

BUILDINGENERGY BOSTON

**Open Source: Sharing Climate Knowledge for
Speed, Scale and Inclusion**

**Sara Kudra, Architecture Towards Neutral
Curt Newton, Massachusetts Institute of Technology**

Curated by Frank Stone

Northeast Sustainable Energy Association (NESEA) | March 21, 2025

A map of Eastern Massachusetts and Western Connecticut, overlaid with semi-transparent blue shapes representing various Native American territories. The map includes labels for numerous towns and regions such as Herkimer, Johnstown, Schenectady, Albany, Bennington, Brattleboro, Manchester, Derry, Pentucket, North Adams, Greenfield, Athol, Lowell, Gloucester, Pittsfield, Amherst, Nonotuck, Agawam, Naumkeag, Hudson, Great Barrington, Nipmuc, Massa-adchu-es-et (Massachusetts), Brockton, Patuxet, Wawarsing, Poughkeepsie, Sicaog (Saukiog), Mansfield, Killingly, Providence, Nahaganset, New Bedford, Nauset, Munsee Lenape, Carmel, Paugussett, Mohegan, South Kingstown, Sakonnet, Falmouth, Oak Bluffs, New Milford, Connecticut, Eastern Nehantick, West Milford, New City, Stamford, Mannansett, Shinnecock, Corchaug, Shinnecock, Setalcott, Matinecock, Merrick, Secatogue, Mohican, Canarsie, and Bangor. The word 'CONNECTICUT' is written in all caps in the center of the map.

Acknowledgement

Massa-adchu-es-et (Massachusetts)

Pawtucket

Naumkeag

<https://native-land.ca/> ← Also open source!

Jamaica Plain Green House



1908 Original (foreclosed)



JPGH Phase 1 (2014)



JPGH Phase 2 (2021)

MIT OpenCourseWare

- Free open-licensed materials from 2,500+ MIT courses
- Reached >500 million learners and educators
- Leader in the global open education ecosystem

<https://ocw.mit.edu>

The screenshot shows the MIT OpenCourseWare website interface. At the top, there is a navigation bar with the MIT logo, 'OpenCourseWare', a search icon, and buttons for 'GIVE NOW', 'ABOUT OCW', 'HELP & FAQs', and 'CONTACT US'. Below this is a blue header for the course: 'RES.ENV-001 | January IAP 2017 | Non-Credit' and 'Climate Action Hands-On: Harnessing Science With Communities To Cut Carbon'. The main content area is divided into three columns. The left column is titled 'Syllabus' and lists four sessions: 'Session 1: Citizen Science and Climate Action', 'Session 2: Methane Leaks Hackathon', 'Session 3: Methane Leaks Field Trip "Safari"', and 'Session 4: Legal and Business Actions, Methane Leak Data Debrief'. The middle column is titled 'Course Description' and contains a paragraph about citizen science and methane leaks, with a 'Show more' link. Below this is the 'Course Info' section, which lists 'INSTRUCTORS' (David Damm-Luhr, Rajesh Kasturirangan, Zeyneb Maqavi, Chris Nidel, Nathan Phillips, Audrey Schulman, Britta Voss, Jeff Warren, Ory Zik) and 'TOPICS' (Energy, Climate, Fossil Fuels, Engineering, Social Science). The right column features a map visualization with red spikes representing methane concentrations, with a caption explaining that the height of the spikes is proportional to the measured concentrations. Below the map is a 'Download Course' button.

The screenshot shows a YouTube video player. The video title is 'Session 2.2: Methane Leak Measurement Hackathon'. The video content shows a group of people in a workshop setting, with one person standing and presenting to a group seated around a table. The video player interface includes a progress bar at 18:29 / 20:16, a play button, and a volume icon. Below the video player, there is a channel name 'MIT OpenCourseWare' with 5.59M subscribers, a 'Subscribed' button, a like button with 3 likes, and a share button. The YouTube logo is visible in the bottom right corner.

Atn:



Source Energy



All Electric



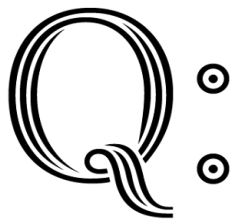
Carbon Reduction



Phius Certified

Learn more at [/archtowards.com/](https://archtowards.com/)





What is open?



What is good about open?



What is hard or challenging?



<https://pollev.com/cjnewton>

Poll responses →

OPEN SOURCE IMAGE: PEXELS

What's the landscape?



