AN ECOTECTURAL HOME BUILDERS GUIDE

The Blueprint of Performance

Understanding the science and certification of the Passive House standard in New Zealand.

THE NEW ZEALAND BASELINE

20.0°C

Average NZ living room temperature on a winter evening.

16.16

Average NZ night-time bedroom temperature.

Data from the HEEP2 national study confirms the New Zealand standard remains well below World Health Organization guidelines, disproportionally impacting the young, elderly, and medically vulnerable.

THE ILLUSION OF HEALTH

1 in 5 households report seeing their breath inside or shivering in winter.

33% of households report their home is damp at least some of the time.

9 out of 10

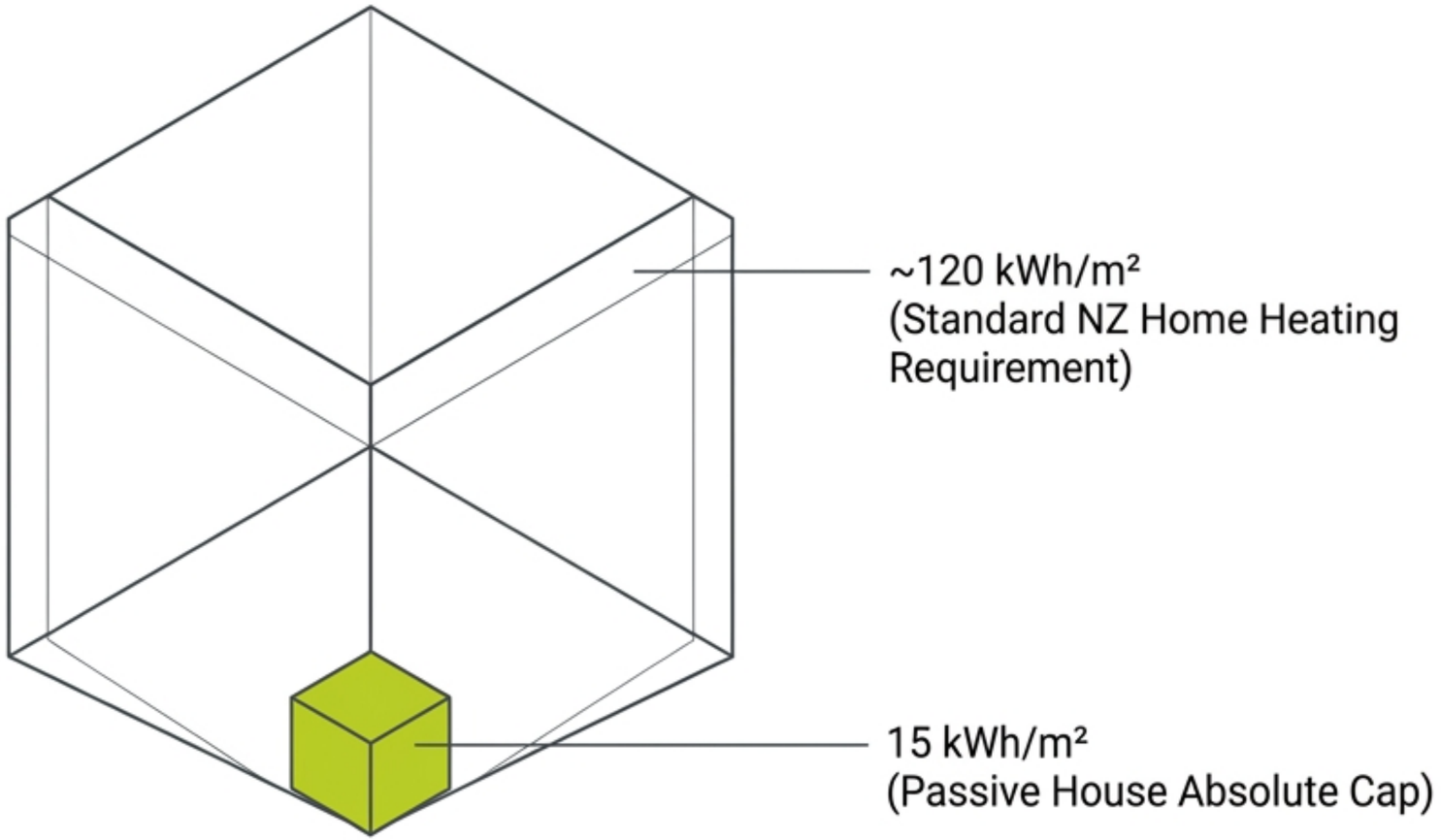
11% live with visible mould larger than a standard sheet of A4 paper.

