



TOWN OF CARRBORO

NORTH CAROLINA

TRANSMITTAL

PLANNING DEPARTMENT

DELIVERED VIA: ☒ *HAND* ☐ *MAIL* ☐ *FAX* ☒ *EMAIL*

To: David Andrews, Town Manager
Board of Aldermen

From: Laura Janway, Environmental Planner
Patricia McGuire, Planning Director

Date: October 1, 2019

Subject: Implementation Update: Energy and Climate Protection Plan (2014) & Community Climate Action Plan (2017)

Summary

The purpose of this memo is to provide the Board with a progress report on implementation of the Energy and Climate Protection Plan (ECPP), adopted May 28, 2014, and the Community Climate Action Plan (CCAP), adopted January 24, 2017. The ECPP concentrates on lowering municipal greenhouse gas emissions and the CCAP establishes a 50% reduction goal in per capita greenhouse emissions by 2025. Town staff are examining and pursuing several initiatives to reach the emissions reductions goals.

ECPP implementation continues with the launch of the LED streetlight conversion project, a grant proposal to the Volkswagen (VW) Emissions Mitigation Fund, and the installation of a new energy-efficient roof on Town Hall.

Recent CCAP implementation measures include the purchase of composting bins for a backyard composting program as the first phase of the Green Neighborhood Initiative. The Town is also working to finalize a phone survey to gather baseline data for CCAP implementation. The survey will ask questions regarding habits of Town residents related to food choices, composting, gardening, and commuting and will be conducted this fall. This baseline data will be used for future benchmarking to track progress of CCAP initiatives, projects, and outreach. Town staff have also worked with the Environmental Advisory Board to revise CCAP goals and are working on several initiatives to promote native plants throughout the Town.

Light-Emitting Diode (LED) Streetlight Conversion

- *Policy Connections:* ECPP Section 2A.

Public Works staff have been working with Duke Energy to implement the LED streetlight conversion. Duke Energy has completed the conversion in several neighborhoods throughout

Town. Public Works staff have been working to address questions from residents and work to find solutions if adjustments to the lights are needed.

The new streetlights will reduce impacts to human health, wildlife, and the night sky when compared to standard LED options. The streetlights will have a color-correlated temperature of 3000K, and were chosen for their warmer, white appearance when compared to the standard LED lights offered by Duke Energy, which have a color-correlated temperature of 4000K. The 3000K LED lights will produce less blue light than the 4000K LED lights and meet American Medical Association (AMA) recommendations and the requirements for the International Dark Sky Association's Fixture Seal of Approval Program.

LED lights will use 40-50% less energy than existing lights. Streetlights make up 19% of municipal greenhouse gas emissions, and the changes in energy use associated with this project will reduce municipal greenhouse gas emissions by approximately 10%.

Energy-Efficiency Upgrades to Town Buildings

- *Policy Connections:* ECPP Section 2.B.ii and CCAP Buildings Recommendation #1: Reduce Emissions Attributed to Carrboro Buildings by 50% by 2025.

Recent upgrades to Town buildings include:

- The installation of a white membrane roof with added insulation on Town Hall is currently ongoing and schedule to be completed soon. White roofs can reduce summer energy use and can lower peak energy demand, saving money and reducing emissions.

Volkswagen (VW) Settlement Phase 1 – Electric Vehicle Charging Stations

- *Policy Connections:* CCAP Transportation Recommendation #1: Reduce Greenhouse Gas Emissions from Motor Vehicle Use by 50% by 2025.

The VW Emissions Mitigation Fund Request for Proposals has not yet been released. Staff will proceed with a funding proposal when the Request for Proposals is released, per the Board's direction in the update on December 4, 2018.

Volkswagen (VW) Settlement Phase 1 – Diesel and Bus Program

- *Policy Connections:* ECPP Section 2.C: Replacement vehicles should be acquired with the goal of minimizing operational costs by replacing vehicles in a timely manner to decrease carbon emissions from the municipal fleet. The ECPP also states that some vehicles could potentially be converted to an alternative fuel.
- *Policy Connections:* CCAP Transportation Recommendation #1: Reduce Greenhouse Gas Emissions from Motor Vehicle Use by 50% by 2025.

