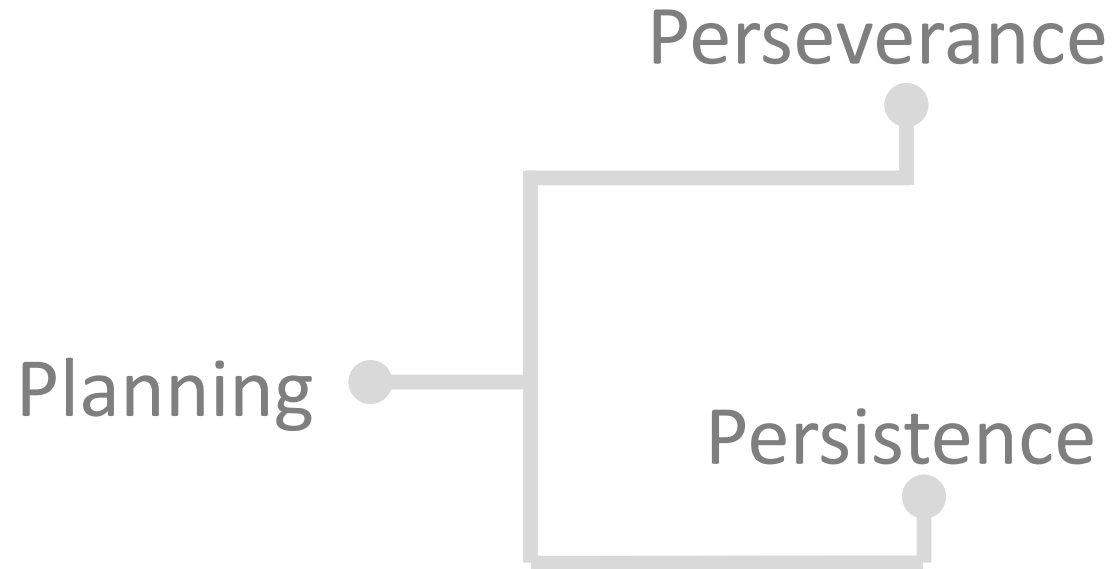


# Integrating Passive House into US model energy codes When and How?



Ian Finlayson, Deputy Director, Energy Efficiency Division  
MA Dept. of Energy Resources



Mahatma Gandhi



Eleanor Roosevelt



Wayne Gretzky



- “I skate to where the puck is going to be, not where it has been.”



- “The future depends on what you do today.”



- “The future belongs to those who believe in the beauty of their dreams.”

**When  
planning to  
transform a  
market....**

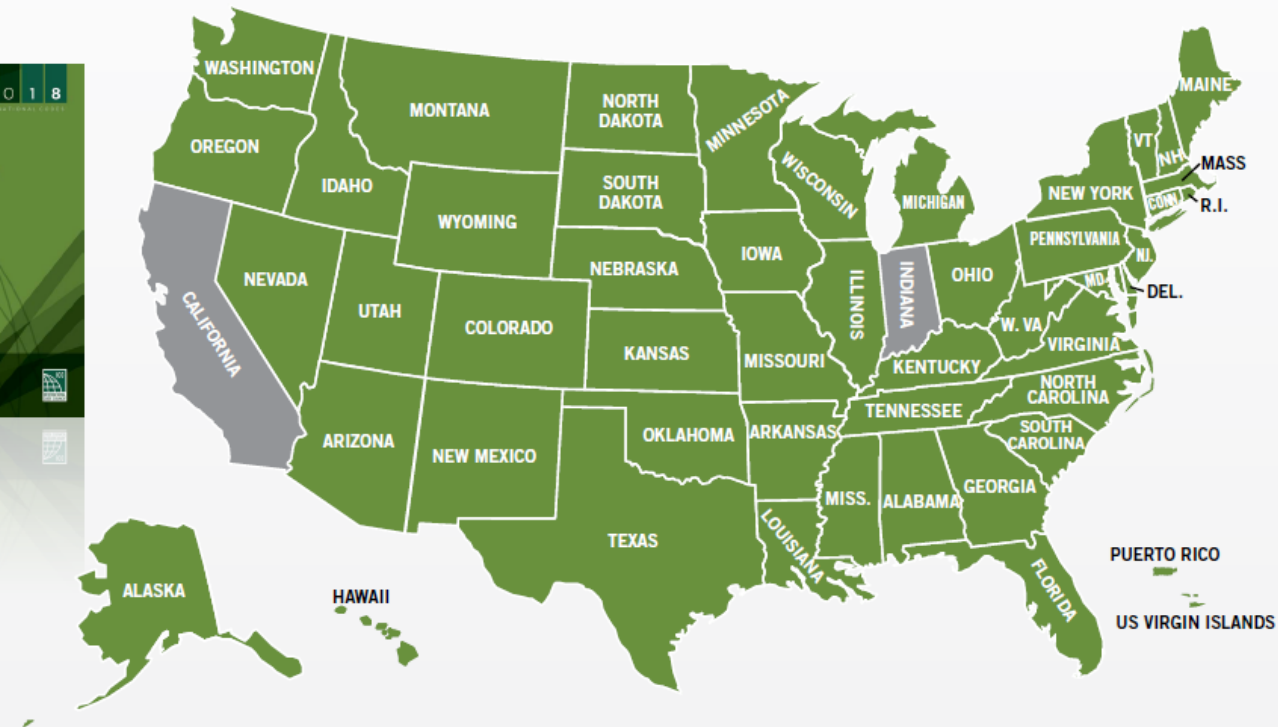
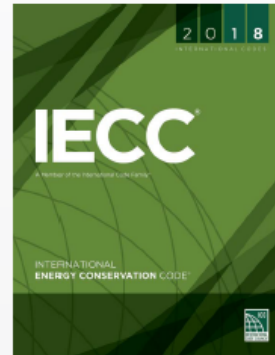
**Have a vision  
for the future**

