

# Cape Cod Climate Action Plan: Energy

# Stakeholder Meeting Summary

Meeting No. 2 (held virtually via Zoom) | November 18, 2020 | 9am-12pm ET

### **MEETING IN BRIEF<sup>1</sup>**

On November 18, 2020, the Cape Cod Commission (Commission) held its second meeting engaging stakeholders on the topic of Energy on Cape Cod to contribute to the development of a Cape Cod Climate Action Plan (CAP). This meeting was the second of three planned meetings with the Energy working group.

The objectives of the second Energy meeting were to:

- Recap Meeting No. 1 and the progress to date on the CAP process
- Review and confirm criteria for use in selecting potential strategies and actions
- Evaluate potential strategies and actions to include in the CAP

This working group will help the Commission develop a plan that addresses the region's contributions to and threats from climate change. After hearing presentations from Commission staff reviewing the proposed CAP purpose Statement, the process to date (particularly the stakeholder meetings that have happened), and the process of gathering the input towards a draft CAP plan, working group participants were split into small groups to discuss the draft framework and draft strategies and actions relevant to Energy.

### To view the full presentation slides, please click <u>here</u>.

## MEETING NO. 1 RECAP AND REFLECTION ON PROCESS TO DATE

Cape Cod Commission Deputy Director, Erin Perry, opened her presentation by providing the working group with the following purpose statement for the Cape Cod CAP:

To identify, study and monitor the causes and consequences of climate change on Cape Cod as a basis to guide and develop science-based policies, strategies and actions that governments, businesses, organizations, and individuals can pursue to:

- improve the region's resilience to climate hazards; and
- mitigate climate change on Cape Cod through reducing net regional greenhouse gas emissions in support of the framework and targets established by the Commonwealth.

Ms. Perry reiterated the various components of the CAP process for the working group noting that there were several pieces that were taking place in parallel with stakeholder

<sup>&</sup>lt;sup>1</sup>For additional detail, please visit the Cape Climate Initiative website: <u>https://www.capecodcommission.org/our-work/climate-change/</u>



engagement, namely the economic impacts modeling and jurisdictional analysis. She noted that these results would be shared with the working group once available.

Ms. Perry then moved to review the stakeholder engagement timeline for the working group members and highlighted the objectives and outcomes of the first meeting. Meeting no. 1 objectives were to discuss what was known about sector contributions to greenhouse gases, vulnerabilities to future climate impacts, and to develop criteria for use in selecting among potential mitigation and adaptation strategies and actions. Meeting no. 1 discussion results were the following:

- Adaptation:
  - Need for affordable housing is an opportunity; development and redevelopment of housing should be in areas away from hazards and include energy efficiency measures and other climate-forward building methods
  - There is an important intersection between local food production, land use, and energy
  - Grid reliability is a concern and consideration should be given to a more dispersed infrastructure
- <u>Mitigation:</u>
  - Responsibility is more personal in this area and changes to individual building energy use must be supported by local and state action; education is needed to adjust expectations and assumptions around reducing energy use
  - There is an opportunity to make the Cape more walkable by increasing density in activity centers
  - Consider alternatives in home heating

Finally, Ms. Perry highlighted that the purpose of meeting no. 2 in this working group series was to begin identifying solutions. Working group members were provided with the opportunity to share key reflections since the first meeting.

Below are working group member questions and comments that followed Ms. Perry's recap presentation. Working group member questions are bolded and answers from the Commission are italicized.

- I think that the purpose statement sounded like a purpose statement for the CAP process, not the action plan itself. Seems like this is about organizing and implementing it.
- It was not clear that the state is already committed to a net-zero outcome.
  - <u>CCC:</u> The process to develop this CAP has a start and end date, but it is building capacity and is all to address the long-term. I understand your comment and once this is included in the plan, there will be a bit more about the roles of the state and local level. We welcome this feedback and will come back to this. Additionally, this purpose statement just references aligning our work with the frameworks/targets established by the Commonwealth. We are waiting for the state to announce new nearer-term targets by end of the year.



- I appreciate the fact that if there are revisions, we will see them again. What is
  the number of surveys going out and is it going to every household? If it is a
  smaller subgroup, how is this determined, and if it is not going out widely,
  could you share the survey questions? I live on the Outer Cape and 25% of the
  population goes to other towns. If the survey is being distributed this way, I'm
  concerned that the Outer/Lower Cape will not get their fair share of surveys.
  We know that 500 would be a lot given the response rate of surveys and this is
  a small subgroup. It would be valuable to have a much wider cross section of
  Barnstable County to gather much more feedback.
  - <u>CCC:</u> This is being done in coordination with the UMass Donahue Institute. What is being sent out is a statistically significant survey (1500 people). They have a scientific method of randomly selecting households and we have requested it is geographically spread among the different sub regions.
- What is the timeline for the economic impact analysis?
  - <u>CCC:</u> We are working with the consultant on this now and will have results early in 2021. The analysis results are intended to inform the CAP.

Following participant comments and questions, CBI Facilitator, Michele Ferenz, reiterated that education was an important piece to be kept in mind at all levels (not just for students). She also noted that the other comments working group members had made regarding issues like transportation were noted, and also that it was key to recognize that the Energy working group had its focus on *one* component of the larger plan with other pieces addressed in other groups that would ultimately fit together into the final CAP.

### **CRITERIA REVIEW**

Commission staff presented the criteria developed from feedback gathered during all four round 1 working group meetings (i.e., Energy, Natural Resources and Working Lands, Housing and Development, and Transportation). During this second meeting of the Energy working group, members were asked to discuss how these criteria could be used to prioritize among actions developed, what the expectations were for using the criteria, and the possibility of linking them to ongoing studies or initiatives that are part of the CAP development process.

The proposed prioritization criteria compiled from all four of the first working group meetings are the following:

Feasibility	Science-based and data-driven actions
	Responsive to context
	Clarity/ease of implementation pathway
Impact	Efficiency/effectiveness of action
	Achievement of multiple public benefits
	Planning for future conditions



	Ability to adapt to changing conditions
	Measurability
Cost	Affordability
Cost	Funding Source
	Meeting the needs of all citizens
Equity	Providing for vulnerable populations
	Who pays?

