Stretch Code and Green Communities Designation Workshop

Prepared by:

Barnstable Infrastructure and Energy Committee

Barnstable Town Council | March 20, 2025

Workshop Introduction

Barry Sheingold
Chair, Infrastructure and Energy Committee

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Green Communities

- State program that provides hundreds of thousands of $ for municipal energy efficiency/decarbonization projects
- GC program requires municipality satisfy 5 criteria, including energy reduction plan & adopting stretch code
- GC designation would advance 2020 Town Council policy to
  - reduce net GHG emissions to zero to extent feasible
  - in “recognition that this climate emergency is driven by human consumption and land use practices”

Background:
Stretch Code/Green Communities

- Stretch Code was brought before Town Council in 2021, but did not pass due to tie vote (no workshop)
- Barnstable is the only town on Cape Cod that has not adopted Stretch Code and received Green Community designation
- Why consider Stretch Code and Green Community designation now?
  - More experience with Home Energy Rating System (HERS) raters, Department of Energy Resources (DOER) administration of codes, and use of performance-based stretch code
  - Changes in state law requiring greenhouse gas (GHG) reductions/focusing on electrification
  - Commercialization of cold climate heat pumps; Mass Save incentives—changed net economics
  - Stretch Code changes—effective February 14, 2025

February 2025 Changes to Stretch Code

- August 2024: in response to industry/public feedback, DOER proposed changes to Stretch Code, mostly regarding large additions (new in 2023)
- Generally, changes clarified and narrowed scope of rules (reducing # of projects subject to Stretch Code), made performance standards more lenient, and gave builders/homeowners more flexibility to comply
- Town of Barnstable submitted comments generally in support

February 2025 Changes to Stretch Code

- **MA Homebuilders and Remodelers Association expressed support for updated Stretch Code**
  - *On behalf of the HBRA of Massachusetts I want to commend the DOER regarding the ongoing efforts to improve the Massachusetts Energy Codes for their effectiveness, clarity and practicality. The recent proposed revisions are both welcomed and clearly reflective of the numerous concerns expressed by many of the organizations and people who are engaged in the designing and/or building of structures regulated by the Energy Codes, as well as those who are tasked with enforcing the code.*

Workshop Agenda & Speakers

- Lisa Sullivan, MA DOER
  - Green Community Program and Requirements
- Mike Rossi, Consultant to DOER
  - Stretch Code
- Sean Hogan, Town of Barnstable Sustainability Manager
  - What the Town needs to do for Green Community designation
  - Potential benefits to the Town
- Chris Mazzola, HERS Rater
  - How builders/owners and HERS raters work together to cost-effectively build to standards, test results, and utilize Mass Save incentives
- Chris Gloninger, Climate Scientist
  - The science behind the Town's net zero policy and MA GHG reduction laws
- Dr. Jane Ward
  - Health impacts
- Questions

Department of Energy Resources: Green Community Program & Requirements

Lisa Sullivan
Green Communities Coordinator for the Southeast Region

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Department of Energy Resources: Stretch Code

Mike Rossi
Energy Code Specialist & Consultant to MA DOER

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Town of Barnstable
Green Community Update

Sean Hogan
Sustainability Manager, Town of Barnstable

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Current Status

- ✓ Criterion 1: By right Solar Zoning
- ✓ Criterion 2: Expedited permitting
- ❑ Criterion 3: Energy Reduction plan (20% from baseline)
- ❑ Criterion 4: Fuel Efficient Vehicle Policy
- ❑ Criterion 5: Adopt Stretch Code

Town Staff Work to be Done

- Establish a new baseline year
  - 2023 or 2024
- Audit energy use (partially done)
- Identify new energy savings opportunities
- Typical energy reduction plans take at least 3 months according to MA DOER

Benefits to the Town of Barnstable

- A grant of $220k for joining
- Eligibility for competitive grants
  - 2 rounds per year, max 1 award per town per year
  - The average per year award per town is $57,000 but can vary widely
- Get rewarded for doing what we are doing anyways
  - Example: EV Sedan Policy would save approximately $600,000 over 10 years
  - Example: Get funding for energy saving measures like heat pump installation

