

Climate Action Plan



STAKEHOLDER WORKING GROUP
NATURAL RESOURCES AND WORKING LANDS - 12/15/2020

Meeting Objectives

- Recap Meeting 2 and progress to date
- Review revisions to strategies, actions, and steps to include in the Cape Cod Climate Action Plan
- Identify and discuss potential actors to lead on key actions and steps, in light of the legal and jurisdictional analysis
- Identify and discuss appropriate performance measures for assessing progress on our actions.
- Discuss next steps

Meeting Agenda

- 1:00** Welcome and Introductions
- 1:10** Recap and Reflect on the Process to Date
- 1:15** Review Updated Action Plan
- 2:00** Identify Key Actors
- Small Groups**
- 3:10** Break
- 3:20** Identify Performance Measures
- 3:40** Public Comment & Next Steps

MEETING GROUND RULES

- Attend all meetings and participate actively in discussions.
- Come prepared having read any draft materials in advance of our meetings and having responded to any facilitator's requests.
- Engage in respectful and constructive dialogue with other participants and seek creative solutions that respond to the interests of your own, as well as others', viewpoints.
- Represent and articulate the diverse range of interests and concerns of the constituencies you represent.
- Seek input from constituents, friends and neighbors, and keep them informed about the discussions and proceedings of the meetings.

A photograph of a marsh landscape with tall, green grasses and a small body of water. The scene is captured in a soft, golden light, likely during sunrise or sunset. The grasses are dense and reach up to the water level. The water is calm and reflects the surrounding greenery.

Cape Cod Climate Action Plan



Stakeholder Process Update



Cape Cod Climate Action Plan

PURPOSE STATEMENT

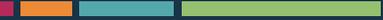
- To identify, study and monitor the causes and consequences of climate change on Cape Cod as a basis to guide and develop science-based policies, strategies and actions that governments, businesses, organizations, and individuals can pursue to:
 - improve the region's resilience to climate hazards;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





Cape Cod Climate Action Plan





Working Group Meeting Series

MEETING 1

OCTOBER

Understanding
Problems



MEETING 2

NOVEMBER

Identifying
Solutions



MEETING 3

DECEMBER

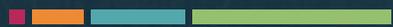
Taking
Action

CLARIFYING QUESTIONS



A photograph of a marsh landscape with tall, green grasses and a small body of water. The scene is captured in a soft, golden light, likely during sunrise or sunset. The grasses are dense and reach varying heights, with some showing signs of being cut or broken. The water is calm and reflects the surrounding greenery and the warm light of the sky.

Cape Cod Climate Action Plan



Updated Action Plan

5

FOCUS
AREAS

14

GOALS

44

STRATEGIES

130

ACTIONS

Refined with Stakeholder Input

CROSS-SECTOR STAKEHOLDER MEETING

December 10th

Objective

Identify opportunities for advancing climate actions that support multiple regional priorities

- Make existing incentives to improve energy efficiency more accessible to all residents
- Balance provision of home efficiency data for homebuyers with financial impacts to sellers
- Recoup energy savings for affordable housing projects
- Build in efficiency measures as priorities in publicly funded projects, not expendable options, to serve as examples for others
- Develop strategies for coordinating solar projects with design and community character considerations
- Identify opportunities to ease regulatory barriers for solar projects where appropriate
- Communicate competing values and highlight importance of shifting values and tradeoffs



Natural Resources and Working Lands

3

GOALS

12

STRATEGIES

41

ACTIONS

STAKEHOLDER WORKING GROUPS

Meeting 2

Potential strategies and actions

Natural Resources & Working Lands

Themes for discussion and suggested edits and additions

- **Coastal Resilience**
 - Public education on the value of wetlands/riparian areas
 - Mapping existing saltmarshes/wetlands
 - Emphasis put on connecting the CAP to existing efforts
- **Open Space**
 - Homeowner education and broad information sharing
 - Mapping of current protected/unprotected open space
 - Relevant regulatory changes or bylaw updates
- **Land Management**
 - Public information
 - Increase cooperation through cross-agency information sharing
 - Inventory of existing processes and habitats that contribute to natural adaptation

