University SA (South Australia)

"A framework for adaptation of Australian households to heat waves" – 2013

NCCARF – National Climate Change Adaptation Research Facility, Univ SA

https://www.nccarf.edu.au/publications/framework-adaptating-australian-households-heat-waves
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Contribution partners: Dept of Climate Change & Energy Efficiency, SA Government, Uniting Care Australia, AIRAH (Australian Institute of Refrigeration, Air Conditioning and Heating).

EXECUTIVE SUMMARY – pg 4 Extract only:

* *The most effective methods for reducing the cooling demand for existing dwellings is to modify their roofs by increasing their total solar reflectance, adding reflective foils and increasing thermal insulation.*

See also - Section 5.3 pages 144-149, which details the case to use reflective foil under roofs in residential buildings.

(The most significant fact is that for the first time in insulation history in Australia since 1953, reflective foil is openly endorsed in a government endorsed technical publication)

ABSTRACT

Those on lower income and elderly individuals are the least able to afford the use of air conditioning and should be a priority for interventions and assistance. Increasing community awareness of cost effective strategies to manage comfort and health during heat waves is a high priority recommended action.

Further selected excerpts from Report

- ducted systems, no consideration is given to the impact of ducting on the star rating. The two major performance reduction factors in ducting are air leakage and heat transmission through the duct walls.
- lack of regulation on the thermal rating of the duct itself,
- Follow-up research has shown that, in combination, these effects have resulted in a 39% increase in electricity usage in the case of Adelaide (Belusko 2012).
- solar radiation has the most significant impact on peak cooling requirements (Athienitis & Santamouris)
- In the last decade, consideration has also been given to the reflectivity of solar radiation from the roof and the impact of reflective foils. Less bulk insulation is required with roofs which reflect more solar radiation, such as light-coloured roofs and those who have had foils applied.

- thermal resistance or R value of bulk insulation is based on AS/NZS 4859.1:2002 which requires measurement of the R value at 23°C.
- As identified in the 1970s, gaps of 5% in roof insulation can degrade the R value by 50% (Verschoor 1977)
- during extreme heat wave scenarios where significantly more heat flows through the roof space.
- a reliability-based approach be applied which aims to recognise the probability of these factors and applies solutions which reduces the risk of high heat flow through the roof in summer.

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