Perspective of a Home Energy Rater Working In and Around Cape Cod

Chris Mazzola
Home Energy Raters

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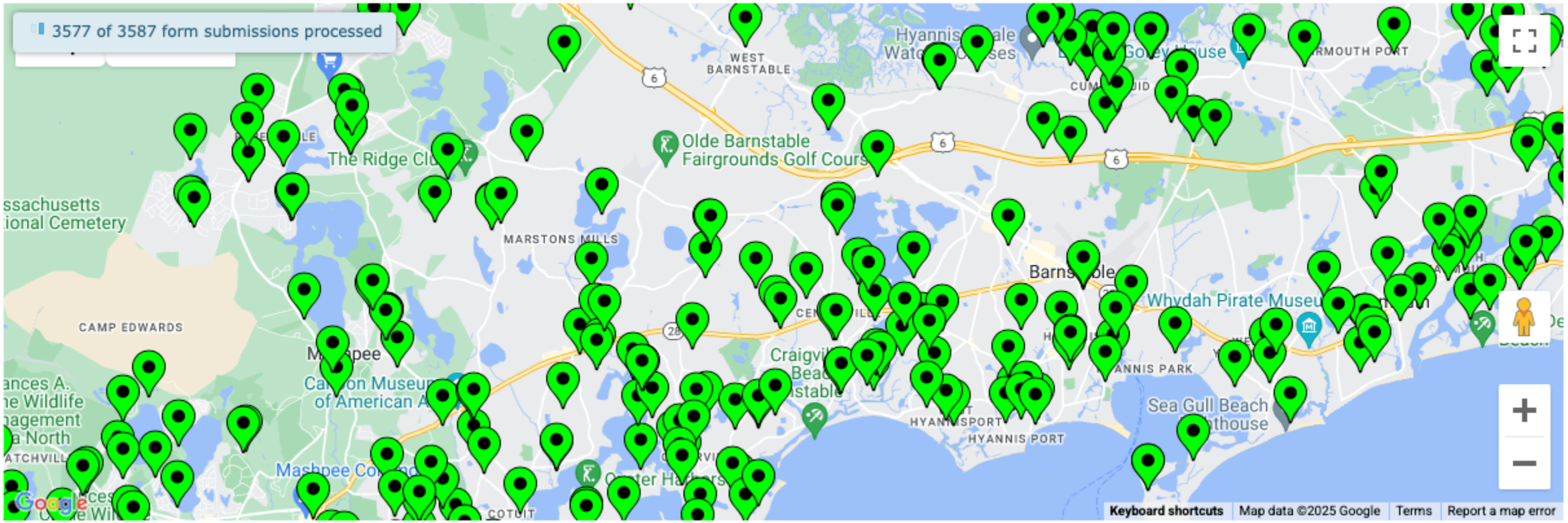
My Background and Experience

- **Chris Mazzola – HERs: 8873503 ICC:8344213**
- Production Manager at Home Energy Raters, New England Air Barrier, KMO
- HERS rater for 20 years
- President of Northeast Home Energy Rating System (NEHERS) Alliance 2023
  - Worked as an electrician, HVAC installer, and framer
- We have 20 employees and completed 1850+ HERs ratings in 2024
- HER ratings, code compliance: RESChecks, COMChecks, Manual J.,LEED, Passive house, Article 37/Berdo, Mass Save Incentives, tax credits, Alternative Energy Certificates

HERS Ratings in and Around the Town of Barnstable



What does a HERS rater do in context of Stretch Code?

- Works with builder/homeowner/architect to design project and procure materials to meet HERS performance standards at lowest net cost or based on customer's preferences
  - New construction
  - Large additions
- Takes into consideration Cape Light Compact/Mass Save® incentives (and tax benefits) to achieve most cost-effective solutions
- Acts as HERS rater for both Stretch Code and Cape Light Compact purposes
- Conducts performance tests to assure compliance/insulation, etc. works as designed
- Third-party verification

Flexibility Benefits/Value Engineering

- Compared to the prescriptive provisions of the base code, the HERS index provisions of the stretch code allows flexibility to achieve the required HERS result, e.g., 45 for all-electric new residential construction
- The HERS rater uses specialized software to model expected results
- Decisions can be made to use less efficient/expensive design elements (e.g., windows or insulation) and still achieve a compliant HERS rating
- The HERS rater's input into these decisions is a form of value engineering

Differing Client Approaches

- Some clients seek compliance at lowest cost or lowest net cost
- Other clients have strong design preferences (e.g., natural gas fireplaces)
- Other clients prefer most robust environmental features (including solar panels)
- The HERS rater operates in a “give and take” mode to achieve client objectives and trade offs

Examples: Current Mass Save®/ Cape Light Compact (CLC) Incentives

- Residential air-source heat pumps - rebates (single-family house)
  - Market rate: $7,500
  - Moderate income: up to $16,000 with rebates; 100% with turnkey pathway
  - Low income: 100%
- Zero interest heat pump loans: up to $25,000 (beyond rebates)
  - 3–7-year term depending on income
- Weatherization (75%-100%) and barrier mitigation (up to 100%), each income dependent
- Cape & Vineyard Solar loan– up to $50,000
  - 10-year term
  - 2.75% interest
- Energy saver home loan- up to $100,000
  - 20-year term
  - 0.5% or 2.0% based on income
- Sources include Update of the Cape Light Compact to Town Council (2/6/2025) https://tobweb.town.barnstable.ma.us/TownCouncilCommunications/2025-02-06%20Cape%20Light%20Compact%20Updated%20Barnstable%20Town%20Council%20Presentation.pdf