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

- 1.1. Strategy: Reduce emissions by increasing protected open space, parks, and tree canopy
- 1.2. Strategy: Avoid new conversion of land uses*
- 1.3. Strategy: Maintain ecosystem diversity, including conservation of the natural communities within the Pine Barrens ecoregion
- 1.4. Strategy: Support and promote protection, preservation, and restoration of wetlands and riparian areas
- 1.5. Strategy: Support and promote protection, preservation, and restoration of habitat connectivity
- 1.6. Strategy: Protect water quality and quantity

2. GOAL: INCREASE CARBON SEQUESTRATION IN THE NATURAL ENVIRONMENT

- 2.1. Strategy: Increase carbon storage and sequestration in soils
- 2.2. Strategy: Enhance carbon storage/sequestration in forests
- 2.3. Strategy: Increase carbon storage in blue carbon ecosystems

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

- 3.1. Strategy: Support sustainable and resilient working lands
- 3.2. Strategy: Support the fishing industry through transitions created by climate change
- 3.3. Strategy: Promote local and regional recognition of the importance of natural resources and working lands to mitigate the impacts of climate change

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

1.1. Strategy: Reduce emissions by increasing protected open space, parks, and tree canopy

ACTION	STEPS
1.1.1. Maintain and increase parks and open spaces	<ul style="list-style-type: none"> ■ Work with towns and land trusts to increase protected open space with public access wherever appropriate ■ Develop new sources of funding for open space and park land acquisitions and maintenance <i>[state]</i> ■ Identify new ways to protect open space (ex. regulations or TDR incentives) <i>[CCC, state]</i> ■ Identify/map remaining areas available for protection and prioritize what is to be protected; Inventory/map areas that have been protected, what is available for protection, where open space is missing <i>[CCC, APCC, land trusts]</i> ■ Quantify the tree canopy in residential areas and identify strategies to preserve that existing tree canopy ■ Provide education on the importance/benefits of the tree canopy ■ Create regulations for limiting new clearing and grading <i>[CCC, towns]</i> ■ Educate the public about the benefits of open space

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

1.4. Strategy: Support and promote protection, preservation, and restoration of wetlands and riparian areas

ACTION	STEPS
1.4.3. Protect, restore, and enhance salt marshes	<ul style="list-style-type: none"> ■ Prioritize protection of salt marshes over restoration ■ Identify salt marshes that have greatest landward migration potential, and those that do not due to human infrastructure. Facilitate salt marsh migration ■ Expand Pleasant Bay Alliance study of which salt marshes across the Cape are most likely to benefit from a resiliency program (using LIDAR) <i>[Pleasant Bay Alliance, CCC, Cooperative Extension]</i> ■ Promote better surface water management to reduce runoff and degradation to help marshes and coastal habitats ■ Identify locations where culverts can be improved to allow for better tidal flushing ■ Develop coastal zoning regulations that provide room for marshes to retreat <i>[CCC, towns]</i> ■ Promote living shorelines where erosion control is needed to allow for salt marsh migration and disincentivize coastal armoring ■ Provide education about living shorelines and alternatives to coastal armoring ■ Mitigation banking to provide funding for green infrastructure (e.g. Chatham) ■ Marsh resilience toolkits for the Northeast ■ Identify or score salt marshes based on overall resilience (not just ability to migrate) ■ Educate the public about the importance of salt marshes for fisheries ■ Promote shoreline management strategies to sustain natural coastal resource processes

2. GOAL: INCREASE CARBON SEQUESTRATION IN THE NATURAL ENVIRONMENT

2.3. Strategy: Increase carbon storage in blue carbon ecosystems

ACTION	STEPS
2.3.1. Protect/restore wetlands (in particular salt marshes) and preserve wetland functions	<ul style="list-style-type: none"> ■ Identify means for calculating the carbon sequestration value of the Cape’s salt marshes and other wetlands [CCC] ■ Provide public education on the importance of salt marshes and how those ecosystems work, including ways property owners can help protect and restore salt marshes on their property ■ Inventory salt marsh locations and identify their specific threats (ex. sea level rise, storm impacts) ■ Support Conservation Commissions in incorporating climate change into wetlands bylaws and regulations
2.3.2. Make room for salt marsh migration (landward)	<ul style="list-style-type: none"> ■ Provide public education on the need for space to allow for salt marsh migration ■ Conduct cost/benefit analysis of thin layer deposition to support salt marsh resilience
2.3.3. Consider seaweed aquaculture as a decarbonization method	<i>None identified yet</i>