# Why focus on the IECC model code?



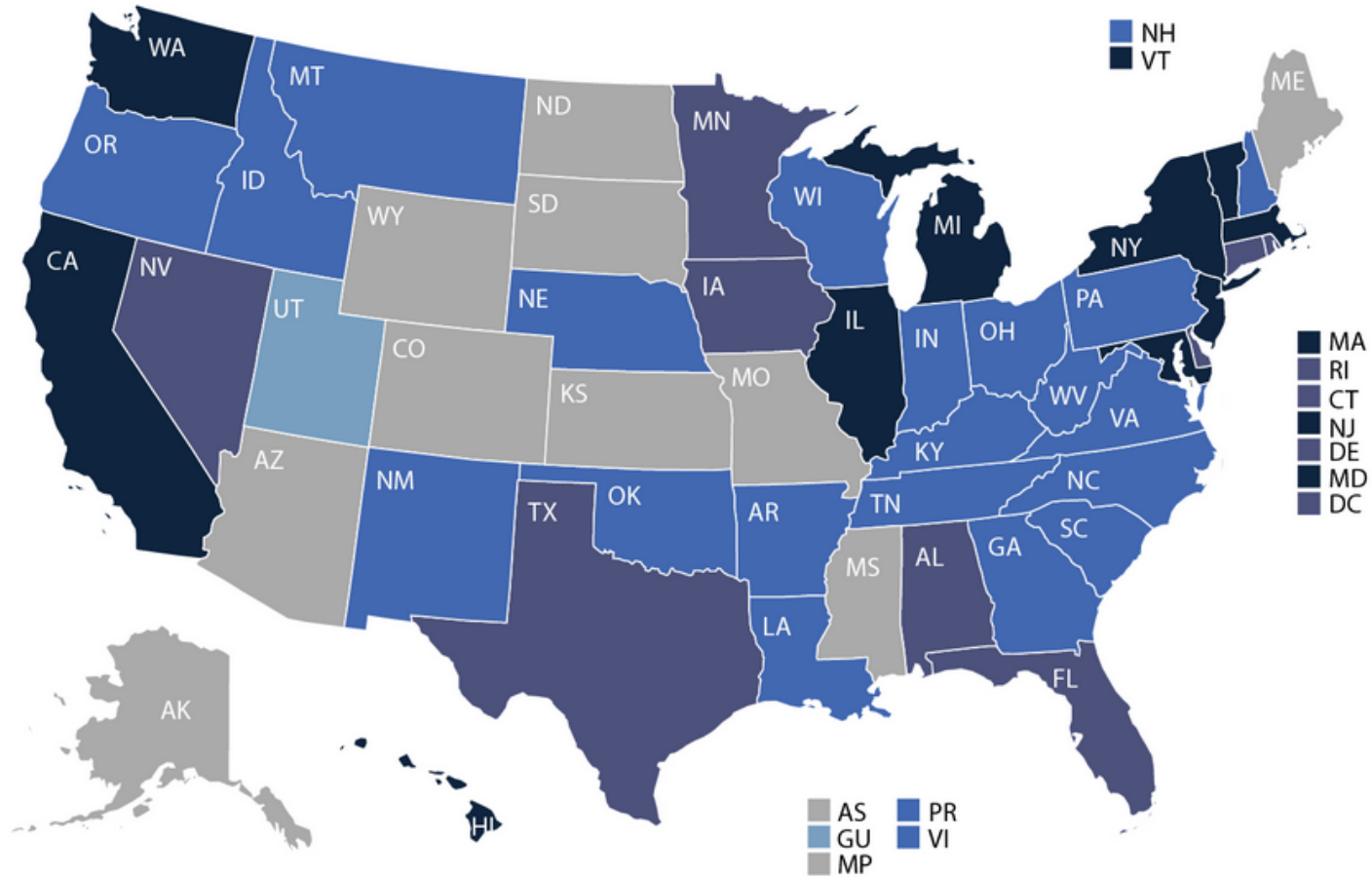
## INTERNATIONAL ENERGY CONSERVATION CODE ADOPTION MAP

The IECC is in use or adopted in 48 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands.



■ IECC administered at the state and/or local level

# Residential Code Status



## STATE INFORMATION

Select a State

## RELATED PAGES

[Code Status Maps](#)

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[Residential Code Status](#)

[View All Code Statuses by State](#)

[Local Adoptions by State](#)

[International Code Status](#)

[Code Status Maps Resources](#)

[Code Adoption Slideshow](#)

## CONTACT US

The Building Codes Assistance Project (BCAP) has created a series of maps to provide a national snapshot of building energy code adoption and implementation status. BCAP makes every effort to ensure that the maps are accurate and up-to-date. If you have any questions or comments about the maps, please [contact us](#).



# ICC CODE DEVELOPMENT PROCESS

## HOW IT WORKS

The International Code Council develops the International Codes, a coordinated, modern set of building codes used in all 50 U.S. states and many other countries. Changes to the I-Codes are made through a transparent and inclusive consensus-based process that complies with the OMB Circular A-119.

### CODE DEVELOPMENT COMMITTEES

Anyone can apply to serve on one of the committees that preside over the Committee Action Hearings (CAH).

The Codes and Standards Council makes recommendations based on these applications to the ICC Board, which appoints members to the committees.

Members of each committee fall into one of three interest categories:

- **General:** government regulatory agencies.
- **User:** building owners, designers, insurance companies, private inspection agencies, academics.
- **Producer:** builders, contractors, manufacturers, distributors.

### CODE CHANGE SUBMISSION AND REVIEW

Anyone can submit code change proposals via ICC's cloud-based program, **cdpACCESS™**.

ICC staff reviews each proposal and assigns them to the applicable Code Development Committee.

### COMMITTEE ACTION HEARINGS

At the CAH, code development committees **approve**, **approve with modifications** or **disapprove** each code change proposal.

Any participants may challenge the committee actions. ICC members vote on these challenges online. Approved challenges result in an automatic public comment to be considered at the PCH.

### PUBLIC COMMENT SUBMISSION AND REVIEW

Anyone can submit public comments via **cdpACCESS™** on the results of the CAH.

### PUBLIC COMMENT HEARINGS

At the PCH, eligible voters discuss and vote on code change proposals.

Eligible voters work for government agencies protecting the public's health and safety and have no financial stake in the outcome.