More on Mass Save®/CLC and Other Incentives

- Additional incentives for higher level energy efficiency investments include:
- $15,000 for Energy Star Next Gen
- $25,000 for Passive House
- Renovations and Additions Program
- Various levels of incentives based on savings formula and extent to which heating, cooking, etc. is all electric
- Incentives may be limited due to 2/28/2025 Department of Public Utilities decision to cut $500 million from 2025-27 Mass Save programs
- Federal tax benefits for heat pumps (up to $2,500), insulation, etc., Alternative Energy Certificates
- HERS rater takes into consideration potentially applicable incentives and associated costs in consultation with clients to achieve desired results

Observations on Economics of Using Heat Pumps Under Stretch Code vs. Using Natural Gas Under Base Code

- Relative costs of heating and cooling, including ducting
- Air infiltration; relative costs of ventilation
- Flexibility benefits using stretch code vs. prescriptive approach under base code
- Cost of HERS rater; offset by net cost savings
- Mass Save and other benefits: net costs
- Ongoing costs
- Conclusion

The Science Behind Net Zero and Massachusetts Greenhouse Gas Reduction Laws

Chris Gloninger
Climate Scientist
Vice Chair, Infrastructure and Energy Committee

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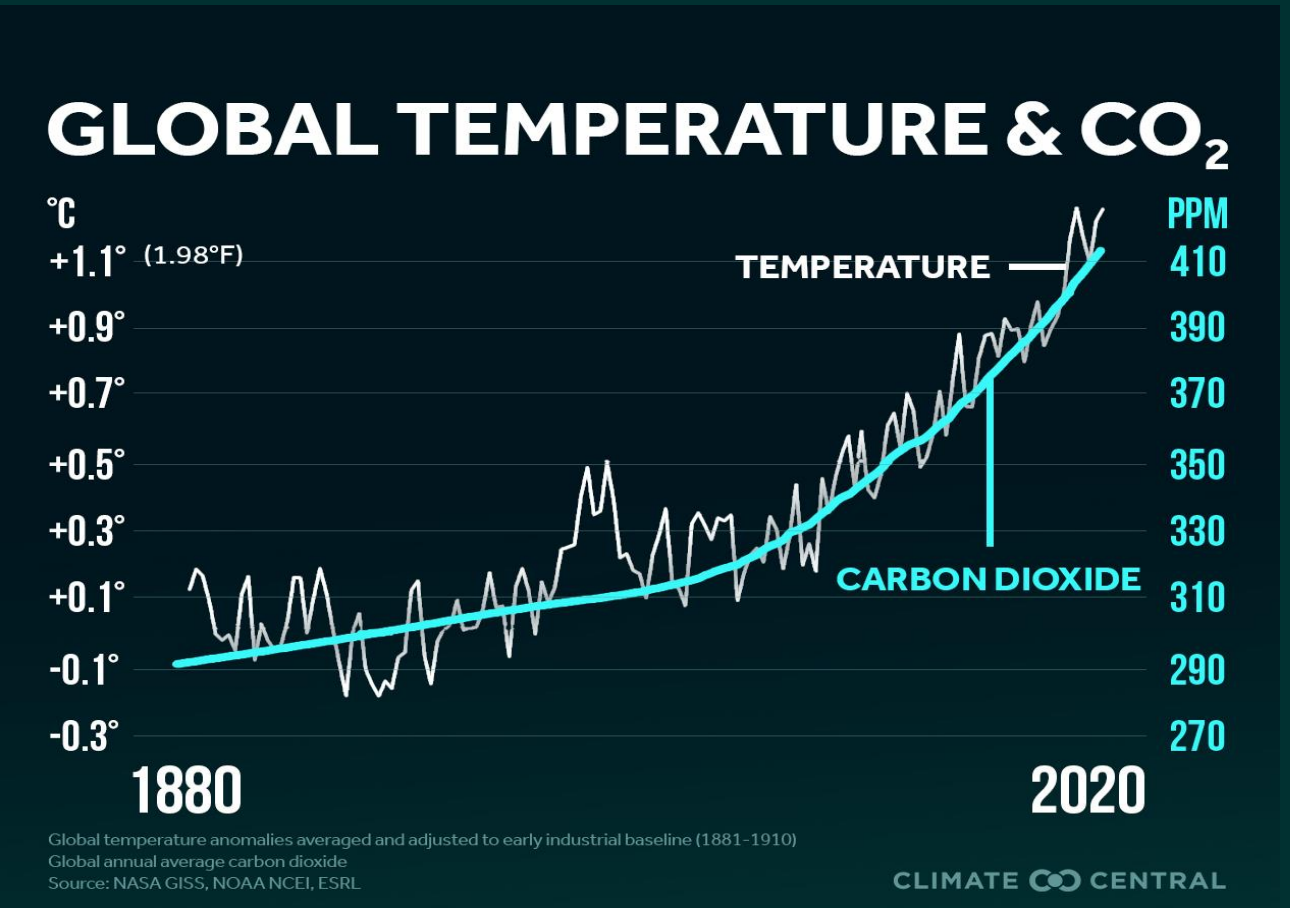
WHERE I'VE WORKED