The North Carolina Division of Air Quality (NCDAQ) in the North Carolina Department of Environmental Quality (NCDEQ) is soliciting proposal applications for participation in Phase 1 of the NC Volkswagen Mitigation Settlement Program, which was designed to achieve significant reductions in NOx emissions from mobile diesel sources. The grant is a reimbursement program which covers up to 100% of the replacement cost of a vehicle for government use. The grant is contingent on procurement and delivery of new vehicles no later than two years from the date of a signed executed contract with NCDEQ. Grant funding can only be used for purchases made after the date of the signed contract and will not apply to the Town's recent refuse truck purchases. Existing vehicles to be replaced must be rendered permanently inoperable. Grant awards will be announced in fall 2019/winter 2020.

In addition to NOx emissions reductions, projects will be evaluated on the following criteria:

- Cost-effectiveness
- Project location
- Environmental justice
- Additional emissions reductions beyond NOx emissions
- Sustainability
- Timeliness
- Useful life of vehicle to be replaced

The Town will submit a proposal to replace two refuse trucks using this funding source with newer, more-efficient diesel models. The Town will also submit a proposal to replace the Ford F-450 Sign Truck and F-550 Bucket Truck with models that have been converted to run using compressed natural gas (CNG). Purchasing these CNG vehicles will be part of a pilot project for a renewable biogas-to-vehicle fuel collaboration between Orange Water and Sewer Authority (OWASA) and the Town of Carrboro. Public Works staff have also expressed interest in downsizing the refuse truck fleet and will be better able to reach this goal with a fleet of new, reliable vehicles that will require less maintenance.

CCAP Outreach

- *Policy Connections:* CCAP Community Integration Recommendation #2: Community Integration Recommendation #2: Expand Public Partnerships to More Explicitly Consider Climate Action.

An outreach event was held in front of Town Hall on September 21, 2019 to coincide with the Global Climate Strike week. Members of the community and Environmental Advisory Board (EAB) volunteered to help Town staff with set-up, tabling, and CCAP outreach to residents. Volunteers printed and separated the CCAP into individual recommendation sections to allow residents to peruse the interest of their choice. Town staff and volunteers introduced the plan to residents, answered questions, and provided informational handouts. Many visitors to the tables signed up to receive more information on their specific climate action interests. Other community groups participated in the event as well to promote climate action topics such as clean power, native plants, and transportation.

Orange County Climate Council

- *Policy Connections:* CCAP Community Integration Recommendation #2: Community Integration Recommendation #2: Expand Public Partnerships to More Explicitly Consider Climate Action.

Town staff and Alderman Sammy Slade attended the first meeting of the Orange County Climate Council on September 24th, 2019. At the meeting, members established a structure and meeting schedule to clarify the process for convening the Council and setting meeting agendas. Members also discussed the processes and perspectives the Council could use to approach climate issues and actions, and agreed to report back before the next meeting with a summary of current initiatives as well as issues experienced related to climate action projects. Orange County is also pursuing a 2017 county-wide greenhouse gas emissions inventory. Carrboro Town staff will work with County staff to determine whether additional calculations can be made to determine which emissions can be attributed specifically to the Carrboro community in order to update the 2012 community inventory (<https://townofcarrboro.org/DocumentCenter/View/2788/2012-GHG-Emission-Inventory-Final>). The next Council meeting will be held in October 2019 and applications for the at-large resident position on the Council will be open until October 10th.

Invasive Species Volunteer Group

- *Policy Connections:* Ecosystem Recommendation #5: Improve Regulations and Community Capacity to Discourage Invasive Plants and Encourage Native Plants

The CCAP recommends pursuing invasive species removal projects, especially in Town parks and along greenways/bikeways/right-of-ways and states that projects could initially focus on:

1. Vining invasives that threaten urban tree health
2. Species which alter soil pH and outcompete many native grasses and shrubs

In late June 2019, Mayor Lavelle and Town staff met with a Carrboro resident to discuss a proposal to form a volunteer invasive species removal team, and decided to move forward with a focus on Town properties. Staff from the Planning, Recreation and Parks, Public Works, and Finance Departments have met to discuss the logistics of the project. Town staff will hold volunteer invasive species removal days similar to the clean-up events held by Recreation and Parks staff. The events will be held on Town property with supervision by one or more Town staff members to make sure volunteers wear proper protective equipment, are informed of Town property boundaries, and dispose of the plant material in the correct location.

Town staff have identified Wilson Park as the initial site for invasive species removal. Japanese wisteria (*Wisteria floribunda*) is present in large quantities in the area, climbing and weakening the native trees. Volunteers will use hand-held tools such as trowels and garden shears to hand-pull and remove invasive plants such as vines, grass, and shrubs. After finalizing paperwork requirements with finance staff, Town staff will move forward with the project.