Yet, the vast majority consider their home a healthy place to live. Normalizing cold, damp housing is a cultural trait, not a biological necessity.

THE CERTIFICATION LANDSCAPE

NZ Building Code (H1)	Homestar (v5)	Passive House	NABERSNZ
The Legal Minimum	The Broad Green Standard	The Absolute Limit	The Commercial Scale
Focuses on elemental minimum compliance settings (a relative ‘reference model’).	A 6–10 star scale assessing 7 categories: water, waste, materials, carbon, and energy.	An international standard focused entirely on ultra-low energy architecture. Caps annual heating demand strictly at 15 kWh/m^2.	Star rating (0-6) primarily targeting commercial and multi-unit developments.

THE FUNDAMENTAL SHIFT: RELATIVE VS. ABSOLUTE



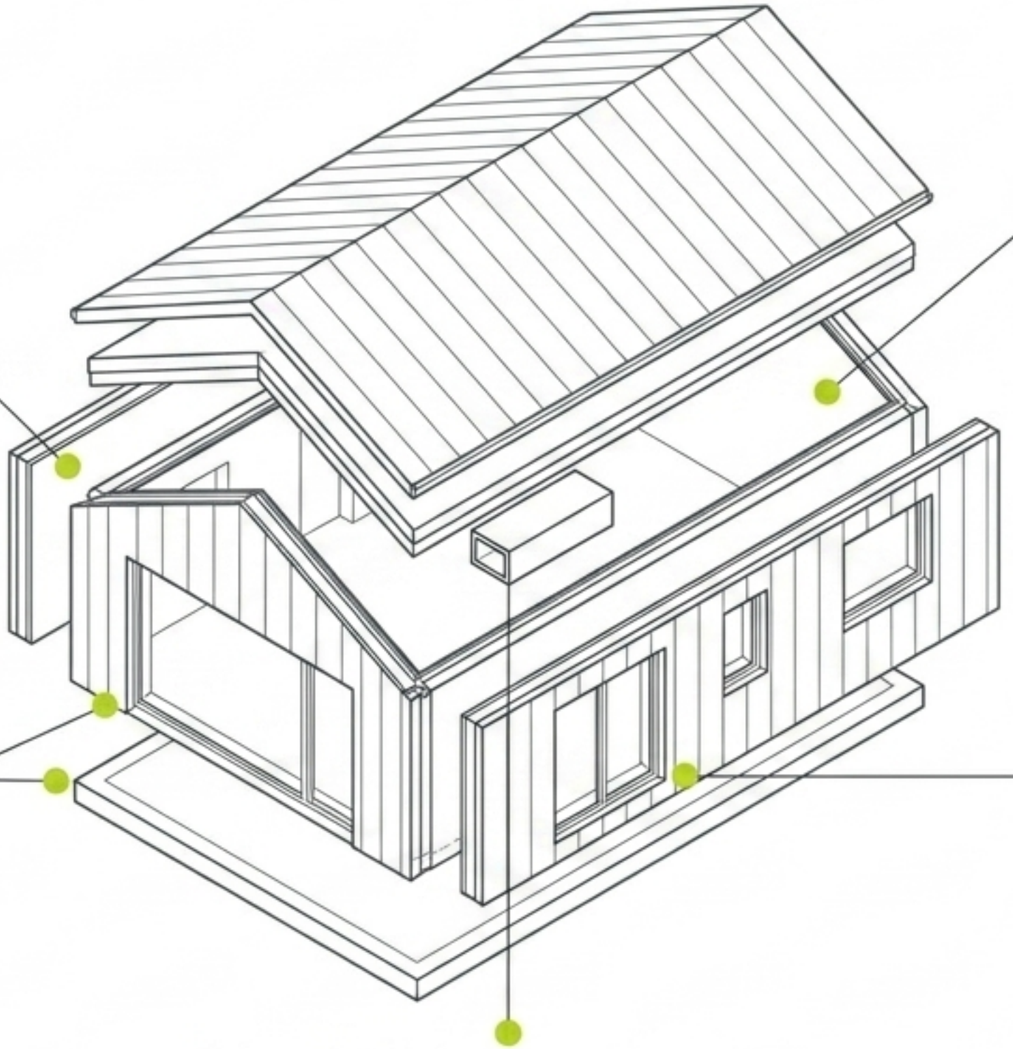
The NZ Building Code relies on relative improvements against a minimum baseline—incentivizing poor thermal design.