# Timeline for IECC adoption



STAGE ONE



STAGE TWO



**When  
planning to  
transform a  
market....**

**Seek  
Professional  
Help**



# Lessons learned from Europe



**PASSIPEDIA**  
The Passive House Resource



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You are here: [Passipedia - The Passive House Resource](#) » [Experiences](#) » **Lessons from the New Passive House Regions**

Sidebar

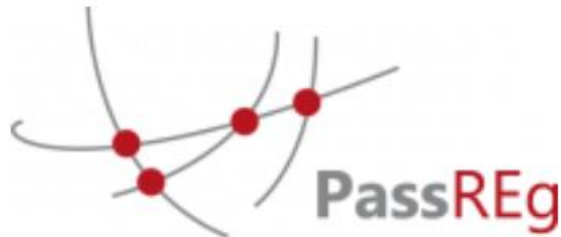
experiences:lessons\_from\_the\_new\_passive\_house\_regions

Table of Contents

## Lessons from the New Passive House Regions



Co-funded by the Intelligent Energy Europe Programme of the European Union



# 2008: EU Project for market transformation

## 2 Embedding Passive Houses in Europe

In order to visualise the effect of the PEP-project a basic market penetration model S-curve has been used. This chapter describes the status of market penetration in the participating PEP countries at the beginning of the PEP-project.

### 2.1 Embedding a new concept

Potential innovations in the building process, such as the passive house through a societal embedding process before the concept is accepted as "normal". According to Rothmans the societal embedding process or diffusion process follows an S-curve with four phases: a pre-development phase, an introduction phase, an acceleration phase and a stabilisation phase (see figure 3).

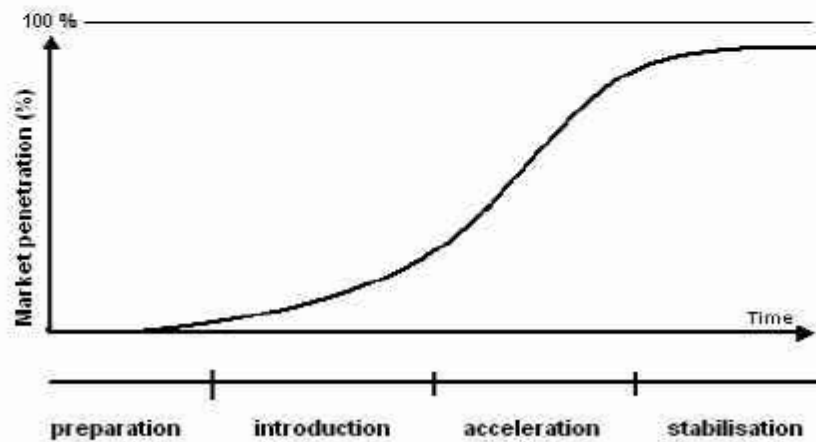


Figure 3: S-curve for embedding process of innovations <sup>5</sup>



Published on *Intelligent Energy Europe* (<https://ec.europa.eu/energy/intelligent/projects>)

## Promotion of European Passive Houses

PEP

Big savings in home energy consumption are there for the taking. The Passivhaus concept offers a workable, affordable solution for achieving such savings. However, we need to pass on the experience we have gained beyond small groups of experts by targeting a wider community of building professionals. PEP therefore set itself the task of spreading this knowledge throughout Europe using various channels.



### Results

- Over 2 000 000 visitors to the PEP web-site in two years.
- Guide for architects and planners with tips on dwelling design and choice of construction sites.
- Guide for energy designers with tips on building envelopes and energy calculations.
- Guide for structural designers with tips on comfort, thermal bridges and air tightness.
- Passivhaus Planning Package improved: a tool allowing design to be checked against Passivhaus requirements after entry of data on material and components

### Lesson learned

- Following the definition developed by the Passivhaus Institut, a Passivhaus has a heat demand of 15 kWh/m<sup>2</sup> floor area per year, whilst the total primary energy use in the house is restricted to 120 kWh/m<sup>2</sup> per year. The Scandinavian partners of the project have shown that these are unrealistic criteria for their countries. In consequence, for Northern Scandinavia and other

# Examples of Passive house adoption – City scale



[Insight](#) Posted Oct 26, 2016 [Add new comment](#)



