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2022 Open House

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Housekeeping

- Please keep your videos and audio OFF
- Post questions in the chat window
- We will have Q&A after the presentations
- You are invited to join discussions in virtual breakout rooms after the Q&A

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Agenda

Introductions

Climate Change and the Urgency for Action

Massachusetts Focus on Climate Change

Green Needham Initiatives

Q&A

Breakout Rooms

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The Green Needham Steering Committee

Michael Greis

Eleanor Rosselini

Jim Glickman

Donna Vello

n Mullen

Maureen Commane

Ed Quinlan

Stephen Frail

Nick Hill

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Climate Change and the Urgency for Action

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“It is unequivocal that human influence has warmed the atmosphere, ocean and land.”

IPCC Sixth Assessment Report

August 2021

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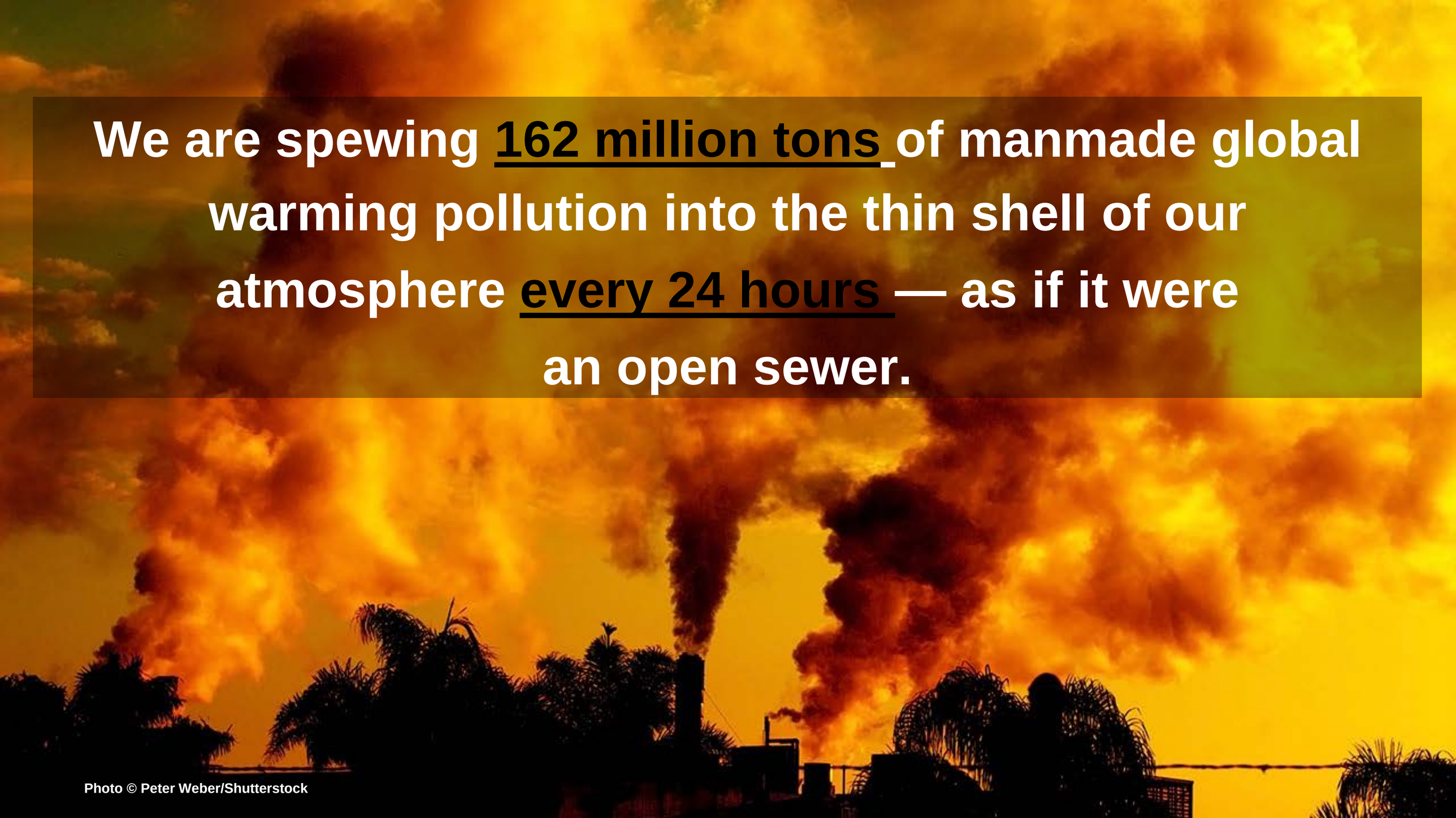

Photo © Peter Weber/Shutterstock


AIR TRANSPORT
THAWING
PERMAFROST
COAL MINING
COAL PLANTS
OIL PRODUCTION
FERTILIZATION
INDUSTRIAL PROCESSES
LAND TRANSPORT
LANDFILLS
© 2017 Don Foley

19 of the 20 Hottest Years on Record Have Occurred Since the Year 2002

The Hottest of All Have Been the Last Seven Years

2020 2016 2019 2017 2015 2018 2021 2014 2010 2013

2005 2007 2009 2012 2006 2002 2003 2011 1998 2008

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Data: NASA/GISS

“Observed climate change has

already affected food security

due to warming,

changing precipitation patterns,

greater frequency of

extreme events.”

IPCC Special Report on Climate Change and Land 2019

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“There may be a threshold

of global warming

beyond which

current agricultural practices

can no longer support

large human civilizations.”

IPCC 5th Assessment Report

2014

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Joint Statement of 230 Leading Medical Journals from All Over the World

“The science is unequivocal:

a global increase of 1.5° C

above the pre-industrial average

and the continued loss of biodiversity

risk catastrophic harm to health

that will be impossible to reverse”

September 2021

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“If we halted our net CO_2 emissions, about

half the human-made CO_2

would be taken

out of the atmosphere

and absorbed into the upper ocean and trees

within about 30 years.”

