



Sharon

MASSACHUSETTS

Specialized Stretch Code

Sharon Energy Advisory Committee

What is the Specialized Stretch Code

“The Specialized Stretch Code ensures that **new** construction is consistent with a net-zero Massachusetts economy in 2050, primarily through deep energy efficiency, reduced heating loads, and efficient electrification.”

It accomplishes this by codifying new building construction as net zero buildings.

“A net zero building is consistent with achievement of MA 2050 net zero emissions, through a combination of highly energy efficient design together with being an all-electric or Zero Energy Building, or where fossil fuels are utilized, a building fully pre-wired for future electrification and that generates solar power on-site from the available Potential Solar Zone Area.”

Sharon's Timeline

2008 Global Warming Solutions Act

2009 Green Communities Act / Program

2017 Sharon Becomes a Green Communities

2019 Sharon Sets Goal for Net Zero by 2050

2020 Sharon Hires a Shared Energy Manager

2021 MA 2050 Decarbonization Roadmap

2021 Sharon Implements Sharon Power Choice with 20% more green

2022 2022-2024, 3 Year Plan

Massachusetts Clean Energy and Climate Plan for 2025 and 2030 (CECP)

2022 Community First Partnership with MassSave

Building Code Pathways for 2024

Base Code

- New and modified construction in cities and towns that have not adopted the Stretch Code
- 51 Communities
- BBRS update effective in 2023

