The CERES Ecohouse – Solar Roofs and EVs before they were cool!

On Sunday the 17th of September 2017, Australia celebrates Sustainable House Day. The CERES Ecohouse will again be part of this day, between 11am and 3pm, with support from Moreland Energy Foundation (MEFL) staff. Our homes shape our habits, and on this day we recognise the important role residences play in a sustainable future.

Currently, the average Victorian house has an energy rating of just two stars. Whilst new builds must meet minimum 6 star standards Victoria's existing inefficient house stock is exacerbating our already unsustainable ecological and carbon footprint.

In response to this situation the team at CERES have created the Ecohouse – part functional home part educational resource. The 1920s weatherboard home provides a model of the sustainable retrofit. Through new technologies and design the Ecohouse demonstrates how we can increase liveability and decrease environmental impact, and all the while paying appropriate consideration to the economics.

Ecohouse Energy Educator Nick Scott

Like many good things in East Brunswick, the Ecohouse was conceived on the back of a truck during the early 80s. The legend goes that it was set for demolition, ready to be knocked down to make way for a new parking lot. Fortunately,

however, at least one person remembered their 3 R's and shipped the building over to the then nascent sustainability park. After relocation in 1982, the Ecohouse now stands in south west of CERES park where it hosts school groups, workshops and public tours every 1st and 3rd Saturday of the month (Including the 17h of September – Sustainable House Day Eve!).

Nick Scott has been at CERES for over 10 years and has witnessed much of the development of the Ecohouse. Prior to its most recent facelift in 2010, the home was already an embodiment of sustainability principles. Solar panels on the roof and on the carport produced emissions free electricity for the home and the converted electric vehicle. Air-lock entry, draft proofing and insulation, double glazing and eaves that allow in winter sun while preventing summer sun all did wonders to reduce heating and cooling demands (36% of the average Victorian homes electricity). And yet the house wasn't functional. There was a lack of connectivity.

"This living room was part of the extension and it was separated by a folding door, you couldn't talk to people on the couch when you were making dinner. It had some nice features but it wasn't a particularly good home."

Before the renovation

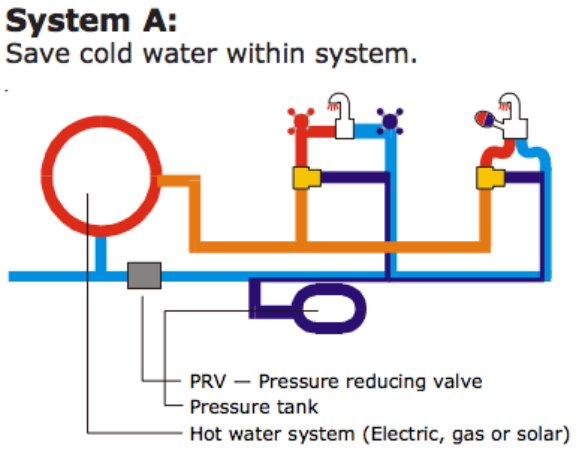
Fast forward to today and you see a house with beautiful design and flow. From the inside the green tech is unnoticeable. What you do notice however is a welcoming open space where you feel relaxed. A wonderful example that demonstrates that sustainable design can be relaxed and blend with a home's aesthetic.

Open plan living

The Ecohouse makes abundant use of smart design. The rendered brick wall at the property is but one example. The reverse brick veneer wall at the south end of the house is passively heated by the winter sun via the clerestory windows, the insulation behind it ensures the stored heat is released internally while in the summer, the clerestory windows are automatically shaded from the higher sun by external fixed timber louvres. The bricks' thermal mass serves to suck heat out of the air.

The house is filled with light but features such as deciduous plants, eaves and automated blinds reduce direct summer sun and together with add-on/retrofitted double glazing, keep the house cool. These features combined with behaviour such as taking advantage of evening cool changes have created a home that rarely requires air conditioning – according to Nick just twice in the last two years.

The Ecohouse is also water conscious. Water savings are achieved through water efficient appliances like the dishwasher, toilet and shower heads, as well as a 23,000L water tank that provides supplies water for flushing toilets and heated water (in a non- public facility this could also be used for potable sources). Something I was particularly impressed by was a nifty gadget called an Ecoverter. The devise is fitted in the hot water taps. It restricts flow and reticulates cold water while the user waits for it to reach temperature. Once it is hot enough the valve is released and the flow automatically increases.



The inner workings of the Ecoverter

There have also been some interesting choices within the house. One has been to hold onto existing lighting. As technology develops there is a constant stream of efficiency upgrades available. For many households the decision to

upgrade is answered by a simple economic equation, usually in the form of the payback period. As Nick explains however, many of us aren't factoring in an important variable, the cost of waste. This cost, ie. the embodied energy of a product and the cost of disposal, is often borne not by the individual but by the planet. Whilst the lights might not be the top of the line, they are still fulfilling their purpose and to replace them would do more harm than good.

This whole of lifecycle thinking has been instrumental in the design of the kitchen, where heavy duty recyclable elements like the stainless steel bench top have been selected. The average Australian kitchen is renovated approximately every 8 years and this turnover adds to landfill and introduces a range of toxic chemical substances into our homes. While the stainless steel may be energy intensive to manufacture it is built to last and will reduce maintenance that might otherwise have been required and is fully recyclable at the end of its life (the Ecohouse has a working kitchen often used for cooking classes).

The Kitchen

So where to from here? Well CERES and the Ecohouse are on a journey of electrification. Electrification acknowledges that while gas is a useful fuel, electricity from renewable sources is a more sustainable choice. As a result, there are additional solar panels (and a future battery storage system in the works). Induction cooking has already usurped the gas stove and soon the hot water will transition from a gas booster to a heat pump. But don't just take it from me. Come down on the 17th September 11am –3pm on Sustainable House Day, or regularly on the 1st and 3rd Saturdays of a month between 9:0am and 2:30pm for a tour with Nick Scott. You'll learn a thing or two and find inspiration in this beautiful functional home.