Regarding these criteria, working group members were polled on the following question to gauge which were receiving the most focus in the moment: *from among these criteria, which three seem the most important to you?* 

The results of this poll were used to spark discussion amongst the working group members about the implementation of these criteria. For this meeting, the most energy was concentrated around two criteria related to feasibility and impact:

- Impact: Efficiency/effectiveness of action
- Feasibility: Science-based and data-driven actions

Working group members were then invited to offer their reactions, comments, and questions. Commission staff reiterated that the CAP process regarding prioritization criteria was still in the brainstorming and idea collection phase. Moreover, that the discovery of a clear path was ongoing.

Following this, participants were asked if they could offer any advice on how to think about and/or apply these criteria. Member questions are bolded and answers from the Cape Cod Commission and/or CBI are italicized.

- If we are trying to mitigate the impacts, what do we understand is going on state-wide/nationally/globally that might hinder us from planning for mitigating actions as we try to implement? Do we understand what impact the Cape can have in terms of GHGs reductions?
  - <u>CCC:</u> One thing we tried to do is develop the GHG inventory in a way that is comparable to the state and the percent relevant to the state in terms of our regional emission vs. state emissions. We are following what is happening at the state/federal level, which is evolving. This could have a number of impacts on how we take action. The legal/jurisdictional analysis is a key piece of understanding we need for supporting the targets at the state/local scale. It will help us understand the appropriate actors for different actions and is something to which we have continuous need to consider/adapt.
- Affordability? Who defines this and is the cost of inaction included? Who defines is relevant both to the action and who the actors are at that level.
  - <u>CCC:</u> We really want to make sure that the cost of inaction is understood and included in the CAP and informs decision-making going forward. We are working



with a consultant to develop that analysis and that is why we identified the noaction scenario. Once this is completed it will be included in the CAP.

# **REVIEW CLIMATE ACTION PLAN STRATEGIES AND ACTIONS FOR ENERGY AND COMMUNITY**

Cape Cod Commission Natural Resources Program Manager, Heather McElroy, gave an introductory presentation to the working group. She provided an overview of the entire draft framework noting the work had been broken down into a total of 5 focus areas, 14 goals, 44 strategies, and 131 actions. She then reviewed the Energy and Community goals and strategies, as well as overarching themes and messages that emerged from the premeeting survey.

The Energy working group had 1 goal, 4 strategies, and 11 actions specific to its focus. Amongst these, those that working group members prioritized for discussion during the second meeting broadly fell into the following three categories:

- Renewable/cleaner energy (including solar)
- Infrastructure including EV charging (batteries and storage)
- Energy conservation\*

\*Energy conservation was identified as missing from the draft strategic framework, and thus an additional focus of the day's discussion.

Following the introductory presentations, for each of these categories, working group members were then broken into small groups for parallel deep dive discussions to review and discuss the specific goals, strategies, and actions connected to these categories.

Those pieces of particular emphasis for the meeting are highlighted below. Working group members were specifically asked to affirm, add to, and/or amend these, in particular to elaborate and brainstorm around the "steps" that might be required to implement these strategies and actions to *achieve* the respective goals. Additionally, and if time permitted, participants were asked to preliminarily identify any key actors who might be necessary to execute successful implementation (these are noted where applicable).

For the full list of DRAFT Energy goals, strategies, actions, and steps used for discussion, please see Appendix B.

Category	Goal	Strategy	Actions
Renewable/cleaner energy (including solar)	Increase the production and use of clean local energy	Generate cleaner energy and greener power	Use clean energy sources in municipal operations* Identify new fuel sources



			Encourage community solar and solar car ports that limit new clearing and loss of sequestered carbon* Identify affordable renewable energy sources Explore potential offshore wind tech jobs, operations center on-Cape
Infrastructure, including EV charging, battery, and storage	Increase the production and use of clean local energy	Modernize and optimize the grid	Support expansion of the EV charging network Support development of storage capability/battery technology Understand potential demand and capacity needs and plan for grid upgrades
	~ Ac	dded Focus ~	upgrades
Energy conservation (identified as a gap in the draft	Reduce GHG emissions from the built	Strive towards Net Zero Energy Buildings; reduce energy consumption in <u>non-residential</u> structures	Ensure new commercial, industrial, and publicly funded construction is built to maximize energy efficiency Retrofit existing commercial, industrial, municipal and other public buildings
strategic framework)	environment	Strive towards Net Zero Energy Buildings; reduce energy consumption in <u>residential</u> buildings	Retrofit existing residential buildings/houses Support Home Energy Scorecards Ensure new residential construction is built to maximize efficiency

### Renewable/cleaner energy (including solar)

Several themes emerged from the discussions across all of the goals, strategies, actions, and steps within the renewable/cleaner energy category. The edits, additions, and amendments group members suggested were, in general, centered around questions



regarding the full life cycle of renewables and how to manage them effectively and efficiently, particularly regarding co-benefits and any possible negative impacts (e.g. health and safety). Participants also expressed the need to ensure affordability and that sustainable and fair pricing was developed for both the commercial and residential uses. Working group members also reiterated the importance of using what already exists, and working to improve upon, prioritize, and maintain those efforts. Participants also noted the importance of communicating and educating the public on these efforts so that there was comprehension of the ongoing efforts, and how individuals might contribute. Working group members requested the continued involvement of existing actors in the renewable/clean energy space (e.g., Cape Light Compact) both as stakeholders, but also as resources for their subject matter expertise. In particular, to contribute to and help with coordinating relevant actions and steps. Furthermore, it was noted that the regulatory environment would need to fit the proposed actions, and to support the existing efforts. Finally, participants highlighted a key concern yet to be addressed as being the tension between increasing need for renewables and decreasing available land.

#### Infrastructure, including EV charging, battery, and storage

Several themes emerged from across the overarching discussion of goals, strategies, actions, and steps within the infrastructure category. The edits, additions, and amendments group members suggested were, in general, centered around accessibility, education, the regulatory environment, and alignment with existing efforts. Working group members noted the importance and necessity of providing access to existing infrastructure like charging stations (e.g., developing an app to locate charging stations). They also highlighted the importance of education about expectations for Cape residents and visitors, noting that illustration of a compelling picture for these best practices would be vital to their success. Working group members further reiterated that ensuring any new actions were building upon what was already being done would be critical. Moreover, that communicating across these efforts was imperative. In conjunction with ensuring alignment across efforts, participants, again, suggested the importance of modernizing existing institutional structures to serve these advancements (e.g., bylaw and regulatory updates), and to do an inventory and/or mapping of possible opportunities (e.g., for solar arrays), for maximum optimization of what is available and feasible.