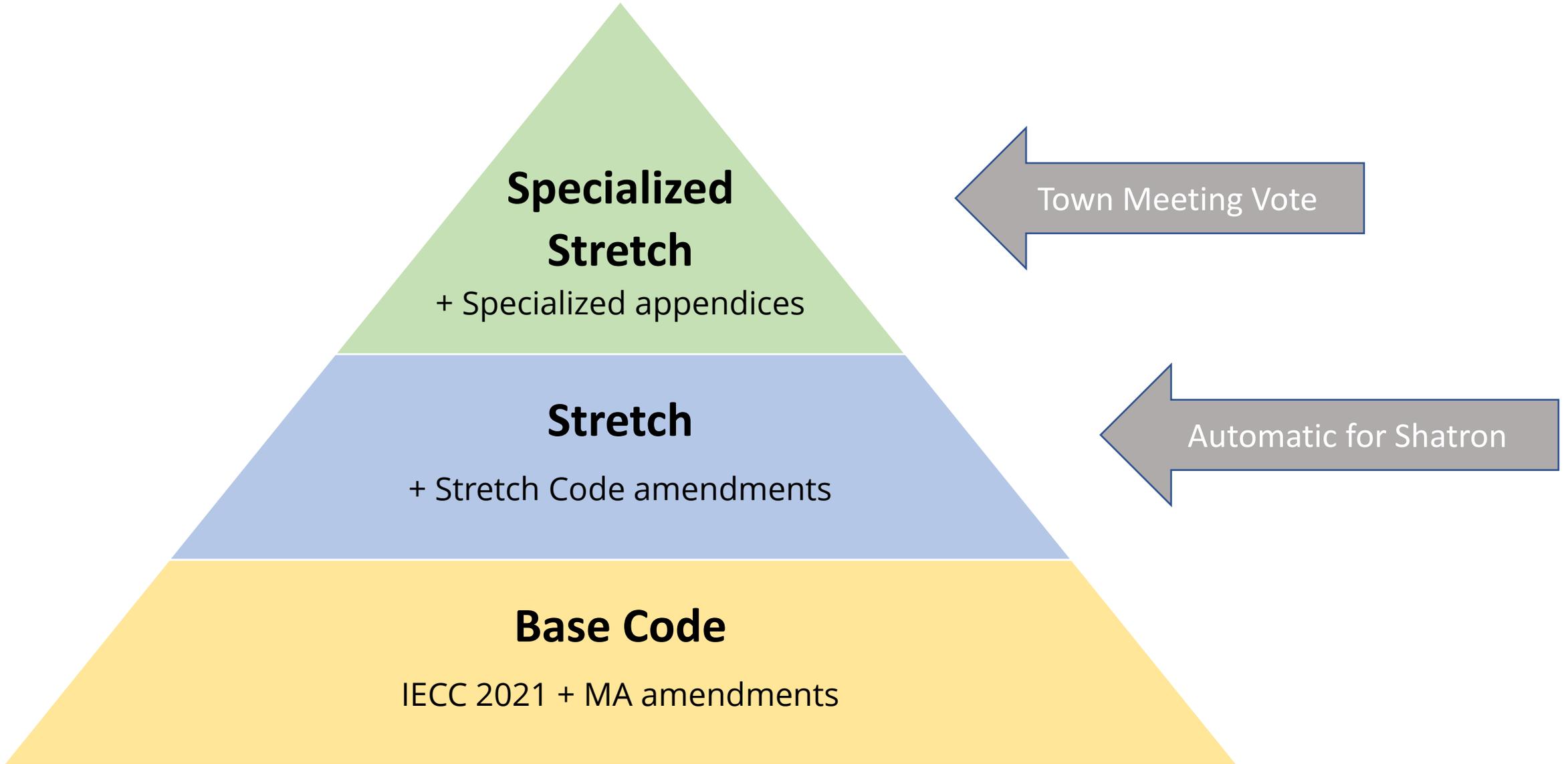
Stretch Code

- New and modified construction in cities and towns that have adopted the Stretch Code
- 291 Communities
- DOER Update Fully Effective 2024

