routes.

Please refer to pages 39-51 to review the goals and greenhouse gas reduction measures in the PCAP.

I strongly support effort to decrease idling and improve mass transit for 1) suburbs to city centers; expedited routes with targeted destinations and times (in other words commuters for jobs), 2) improved mass transit options in urban areas (target routes to the prevalence of people that want to go cross town, for example. I also strongly support working toward regulations for trucks - as part of this plan industrial users will have to divulge how many trips in what types of trucks they need for their business (think fossil fuel port deliveries, sludge trucks, etc. I favor this over other suggestions for LIDAC communities.

5. Electricity Production and Consumption

This sector was broken down by the residential and commercial/industrial subgroups, accounting for 9% of New Haven County's total GHG emissions.

Please refer to pages 52-61 to review the goals and greenhouse gas reduction measures in the draft PCAP.

Energy efficiency in all forms is key, transparency for renters in how much it costs to live in the apartement, solar heating intallations would bypass the restriction on solar panels for multifamily homes, focusing on public housing in LIDAC communities does not help the majority of LIDAC residents that rent in 2-4 unit multifamily homes- the majority of renters in New Haven. We need small scale solar installations with storage that can help decrease electricity consumption behind the meter to help our disadvantaged residents, Public housing facilities already get a lot of state and federal support, I think, and most of those residents do not pay utilities,

6. Energy Efficiency and Buildings

This sector was also broken down by the residential and commercial/industrial subgroups, accounting for 30% of New Haven County's total GHG emissions, which makes it the 2nd largest emitting sector. Beyond environmental benefits, energy efficiency in buildings yields reduced utility bills and operating costs for
owners and occupants, as well as improved living conditions.

Please refer to pages 62-70 to review the goals and greenhouse gas reduction measures in the draft PCAP.

yes to all. We need transition from oil furnaces to heat pumps directly bypassing natural gas- this is super important to reduce our reliance on fossil fuels now. Unfortunately, the natural gas industry is doing all that they can to encourage transition to natural gas. This is a huge mistake, in my opinion.

7. Waste Management

This sector has become a pressing issue for Connecticut as a whole with the recent closure of a major waste-to-energy plant. Since the plant's closure, CT now ships 40% of its garbage to other states at a significant cost - both financially and environmentally. While this sector only accounts for a small percentage of both the State and County's total GHG emissions, the shipment of garbage across state lines produces emissions accounted for in other sectors, such as transportation.

Please refer to pages 71-77 to review the goals and GHG reduction measures in the draft PCAP.

I support organic diversion at a local level through reduce, reuse and recycle. Food sharing and food rescue are doable and we should be supporting those efforts. Composting is preferable to anaerobic digestion. Not only is it less costly but it is better for the environment I do not support a mega waste facility in North Haven. Not only will it give inordinate control of waste management to the haulers but will adversely affect a LIDAC community and risk environmental damage to important wetlands in the Quinnipiac watershed. In addition it will aggravate an already overburdened host community with polluting facilities (cumulative effect) and increase trucking throughout our region and beyond? The promoters talk as if the sky is the limit for them.

8. Industrial

This sector is broken down into two subgroups: stationary combustion and electricity consumption. It accounts for 13% of New Haven County's total GHG emissions, which is 5% higher than the State of Connecticut's industrial sector emissions.

Please refer to pages 78-85 to review the goals and GHG reduction measures in the draft PCAP.

CT exports quite a bit of its electricity generation including sending 300 + megawatts of electricity to Long Island via the Cross Sound Cable. I would like to see the communities that are using our power generation build their own power stations to supply their communities so that CT can retire some of its aged power plants and avoid building out additional natural gas infrastructure.
I would love to see solar canopies in brownfields for residents to have a share in (as in a cooperative arrangement) to reduce their electric bill virtually.

9. Working Lands and Forestry

Unlike the other sectors, the working lands and forestry sector actually has potential to remove GHG emissions from the atmosphere through effective carbon sequestration an storage measures.