#### Energy conservation (identified as a gap in the draft strategic framework)

Energy conservation was identified as missing from the broader strategic framework. Commission Natural Resources Program Manager, Heather McElroy, briefly provided some background on where energy conservation had appeared in the framework thus far, and highlighted for example, that it did emerge in housing and development through two pathways related to residential and commercial buildings. She then provided the working group with a couple of actions for consideration and opened up a discussion to the full group to reflect on the presented proposal (see the green section in table above).

Working group members provided the following comments (in bold):

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- I always think about the scope of this and that the emphasis needs to be on existing buildings. There are more than 95K on Cape Cod, and in Sandwich there are 7K+ homes with approximately 11 new homes built per year. We have a huge problem with existing buildings and making them as renewable as possible. I am always impressed with the Cape Light Compact's work on this. In these bullets we are always talking about the new things, but the greatest part of the problem is with existing buildings. There are a lot of old buildings with no insulation and bad windows that should be fixed. I urge you to emphasize making existing buildings energy efficient as Step #1.
- What can be done about the restrictions for adaptations to historic buildings?
  - The bulk of the buildings were built in the 1960s-70s, so most buildings that were built during a time are actually <u>not</u> "historic". The historic commission is very open and liberal towards making energy conservation efforts in historic buildings; Sandwich could be used as a model for the rest of the Cape. As a major part of the problem, if we are trying to stop the sinking boat, this is where the efforts should be made.
- Regarding the goal to reduce GHGs: it should instead be to eliminate them entirely; the strategy should be to strive for net zero GHGs. These actions should ensure new construction is not built to maximum energy efficiency but to net zero emissions. If this is not done, we are taking our eyes off the ball because the goal is to reduce GHGs to zero. If people need to switch the way they heat, the strategy is air source heat pumps and moving away from burning fuel oil to using mini splits. Conservation helps you reduce energy consumption, and our goal is zero GHGs, not net zero energy usage.
- There is a lot of value in having denser cores. But on the Outer Cape, there will be no significant new developments where you could have cluster zoning. We are largely stuck with what we have and how it's been built, as are a lot of other towns on the Cape. We can say we want a denser core, but it is hard to change what has already been built, which is widely spread low-density residential areas.
- We need to go step by step and think through how we get there. I re-insulated my house and I use a lot less energy than before. There are a lot of problems with [retrofitting and re-insulating] and it would be great to figure out how to pay for this (e.g., many homes have issues with asbestos, etc.)
  - Cape Codders already put money into a fund that supports these activities via things like the Cape Light Compact. A lot of the work is able to be set up and paid for through these programs. These programs are actually there in large measure.

#### Full-Group Reflection

Following breakouts, participants were asked to reflect on whether anything was particularly striking from their discussions throughout the day.



Working group members provided the following comments, suggestions, and questions:

- **Data.** We need data on what is being used and installed, which is a role that the Commission could play. They could provide analysis of where and what the building needs are, what population ebb/flow is, scope educational needs for visitors. I am always finding myself wondering, what is all the data behind this and how will that be pulled together?
- Existing Efforts and Accomplishments. An understanding of what has already been happening is missing. A lot of these actions/steps are already happening or have happened, and this should be explored in more detail. We need illustration and communication of the opportunities that we have for energy production and efficiency and that it is all feasible. Regarding the education piece, it needs to be reframed as less daunting, so it is possible to illustrate for our neighbors what we've done so far, the continued potential, and any realistic obstacles
- **Time scales.** A missing piece is discussion of space and the difference between incremental and long-term change. A question to ask is: is it possible to influence the sense that this is an emergency that needs to be dealt with immediately, instead of with traditional incremental solutions? Is it possible to frame energy use as a value proposition (i.e., this is good for the environment and it will save you money) so people will adopt faster?
- **Cost.** It will not be easy, or affordable, for everyone to do this, so it is critical to look at the costs we've incurred, what costs will be coming up in the future, and how can we spread them equitably, which will be challenging. The majority of emissions reductions are due to coal/oil-powered fire generation. Natural gas used to be the fuel of choice, but it is now our single largest source of emissions, and there is no definitive conclusion that we have achieved our 25% reduction by 2020. There is still uncertainty and while some things have been accomplished, the hardest work is not just in the next decade but in the two decades that follow.
- Role of Energy Providers (an example). Eversource feels they would be highly involved with modernizing the grid, what we need to think about is how all these initiatives are going to change the grid (i.e., the distribution grid will need upgrades to accept new energy generation). Our ultimate goal is that the grid is reliable and safe, but we also have significant clean energy goals and cost needs to be considered. It seems like as time goes on, the interaction between this group and our system of planning and distribution engineering will need to have more information to provide back to this group on how everything will work.

#### **PUBLIC COMMENT**

No public comment was made during this meeting.



#### **NEXT STEPS AND WRAP UP**

Deputy Director Erin Perry thanked working group members for their feedback, acknowledging the feat of just one group to brainstorming steps while simultaneously recognizing there are other interrelated goals, strategies, and actions happening in parallel.

Ms. Perry then provided information on next steps, highlighting the Commission team would be taking all of the feedback provided and use it to edit and refine the database for the following meeting. She provided a synopsis of meeting no. 3, previewing that the working group would be next asked to think about structure and focus on implementation and/or partnerships to get to an implementation plan.

Finally, Ms. Perry noted that next steps in the overall CAP process, subsequent to the final round of Stakeholder meetings, would be hold another round of focus groups with participating organizations to bolster implementation capacity for these actions.

The facilitation team closed the meeting by reminding working group members they would likely receive light homework prior to the next call and to reach out with any questions in the interim.



