

# BASIX - Tips & Tricks

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## Introduction

# Brad Hoad – Thermal Performance

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- Basix & natHERS certificates for many builders, designers & certifiers
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# Agenda

- Water
- Thermal
- Energy
- Examples
- Summary

# Changes

The latest update requires;

- 18- 31% reduction in heat/cool loads depending on climate zone
- 10% increase (from 40 to 50) for energy score depending on post code

# Water

- This section has not changed
- Best advice is ;
  - Landscape area, smaller the better, look to reduce with landscaping treatments such as pebbles, timber decks that are not hardstand but not irrigated
  - Highest WELS rated showerheads, tapware & WC you can spec/purchase
  - Rainwater tank with 50 - 100% of roof draining to it connected to irrigation, clothes washing and toilet flushing

# Water – Tips & Tricks

- Minimise garden/lawn area and or increase indigenous area
- Land over 1,000m<sup>2</sup> use a formal garden area to reduce tank if reducing cost is your objective
- Typical WELS rating 7.5 - 9 litre/min showerhead, 4 - star toilet, 3 - star basin & kitchen taps
  - Changing to 5 - star basin & kitchen taps achieves 1%
  - Changing to 6 - 7.5 litre/min showerhead achieves 2%
  - Changing to 4.5 - 6 litre/min showerhead achieves 4%
- Water tank size is a combination of land size, garden/lawn area, roof area to tank (basix considers rain fall in area also)



# Thermal

- This section has changed, there are two methods to comply;
  - Do it yourself (DIY)
  - Simulation method

# Thermal

- **DIY (within the \$50 fee for Basix)**
  - Has a set of conditions that if the projects meets them it can be assessed under DIY
  - Things to note;
    - DIY can only specify the minimum levels of insulation from the BCA and will use performance glass to achieve a pass
    - In DIY There is no bonus given to energy score if you do a great job thermally



# Thermal

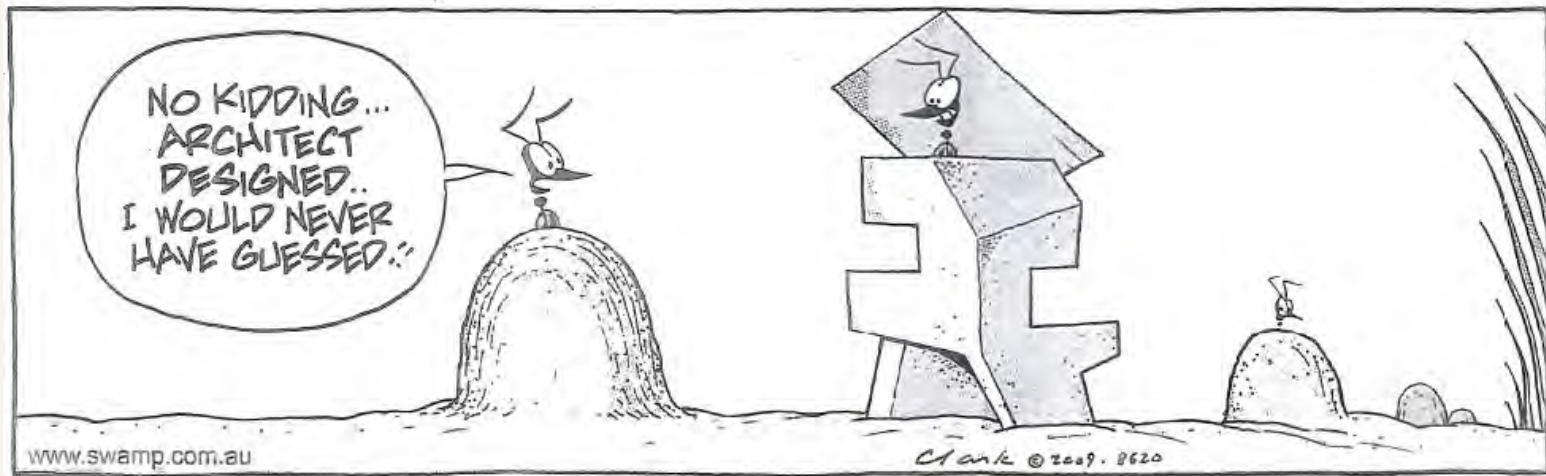
- **Simulation Method (from \$150, typical \$300 - \$450, \$750 plus)**
  - Uses the projects post code to determine the climate zone which then sets the maximum heating & cooling loads for the project.
  - Things to note;
    - You can trade off higher insulation levels or different construction methods against performance glass to achieve a pass
    - Achieving good thermal performance will result in bonus % in Energy section
    - Basix specifies the maximum loads expressed in MJ/m<sup>2</sup> based on the energy required/consumed to keep the dwelling comfortable (approx. 18 - 22 degrees) considering the conditions of the local climate

# Thermal

- Best advice is use simulation method;
  - Use an accredited natHERS assessor (good experience & knowledge) in building & products
  - Consider the following checklists at sales/design/estimating stages
  - Consider climate when selecting construction methods/materials (lightweight & high mass solutions)
  - Get orientation right, main living areas need to face north (natural heat & light)
  - A good level of insulation will have a large effect on the rating for a low cost
  - Consider air tightness and gaps in insulation (downlights & exhaust fans)