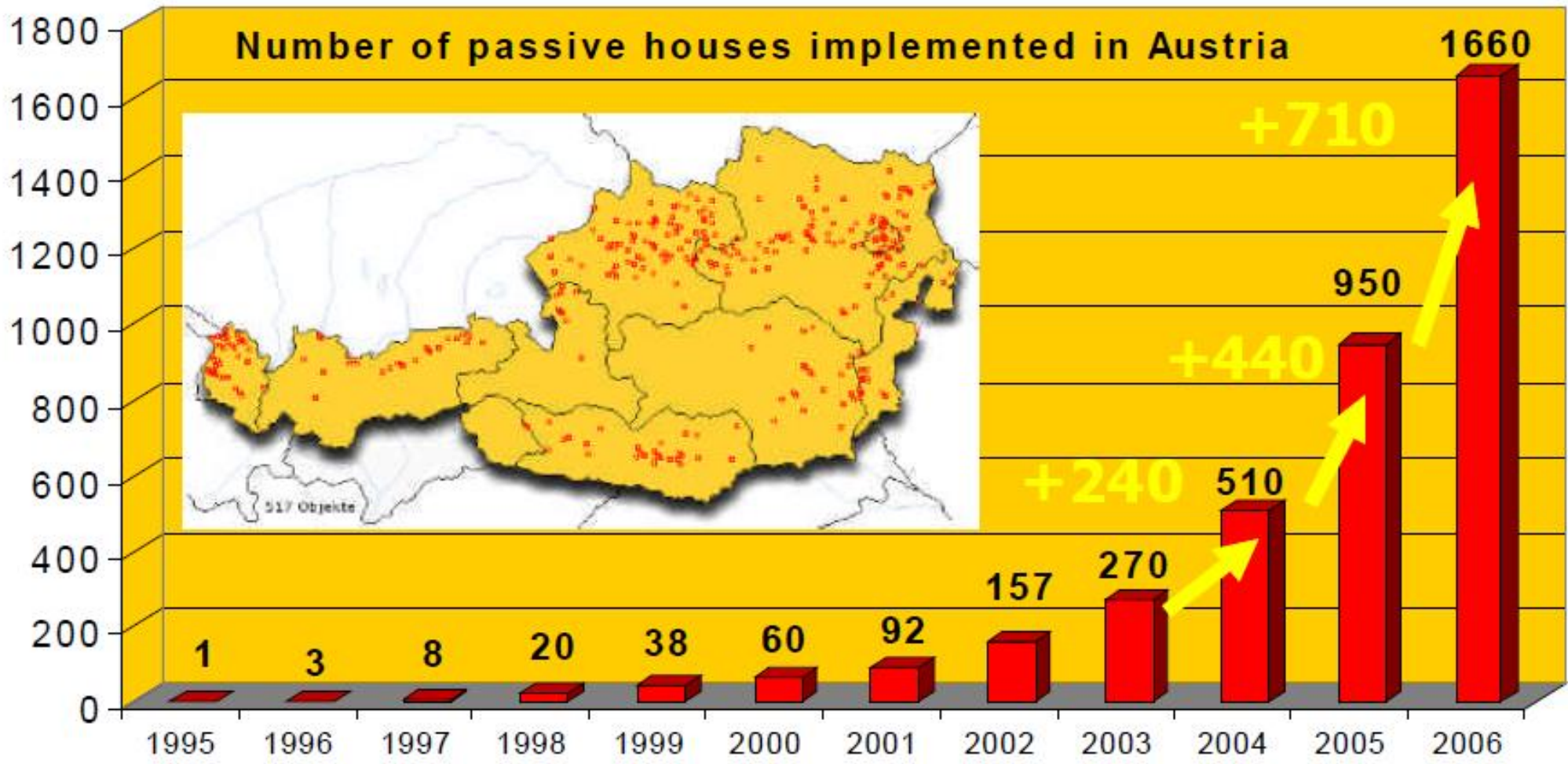
Lenny  
Antonelli

<http://lennyantonelli.ie/>

## How Brussels went passive

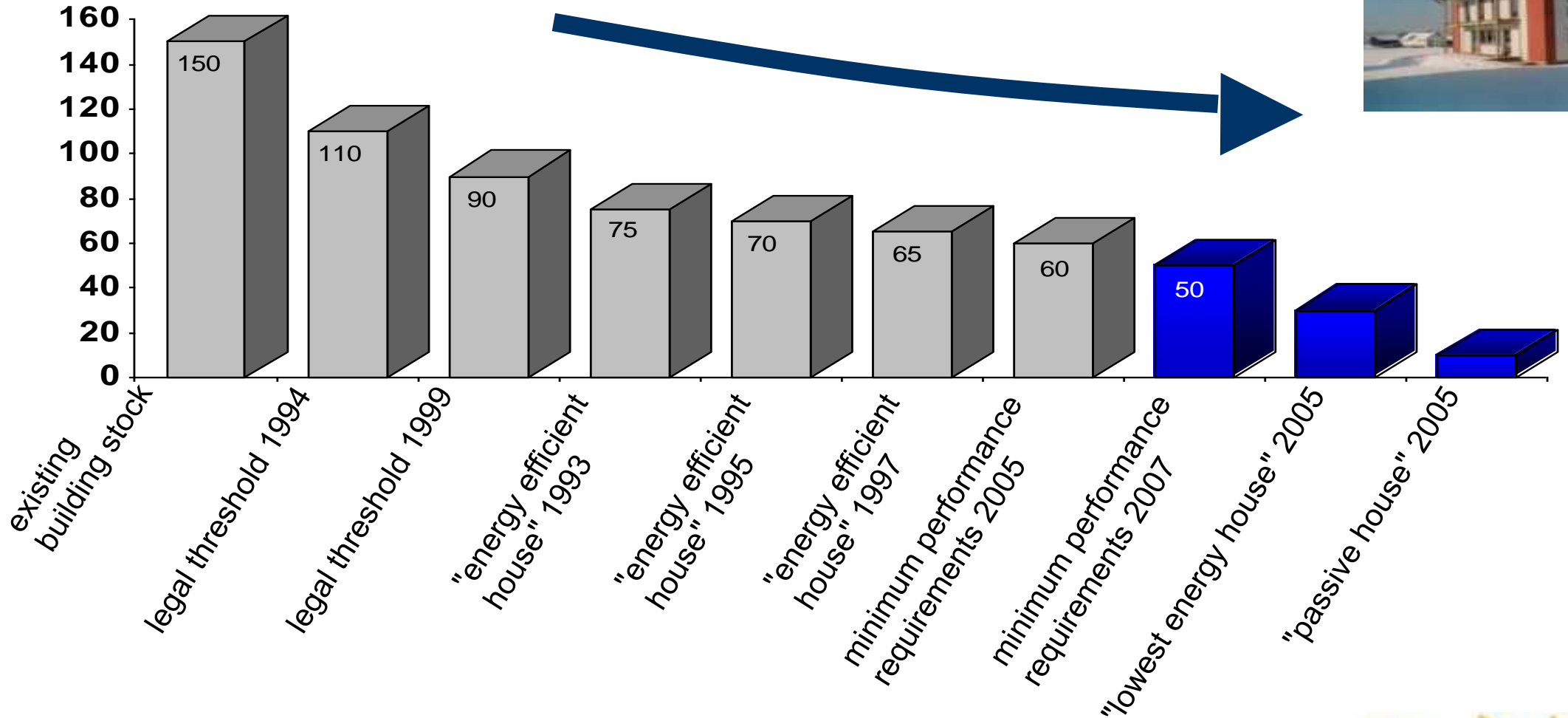
Ten years ago Brussels had some of the most energy inefficient building stock in Europe — now it boasts a groundbreaking policy that means all new buildings in the region must be passive. How did the city do it?