Passive House enforces an absolute, non-negotiable ceiling on energy intensity. The result is a home requiring up to 90% less energy to maintain a constant 20–25°C.

ANATOMY OF A PASSIVE HOUSE

01. Super Insulation:
Continuous thermal barriers, often utilizing Structural Insulated Panels (SIPs).

02. Thermal Bridge-Free Design:
Eliminating structural weak points where heat escapes.

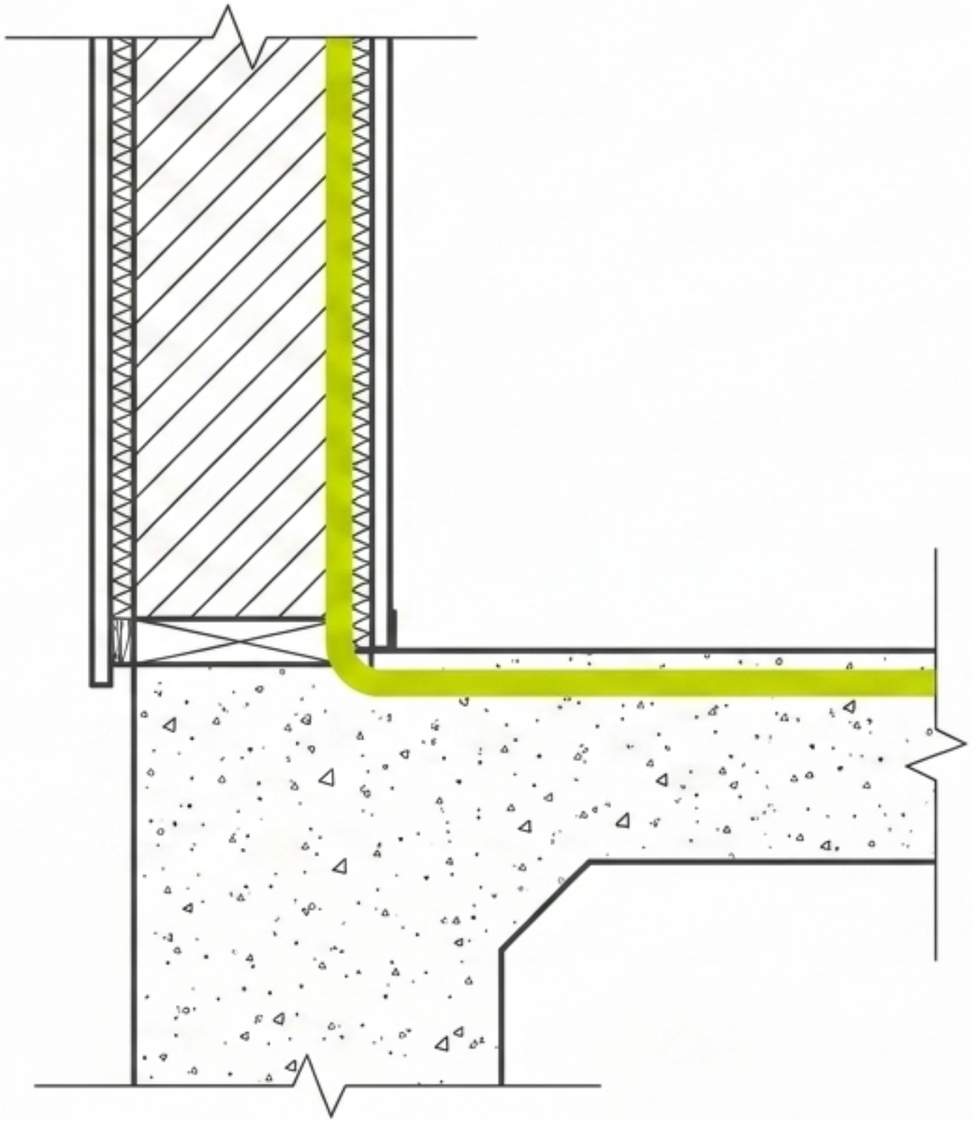