### **APPENDIX A: LIST OF PARTICIPANTS**

First Name	Last Name
Brian	Miner
Chris	Powicki
Dick	Elkin
Francie	Williamson
Gordon	Starr
Jack	McCormack
Johannes	Raatz
Judith	Holt
Kari	Parcell
Lauren	Sinatra
Lee	Burns
Lew	Stern
Lilli-Ann	Green
Liz	Argo
Margaret	Song
Ronit	Goldstein
Ryan	Curly
Steve	Casey
Tom	Wilson
Walter	North



### APPENDIX B: CAPE COD CLIMATE ACTION PLAN GOALS, STRATEGIES, ACTIONS AND STEPS DRAFT

(See next page for handout made available to stakeholders)



# Cape Cod Climate Action Plan Goals, Strategies, Actions and Steps DRAFT

The Cape Cod Climate Action Plan will include goals, strategies, actions, and steps to be taken in implementing the plan. The following list represents a first draft based on literature review, stakeholder input and efforts of the Cape Cod Climate Change Collaborative (which are denoted with \*).



### **GOAL: REDUCE GHG EMISSIONS FROM THE BUILT ENVIRONMENT**

Strategy: Strive towards Net Zero Energy Buildings; reduce energy consumption in non-residential structures

ACTION	STEPS
Ensure new commercial, industrial, and publicly funded construction is built to maximize energy efficiency*	<ul> <li>All Cape communities adopt the Mass stretch building code; includes 3-year updates consistent with requirements of the Green Communities Act</li> <li>Building energy efficiency bylaws/ordinances to establish bench marking, retro-commissioning, and energy audits for new buildings</li> <li>Institute a renewable fuel standard for heating systems</li> <li>Require that new buildings are EV and PV ready</li> <li>Establish new procurement rules for new construction</li> </ul>
Retrofit existing commercial, industrial, municipal and other public buildings*	<ul> <li>Subsidize energy efficient equipment; includes deep retrofits of HVAC, moisture management, appliances</li> <li>Promote smart temperature controls in all municipal (commercial, industrial) buildings*</li> <li>Encourage towns to develop solar PV projects</li> <li>Subsidize energy conservation measures; reducing air leaks, adding insulation, switching to efficient lighting and appliances</li> <li>"Lead by example" in publicly funded buildings</li> <li>Cool roofs, sub-metering</li> <li>Require progressively tighter GHG emissions standards for heating systems</li> </ul>
Expand the <i>Solarize Our Town</i> program to all Cape communities*	Engage Boards of Selectmen and Barnstable Town Council
Accelerate the decarbonization of industrial uses and processes	<ul> <li>Transition to cleaner heating and cooling systems</li> </ul>



### GOAL: REDUCE GHG EMISSIONS FROM THE BUILT ENVIRONMENT (CONT.)

#### Strategy: Strive towards Net Zero Energy Buildings; reduce energy consumption in residential buildings

ACTION	STEPS	
Retrofit existing residential buildings/houses*	<ul> <li>Utilize incentives, rebates, and MassSave to weatherize and improve energy efficiency of residential buildings</li> <li>Replace oil, propane, and gas energy systems with electric heat pumps</li> <li>Address unique considerations of historic homes, both their ability to electrify, and community character concerns</li> </ul>	
Support Home Energy Scorecards	Promote climate-friendly building products	
Ensure new residential construction is	<ul> <li>Advance the design of new homes; promote Passive House principles</li> </ul>	
built to maximize efficiency	<ul> <li>Support training of architects, contractors, builders, building code enforcement officials</li> <li>Support Cape communities in adopting the Mass stretch building code; includes 3-yr updates consistent with requirements of the Green Communities Act</li> </ul>	
Strategy: Promote efficient lar	nd use policies that protect the nature and character of the region	
ACTION	STEPS	
Advance sound land use policies within the Regional Policy Plan (RPP) that promote development within activity centers and reduce sprawl, encourage and reward re-development, and discourage new clearing of forested lands	New zoning, transfer of development rights bylaws See also the actions and steps under the transportation strategy "Encourage more efficient land use patterns"	
GOAL: REDUCE GHG EMI	ISSIONS FROM WASTE MANAGEMENT SYSTEMS	
Strategy: Increase diversion of term	waste from landfills in the short-term; eliminate sending waste to landfills in the long-	
ACTION	STEPS	
Promote building materials reuse	<ul> <li>Promote the reuse of building materials and organizations whose function is collection and reuse of these materials</li> </ul>	



Promote preservation of historic structures	None yet identified	
Reduce plastic consumption	None yet identified	
Enhance recycling programs	<ul> <li>Educate and/or enforce recycling bylaws</li> <li>Create partnerships between non-profits and municipalities to advance recycling (e.g. Take Care Cape Cod)</li> </ul>	
Explore regional waste management and collection agreements	Pay as you throw programs	
Strategy: Reduce landfill emiss	sions	
ACTION	STEPS	
Capture methane	<ul> <li>Reduce the regulatory barriers to capturing and converting methane to energy</li> </ul>	
Strategy: Improve efficiency of wastewater treatment systems		
ACTION	STEPS	
Develop, approve, and fund wastewater treatment plans; collaborate with neighboring communities when appropriate	None yet identified	
Improve operational efficiencies of wastewater treatment facilities	<ul> <li>Utilize U.S. Dept. of Energy's Sustainable Wastewater Infrastructure of the Future (SWIFt) Initiative to improve WWTF energy use; toolkit available</li> </ul>	
Maintain good maintenance practices of plants	None yet identified	



## GOAL: IMPROVE AND ADVANCE THE RESILIENCE OF THE BUILT ENVIRONMENT

#### Strategy: Address vulnerabilities in public infrastructure

ACTION	STEPS	
Explore remedies to state regulatory barriers that delay or prevent solutions to resiliency problems	<ul> <li>Communicate with state agency staff, legislative delegation about regulatory barriers</li> </ul>	
Develop guidance on planning for long- range sea level rise scenarios	None identified yet	
Assess and correct vulnerabilities in utility infrastructure	<ul> <li>Address threats to the electricity distribution network from wildfire, storms, and flooding</li> <li>Address threats to wastewater collection facilities from flooding</li> </ul>	
Conduct vulnerability assessments of municipal facilities	<ul> <li>Assess community shelters and critical facilities</li> <li>Conduct Stormtide pathways analyses where not yet complete (Nantucket Sound shoreline)</li> </ul>	
Strategy: Identify a uniform ap	proach to managing development in coastal resource areas region-wide	
Adopt uniform regulations region-wide to limit new development and redevelopment in the floodplain and vulnerable areas	<ul> <li>Identify best practices for conservation commissions to address properties vulnerable to erosion and/or flooding</li> </ul>	
Develop regional sediment management plans	<ul> <li>Consider nature-based alternatives to address the sediment transport dynamics at vulnerable locations</li> </ul>	
Look at remedies to the challenges of private property ownership in coastal hazard areas	<ul> <li>Investigate legal remedies to coastal private property ownership/management</li> <li>Protect properties using green or nature-based solutions, or buy-out and "undevelop" with willing owners</li> </ul>	
Consider a coastal District of Critical Planning Concern	None identified yet	



