



COMMONWEALTH OF MASSACHUSETTS

Charles D. Baker, Governor

Karyn Polito, Lt. Governor

Matthew A. Beaton, Secretary

Judith Judson, Commissioner

The Green Communities Program – Partnering with Massachusetts Cities and Towns

*Westhampton
October 2018*

Jim Barry – Regional Coordinator

Green Communities Division

Department of Energy Resources

Executive Office Energy and Environmental Affairs

Massachusetts: Cleaner Energy is Part of Our Future

Priorities of the Baker-Polito Administration:

- Community Compact Cabinet
 - Executive Order No. 554 signed Jan-2015
- Global Warming Solutions Act
 - GHG reduction goals: 25% by 2020;
80% by 2050
- Green Jobs Act
 - 2013 Clean Jobs report: 11.8% inc in
clean energy jobs from 2012 – 2013
- Green Communities Act
 - Energy Efficiency
 - Renewables Investment
 - Creation of the

Green Communities Division within DOER



Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth



**Lt. Gov. Polito announces \$8.9m
in Competitive Grants**



Green Communities Designation and Grant Program

- Grant allocations based on a \$125K base plus a population/per capita income formula; maximum \$1M.
 - Range from \$130,725 in Hatfield to \$1M for Boston
 - **Westhampton would likely receive about \$125,000**
- Over \$50M awarded in total for both designation and competitive grants programs - \$9.8 million last Spring
- Projects being funded include energy conservation measures, solar PV projects, incremental costs for hybrid vehicles.
- 140 grants complete to date (85 designation, 55 competitive)
 - Total Project Costs - \$41.6M
 - Total GC grant funds used - \$25.7M
 - Total Utility incentives - \$8.5M
 - Projected annual savings (\$) - \$6.95M
- **Residential Projects CAN be considered**



Green Communities Grant Program

- Provides up to \$20 M annually in grants and loans to ***qualifying*** communities (RGGI Auction proceeds)
 - Grants will fund significant energy efficiency initiatives, renewable energy, innovative projects
- **5 Qualification Criteria**
 1. Adopt as-of-right siting, in designated locations, for RE/AE generation, or RE/AE R&D, or RE/AE manufacturing
 2. Adopt expedited (12 month) application/permitting process
 3. Establish an energy use baseline inventory with a program to reduce baseline by 20% in 5 years
 4. Purchase only fuel-efficient vehicles
 5. Require all new residential construction > 3000 ft², and new commercial and industrial real estate construction to minimize life-cycle energy costs



Criteria #1: As-Of Right Siting

**Adopt as-of-right siting,
in designated locations,
for RE/AE Generation,
OR for RE/AE Manufacturing,
OR for RE/AE Research and Development**

- Site Plan Approval and ConCom review still applicable
but NO Special Permits
- Designated locations means NOT everywhere in town
- RE = Renewable Energy (Solar PV, Wind, Wave)
- AE = Alternative Energy (Biomass Combined Heat & Power)

Many small towns consider a Solar By-law



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Criteria #1: As-Of Right Siting



Minimum 250 kW Ground-Mounted Solar PV
Takes about an acre for the panels
Could be for Town Owned Property only
Might not actually be built



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Criteria #2: Expedited Permitting Process

- **12 Months** from date of complete application
- Not all permits, just those that relate to Criteria #1

MGL 43 D ~ Priority Development Site is acceptable (this requires 6 month process)

OR a letter from legal counsel:

- Affirm no preclusions for expedited permitting
- Include language addressing approval procedures
- Associated timing from any applicable bylaws/ordinances or regulations.

Pretty simple to get the letter from Town Counsel



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Criteria #3: Energy Use Baseline

Establish Energy Use Baseline AND Adopt a 5 Year Plan to reduce it by 20%

- Includes all Municipal Buildings, Vehicles, Street and Traffic Lights
- You can use our free Mass Energy Insight
Or Energy Star Portfolio Manager or other tools
- The Baseline Year can go back 2 years (to FY 2016)
- Comprehensive 5 year plan to reduce that baseline usage by 20 %
- You are getting an ASHRAE Level II audit



MassEnergyInsight

● ● ● ● ● POWERING EFFICIENCY

- **FREE** online tool for MA cities, towns, RSD & WTP



- **Benchmark:** track energy use by town, department or building
- **Identify:** least efficient buildings for efficiency action
- **Measure and verify:** energy use trends by building over time