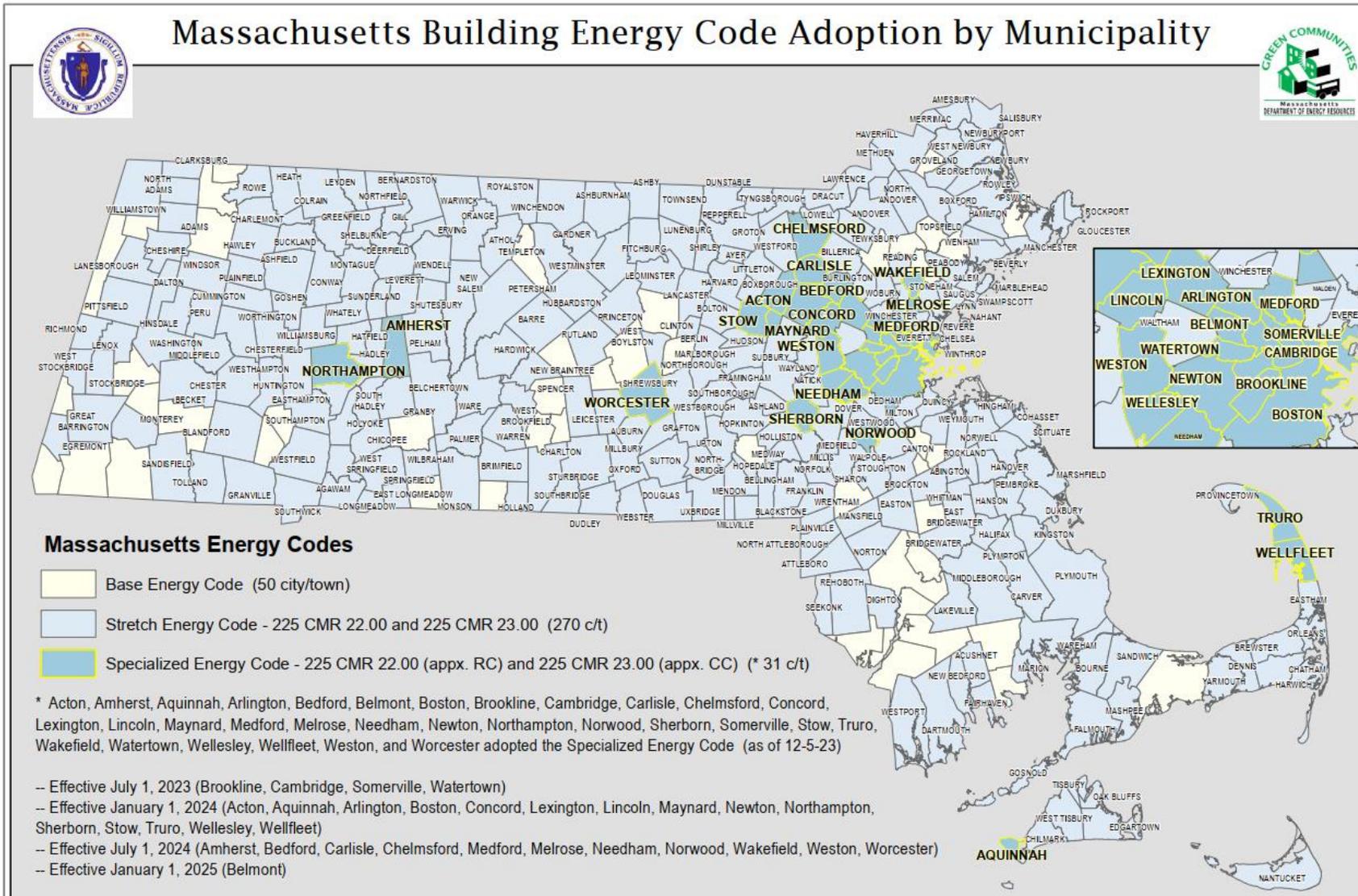
Specialized Stretch Code

- **New** construction in cities or towns that choose to opt into Specialized Stretch Code
- Available in December 2022

How the Code Pathways Stack



Stretch Code Pathway Adoption



31 Cities and Towns have already adopted the Specialized Stretch Code

Why Should Sharon Adopt

Massachusetts's goal of Net Zero by 2050

Sharon's goal of Net Zero by 2050

3% Adder for MSBA Projects

Required for Climate Leader Community

Cost Savings for the Community

Definitions

TEDI

Thermal Energy Demand Intensity - only considers heating / cooling loads. Not lighting, plug loads, etc

Net Zero Building

A building which is consistent with achievement of MA 2050 net zero emissions, through a combination of highly energy efficient design together with being an all-electric or a Zero Energy Building, or where fossil fuels are utilized, a building fully pre-wired for future electrification and that generates solar power on-site from the available Potential Solar Zone Area.

Zero Energy Building

A building which through a combination of highly energy efficiency design and onsite renewable energy generation is designed to result in net zero energy consumption over the course of a year as measured in MMBtus or KWheq, on a site energy basis, excluding energy use for charging vehicles.

HERS

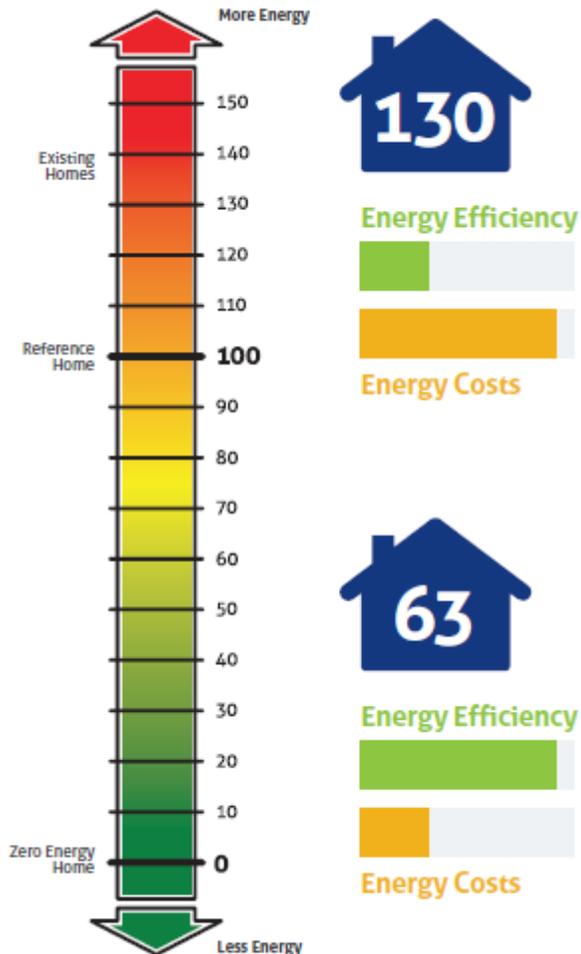
A Home Energy Rating is an estimated measurement of a home's energy efficiency based on normalized modified end-use loads. Similar to TEDI but for Homes

Passive House

A standard for energy efficiency in a building, which reduces the building's ecological footprint. It results in ultra-low energy buildings that require little energy for space heating or cooling.