Communities & Cultures

Content

Infrastructure & Tools

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Shades of Open

US Government



Some rights reserved



MIT OpenCourseWare, Wikipedia, OA journals

Free online to read & link
but © all rights reserved

Social media
thanks for your data

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AIA U



WHY

Access for All

Equity & Inclusion

Speed & Scale



The Human Brain



Seeds of Resilience

Data + Screening Tools

Data & Tools Get Involved About News

Public Environmental Data Partners

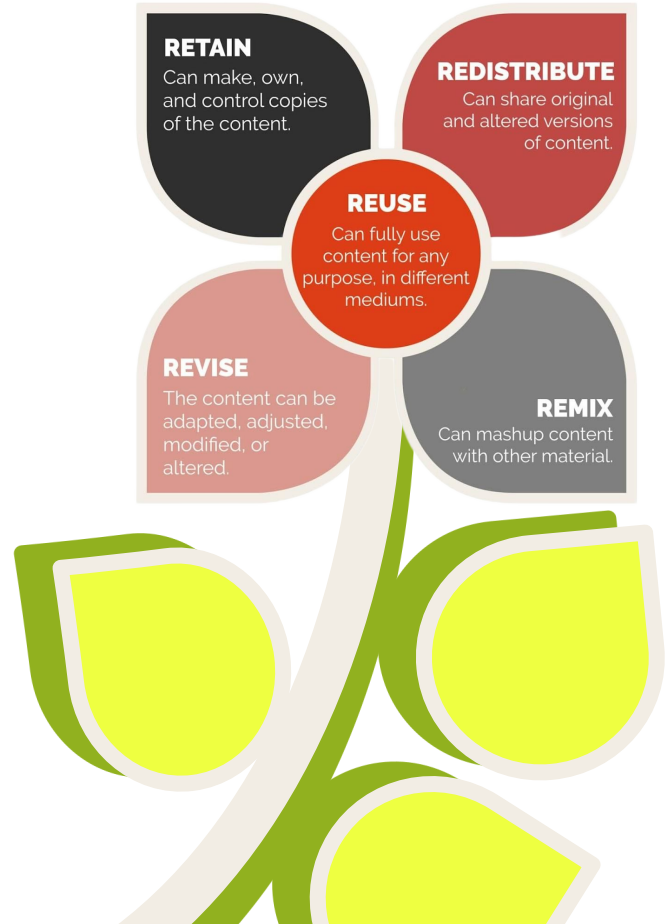
The Public Environmental Data Partners are **committed to preserving and providing public access to federal environmental data**. We are a volunteer coalition of several environmental, justice, and policy organizations, researchers across several universities, archivists, and students who rely on federal datasets and tools to support critical research, advocacy, policy, and litigation work. To gather insights on what data to preserve, we reached out to our networks, which consist largely of environmental justice groups and networks, state and local government climate offices, and academic researchers. We compiled a large list of federal databases and tools, and prioritized them based on their relative impact, our confidence that we could archive them, and the relative effort it would take to obtain and archive them.

Fill out the form [here](#) to nominate data for us to preserve.

Updates

- [February 28, 2025] Access to DOE [Local Investment Map for Demonstration and Deployment Projects](#) was made publicly available.
- [February 27, 2025] Access to [FEMA's Future Risk Index](#) was made publicly available.
- [February 14, 2025] Access to [EPA EJAM](#) was made publicly available.
- [February 7, 2025] Access to [EPA EJScreen](#) was made publicly available.
- [January 31, 2025] Access to [CDC's Social Vulnerability Index and Environmental Justice Index](#) was made publicly available.
- [January 24, 2025] Access to [Council on Environmental Quality EJScorecard](#) was made publicly available.
- [January 24, 2025] Access to [Climate and Economic Justice Screening Tool](#) was made publicly available.
- [January 23, 2025] Based on these criteria, we have identified 57 high-priority databases, of which we've archived 37 thus far. In addition, we have made replicas of the Climate and Economic Justice Screening tool, and EJScreen.