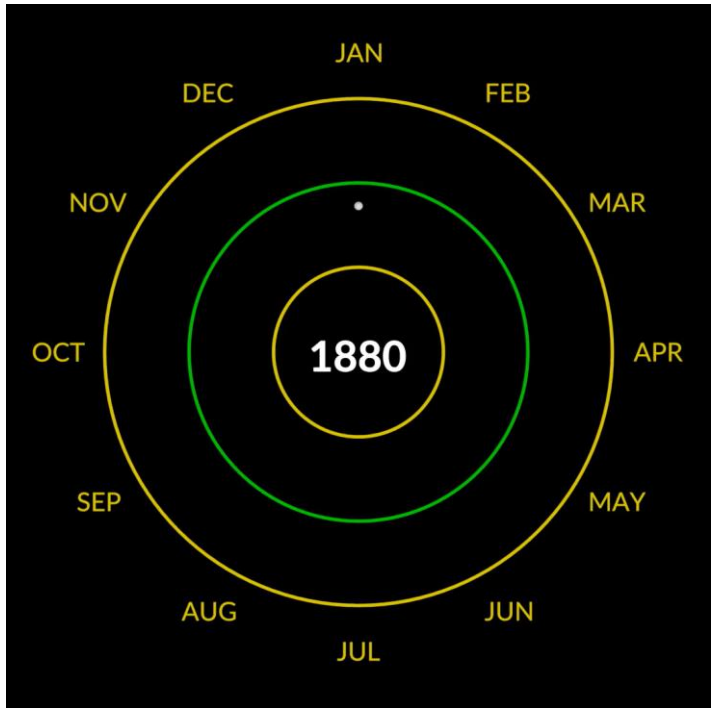


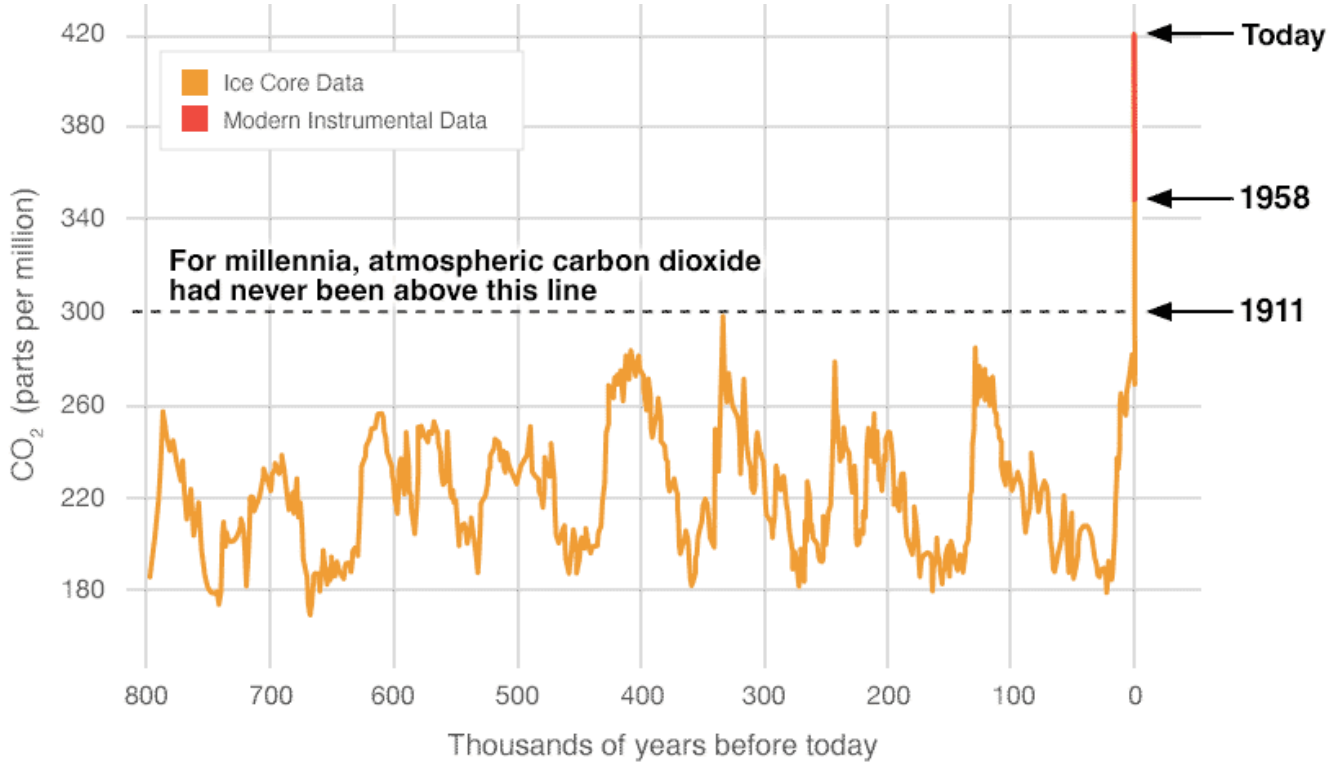
INDUSTRIAL REVOLUTION BEGINS

A LOOK BACK IN TIME

METHOD	DATASET
TREE RINGS	Up to 5,000 years
ICE CORES	>100,000 years
OCEAN SEDIMENT	Up to 5,000,000 years