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

1.3. Strategy: Maintain ecosystem diversity, including conservation of the natural communities within the Pine Barrens ecoregion

ACTION	STEPS
1.3.9. Remove/reduce environmental review/permitting barriers to restoration projects	<ul style="list-style-type: none">■ Review/revise state and local regulations <i>[state]</i>■ Coordinate funding■ Increase technical support■ Expand public outreach and education

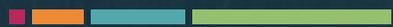
Questions



Discussion

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Cape Cod Climate Action Plan



Key Actors

GOVERNMENTAL ACTORS



Federal



State



Regional



Local

PUBLIC NGO ACTORS



Advocacy Orgs



Researchers

PRIVATE ACTORS



Businesses



Individuals



Federal

Governmental
Actors and
Example Actions

EXAMPLES

- **Establish Efficiency Standards for Appliances**
- **Set Renewable Fuel & Fuel Efficiency Standards**
 - Local/other subdivisions of government may not adopt more stringent fuel efficiency standards
- **Provide Financial Incentives**
 - Fed. Income tax Credit - up to \$7500/purchase of new all electric/plug in vehicles



State

Governmental
Actors and
Example Actions

EXAMPLES

- **Establish GHG Reduction Targets**
 - “Net Zero” by 2050 - Global Warming Solutions Act (GWSA)
 - Obligations to implement GWSA rest with state agencies and a limited number of industries
- **Address GHG Emissions through Project Review**
 - Massachusetts Environmental Policy Act - Projects must quantify emissions; identify measures to avoid, minimize and mitigate; evaluate alternatives to lower emissions; and quantify emissions and energy savings of mitigation measures.
- **Establish Energy Efficiency Provisions through Building Code**
 - Municipalities may adopt more stringent “Stretch Code”



Regional

Governmental
Actors and
Example Actions

EXAMPLES

- **Adopt goals and policies that support the Commonwealth's targets**
- **Adopt enhanced GHG emissions and climate impact modeling and reporting requirements for development project applicants**
- **Support municipal efforts to adopt zoning, development-related bylaws and other local regulations that minimize GHG emissions**
- **Support adoption of the Stretch Energy Code at the local level**
- **Identify opportunities for County government to implement GHG reduction measures with respect to County-owned capital facilities and assets**
- **Provide technical assistance for municipalities and private sector to undertake GHG emissions reduction measures**



Local

Governmental Actors and Example Actions

EXAMPLES

- **Adopt goals and policies that support the Commonwealth's targets**
 - Often non-binding format versus creating a law with enforceable targets
- **Become a designated Green Community**
 - Adopt the "Stretch Code"
 - Allow as-of-right siting for renewable/alternative energy generating, R&D or manufacturing in designated areas
 - Calculate municipal energy use, create a baseline, and adopt a plan to reduce energy use by 20% within five years;
 - Purchase fuel-efficient vehicles for municipal use, to the extent commercially available and practicable
- **Prioritize emissions reductions through project review**
 - Adopt local regulations, such as requiring project to demonstrate compliance with "LEED" green building rating systems and to complete a Climate Resiliency checklist

