

Why Passive House?



College of the Atlantic, Maine | OPAL Architecture

 The
Passive House
Network

The Network



Global Knowledge. Regional Context. Local Applications

Join us!

get started
with this
brochure



Buildings Are Super Important & Are Failing Us



90% time indoors
40% global emissions
>Unreliable
>Expensive
>Unhealthy

What's sustainability to you?



- **Reduced Carbon Emissions**
- **Net Zero Energy**
- **Support Healthy Environments**
- **Green Infrastructure**
- **Provide Resilience**
- **Support Affordability**
- **Environmental & Social Justice**
- **Historic Preservation**
- **Protect our Investments**
- **Comfort & Joy**

Passive House is the Platform

For all kinds of buildings, in all kinds of places



Simplicity of a concept



THERMAL COMFORT & HEALTH, with EFFICIENCY, DRIVE PERFORMANCE

“A Passive House is a building, for which thermal comfort (ISO 7730) can be achieved solely by post-heating or post-cooling of the fresh air mass, which is required to achieve sufficient indoor air quality conditions – without the need for additional recirculation of air.” – Passive House Institute, passipedia.org

Health, Comfort & Energy Efficiency Support Each Other.

What is Passive House?

Passive House is the world's most rigorous building energy efficiency standard.

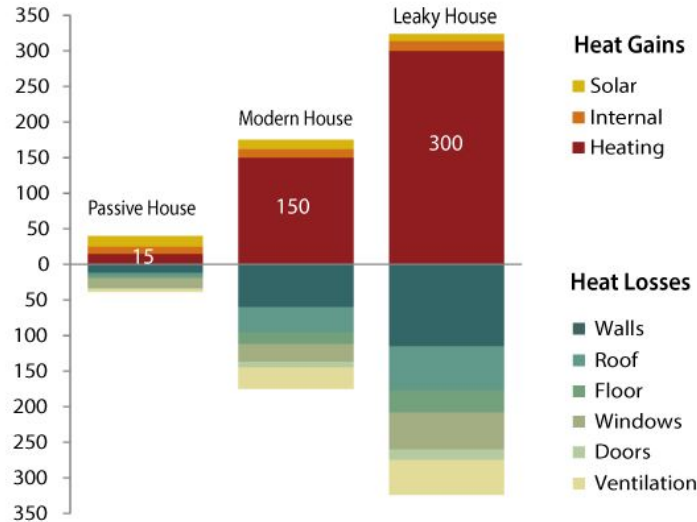
It is platform for a wide range of sustainability goals.



It's All About Energy Balance

The Value of a Well Insulated Home

Average heating gains and losses by house type in kWh/m²a



Data: typical values for Northern European climates

shrinkthatfootprint.com



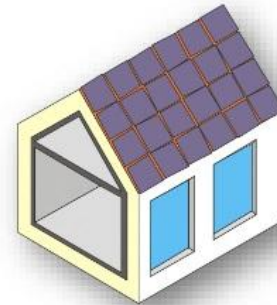
Results in **75% reduction in heating/cooling systems** and **up to 90% reduction in energy use.**

Clear outcome with fixed targets

Airtightness
Heating
Cooling/Dehumidification
Energy Use Intensity



Three Certification Levels to Passive House



Certified Retrofits: EnerPHit



Credit: Ryall Sheridan Architects



Predictable

Lowers Risk and Protects.