Please refer to pages 86-91 to review the goals and GHG reduction measures in the draft PCAP.

URI in New Haven has invested in tree planting in New Haven in partnership with the City of New Haven. I think it is popular and successful. However, I know that they have difficulty reaching LIDAC households partly because the residents need to commit time and effort in taking care of the young trees in order for the program to be successful. It would be good to offer them outreach assistance.

Open comment

Please use this space to leave us a comment about any part of the plan that wasn't sector specific.

10. Let us know what you think of the draft PCAP below.

I think that you have put a lot of effort in to it. It is particularity hard with such diverse communities and so much of the LIDAC needs are beyond your control (in other words require new legislation for solar sharing on a small level).

11. Is there an organization we should reach out to as we move into the Comprehensive Climate Action Plan phase of this grant program?

Don't know.

View results

Respondent

4 Anonymous

1371:22
Time to complete

1. Please list your first and last name. *

Sheila Dravis-Cosgrove

2. What municipality do you live in? *

- Ansonia
- Beacon Falls
- Bethany
- Branford
- Cheshire
- Derby
- East Haven
- Guilford
- Hamden
- Madison
- Meriden
- Middlebury
- Milford
- Naugatuck
- New Haven
- North Branford
- North Haven
- Orange
- Oxford
- Prospect
- Seymour
- Southbury
- Wallingford
- Waterbury
- West Haven
- Wolcott
- Woodbridge

◯ Other

3. Are you representing an organization? If yes, please tell us which organization you are representing. If no, please write "N/A" or "No." *

Town of Wallingford

Comment on the Greenhouse Gas (GHG) reduction measures

Please note that the following sector categories were selected by the EPA.

4. Mobility & Transportation

Our research found that transportation is the largest contributing sector for GHG emissions in both the State (39%) and the County (41%), with private vehicles and light trucks (diesel vehicles) making up the majority of those emissions. Our research also found that asthma burdens are present in a large number of tracts in our region due to proximity to major roadways and trucking routes.

Please refer to pages 39-51 to review the goals and greenhouse gas reduction measures in the PCAP.

State CT DEEP should install EV and Plug in Hybrid (PHEV) charging stations (level 1, 2, 3) in public parking on highway or off highway. Incentivize retail and property owners to install. Provide transportation cost discount to residents living with .5 mile or in transit orient zones.

CT Town employee(s) and elected officials are not moving on this front. There is push back and/or a general lack of technological sophistication in town departments.

5. Electricity Production and Consumption

This sector was broken down by the residential and commercial/industrial subgroups, accounting for 9% of New Haven County's total GHG emissions.

Please refer to pages 52-61 to review the goals and greenhouse gas reduction measures in the draft PCAP.

State CT DEEP should incentivize hospitals, retail and commercial owners to reduce energy consumption. upgrade building lights, heating etc. CT Town employee(s) and elected officials are not moving on this front. There is push back and/or a general lack of technological sophistication in town departments.

6. Energy Efficiency and Buildings

This sector was also broken down by the residential and commercial/industrial subgroups, accounting for 30% of New Haven County's total GHG emissions, which makes it the 2nd largest emitting sector. Beyond environmental benefits, energy efficiency in buildings yields reduced utility bills and operating costs for
owners and occupants, as well as improved living conditions.

Please refer to pages 62-70 to review the goals and greenhouse gas reduction measures in the draft PCAP.

State CT DEEP should create new program to upgrade electrical system to accommodate new EE appliances, lighting, heating etc. to reduce energy consumption. Current programs do not cover these costs. Town employee(s) and elected officials are not moving to introduce such programs. There is push back and/or a general lack of technological sophistication in town departments.

7. Waste Management

This sector has become a pressing issue for Connecticut as a whole with the recent closure of a major waste-to-energy plant. Since the plant's closure, CT now ships 40% of its garbage to other states at a significant cost - both financially and environmentally. While this sector only accounts for a small percentage of both the State and County's total GHG emissions, the shipment of garbage across state lines produces emissions accounted for in other sectors, such as transportation.