Helping Massachusetts Municipalities Create A Cleaner Energy Future

Criteria #4: Purchase Only Fuel Efficient Vehicles



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Criteria #4: Purchase Only Fuel Efficient Vehicles



Criteria #4: Purchase Only Fuel Efficient Vehicles

Whenever such vehicles are commercially available and practicable

- Heavy duty vehicles such as Fire Trucks, Ambulances and some DPW trucks are **exempt** (GVW of 8500 lbs or more)
- Police cruisers are exempt; until they become commercially available
- Pick Up Trucks: 2wd = 17mpg; 4wd= 16 mpg
- Cars 2wd = 29 mpg; 4wd = 24 mpg



Criteria #5 – Minimize Life Cycle Costs

Require all new residential construction and all new commercial and industrial real estate construction to minimize, to the extent feasible, the life-cycle cost of the facility by utilizing energy efficiency, water conservation and other renewable or alternative energy technologies.

The DOER recommended way for cities and towns to meet this requirement is by adopting the BBRS Stretch Code (780 CMR 115.AA) an appendix to the MA State Building Code.



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Stretch Code old MIS-conceptions

- ‘Stretch Code is new and experimental.’
No; It is based on Energy Star for Home
- ‘Stretch Code requires tight unhealthy homes’
No; Building science has evolved
- ‘Homes w/ oil heat can’t meet the Stretch Code’
No; It is easier to meet SC with gas, but ...
- ‘Town residents will be required to update their existing homes’
No; New Stretch Code only applies to **NEW** residential construction and explicitly exempts additions, renovation & repairs



The Stretch Code is no longer much of a Stretch

A few years ago, the Stretch Code WAS a bit of a stretch compared to the base energy code (IECC 2009).

But on July 1, 2014 a new base energy code (IECC 2012) took effect. It required blower door tests and increased insulation levels in walls and attics. Your town had operated under that more energy efficient code for 4 years

That base code “caught up” with the Stretch Code and some builders say that the Stretch Code was ‘easier’ to comply with than that 2012 Code (insulation levels for example...)



The Stretch Code is no longer much of a Stretch

January 1, 2017 – there is now a NEW base energy code (IECC 2015) and an associated NEW Stretch Code which is almost NO Stretch at all.

Basic difference in cost is for a HERS Energy Rater which is required by Stretch Code for new residential construction. Total additional costs are between \$1,600 and \$3,000 for typical single family home. MassSave rebate covers most of this extra cost: \$1,300 - \$1,700.

And home owner receives annual energy cost savings year after year after year.



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What does Stretch Code Apply to?

Same application as the MA base energy code

- Insulation
- Doors, Windows, Skylights
- Mechanical Equipment
- Lighting
- Appliances
- Building tightness
- Duct tightness
- Renewables



Not required but 'points' given

Criteria #5: Require new buildings to be more Energy Efficient

Municipalities can meet this criteria by adopting the new BBRS Stretch Code

- Stretch Code is an optional appendix to the 9th Edition of the Mass Building Code 780 CMR
- Similar process to Energy Star for Homes
- Training for Building Officials has been done
- Provides for Performance testing, rather than Prescriptive measures.



What is a HERS Rating? (Home Energy Rating System)

Annualized energy analysis

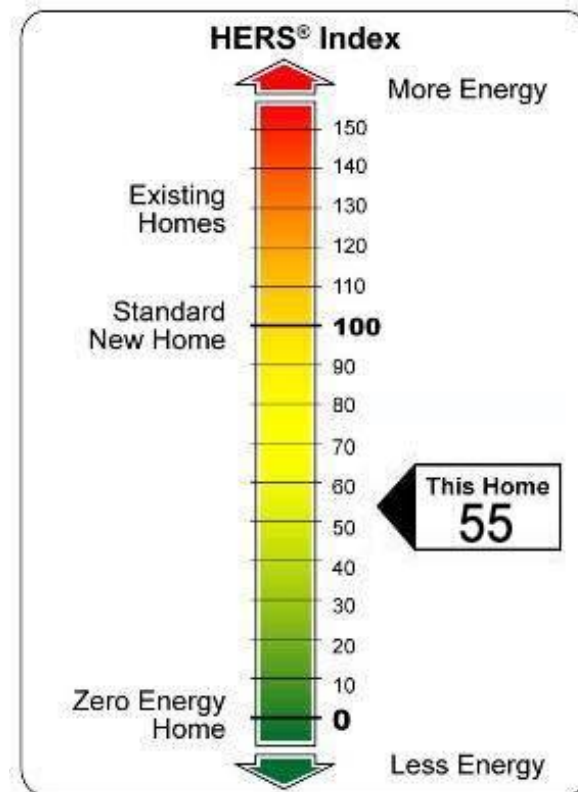
Heating, Cooling, Water Heating,
Lighting and Appliances....