<https://screening-tools.com>



This is an unofficial copy of EJScreen hosted by the [Public Environmental Data Partners](#). We are working on an overhaul, but in the meantime some links and text may incorrectly suggest that this site is



Compare to US Compare to State

Environmental Burden Indicators

Socioeconomic Indicators

Demographic Index

Supplemental Demographic Index

People of Color

Low Income

Unemployment Rate

Limited English Speaking

Less Than High School Education

Under Age 5

Over Age 64

Environmental Justice Indexes

Supplemental Indexes

Climate Change

Health Disparities

Critical Service Gaps

Find address or place

Map Contents

Socioeconomic Indicators

Map color bin for Demographic Index

- 95 - 100 percentile
- 90 - 95 percentile
- 80 - 90 percentile
- 50 - 80 percentile
- Less than 50 percentile
- Data not available

[What does this mean?](#)

Welcome!



This is an unofficial copy of EJScreen, hosted by the [Public Environmental Data Partners](#). Some links and text may incorrectly suggest that this site is affiliated with the US Government. We've published an initial reconstruction - you can identify the EJScreen data and index percentiles for a given block group right now. Check back soon as we put more time and resources toward the functionality of EJScreen you might be used to. Thanks for your patience and support.

EJScreen is the environmental justice screening and mapping tool that utilizes standard and nationally consistent data to highlight places that may have higher environmental burdens and vulnerable populations.

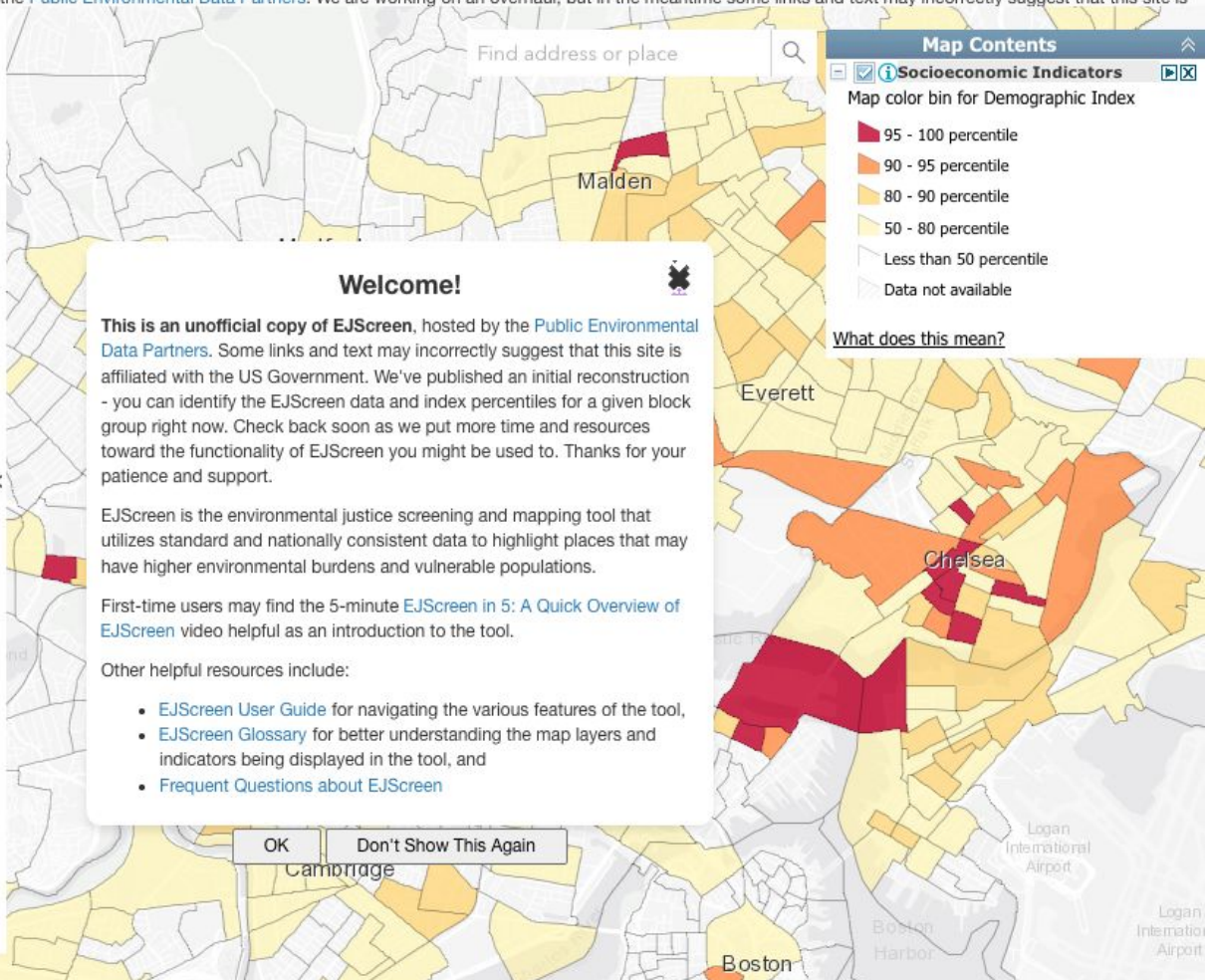
First-time users may find the 5-minute [EJScreen in 5: A Quick Overview of EJScreen](#) video helpful as an introduction to the tool.