Drew Shindell

Distinguished Professor of Earth Sciences

Duke University, Nicholas School of the Environment

September 2021

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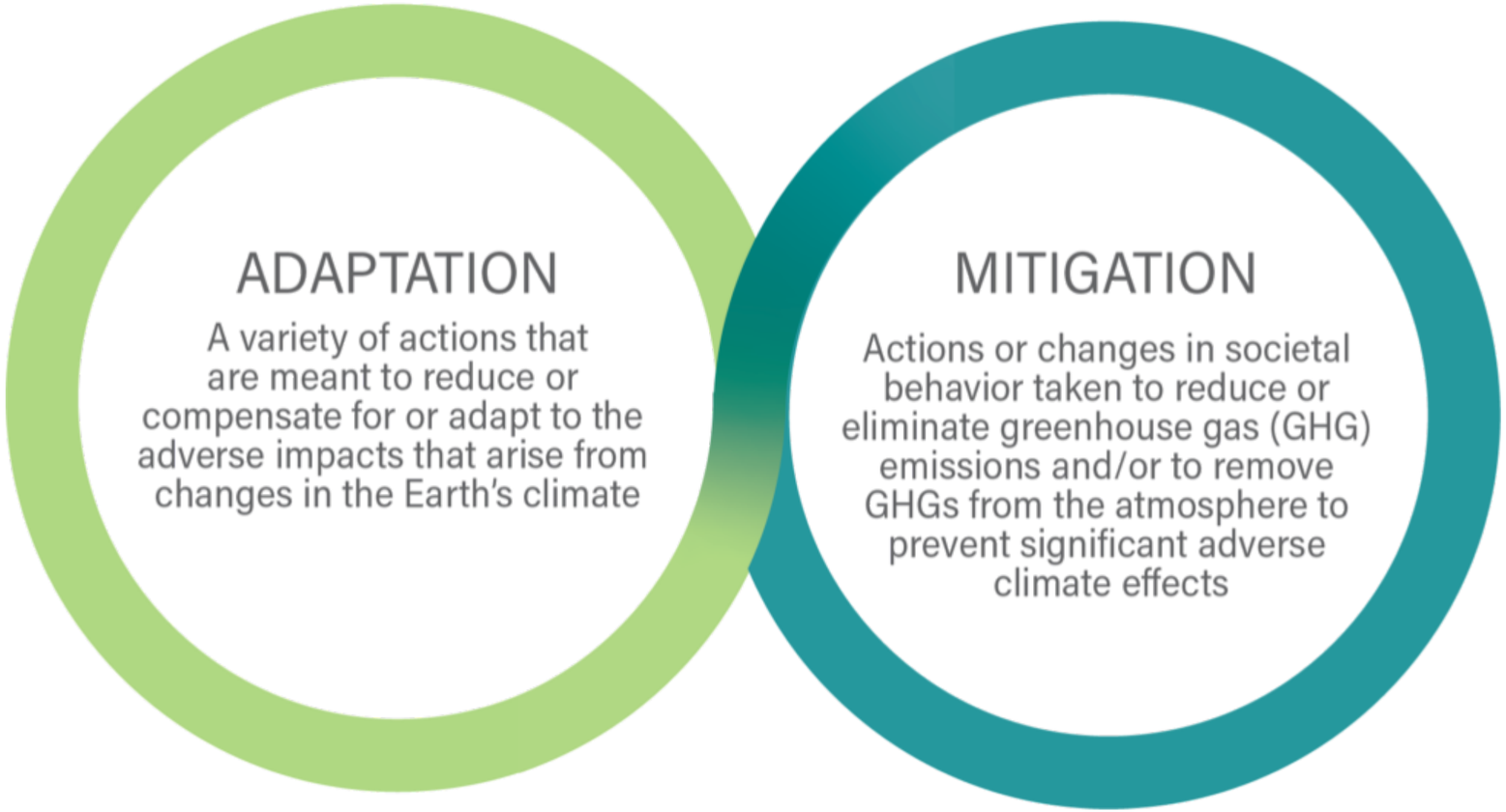
Some global warming is already unavoidable



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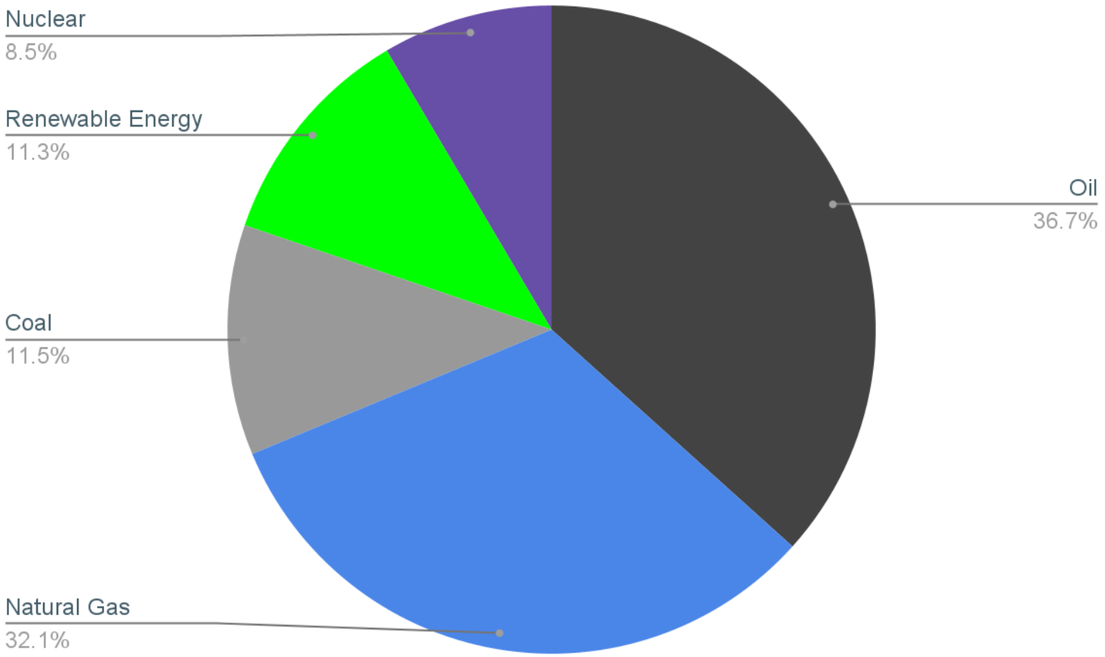
We must both mitigate and adapt