Rating Systems

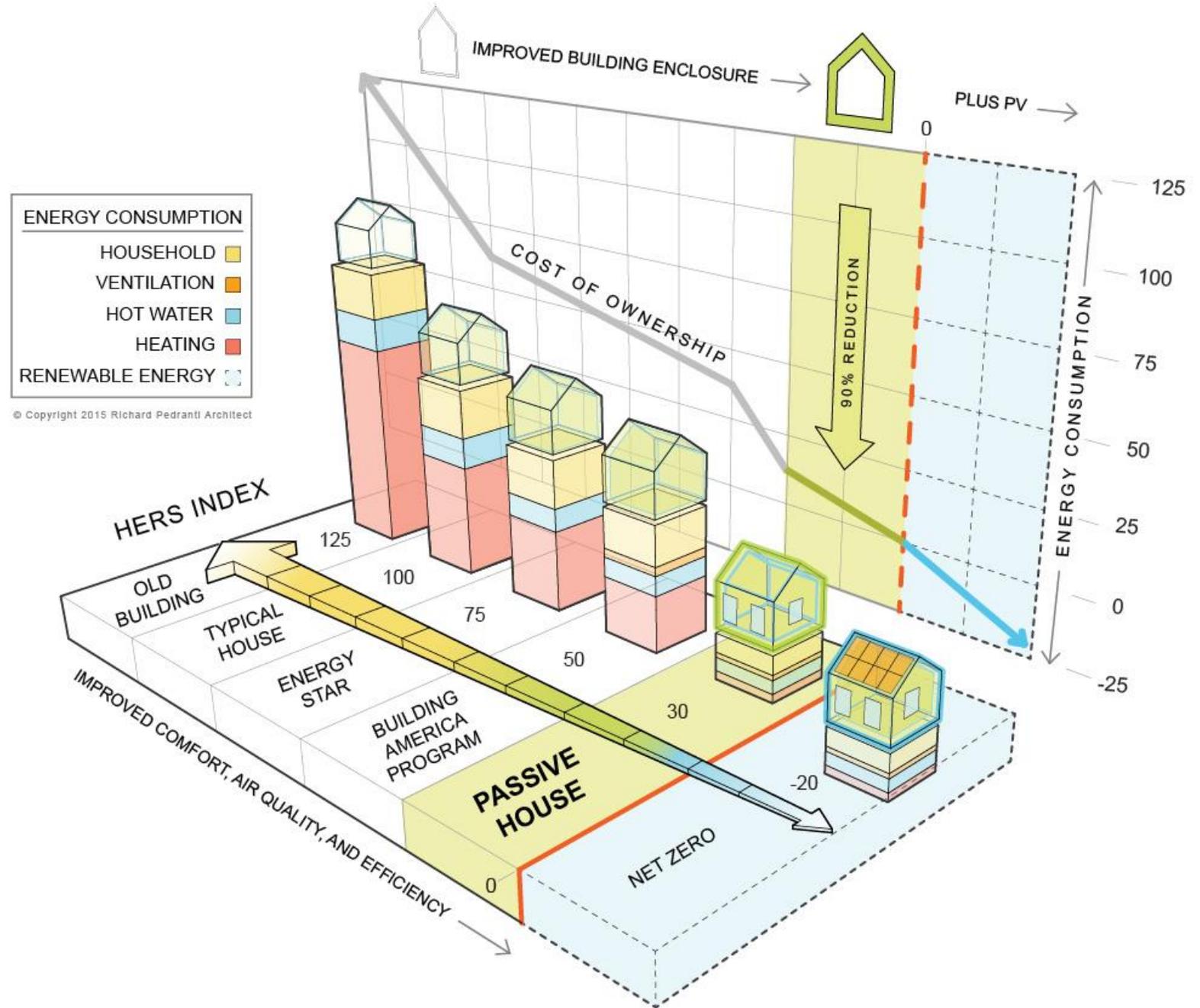
HERS Rating



On-site Clean Energy Application	Maximum HERS Index score (before renewable energy credit)		
	New construction		Alterations, Additions and Change of use
	Updated Stretch Code July 1, 2024	Stretch Code	Stretch Code
Mixed Fuels	42	52	52
plus Solar		55	55
All-Electric	45	55	55
Solar & All Electric		58	58

Stretch Code and Specialized Stretch code HERS rating requirements will be the same on 7/1/2024

Rating System Comparison



Comparison of updated Stretch Code and Opt-In Specialized Stretch Code - Residential

Building Size	Fuel Type	Minimum Efficiency		Electrification		Renewable Generation	
		Stretch Code	Specialized Stretch Code	Stretch Code	Specialized Stretch Code	Stretch Code	Specialized Stretch Code
Dwellings <= 4,000 sf	All Electric	HERS 45 or Passive House		Full	Full	Optional	Optional
Dwellings <= 4,000 sf	Mixed Fuels	HERS 42 or Passive House		Optional	Pre-wiring Required	Optional	Solar PV > 4kW for single family and > 0.75 W/sf for multi-family
Dwellings > 4,000 sf	All Electric	HERS 45 or Passive House		Full	Full	Optional	Optional
Dwellings > 4,000 sf	Mixed Fuels	HERS 42 or Passive House	HERS 0 or Phius ZERO	Optional	Pre-wiring Required	Optional	Solar PV or other renewable to meet Zero Energy Building

Comparison of updated Stretch Code and Opt-In Specialized Stretch Code – Commercial pg 1

Building Type	Fuel Type	Minimum Efficiency		Electrification		Renewable Generation	
		Stretch Code	Specialized Stretch Code	Stretch Code	Specialized Stretch Code	Stretch Code	Specialized Stretch Code
Offices and Schools >20,000 sf	All Electric	TEDI or Passive House		Full	Full	Optional	Optional