Please refer to pages 71-77 to review the goals and GHG reduction measures in the draft PCAP.

Really??? State CT DEEP should go full throttle to EDUCATE RESIDENTS, COMMERCIAL AND TOWNS and reduce SOLID WASTE. PURCHASE OR take private property by eminent domain and BRING BACK INCINERATOR in CT. Stop trucking WASTE OUT OF CT!!!

8. Industrial

This sector is broken down into two subgroups: stationary combustion and electricity consumption. It accounts for 13% of New Haven County's total GHG emissions, which is 5% higher than the State of Connecticut's industrial sector emissions.

Please refer to pages 78-85 to review the goals and GHG reduction measures in the draft PCAP.

State CT DEEP should incentivize retail and commercial owners to reduce energy consumption. upgrade building lights, heating etc.

9. Working Lands and Forestry

Unlike the other sectors, the working lands and forestry sector actually has potential to remove GHG emissions from the atmosphere through effective carbon sequestration an storage measures.

Please refer to pages 86-91 to review the goals and GHG reduction measures in the draft PCAP.

State CT DEEP should incentivize property owners and towns to plant pollinator fields under solar panels and to GROW trees.

Open comment

Please use this space to leave us a comment about any part of the plan that wasn't sector specific.

10. Let us know what you think of the draft PCAP below.

It aligns with my views. I attended and participated in CPRG presentations by SCRCOG.

11. Is there an organization we should reach out to as we move into the Comprehensive Climate Action Plan phase of this grant program?

Southern CT Regional Council of Governments (SCRCOG)

View results

Respondent

5 Anonymous

11:28
Time to complete

1. Please list your first and last name. *

Gary Sippin

2. What municipality do you live in? *

- Ansonia
- Beacon Falls
- Bethany
- Branford
- Cheshire
- Derby
- East Haven
- Guilford
- Hamden
- Madison
- Meriden
- Middlebury
- Milford
- Naugatuck
- New Haven
- North Branford
- North Haven
- Orange
- Oxford
- Prospect
- Seymour
- Southbury
- Wallingford
- Waterbury
- West Haven
- Wolcott
- Woodbridge

Monroe

3. Are you representing an organization? If yes, please tell us which organization you are representing. If no, please write "N/A" or "No." *

Sippin Energy Products

Comment on the Greenhouse Gas (GHG) reduction measures

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Our research found that transportation is the largest contributing sector for GHG emissions in both the State (39%) and the County (41%), with private vehicles and light trucks (diesel vehicles) making up the majority of those emissions. Our research also found that asthma burdens are present in a large number of tracts in our region due to proximity to major roadways and trucking routes.

Please refer to pages 39-51 to review the goals and greenhouse gas reduction measures in the PCAP.

First and most importantly, none of the plans detailed in this outline will affect the climate, global CO2, or the weather. Anyone who thinks otherwise is living in a fantasy land. The goal of electrifying cars and trucks will also contribute no benefit to US consumers, the truck and auto industry, or the climate. Most importantly, the US auto industry is now being financially crushed by EV mandates, with Ford, GM and many others in dire financial conditions. More ridiculously, mandates to convert midsize up to class VIII trucks to electric will literally destroy the US trucking industry, and again most importantly not have any meaningful effect on global CO2 for the climate. The United States contributes only around 12 or 13% of the world CO2, with over 180 countries not participating with any CO2 reductions whatsoever. That being said, science has taught us that CO2 does not control the climate, I would encourage anybody wanting to research this to go visit the www.co2coalition.com website for meaningful information.

5. Electricity Production and Consumption

This sector was broken down by the residential and commercial/industrial subgroups, accounting for 9% of New Haven County's total GHG emissions.

Please refer to pages 52-61 to review the goals and greenhouse gas reduction measures in the draft PCAP.