In the book, *Drawdown*, edited by Paul Hawken, healthy, biodiverse temperate forests are ranked Number 12 on the list of most effective solutions for climate action based on the amount of greenhouse gas emissions they can sequester and store.

Managed Natural Landscape Ordinance

- *Policy Connections:* Ecosystem Recommendation #5: Improve Regulations and Community Capacity to Discourage Invasive Plants and Encourage Native Plants

A Carrboro resident attended the June 11, 2019 Board of Aldermen meeting to discuss the inconsistency between the native garden in his yard and the Town Code and the Town's commitment to native plants in the CCAP and Bee City USA program. Town staff met with the resident and are currently working to finalize a draft to amend Chapter 11, Article 2, Section 11-8 of the Carrboro Town Code relating to Noxious Growth to allow for managed natural landscapes.

The ordinance will discuss how the establishment and maintenance of managed natural landscapes is beneficial to the Town's environment and its residents and serves to further adopted Town goals and promote public health, safety, and welfare by:

- 1) Promoting microhabitats in urban areas for the conservation of wildlife such as birds, pollinators, and other beneficial insects;
- 2) Creating larger, more connected plant populations, helping ensure the future of native plant species by increasing their ability to migrate in response to changes in climate;
- 3) Conserving water resources by promoting water-efficient landscaping through the use of appropriate native plants which, once established, typically require less water than other species;
- 4) Protecting water quality by reducing the use of fertilizers and other inputs used to maintain landscaping;
- 5) Reducing the negative impacts of landscape maintenance equipment on local air quality and climate change;
- 6) Reducing the financial costs of landscape maintenance;
- 7) Improving stormwater retention and preventing erosion;
- 8) Increasing biodiversity;
- 9) Storing carbon; and
- 10) Meeting goals of Carrboro's Bee City USA commitment to promote healthy, sustainable habitats and communities for bees and other pollinators.

Requirements being explored in the draft ordinance include:

- The prohibition of invasive plant species, turfgrass lawns left unattended for the purpose of returning to a natural state, and vegetation which overhangs public streets or sidewalks in violation of Section 7-2 of the Town Code;
- Framing natural landscapes using setbacks to create a more intentional appearance, keep vegetative growth from entering neighboring property, and maintain sight lines for vehicle and pedestrian travel; and
- Avoiding interference with the requirements of Section 7-7 of the Town Code to mow and properly maintain drainage swales.

Tree Ordinance

- *Policy Connections:* CCAP Ecosystem Recommendation #4: Tree Preservation, Protection and Conservation

At the March 27, 2018 Board of Aldermen meeting, a Public Hearing was held on Land Use Ordinance Amendments relating to tree protection, shade trees, canopy coverage, and replacement

standards. During the Public Hearing, Alderman Haven-O'Donnell suggested that she and Alderman Slade work on language to send to staff and the Board. Town staff recently met with Alderman Haven-O'Donnell and Alderman Slade to discuss the updates to this ordinance and ensure that it reflects the goals in the CCAP. Staff will gather additional information and report back to Board members as discussions continue.

Revising CCAP Goals

- *Policy Connections:* Resolution Requesting Environmental Advisory Board to Advise on an Update to Town's Climate Goals; Recommend Updated Projects in Climate Plans; and Recommend 10 Year Budget Plan for Implementing Climate Action Plans, Broken Down Per Annual Budget Cycle in Time for Consideration in 2020-21 Budget Cycle (June 25, 2019).

On June 25, 2019, the Board of Aldermen passed a Resolution directing the Environmental Advisory Board (EAB) to recommend to the Carrboro Board of Aldermen an update to the carbon reduction goals in the ECPP and CCAP using the town's climate action goal setting standard as defined in the 2009 climate resolution using the latest science on climate justice.

Town staff performed research and provided the EAB with a summary of municipal and community goals from around the country. Staff also provided the EAB with a summary of the Intergovernmental Panel on Climate Change (IPCC) recommendations and a glossary of terms relevant to setting climate action goals, as well as information regarding climate equity and how it can be used to inform these goals.