Offices and Schools > 20,000 sf	Mixed Fuels	TEDI or Passive House		Optional [◇]	Pre wiring required	Optional	On-site PV: Min of 1.5 W/sf for each sf of the 3 largest floors or 75% of potential solar
High Ventilation (Hospitals, Labs, etc.)	All Electric	TEDI, 10% better than 2019 ASHRAE Appendix G, or Passive House		Full	Full	Optional	Optional
High Ventilation (Hospitals, Labs, etc.)	Mixed Fuels	TEDI, 10% better than 2019 ASHRAE Appendix G, or Passive House		Optional [◇]	Pre wiring required	Optional	On-site PV: Min of 1.5 W/sf for each sf of the 3 largest floors or 75% of potential solar

Comparison of updated Stretch Code and Opt-In Specialized Stretch Code – Commercial pg 2

Building Type	Fuel Type	Minimum Efficiency		Electrification		Renewable Generation	
		Stretch Code	Specialized Stretch Code	Stretch Code	Specialized Stretch Code	Stretch Code	Specialized Stretch Code
Multi-family >12,000 sf	All Electric	TEDI, HERS 45*, Passive House	Passive House or HERS 0§	Full	Full	Optional	Optional
Multi-family >12,000 sf	Mixed Fuels	TEDI, HERS 42*, Passive House	Passive House or HERS 0§	Optional◇	Pre wiring required	Optional	Optional
Small Commercaill (<20,000 sf)	All Electric	Perscriptive pathway plus Stretch Code ammendments	Perscriptive pathway plus Stretch Code ammendments	Full	Full	Optional	Optional
Small Commercial (<20,000 sf)	Mixed Fuels	Perscriptive pathway plus Stretch Code ammendments	Perscriptive pathway plus Stretch Code ammendments	Optional◇	Pre wiring required	Optional	On-site PV: Min of 1.5 W/sf for each sf of the 3 largest floors or 75% of potential solar area

What's the Cost Effect - Residential

DOER hired an independent building energy consulting firm to look at the cost-benefit equation of building a representative set on new single-family and multi-family homes to the updated 2023 Stretch Code and the Specialized Code.