GOVERNMENTAL ACTORS



Federal



State



Regional



Local

PUBLIC NGO ACTORS



Advocacy Orgs



Researchers

PRIVATE ACTORS



Businesses



Individuals

CLARIFYING QUESTIONS



SMALL GROUPS



NGOs
Scientists/Researchers
Key Opportunities for Private Actors

BREAK



Return at 3:17

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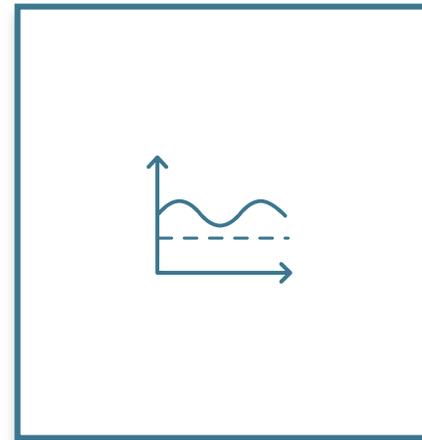
Cape Cod Climate Action Plan



Performance Measures

PERFORMANCE MEASURES – PRINCIPLES

- Measuring long-term progress while tracking shorter-term implementation
- Informed by the GHG inventory
- Measurable over time
- Linked to other regional plans and initiatives



GHG Inventory
sets the baseline to
measure emissions
going forward



Create quantifiable
**performance
measures**

PERFORMANCE MEASURES – EXISTING TRACKING



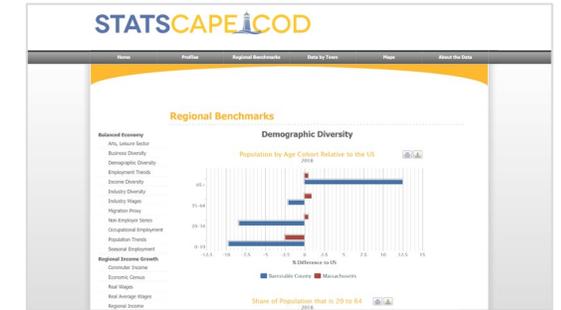
Regional Policy Plan (RPP)



Comprehensive Economic Development Strategy (CEDS)



Regional Transportation Plan (RTP)



Stats Cape Cod



Cape Cod Climate Action Plan

PURPOSE STATEMENT

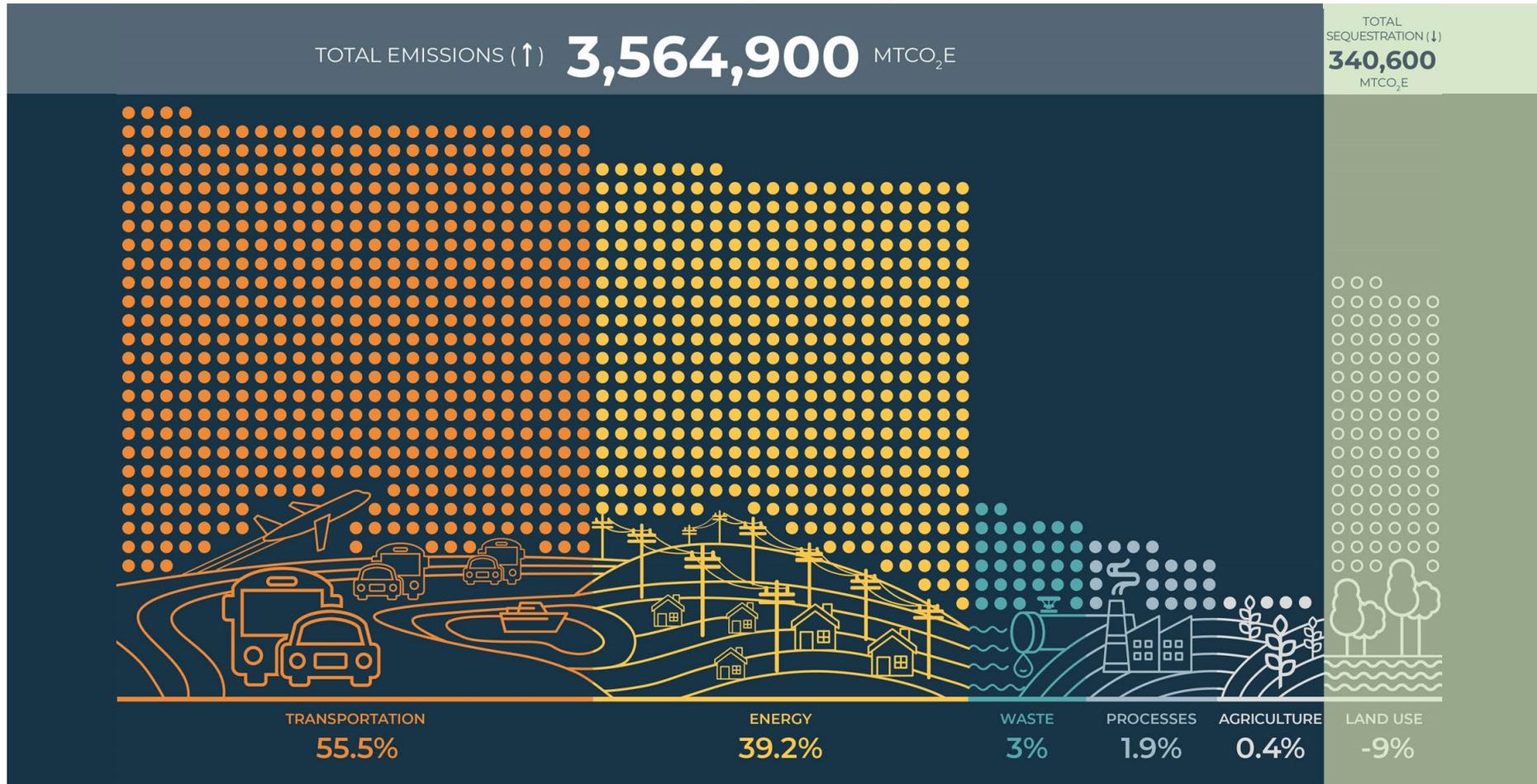
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 - improve the **region's resilience to climate hazards**; and
 - mitigate climate change on Cape Cod through reducing **net regional greenhouse gas emissions** in support of the framework and targets established by the Commonwealth.