# GOAL: IMPROVE AND ADVANCE THE RESILIENCE OF THE BUILT ENVIRONMENT (CONT.)

### Strategy: Retrofit buildings located within climate hazard areas

Elevate buildings	None identified yet		
Floodproof or retrofit buildings to withstand flooding	None identified yet		
Support on-site renewable energy generation	None identified yet		
Strategy: Address vulnerabilitie	es in the road network		
Improve stormwater management through culvert retrofits and other stormwater best management practices	None identified yet		
Assess low-lying roads and take appropriate action	<ul> <li>Protect coastal land, elevate roads, utilize green solutions, or relocate</li> </ul>		
Strategy: Relocate vulnerable l	buildings and structures		
Move buildings and infrastructure out of the floodplain	None identified yet		
Strategy: Ensure regional polic	Strategy: Ensure regional policies promote long-term infrastructure resiliency		
None identified yet	None identified yet		

# GOAL: INCREASE THE PRODUCTION AND USE OF CLEAN LOCAL ENERGY

### Strategy: Generate cleaner energy and greener power

ACTION	STEPS
Facilitate renewable energy investment*	<ul> <li>Encourage community partners to finance and install renewable systems on private facilities</li> <li>Train workers in solar installations and servicing</li> </ul>
Use clean energy sources in municipal operations*	<ul> <li>Support and invest in electric municipal vehicles</li> </ul>
Identify new fuel sources	<ul> <li>Renewable biomethane</li> <li>Investigate potential for combined heat and power generating facilities</li> <li>Hydroelectric power; tidal power</li> </ul>
Encourage community solar and solar car ports that limit new clearing and loss of sequestered carbon*	<ul> <li>Support new renewable energy projects, appropriately sited</li> <li>Develop and adopt model solar bylaws</li> <li>Incentives to generate local/onsite renewable energy</li> </ul>
Decarbonize industrial processes	Ensure use of scrubbers at industrial facilities
ldentify affordable renewable energy sources	<ul> <li>Continue to support bulk clean power purchase agreements</li> <li>Establish energy financing districts; offer renewable energy system financing to small commercial properties</li> </ul>
Explore potential offshore wind tech jobs, operations center on-Cape	Need for workers to service more easterly offshore wind lease areas, with access from Cape Cod

# Strategy: Modernize and optimize the grid

ACTION	STEPS
Support expansion of electric vehicle (EV) charging network*	<ul> <li>Develop options for fully charged EV auto rental service*</li> <li>Develop / support programs to reward tourists for utilizing local EV rentals*</li> <li>Identify locations for new or expanded EV charging infrastructure</li> </ul>
Support development of storage capability/battery technology*	<ul> <li>Promote customer adoption of small-scale storage*</li> <li>Support efforts to demonstrate warranty battery safety and educate planning/permitting agencies*</li> <li>Work to ensure that the electric distribution company, Eversource, does not prevent customers from owning and installing battery storage*</li> </ul>

🖗 Energy	
	<ul> <li>Encourage towns and other municipal organizations to develop storage to pair with their existing solar in order to levelize their electric usage*</li> <li>Utilize EV rental depot for battery storage deployment at utility scaling*</li> </ul>
Understand potential demand and capacity needs and plan for grid upgrades	<ul> <li>Identify potential offshore energy landfalls</li> <li>Understand potential electricity demand with electrification of overall energy demand</li> <li>Understand capacity of existing transmission corridors, substations</li> </ul>

# Strategy: Identify and utilize carbon offsets

ACTION	STEPS
Identify and calculate GHG emissions that are permanently reduced, avoided, or removed (sequestered) from the atmosphere	<ul> <li>Calculate offsets from forests (Cape Cod woodland types), freshwater wetlands and salt marshes</li> </ul>
Strategy: Achieve Green Communities designation in all Cape towns	
None identified yet	None identified yet

# **GOAL: REDUCE EMISSIONS FROM THE TRANSPORTATION SECTOR**

#### Strategy: Reduce vehicle miles traveled

ACTION	STEPS
Improve broadband access across Cape Cod	None identified yet
Support work from home policies	None identified yet
Explore pricing mechanisms that incentivize GHG reduction strategies and funds other strategies	None identified yet

# Strategy: Enhance public transportation, bicycling, walking, and shared transportation options\*

ACTION	STEPS
Encourage carpooling and ridesharing*	None identified yet
Expansion and improvements of park and ride facilities	None identified yet
Improved coordination between modes	None identified yet
Reduce parking standards/requirements	None identified yet
Improve and expand the public transit network	<ul> <li>Expanding routes</li> <li>Expanding service days/hours</li> <li>Increase frequency on busy routes</li> <li>Focus on predictability/reliability</li> </ul>
Expand passenger rail service	<ul> <li>Expanded passenger rail</li> <li>Consider local/light rail service (intra-Cape)</li> </ul>

🛱 Transportation		
Expand and improve the bicyclist and pedestrian network as alternate transportation modes	<ul> <li>Encourage adoption of Complete Streets policies</li> <li>Bike share and rental programs</li> <li>Bicycle infrastructure (including lighting, end-of-trip facilities)</li> <li>Retrofitting existing roads to better accommodate non-motorists</li> <li>Encourage responsible use of electric bicycles</li> <li>Support safe routes to schools efforts</li> </ul>	
Consider new water transportation options	None identified yet	
Strategy: Accelerate the electr	ification of the transportation system*	
ACTION	STEPS	
Support investments in EV infrastructure and programs that incentivize EV adoption, including for Cape visitors*	<ul> <li>Develop programs to reward tourists for utilizing local EV rentals</li> <li>Zoning – encourage EV stations in new/redevelopment</li> <li>Support renewable energy production/battery storage/charging at transportation terminals</li> <li>Additional public EV charging station</li> <li>Support financing options for EV purchases/EV infrastructure</li> </ul>	
Electrify public transit vehicles*	None identified yet	
Electrify vehicle fleets (municipal vehicles, school buses, delivery vehicles, etc.)*	None identified yet	
Electrify ocean-based transport (personal watercraft, commercial fleets, improve dockside infrastructure, etc.)*	<ul> <li>Dockside EV infrastructure</li> <li>Offer incentives like providing a discount on docking fees if you have an electric craft</li> </ul>	
Strategy: Make efficiency impr	Strategy: Make efficiency improvements to the transportation system	
ACTION	STEPS	
Address inefficient traffic signals, upgrades	<ul> <li>Retime/adaptive signals</li> <li>Consider replace with roundabout</li> <li>LED upgrades</li> </ul>	
Address bottleneck locations (congested roadways and intersections)	None identified yet	
Upgrade LED for streetlights	None identified yet	

