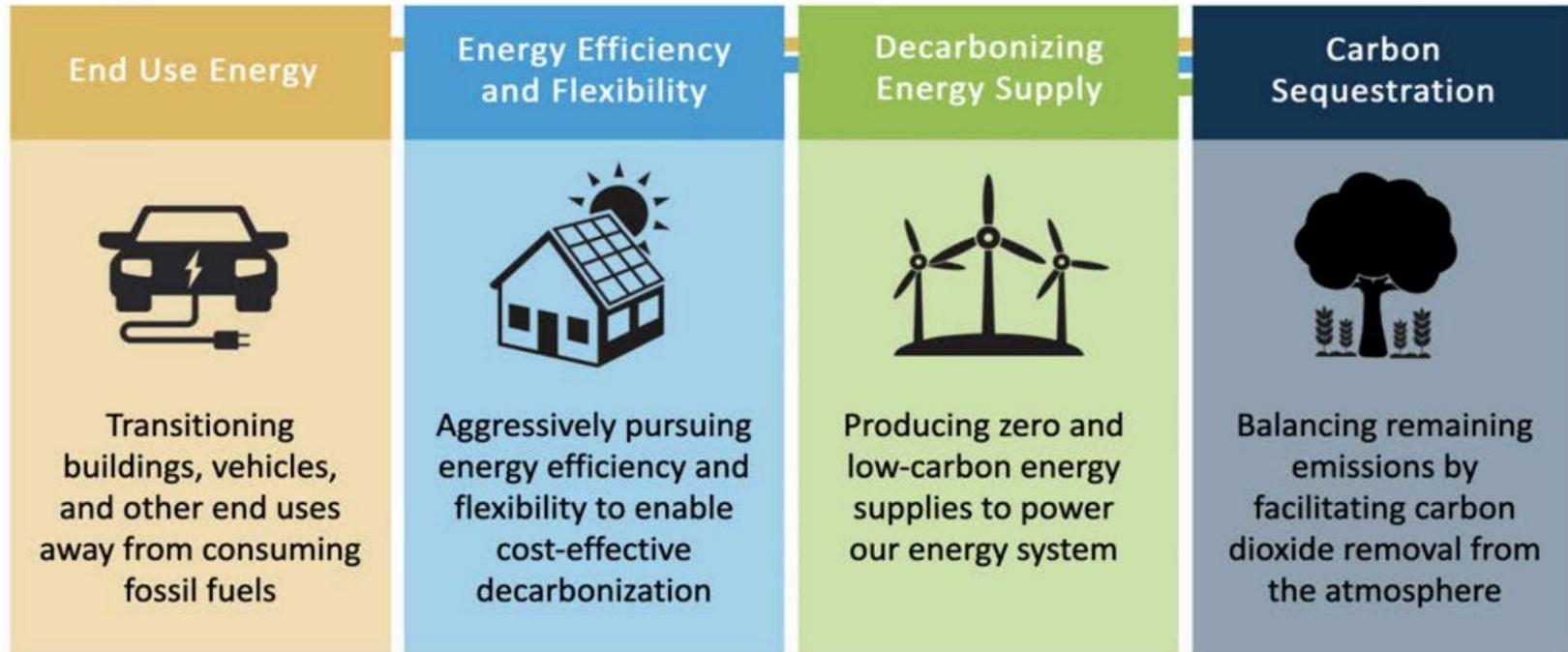


# Specialized Opt-in Code

Overview for Master Plan Implementation Committee

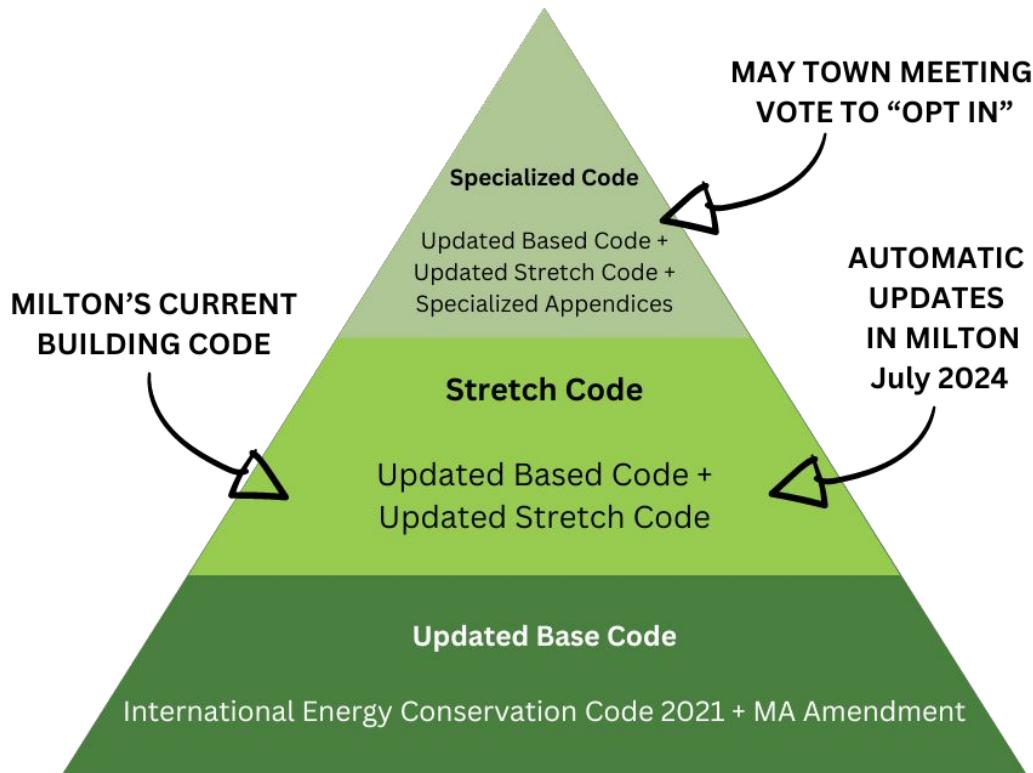
# Massachusetts' net-zero strategy

The [2021 Climate Act](#) commits Massachusetts to net-zero emissions by 2050



Source: Massachusetts 2050 decarbonization roadmap  
<https://www.mass.gov/doc/ma-decarbonization-roadmap-lower-resolution/download>

# MA communities choose from three standard building codes



## Specialized Opt-in Code: Key Points

- New requirements are for **new construction only**
- Encourages all-electric buildings: cost-competitive, healthier, and necessary to address climate change
- Preserves choice for present and future energy needs
- Avoids costly future retrofits for mixed-fuel buildings

# Incremental requirements of specialized code

1. **Pre-wiring:** new buildings using fossil fuels must pre-wire for future electrification, including EV charging
2. **Solar:** new buildings using fossil fuels must install a certain amount of onsite solar
3. **Exemplary Performance for Large Homes:** New single-family homes greater than 4,000 square feet must be all-electric or certified zero Energy (solar to offset energy usage)
4. **Exemplary Performance for Large Multi-family:** New multi-family homes greater than 12,000 square feet must use Passive House compliance pathways (highly efficient by design).

## Key Points

- **Do not** affect additions or renovations of existing homes,
- Removes obstacles to future, necessary electrification
- Construction costs offset by lower energy costs.

# What does “pre-wiring” mean?

Adequate electrical service to the building, designated circuits, and appropriate outlets for:

- **Heating:** cold weather rated air source or ground source heat pump for both heating and cooling
- **Hot Water**
- **Cooking:** induction stovetop and electric oven
- **Clothes Drying**
- **Electric Vehicle Charging** (already included in stretch code)

Electric appliances are complemented with onsite solar electricity generation to further lower emissions and saves money for the homeowner.

