Notes to accompany presentation "Six Star Tips"

From 5 to 6-star:

So, a six star home uses less energy to heat and cool to a comfortable temperature. This is good news for everyone.

There are many ways to achieve a 6-star energy efficiency rating.

Based on our experiences of hundreds of completed six-star homes, we have compiled for you this morning a brief explanation of what we believe are some of the easiest and most efficient ways to achieve a 6-star rating.

Lot orientation:

Correct lot orientation plays a big role in improving the ease with which a 6-star energy efficient rating can be achieved. In our urban design masterplans, VicUrban aims to maximise lots with an east-west orientation, by planning north-south road networks. You can see this in the urban design of our latest stages at Aurora to the right.

Lot orientation determines how much sunlight will enter the home at different times of the year; therefore influencing how much artificial heating or cooling is required.

Correct lot orientation maximises exposure to the northern winter sun while minimising exposure to harsh and low morning and afternoon summer sun. This orientation encourages you to design homes that can locate more living rooms to the north.

We have a model on our sales floor that demonstrates the benefits of correct lot orientation by showing how the sun interacts with a home at different times of the year. It is also a very useful tool at point of sale to communicate the benefits of VicUrban's lot planning and urban design masterplans.

Easy 6-star tips:

Through working with builders delivering 6-star energy efficient homes on our projects, VicUrban has identified six tips for easy and cost effective ways to achieve a 6-star energy rating.

These are tips only; there are many ways to achieve a 6-star rating and different lots and home designs will require different initiatives to achieve a 6-star rating.

Step 1 - floor plan

By reducing the amount of wall area you can minimise the loss of heat, reducing the home's reliance on heating. It also reduces solar gain in summer, reducing reliance on cooling.

Simply reduce the ratio of the length of the perimeter wall to the footprint of the home as in the example on the left.

Use regular geometry in planning the home.

Step 2 - private open space

By positioning the private open space correctly you can maximise the solar gain in winter and avoid overshadowing from your neighbours, keeping your home warmer in winter.

Locate private open space to the north of the main living space of the home, with direct access from inside (as in the top diagram).

Avoid covering the private open space area with a roof, as this prevents the benefits of winter sun penetration (as in the bottom diagram).

If a pergola is included, angled louvers should be used to block summer sun and allow winter sun penetration. You can still have a covered outdoor dining area under the main roof, it just needs to be in addition to the uncovered area to the north of living areas.

Eaves to the north of at least 450mm are of course essential.

Step 3 - windows

Windows play a major role in attracting and losing heat. Careful selection of window size and orientation will help keep the home at a comfortable temperature.

Work with the glass percentages indicated for each direction shown on this plan:

- 25% to the north, 20% to the east, 22% to the south + 18% utility windows which do not affect the 6 star rating, and 15% to the west.
- These figures are as a percentage of the total glass used on the external walls of the home.
- Utility windows, generally located on the south, are not considered by the rating software and therefore do not influence the outcome

The rule of thumb I use for north facing living areas is that the area of north facing glazing should be around 20% of its floor area.

Step 4 - materials

Careful selection of materials and insulation for walls, floors, ceilings and roofs will help avoid extreme variances in temperature and will also help avoid unwanted heat loss or gain. Slab on ground is far superior to a timber structure on stilts.

Step 5 - airlock

An airlock forms a buffer to minimise the attraction of unwanted heat, cold air and drafts to living areas. This improves the Star Energy Rating by up to 2 points. To create an airlock:

- Introduce a door to the entry passage area.
- Add doors to any living spaces connected to the entry/airlock.
- Staircases in Double Storey houses should be closed off from the airlock.

Step 6 - sunshading

Sunshades augment the performance of windows and reduce the impact of harsh summer heat.

Shading of northern and western windows will also assist in reducing the summer heatload, while importantly allowing for solar gain in winter.

There are a range of modern sunshades which can act as architectural features, adding additional appeal to your home. VicUrban is also investigating the use of low-e coatings and tintings, and testing their effectiveness as sunshades.