UNDERSTANDING THE PROBLEM





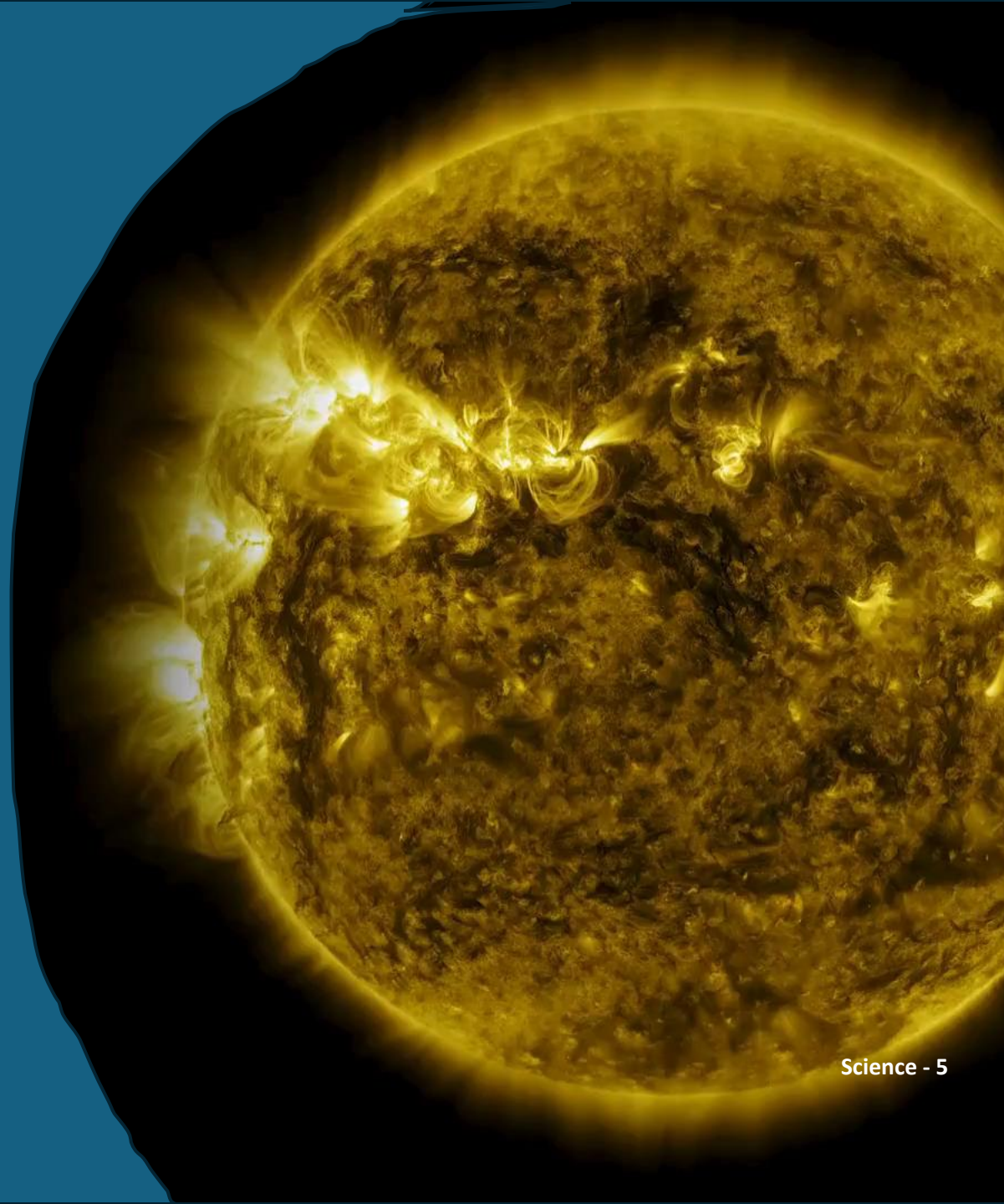
IS IT REALLY US?

Natural Variability: Despite natural fluctuations, extensive analysis indicates that the observed warming trend cannot be solely attributed to natural factors – i.e., El Nino, NAO, etc.