# ➡ Transportation

Improve the efficiency of freightNone identified yetmovement (including waste) by allmodes (on-road, rail, and waterborne)

#### Strategy: Encourage more efficient land use patterns

ACTION	STEPS
Mix land uses where possible	<ul> <li>Zoning that allows commercial and residential uses in the same area</li> </ul>
Promote infill and adaptive use development	<ul> <li>Density bonuses or increased coverage for developments that are redeveloping or infilling</li> </ul>
Promote Transit Oriented Development (TOD)	None identified yet
Focus Growth in Activity Centers	<ul> <li>Zoning that promotes density in Community Activity Centers (but outside of Special Flood Hazard Areas)</li> </ul>
Consider undevelopment where appropriate	<ul> <li>Zoning that promotes compact multifamily development in walkable areas</li> <li>Buy-out program for vulnerable properties</li> <li>Zoning that minimizes impervious surfaces (allows multi-story buildings) that allows for more natural area for sequestration</li> </ul>

# GOAL: IMPROVE THE RESILIENCE OF THE TRANSPORTATION SYSTEM TO THE IMPACTS OF CLIMATE CHANGE

Strategy: Adapt critical transportation infrastructure for climate change impacts

ACTION	STEPS
Low-lying roads – elevate, relocate, or abandon	None identified yet
Culverts	None identified yet
Bridges	None identified yet
Evacuation routes/potentially disconnected area	None identified yet

# Strategy: Design transportation infrastructure for future conditions

ACTION	STEPS
Redesign for future precipitation/storm patterns	None identified yet
Planning for the impact of increased temperature/heat events	None identified yet

# GOAL: SUPPORT AND PROMOTE PROTECTION, PRESERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

Strategy: Reduce emissions by increasing protected open space, parks, and tree canopy (and assuring local food security)\*

ACTION	STEPS
Maintain and increase parks and open spaces	<ul> <li>Quantify carbon sequestration by forests and wetlands</li> <li>Work with towns and land trusts to increase protected open space</li> <li>Develop new sources of funding for open space and park land acquisitions and maintenance</li> </ul>
Urban reforestation. Plant trees or increase urban tree canopy Reforestation of disturbed areas	<ul> <li>Identify shade-starved areas and support tree planting programs</li> <li>Strategic planting of trees to provide building shading or cooling benefits</li> <li>Creation of parks and green spaces on abandoned or underutilized spaces</li> <li>Work with towns and land trusts to increase parks in activity centers</li> <li>Work with towns and non-profits to increase tree canopy in activity centers</li> <li>Integration of trees as part of LID or stormwater runoff projects</li> <li>Identify disturbed areas suitable for reforestation and support tree-planting programs</li> </ul>
Strategy: Avoid new conversio	
ACTION	STEPS
Avoid forest conversion to non-forest land uses by preventing development sprawl	<ul> <li>TDR bylaws, other changes to zoning to enable this vision</li> <li>Promote compact mixed-use development downtown and in activity centers (where infrastructure can support it)</li> <li>Create incentives to build and infill in activity centers and away from natural areas</li> <li>Invest in infill development, support local and regional policies that make redevelopment more affordable than new development</li> </ul>

# GOAL: SUPPORT AND PROMOTE PROTECTION, PRESERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS (CONT.)

Strategy: Maintain ecosystem diversity, including landscape scale preservation of pine barrens mosaic

ACTION	STEPS
Limit ecosystem stressors by reducing threats such as habitat conversion and fragmentation (i.e. development), invasive species, and airborne and waterborne pollutants	<ul> <li>Prevent the introduction and establishment of invasive species and control existing damaging invasive species</li> <li>Increase monitoring for invasive species (especially at pathways for infestation - trailheads, roads)</li> <li>Control invasive species through physical or chemical treatments</li> <li>Clean equipment prior to activities</li> <li>Education on invasive species identification and notification protocols</li> </ul>
Protect ecosystems of sufficient size	<ul> <li>Expand the boundaries of existing open space</li> <li>ID opportunities to acquire/protect lands adjacent to existing open space</li> </ul>
Protect ecosystems across a range of environmental settings	<ul> <li>Inventory existing and potential protected open space to ID natural communities protected and any lacking protection</li> </ul>
Protect multiple example ecosystems to capture redundancy	<ul> <li>Inventory existing and potential protected open space to ID natural communities protected and those requiring additional examples protected</li> </ul>
Maintain large-scale ecosystem processes and prevent habitat isolation	None identified yet
Embrace adaptive management	<ul> <li>Preserve options for natural adaptation</li> <li>Expect and plan for species losses and gains (i.e. changes in species assemblages)</li> <li>Favor or restore native species that are expected to be adapted to future conditions</li> <li>Establish or encourage new mixes of native species that may be a suitable combination under future conditions</li> <li>Manage for species with wide moisture and temperature tolerances</li> <li>Prompt revegetation of sites following severe disturbance</li> <li>Allow for areas of natural regeneration to test for future-adapted species</li> <li>Support monitoring</li> <li>Public funding and progressive, flexible, and climate-responsive regulations</li> </ul>
Use nature-based adaptation solutions	<ul> <li>Consider soft engineering approaches as alternatives to hard engineering solutions during project planning, design, site plan review, and permitting</li> </ul>

# GOAL: SUPPORT AND PROMOTE PROTECTION, PRESERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS (CONT.)

Strategy: Maintain ecosystem diversity, including landscape scale preservation of pine barrens mosaic (cont.)