Other helpful resources include:

- [EJScreen User Guide](#) for navigating the various features of the tool,
- [EJScreen Glossary](#) for better understanding the map layers and indicators being displayed in the tool, and
- [Frequent Questions about EJScreen](#)

OK

Don't Show This Again



MIT Open Climate Learning: General Audience

 Climate Portal



Learn about climate change straight from MIT experts

Primer

Podcast

Explainers

Ask MIT Climate

Updated for 2024


Climate Science, Risk & Solutions

Climate Knowledge for Everyone

Heat and humidity

Warning is also of direct concern. Human comfort is measured by a quantity called the wet-bulb temperature, which is the lowest temperature a damp surface can have in air of a given temperature and humidity. When the wet-bulb temperature exceeds about 35°C (95°F) the human body cannot transmit heat to the surrounding air fast enough to compensate for its internal production of heat, and body temperature

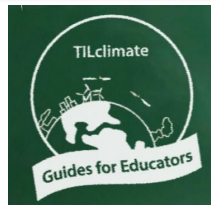
By the end of this century, parts of the American Southwest may see temperatures above 95°F for a majority of the year.



TILclimate | S2:EP4
TIL about energy efficiency



08:00 1X PRIVACY SHARE



EXPLAINER

Energy Storage

Listen with Speechify 0:00

Energy storage is a technology that holds energy at one time so it can be used at another time. Building more energy storage allows renewable energy sources like wind and solar to power more of our electric grid. As the cost of solar and wind power has in many places dropped below fossil fuels, the need for cheap and abundant energy storage has become a key challenge for building an energy system that does not emit greenhouse gases or contribute to climate change.

Energy storage will be even more important if we change our transportation system to run mainly on electricity, increasing the need for on-demand electric power. Because transportation and electricity together produce almost half of the world's greenhouse gas emissions, cheap energy storage has a huge role to play in fighting climate change.

The "Grid Level Energy Storage Problem"

Solar and wind provide "intermittent" electricity, meaning their energy

ASK MIT CLIMATE

How long will it take temperatures to stop rising, or return to 'normal,' if we stop emitting greenhouse gases?

Listen with Speechify 0:00 3:22

Temperatures will likely stop rising in a few years or decades—but it could take centuries for them to fall to the levels humans enjoyed before we started burning fossil fuels.



MIT Open Climate Learning: Open Academic Courses

MITx: Sustainable Building Design

4.6 ★★★★★ 33 reviews

Learn and explore key scientific principles, technologies, and analysis techniques for designing comfortable indoor environments while reducing energy use and associated climate change effects.



Instructor-paced

Instructor-led on a course schedule



13 weeks

8 – 10 hours per week



Earn a certificate

[Learn more](#)

Free to explore
and audit



Approved
Continuing
Education

Case Study: The Kenzi Battery Backup



Case Study: The Kenzi Battery Backup



PASSIVE HOUSE DESIGN CHALLENGE



**The Challenge:
Dispel Misperceptions
about Passive
House Construction
Costs**

Closed

Program Area
High Performance Buildings

Program Duration
2017 - 2018

Activities Supported

English ▾

MIT Open Climate Learning: Battery Chemistry

MIT OpenCourseWare



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3.091 | Fall 2018 | Undergraduate

Introduction To Solid-State Chemistry

Syllabus

Instructor Insights

Lecture Videos

Why This Matters

Readings

Goodie Bag
Tutorials and
Problems

Recitations

Practice
Problems

Exams and
Quizzes

Resource Index

Why This Matters

The Battery Revolution



Climate Portal

Climate 101

Explore

MIT Action



A new concept for low-cost batteries



MIT by MIT News

Photo Credit: Image: Rebecca Miller

Author: David L. Chandler

As the world builds out ever larger installations of wind and solar power systems, the need is growing fast for economical, large-scale backup systems to provide power when the sun is down and the air is calm. Today's lithium-ion batteries are still too expensive for most such applications, and other options such as pumped hydro require specific topography that's not always available.