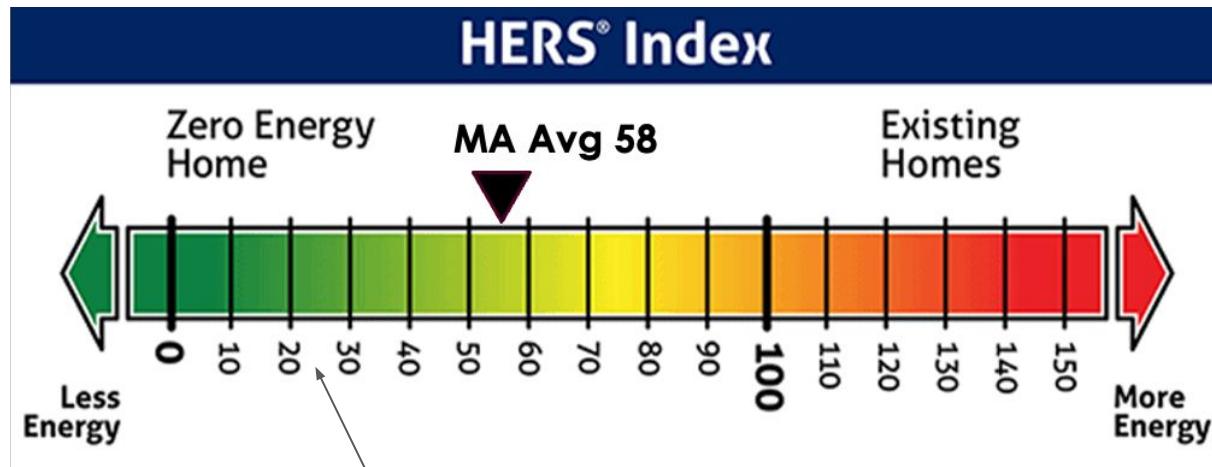
# Compliance Pathways Details

New with Specialized Code

Building Size	Fuel Type	Minimum Efficiency		Electrification	Onsite Solar
		Stretch Code	Specialized Code		
Home under 4000 sq ft 	All Electric 	HERS 45 or Passive House pathways	Same	N/A	Optional
Home under 4000 sq ft 	Mixed Fuel 	HERS 42 or Passive House	Same	Pre-wiring 	Required  (except shaded sites)
Home more than 4000 sq ft 	All Electric 	HERS 45 or Passive House	Same	N/A	Optional
Home more than 4000 sq ft 	Mixed Fuel 	HERS 42 or Passive House	HERS 0 or Phius ZERO	Pre-wiring 	Required  (except shaded sites)
Low-rise Multi-family >12k sq ft 	All Electric 	HERS 45 or Passive House	Passive House	N/A	Optional
Low-rise Multi-family >12k sq ft 	Mixed Fuel 	HERS 42 or Passive House	Passive House	Pre-wiring 	Optional
Commercial 	All Electric 	Per Stretch Code	Same	N/A	Optional
Commercial 	Mixed Fuel 	Per Stretch Code	Same	Pre-wiring 	Required  (except shaded sites)

# The HERS Index Rates a Building's Energy Efficiency

Nationally-recognized standard to measure a home's energy efficiency using variables like walls, insulation, ceiling/roof/window/doors, and HVAC systems. Based on an audit conducted by a certified HERS rater.



HERS 0: The home produces as much energy as it consumes

"Passive House": Roughly HERS ~20

HERS 100: The energy efficiency of a typical home in 2006.