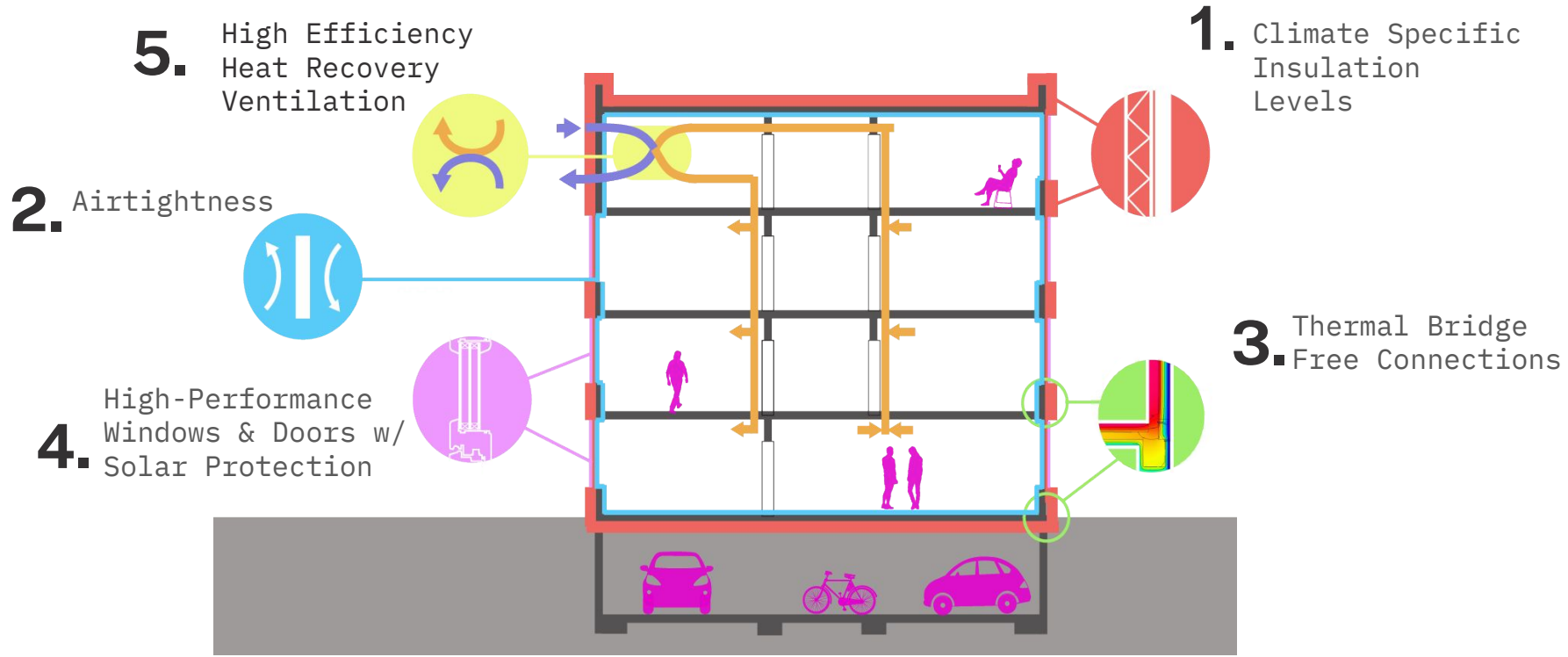


the first Passive House (1990)

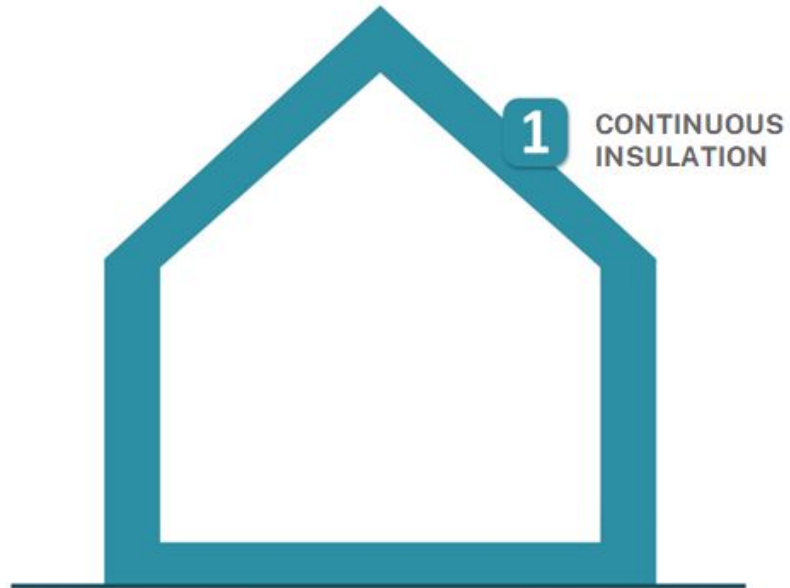


Credit: Passive House Institute

An Integrated Methodology w/ Five Key Principles



Principle #1: Continuous Insulation



Principle #1

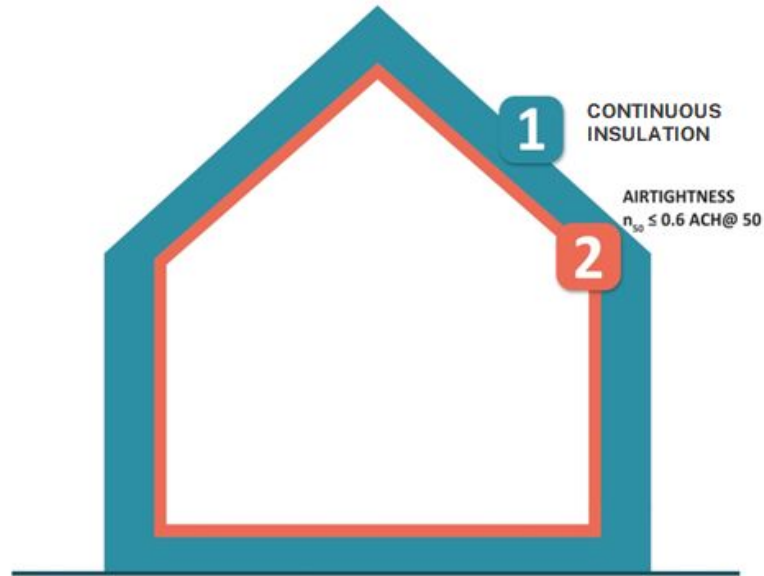


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Insulation thickness is climate-specific, like a climate rated sleeping bag.