PERFORMANCE MEASURES – REGIONAL GHG EMISSIONS

TOTAL NET EMISSIONS **3,224,300** MTCO₂E

TOTAL EMISSIONS (↑) **3,564,900** MTCO₂E

TOTAL SEQUESTRATION (↓)
340,600
MTCO₂E



PERFORMANCE MEASURES – FOCUS AREAS



**Housing and
Development**



Energy



Transportation



**Natural
Resources and
Working Lands**



Community

GOAL

Reduce GHG emissions from the built environment

PERFORMANCE MEASURES

Percent of homes/businesses heated by electricity

- New construction with electric heat **(New)**
- Homes/businesses converted to heat pumps **(New)**

Percent of homes/businesses with improved energy efficiency

- Homes/businesses receiving weatherization assistance **(New)**
- Number of new homes/businesses receiving a specific HERS rating **(New)**

Smart/Green Development Indicators

- Housing density in community Activity Centers
- Ratio of new development inside and outside of Community Activity Centers
- Number of housing units located within ½ mile of transit
- Number of Communities with Complete Streets Programs
- New zoning adopted that supports mixed use and/or multifamily development **(New)**

GOAL

Reduce GHG emissions from waste management systems

PERFORMANCE MEASURES

Tons of waste per capita sent shipped off-Cape to:

- Landfill
- Incinerator
- Recycling **(New)**

GOAL

Improve and advance the resilience of the built environment

PERFORMANCE MEASURES

Indicators of resiliency of built environment

- Number of up-to-date Hazard Mitigation Plans **(New)**
- Number of homes/businesses in the floodplain
- Number of new developed lots and expansion of footprints in the floodplain
- Land developed and land protected within FEMA A and V zones
- Number of homes/businesses with resiliency measures in place **(New)**
- Number of green infrastructure projects **(New)**
- Miles of utilities placed underground

GOAL

Reduce emissions from the transportation sector

PERFORMANCE MEASURES

Percent of vehicles powered by electricity

- Percent of new vehicle purchases that are EVs **(New)**
- Number of EVs
- Number of EVs in municipal fleets
- EV charging stations