03. Absolute Airtightness:
A measured, draft-free, sealed envelope.

04. High-Performance Glazing:
Engineered double or triple pane systems.

05. Mechanical Heat Recovery Ventilation:
The breathing lungs of the home.

THE THERMAL ENVELOPE



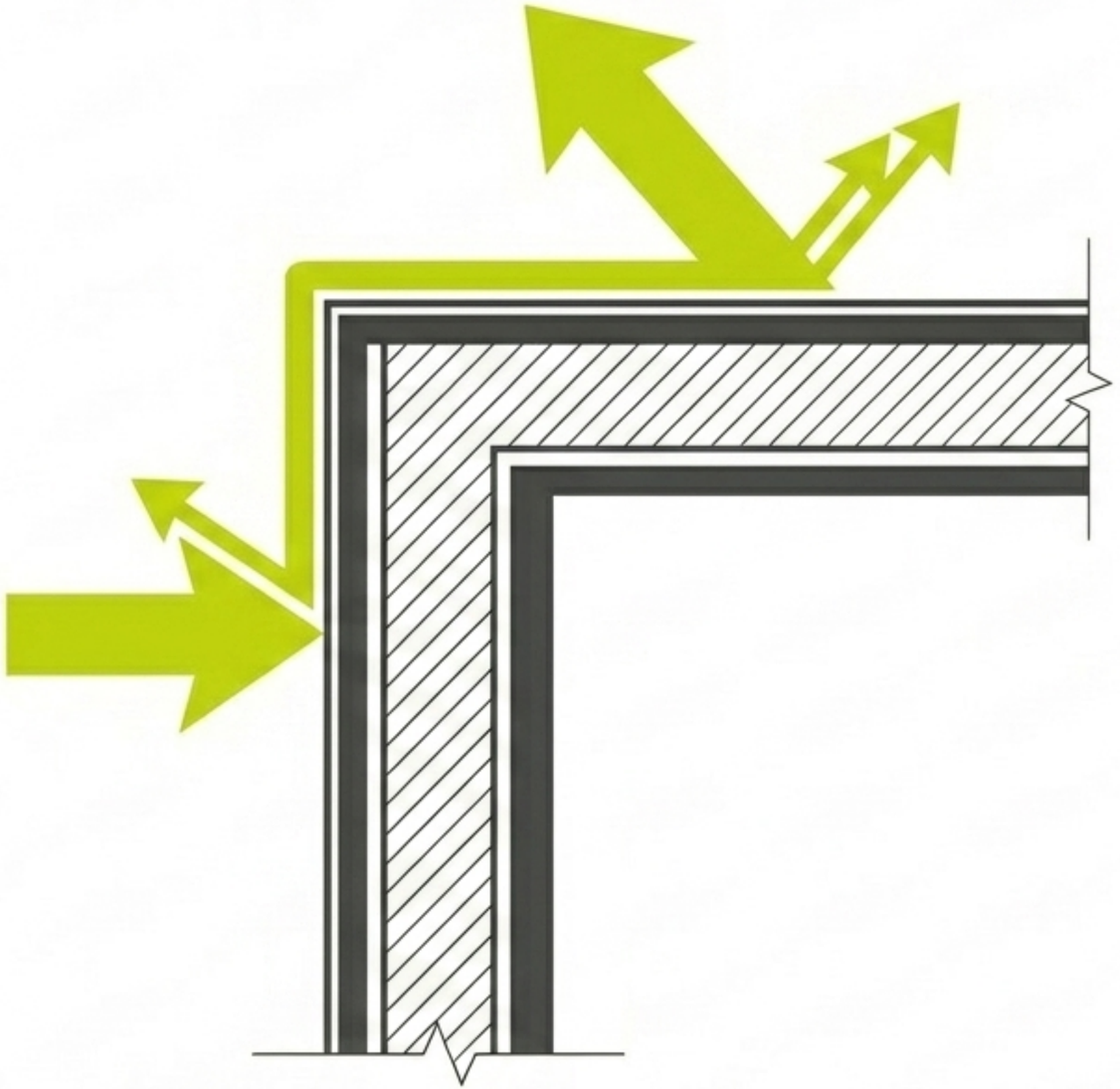
Structural Insulated Panels (SIPs)

SIPs replace traditional timber framing and batts, wrapping the home in a continuous, highly insulated layer.