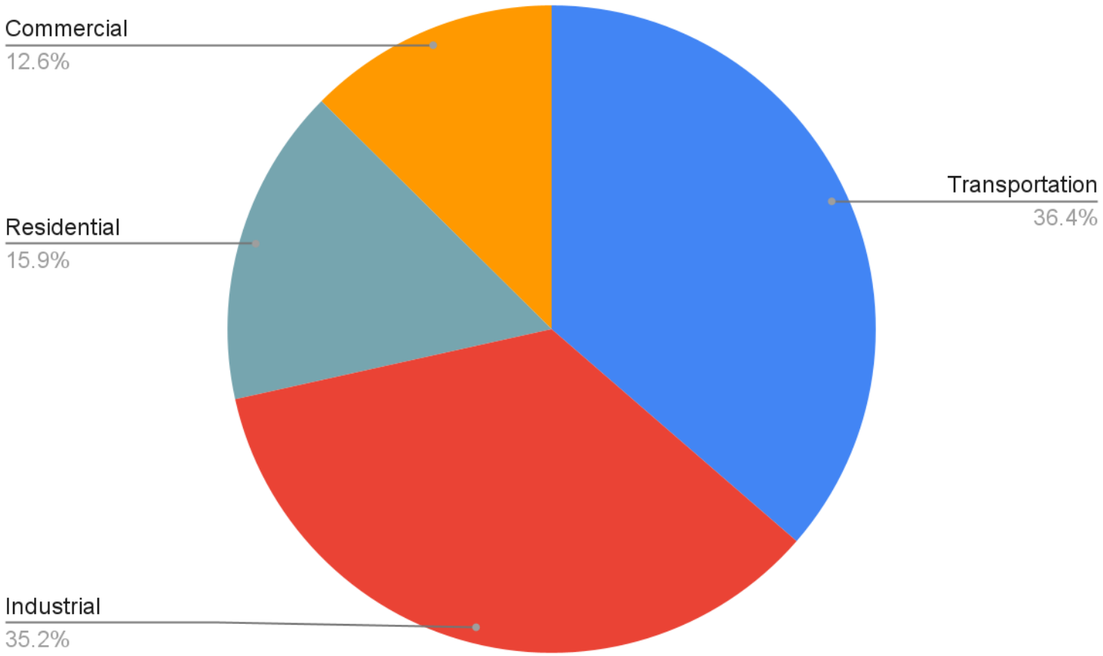
Mitigating Climate Change

Decarbonize the Electricity Supply



US Electricity Supply by Source

Electrify Everything, Reduce Waste, Decarbonize Everything Else



US Energy Consumption by Sector

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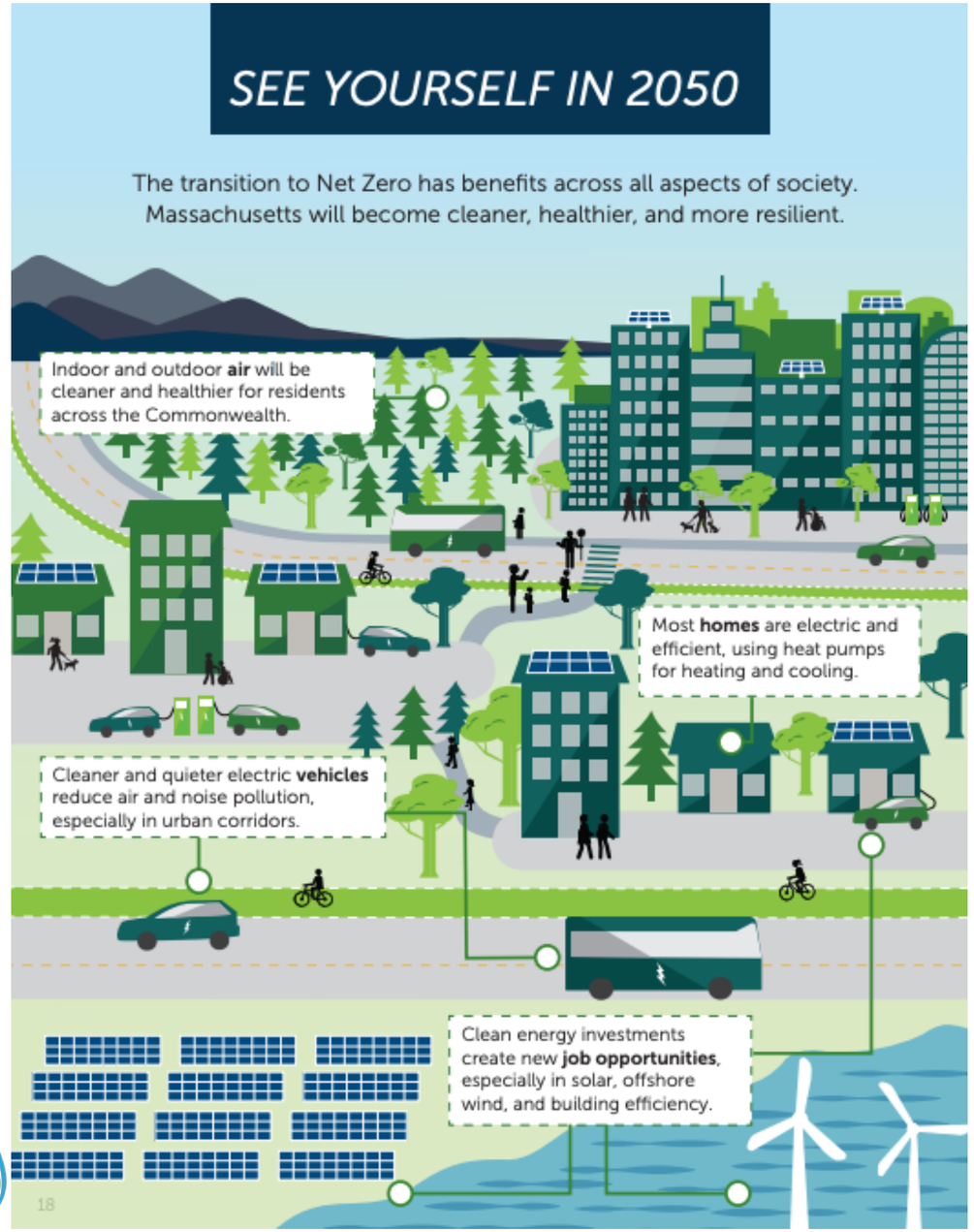
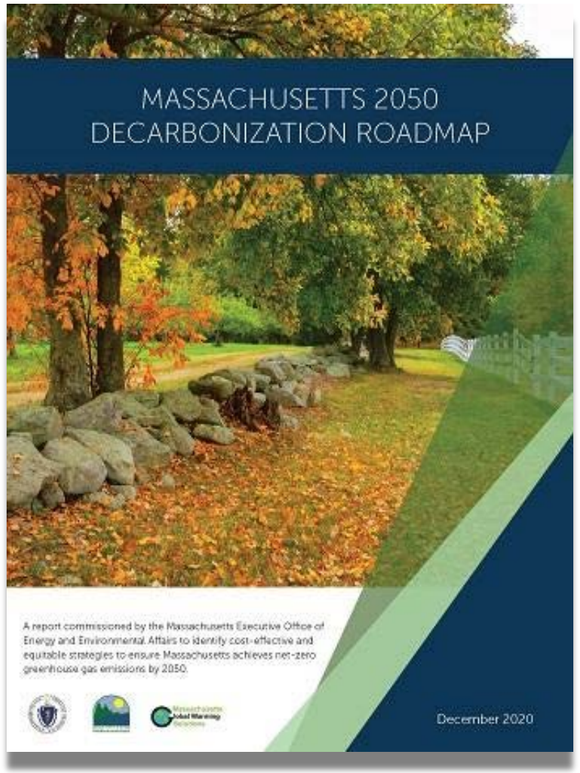
Massachusetts 2050 Decarbonization Roadmap





