



MASSACHUSETTS
**DEPARTMENT OF
ENERGY RESOURCES**

Climate Leader Communities & Opt-In Specialized Code

Presentation for Shutesbury Energy Committee

March 17, 2025

Presented by
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Today's Presentation

Policy Background

Climate Leader Communities
Program Grants

Specialized Stretch Code





Policy Background

Climate Act and Green Communities Climate Leaders



Climate Act 2021

The legislation signed into law updates the greenhouse gas emissions limits related to the 2008 Global Warming Solutions Act, commits Massachusetts to achieve **Net Zero emissions in 2050**, and authorizes the Secretary of Energy and Environmental Affairs (EEA) to establish an emissions limit of no less than **50% for 2030**, and no less than **75% for 2040**.



Four Pathways to Decarbonization

Electrify buildings

Electrify vehicles

Clean up the grid

Carbon sequestration

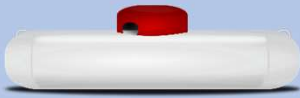
2020

Current grid emissions: ~680 lbs./MWh

OIL



PROPANE



GAS



ELECTRIC
RESISTANCE



ELECTRIC
COLD CLIMATE
AIR SOURCE
HEAT PUMP



ELECTRIC
GROUND SOURCE
HEAT PUMP



Pounds of emissions to deliver 1 MMBtu of heat

170

145

120

205

65

45

45% Less

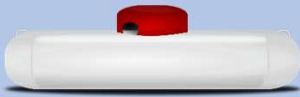
2050

Future grid emissions: ~200 lbs./MWh

OIL



PROPANE



GAS



ELECTRIC
RESISTANCE



ELECTRIC
COLD CLIMATE
AIR SOURCE
HEAT PUMP



ELECTRIC
GROUND SOURCE
HEAT PUMP



Pounds of emissions to deliver 1 MMBtu of heat

170

145

120

~~205~~

59

~~65~~

18

45

13

85% Less



Climate Leader Communities



Requirements for Certification



Must be an existing Green Community in “good standing”



Establish/maintain a local committee to advise, coordinate, and/or lead clean energy and climate activities



Commit to municipal decarbonization by 2050 and formulate a roadmap for implementation



ZEV-First vehicle policy



Specialized Stretch Code Adoption

What does Climate Leaders offer?

Technical Assistance

\$150,000

- Technical studies for the below

Capital funding
(Accelerator Grant)

\$1,000,000

- On-site Solar PV
- Solar thermal
- Heat pumps
- Energy Storage
- Other decarbonization activities