[DOER Stretch Code](#)

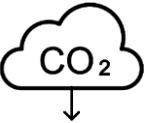
The next four slides show the results for residential dwellings.



HERS Index (ERI)
52 **42**
 Base Stretch



2030 Annual Greenhouse Gas
0.75 | **2.56**
 Stretch Tons Tons Saved



Home Details

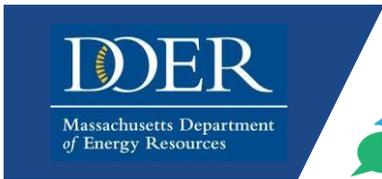
- 2,100 sq.ft.
- Small Single Family
- 3 Bedrooms
- Worcester, MA

Small Single Family - Electric

Costs and Benefits to Meet Stretch Code

	COSTS		BENEFITS	NET
BUILDER	-\$11,597 Total Adjustments		\$17,000 Rebates & Tax Rebates ¹	-\$28,597 Cost Compared to Base Code
HOME BUYER	-\$5,719 Change to Downpayment ³	-\$1,244 Change to Annual Mortgage Payment ³	-\$191 Estimated Energy Cost Savings per Year ²	-\$1,053 Buyer Annual Net

1. Rebates are calculated on a per unit basis, using Mass Save® residential new home construction incentives & Tax credit allows for up to \$2,000 for new homes independently rated below HERS 50.
2. Energy costs are based on 22 cents/kWh, \$1.53/therm, and \$3.09/gal propane
3. 30-year mortgage assumes 20% down payment at 3.5% APR
4. In addition to the Mass Save® rebates, HERS Rated homes are eligible for the \$2,000/unit residential builder energy efficiency tax credit under section 1332, Credit for Construction of New Energy Efficient Homes, of the Energy Policy Act of 2005





Small Single Family - Gas

Costs and Benefits to Meet Stretch Code

HERS Index

52

Base

42

Stretch



Gas

2030 Annual Greenhouse

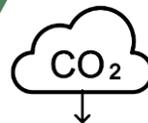
Gas

2.92

Stretch Tons

0.38

Tons Saved



Home Details

- 2,100 sq.ft.
- Small Single Family
- 3 Bedrooms
- Worcester, MA

	COSTS	BENEFITS	NET	
BUILDER	<p>\$14,064</p> <p>Total Adjustments</p>	<p>\$6,157</p> <p>Rebates & Tax Credits¹</p>	<p>\$7,907</p> <p>Cost Compared to Base Code</p>	
HOME BUYER	<p>\$1,581</p> <p>Change to Downpayment³</p>	<p>\$344</p> <p>Change to Annual Mortgage Payment³</p>	<p>-\$153</p> <p>Estimated Energy Cost Savings per Year²</p>	<p>\$496</p> <p>Buyer Annual Net</p>

1. Rebates are calculated on a per unit basis, using Mass Save® new construction program pay-for-savings Incentive calculations & Tax credit allows for up to \$2,000 for new homes independently rated below HERS 50.
2. Energy costs are based on 22 cents/kWh, \$1.53/therm, and \$3.09/gal propane
3. 30-year mortgage assumes 20% down payment at 3.5% APR
4. In addition to the Mass Save® rebates, HERS Rated homes are eligible for the \$2,000/unit residential builder energy efficiency tax credit under section 1332, Credit for Construction of New Energy Efficient Homes, of the Energy Policy Act of 2005