ACTION	STEPS
Develop a unified vision or regional plan for collaborative conservation of natural resources	<ul> <li>Use State Wildlife Action Plan, BioMap2, Pine Barrens Green Infrastructure Map, and Mass Wildlife Climate Action Tool as resources for protection and restoration</li> <li>Improved, better integrated, and increasingly coordinated monitoring systems would be helpful to detect, track, and attribute species and habitat shifts to climate change over spatiotemporal scale.</li> </ul>
Remove/reduce environmental review/permitting barriers to restoration projects	<ul> <li>Review/revise state and local regulations</li> <li>Funding coordination</li> <li>Increase technical support</li> <li>Expand public outreach and education</li> </ul>
Strategy: Support and promot	e protection, preservation, and restoration of wetlands and riparian areas
ACTION	STEPS
Protect, restore, and enhance riparian areas (river and associated wetland buffers)	<ul> <li>Restore native communities and ecosystem components (e.g. natural groundcover, litter layer, coarse woody debris) in riparian areas</li> <li>Plant/restore a diversity of tree and plant species</li> <li>Educate property owners on importance of natural buffers, native species</li> <li>Reclaim developed sites and restore or reforest riparian areas</li> </ul>
Protect, restore, and enhance freshwater wetlands, including ponds and lakes	<ul> <li>Update Ponds and Lakes Atlas</li> <li>Widen existing buffers to wetlands</li> <li>Protect/restore vegetation around ponds</li> <li>Avoid chemical/fertilizer use around waterbodies</li> <li>Avoid/reduce sources of land-based pollutant and nutrient loads</li> </ul>
Protect, restore, and enhance salt marshes	ID salt marshes that have greatest landward migration potential and facilitate salt marsh migration
Support continued operation of active cranberry bogs while also preparing for retirement of bogs	<ul> <li>ID bogs with wetland restoration potential and with high upland habitat connectivity value</li> <li>Reduce or eliminate agricultural drainage improvements near wetlands</li> </ul>

# GOAL: SUPPORT AND PROMOTE PROTECTION, PRESERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS (CONT.)

#### Strategy: Support and promote protection, preservation, and restoration of habitat connectivity

ACTION	STEPS
Construct, retrofit, or replace crossing structures for wildlife passage	<ul> <li>ID key sites for connectivity improvements</li> <li>Plan, design and build for future conditions</li> </ul>
Reduce landscape fragmentation and maintain/create habitat corridors	ID opportunities to connect existing open space parcels and acquire/protect these connections

#### Strategy: Protect water quality and quantity

ACTION	STEPS
Restore natural hydrology	<ul> <li>Remove remnant hydrological modifications</li> </ul>
Incorporate natural or low impact development into designs	<ul> <li>Direct runoff into natural features</li> <li>Use low impact designs such as permeable paving</li> </ul>
Protect drinking water supply	<ul> <li>Protect/acquire lands in Zone IIs</li> <li>Limit development activities in Zone IIs</li> </ul>
Plan for and design "shovel-ready" projects that achieve restoration and water quality goals	<ul> <li>Align planning, design, permitting, and construction of water quality restoration projects</li> </ul>

### GOAL: INCREASE CARBON SEQUESTRATION IN THE NATURAL ENVIRONMENT

#### Strategy: Increase carbon storage and sequestration in soils

ACTION	STEPS
Improve soil management techniques	<ul> <li>Minimize soil disturbance by avoiding or reducing grading for development or tillage for planting, weed control, or other purposes</li> <li>Avoid/reduce fertilizer and pesticide use</li> <li>Use fertilizers, pesticides and other soil amendments more efficiently</li> <li>Use compost</li> <li>Use soil cover (mulch, cover crop) to conserve soil moisture and reduce soil temperatures</li> <li>Incorporate ruminant grazing</li> <li>Reduce topsoil erosion</li> </ul>



# GOAL: INCREASE CARBON SEQUESTRATION IN THE NATURAL ENVIRONMENT (CONT.)

### Strategy: Enhance carbon storage/sequestration in forests

ACTION	STEPS
Protect and restore trees and forests	<ul> <li>Maintain vegetation or revegetate disturbed areas</li> <li>Retain large diameter trees</li> <li>ID areas with high carbon stocks and prioritize protection of these</li> </ul>
Keep natural lands intact*	<ul> <li>Set high fees for conversion of intact landscapes</li> <li>Protect forested land through deed/conservation restrictions</li> <li>Prioritize large, unfragmented forest patches for avoidance of disturbance or protection</li> <li>ID and reforest lands that have been deforested</li> </ul>
Support forest management to protect healthy forests and reduce wildfire threat and severity	<ul> <li>Forest thinning</li> <li>Establish and maintain fuel breaks</li> <li>Prescribed fires</li> </ul>
Strategy: Increase carbon stor	age in blue carbon ecosystems
ACTION	STEPS
Protect/restore wetlands (in particular salt marshes)*	None identified yet
Make room for salt marsh migration (landward)	None identified yet
Consider seaweed aquaculture as a decarbonization method	None identified yet

# GOAL: PROTECT THE ABILITY OF WORKING LANDS AND WATERS TO PROVIDE ESSENTIAL SOCIAL AND ECONOMIC SERVICES WHILE PROTECTING THE ENVIRONMENT

