Observations …

One outstanding building in a row of real estate …

… retrofitted to perform like an ‘architectural esky’.
Typical Facade Designs ... Australia

Sydney (2013)

Melbourne (2014)

BCA-Compliance ... no worries, but ...
... A (building performance) & Health Issue

Novel Toolbox for Architects
1) ... Seriously Airtight

Dynamic moisture management using smart building membrane

Solution: Membranes & tapes
Challenge: Airsealing to $n_{50}$

Importance of Airtightness

Insulation Performance (thermal)

**Experimental conditions**

- Inside temperature: +20°C
- Outside temperature: -10°C
- Pressure difference: 20 Pa = wind force 2-3

**Measurement:**
Institute of building physics, Stuttgart
Source: DBZ Dec 1989, page 1639ff

**Without gap:** R-Value 3.3 W/m²K

**With 1mm gap:** R-Value 0.7 W/m²K

*Performance down by 4.8!*
Importance of Airtightness

**Insulation Performance (moisture)**

**Experimental conditions**
- Inside temperature: +20°C
- Outside temperature: -10°C
- Pressure difference: 20 Pa = wind force 2-3

Measurement: Institute of building physics, Stuttgart
Source: DBZ Dec-1989, page 1639ff

Without gap: 0.5 g-water / m² x 24h
With 1mm gap: 800 g-water / m² x 24h

**Moisture escape up 1’600 fold!**

2) ... Seamless Insulation

**Solution:** Schöck Isokorb

: Challenge
Thermal bridge

: Challenge
Thermal bridge

Solution: Schöck Isokorb
3) ... External Shading

**Challenge:**
Solar (heat) gain (control)

**Solutions:**
Awnings & blinds

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4) ... Comfort Ventilation

**Challenges:**
Fresh-air supply, CO₂, temp. & rel. humidity man’g’t

**Solution:**
Air2air energy recovery ventilation with integrated HVAC
Building with Wood – Smartly
2000-Watt Society Buildings

= Passivhaus buildings ... eskies with windows ... and ...
... all-(solar)-electric buildings.

f-prefab timber
carbon-neutral
autark (e & w)
„eco“ - for life