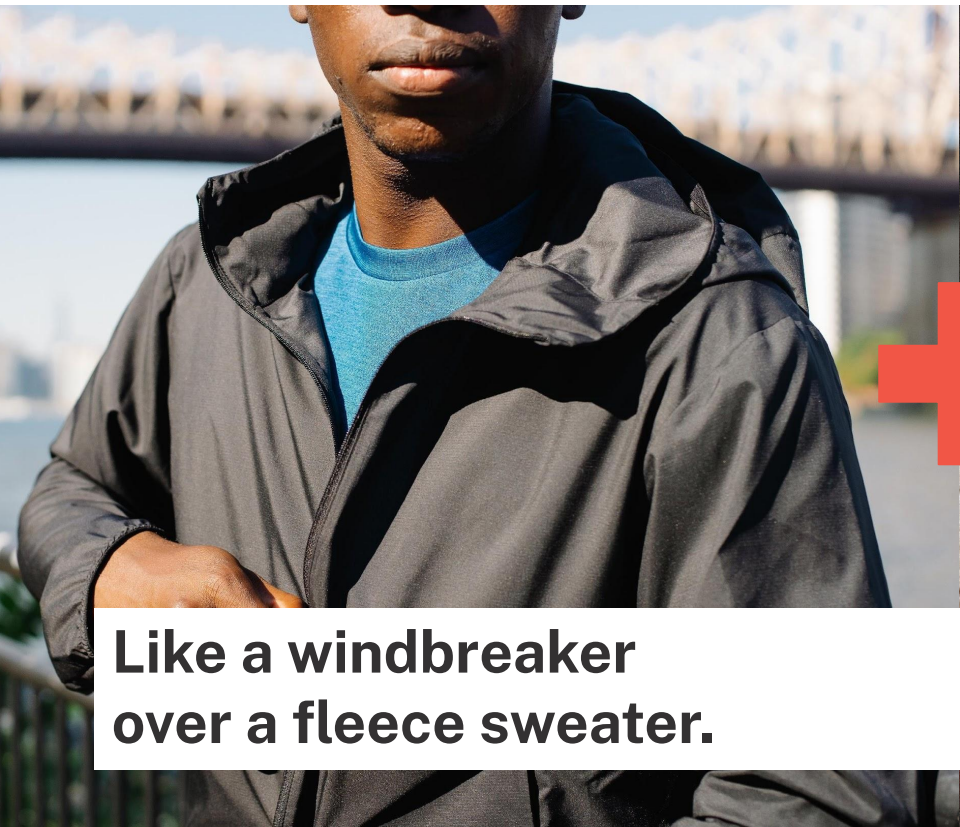
Principle #2: Airtightness



Principle #2

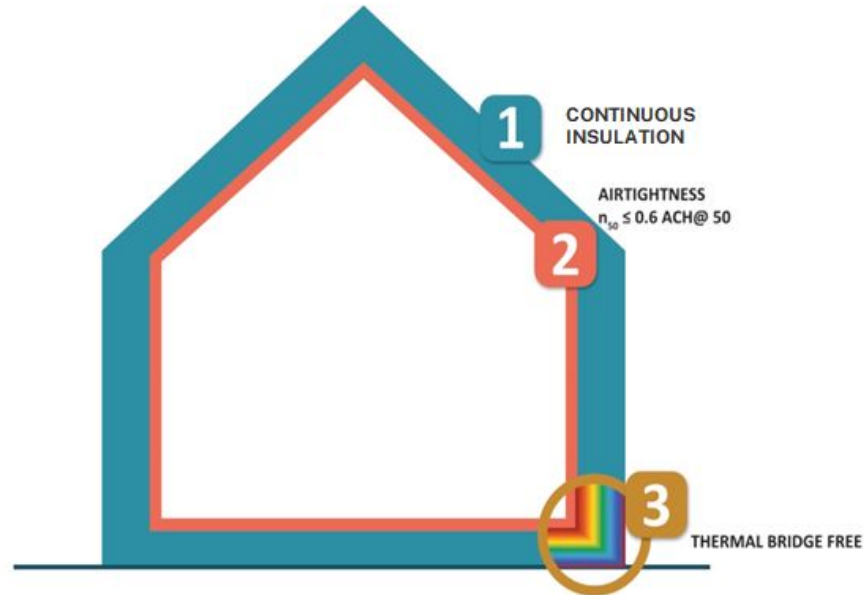


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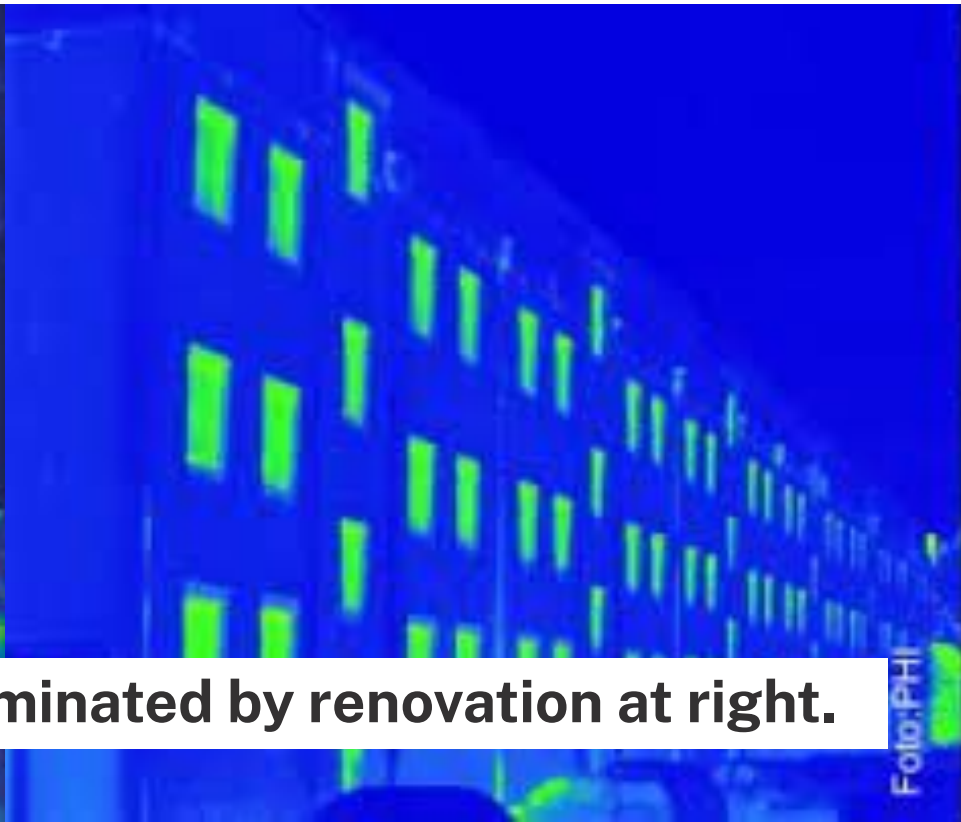