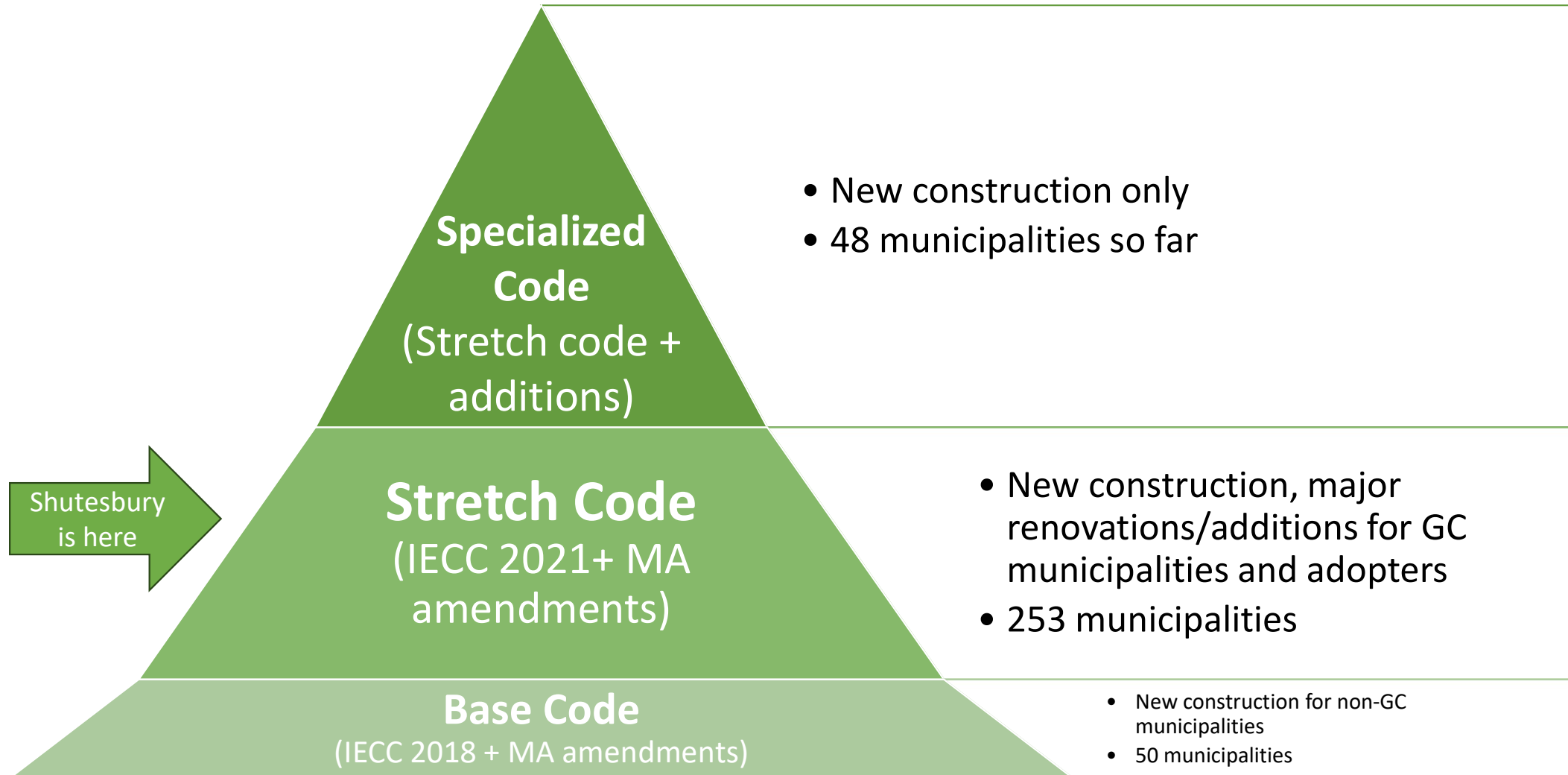


Opt-in Specialized Energy Code

Details of the code for small residential

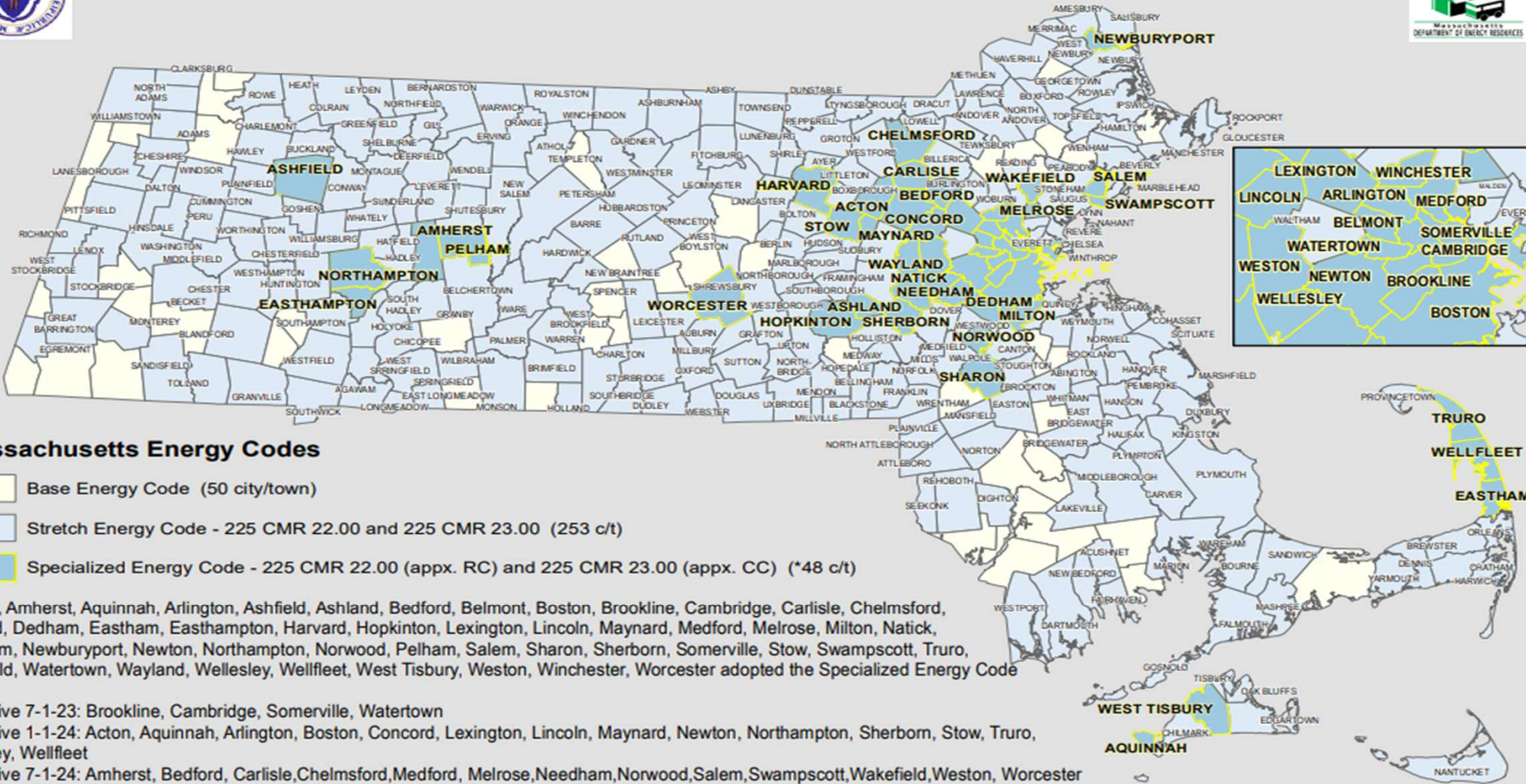