# Specialized Opt-in Code Resources

- [DOER Summary of Stretch and Specialized code](#)
- [Wentworth MIT Center for Real Estate Study](#)
- Code Documents:
  - Residential construction code - [225 CMR 22.00](#)
  - Commercial, multi-family, and other code - [225 CMR 23.00](#)
- MassSave incentives for [All Electric Homes](#)
- DOER stretch code [cost-benefit study](#)

# Climate Action Planning Committee



# Milton Climate Action Planning Committee

## The committee's charge:

- Research and recommend for strategies for
  - greenhouse gas emission reduction,
  - mitigating climate risks,
  - energy efficiency, and
  - renewable energy deployment
- solicit public input from experts, stakeholders, and residents
- Prepare a Climate Action Plan (CAP) that addresses the strategies and best practices for reducing community-wide greenhouse gas emissions in alignment with the targets set by Massachusetts law\*:
  - 50% by 2030
  - 75% by 2040
  - net-zero by 2050
- measure the implementation and progress of the strategies set forth in a Climate Action Plan.

\* (M.G.L. Chapter 21N)

# CAPC Scope and Timelines

TASK	JUN '23	SEP '23	JAN '24	MAR '24	JUN '24	SEP '24	JAN '25	MAR '25	JUN '25	SEP '25	JAN '26	...
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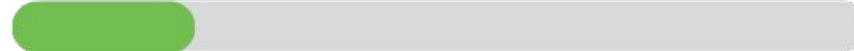
Get Organized:  
Scope and Timeline



Research outline  
and straw proposals



Expert + Stakeholder  
Engagement



Broad community  
engagement



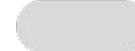
Write draft plan



Public feedback and  
refinement



Seek plan  
endorsements



Facilitate  
implementation and  
measure progress



In progress



# Milton Climate Action Planning Committee (CAPC)

## Members (2023-2024)

- Arthur Doyle (Conservation Commission)
- Dr. John Godleski
- Dr. Alexander Hasha (Sustainable Milton Designee)
- Ron Israel
- Maggie Oldfield (Planning Board)
- Mary Stefanidakis
- Lisa Troy (School Committee Designee)
- *Vacant (Select Board designee)*
- *Vacant (Milton Chamber of Commerce Designee)*



# Appendix

# Cost of Net Zero Buildings in MA

Key Findings from [2019 report](#) and [2023 reports](#) on MA Net Zero and Net Zero Ready buildings:

- In Massachusetts, there's over **32 million square feet** of Net Zero Ready buildings and that number is growing exponentially.
- Of the 7 million GSF with reported cost data, **81% reported <1% construction cost premium** to achieve Net Zero Ready.
- When there is an upfront cost premium for new buildings, it ranges from 0-7%, and the **payback is 8 years**. (Aside: retrofits payback in 6 years).
- When construction is financed via loans or bonds, operating cost savings more than offsets the loan payment premiums. **This results in positive cash-flow from day one.**
- Building **energy demand can be reduced 44 – 54 percent** across all building types with technology that's readily available today.
- In summary, the upfront cost premium is usually **<1%**, and when it exists, the **payback is strong because of the significant operating cost savings.**

# Kate Crosby Energy Manager, Acton-Boxborough Regional School District

“

The cheapest new building to build today is all-electric geothermal, because of [Inflation Reduction Act tax credits](#) (via **direct pay** to non-profits like local govt) and **generous MassSave incentives**.

An all-electric geothermal building is also the cheapest to operate - this has been true right along, due to the high efficiency, low energy footprint, and low maintenance costs.

In 2019 when our [Acton] School Building Committee selected the all-electric geothermal option, it was more expensive to build but that was offset by the "cheapest to operate" -- it was equivalent to a high-efficiency gas building over time.