On site power generation-renewable energy

Reference Home

- Based on IECC **2006** Code
(International Energy Conservation Code)
Defined as 100 Points
- 1 percent change in consumption = 1 point

**HERS 55 means about
45% more efficient than reference home**



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What is HERS Process?

1. Review Building Plans via Computer Modeling
2. In-process inspections
 - First inspection
 - Thermal Bypass Checklist
 - Duct tightness test (if applicable)
 - Second Inspection (usually combined with 1st)
 - Insulation
 - Final Inspection
 - Blower door test
3. Finalize energy model based on verified performance and equipment



9th Edition Stretch Code Modeling Analysis

2550 sq.ft. 3 BR Single Family Home with Propane Heat
Worcester, MA



HERS Index (ERI)

Target	55
Example Base	66
Example Stretch	55

Costs and Benefits to Meet Stretch Code

COSTS		BENEFITS	NET	
BUILDER	Adjustments + HERS Rater Fee		Utility Rebates ¹	
	+\$(2,606)		-\$1,626	
HOMEBUYER	Change to Downpayment ³	Change to Annual Mortgage Payment ³	Estimated Reduced Energy Cost per Year ²	Year 1 Cash Flow
	+\$ (98)	+\$ (77)	-\$475	\$299
				Year 2+ Cash Flow
				\$397

1 – Incentives are determined using the Blended Savings Approach calculator. Savings compared to MA reference home.

BSA Incentive = \$0.35 * kWh savings + \$35 * MMBtu savings + \$3000 * 0.xx percent savings (single family home)

2 – Energy costs are based on 19 cents/kWh, \$0.97/therm, \$2.88 gal propane, \$2.58 gal oil. Savings are compared with Base Code home

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



9th Edition Stretch Code Modeling Analysis

2550 sq.ft. 3 BR Single Family Home with Propane Heat
Worcester, MA



Breakdown of Construction Costs to Meet Stretch Code

FEATURE	Base Code	Stretch Code	Construction Cost
HERS RATING	66	55	\$500
WINDOWS (U-VALUE/SHGC)	.30/.30	.27/.30	\$500
HEATING	92% propane furnace	96% propane furnace	\$290
COOLING	13 SEER	15 SEER	\$392
DHW	0.62 EF 40 Gallon tank Propane	0.94 EF Tankless Propane	\$724
DUCT LEAKAGE TO OUTSIDE	4 CFM25 / 100 CFA	2 CFM25 / 100 CFA	\$200
AIR INFILTRATION	3.0 ACH50	<i>No change required</i>	\$0
HIGH EFFICACY LIGHTING	100% CFL	<i>No change required</i>	\$0
FOUNDATION	Unconditioned, uninsulated basement	<i>No change required</i>	\$0
FLOOR	R38 fiberglass Grade 1	<i>No change required</i>	\$0
WALLS	R21 fiberglass Grade 1	<i>No change required</i>	\$0
CEILING – FLAT	R-50 blown in cellulose	<i>No change required</i>	\$0
TOTAL			\$2,606

9th Edition Stretch Code Modeling Analysis

2550 sq.ft. 3 BR Single Family Home with Oil Heat
Worcester, MA



HERS Index (ERI)

Target	55
Example Base	70
Example Stretch	54

Costs and Benefits to Meet Stretch Code

COSTS		BENEFITS	NET	
BUILDER	Adjustments + HERS Rater Fee		Utility Rebates ¹	
	+\$(4,011)		-\$1,593	
HOMEBUYER	Change to Downpayment ³	Change to Annual Mortgage Payment ³	Estimated Reduced Energy Cost per Year ²	Year 1 Cash Flow
	+\$ (241)	+\$ (192)	-\$697	\$262
				Year 2+ Cash Flow
				\$505