Base, Stretch, and Specialized – 3 Options





Massachusetts Building Energy Code Adoption by Municipality

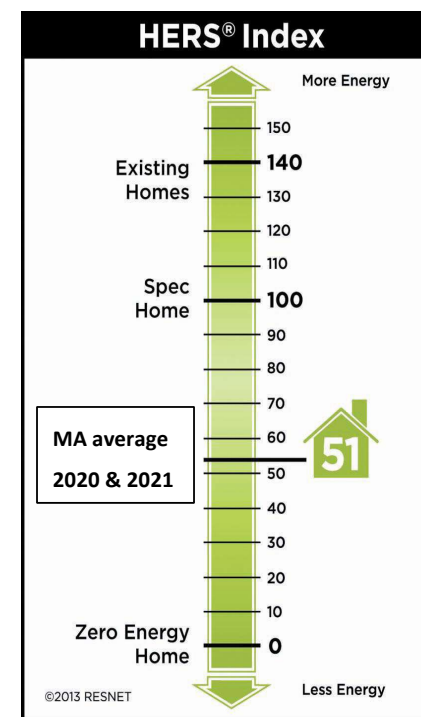
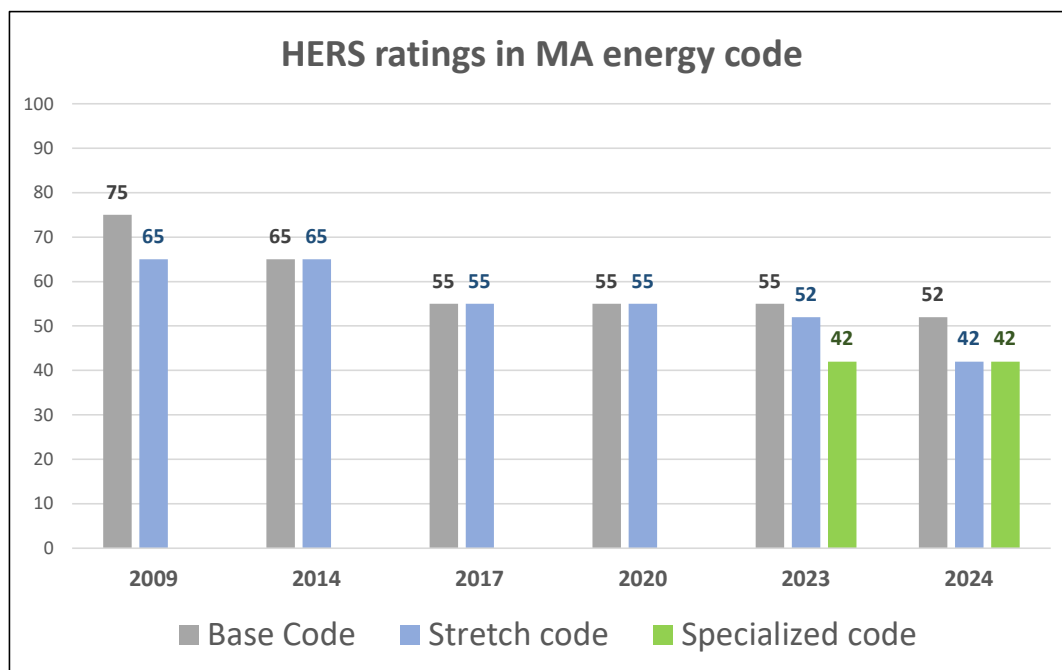