Reduction in vehicle miles traveled

- Percent of trips by transit, bicycling, and walking
- Public transit ridership
- Population within a ½ mile of fixed route transit service
- Miles of sidewalks, multiuse paths, and bike lanes
- Parcels connected to the sidewalk network
- Percent of signalized intersections with pedestrian signal heads
- Homes/businesses connected to broadband **(New)**

GOAL

Improve the resilience of the transportation system to the impacts of climate change

PERFORMANCE MEASURES

Indicators of resiliency of built environment

- Low lying road segments remediated **(New)**
- Culverts replaced **(New)**
- Stormwater projects implemented **(New)**

GOAL

Increase the production and use of clean energy

PERFORMANCE MEASURES

Percent of electricity from green sources

- Percent of electricity from non-utility scale, distributed sources
- MW of solar energy generation on Cape Cod (non-roof generation) **(New)**

GOAL

Support and promote protection, preservation, and restoration of natural ecosystems

PERFORMANCE MEASURES

Indicators of conservation and resiliency of the natural environment

- Acres of BioMap 2 Core Habitat and Critical Natural Landscapes protected
- Number of green infrastructure projects designed and/or implemented **(New)**
- Funding secured for restoration projects **(New)**

GOAL

Increase carbon sequestration in the natural environment

PERFORMANCE MEASURES

Indicators of natural sequestration ability

- Acres of open space preserved
- Number new parks created **(New)**
- Acres of upland habitat restored **(New)**
- Acres of salt marsh restored or allowed to migrate **(New)**

GOAL

Protect the ability of working lands and waters to provide essential social and economic services while protecting the environment

PERFORMANCE MEASURES

Indicators of resiliency of built environment

- Acres of agricultural lands **(New)**
- Number of farmers markets **(New)**
- Acres of aquaculture lease areas **(New)**
- Harbors with commercial fishing activity **(New)**
- Number of active fishing boats on Cape Cod

PERFORMANCE MEASURES – DRAFT KEY MEASURES



% of Homes/Business Heated by Electricity



% of Electricity from Renewable Sources



% of Vehicles Powered by Electricity



**Acres of open space preserved
(sequestration indicator)**



**Equity Considerations/
Balance with other Regional Priorities**

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Cape Cod Climate Action Plan