The only logical answer for reliable grid level power his nuclear, and natural gas fired power plants. These plans have to be accelerated throughout the United States. Most importantly Connecticut's one and only nuclear power plant needs to be supported for decades to come. The conversion from oil and coal to natural gas power plants has been the sole reason that the United States has decreased its CO2 emissions over the past 10 years. Again, this is a moot point due to the fact that CO2 does not control the climate in any meaningful way.

6. Energy Efficiency and Buildings

This sector was also broken down by the residential and commercial/industrial subgroups, accounting for 30% of New Haven County's total GHG emissions, which makes it the 2nd largest emitting sector. Beyond environmental benefits, energy efficiency in buildings yields reduced utility bills and operating costs for
owners and occupants, as well as improved living conditions.

Please refer to pages 62-70 to review the goals and greenhouse gas reduction measures in the draft PCAP.

Energy efficiency for buildings makes complete sense. Insulation, high-efficiency doors and windows, and upgrades to heating oil, propane, and natural gas heating systems as well as domestic hot water systems. Upgrades of AC and heat pumps to high-efficiency versions will also be most helpful.

7. Waste Management

This sector has become a pressing issue for Connecticut as a whole with the recent closure of a major waste-to-energy plant. Since the plant's closure, CT now ships 40% of its garbage to other states at a significant cost - both financially and environmentally. While this sector only accounts for a small percentage of both the State and County's total GHG emissions, the shipment of garbage across state lines produces emissions accounted for in other sectors, such as transportation.

Please refer to pages 71-77 to review the goals and GHG reduction measures in the draft PCAP.

Spending a lot of money in this area probably doesn't make sense, because it represents a very small energy footprint.

8. Industrial

This sector is broken down into two subgroups: stationary combustion and electricity consumption. It accounts for 13% of New Haven County's total GHG emissions, which is 5% higher than the State of Connecticut's industrial sector emissions.

Please refer to pages 78-85 to review the goals and GHG reduction measures in the draft PCAP.

Industrial and commercial users should be encouraged to use natural gas, which is abundant and inexpensive. Converting any industrial or commercial application to electric heat pumps, will not only create poor performing systems, but will put a tremendous load on our already weakened grid.

9. Working Lands and Forestry

Unlike the other sectors, the working lands and forestry sector actually has potential to remove GHG emissions from the atmosphere through effective carbon sequestration an storage measures.

Please refer to pages 86-91 to review the goals and GHG reduction measures in the draft PCAP.

Planting trees, and encouraging reforestation of lands is always a great idea. Unfortunately many forested areas have been cleared for the installation of solar microgrids, which do not make sense economically, and provide inherently unreliable energy. They have no real impact on our energy grid as they cannot be used to produce dispatch of all power. Also, when it is cloudy, or when it snows, or during the evening there is no power produced by these facilities.

Open comment

Please use this space to leave us a comment about any part of the plan that wasn't sector specific.

10. Let us know what you think of the draft PCAP below.

Virtually all of what is outlined in this draft are things that will cost an outrageous amount of money, cause economic hardship for industries in consumers, and will have no measurable impact on global CO2 or the climate.

11. Is there an organization we should reach out to as we move into the Comprehensive Climate Action Plan phase of this grant program?

www.co2coalition.org

View results

Respondent

6 Anonymous

23:48
Time to complete

1. Please list your first and last name. *

Kyle Horton

2. What municipality do you live in? *

- ○ Ansonia
- ○ Beacon Falls
- ○ Bethany
- ○ Branford
- ○ Cheshire
- ○ Derby
- ○ East Haven
- ○ Guilford
- ○ Hamden
- ○ Madison
- ○ Meriden
- ○ Middlebury
- ○ Milford
- ○ Naugatuck
- ◉ New Haven
- ○ North Branford
- ○ North Haven
- ○ Orange
- ○ Oxford
- ○ Prospect
- ○ Seymour
- ○ Southbury
- ○ Wallingford
- ○ Waterbury
- ○ West Haven
- ○ Wolcott
- ○ Woodbridge

- ◯ Other

3. Are you representing an organization? If yes, please tell us which organization you are representing. If no, please write "N/A" or "No." *

No

Comment on the Greenhouse Gas (GHG) reduction measures

Please note that the following sector categories were selected by the EPA.

