Abstract:

Climate change or global warming is increasingly a concern for the global community. Centre to this is greenhouse gas (GHG) emissions due to anthropogenic activities. Reduction of energy and resource use is a key component of 'sustainability' although it also includes economic and social sustainability. In a developed country such as Australia, residential greenhouse gas emissions are responsible for about 20% of its total GHG emissions. Therefore, sustainability in the housing sector is important towards overall reduction of GHG emissions.

The basic approach of sustainable housing is to make homes energy and resource efficient. The major components of sustainable housing are passive heating or cooling; insulation in the building envelope; solar hot water system and photovoltaic panels to conserve energy from grid; rainwater tank, greywater recycling and low flow fixtures to reduce water use and a number of strategies to reduce waste during construction and running. Households’ awareness towards energy, water and resource conservation is also important. In this presentation, sustainable housing issues will be discussed. Australian experience of sustainable housing includes demonstration homes, legislative and financial incentives and development of rating tools.

Centre of this research is the Ecohome at Cairnlea in Melbourne. This standard home added with ‘off the shelf’ sustainable features and having a FirstRate star rating of 6 stars is intended for the volume home market. Sustainability outcomes presented include thermal performance, indoor air quality, energy and water savings and residents feedback. Several thermal performance indicators are proposed which include "Attenuation Factor", "Time Lag", "Heating and Cooling Need" in degree hours, "Degree C Warmer" and "Percentage Time in Comfort Zone". Prediction of indoor temperature will also be discussed.