What is the HERS Process?

- ✓ Review Building Plans via Computer Modeling
 - ✓ Preliminary HERS score
- ✓ In-process inspections
 - ✓ Duct tightness test (if applicable)
 - ✓ Insulation inspection
- ✓ Final inspection
 - ✓ Blower door test
- ✓ Finalize energy model based on verified performance and equipment
- ✓ Final HERS certificate provided to local code official



(Simplified) History of HERS ratings in MA energy code

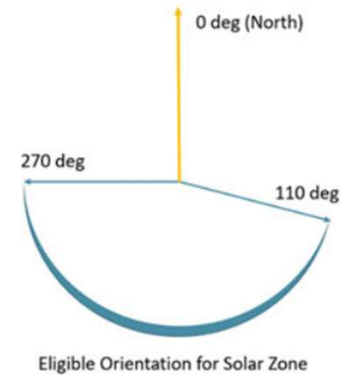


Specialized vs Stretch code - Residential Low-Rise

Energy Source(s)	Home Size	Stretch code (July 2024)	Specialized Code (Jan 2024)
All Electric New Homes	Any Size home	HERS 45 or Passivehouse	
Mixed-Fuel New Homes	Under 4,000 sq ft	HERS 42	+Solar PV (min 4kw) + wiring for electrification
	4,000 sq ft and over	HERS 42	+ Solar PV (to net-zero) + wiring for electrification
	Any	Passivehouse option	+ wiring for electrification
Home additions & alterations	Any	Same as Stretch code	
Historic or Existing homes	Any	Energy Code exemption if it would damage the historic fabric of the building	

Specialized Residential Code: Solar PV sizing

- Mixed-fuel: Solar required for mixed fuel buildings when there is a suitable solar-roof zone ≥ 300 sq. ft. AND at right orientation
 - Can be ground mounted as long as it's on-site
 - Direct ownership or third-party (lease, PPA) allowed
 - No trees need to be cut down
- All-electric: No PV required, just solar-ready roofs (regular stretch code)



A 4-kW system would take up about 230 ft² while an 8-kW system would take up 460 ft²

Home Type	Solar required
All-electric	No
Mixed-fuel < 4,000 sq. ft.	4 kW unless Passive House
Mixed-fuel > 4,000 sq. ft.	Enough for net-zero (8+ kw)
Other residential	0.75 W/sq. ft
Commercial	1.5 W/sq. ft of three largest floors
Commercial high ventilation	0.5 W/sq. ft of three largest floors