4. Mobility & Transportation

Our research found that transportation is the largest contributing sector for GHG emissions in both the State (39%) and the County (41%), with private vehicles and light trucks (diesel vehicles) making up the majority of those emissions. Our research also found that asthma burdens are present in a large number of tracts in our region due to proximity to major roadways and trucking routes.

Please refer to pages 39-51 to review the goals and greenhouse gas reduction measures in the PCAP.

I am strongly interested in the positive effects of T5: Transit-first approach and overall reducing single-occupant car trips. I believe it will be a big positive impact on my city (New Haven)

5. Electricity Production and Consumption

This sector was broken down by the residential and commercial/industrial subgroups, accounting for 9% of New Haven County's total GHG emissions.

Please refer to pages 52-61 to review the goals and greenhouse gas reduction measures in the draft PCAP.

6. Energy Efficiency and Buildings

This sector was also broken down by the residential and commercial/industrial subgroups, accounting for 30% of New Haven County's total GHG emissions, which makes it the 2nd largest emitting sector. Beyond environmental benefits, energy efficiency in buildings yields reduced utility bills and operating costs for
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Please refer to pages 71-77 to review the goals and GHG reduction measures in the draft PCAP.

I am most interested in W2: Establish a regional waste management authority in New Haven county.

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Open comment

Please use this space to leave us a comment about any part of the plan that wasn't sector specific.

10. Let us know what you think of the draft PCAP below.

11. Is there an organization we should reach out to as we move into the Comprehensive Climate Action Plan phase of this grant program?

View results

Respondent

7 Anonymous

65:02
Time to complete

1. Please list your first and last name. *

Adelheid Koepfer

2. What municipality do you live in? *

- ○ Ansonia
- ○ Beacon Falls
- ○ Bethany
- ○ Branford
- ○ Cheshire
- ○ Derby
- ○ East Haven
- ○ Guilford
- ○ Hamden
- ○ Madison
- ○ Meriden
- ○ Middlebury
- ○ Milford
- ○ Naugatuck
- ○ New Haven
- ○ North Branford
- ○ North Haven
- ○ Orange
- ○ Oxford
- ○ Prospect
- ○ Seymour
- ○ Southbury
- ◉ Wallingford
- ○ Waterbury
- ○ West Haven
- ○ Wolcott
- ○ Woodbridge

◯ Other

3. Are you representing an organization? If yes, please tell us which organization you are representing. If no, please write "N/A" or "No." *

No

Comment on the Greenhouse Gas (GHG) reduction measures

Please note that the following sector categories were selected by the EPA.

4. Mobility & Transportation

Our research found that transportation is the largest contributing sector for GHG emissions in both the State (39%) and the County (41%), with private vehicles and light trucks (diesel vehicles) making up the majority of those emissions. Our research also found that asthma burdens are present in a large number of tracts in our region due to proximity to major roadways and trucking routes.

Please refer to pages 39-51 to review the goals and greenhouse gas reduction measures in the PCAP.

P.41: exactly because so many low income families don't have access to cars, we need to enhance bus and train service, make it more accessible and more affordable! (And yes, electric)
My town Wallingford has exactly one bus line connecting affordable housing to shopping (Walmart etc.) good, but not enough! I can not get "down the hill" to town center on public transportation, and there isn't any bike lane on those hills either. Towns need help with costs and expertise/ panning staffing. I understand the cities get priority, but connecting the 'burbs and rural areas is just as important. Trains stop in Wallingford, but how often? Not during rush hour, it's almost impossible to get to New Haven for Office begin!