- Commits Commonwealth of Massachusetts to Net Zero GHG goals
- 85% reduction in GHG by 2050
- Offers strategies, policies, and multiple implementation pathways to Cities and Towns

Decarbonization Pathways

Energy

Buildings

Mobility

Waste

Natural Resources

Governance

Green Needham Initiatives

“Lightning Round”

- Needham’s Climate Action Plan
- Community Electricity Aggregation
- Net Zero Energy Buildings
- Solar Parking Canopies & EV Charging
- Home Energy Savings
- Toward Zero Waste

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Needham’s Climate Action Plan (CAP)

- A tool, or roadmap, for how Needham reduce greenhouse gas emissions and strengthen its resilience to climate change.
- Needham’s Climate Action Plan Committee (CAPC) was formed in March 2022 and charged with guiding the Town’s CAP development.
- CAPC consists of five interested residents, two members of the Planning Board, and two Select Board members, assisted by DPW staff.

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Needham’s Climate Action Plan Importance

- **The CAP will serve as a Flexible and Actionable Plan to help all of Needham move towards a carbon-neutral future.**
  - We need a plan to reach our climate goals
  - We need to be able to measure progress
- **The CAPC is a Town Committee, but not just focused on Town activities**
  - Working to drive action across all segments of Needham
  - Energize the entire community to understand and make changes towards drastically reducing our GHG emissions.

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Needham’s Climate Action Plan - Accomplishments to Date

- **Reviewed the CAP materials from peer towns**
  - Learn from their methods, processes and recommendations
- **Discussions with the Metropolitan Area Planning Commission (MAPC) and others about the process of developing a CAP**
- **A Greenhouse Gas (GHG) Inventory is in progress**
  - Expected to be formalized and completed by Fall 2022

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Greenhouse Gas (GHG) Inventory

- **Sets the baseline and tells us about the makeup of Needham's GHG Emissions.**
- **Initiated by Green Needham in 2021, using the MAPC analysis tools. Inputs came from:**
  - Town energy use data
  - Discussions with Town Staff
  - Public data sets
- **What we learned**
  - 89% of emissions come from 3 types of sources – Residential buildings, Commercial and Industrial Buildings and Passenger Vehicles
  - Town buildings and vehicles only contribute 2.4% of Needham's emissions,

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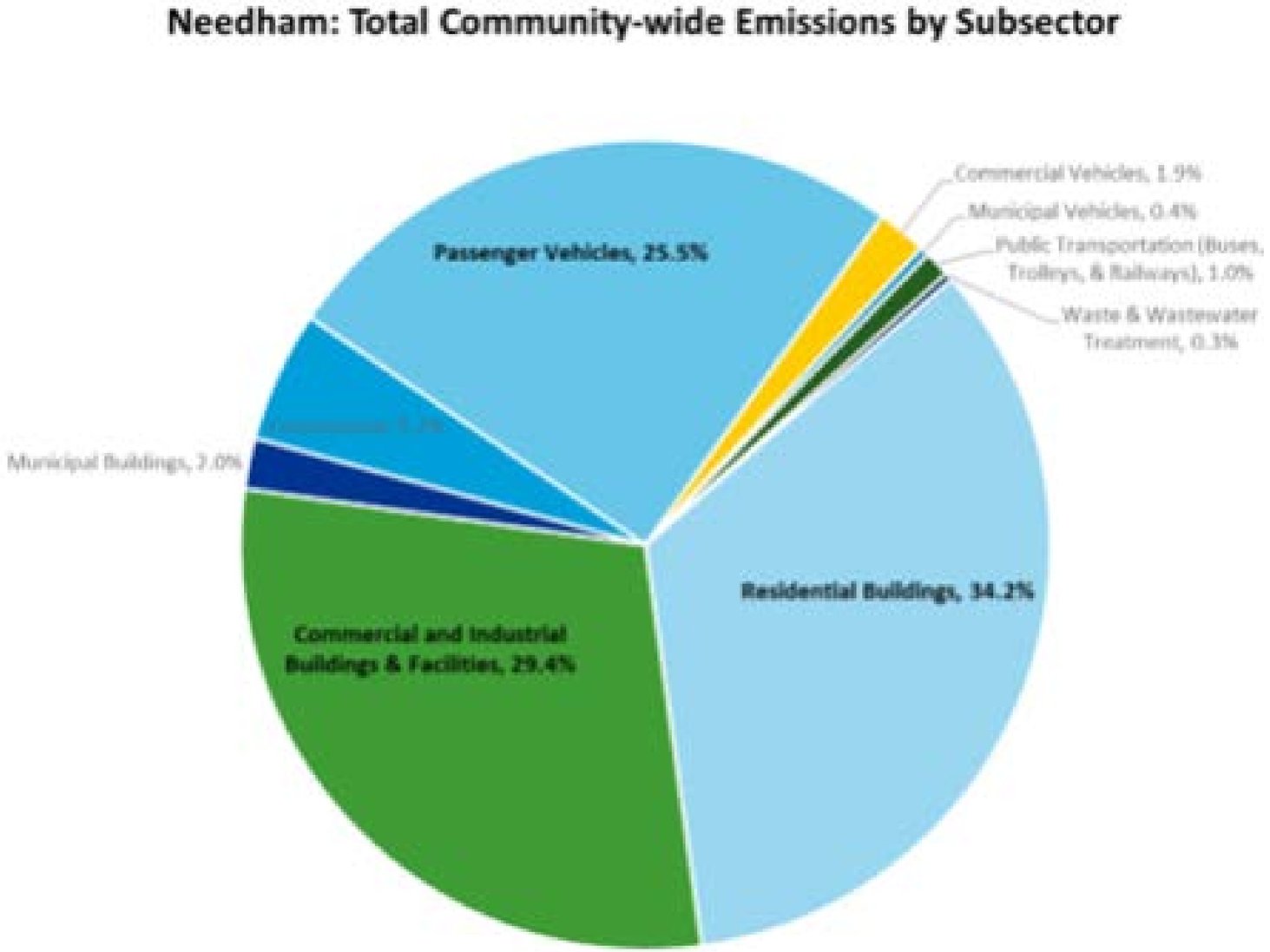
Greenhouse Gas Inventory



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Needham’s Climate Action Plan - Next Steps

- **CAP development is an 18- to 24-month process.**
- **The CAP will be an actionable document that sets out a path for curbing Needham’s greenhouse gas emissions.**
- **During this process, we will be:**
  - Engaging stakeholders (e.g.: Town departments, businesses, Eversource)
  - Evaluating tools and tactics to implement some strategies (e.g.: compatibility of solar canopies with zoning regulations)
  - Developing community resources (e.g.: promoting intensive use of Eversource energy efficiency programs, reducing barriers to electric vehicle adaptation)
- **Some actions may be undertaken before the formal plan is adopted.**
  - (e.g.: evaluation of Community Electricity Aggregation options)