# Examples of Passive House adoption – State scale



# Building Trends in Upper Austria (2008)

kWh/m<sup>2</sup>,a



**When  
planning to  
transform a  
market....**

**Use all  
Tools  
Available**



# Upper Austria's sustainable energy strategy

## 3 Pillars



"stick"



"carrot"



"tambourine"

# Carrots, Sticks and Tambourines

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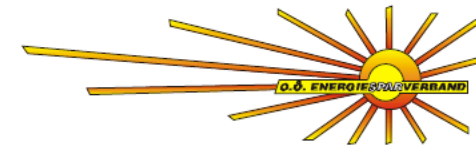






## Sustainable buildings programme for non-residential buildings

- Support from the national and regional governments
- amount depends on energy performance indicator achieved after renovation, e.g. 15% if half of the required energy performance indicator is achieved
- energy performance certificate to document reduction of heat demand by 25% -> 30% support
- minimum investment of 35,000 €
- typical measures: insulation of building shell, renovation of windows, heat recovery for ventilation systems, shading to reduce cooling load



# Carrots

&

# Tambourines

- Utility incentive programs
  - Soft costs – design charrettes
  - Hard costs – project rebates
- Affordable housing tax credits
  - Competitive Points in Qualified Action Plan (QAP)
- State incentive programs
  - Solar multiplier for PH
  - APS multiplier for PH
- Industry professional events
- Passive house Trainings
- Demonstration projects
- Case studies
- Building Code training
  - PH optional compliance pathway

2015

INTERNATIONAL ENERGY CONSERVATION CODE

# IECC

A New Year on the Ground for the 2015 IECC

INTERNATIONAL  
ENERGY CONSERVATION CODE

## Sticks

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State government building mandates

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Municipal building mandates

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Stretch energy code

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State/Local baseline energy code

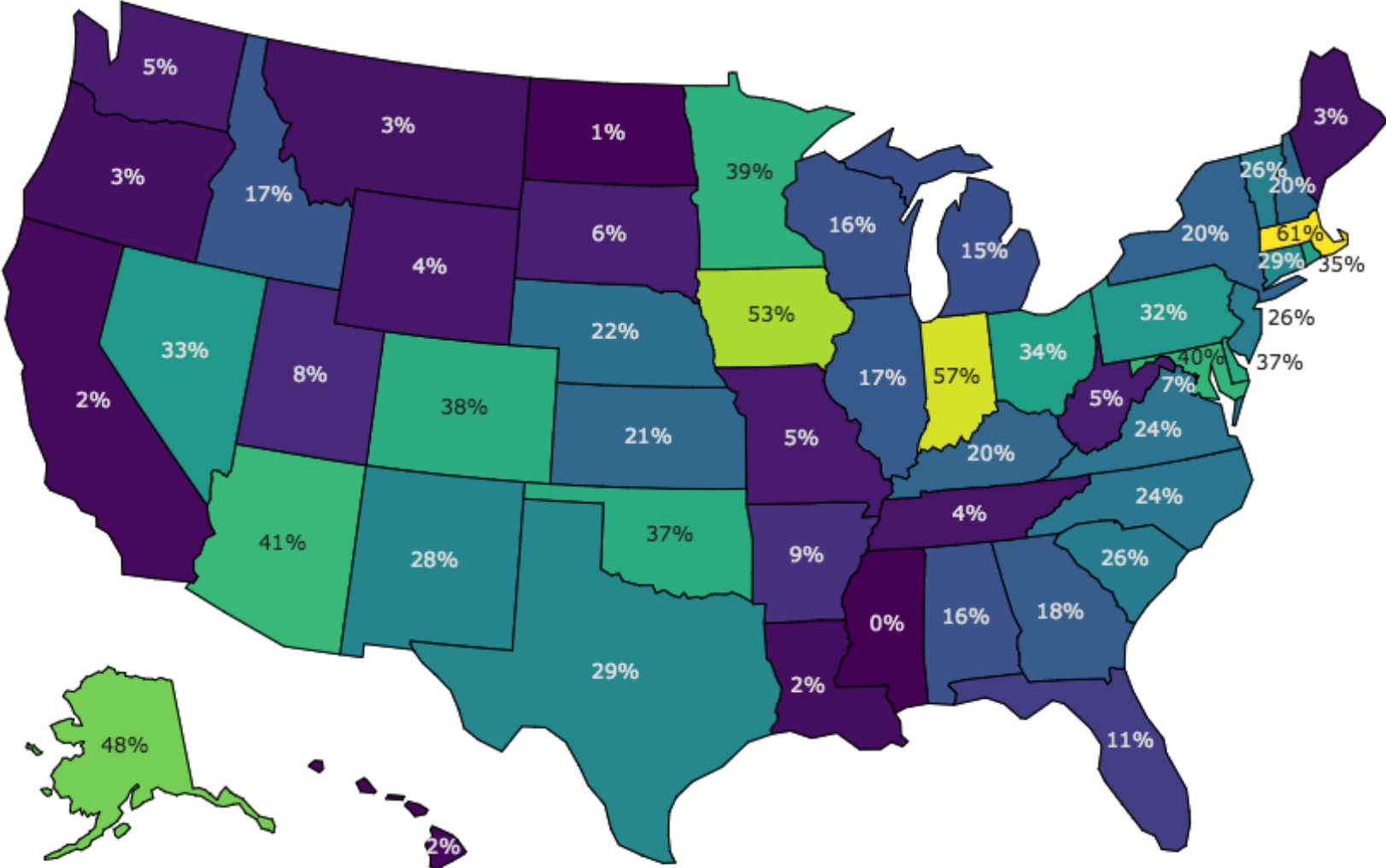
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IECC / ASHRAE 90.1 model energy code