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2 – Energy costs are based on 19 cents/kWh, \$0.97/therm, \$2.88 gal propane, \$2.58 gal oil. Savings are compared with Base Code home

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



9th Edition Stretch Code Modeling Analysis

2550 sq.ft. 3 BR Single Family Home with Oil Heat
Worcester, MA



Breakdown of Construction Costs to Meet Stretch Code

FEATURE	Base Code	Stretch Code	Construction Cost
HERS RATING	70	54	\$500
WINDOWS (U-VALUE/SHGC)	.30/.30	.27/.30	\$500
HEATING	83% oil furnace	96% oil furnace	\$1,759
COOLING	13 SEER	15 SEER	\$392
DHW	0.95 EF Tank Electric	3.24 EF Heat Pump DHW	\$660
DUCT LEAKAGE TO OUTSIDE	4 CFM25 / 100 CFA	2 CFM25 / 100 CFA	\$200
FOUNDATION	Unconditioned, uninsulated basement	No change required	\$0
FLOOR	R38 fiberglass Grade 1	No change required	\$0
WALLS	R21 fiberglass Grade 1	No change required	\$0
HIGH EFFICACY LIGHTING	100% CFL	No change required	\$0
CEILING – FLAT	R-50 blown in cellulose	No change required	\$0
DUCT INSULATION	R-8	No change required	\$0
TOTAL			\$4,011



9th Edition Stretch Code Modeling Analysis

2550 sq.ft. 3 BR Single Family Home with Electric Heat Pump
Worcester, MA



HERS Index (ERI)

Target	55
Example Base	66
Example Stretch	54

Costs and Benefits to Meet Stretch Code

COSTS		BENEFITS	NET	
BUILDER	Adjustments + HERS Rater Fee		Utility Rebates ¹	
	+\$(2,360)		-\$1,900	
HOMEBUYER	Change to Downpayment ³	Change to Annual Mortgage Payment ³	Estimated Energy Cost Savings per Year ²	Year 1 Cash Flow
	+\$(46)	+\$(36)	-\$704	\$621
				Year 2+ Cash Flow
				\$667

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BSA Incentive = \$0.35 * kWh savings + \$35 * MMBtu savings + \$3000 * 0.xx percent savings (single family home)

2 – Energy costs are based on 19 cents/kWh, \$0.97/therm, \$2.88 gal propane, \$2.58 gal oil. Savings are compared with Base Code home

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2550 sq.ft. 3 BR Single Family Home with Electric Heat Pump
Worcester, MA



Breakdown of Construction Costs to Meet Stretch Code

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HERS RATING	66	54	\$500
WINDOWS (U-VALUE/SHGC)	.30/.30	.27/.30	\$500
DHW	0.95 EF Tank Electric	3.24 EF Heat Pump DHW	\$660
HEATING	10 HSPF / 19 SEER Heat Pump	12 HSPF / 19 SEER Heat Pump	\$500
COOLING			
DUCT LEAKAGE TO OUTSIDE	4 CFM25 / 100 CFA	2 CFM25 / 100 CFA	\$200
FOUNDATION	Unconditioned, uninsulated basement	<i>No change required</i>	\$0
FLOOR	R38 fiberglass Grade 1	<i>No change required</i>	\$0
WALLS	R21 fiberglass Grade 1	<i>No change required</i>	\$0
HIGH EFFICACY LIGHTING	100% CFL	<i>No change required</i>	\$0
CEILING – FLAT	R-50 blown in cellulose	<i>No change required</i>	\$0
AIR INFILTRATION	3.0 ACH50	<i>No change required</i>	\$0
TOTAL			\$2,360

BSA - Incentive



- Builder Incentive
 - $A * kWh + B * MMBtu + C * \%Savings$
 - $A = \$0.35/kWh$
 - $B = \$35.00/MMBtu$
 - $C = \$3,000$ single family (1-4 units)
 - $= \$2,000$ multifamily (5+ units)
- Rater Incentive:
 - \$350 Single Family (1-4 units)
 - \$100 Multifamily (5+ units)
 - \$50 Failed Unit