Small residential incentives


	Single Family	Small multifamily (2-4 units)
State (Mass Save)	\$15,000 for HERS < 46	\$17,500 - \$22,500 for HERS < 46
	\$25,000 for Passive House	\$25,000 - \$40,000 for Passive House
	Adders for certain technology (induction stoves, HPHW)	
Federal (45L)	\$2,500 for Energy Star	\$500 for Energy Star \$2,500 for Energy Star + prevailing wage
	\$5,000 for Zero Energy Ready	\$1,000 for Zero Energy Ready \$5,000 for Zero Energy Ready + prevailing wage

Solar incentives:

- ☀ 30% federal tax credit through 2032
- ☀ 15% state tax credit (\$1,000 cap)
- ☀ Net metering
- ☀ SMART
- ☀ No sales tax, no extra property tax on added value to home



HERS Index (ERI)
45 ▶ 45
 Stretch Specialized

 Electric Heat Pump

MA 10th Edition Building Code | 2025
Large Single Family - Electric

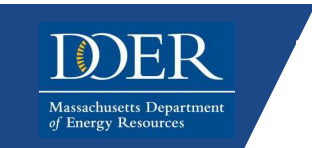
Costs and Benefits to Meet Specialized Code

	COSTS^{1,2}	BENEFITS	NET
Pre-Wiring Costs³	\$0 Total Pre-Wiring Cost	\$0 Rebates	\$0 Cost Compared to Stretch Code
Solar Costs	\$0 Total Solar Cost	\$0 Rebates	\$0 Cost Compared to Stretch Code

Home Details

- 4000 ft²
- Large Single Family
- 5 Bedrooms
- Worcester, MA

1. For All-Electric buildings, there is no cost difference between the Stretch Code and the Specialized Code because the requirements are the same.
2. Pre-wiring and solar costs are only applicable to mixed fuel projects following the Specialized code and do not apply to all-electric buildings.
3. Pre-wiring includes the costs to add a dedicated branch circuit and outlet nearby any equipment currently using fossil fuels for space heating, water heating, cooking, and clothes drying. This does not include the costs associated with upgrading an electrical panel.





MA 10th Edition Building Code | 2025

Large Single Family - Electric

HERS Index (ERI)

45 ▶ 45

Stretch Specialized



4000 ft² Large Single Family
5 Bedroom - Worcester, MA


Breakdown of Construction Costs to Meet Specialized Code

FEATURE	STRETCH CODE	SPECIALIZED CODE	COST DIFFERENTIAL ¹
HERS INDEX ⁴	42	42	
Windows (U-Value/SHGC)	U-0.28, 0.29 SHGC	U-0.28, 0.29 SHGC	\$0
DHW	HPWH, 50 gal, 2.35 EF	HPWH, 50 gal, 2.35 EF	\$0
Heating			
Cooling	SEER 20, 12 HSPF, Ducted	SEER 20, 12 HSPF, Ducted	\$0
Duct Leakage to Outside	In Conditioned Space	In Conditioned Space	\$0
Foundation Insulation	NA	NA	\$0
Floor Insulation	R-30 Fiberglass Batt	R-30 Fiberglass Batt	\$0
Walls Insulation	R-21, 2x6, 16 in o.c.	R-21, 2x6, 16 in o.c.	\$0
High Efficacy Lighting	100% LED	100% LED	\$0
Ceiling Insulation	R-38 Open Cell Spray Foam, Unvented	R-38 Open Cell Spray Foam, Unvented	\$0
Air Infiltration	1.5 ACH50	1.5 ACH50	\$0
Mechanical Ventilation	HRV, 75%	HRV, 75%	\$0
Pre-Wiring ^{2,3}	N/A	N/A	\$0
Solar Array ²	N/A	N/A	\$0
TOTAL			\$0

1. For All-Electric buildings, there is no cost difference between the Stretch Code and the Specialized Code because the requirements are the same.
2. Pre-wiring and solar costs are only applicable to mixed fuel projects following the Specialized code and do not apply to all-electric buildings.
3. Pre-wiring includes the costs to add a dedicated branch circuit and outlet nearby any equipment currently using fossil fuels for space heating, water heating, cooking, and clothes drying. This does not include the costs associated with upgrading an electrical panel.
4. Please note that an all-electric home qualifies for a three-point increase in the HERS Index, reducing the stringency from HERS 52 to 55 when following the Base Code, and HERS 42 to 45 when following the Stretch Code. For the purposes of this analysis, a HERS Index of 52 (for Base Code) and 42 (for Stretch and Specialized Code) have been used in the energy models for the all-electric scenario.