Thermal Bridging Elimination

Heat conducts rapidly through timber and aluminium. By designing out these ‘bridges’ at wall and floor junctions, heat loss and hidden surface condensation are completely eliminated.

ABSOLUTE AIRTIGHTNESS



0.6 ACH n50

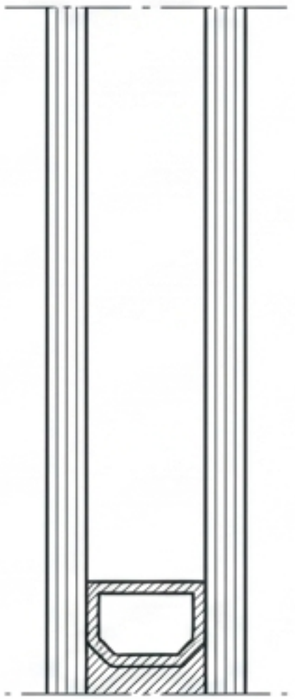
Standard New Zealand homes rely on large wall cavities and drafty frames for passive drainage, bleeding expensive heat into the atmosphere.

A Passive House is sealed to an absolute maximum of **0.6 Air Changes per Hour** at **50** Pascals of pressure.

This does more than stop drafts; it prevents internal moisture from entering and degrading the structural insulation.