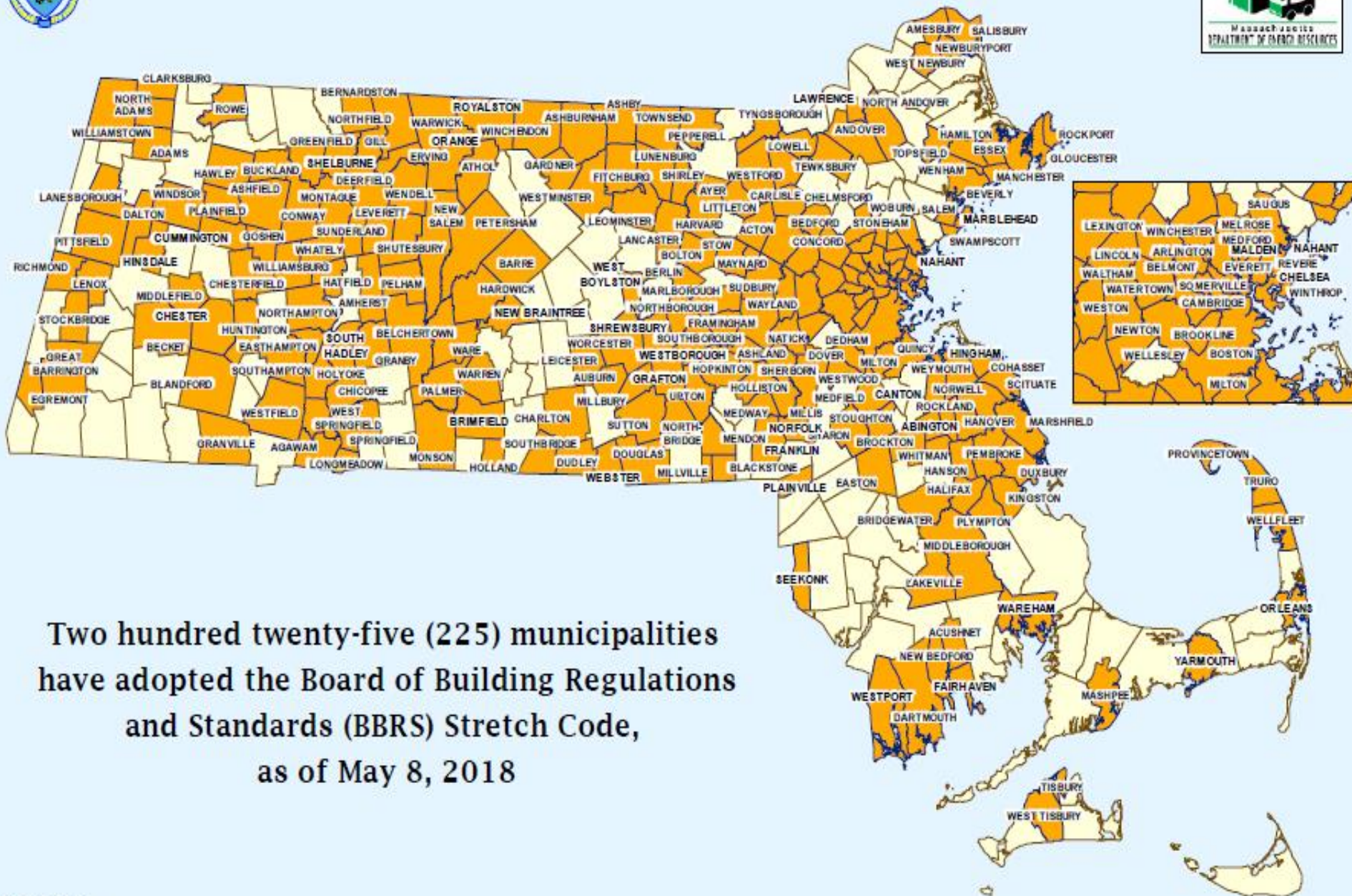
2017 Stretch Code Summary

- 1. The Stretch Code is no longer much of a Stretch ... Base Code ‘caught up’ to it.**
- 2. You do need a HERS Rater’s involvement but the Base code requires one also.**
- 3. The extra cost for the extra involvement is offset by the Mass Save Residential New Construction Program**
- 4. Additions, renovations and repairs to existing residential homes are EXEMPT**