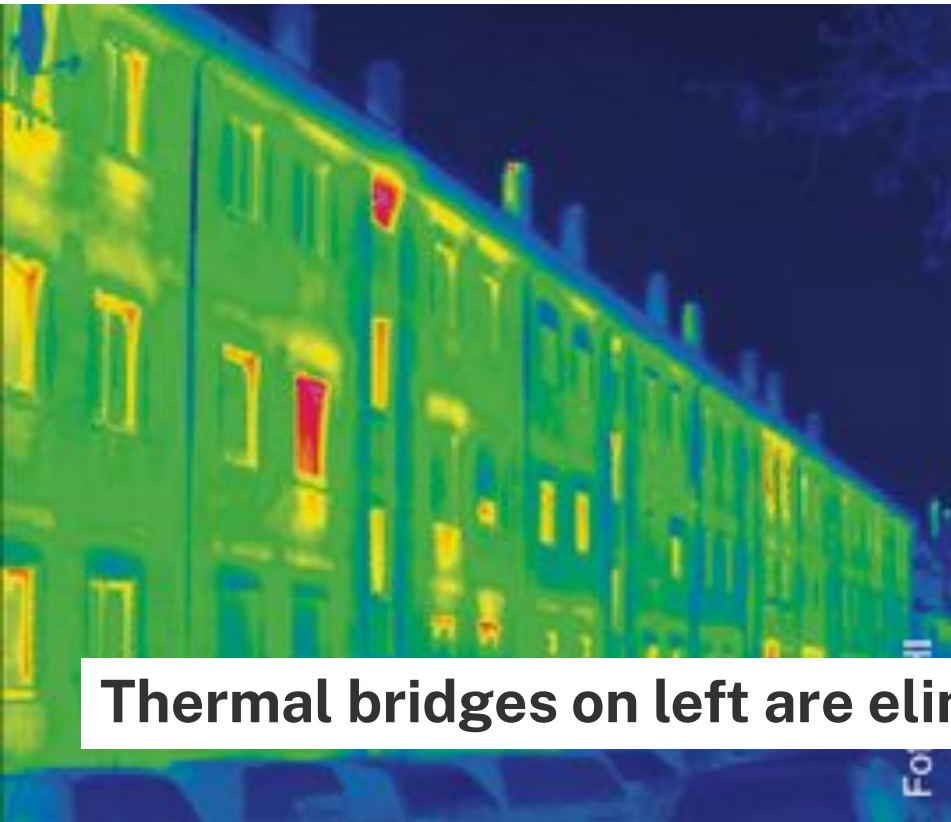


**Like a windbreaker
over a fleece sweater.**

Principle #3: Thermal Bridge Free Construction

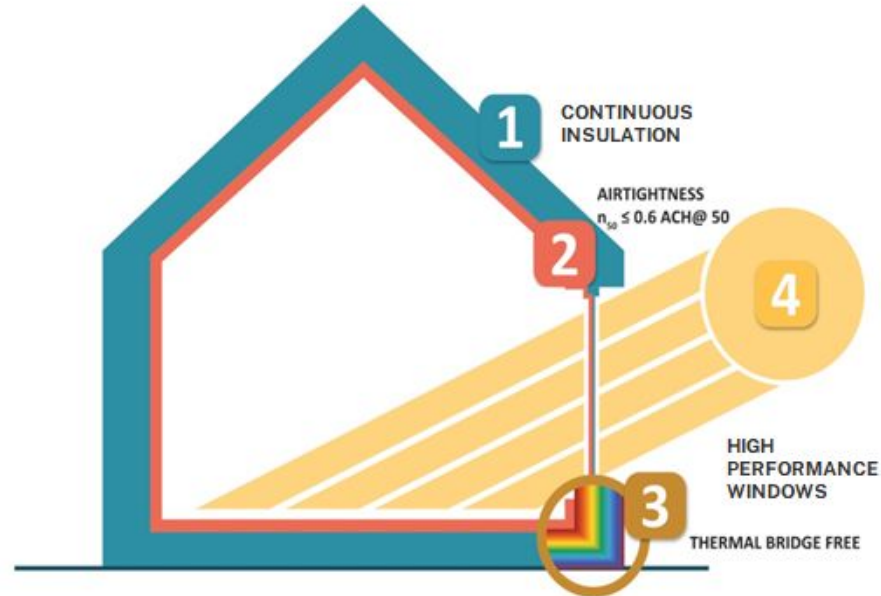


Principle #3



Thermal bridges on left are eliminated by renovation at right.