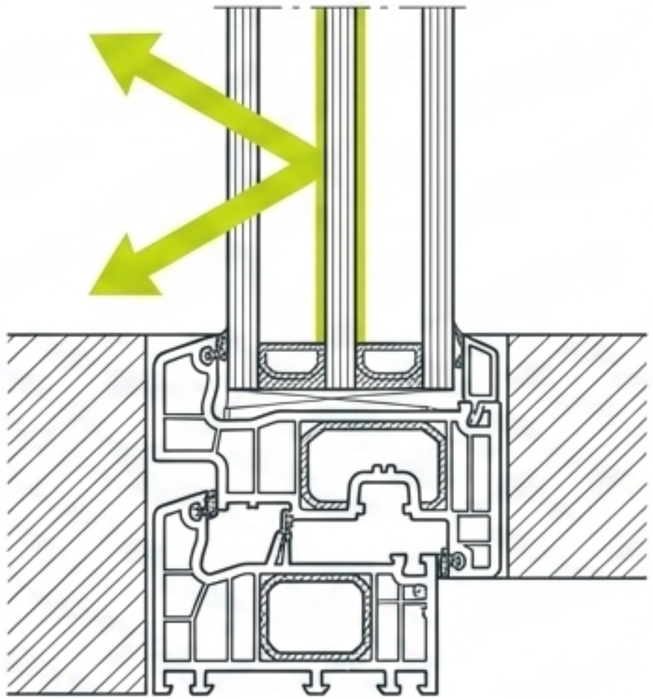
THE PHYSICS OF GLAZING

STANDARD DOUBLE



- R1.1 Value
- 25mm standard spacer
- Conductive frames

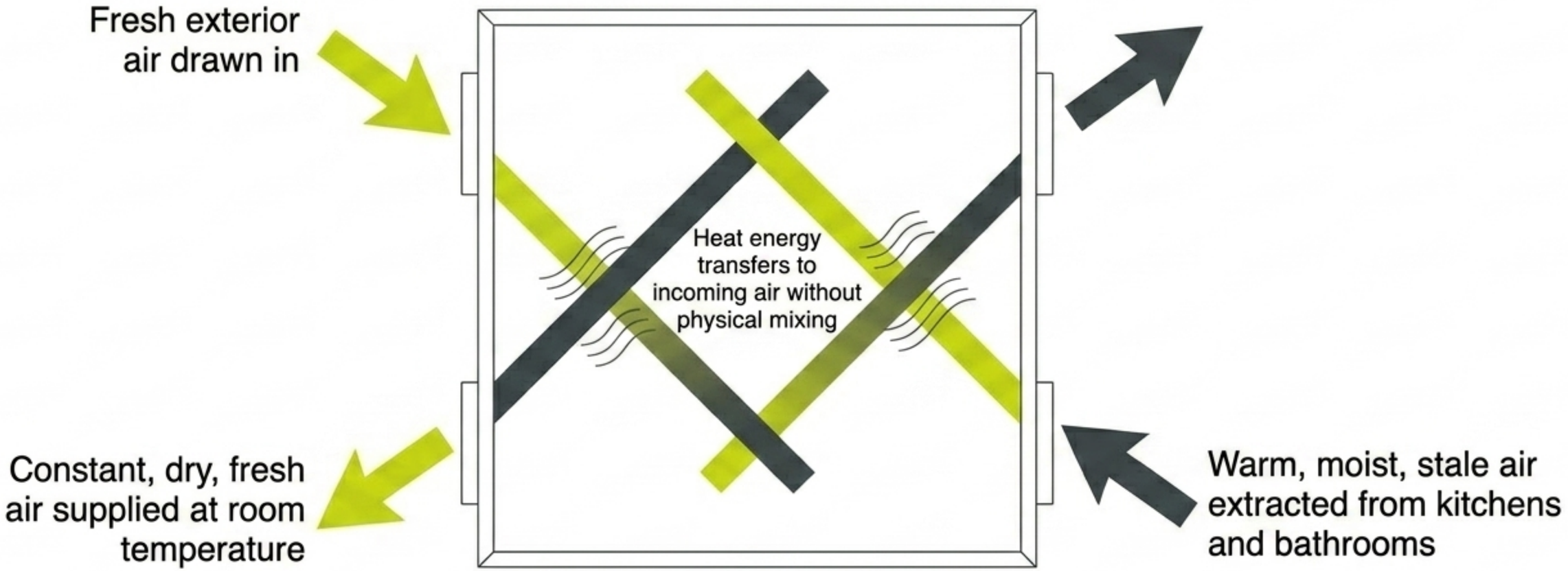
PREMIUM TRIPLE



- R2.0 Value (81% efficiency increase)
- 2x18mm warm spacers with Argon gas
- Thermally broken or insulating uPVC frames
- Recessed installation aligns with thermal envelope

Triple glazing with Low-E coatings reduces heat loss by up to 59%, reflects summer solar radiation to prevent overheating, and dampens external noise pollution by up to 80%.

THE MECHANICAL LUNG



An airtight home cannot rely on opening windows in winter—doing so wastes heat and introduces moisture. Mechanical Ventilation with Heat Recovery (MVHR) ensures a healthy CO2 balance with almost zero heat energy lost in the exchange.

THE CERTIFICATION PATHWAY

STEP 01
Design & PHPP Modelling
Predictive science utilizing the Passive House Planning Package.