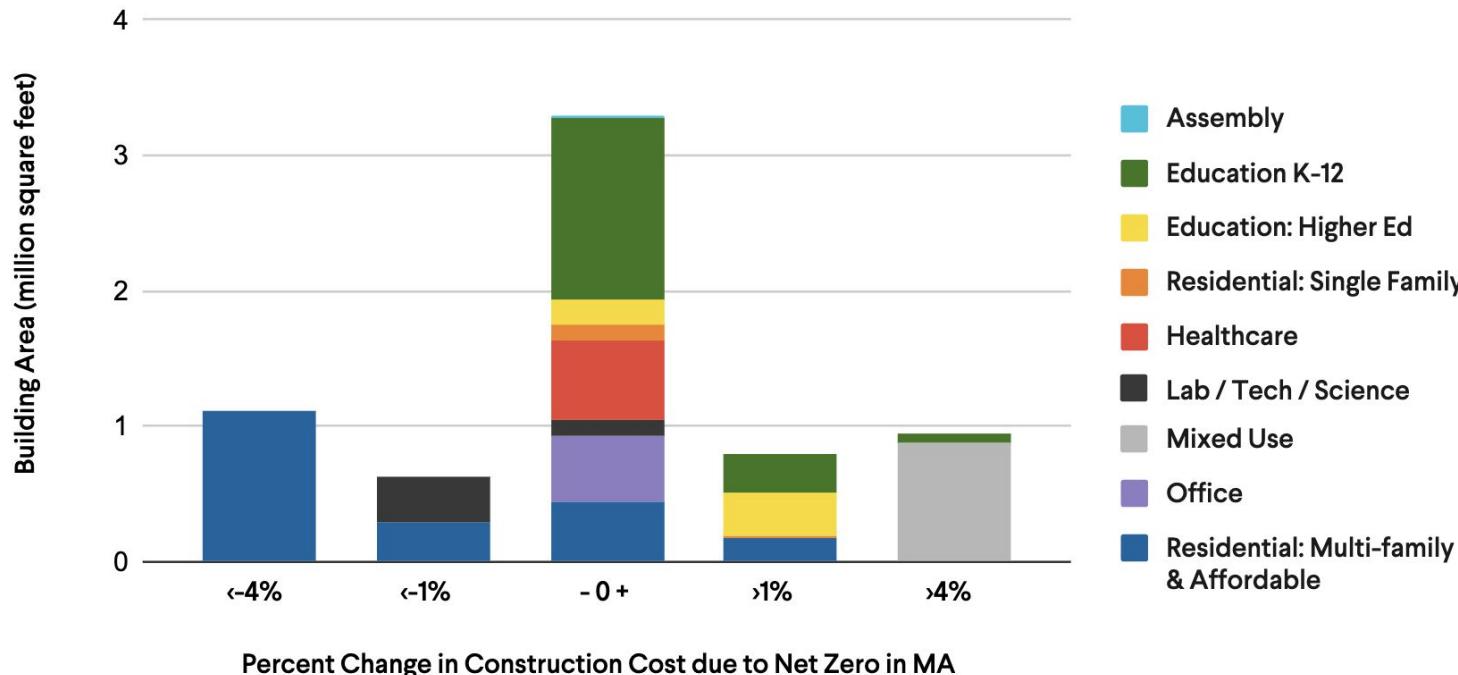
**Today, an all-electric geothermal school building is both cheapest to build and also cheapest to operate.**

”