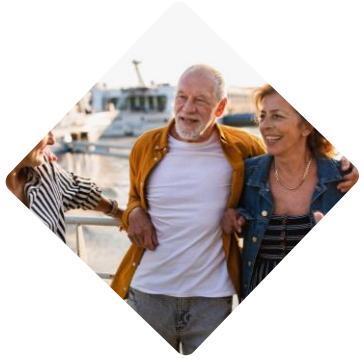
Volcanic Activity: While volcanic eruptions can temporarily cool the planet by emitting sulfur dioxide, they do not account for the sustained warming observed over the long term.

Solar Variability: While changes in solar activity can influence climate on shorter timescales, they cannot fully explain the rapid and consistent warming observed in recent decades. Cycles last approximate 11 years.

Milankovitch Cycles: Long-term changes in Earth's orbit and axial tilt, known as Milankovitch cycles, occur over thousands of years and do not match the rapid warming trend observed in recent decades.



BELOW 5 FEET IN BARNSTABLE COUNTY



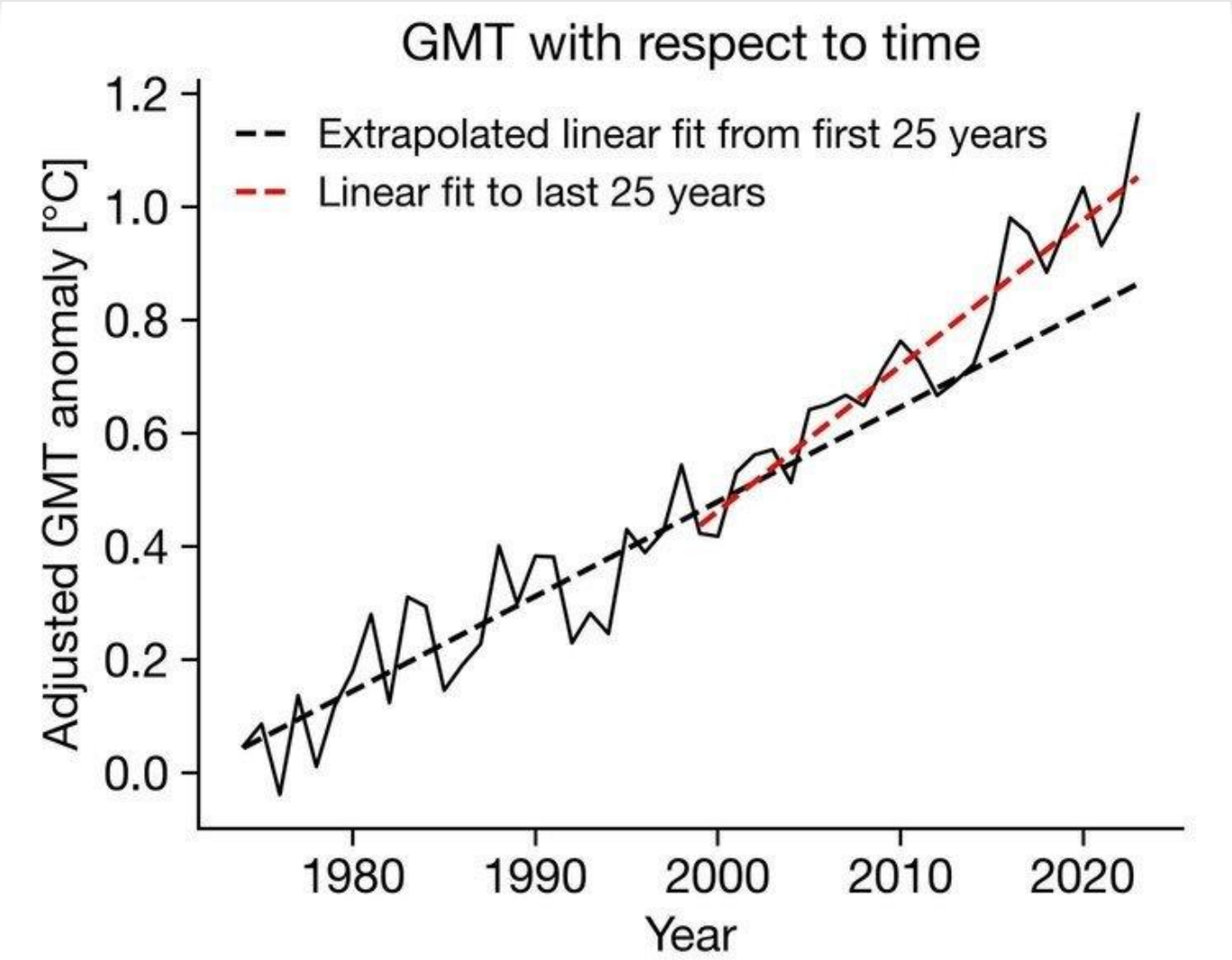
Population: 4,753

Roads: 147 miles

Homes: 6,898
Property Value:
$5.6 Billion

Land: 18 sq. miles

WARMING IS ACCELERATING



PROGRESS TOWARD U.S. EMISSIONS TARGET

Net GHG emissions (including land carbon sinks). Projections: current policy scenarios (optimistic).
Source: U.S. EPA (2005-2020); Jenkins et al. REPEAT Project (2025-2030)