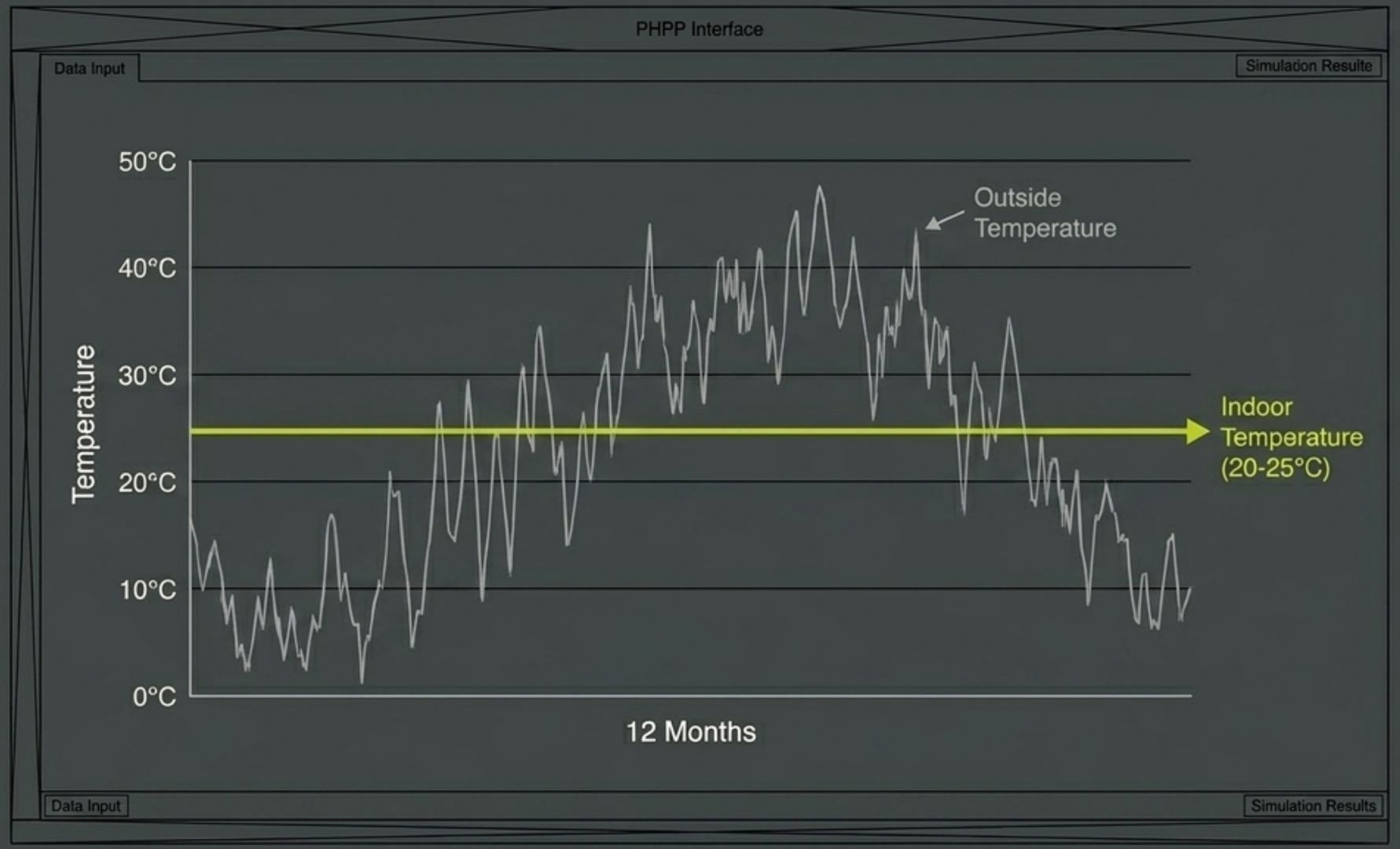
STEP 02
Initial Design Review
Independent check by a certified professional.

STEP 03
Construction
Executing the thermal envelope using approved materials.

STEP 04
Blower Door Test
Physical pressurization to verify the 0.6 ACH airtightness metric.

STEP 05
Final Certification
The formal awarding of the international standard.

