Key outcomes of the tropical design forum

Key themes and outcomes arising from the tropical design forum convened in Cairns on 2 March 2010 by the Honourable Stirling Hinchliffe MP, Minister for Infrastructure and Planning

Optional credits for outdoor living areas

Key themes

- Outdoor living areas have potential benefits in a wide range of climate zones. There is potential for implementation of outdoor living area provisions beyond the current tropical and sub-tropical zones.
- It was suggested that outdoor living areas may benefit warm temperate areas (climate zone 5—Toowoomba, Darling Downs) in winter and hot arid areas (climate zone 3—Dalby, Longreach, Mt Isa) in summer.
- Siting provisions for outdoor living areas that take into account both sun and prevailing breezes may maximise the area's contribution to a building's performance. It was acknowledged, however, that locating these areas on the front of a house block (i.e. for north east facing buildings) is problematic but there was no agreement on changing the current approach because there were a lot of ways homeowners could manage shading.
- There is potentially a need for increasingly sophisticated software to embody outdoor living areas into the software modelling.
- There is a need to consider wall-mounted fans in addition to ceiling fans in the outdoor living area provisions.
- There was general support for the government's decision to allow a credit for outdoor living area provisions as a compliance option for achieving an average 5-star energy equivalence rating in class 2 buildings (multi-residential buildings) from 1 March 2010 (including automatic air-conditioner shut-off).

Key outcomes

- Software options that would incorporate outdoor living areas into modelling to be investigated and continue to work towards a more holistic performance metric for Queensland homes.
- Provisions for wall-mounted fans in outdoor living area provisions to be investigated.
- Amendments to outdoor living area provisions to include an appropriate credit for climate zones 3 and 5 to be investigated.

Other options for credits

Key themes

- A 5-star building shell is considered by industry to be a high performing building envelope, particularly in climate zones 1 and 2 (tropical and sub-tropical). There is a diminishing return for improvements to the thermal performance of the shell as star ratings get higher. Given this, there could be merit in adding an additional focus to energy efficiency and including a more holistic assessment of the reduction in greenhouse gas emissions.
- Credits for energy production, such as solar photovoltaic systems or more efficient appliances such as solar air-conditioning, may be a practical solution to achieve further reductions in household greenhouse gas emissions. There needs to be appropriate reward for renewable energy production in households.
- Additional credits should not detract from the high energy efficiency standard provided by the minimum 6-star standard.
- It is important not to devalue the star system because of its value in public education.
- The energy used in the production building materials is a matter that should be considered.

Key outcomes

- Appropriate base levels for the energy efficiency of the building shell to be investigated.
- The addition of nominal photovoltaic systems and other credits suitable for the Queensland climate for buildings to achieve 6-star to be investigated.
- The recognition of the energy used in the production of building materials into energy efficiency solutions to be investigated as part of our input in the Commonwealth processes that are considering a new building performance metric.

Other industry issues (e.g. lighting requirements, condensation)

Key themes

- Consider developing a broad public and industry education campaign about the star rating system, including the benefits of outdoor living areas and photovoltaic systems.
- There is a need to actively educate the public about the benefits of sustainable housing design. This will involve a paradigm shift in thinking for consumers to buy tomorrow's houses not yesterday's building practice.
- The 80 per cent energy efficient lighting requirements in the Queensland Development Code provide a reasonable compliance approach to energy efficiency lighting requirements. There was general agreement that industry is looking for flexibility in this area.
- There is a need to educate the public about progression in energy efficient lighting technology and the resultant light production.
- Condensation caused by insulated suspended floors would become more of a concern in tropical Queensland (particularly if homes used air-conditioning) if it became common practice as proposed by southern based 6-star requirements.
- There is no recognised problem at the moment for indoor-outdoor connections for restaurants and shops but delegates accepted the need for Queensland to ensure building standards do not drive bad outcomes.

Key outcomes

- Compliance options that combine both Building Code of Australia 2010 lighting provisions and the current 80 per cent requirements to be investigated.
- Efforts to educate the public about the benefits of sustainable housing design to be continued.
- Work done in the Building Code of Australia 2010 that may affect indoor-outdoor connections for restaurants and shops to be continued.