5. Electricity Production and Consumption

This sector was broken down by the residential and commercial/industrial subgroups, accounting for 9% of New Haven County's total GHG emissions.

Please refer to pages 52-61 to review the goals and greenhouse gas reduction measures in the draft PCAP.

Municipal energy (electricity) providers should also be required to adhere to portfolio standards (E2)
On-site Renewable generation, storage and micro grids would make the SCRCOG area more energy safe, less dependent from gas supply and volatile prices, and the electric grid seems much more effective and efficient to update than leaking gas pipelines.
Towns should promote solar on rooftops (schools, admin buildings, equipment buildings, ...) and solar canopies on parking lots, electric school buses as mobile storage for summer AC needs, and micro grids. No solar on farm or forest land! There are enough roofs!
The geothermal pilot in Wallingford is a good effort, but given CT's geology (lots of red rock) I think promoting solar would be more effective.
P.56, E8 (ordinances): cost burden calculation seems unfair, must include life cycle costs- upfront investment as well as long term savings and independence!

6. Energy Efficiency and Buildings

This sector was also broken down by the residential and commercial/industrial subgroups, accounting for 30% of New Haven County's total GHG emissions, which makes it the 2nd largest emitting sector. Beyond environmental benefits, energy efficiency in buildings yields reduced utility bills and operating costs for
owners and occupants, as well as improved living conditions.

Please refer to pages 62-70 to review the goals and greenhouse gas reduction measures in the draft PCAP.

Are Schools mentioned in this strategy/ goal? B3? Making schools more energy efficient needs more emphasis and (planning & funding) support

7. Waste Management

This sector has become a pressing issue for Connecticut as a whole with the recent closure of a major waste-to-energy plant. Since the plant's closure, CT now ships 40% of its garbage to other states at a significant cost - both financially and environmentally. While this sector only accounts for a small percentage of both the State and County's total GHG emissions, the shipment of garbage across state lines produces emissions accounted for in other sectors, such as transportation.

Please refer to pages 71-77 to review the goals and GHG reduction measures in the draft PCAP.

Biggest challenge seems that each town does their own thing. I have 3 different privat trash haulers in my cul-de-sac, and then some folks still bring their trash to the town dump. Can that be streamlined, to make food scrap diversion and pay-per-unit work?
Yes! To W1-3!
W2 is listed twice?
More support for school food waste diversion, please! And other large facilities (Gaylord, Masonicare, Choate, restaurant sector...)
When pay-per-unit is implemented, take care of young families (and older folks) with lots of diapers, or even better: promote reusable diapers, laundry/ delivery, new solutions with less waste?
Was no more action and strategies: reduce single use packaging in the county or make retailers take it back; promote and implement new bottle redemption bill; enhance plastic bag ban; promote reusable take-out containers (return for deposit); make hazwaste drop-off more accessible; what about construction material?
Reduce comes before re-use; also: repurpose!
Online retail packaging is ridiculous, it i guess that's beyond SCRCOG?

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This sector is broken down into two subgroups: stationary combustion and electricity consumption. It accounts for 13% of New Haven County's total GHG emissions, which is 5% higher than the State of Connecticut's industrial sector emissions.

Please refer to pages 78-85 to review the goals and GHG reduction measures in the draft PCAP.

Big concrete and steel factories - "make them"/ incentivize green steel and carbon-storing instead of -emitting concrete!

9. Working Lands and Forestry

Unlike the other sectors, the working lands and forestry sector actually has potential to remove GHG emissions from the atmosphere through effective carbon sequestration an storage measures.

Please refer to pages 86-91 to review the goals and GHG reduction measures in the draft PCAP.

Urban tree canopy everywhere :)

Open comment

Please use this space to leave us a comment about any part of the plan that wasn't sector specific.

10. Let us know what you think of the draft PCAP below.

Great effort, thank you!

11. Is there an organization we should reach out to as we move into the Comprehensive Climate Action Plan phase of this grant program?

CT Energy Network
New Haven Climate Movement

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