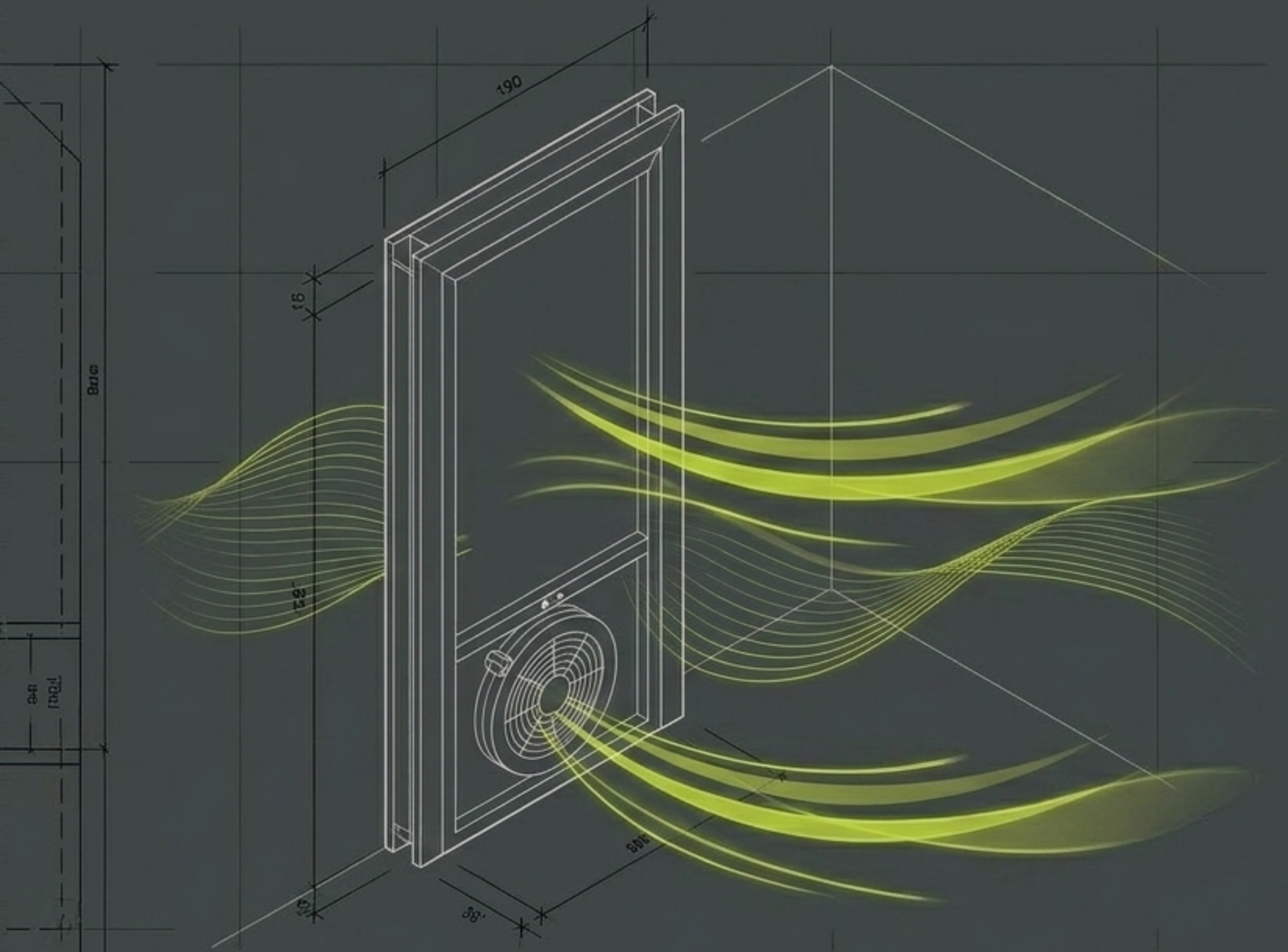
PROOF PHASE I: VIRTUAL PERFORMANCE



Before ground is broken, the home is built virtually. The Passive House Planning Package (PHPP) models exact climate data, site orientation, component specifications, and local shading.

By incorporating specific design plans—down to exact window R-values and structural splines—we predict energy use and internal temperatures with exceptional accuracy, eliminating the performance gap common in standard builds.

PROOF PHASE II: PHYSICAL REALITY



THE MOMENT OF TRUTH

The Blower Door Test artificially pressurizes the sealed home to 50 Pascals. Instruments measure exactly how much air escapes through imperceptible gaps.

To pass, the home must not exceed 0.6 air changes per hour. It is undeniable, physical proof of the builder's exactitude and the envelope's integrity.

THE ECOTECTURAL SYNTHESIS

20–25°C CONSTANT

Every room, in every season, operates perfectly within this band without cold spots.

ZERO CONDENSATION

Continuous insulation and MVHR eliminate the dampness and mould endemic to NZ housing.

WHISPER QUIET

Premium triple glazing and dense structural insulation reduce urban noise pollution by up to 80%.

~4000kg CARBON SAVED

Operating at 15 kWh/m² yields drastic lifetime energy reductions and minimal ongoing utility costs.

A certified Passive House is not merely a method of construction.
It is the guarantee that your home will perform exactly as designed—
an enduring asset rooted in absolute building science