# Thermal

We will go through this in more detail after a brief look at energy



# Energy

- Has changed from 40% to 50% (for most of NSW), best advice is;
- Approximately half your projects will pass with typical 6 - star gas instantaneous HWS, r/c air conditioning, LED/Fluro lighting, gas cooktop and clothesline
- There a few options that will achieve 1 - 5% at low cost
- If failing by more than 5 - 6% the best solution is to install a 1.5 kW or preferably larger 3 - 4.5kW PV system and remove other commitments

## Energy – Tips & Tricks

- Changing a study or store to a bedroom, Basix assumes number of occupants on the number of bedrooms, more people = more energy, you will achieve a better score (may effect private open space requirements)
- If going for the 1 - 5%
  - Well ventilated fridge space achieves 2%
  - External clothesline achieves 4 % & Indoor clothesline achieves 1%
  - Check how many separate bathrooms or toilet have natural lighting (window or skylight)
  - Add ceiling fans in a living room will achieve 1%
  - Check a/c performance EER/COP most 3.0 - 3.5 for both, some 3.5 - 4.0 for heating, achieves 1%

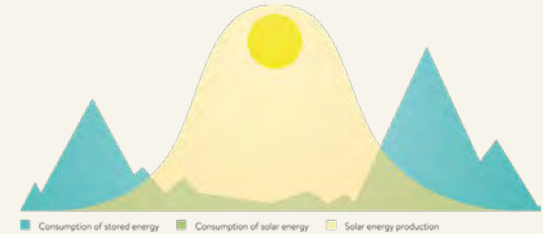
## Energy – Tips & Tricks

- If going to PV
- Consider changing HWS and cooktop to electric and removing gas plumbing and gas connection fee to offset the initial cost
  - PV – 1.5kW system achieves around 18%
  - PV – 2kW system achieves around 26%
  - PV – 3kW system achieves around 37%
  - PV – 4.5 kW system achieves around 38%
- No ongoing gas bill price rises which are increasing quicker than electricity



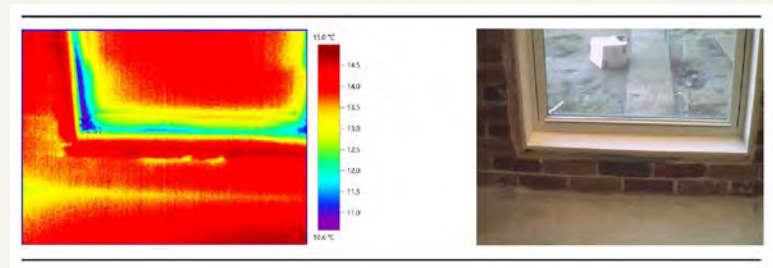
## Energy – Tips & Tricks

- If PV installed consider adding a battery system and remove 30 - 90% of your electricity bill
- Costs
  - ADD - PV system \$2,000 – \$3,000 small system 1.5 kW or
  - ADD - PV system \$6,000 – \$8,000 large system 4.5 kW
  - ADD - Heat pump HWS \$3,000 - \$5,000
  - REDUCE no gas \$1,500 - \$2,000
  - REDUCE ongoing gas bill saving \$150 - \$200 per quarter
  - REDUCE ongoing electricity saving \$150 quarter (depends on size of system and if any battery present )
- POTENTIAL Battery Sonnen or Tesla 2 \$11,000 - \$13,000 which would achieve 85 - 95% independence



# Examples

- [Checklist](#)
- [House simulations/climate zone](#)
- [Window performance options](#)





# Summary – Water & Energy

- Water
  - WELS rated showerhead and rain water tank
  - Landscape area verse roof area
- Energy
  - Options if only needing 5%
  - PV if needing more than 5%

# Summary – Thermal

- Main living areas facing North = best result
- Typical specification (mainly insulation) does most the work to pass
- Colours help to either passively heat or cool
- Sarking (depending on climate and house design)
  - Generally, helps achieve a better overall score
  - Roughly 1 - 2% improvement
  - If house has a large heating problem if you remove the sarking it improves the score 4 - 16% depending on the climate
- Self closing exhaust fans improve the score 6 - 8%
- Roof ventilators improve the score approximately 2% (cooling reduction, heating increase)

## Summary – Thermal

- Adding a small amount of thermal mass to a design will improve the score approx. 1% (mainly cooling)
- Changing the construction to insulated thermal mass will improve the score generally 3 - 7% however could be higher if the windows were adjusted to suit the mass and the climate (if the windows are not changed then it will hurt the heating load with the current designs).
- A metal roof generally heats up and cools down quicker than tiles and performs 1 - 2% better assuming a blanket is used not sarking only

# Summary – Thermal

- Good design can allow a lower cost for windows/construction methods
- If design can't change windows will be the key to passing
- Upgrading windows, generally
  - Comfort plus is a good middle of the road option, works mainly in summer (lower shgc) however has a small winter improvement as well due to the lower  $U_w$
  - If possible consider shading in lieu of reducing the shgc, lower than 0.45ish as this will start to hurt winter performance, whereas shading will work both summer and winter
  - Generally - Double glazing is about keeping heat in & low e is about keeping heat out

Questions?

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