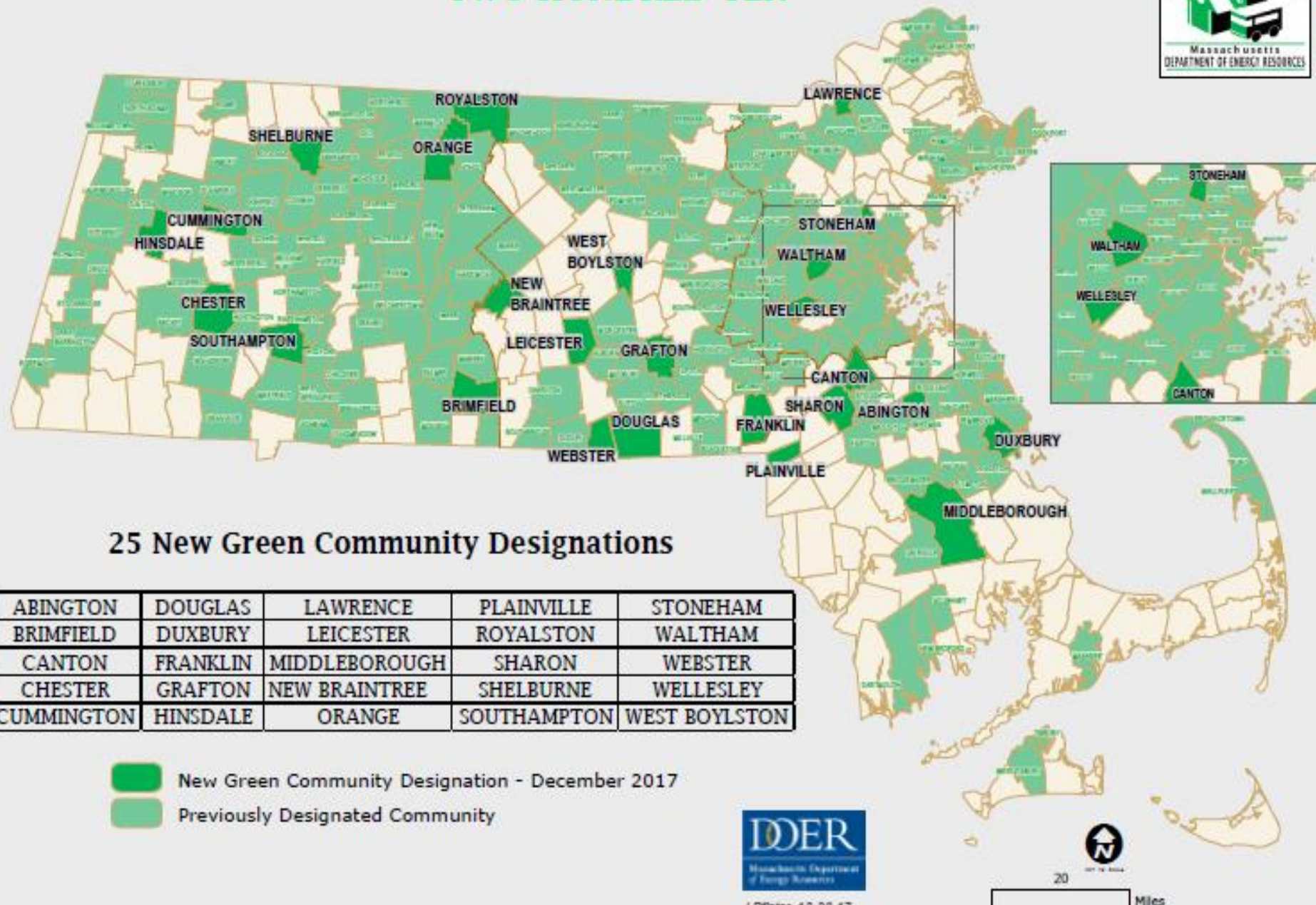


Stretch Code Adoption, by Community

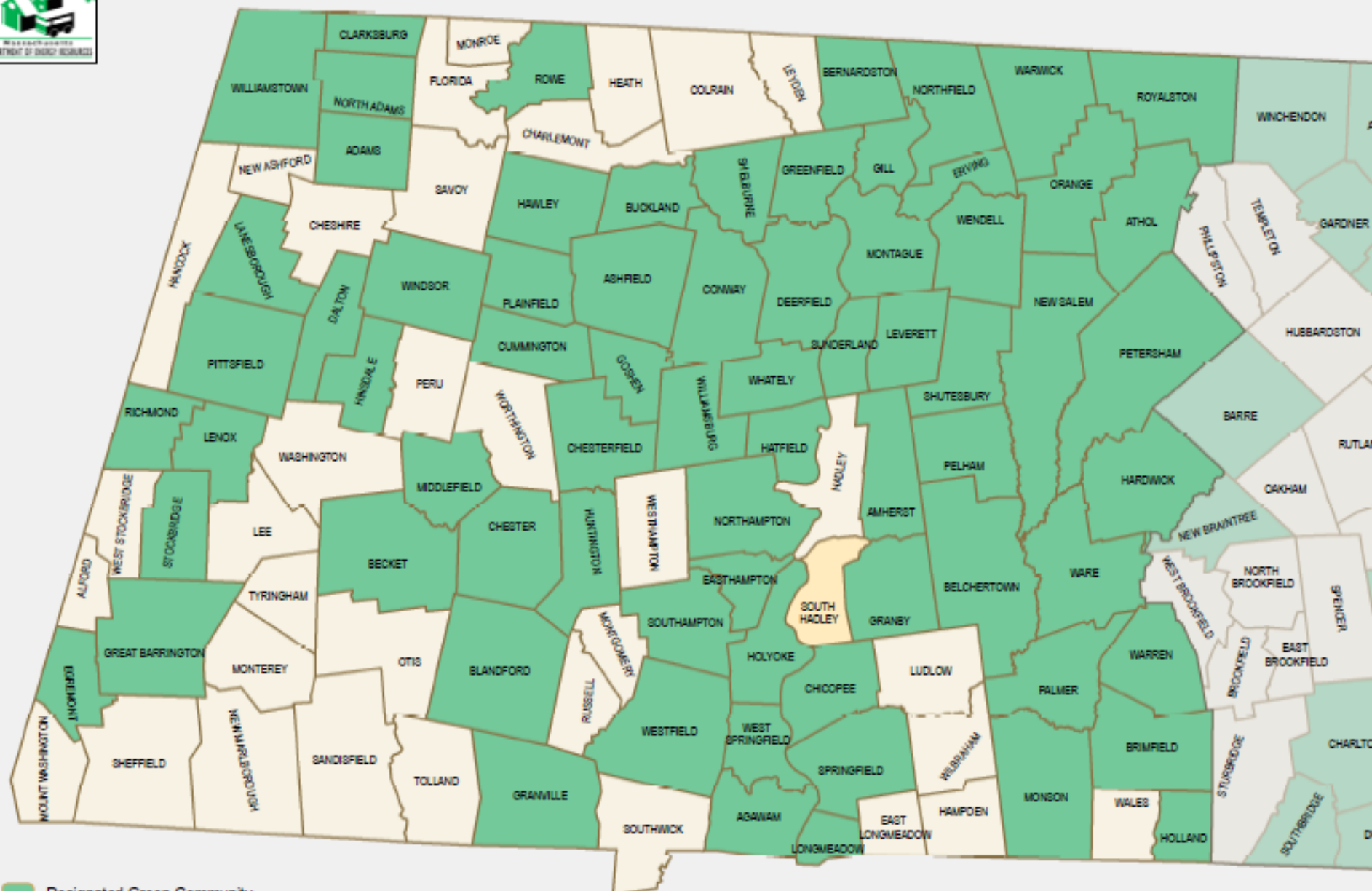


Two hundred twenty-five (225) municipalities
have adopted the Board of Building Regulations
and Standards (BBRS) Stretch Code,
as of May 8, 2018

GREEN COMMUNITY DESIGNATIONS REACH TWO HUNDRED TEN



Western Region



- Designated Green Community
- Passed Stretch Code but not Designated
- Other City or Town

Green Communities Designation and Grant Program

- Grant allocations based on a **\$125K** base plus a population/per capita income formula
- Projects being funded include electric and thermal (natural gas and fuel oil) energy saving projects, incremental costs for hybrid vehicles and grant administration costs.

<u>TOWN</u>	<u>POPULATION</u>	<u>GRANT</u>
Chesterfield	1,300	\$ 140,000
Williamsburg	2,400	\$ 150,000
Southampton	6,000	\$ 138,600
Huntington	2,000	\$ 140,650
Chester	1,300	\$ 130,170



Contact Information

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www.mass.gov/energy/greencommunities

www.mass.gov/doer

Email updates via listserv – Sign up by sending an email to:

join-ene-greencommunities@listserv.state.ma.us



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