HERS Index (ERI)
42 ▶ **0**
 Stretch Specialized



MA 10th Edition Building Code | 2025

Large Single Family - Gas

Costs and Benefits to Meet Specialized Code*

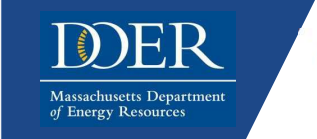
	COSTS	BENEFITS ³	NET
Pre-Wiring Costs⁵	\$9,000 Additional Pre-Wiring Cost	\$0 Rebates ^{1,2}	\$9,000 Cost Compared to Stretch Code
Solar Costs	\$22,902 Additional Solar Cost	\$7,871 Credits ²	\$15,031 Cost Compared to Stretch Code
Total Costs	\$24,031 Total Additional Costs	\$2,273 Annual Energy Bill Savings ⁴	

Home Details

- 4000 ft²
- Large Single Family
- 5 Bedrooms
- Worcester, MA

*Green shaded boxes indicate cost savings, while red shaded boxes indicate added costs.

1. Rebates are calculated on a per unit basis, using Mass Save® new construction program Base Tier Incentives of \$7,500 without any Market Transformation Adders. These incentives are not applicable to mixed fuel projects.
2. Projects with solar installed may be eligible for a Federal 30% Tax Credit of the solar install; and a 15% MA State tax credit of the solar cost, up to \$1,000.
3. Mass Save Incentives are not available in communities with municipal light plants, which are locally owned utilities which represent 52 towns that make up about 13% of the MA population
4. The PV Watts Calculator was used to determine the total kWh saving of the project, using defaults for module type, array type, system losses, tilt, azimuth, etc. The kWh savings was compared to the total kWh used in the energy model. The savings calculation estimates an energy cost of 28.7 cents/kWh.
5. Pre-wiring includes the costs to add a dedicated branch circuit and outlet nearby any equipment currently using fossil fuels for space heating, water heating, cooking, and clothes drying. This does not include the costs associated with upgrading an electrical panel.





MA 10th Edition Building Code | 2025
Large Single Family - Gas

HERS Index (ERI)

42 ▶ **0**

Stretch Specialized



Gas

4000 ft² Large Single Family
5 Bedroom - Worcester, MA

Breakdown of Construction Costs to Meet Specialized Code

FEATURE	STRETCH CODE	SPECIALIZED CODE	COST DIFFERENTIAL ¹
HERS INDEX	42	0	\$0
Windows (U-Value/SHGC)	U-0.18, 0.29 SHGC	U-0.18, 0.29 SHGC	\$0
DHW	Gas Tankless 0.94 EF	Gas Tankless 0.94 EF	\$0
Heating	Gas, 98% AFUE	Gas, 98% AFUE	\$0
Cooling	SEER 16	SEER 16	\$0
Duct Leakage to Outside	In Conditioned Space	In Conditioned Space	\$0
Foundation Insulation	NA	NA	\$0
Floor Insulation	R-30 Fiberglass Batt	R-30 Fiberglass Batt	\$0
Walls Insulation	R-21, 2x6, 16 in o.c., R-5 XPS	R-21, 2x6, 16 in o.c., R-5 XPS	\$0
High Efficacy Lighting	100% LED	100% LED	\$0
Ceiling Insulation	R-38 Open Cell Spray Foam, Unvented	R-38 Open Cell Spray Foam, Unvented	\$0
Air Infiltration	1.5 ACH50	1.5 ACH50	\$0
Mechanical Ventilation	HRV, 75%	HRV, 75%	\$0
Pre-Wiring ⁴	N/A	Yes	\$9,000
Solar Array ²	N/A	6.14 kW³	\$15,031
TOTAL			\$24,031