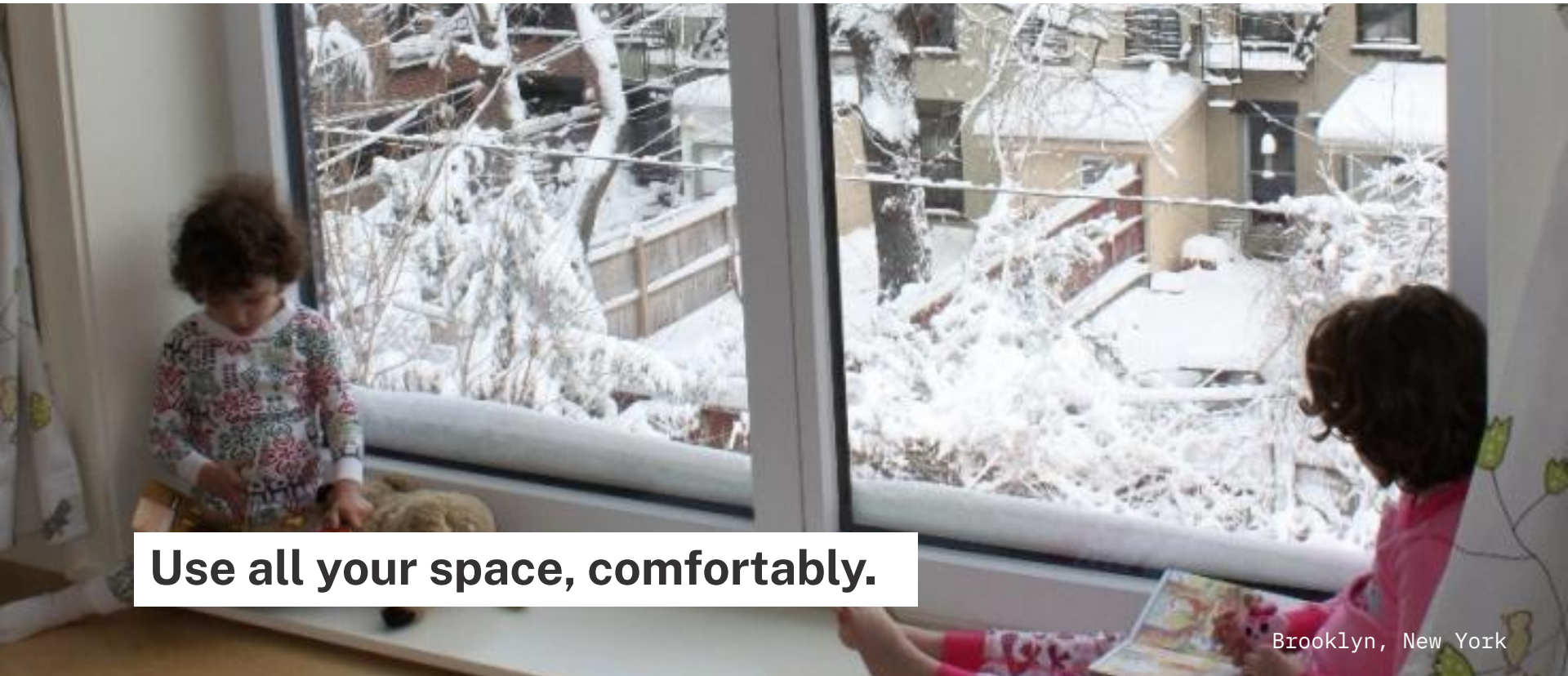
Principle #4: High Performance Windows & Doors



Principle #4



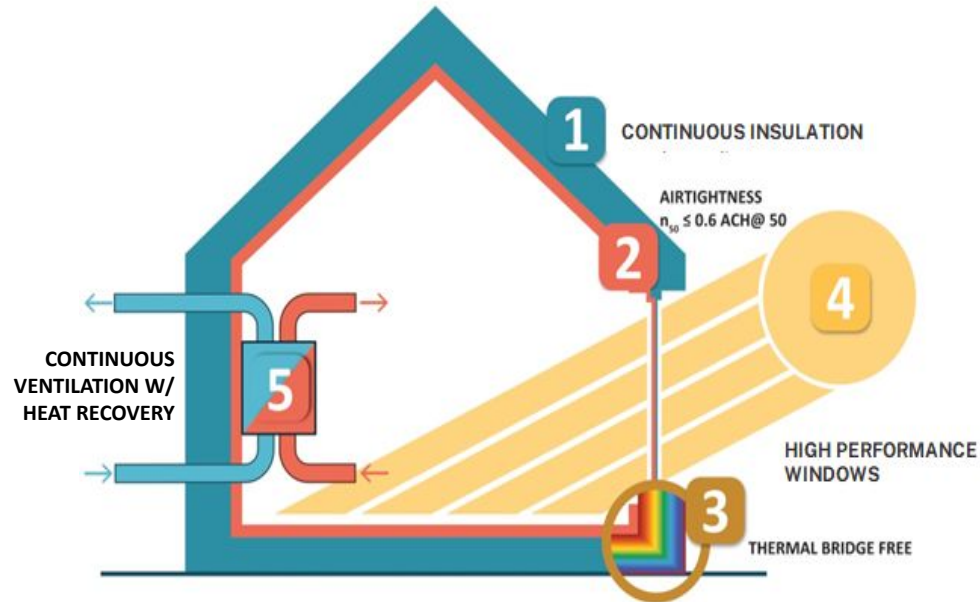
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Use all your space, comfortably.