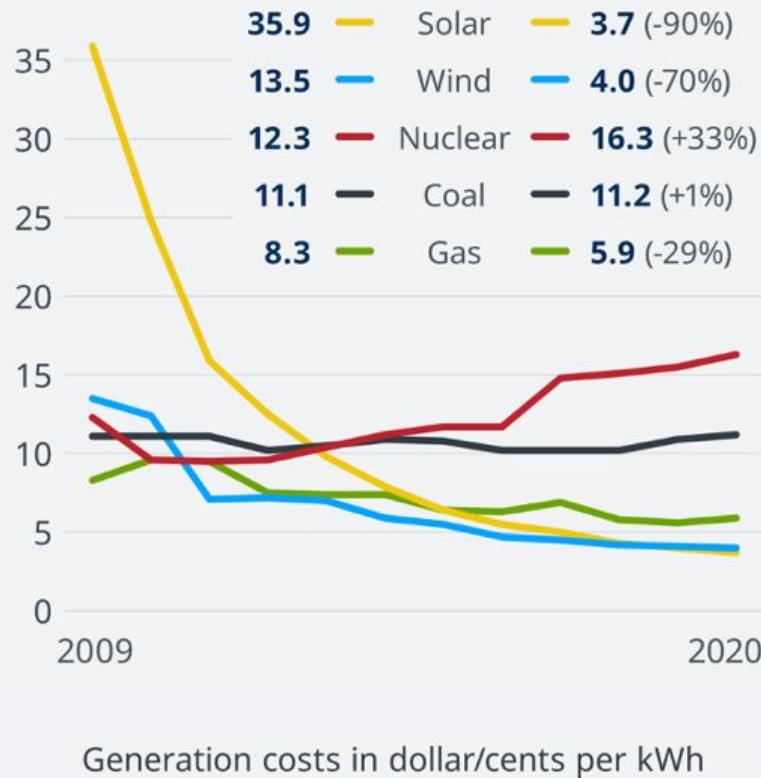
# Clean, energy-efficient construction taking advantage of generous incentives is the fiscally responsible choice

- >30 net-zero and all-electric schools built in MA in recent years ([incomplete tracker](#))
- "[Making Cents](#)" webinar on how to access incentives:
- Eversource Net-Zero Program - ([watch](#))
- [Inflation Reduction Act](#):
  - Cash reimbursement of 30% tax credits
- Lexington Select Board presentation on economics of net-zero schools - ([watch](#))
- [MSBA](#) offers bonus for all-electric construction - 3% of amount awarded

# Cost of Net Zero Projects, 2023

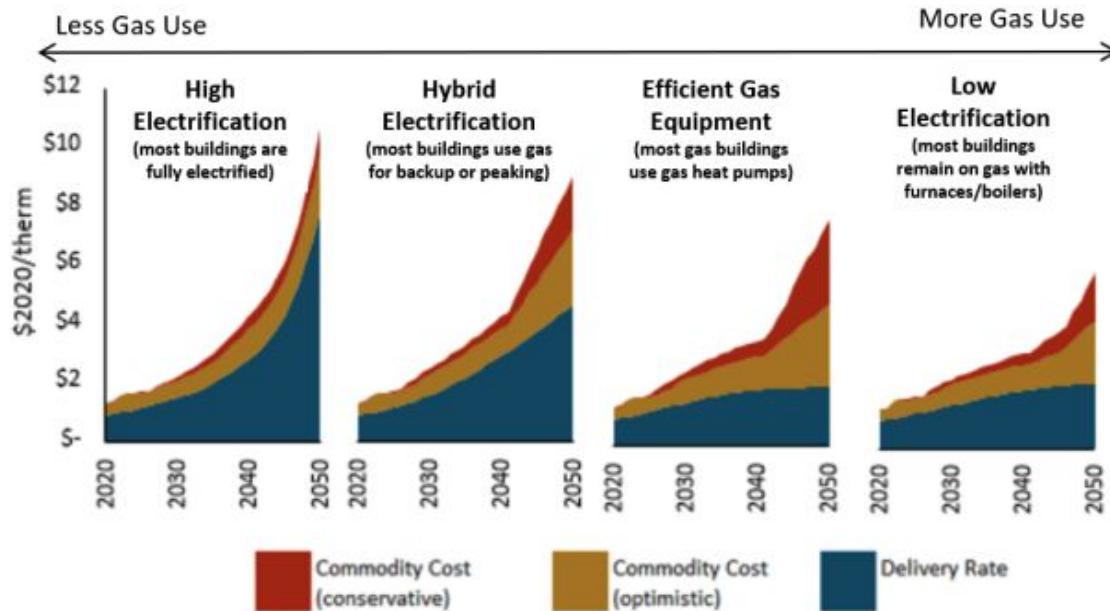


# Clean Energy Benefits



- Costs much less
- Clean & healthy
- More equitable
- Good for nature
- Creates more jobs
- No heat or water waste
- No cause for price spikes