Table 1. Summary of IPCC Emissions Reduction Goals

	Emissions Reduction Goal	Year
IPCC (2018) - 1.5 Degrees C	45%	2030
	Net-zero	2050
IPCC (2018) - 2 Degrees C	25%	2030
	Net-zero	2070

Table 2. Summary of Climate Equity from IPCC (2018)

Climate Equity	
IPCC: Four key framing asymmetries associated with the conditions of a 1.5°C warmer world (Allen, 2018)	
Differential contributions to the problem	The benefits from industrialization have been unevenly distributed and those who benefited most historically also have contributed most to the current climate problem and so bear greater responsibility (Shue, 2013; McKinnon, 2015; Otto et al., 2017; Skeie et al., 2017).
Differential Impact	The worst impacts tend to fall on those least responsible for the problem, within states, between states, and between generations (Fleurbaey et al., 2014; Shue, 2014; Ionesco et al., 2016).
Asymmetry in Capacity to Shape Solutions and Response Strategies	Asymmetry in capacity to shape solutions and response strategies, such that the worst-affected states, groups, and individuals are not always well represented (Robinson and Shine, 2018).
Asymmetry in future response capacity	Some states, groups, and places are at risk of being left behind as the world progresses to a low-carbon economy (Fleurbaey et al., 2014; Shue, 2014; Humphreys, 2017).

The IPCC Fifth Assessment Report also details five categories of effort-sharing in relation to addressing climate action. Figure 1 and Table 3 show research from Robiou du Pont, et al (2017), found at <http://paris-equity-check.org>, which displays equitable emissions contributions in accordance with these categories. Using Figure 1, the Nationally Determined Contribution (NDC) of each country in the Paris Agreement can be compared with these five categories to determine how well it incorporates different definitions of climate equity.

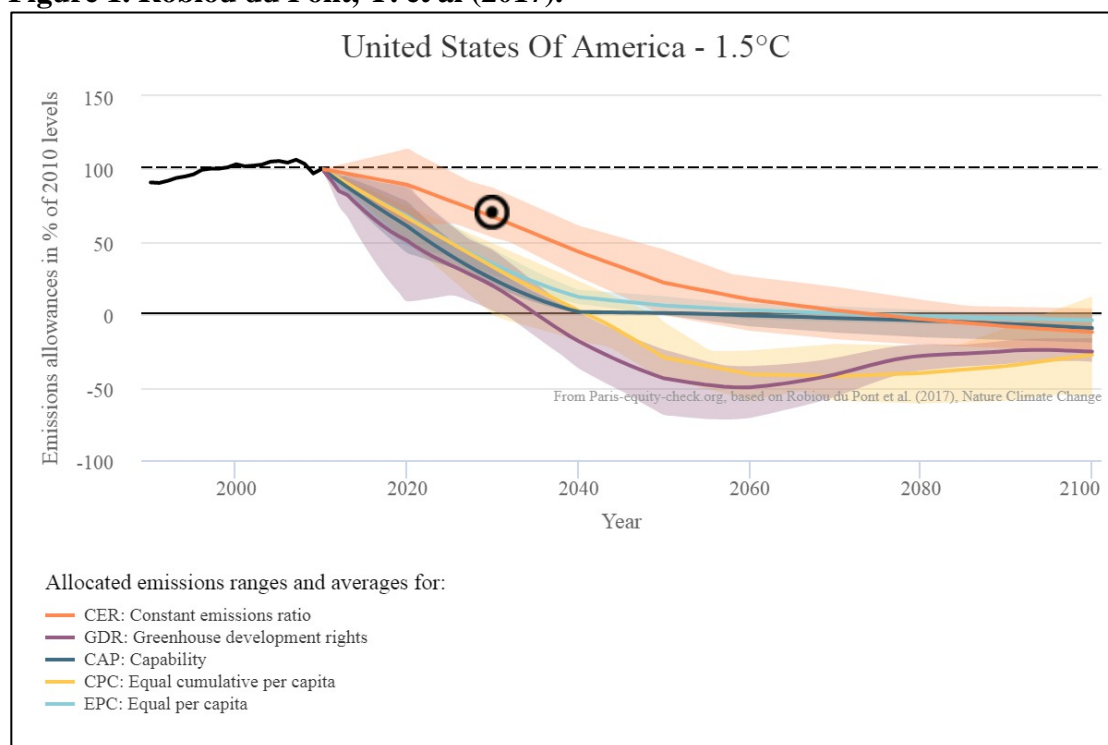





Figure 1. Robiou du Pont, Y. et al (2017).

Table 3. Robiou du Pont, Y. et al (2017).