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Community Electricity Aggregation

Town contracts with an electricity supplier to…

Reduce Greenhouse Gas Emissions

and Stabilize Costs

Image source: Inside Climate News

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Community Electricity Aggregation Overview

- **Electric service has two parts - supply and delivery**
- **Town contracts with energy *supplier* on behalf of residents, business owners and the municipality itself to obtain a bulk rate for electricity**
- **Goal is to increase use of renewable energy & stabilize electricity rates**
- **Over 100 municipalities in Massachusetts currently have a CEA**
- **Individual ratepayers have options!**

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Image source: https://charlton-cea.com/

Community Electricity Aggregation Importance

- **Critical step toward net zero by 2050!**
- **Reduces greenhouse gas emissions → counter climate change**
- **Supports the renewable energy sector**
- **Stabilizes electricity rates**

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Community Electricity Aggregation - Accomplishments to Date

- Packet introducing Community Electricity Aggregation submitted to Select Board in February 2021
- Packet referred to the Climate Action Plan Committee in April 2022 by Select Board
- Climate Action Plan Committee in May 2022 recommended that the Select Board prioritize a CEA for the Town of Needham

Image Source: https://www.vassar.edu/

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Community Electricity Aggregation Next Steps

- **Select Board to vote on whether to make CEA a goal for 2022/23 (Summer 2022) and, if so, submit an Article to Town Meeting**
- **Town Meeting must authorize Select Board to begin process (Fall 2022)**
- **If passed at Town Meeting…**
  - Town specifies the mix of renewable options it desires and hires consultant
  - Consultant negotiates pricing for options and submits options to Town
  - Town finalizes the options and sets default option
- **Implement plan**
  - Town rolls plan out to Needham residents, businesses, organizations
  - Payers can stick with default option, or switch to a different plan

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Net Zero Energy Buildings

Science Lab

Office Building

Home (Newton)

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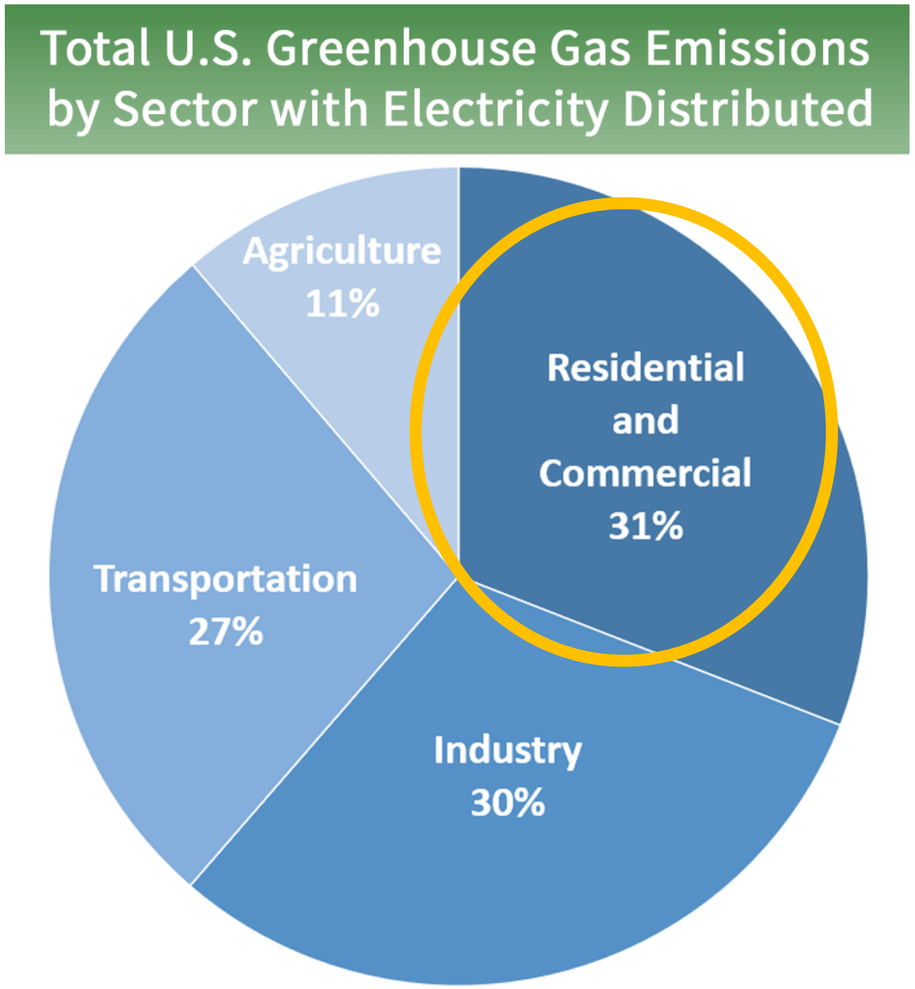
Net Zero Energy Buildings Importance



U.S. Environmental Protection Agency (2022). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020

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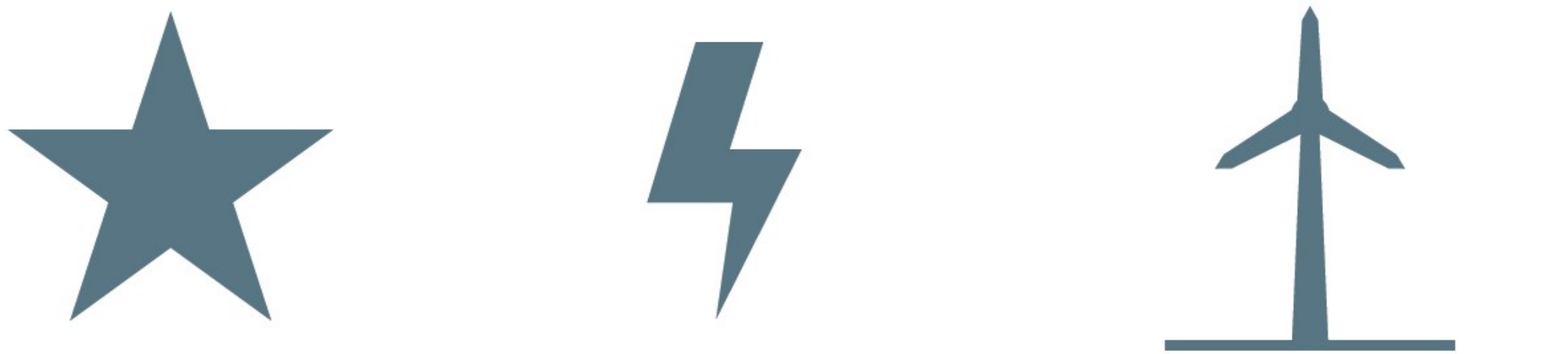
Net Zero Energy Buildings Overview