1. Additional Costs are the costs above Stretch Code to reach Specialized Code.
2. Solar costs are based on the [Massachusetts Clean Energy Center Solar Costs Comparison Tool](#), using the median dollar per watt of \$3.73 as of July 30, 2024. The model does not take credit for any solar energy kWh generation.
3. This number is project specific and subject to change. The PV Watts calculator was used to determine which size array would equal the total energy use of the project, using defaults for module type, array type, system losses, tilt, azimuth, etc. In our energy model, a 6.14 kW array offsets the total energy use of the project.
4. Pre-wiring includes the costs to add a dedicated branch circuit and outlet nearby any equipment currently using fossil fuels for space heating, water heating, cooking, and clothes drying. This does not include the costs associated with upgrading an electrical panel.



MA 10th Edition Building Code | 2025

Small Single Family - Electric

Costs and Benefits to Meet Specialized Code

	COSTS ^{1,2}	BENEFITS	NET
Solar Costs	\$0 Total Solar Cost	\$0 Rebates	\$0 Cost Compared to Stretch Code
Pre-Wiring Costs³	\$0 Total Pre-wiring Cost	\$0 Rebates	\$0 Costs Compared to Stretch Code

HERS Index (ERI)

45 ▶ 45

Stretch Specialized



Home Details

- 2100 ft²
- Small Single Family
- 3 Bedrooms
- Worcester, MA

1. For All-Electric buildings, there is no cost difference between the Stretch Code and the Specialized Code because the requirements are the same.
2. Pre-wiring and solar costs are only applicable to mixed fuel projects following the Specialized code and do not apply to all -electric buildings.
3. Pre-wiring includes the costs to add a dedicated branch circuit and outlet nearby any equipment currently using fossil fuels for space heating, water heating, cooking, and clothes drying. This does not include the costs associated with upgrading an electrical panel.

DER
Massachusetts Department
of Energy Resources

PSD



MA 10th Edition Building Code | 2025

Small Single Family - Electric

HERS Index (ERI)

45 ▶ 45

Stretch Specialized



2100 ft² Small Single Family
3 Bedroom - Worcester, MA

Breakdown of Construction Costs to Meet Specialized Code

FEATURE	STRETCH CODE	SPECIALIZED CODE	COST DIFFERENTIAL ¹
HERS INDEX ⁴	42	42	
Windows (U-Value/SHGC)	U-0.28, 0.29 SHGC	U-0.28, 0.29 SHGC	\$0
DHW	HPWH, 50 gal	HPWH, 50 gal	\$0
Heating	SEER 20, 12 HSPF, Ductless	SEER 20, 12 HSPF, Ductless	\$0
Cooling			
Duct Leakage to Outside	Ductless	Ductless	\$0
Foundation Insulation	NA	NA	\$0
Floor Insulation	Basement Ceiling R-30	Basement Ceiling R-30	\$0
Wall Insulation	R-21, 2x6, 16 in o.c.	R-21, 2x6, 16 in o.c.	\$0
High Efficacy Lighting	100% LED	100% LED	\$0
Ceiling Insulation	Roof R-38 Spray Foam, Unvented	Roof R-38 Spray Foam, Unvented	\$0
Air Infiltration	2 ACH50	2 ACH50	\$0
Mechanical Ventilation	HRV, 75%	HRV, 75%	\$0
Pre-Wiring ^{2,3}	N/A	N/A	\$0
Solar Array ²	N/A	N/A	\$0
TOTAL			\$0

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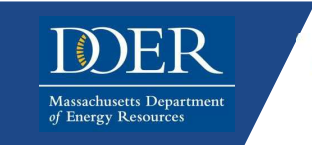
HERS Index (ERI)
42 ▶ 42
 Stretch Specialized



Gas

Home Details

- 2100 ft²
- Small Single Family
- 3 Bedrooms
- Worcester, MA



MA 10th Edition Building Code | 2025

Small Single Family - Gas

Costs and Benefits to Meet Specialized Code*

	COSTS	BENEFITS ³	NET
Pre-Wiring Costs⁵	\$4,000 Total Pre-Wiring Cost	\$0 Rebates ^{1,2}	\$4,000 Cost Compared to Stretch Code
Solar Costs	\$14,920 Total Solar Cost	\$5,474 Credits ²	\$9,446 Cost Compared to Stretch Code
Total Costs	\$13,446 Total Additional Costs	\$1,482 Annual Energy Bill Savings ⁴	

*Green shaded boxes indicate cost savings, while red shaded boxes indicate added costs.