Brooklyn, New York

Principle #5: Fresh Air Ventilation w/ Heat Recovery



Principle #5



Fewer allergies, less asthma, more healthy.

Calculated Predictability = Optimized Design

Passive House Energy Model: PHPP

5

Principles



90%

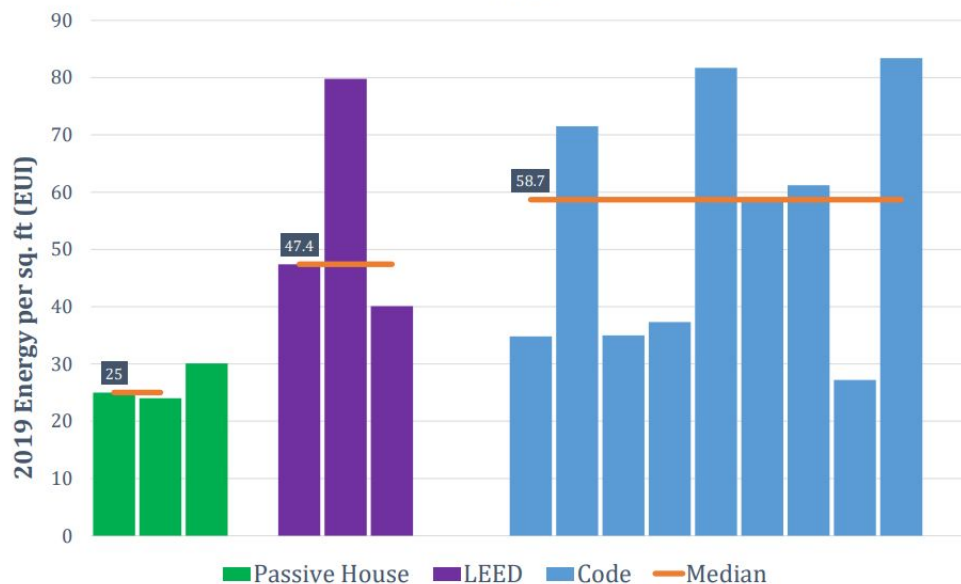
Reduction in
heat demand



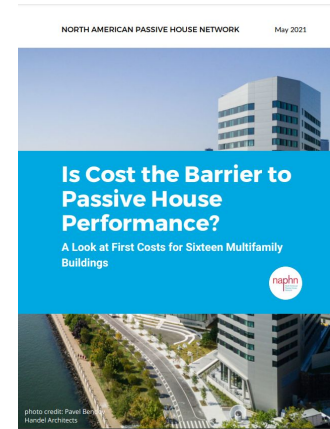
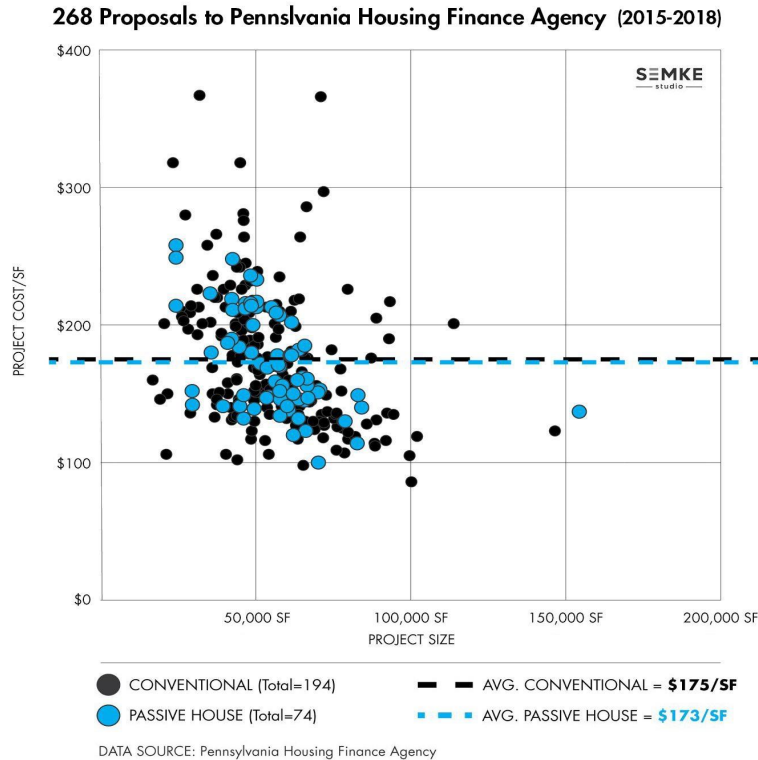
Predictable vs. Unpredictable Performance

Performance: PHILADELPHIA Affordable

PH Median is 57% less energy per sq. ft. than Median



Not a Typical “Cost-Plus” Paradigm



Stay in budget & on target:

- Passive House on day one
- Work with certifier from day one
- Require team to have proper training
- Optimize from start & stick to certification & target