NET ZERO - 12.9 Million Sq Ft in MA



ENERGY EFFICIENCY

MINIMIZE FOSSIL FUEL

ON + OFF-SITE RENEWABLE ENERGY

NET ZERO READY - 16.5 Million Sq Ft in MA

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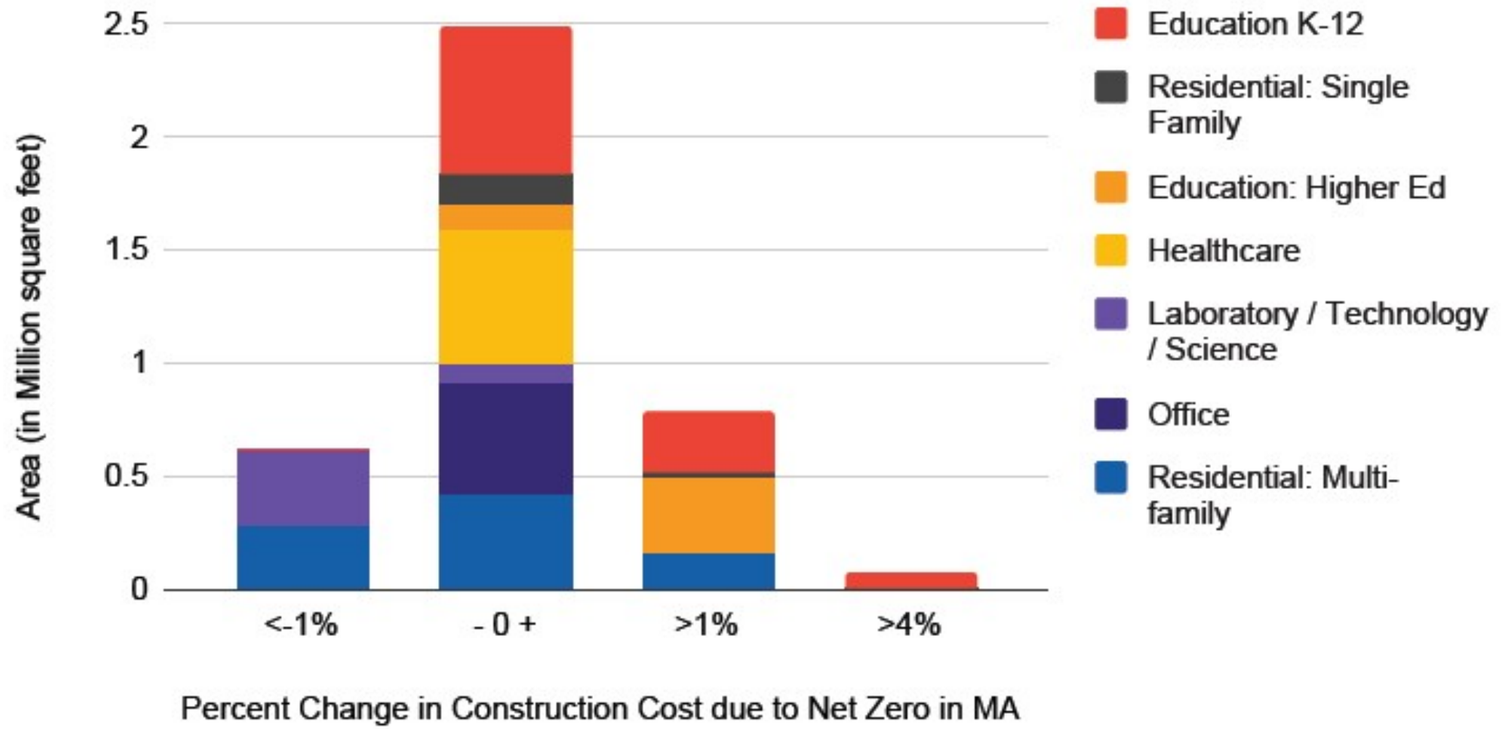
Net Zero Energy Buildings Overview

HOW MUCH DOES IT COST TO BUILD NET ZERO READY?

*25% OF THE PROJECT GSF AND 55% OF SUBMISSIONS REPORTED ON % COST DIFFERENCE

NOT MUCH!



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Net Zero Energy Buildings Initiative - Components

- Net Zero Residential
- Net Zero Commercial
- Net Zero Municipal
- Net Zero Energy Codes

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Net Zero Energy Buildings - Residential

Outreach and education for builders, realtors and homebuyers

small or no cost premium, significant operational cost savings, greater comfort, future-proofed investment

January webinar – Net Zero Energy Homes

- 130 Attendees
- Builders, realtors, architects, residents

Ask the Expert – working with residents

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Net Zero Energy Buildings - Commercial

Commercial developers and property owners have been ahead of the curve on highly energy efficient properties – e.g. LEED, Green Buildings

Bulfinch proposed development for Muzi site

- Ambitious sustainability targets
- If achieved, will be a model for all future development in Needham
- Green Needham is engaged with Bulfinch and in the community
    - Advocate – developer, town boards, community
    - Educate & inform – build community support for best-in-class sustainability

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Net Zero Energy Buildings - Municipal

- Working with Permanent Public Building Committee (PPBC) and Select Board to **establish Net Zero as target for all municipal construction**

- Engage and support active projects – **Emery Grover Renovation**
  - Design to Mass Save ZNE-Ready target Energy Use Intensity (EUI) of 30 kBTU/sf
    - Current design will achieve 29.2 EUI
    - When completed, this 120 year old building will have an EUI **40% below the current median for office buildings**
  - Deep retrofit of building envelope energy efficiency
  - Fully electrified HVAC – Air-source heat pumps

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Net Zero Energy Buildings - Energy Codes

- Work with Town Boards, Town Meeting and community to adopt Net Zero Energy Stretch Code when available

- Work with Planning Board and Planning Department to incorporate net zero and sustainable principles throughout Needham's planning and zoning

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Transportation –
Solar Canopies and EV Charging Stations