Now, researchers at MIT and elsewhere have developed a new kind of battery, made entirely from abundant and inexpensive materials, that could help to fill that gap.

OPEN SOURCE

Case Study: Networked Geothermal



heet



OER

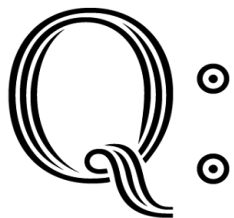
Workshops

Open Resource Library

Collaborative Adaptations

Local Action + Open Research





What's something you've discovered?



Really awesome/ had good information available?



Got stuck on, or didn't find clear information?



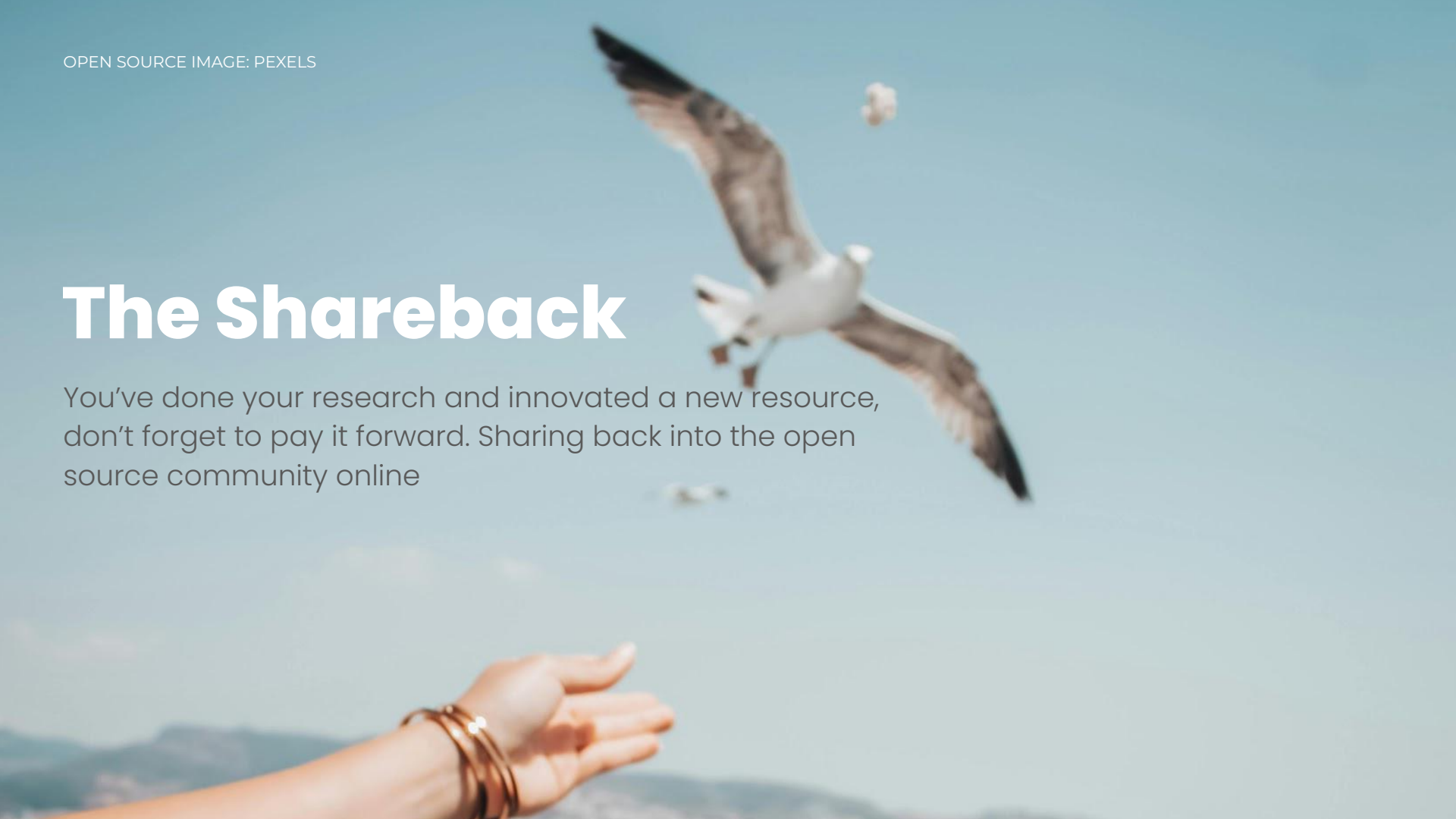
<https://pollev.com/cjnewton>

Poll responses →

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The Shareback

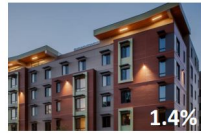
You've done your research and innovated a new resource, don't forget to pay it forward. Sharing back into the open source community online