CLIMATE CENTRAL

Health Promotion with MA Stretch Code and Green Communities Designation

Jane Ward, MD, MPH, Colonel (retired) USAF
LEED Green Associate
Member, Infrastructure and Energy Committee

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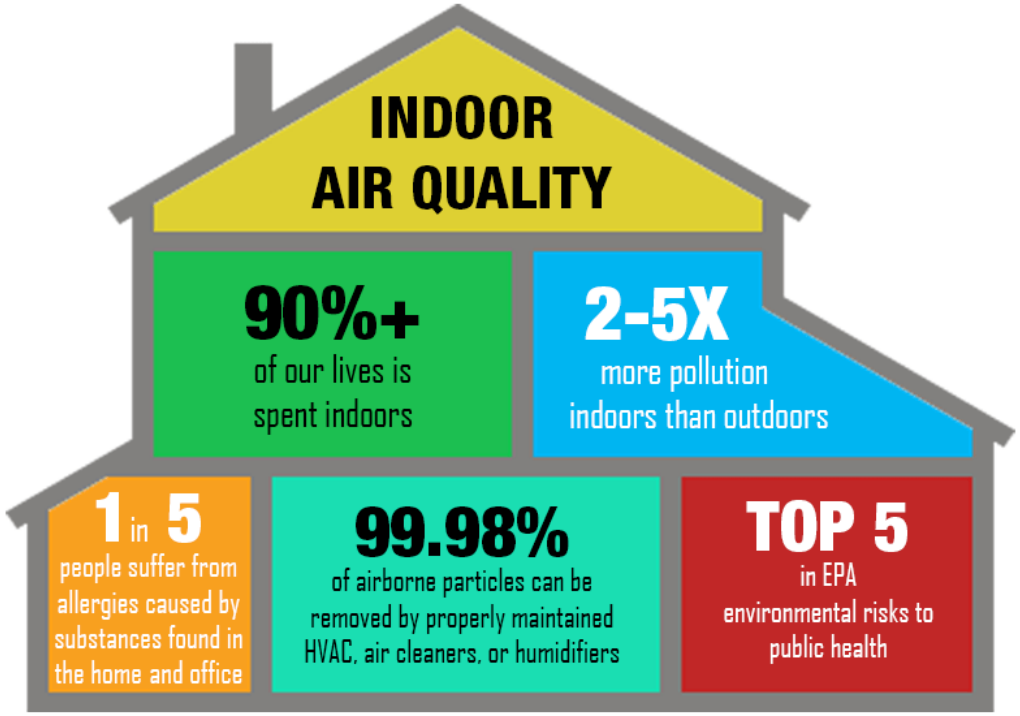
Stretch Code



HEALTH IMPROVEMENTS

- VENTILATION
- ELECTRIFICATION

Health risks from poor indoor air quality/ inadequate ventilation

HEALTH ISSUES

- "Sick Building Syndrome"
- Asthma*, allergies, other respiratory issues
- Infectious disease (flu, measles, COVID19, RSV)
- Heart disease & diabetes
- Dementia
- Immune disease (Chronic Fatigue, others)
- Lung Cancer
- Sleepiness, poor concentration
- * Asthma- #1 cause for k-12 absenteeism

INDOOR AIR CONTAMINANTS

1. Particulate Matter (PM)- smoke, dust, allergens, viral particles, mold
2. Volatile Organic Compounds (VOCs)- paints, cleaning products, combustion
3. Carbon Dioxide (CO_2)--Human respiration. Also, combustion product from gas appliances, wood stoves
4. Radon (Rn) radioactive gas from the ground
5. Mold and Mildew- water intrusion