# Natural Gas prices are expected to increase significantly in coming years

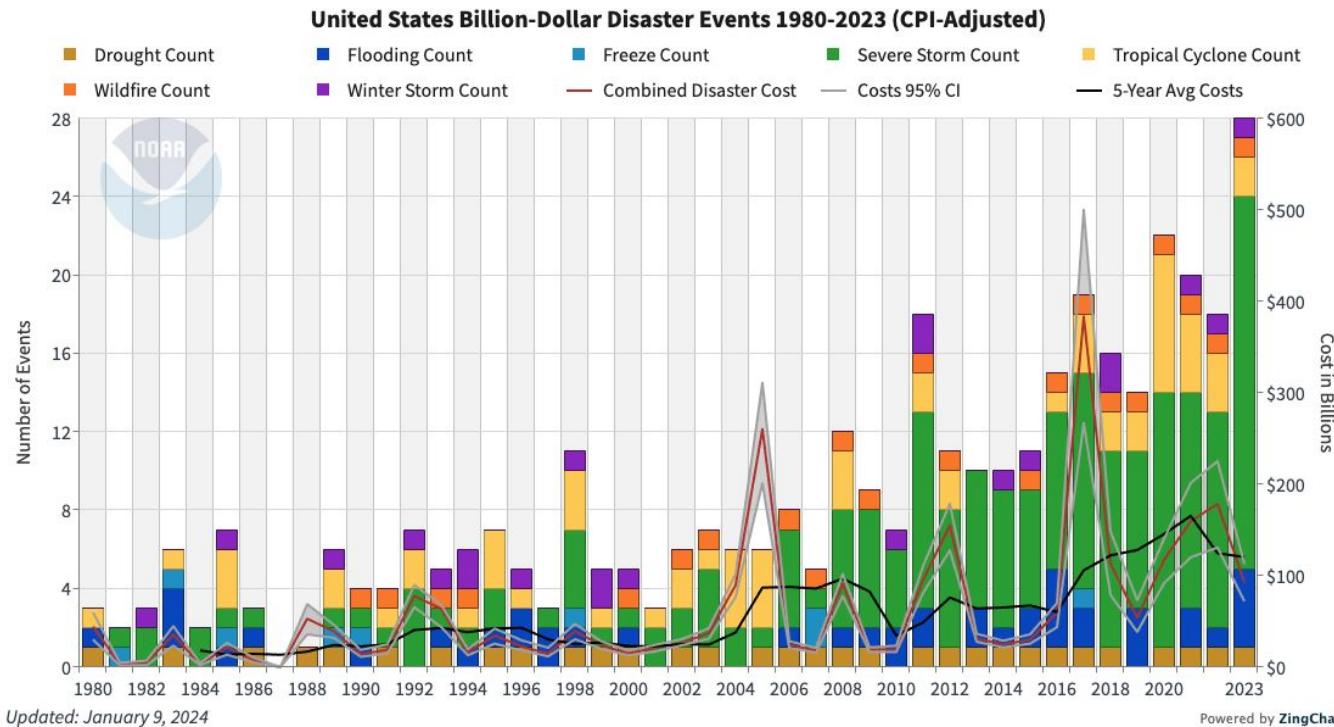


**Figure 6:** The impact of several gas transition scenarios on customer rates adapted from the independent consultant report for the gas utilities in the MA DPU 20-80 Investigation. Note: The gas heat pump in the Efficient Gas Equipment scenario uses pipeline gas (rather than electricity) to power a heat pump cycle.

