Why Passive House?
The Network

Passive House Rocky Mountains
Passive House Minnesota
New Jersey Passive House
Passive House Empire State
Passive House Pennsylvania
Passive House Washington DC
Passive House America

Global Knowledge. Regional Context. Local Applications

Join us!

get started with this brochure

Why Passive House?

www.passivehousenetwork.org
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

University - Australia

Factory - Sri Lanka

Library - Pittsburgh

Housing - NYC

Office Tower - Boston
Simplicity of a concept
It starts with the occupants

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.
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)
An Integrated Methodology w/ Five Key Principles

1. Climate Specific Insulation Levels

2. Airtightness

3. Thermal Bridge Free Connections

4. High-Performance Windows & Doors w/ Solar Protection

5. High Efficiency Heat Recovery Ventilation
Principle #1: Continuous Insulation
Principle #1

Insulation thickness is climate-specific, like a climate rated sleeping bag.
Principle #2: Airtightness

CONTINUOUS INSULATION

AIRtightness

n_{50} \leq 0.6 ACH@50
Principle #2

Like a windbreaker over a fleece sweater.
Principle #3: Thermal Bridge Free Construction

1. Continuous Insulation
2. Airtightness $\nu_w \leq 0.6 \text{ ACH@50}$
3. Thermal Bridge Free
Principle #3

Thermal bridges on left are eliminated by renovation at right.
Principle #4: High Performance Windows & Doors
Principle #4

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

Why Passive House?
www.passivehousenetwork.org
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

Tanner Windows and Doors
Support Resilience, Security & Equity

Credit: Think! Architecture
Support Our Policymakers: Zero Carbon

- Boston's Current Path
- Boston's Path to Carbon Neutrality by 2050

Why Passive House?

www.passivehousenetwork.org
Support Electrification & Renewables

- Shaded/Green Roofs
- On-Site Renewables
- Off-Site Renewables

90% Source Energy Reduced

(More)

Renewable

(Less)

Non-Renewable

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Support the Urgency of Embodied Carbon

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

- Embodied Carbon Emissions Become Dominant
- Operational Emissions Dramatically Reduced

Why Passive House?

www.passivehousenetwork.org
Supports Many UN Sustainable Development Goals
Simple, Predictable & Supportive
Think & Work Differently
New expectations.
You care. You’re active. You make change happen.
Our Ask:

Actively think about Passive House.
Think about renovating & building new Passive House.

Waring School, Beverly, Massachusetts
Think about

Think about getting your team certified training.
Let’s build a healthy, equitable & sustainable world.

Passive House can transform the status quo.

Philadelphia, Pennsylvania
Thank you!

get started with this brochure

Ken Levenson, ken@passivehousenetwork.org

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