The benefits of ventilation in tropical and sub-tropical areas

Key themes

- Ventilated design appears to be helping to avoid problems with condensation in climate zones 1 and 2.
- There is significant potential to take more advantage of natural ventilation, particularly in Far North Queensland. This may involve adopting very different designs to those being adopted in colder climates.
- Need to encourage innovation in ventilation which is not just focusing on large windows that contribute to heat gain but using other ventilation options such as louvres and openings in walls.
- There is a desire to ensure that software better recognises ventilation benefits where appropriate.

Key outcomes

- Liaise with the Commonwealth government to investigate options (e.g. improved climate files) to enhance recognition of ventilation benefits in tropical and sub-tropical areas.
- Help ensure that software recognises ventilation benefits where appropriate.
- Develop public education to encourage design innovation that includes appropriate acknowledgement of the benefits of other methods and materials that improve natural ventilation.

Materials use for tropical design

Key themes

- Concerns expressed about undesirable outcomes with respect to window sizes and types by encouraging new design types such as envelopes shielding the thermal mass, ventilated walls and the appropriate use of lightweight designs.
- Intelligent designs with high thermal mass cores and light weight exteriors may be a best practice solution.
- Desire to encourage improved combinations of materials and design to achieve higher energy efficiency outcomes.
- Concerns were expressed about the appropriateness of uninsulated concrete block construction and whether insulation should be required.

Key outcomes

- Consider preparing a guideline to encourage industry innovation in material use and to use designs with a clear and deliberate understanding about how the home is intended to be used.

Designing for suspended timber flooring

Key themes

- Insulating a suspended floor as currently promoted in the proposed 6-star provisions is unlikely to be a good option in a hot climate as it will reduce performance and potentially lead to condensation problems in sub-tropical climates. This risk is likely to increase where air-conditioning is used.
- Software assessments in hot climates reward designs that 'tie' the building to the ground by enclosing suspended floors. However, insulating the floor alone is likely to reduce the energy efficiency rating of the building provided by a software assessment.

Key outcomes

- Ensure that the positive aspects of elevated and light weight traditional Queenslander designs are retained into the future including suspended timber flooring.
- An appropriate deemed-to-satisfy workaround or concession for suspended flooring for compliance with 6-star to be investigated.

Use of energy assessment software

Key themes

- Desire for government to work with the industry to resolve software issues to ensure that software solutions drive innovative design for future Queensland houses.
- Desire for the Queensland Government to work with the federal government to remove inconsistencies between the BCA and Nationwide House Energy Rating Scheme (NatHERS) Protocols.
- Further work on the software to take into account likely future climate data that is equal to the average life of a home (e.g. 50 years) as opposed to just relying on data for the past 30 years.
- There could also be merit in investigating a change in the philosophy behind the current software tools to move towards a greenhouse emissions indicator.
- Concerns were raised regarding disparity in outcomes between software applications. Discussion centred around to two possible reasons for the variety of results—operator error and the high sensitivity to small changes in energy efficiency, particularly in Brisbane.
- Discussion that energy ratings in Brisbane are more susceptible to small changes in the performance of the building's shell. This is because of the lower levels of energy used for heating and cooling. Brisbane is recognised as a mild climate under the software protocol and errors by the operator can be magnified due to the smaller gaps in the star bands. Errors in other climate zones around Queensland may have the same impact as Brisbane but are less likely to cause a change in the star rating as the gap in the star bands is larger.

Key outcomes

- Liaise with NatHERS administrator on software consistency issues and the potential to create more accurate climate files for tropical climates and/or micro-climates.
- Work towards consistency and removal of confusion between the BCA and NatHERS protocols.
- Options to change the philosophy of rating tools to a greenhouse gas emission focus rather than megajoules to be investigated.
- Way to improve the reliability of energy assessments (e.g. mandatory association accreditation) to be investigated.

Department of Infrastructure and Planning
PO Box 15009 City East Qld 4002 Australia
tel +61 7 3227 8548
fax +61 7 3224 4683
info@dip.qld.gov.au

www.dip.qld.gov.au