**When  
planning to  
transform a  
market....**

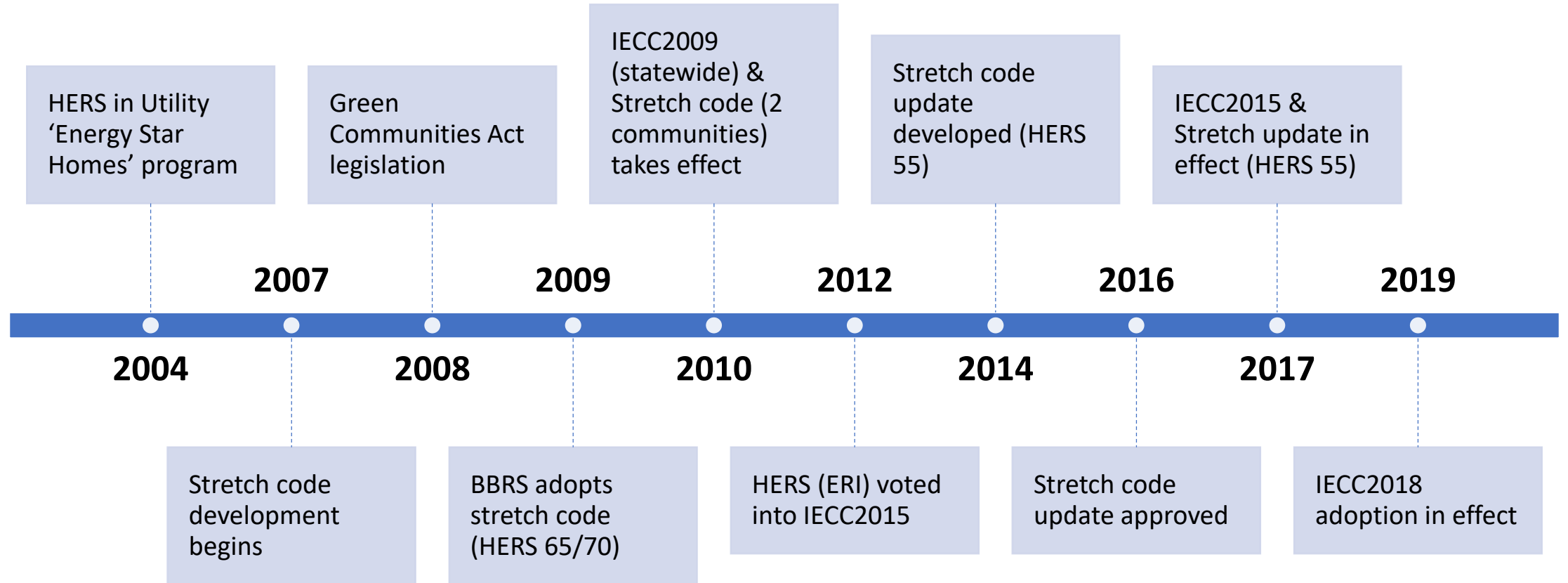
**Have a  
Delivery  
Vehicle**

# MA: Highest % of HERS Rated Homes in 2016

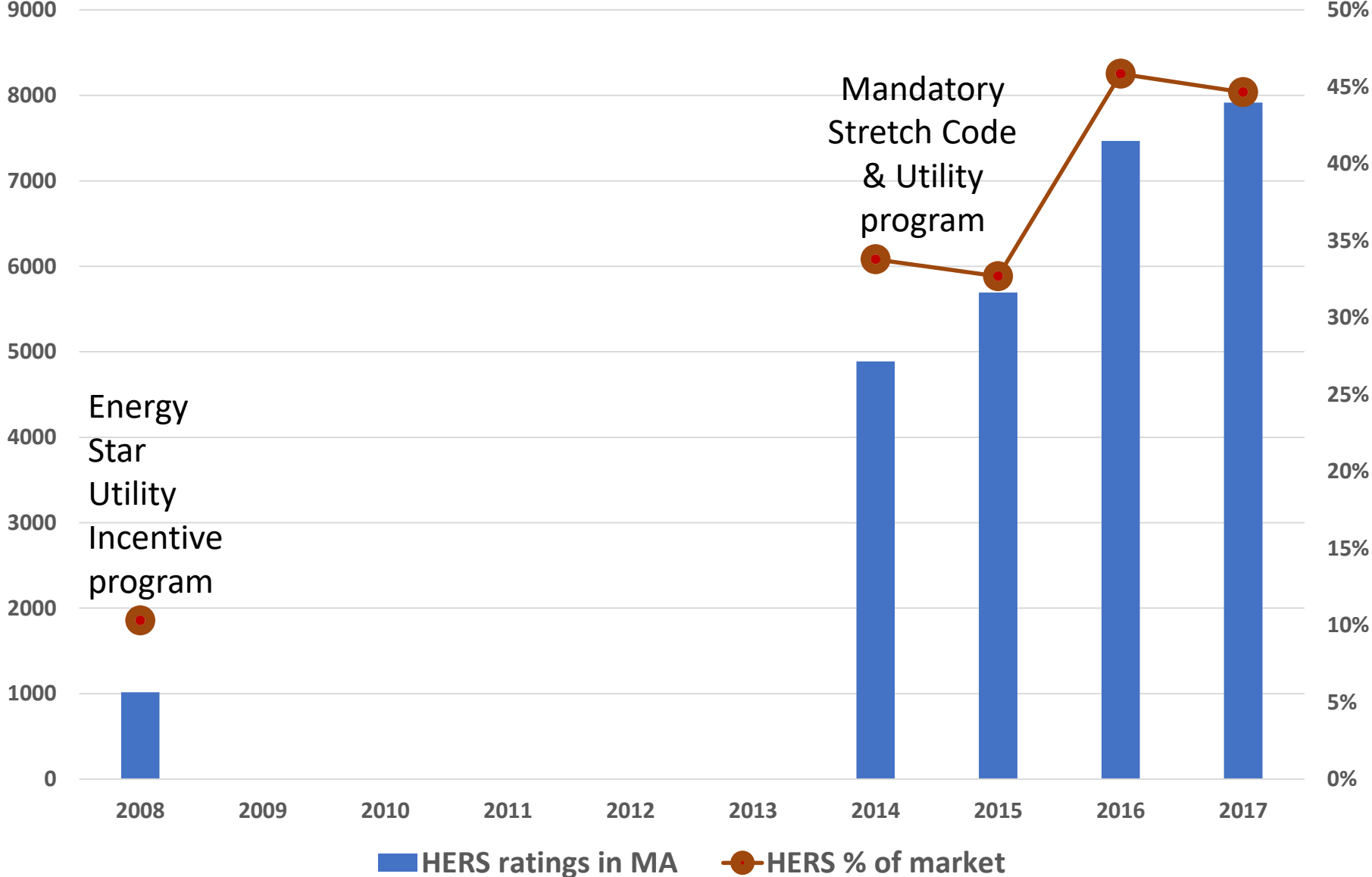


Source: RESNET

# HERS ratings timeline in MA



# HERS rating adoption in MA 2008-2017

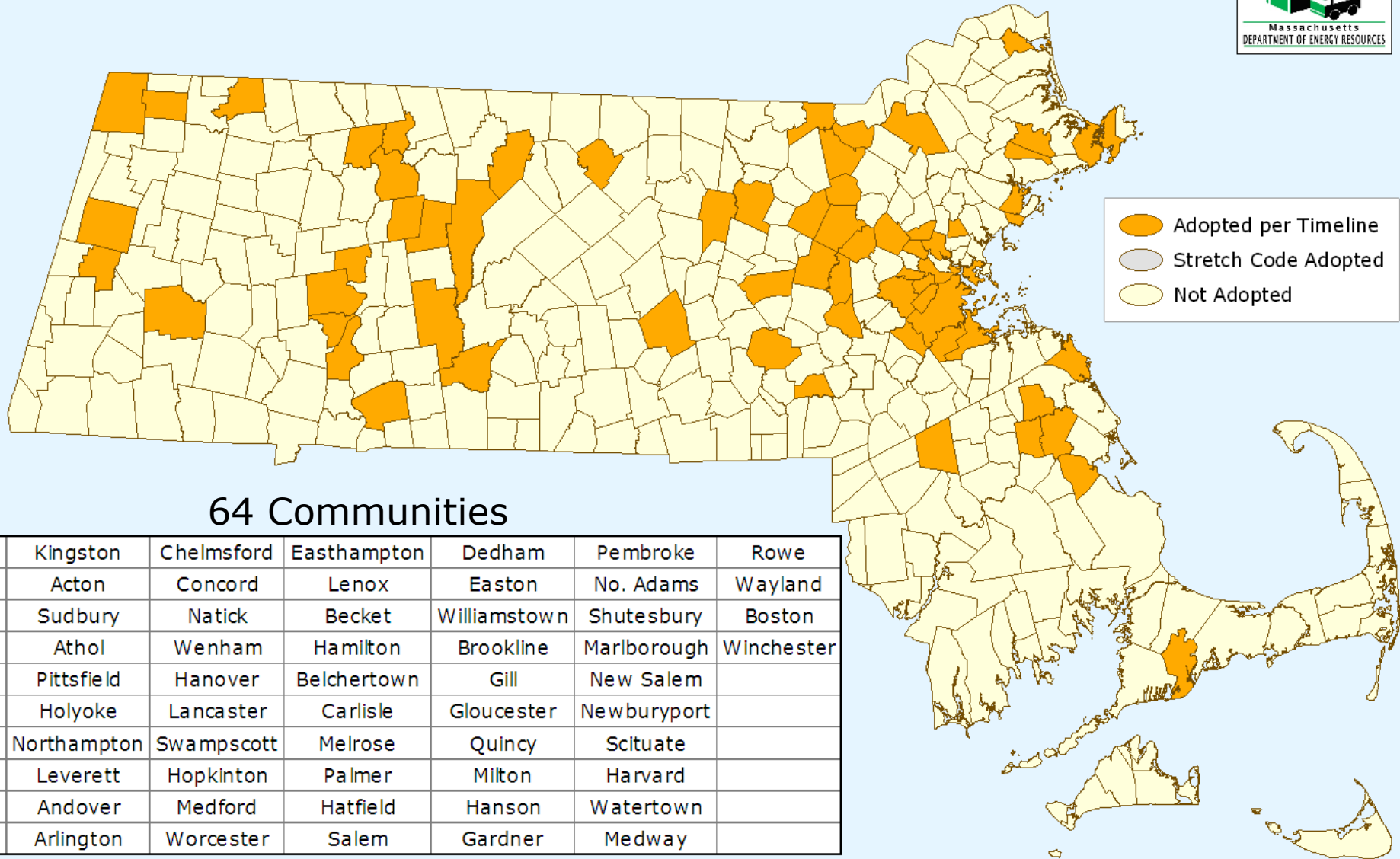






# Stretch Code Adoption, by Community

End of November 2010



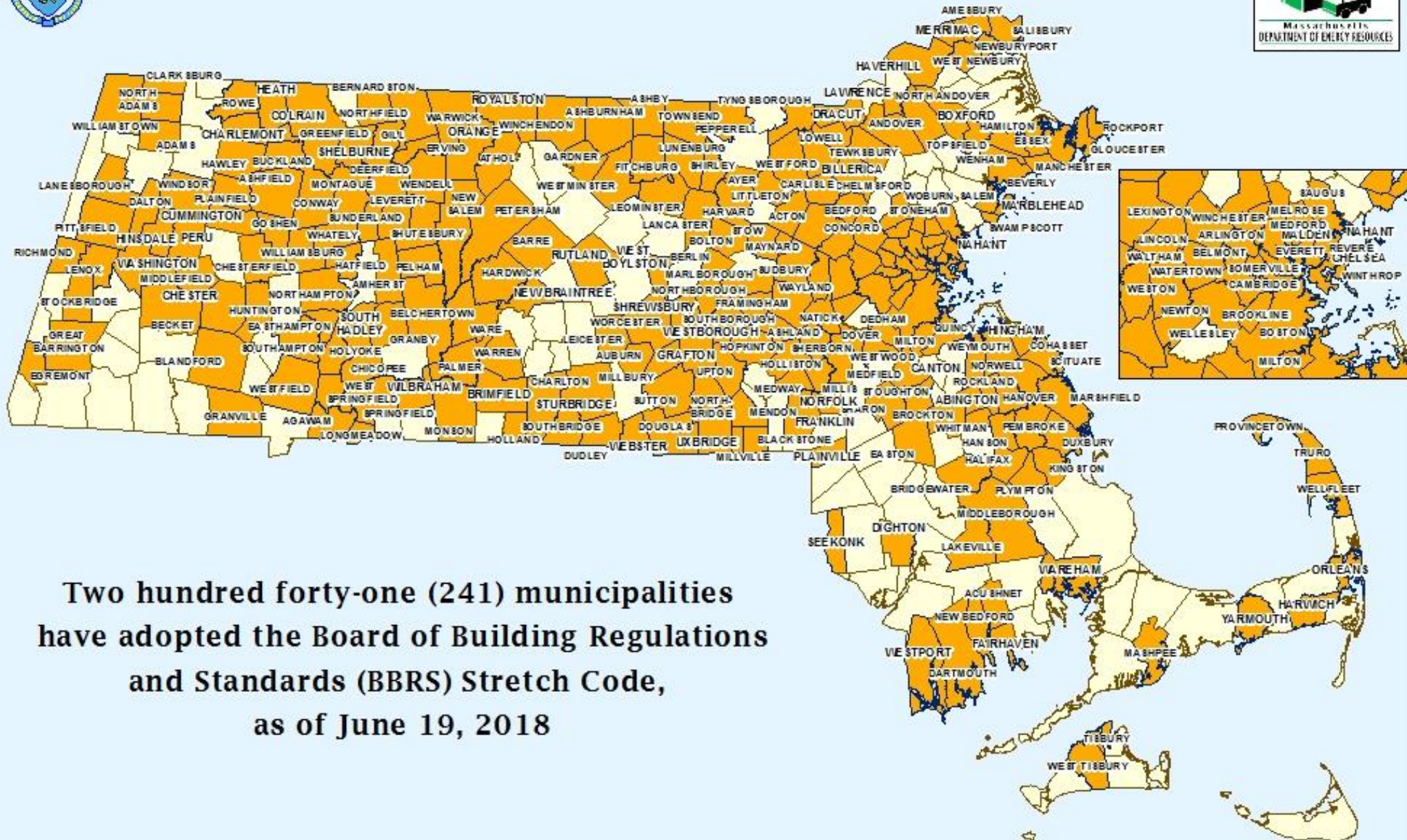
- Adopted per Timeline
- Stretch Code Adopted