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2. Projects with solar installed may be eligible for a Federal 30% Tax Credit of the solar install; and a 15% MA State tax credit of the solar cost, up to \$1,000.
3. Mass Save Incentives are not available in communities with municipal light plants, which are locally owned utilities which represent 52 towns that make up about 13% of the MA population.
4. The PV Watts Calculator was used to determine the total kWh saving of the project, using defaults for module type, array type, system losses, tilt, azimuth, etc. The kWh savings was compared to the total kWh used in the energy model. The savings calculation estimates an energy cost of 28.7 cents/kWh.
5. Pre-wiring includes the costs to add a dedicated branch circuit and outlet nearby any equipment currently using fossil fuels for space heating, water heating, cooking, and clothes drying. This does not include the costs associated with upgrading an electrical panel.



MA 10th Edition Building Code | 2025
Small Single Family - Gas

HERS Index (ERI)
42 ▶ 42
 Stretch Specialized

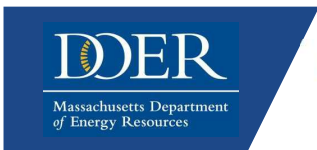


**2100 ft² Small Single Family
 3 Bedroom - Worcester, MA**

Breakdown of Construction Costs to Meet Specialized Code

FEATURE	STRETCH CODE	SPECIALIZED CODE	COST DIFFERENTIAL ¹
HERS INDEX	42	42	
Windows (U-Value/SHGC)	U-0.18, 0.29 SHGC	U-0.18, 0.29 SHGC	\$0
DHW	Gas Tankless 0.94 EF	Gas Tankless 0.94 EF	\$0
Heating	Gas, 98% AFUE	Gas, 98% AFUE	\$0
Cooling	SEER 16	SEER 16	\$0
Duct Leakage to Outside	In Conditioned Space	In Conditioned Space	\$0
Foundation Insulation	Basement Walls R-21	Basement Walls R-21	\$0
Floor Insulation	NA	NA	\$0
Walls Insulation	R-21, 2x6, 16 in o.c. R-5 XPS	R-21, 2x6, 16 in o.c. R-5 XPS	\$0
High Efficacy Lighting	100% LED	100% LED	\$0
Ceiling Insulation	Roof R-38 Spray Foam, Unvented	Roof R-38 Spray Foam, Unvented	\$0
Air Infiltration	1 ACH50	1 ACH50	\$0
Mechanical Ventilation	HRV, 75%	HRV, 75%	\$0
Pre-Wiring ³	N/A	Yes	\$4,000
Solar Array ²	N/A	4 kW	\$9,446
TOTAL			\$13,446

1. Additional Cost are the costs above Stretch Code to reach Specialized Code.
2. Solar costs are based on the [Massachusetts Clean Energy Center Solar Costs Comparison Tool](#), using the median dollar per watt of \$3.73 as of July 30, 2024. The model does not take credit for any solar energy kWh generation.
3. Pre-wiring includes the costs to add a dedicated branch circuit and outlet nearby any equipment currently using fossil fuels for space heating, water heating, cooking, and clothes drying. This does not include the costs associated with upgrading an electrical panel.



Resources

Stay in touch

Sign up for DOER energy code email updates:

<https://app.e2ma.net/app2/audience/signup/1965182/1356542/>

Code language, case studies, detailed technical information here: <https://www.mass.gov/info-details/stretch-energy-code-development-2022>

Local vote coming up? Contact your local Green Communities Coordinator

<https://www.mass.gov/service-details/contact-gc-coordinator>

Energy Code Training (free via Mass Save®)

<https://www.masssave.com/en/learn/partners/energy-code-training-and-events>

Contractor Training

<https://www.masssave.com/en/saving/residential-rebates/passive-house-training>