Supportive of Wide Range of Goals

with Fundamental Benefits



Support health & wellbeing



Support Comfort



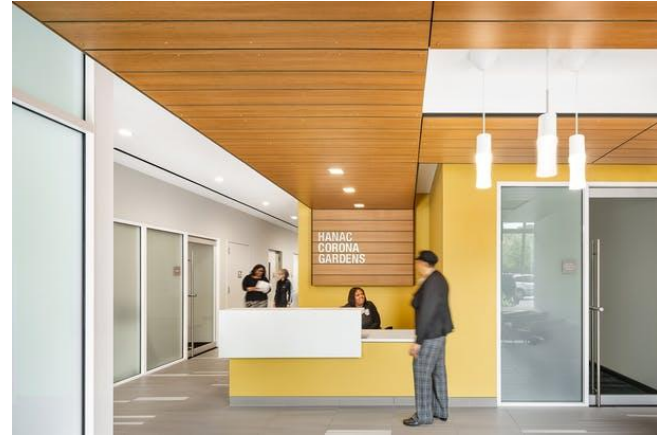
Support Resilience, Security & Equity



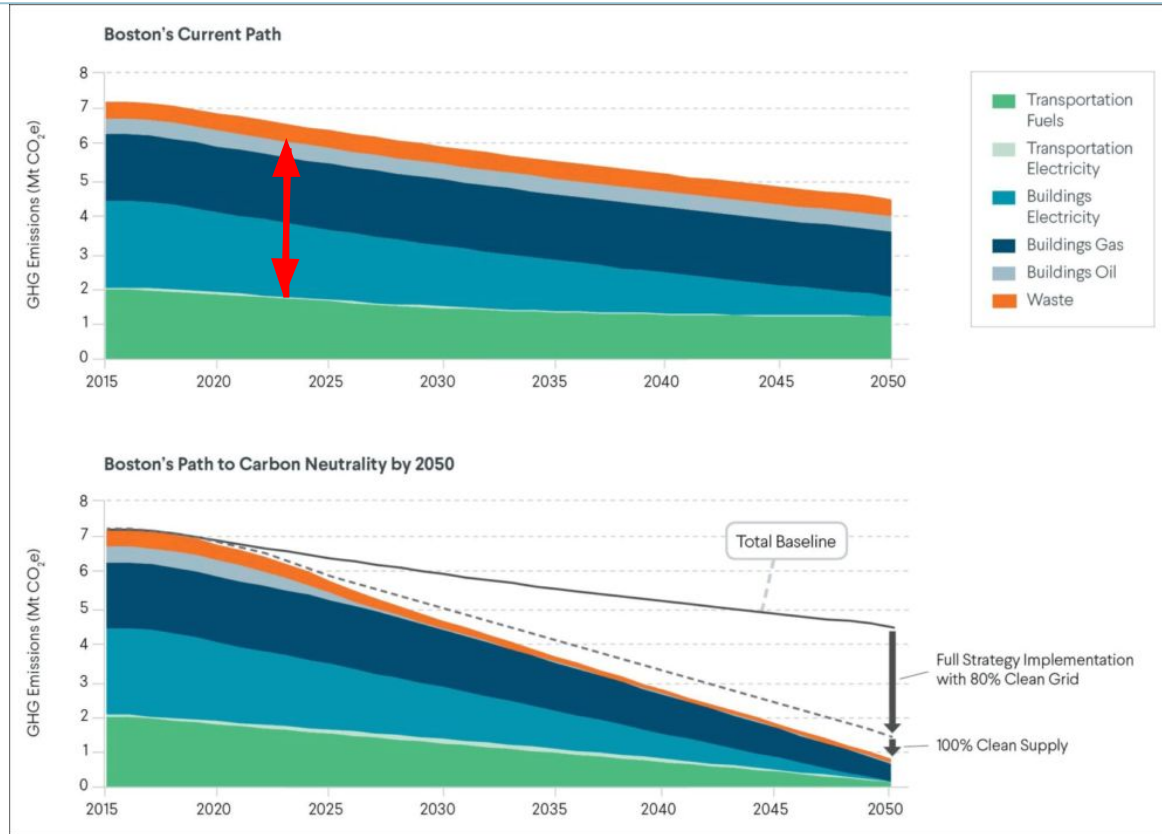
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Credit: Think! Architecture