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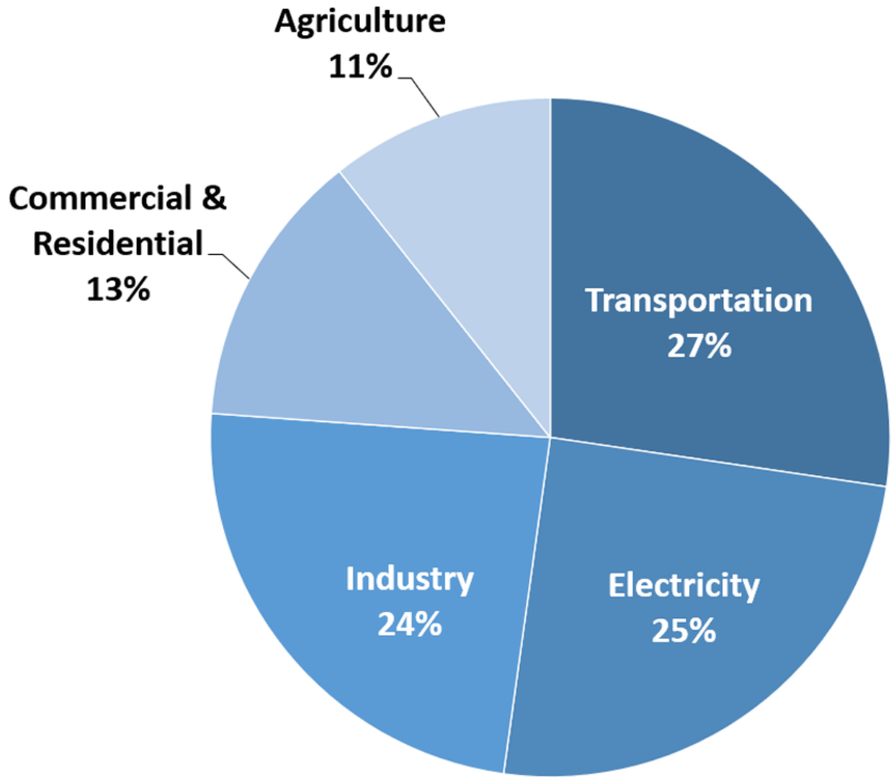
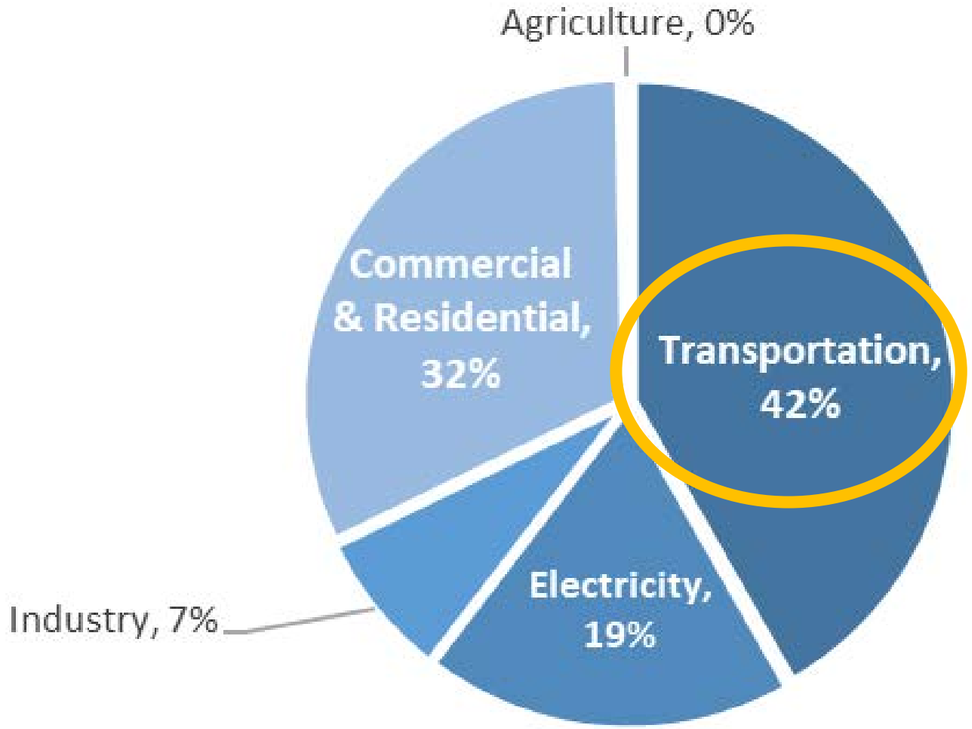
Transportation Electrification - Importance

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2020



U.S. Environmental Protection Agency (2022). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020

Total MA GHG Emissions by Economic Sector in 2017



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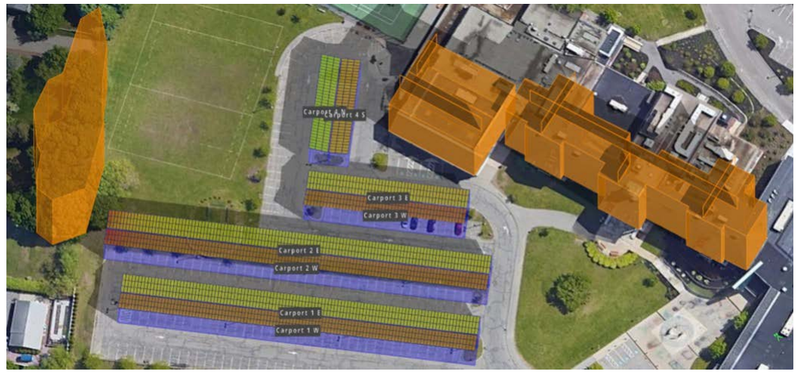
Solar Canopies

- Initiated by leaders of NHS Environmental Club
  - Reached out to Green Needham
- Developed proposal for Parking Canopy at NHS
- Engaged with School Committee, Select Board, Town Manager, DPW, Public Safety
  - Redesigns could not overcome objections from Fire Chief
- Revised proposal for Newman School with options for considering additional town lots
- Next steps – Town develops and issues and RFP



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EV Charging Stations

Build a robust network of public and private EV charging facilities to facilitate and promote EV adoption by residents, businesses and the Town

- Existing Level 2 charging stations at Sunita Williams and Rosemary Complex funded through VW settlement

- Leverage the Massachusetts EVIP (Electric Vehicle Incentive Program) and Eversource MakeReady programs to install more Level 2 charging at:
  - Town-owned facilities (for fleet and public use)
  - Commercial properties (office parks, privately-owned parking lots
  - Multi-family residential properties (apartments and condominiums)

  - Several Level 2 stations being installed now at town-owned facilities
  - 2022 Community Action Project by NHS Greater Boston Project students

- Identify opportunities for Level 3 (Fast charging) with new construction and through CAP

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Promote EV Adoption and Transportation Alternatives

- Increase EV (&PHEV) adoption by residents
  - EV showcases at Town's new charging facilities (Fall 2022)
  - EV Ambassador program (Future)

- Promote EV adoption by businesses

  Work underway through Charles River Chamber Environmental Committee

- Electrification of Town Fleet

  EV School Buses

  Light Duty Vehicles – sedans, vans, police cruisers

  Heavy Duty vehicles – Construction and Fire vehicles

- Promote alternative transportation options

  eBikes

  Walking

  Public Transportation

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Home Energy Savings

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Home Energy Savings Overview

Our focus:

We promote energy saving in the home.