# Frequently Asked Questions

Question	Answer
Is it expensive to comply?	DOER study shows All-Electric homes cost \$20K less to build and \$548/yr less to operate.
Does this apply to 40Bs?	<b>Yes.</b>
What about backup power?	You can install a fossil fuel backup generator on an all-electric home.
Will I have to cut down trees to install rooftop solar?	<b>No.</b> Homes are exempt where solar access is less than 70% or the roof is too steep.
Will the grid be ready?	Eversource has filed plans to increase grid capacity by 180% to support “full electrification.”

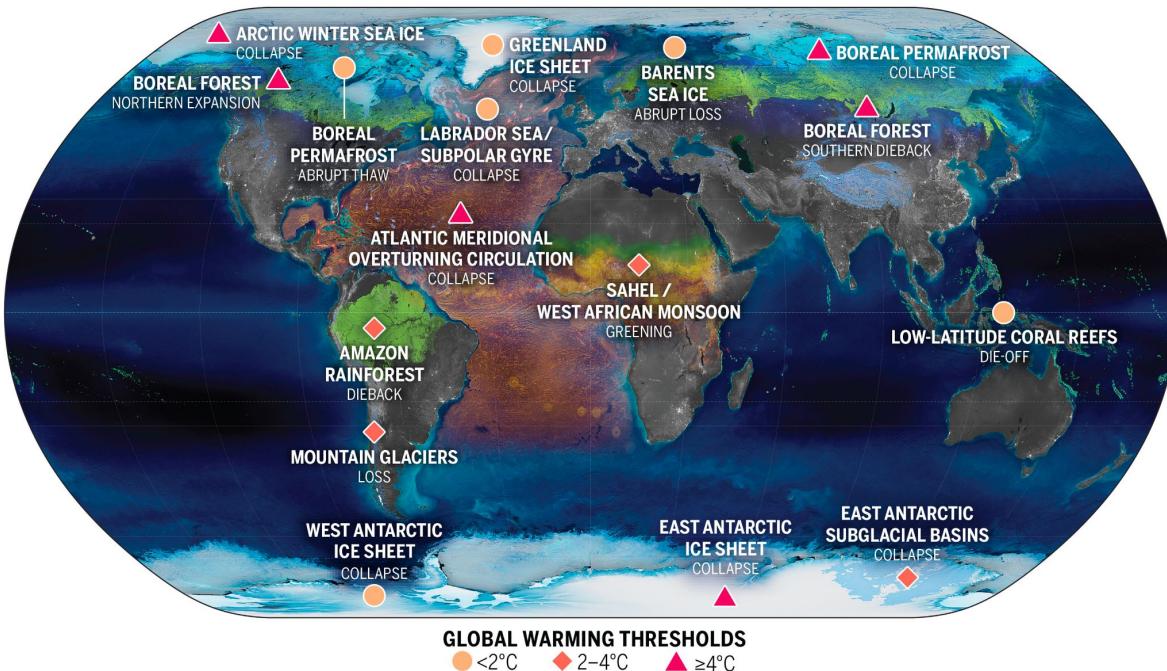
# U.S. Billion-Dollar Weather and Climate Disasters



Updated: January 9, 2024

Powered by ZingChart

# Climate “tipping points” risk abrupt, irreversible change



“Climate tipping points are conditions beyond which changes in a part of the climate system become self-perpetuating. These changes may lead to abrupt, irreversible, and dangerous impacts with serious implications for humanity.”

**Worst-case scenarios** grow rapidly more likely the longer fossil-fuel consumption continues unchecked:

- Sea-level rise up to **230 feet**
- Europe experiences **drastically colder temperatures** similar to northern Canada
- Regional collapses of fresh water supplies
- Widespread crop failures
- Life-threatening heat waves lasting 250 days a year in some areas.
- Total loss of critical ecosystems

Source: Armstrong, et al. "[Exceeding 1.5°C global warming could trigger multiple climate tipping points](#)", Science, vol. 377, no. 6611, 2022