

1 August 2005

Energy Efficiency Project  
Australian Building Codes Board  
GPO Box 9839  
Canberra ACT 2601

Attention Mr. Mark Davis

Dear Mark,

**RE: Proposed 5 star housing energy efficiency regulations**

The Insulation Council of Australia and New Zealand (ICANZ) was formed in July 2004 to replace the industry association, FARIMA. This body now includes New Zealand membership reflecting the trend towards common building standards, closer ties in research, testing and other trans-Tasman building initiatives. Please find attached further brief details on ICANZ.

Issues of energy supply, energy efficiency, climate change and sustainability are now high on the agendas of both government and industry. The insulation industry has an important role to play in addressing these issues.

ICANZ commissioned Tony Isaacs Consulting (TIC) to evaluate the impacts of the new regulations. Tony is one of Australia's foremost experts in energy efficient housing and thermal modelling. Tony used the AccuRate simulation software (v0.99 2.0) to evaluate the impacts of the regulations. AccuRate is the current state of the art in Australian house thermal performance simulation. His report is attached. We believe that ABCB will find his analysis very useful in helping to improve the proposed regulations.

ICANZ supports increasing the efficiency of energy efficiency regulations. Whilst the move to 5 star is a positive one, in an international context, however, this standard is still far from world's best practice. Standards in European and North American countries *with similar temperate climates* remain higher. Further increases to stringency are planned in response to the need to contain greenhouse gas emissions. ICANZ therefore believes that while the proposed regulations are a step in the right direction, further improvements will continue to be necessary to achieve the Australian Government's stated objectives.

While ICANZ supports the development of regulations to a 5 star standard and the regulations in general, there are some specific aspects which fail to capture cost effective energy savings. ICANZ proposes the following amendments:

**1 A simple solution to insulation R values across Australia.**

The TIC report demonstrates that the conventional wisdom of providing only minimal levels of insulation in hot climates so that buildings can cool down more rapidly is incorrect for houses which conform to the new regulations. Because the regulations limit solar gains and provide adequate ventilation high levels of insulation will not create 'hot boxes'. **Conventional wisdom does not apply to houses conforming to the new regulations because such houses are not conventional.**

**Insulation is the simplest and most cost effective way to improve comfort, energy use and greenhouse gas emissions from heating and cooling Australian houses.** Increased insulation levels have small incremental costs yet deliver significant energy, peak load, comfort and greenhouse benefits that do not affect housing affordability because they pay for themselves. The proposed regulations, however, recommend quite low levels of insulation in hot climates. The TIC report demonstrates a wide variety of benefits for increasing the required insulation levels in hot climates:

- **R3.5 ceiling insulation in climate zones 1 to 3 is undoubtedly cost effective.**

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- **All insulation R values have a similar effect on household cash flow.** In most cases even if energy savings were half the predicted level this impact would still be positive even at the highest R values. While this analysis has been completed only for climate zones 1 to 3 it is very likely to apply to all other climate zones.
- **Insulation of timber floors over unenclosed sub floor spaces produces energy savings which are greater than wall insulation** in Climates Zones 1 to 3.
- **A high level of insulation improves comfort as well as reducing energy use in hot climates.**
- **Higher insulation levels to walls floors and ceilings in hot climates can reduce energy use and greenhouse gas emissions in Climates Zones 1 to 3 by 22%, 27% and 42% respectively.**
- **This higher insulation also helps to further reduce domestic air conditioning peak loads by typically 10 -15%** in the houses studied. With the stock of air conditioners set to rise by 50% in all states (2,000,000 across Australia) in the next 10 years every reduction in peak loads that the regulations can achieve will provide substantial benefit. New homes will see a significant proportion of increased air-conditioner ownership.

Because higher wall ceiling and floor insulation levels are clearly beneficial in climates 1 to 3 the variation in required R values across Australia should be minimal. This provides ABCB with the opportunity to simplify the regulation, with only minor variations required for Alpine areas and enclosed subfloors. The following total R values are recommended:

Element	Total R value
Ceilings	3.9
1 storey walls	2.5
2 storey walls	3.0
Floors with unenclosed subfloor space	3.7

These insulation levels would also increase the required R values in climates 4 to 6 and in some cases climate 7. While not directly studied in the TIC report ICANZ believe that these higher R values would be easily justified due to the small incremental costs of higher insulation as the cash flow analysis for Climates Zones 1 to 3 demonstrates. High insulation levels provide improved performance of opaque elements and this allows greater flexibility in other areas such as glazing area without sacrificing efficiency and will help the regulations achieve a more consistent star rating outcomes.

## 2 Trade off clauses allowing lower insulation should be deleted

The TIC report shows

- The trade off between wall shading and wall insulation does not work. **Insulation produces energy savings which are 6 to 10 times greater than the wall shading.**
- The wall insulation / higher performance glazing trade off intended for use with mud brick houses could also be used to lower wall insulation levels in general for houses which achieve better glazing performance than the minimum. The larger the house the more likely the glazing performance will be better than the minimum as such houses have lower glass to floor area ratios. Consequently **large houses with the highest total energy use will be able to use the lowest insulation levels.**

While ICANZ understands ABCB's need to provide flexibility it believes energy ratings already provide this and there is no need to allow for additional flexibility in the Deemed to Satisfy clauses. Construction of trade-off clauses can not hope to represent the true complexity of the thermal performance of a house with the accuracy of a rating tool. **Energy rating is the only reliable way to allow trade off performance between elements that does not sacrifice easily obtainable energy savings.**

### **3 The Deemed to Satisfy clauses should be phased out**

Energy Ratings have many benefits. The Sustainable Energy Authority of Victoria has shown they can lower compliance costs by implementing a ratings only method of compliance. This also helps to educate the user in good design. The increased complexity of the proposed regulation means that the time taken to determine compliance using an energy rating is similar to establishing compliance using the DtS. There seems to be little reason to persist with DtS in future particularly as the industry has shown that it can cope with rating only regulations in the ACT, Victoria and the NSW energy smart homes program.

While the DtS are generally a great improvement over the 2003 regulations there are still many important factor that rating tools handle far better such as winter solar gains, overshadowing, surface area effects and area correction. This means that inevitably the DtS will struggle to deliver a consistent rating level and may even fail to achieve 5 stars at all for some houses. Further, as the rating scheme evolves and improves in response to the needs of industry and technological development the existing DtS will depart further and further from the 5 star solution.

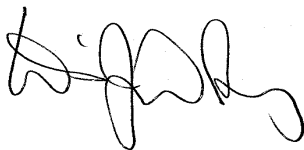
**ICANZ believes that these regulations should be the last to contain DtS clauses and that a time table for the phasing out of the current clauses should be developed.** The earlier such an announcement is made the sooner industry can begin to adapt., The ABCB should spell out a time frame for the sunset of these DtS prior to their introduction.

ICANZ notes that the ABCB is yet to release its Regulatory Impact Statement which will presumably detail the costs of energy efficiency improvements and their associated energy, greenhouse and peak load benefits. ICANZ looks forward to providing further comment when this is released.

The parameters of the new rating schemes are yet to be finalised. ICANZ believes it is important that the DtS do achieve consistent rating levels across the board and would like to take the opportunity to make further comment on this issue when the parameters of the new rating scheme are finalised.

Finally ICANZ wishes to advise the ABCB that the R values attributable to reflective foil products are currently being updated by the Australian Standards committee. This would mean that the R values listed in the regulations for foil products in horizontal or sloping applications will need to be revised once the committee has made its decision.

Yours sincerely



Dennis J D'Arcy  
ICANZ President.