- Not Adopted

## 64 Communities

Newton	Kingston	Chelmsford	Easthampton	Dedham	Pembroke	Rowe
Cambridge	Acton	Concord	Lenox	Easton	No. Adams	Wayland
Mashpee	Sudbury	Natick	Becket	Williamstown	Shutesbury	Boston
Springfield	Athol	Wenham	Hamilton	Brookline	Marlborough	Winchester
Tyngsborough	Pittsfield	Hanover	Belchertown	Gill	New Salem	
Greenfield	Holyoke	Lancaster	Carlisle	Gloucester	Newburyport	
Lowell	Northampton	Swampscott	Melrose	Quincy	Scituate	
Lincoln	Leverett	Hopkinton	Palmer	Milton	Harvard	
Lexington	Andover	Medford	Hatfield	Hanson	Watertown	
Montague	Arlington	Worcester	Salem	Gardner	Medway	

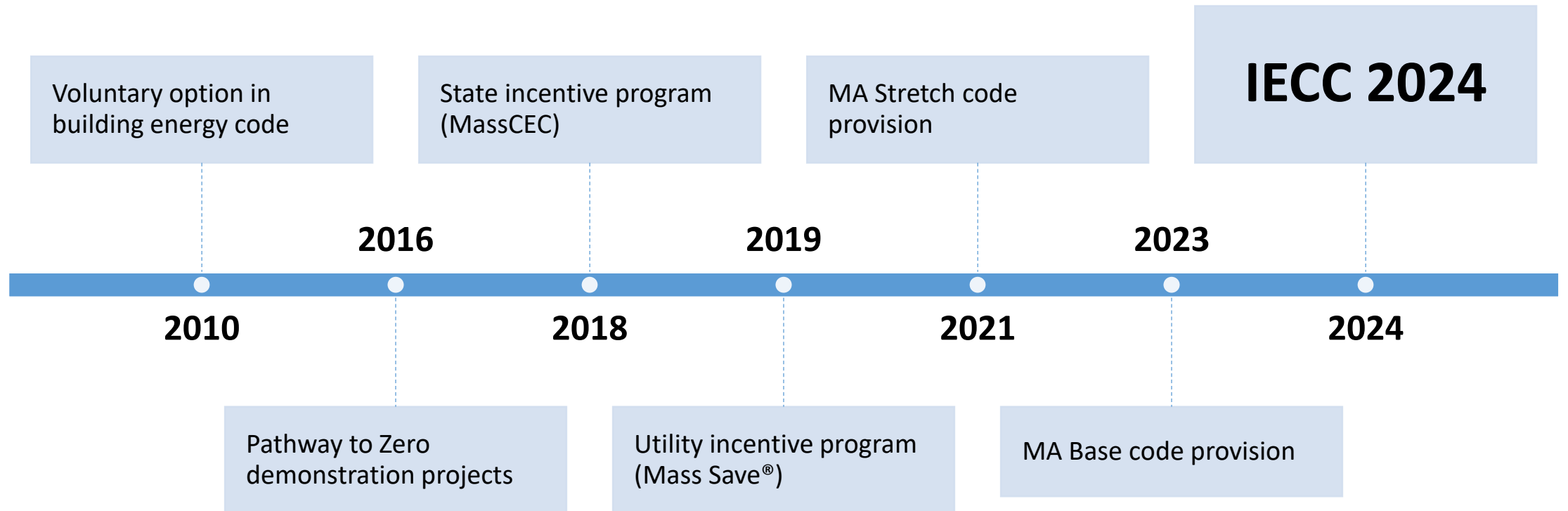


# Stretch Code Adoption, by Community



**Two hundred forty-one (241) municipalities  
have adopted the Board of Building Regulations  
and Standards (BBRS) Stretch Code,  
as of June 19, 2018**

# Passive house – Possible MA timeline



# Questions - Discussion

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