#### Strategy: Support sustainable and resilient working lands

ACTION	STEPS
Increase agriculture activities	<ul> <li>Incentivize local food production</li> <li>Address Community Supported Agriculture (CSAs) disappearing - labor challenges</li> <li>Update farmland current use taxation program (Ch61A) to further support agricultural activities</li> <li>Support local food production though infrastructure and policy (e.g. right to farm bylaws)</li> <li>ID areas/parcels with prime agriculture soil and encourage/zone it for agriculture</li> </ul>
Protect water quality and quantity from agricultural activities	<ul> <li>Reassess nutrient applications and ensure that use of organic materials, fertilizers, amendments, and all sources of nutrients is matched to changing climate conditions</li> <li>Reassess pesticide risk and ensure that all pesticide applications consider changing climate conditions</li> <li>Avoid/reduce irrigation or increase irrigation efficiencies</li> </ul>
Reduce crop stressors	<ul> <li>Enhance use of integrated pest management</li> <li>Use of varieties and species resistant to heat, drought, flash floods, pests, and diseases</li> <li>Altering crop rotations</li> <li>Monitor for and eradicate noxious weeds</li> </ul>
Reduce risks from warmer and drier conditions by adjusting agricultural practices	<ul> <li>Adjust timing of planting and other operations to account for longer growing season and altered conditions</li> </ul>
Manage farms and fields as part of a larger ecosystem, promoting biological diversity through the landscape	<ul> <li>Maintain or restore natural ecosystems</li> <li>Promote biological diversity across the landscape</li> <li>Enhance landscape connectivity</li> </ul>
Alter agriculture management to accommodate expected future conditions	<ul> <li>Diversification - add additional farming activities or new commodities</li> <li>Switch to commodities expected to be better suited to future conditions (e.g. new cultivars/species that match a changing climate, more water-efficient crops)</li> <li>Add and/or remove lands to agricultural production as lands become more or less suitable for agriculture</li> <li>Upgrade to more energy efficient equipment and/or integrate on-farm renewable energy generation</li> </ul>

# GOAL: PROTECT THE ABILITY OF WORKING LANDS AND WATERS TO PROVIDE ESSENTIAL SOCIAL AND ECONOMIC SERVICES WHILE PROTECTING THE ENVIRONMENT (CONT.)

#### Strategy: Support the fishing industry through transitions created by climate change

ACTION	STEPS
Increase the public's demand for "emerging" seafood varieties (e.g. dogfish, shellfish varieties)	<ul> <li>Assist with marketing and educating the public on alternative seafood products (e.g. dogfish, shellfish varieties)</li> </ul>
Expand research, data access, and forecasting of fisheries trends	<ul> <li>Support research into local ocean acidification trends</li> <li>Keep tabs on ocean acidification and impacts on shellfish</li> <li>Data access to support long-range planning and capital projects</li> </ul>
Restore native shellfishing areas	None identified yet
Protect harbor and fishing access infrastructure	<ul> <li>Zoning changes to protect maritime access and industries</li> </ul>
Strategy: Promote local and re mitigate the impacts of climat	egional recognition of the importance of natural resources and working lands to se change
ACTION	STEPS
Adopt municipal statements or policies about the contribution of natural resources and working lands to mitigate the effects and causes of climate change	None identified yet

# GOAL: IMPROVE BROAD PUBLIC KNOWLEDGE AND UNDERSTANDING OF CLIMATE CHANGE IMPACTS AND PROGRAMS

#### Strategy: Increase education and communications about climate change mitigation options

Community

ACTION	STEPS
Identify the legal framework that towns and other actors must work within (consider how to reach vulnerable populations)	<ul> <li>Identify how information flows through neighborhoods, how to reach vulnerable populations</li> </ul>
Provide guidance for communities that help prioritize actions to reduce greenhouse gas emissions	None identified yet
Improve communication between municipalities	None identified yet
Develop curriculum and hands-on programming for students of all ages to become informed about climate change and the actions available to address it*	<ul> <li>Engage students and faculty (high school and college) in the development of curriculum. Include department of education to change curriculum.</li> <li>Widely distribute the Climate Action Plan in print and other media; include town halls, libraries, bookstores, Chambers of Commerce, etc.</li> </ul>
Provide information about the impact that eating a plant-based diet can have on personal greenhouse gas emissions	<ul> <li>Vendor fairs, lectures, peer influence (climate influencers)</li> </ul>
Identify individual actions or lifestyle choices that individuals can take; provide that information as guidance	<ul> <li>Utilize the Climate Action Networks to distribute information</li> </ul>
Identify and distribute a GHG calculator to assess emissions associated with personal travel, consumption choices, etc.	None identified yet
Strategy: Increase education and communications about climate change adaptation options	
ACTION	STEPS
None identified yet	None identified yet

# GOAL: ACCELERATE ADOPTION OF EMISSIONS REDUCTION STRATEGIES AND ACTIONS ACROSS REGIONAL AND LOCAL GOVERNMENTS

Strategy: Where suitable, identify and adopt regional goals and policies that help advance mitigation strategies and actions

ACTION	STEPS
Adopt a goal in the Regional Policy Plan (RPP) to advance the Commonwealth's greenhouse gas reduction goals	None identified yet
Adopt a new performance measure in the RPP that tracks progress on greenhouse gas emissions	None identified yet
Adopt objectives in the RPP to promote low carbon transportation alternatives, low carbon technologies for building heating and cooling, to promote carbon sequestration through land use practices, and to promote low carbon energy generation	None identified yet
Amend existing technical guidance to advance net or near zero construction methods and elements, including solar considerations*	None identified yet
Develop technical guidance to support the new RPP goal and objectives	<ul> <li>Develop technical guidance on Net or Near- Zero construction; alternate fuel sources and HVAC systems; Electric vehicles including transit; bike and pedestrian networks; means for preventing the reduction of, and promoting new carbon sequestration</li> </ul>
Strategy: Create mandates for municipal mitigation actions	
ACTION	STEPS
None identified yet	None identified yet



# Strategy: Increase capacity within municipal staffs; provide outside technical assistance

ACTION	STEPS
Increase technical assistance capacity within regional organizations to support local governments (develop model bylaws, regulations, and policies)	<ul> <li>Develop model bylaws, regulations, and policies to assist local governments</li> </ul>
Create and fund new staff positions within municipal government to advance climate change actions	None identified yet
Provide grant-writing assistance	None identified yet
Strategy: Identify more granular, town-specific data of GHG emissions         ACTION       STEPS	
Request legislative change to mandate provision of fuel use data at municipal level	None identified yet
GOAL: ENSURE THE HEA SOLUTIONS	LTH, SAFETY, AND EQUITABILITY OF MITIGATION AND ADAPTATION
Strategy: Assess opportunities for green economy to create jobs with livable wages	
ACTION	STEPS



# GOAL: ESTABLISH STRATEGIC PARTNERSHIPS TO ADVANCE SHARED GOALS

# Strategy: Foster collaborations between levels of government

ACTION	STEPS
Look at opportunities to combine road retrofits with new utility installations (e.g. wastewater when addressing sea level rise or flooding)	None identified yet
Strategy: Foster collaborations between the public and private sectors*	
ACTION	STEPS
Identify opportunities for strategic partnerships to advance common goals or objectives	None identified yet