Next Steps



ECONOMIC IMPACTS
OF CLIMATE HAZARDS



Fiscal impacts of what the region
might face due to climate change



SEA LEVEL RISE &
STORM SURGE
IMPACTS

COASTAL
EROSION
IMPACTS



WATER
QUALITY
IMPACTS



PUBLIC HEALTH
IMPACTS

PRECIPITATION
IMPACTS



FISHERIES,
AQUACULTURE, &
AGRICULTURE IMPACTS



MITIGATION SCENARIOS



4 scenarios for comparison

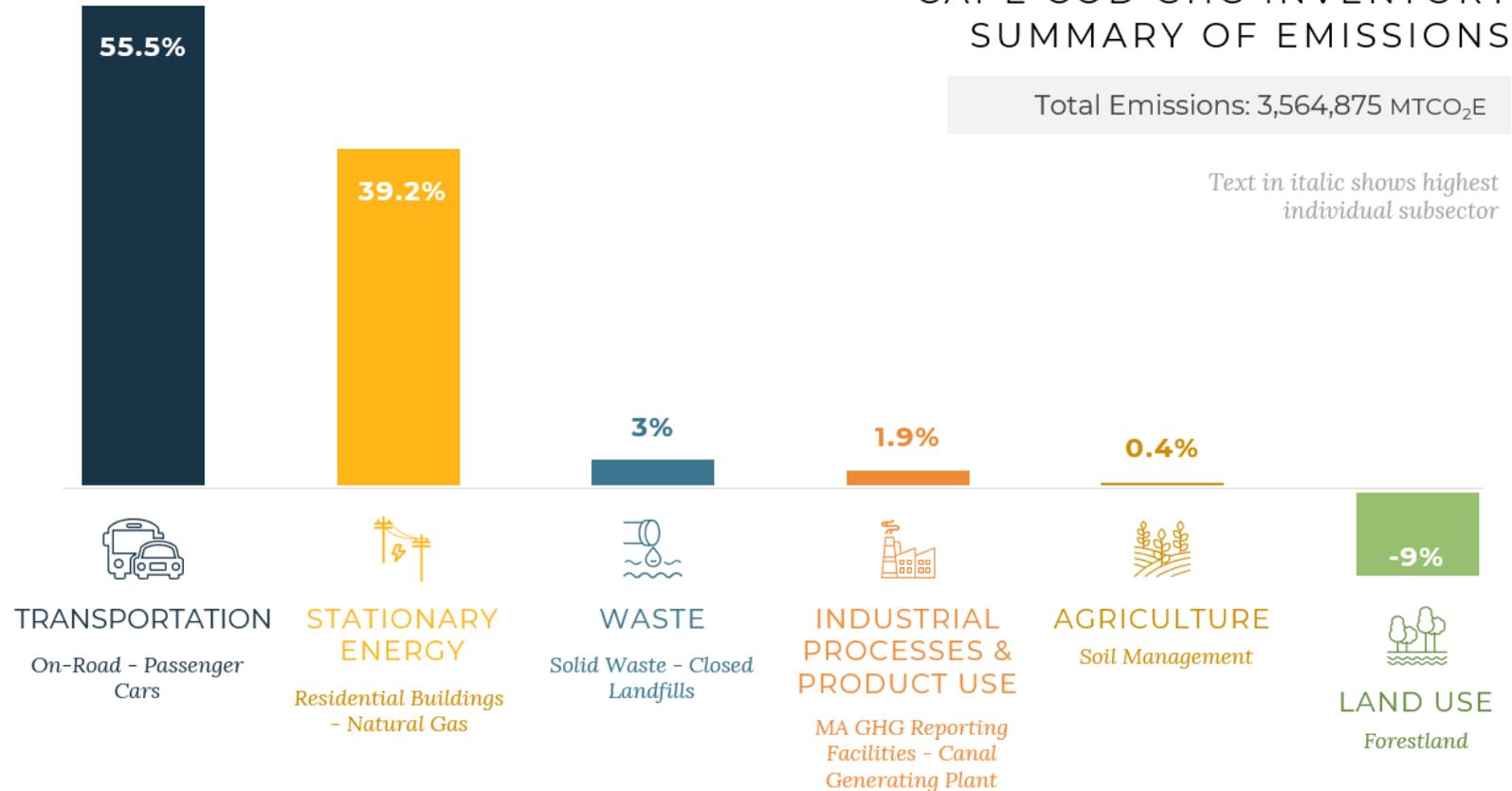


BUSINESS AS USUAL

CAPE COD GHG INVENTORY SUMMARY OF EMISSIONS

Total Emissions: 3,564,875 MTCO₂E

Text in italic shows highest individual subsector



MITIGATION
SCENARIOS



4 scenarios for comparison



BUSINESS AS USUAL



ELECTRIFICATION



EFFICIENCY +
ELECTRIFICATION



SEASONAL TO YEAR-ROUND
SHIFT

MITIGATION SCENARIOS METRICS



Comparison of mitigation scenarios

EMISSIONS COMPARISONS



EV MARKET SHARE



VEHICLE MILES TRAVELED



HOMES WEATHERIZED

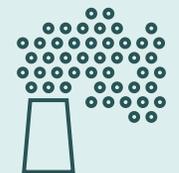


HEAT PUMPS

ENERGY CONSUMPTION



CRITERIA POLLUTANTS



ECONOMIC IMPACTS
OF CLIMATE ACTION
STRATEGIES



Potential costs and benefits and cost-effectiveness of climate action strategies



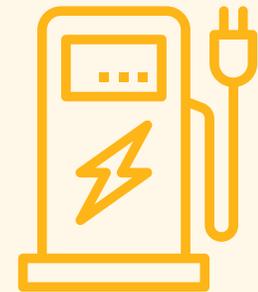
COST OF DOING NOTHING

ADAPTATION
STRATEGIES



Cost-benefit

MITIGATION
STRATEGIES



Cost-effectiveness

CAPE COD CLIMATE ACTION PLAN



THANK YOU!