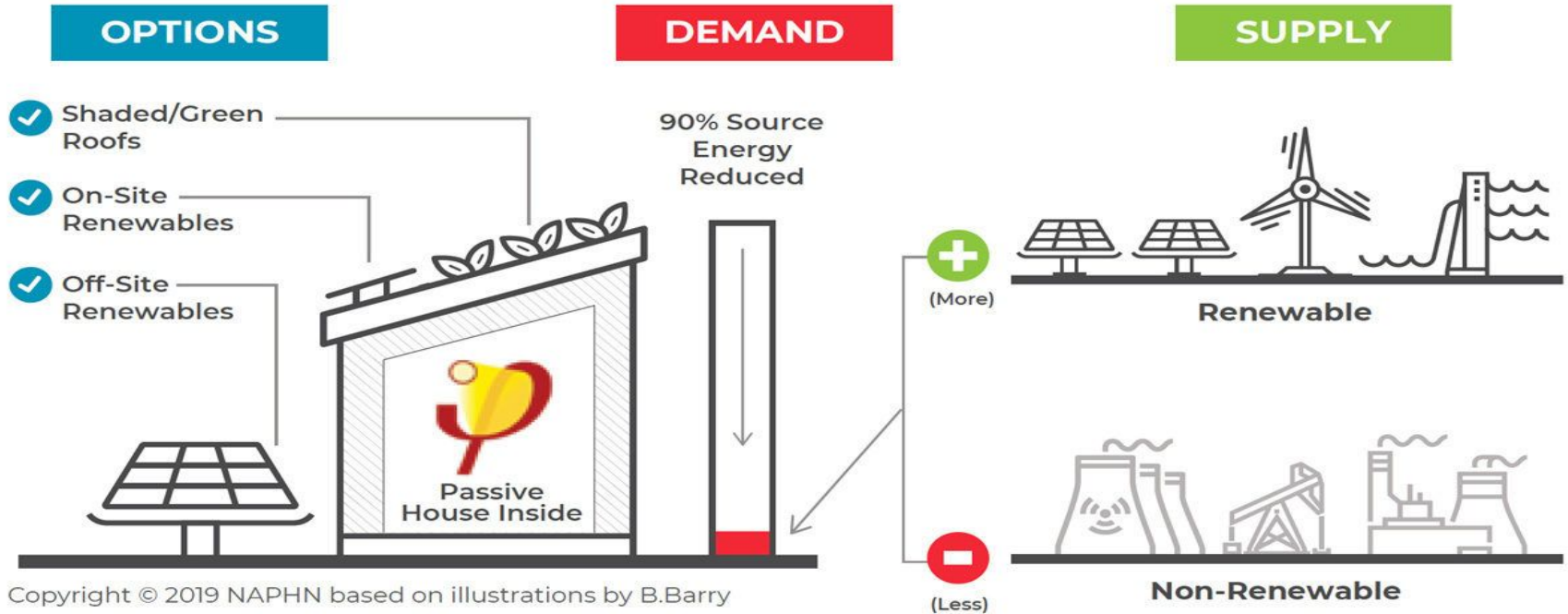


Support Our Policymakers: Zero Carbon



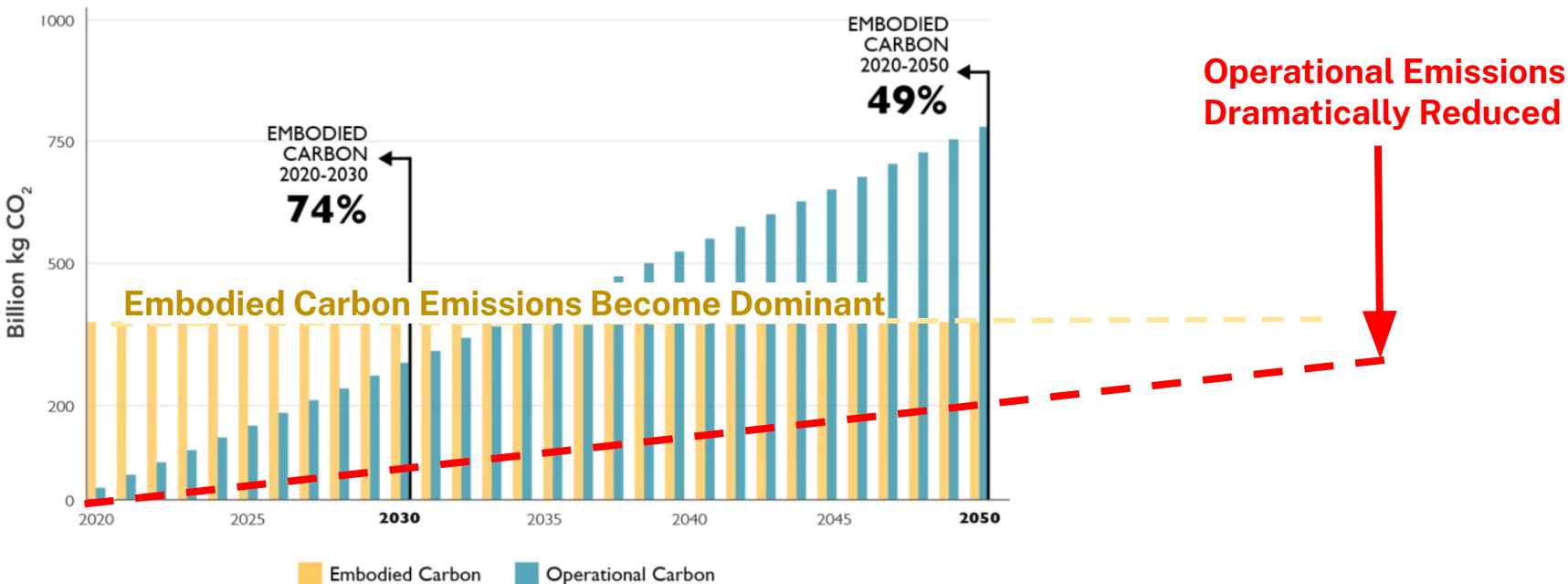
WBUR

Support Electrification & Renewables



Support the Urgency of Embodied Carbon

Total Carbon Emissions of Global New Construction
from 2020-2050
Business as Usual Projection



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Data Sources: UN Environment Global Status Report 2017; EIA International Energy Outlook 2017

Supports Many UN Sustainable Development Goals



SUSTAINABLE DEVELOPMENT GOALS



Simple, Predictable & Supportive



Think & Work Differently

New expectations.



Our Ask:



Actively think about Passive House.

Think about



The Passive House Network



renovating & building new Passive House.

Waring School, Beverly, Massachusetts

Think about



**requiring Passive House for public
buildings & private developments.**



Northland Newton Development, Massachusetts

Think about getting your team certified training.



Why Passive House?

www.passivehousenetwork.org

Let's build a healthy, equitable & sustainable world.



Passive House can transform the status quo.



Philadelphia, Pennsylvania

Passive House is the platform.



Thank you!

**get started with
this brochure**



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www.passivehousenetwork.org