No-cost home energy audits through the state's Mass Save Program.

We encourage follow-up insulation work, and heat-pumps.

We partner with HomeWorks Energy, a Mass Save contractor.

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Home Energy Savings Importance

Home efficiency is a key pathway to reducing energy use in Needham

Home electricity, heating and cooling is a large percentage of Needham's energy use

Home energy assessments result both in more energy efficient homes and lower energy costs

Home energy retrofits - insulation, electrification (heat pumps for heating and cooling) reduce energy use and emissions

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Home Energy Savings Accomplishments to Date

Green Needham / HomeWorks Energy events:

- RTS
- Harvest Fair and Sidewalk Sale Days on the Needham Common
- Volante Farms
- Trader Joe’s
- Co-branded Green Needham/HWE mailings

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HomeWorks Energy

Home Energy Savings Next Steps

Engaging with Needham families and businesses:

- **Incentive to local businesses / organizations for every energy audit sign-up**
- **Volunteers can assist at RTS and other sign-up efforts**
- **We are working on ways to encourage use of heat pumps for home heating and cooling**

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Toward Zero Waste Initiatives

Reduce/Reuse/Recycle

Rethink/Redesign (Has the product been designed to last and to be recycled at the end of its useful life?)

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Toward Zero Waste Importance

In 2019 Massachusetts had 5.5 million tons of trash.

Per capita plastic waste went from 60 pounds per year in 1980 to 218 pounds in 2018.

Why aim for Zero Waste?

- **help reduce pollution and greenhouse gas emissions**
- **conserve energy**
- **preserve resources**
- **create job opportunities**
- **and stimulate the growth of green technology**

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Toward Zero Waste Initiatives - Accomplishments to Date

Plastic Waste Reduction

- 2018 - Largest stores to voluntarily discontinue single-use plastic check-out bags
- 2022 - Request Select Board implement mandatory plastic bag ban to address the increased use of thicker “reusable” bags by several stores.
- Education and outreach campaign to promote use of reusable bags

Needham Recyclopedia

Food Scrap Collection at the RTS

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Toward Zero Waste Initiatives Next Steps

Recycling Ambassador program:

Volunteers needed to help design a program that will engage and educate people one-on-one about recycling smart.

Example: Volunteers at the RTS can distribute the pamphlets or flyers, along with having conversations in more depth about the why, the how and any other questions people have

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Q&A

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Thank you

Follow-up

https://www.greenneedham.org/blog/open-house-questions/

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Breakout Rooms

- Needham’s Climate Action Plan
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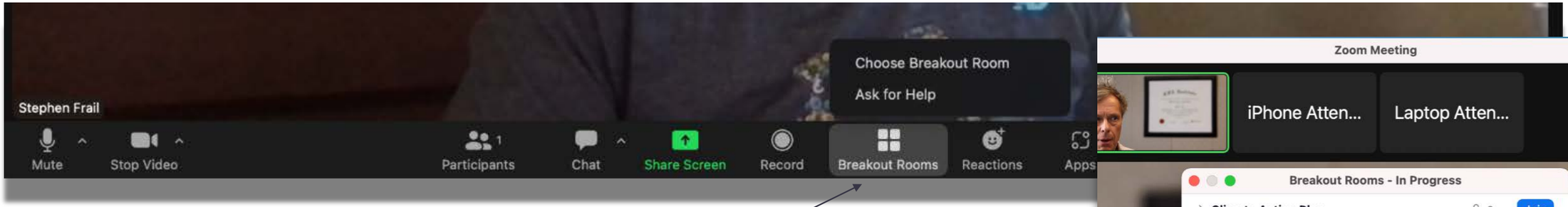
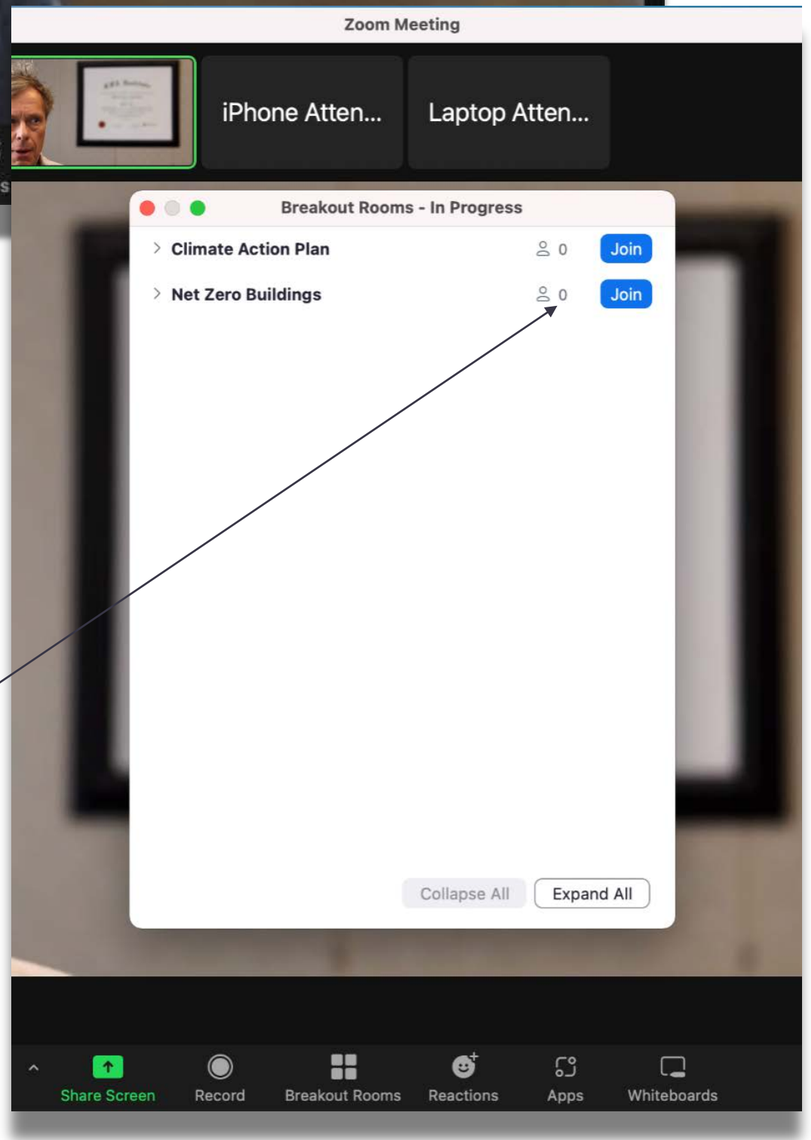
Breakout Rooms





Click on the Breakout Rooms button at the bottom of your screen.

Then, select the room you want to join.

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