DER

Massachusetts Department of Energy Resources



PERFORMANCE SYSTEMS DEVELOPMENT

Large Single Family - Electric

Costs and Benefits to Meet Stretch Code



HERS Index

52

Base

42

Stretch



Electric Heat Pump

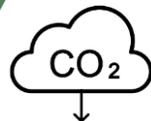
2030 Annual Greenhouse Gas

1.19

Stretch Tons

4.43

Tons Saved



Home Details

- 4000 sq.ft.
- Large Single Family
- 5 Bedrooms
- Worcester, MA

	COSTS		BENEFITS	NET
BUILDER	-\$3,062 Total Adjustments		\$17,000 Rebates & Tax Rebates ¹	-\$20,062 Cost Compared to Base Code
HOME BUYER	-\$4,013 Change to Downpayment ³	-\$873 Change to Annual Mortgage Payment ³	-\$325 Estimated Energy Cost Savings per Year ²	-\$548 Buyer Annual Net

1. Rebates are calculated on a per unit basis, using Mass Save® residential new home construction incentives & Tax credit allows for up to \$2,000 for new homes independently rated below HERS 50.

2. Energy costs are based on 22 cents/kWh, \$1.53/therm, and \$3.09/gal propane

3. 30-year mortgage assumes 10% down payment at 4% APR

4. In addition to the Mass Save® rebates, HERS Rated homes are eligible for the \$2,000/unit residential builder energy efficiency tax credit under section 1332, Credit for Construction of New Energy Efficient Homes, of the Energy Policy Act of 2005

DER

Massachusetts Department of Energy Resources



PERFORMANCE SYSTEMS DEVELOPMENT



Large Single Family - Gas

Costs and Benefits to Meet Stretch Code

HERS Index

52 Base **42** Stretch

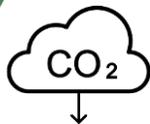


Gas

2030 Annual Greenhouse Gas

4.13 | **1.49**

Stretch Tons | Tons Saved

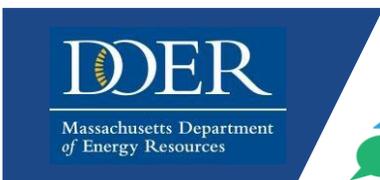


	COSTS	BENEFITS	NET
BUILDER	\$10,892 Total Adjustments	\$7,708 Rebates & Tax Rebates ¹	\$3,184 Cost Compared to Base Code
HOME BUYER	\$637 Change to Downpayment ³	\$139 Change to Annual Mortgage Payment ³	\$440 Estimated Energy Cost Savings per Year ²
			-\$302 Buyer Annual Net

Home Details

- 4000 sq.ft.
- Large Single Family
- 5 Bedrooms
- Worcester, MA

1. Rebates are calculated on a per unit basis, using Mass Save® new construction program pay-for-savings Incentive calculations & Tax credit allows for up to \$2,000 for new homes independently rated below HERS50.
2. Energy costs are based on 22 cents/kWh, \$1.53/therm, and \$3.09/gal propane
3. 30-year mortgage assumes 10% down payment at 4% APR
4. In addition to the Mass Save® rebates, HERS Rated homes are eligible for the \$2,000/unit residential builder energy efficiency tax credit under section 1332, Credit for Construction of New Energy Efficient Homes, of the Energy Policy Act of 2005



What's the Cost Effect - Commercial

	Improves Life Cycle Cost	Incremental Cost to Build	GHG Reduction
Primary School	Yes	1.1 to 2.8%	26 to 39%
Secondary School	Yes	0 to 0.5%	34 to 39%
Small office	Yes	3.4 to 4.5%	25 to 50%
Large Office	Yes	-4 to -4.6% less	31 to 33%
Lab/Office	Yes	-0.7 to -1.2% less	29 to 67%
Multi-family	Yes	< 1.9 to 2.9%	45% +/-

Warrant Article

SAMPLE TOWN WARRANT ARTICLE FROM DOER:

To see if the Town will vote to enact Chapter ____ of the Town of Sharon General Bylaws, entitled “Specialized Energy Code” for the purpose of regulating the design and construction of buildings for the effective use of energy and reduction of greenhouse gas emissions, pursuant to the entirety of 225 CMR 22 and 23 including Appendices RC and CC, including future editions, amendments or modifications thereto, with an effective date of January 1st, 2025, a copy of which is on file with the Town Clerk, or take any other action relative thereto.

Questions?

Contact Email:
energy@townofsharon.net