

Presentation to Senate Hearing on Energy Efficient Homes Package

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Background - qualification and employment

- Registered architect in QLD and formerly in NSW
- Academic & Consultant for 35 years in architecture and engineering
- Member Australian Standards home insulation committees 1975-2005
- Now employed as Director R&D by a large fan company

Expertise and Experience in Insulation Performance

- ❑ Expertise in tropical architecture, natural ventilation, thermal comfort
- ❑ Taught thermal transfer in buildings (including insulation) to undergraduates, postgraduates and supervised post graduate research in this area and acted as a consultant to industry and government since 1970
- ❑ Tested some insulations while Prof. Tropical Architecture and Director Australian Inst. Tropical Architecture at James Cook University from mid 1990s to 2000
- ❑ Consultant at times to foil industry. Has collaborated with Oak Ridge National Laboratory in US where significant research was conducted in 1980s and 1990s for the US Department of Energy.

Recommendations re program continuation

- ❑ That the **Energy Efficient Homes Package** should continue but be modified. Existing housing stock needs to be made more energy efficient and insulation in roofs is the most effective method. The existing problems are not the fault of the products. They are the lack of already defined safety procedures being followed and the large volume of installations occurring.
- ❑ Recommend that building owners be formally advised of the correct installation process and the safety issues involved in ceiling spaces and know what to expect and how to get help

Recommendations (continued)

- ❑ Recommend that installers and building owners be given installation handouts based on existing industry standards*.
- ❑ Recommend that home owners be required to contribute a small share of the costs to encourage their heightened interest in installation and safety (see PIMAA's and Amalgamated Metal Industries' submissions)
- ❑ That downlight protection and other safety features must be included in the installation package (see Arrowform's submission).

*
eg. ASTM C 727 -01 Standard practice for installation and use of reflective insulation in building construction

Recommendations (continued)

- ❑ Locally sourced insulation is preferable and imported insulation is required to meet Australian standards – and these installations should be randomly inspected .
- ❑ Consider ways to raise the number of rental properties that are included in this program (see Tenants Union's and ACOSS/ACF's submission).

Insulation Product Differences

- ❑ It is now better understood that there are 3 types of heat transfer (radiation, conduction and convection).
- ❑ Only reflective insulation adequately deals with radiation.
- ❑ Roofs in warmer parts of Australia can reach over 60 deg C regularly in summer from solar radiation.
- ❑ Foil will prevent over 90% of radiant heat entering the living space in summer.
- ❑ Other types of insulation cannot do that.
- ❑ Other types of insulations work best against conduction and to a lesser extent convection in heated spaces in winter

Insulation Product Differences

(continued)

- Foil, when used as a radiant barrier, stops radiant heat transfer downward through the roof space during the day but it permits heat transfer by conduction and convection transfer upward at night.
- Foil is therefore desirable for houses in warm winterless climates but may need to be augmented with other types of insulation where there are cold winters.

General Recommendations

- Australian government urgently needs to establish an ongoing testing and research facility to independently test various building products **under Australian climate conditions**, especially for energy-efficient performance.

General Recommendations

(continued)

- That the Senate review the new BCA regulations to be implemented in May where foil will be forced to combine with other insulation types to achieve the required R-Value. This will mean that, in warm climates, heat gain (through roofs, uninsulated walls and through glazing) will be trapped inside buildings at night instead of being able to escape – increasing demand for air conditioning when ceiling fans should be more than adequate.

Adding this extra insulation, above current requirements, is not going to have any significant effect on the building's performance. It is overkill and a waste of money. Alternatively there will be no foil in the ceilings which is much worse in the tropical and sub-tropical regions. (see also Autex's, AFIA's submissions).

Final comments

- ❑ Australia has had to rely too much on building material performance testing and research conducted in other countries which have very different climates and building practices. We need to start conducting our own research and testing.
- ❑ Standards Australia is ineffective in providing up-to-date basic relevant building standards in Australia. The committee relating to Energy Efficiency in building has not met for years. ISO standards are not properly reviewed by SA as is its obligation. It is time to substitute professional and trade body standards as in other countries (e.g. ASHRAE, and ASTM).

Thank you for your attention

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