Allocation name	Code	IPCC category	Allocation characteristics
 Constant emissions ratio	CER	Staged approaches	Maintains current emissions ratios, preserves status quo. This approach, often referred to as 'grandfathering', is generally not considered as an equitable option in climate justice and is not supported as such by any Party.
 Greenhouse Development Rights	GDR	Responsibility-capability-need	Countries with high GDP per capita and high historical emissions per capita have low emissions allocation. This approach preserves a 'right to development' through the allocation of mitigation requirements.
 Capability	CAP	Capability	Countries with high GDP per capita have low emissions allocations.
 Equal cumulative per capita	CPC	Equal cumulative per capita	Populations with high historical emissions have low emissions allocations. This approach allocates to each country total cumulative emissions proportional to its cumulative population over the 1990-2100 period.
 Equal per capita	EPC	Equality	Convergence towards equal annual emissions per person in 2040.

The EAB held a Special Meeting on September 19, 2019. At the meeting, they voted to recommend a change in the CCAP goals to an 80% community reduction of 2010 levels by 2030. Staff will continue working with the EAB to revise ECPP goals and will bring them to the Board of Alderman for approval.

The June 25, 2019 Resolution also directed staff to work with the EAB in developing a 10 year climate emergency budget plan, broken down per yearly budget cycles, for implementing identified projects and meeting the updated climate emergency goals, in time for consideration by the Carrboro Board of Alderman annually beginning in the 2020-21 annual budget cycle.

Town staff have met to discuss a timeline for the climate emergency budget plan and have received input from EAB members. Town staff will continue to refine the ideas with the EAB over the next few months and create a draft climate emergency budget plan by December.

Discussion of Advisory Board Restructuring

On June 25, 2019, a Public Hearing was held on Amendments to the Text of the Land Use Ordinance and the Town Code Relating to Advisory Boards. Staff have held further conversations with the EAB to discuss their role in CCAP implementation. EAB members have prepared a memo which can be shared with the Board of Alderman in a future meeting. Staff have also been considering holding public meetings at regular or key intervals to engage members of the community on CCAP topics.

Green Neighborhoods Phase 1: Backyard Composting

- *Policy Connections:* CCAP Ecosystem Integration Recommendation #3:
Accelerate Efforts to Study and Implement a Comprehensive Organics Collection and Composting Program

The Town anticipates unrolling a backyard composting program as the first phase of the Green Neighborhood Initiative this fall. Through composting promotion, the Town can begin to build communication networks within neighborhoods and between neighborhoods and the Town. These networks can be used to expand public outreach to encourage other emissions reduction initiatives outlined in the CCAP.

Composting improves soil quality, increases soil organic content, enhances water quality by improving infiltration, and decreases methane gas landfill emissions and greenhouse gas emissions from trash pickup.

To encourage composting, the Town has purchased kitchen composting bins and backyard composting bins, which will be offered at a discount to Carrboro residents. The Town Finance Department has discussed the sales with the Town Attorney, and the Town will need a sales tax permit from the state before selling the bins. After these details are finalized and internal protocols are in place, the Town will begin sales of the composting bins.

Multifamily Housing

Town residents who live in rental units will have less ability to compost at home. The Town will need to ensure that these residents have access to participate. The Town will begin by offering discounted kitchen bins to residents of multifamily housing and by promoting the free composting drop-off at the Carrboro Farmers' Market. Next, the Town will pursue a pilot project with a multifamily complex to organize organic waste collection by a composting company such as CompostNow or Brooks Compost.

Public Outreach

Public works staff have updated the Town's composting web pages. The web pages (<http://townofcarrboro.org/2241/Composting>) include information about composting benefits and uses, backyard composting, local composting drop-off, and vermicomposting.

Town staff also worked to write, produce, and film an informational composting video that will be available on the Town website.

Staff have also worked to create a composting brochure and are exploring additional outreach ideas for the Carrboro composting program.

Metrics, Reporting, Evaluating Participation

In order to determine the greenhouse gas emissions reduction based on participation in backyard composting, staff will use the Town's SurveyMonkey subscription.

Staff will create a separate page on the Town website containing a link to the SurveyMonkey reporting form. The reporting form will contain information needed for Town staff to calculate greenhouse gas emissions reduction and to determine participation in each neighborhood, including:

- Number of times kitchen bin is emptied each week
- Estimated percentage of kitchen bin filled with material when emptied
- Approximate percentage of specific categories of organics composted (food waste, yard waste)
- Resident address or nearest intersection

Participants who purchase a composting bin will be asked to report their bin usage to the Town for a specified time period. Staff will calculate greenhouse gas emissions reductions using the EPA's Waste Reduction (WARM) Model.

