

Designing and using a sustainable home

Architects have always known that there is a big difference between how a building is designed and how it is used, and nowhere is this more obvious than with so called 'green' or 'sustainable' homes. You can painstakingly design a house so that it has great sustainable values, with high star ratings for thermal comfort and appliances, large water tanks, low outgassing materials and so on, but it is all undone if the heating or air conditioning is used excessively on high settings, the tanks are bypassed and one repaint with the wrong paint can undo months of careful material selection and construction.

In our practice we design both one off 'bespoke' houses and display homes that are built 'en masse' in subdivisions. The essential difference derives from this disconnection between design and use. On the one hand you have a client who will describe their life patterns and you will try to use that as a basis for the house design (as we have here); on the other you have no client, only an imagined 'customer', whose life you impute from the successful house plans that are sold at home display centres.

With our clients we always describe the house as we imagine it being used, rather than relying on the 'look' of the house; that is an experiential rather than visual description. This will put the client in mind of how to get the best out of the house with the lowest energy and water use, and the benefits of the materials we are choosing. It will also allow us the chance to explain the trade offs that the occupants can make to get the best enjoyment out of the house. For instance we will describe the large areas of courtyard sliding doors, which are a negative in achieving a high star rating, in terms of the benefits for private views, indoor-outdoor living and the joy of having both at the same time. It is then a short leap to explaining how this may mean that the inside will be a bit cooler in winter or a bit hotter in summer, because you wouldn't try to have the heating or air conditioning working with the doors open. Essentially you are encouraging the client to accept a wider range of thermal comfort as a trade off for a better lifestyle.

Our experience is that our clients would rather dress for the climate (as with this 'outdoors' couple) than expect the house to do all the work, and the energy use goes down as a result. As a result this house has limited gas heating and no air conditioning. Instead there is a reliance on the use of passive warming in winter through two sets of north facing glass (an advantage of an atrium courtyard) and two means of cross ventilation in summer: opening the doors of the room will cool the occupants, and opening the upper louvres will allow the breeze to cool the house (by venting the hot air at the upper level of the room giving coolth to the thermal mass). This promotes comfort all summer: when there is little breeze the hot air rises up the skillion roof and out, and when the breeze is too strong you can close the doors but still vent the upper level. The owners quickly learn how to 'run' the house instead of switching on the machinery!

But you cannot apply the same logic when you don't lead a client through the design ideas, which is the case for 80% or more of our houses. The designs can be well intentioned but not used appropriately, so the state governments have decided we must have rules, the star ratings, to prevent worst practice. In so doing they also prevent the better practice of allowing the client to learn how to operate a house that may on paper have a lower star rating but could be operated with much lower energy use. That is why so many display homes are now being marketed as both being adapted to clients' needs, and with an education program of how to get the best of the house once you are living in it.

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