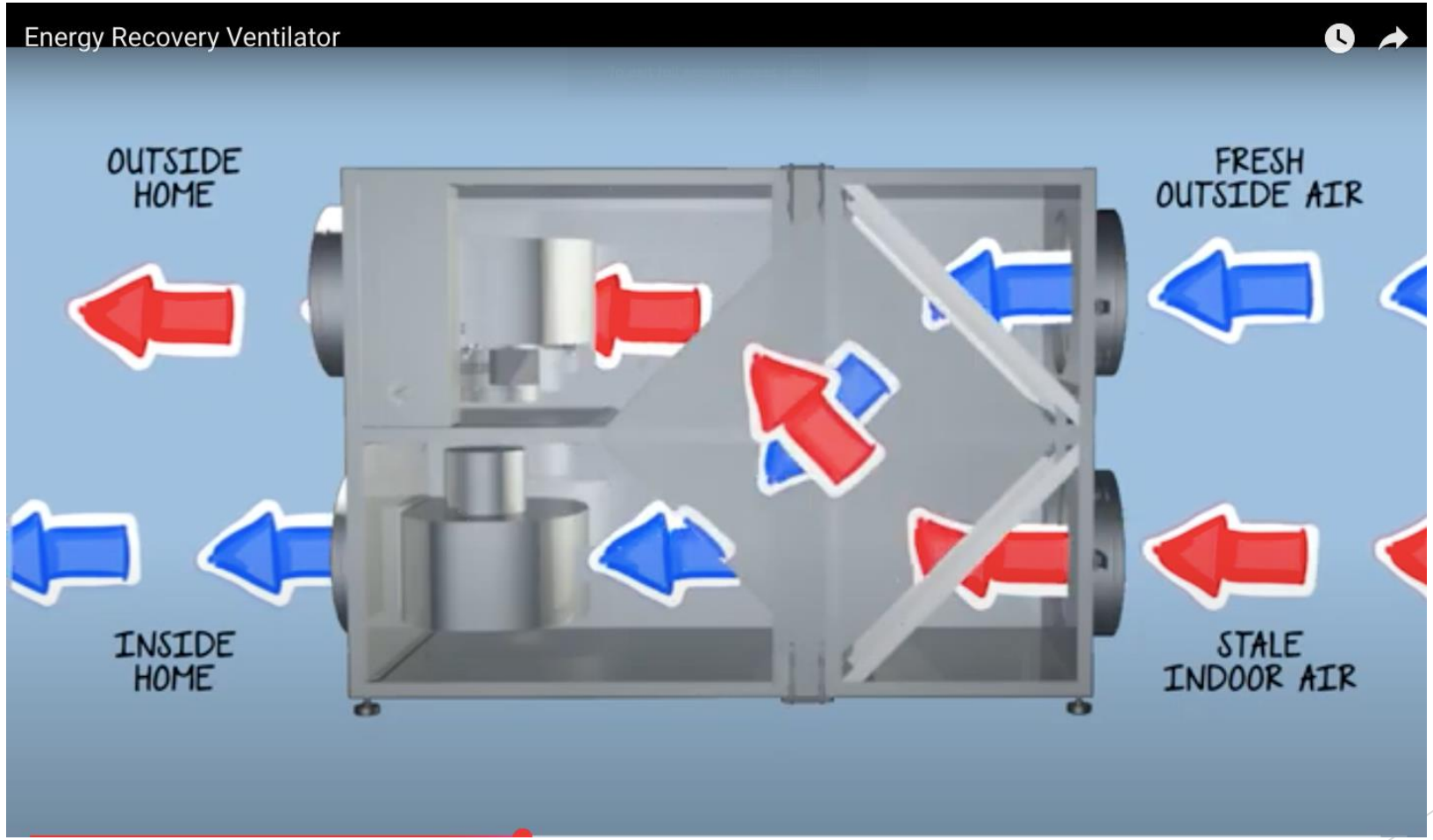
Note: multiple contaminants might contribute to multiple health problems

STRETCH CODE VENTILATION with Energy Recovery Ventilation

Manages humidity – superior to Heat Recovery Ventilation

BALANCES ENERGY SAVINGS with INDOOR AIR Quality IMPROVEMENT

STRETCH CODE VENTILATION with Energy Recovery Ventilation



Link to YouTube video: https://www.youtube.com/watch?v=t-ejqk5ounE

Stretch Code:
ELECTRIFICATION Improves HEALTH

ELECTRIC appliances and HVAC systems avoid combustion contaminants in the air emitted from gas appliances, furnaces, wood stoves

- Including CO, CO2, N02, particulate matter, volatile organic compounds, formaldehyde, Polycyclic aromatic compounds, sulfur dioxide (S02)
- Can be triggers for asthma, cancer, heart disease and more

Green Community $ can be used to improve indoor air quality in schools & other municipal buildings

Mashpee (Green Community since 2010) leads Cape with school GC improvements across all categories:

- HVAC, lighting, weatherization, building controls, energy management, and staff training

Four Cape Cod towns have used Green Community funds for improvements: Mashpee, Orleans, Wellfleet, Yarmouth

1. HVAC: 100% adoption (4/4 towns)
2. LED Lighting: 100% adoption (4/4 towns)
3. Energy Management: 75% adoption (3/4 towns)
4. Building Controls: 50% adoption (2/4 towns)
5. Weatherization: 25% adoption (1/4 towns)
6. Staff Training: 25% adoption (1/4 towns)

Stretch Code adoption and Green Community designation improves indoor air quality and health

1. The STRETCH CODE IMPROVES INDOOR AIR QUALITY AND HEALTH by

- Requiring enhanced VENTILATION
- Incentivizing ELECTRIFICATION of HVAC/major appliances

2. Green Community designation provides grant funds for energy efficiency/decarbonization measures in schools & municipal buildings which can improve indoor air quality & health


GREEN COMMUNITIES
Massachusetts
DEPARTMENT OF ENERGY RESOURCES

Discussion