In the December 4, 2018 Energy and Climate Protection Plan and Community Climate Action Plan Implementation Update, Town staff analyzed multiple composting scenarios using EPA's WARM model. Staff updated the WARM model by removing yard waste components to obtain additional estimates of emissions reduction from different composting scenarios. The average emissions reduction from a composting program was 236.89 MTCDE/year. The analyzed scenarios involved only single-family housing. Promoting composting efforts in multifamily housing will increase the estimated emissions reduction.

Program Expansion

In order to maximize emissions reduction, the Town will need to continue to promote composting beyond backyard efforts. The Town will continue to explore the following options to expand the program:

- Hold discussions with Orange County and Brooks for potential organics drop-off station in Town Hall parking lot
 - Brooks currently collects bins from Town Hall for the Farmers' Market composting initiative with Orange County.
- Hold discussions with local businesses such as restaurants to expand composting through CompostNow, Brooks, or McGill
- Identify local institutions and businesses that generate substantial quantities of food scraps and assess potential for on-site composting
- Explore incentives and grants for businesses and institutions to purchase supplies and equipment to facilitate the organics collection and on-site composting.

The Town has created a preliminary Green Neighborhoods Map. As residents purchase bins and provide address information, the Town will create a heat map showing neighborhoods actively participating in organic waste diversion. An active neighborhood will be chosen for an Every-Other-Week pilot initiative designed by Planning Department and Public Works staff. The heat map will also provide information about the success of composting in rental units and inform Town staff how to modify strategies for greater waste diversion.

The Green Neighborhood initiative will be expanded as composting momentum grows. Town staff will pursue other initiatives outlined in the CCAP, such as promoting home energy efficiency and invasive species management as Green Neighborhoods are formed and communication channels are established.

Community Climate Action Plan Survey

- *Policy Connections:* CCAP Food Choice Recommendation #2: Develop Local Dietary Consumption and Associated GHG Profile

In order to gauge backyard composting progress, the Town has worked to develop a survey to provide statistically-valid data regarding the current composting habits. The survey will provide data for a baseline snapshot of habits related to other CCAP recommendations as well, including food choices, commutes, and gardening. CCAP Food Choice Recommendation #2 involves capturing diet-related greenhouse gas emissions in order to measure progress towards the Town's reduction goal. This baseline data will allow the Town to begin benchmarking and tracking progress towards emissions-reduction goals.

Town staff have revised several drafts of the survey and are working to finalize the questions. A research team will assist Town staff in formatting questions to ensure the results provide the Town with all necessary information.

To complete the survey, a research team will call 400 Carrboro residents over age 18 randomly, and call each number four times if no answer is received. This results in a +/- 5% error rate, the industry standard.

Once the survey begins in fall 2019, it will take 4-6 weeks to complete. A research team will cross-tabulate the data with demographic information to illustrate further trends in residents' habits.

Government Alliance on Race and Equity (GARE)

- *Policy Connections:* CCAP Community Integration Recommendation #7: Integrate Climate Action and Social/Equity Initiatives.

In October 2018, the Town joined the GARE initiative. GARE will provide the Town with tools to integrate consideration of racial equity in decisions, policies, practices, programs, and budgets. The Town has formed a GARE Core Team with representatives from each department who will use GARE toolkits when working to implement climate action initiatives. As a first step in participation, the Town conducted an employee survey to review employee understanding of equity and inclusion.

Staff from the Planning Department will participate in the GARE Equity Core Team, the primary leadership team responsible for designing, coordinating, and organizing racial equity tools across the Town, committed to equitable systems change. The team will also help facilitate training and awareness activities for employees and the community.

Team members have committed to a 12-18 month commitment with up to 40 hours of training. Town staff will use the equity toolkit and GARE training to implement CCAP initiatives.

Municipal Greenhouse Gas Inventory

- *Policy Connections*: ECPP Section 4 (Measurement, Inventory, Assessment, and Reporting). Pursuing these activities will inform actions and stakeholders and create transparency.

Town staff will complete the 2018 Municipal Greenhouse Gas Inventory this fall to continue tracking ECPP implementation progress.

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