Case Study: The Kenzi

When your cover looks like this, we're in trouble

Design Challenge: Project Incremental Cost



WE ARE MASS SAVE:



EVERSOURCE

Liberty

nationalgrid

Unitil

Scaling Up Passive House Multifamily: The Massachusetts Story

WE ARE MASS SAVE:



EVERSOURCE

Liberty

nationalgrid

Unitil

Scaling Up Passive House Multifamily: The Massachusetts Story

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Jayne Lino, Massachusetts Clean Energy Center

ABSTRACT

Two years ago, there was one Passive House certified multifamily building in Massachusetts. Since then, two more have certified and five more have completed construction and are in the certification process. As of June 2022, an additional 135 buildings are in design or construction. Altogether, 141 buildings with 8,500 units are on the path to building and certifying to the Passive House Standard. How did this momentum build? What are the policies and incentives that have led to this transformation in the new construction market? What are the incremental costs to upgrade to the Passive House standard? Lastly, do these buildings perform as designed?

Interest in Passive House in Massachusetts began with building and policy experts who believed that the Passive House Standard would provide a pathway for the design of exceptionally low energy buildings. Early on, it was codified as alternative energy code compliance path, but it did not gain traction due to market barriers including incremental cost, training, and perceived risk to overcome these hurdles. In 2017, the Massachusetts Clean Energy Center (MassCEC) launched the Passive House Design Challenge to track incremental costs and validate modeled energy performance for eight buildings. Separately, in 2018 Berkshire Gas, Cape Light Compact, Eversource, Liberty, National Grid, and Unitil, collectively the Mass Save Program Administrators (PAS), launched an incentive offer for Passive House multifamily projects to accelerate market transformation. These incentives fund both pre-construction technical support and robust post-construction incentives. This paper will discuss the results to date of both these efforts.

Introduction

In 2008, the Commonwealth of Massachusetts adopted the Green Communities Act and Global Warming Solutions Act (GCA 2008 and GWSA 2008), which included the state's first greenhouse gas emissions reduction framework and gas emissions targets to address climate change. The acts call for Massachusetts to pursue all cost-effective energy efficiency opportunities and to limit statewide emissions to at least 80 percent below the 1990 level by 2050. As part of the plan to achieve these goals, buildings were included as one of five decarbonization sectors, and recommendations include "high performance, Passive House level of envelope efficiency" for new construction. Massachusetts has historically used its clean energy programs and top ranked energy-efficiency programs to carry out legislative policy goals.

Massachusetts is home to an active Passive House network that advocated for a policy framework promoting passive design for improved energy performance. Stakeholders met with the Massachusetts Department of Energy Resources, which was seeking to promote Passive House design to achieve the state's energy reduction targets. They also successfully lobbied the state's affordable housing agency, the Department of Housing & Community Development

House consultant and
certification
ification

for the Design were funded with Low tion and facility t developers were ion typology, design units to 135 units. Some dings. Locations include loucester, Hanson, and

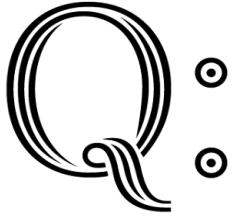
Units	Gross Square Feet
98	111,450
55	51,272
53	55,538
30	33,186
48	104,981
135	178,875
72	53,675
50	45,031

ed to comply with the ECC) 2015 plus MA ance-oriented code rith local communities went design changes s used as the basis for the initial design of set the developers' sing development, where

OPEN SOURCE IMAGE: PEXELS



**How does emergent knowledge
build and flow?**



How will you share back to the open information community?



<https://pollev.com/cjnewton>

[Poll responses →](#)

QUICK TIP

Advanced search function in Google Chrome - choose usage rights -

LEARN MORE

[.archtowards.com/blog/opensource](https://archtowards.com/blog/opensource)

Q & A

