The Ecoliving Display Village: 
A Practical Demonstration of Sustainability

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ABSTRACT: To encourage sustainability innovation that is practical and replicable in the project home industry, Landcom, the NSW Government’s property developer, devised a project to mainstream the concept of sustainability in project homes. After a competitive tendering process, Landcom partnered with Clarendon Homes to design and deliver the Ecoliving Display Village, comprising three homes, at The Ponds, in north-western Sydney. Each home showcases different aspects of sustainability, with progressively better sustainability performance for each home. The Benchmark Home shows how a little extra attention to building siting; design and fit-out can substantially improve sustainability performance. The Greencycle Home features recyclable and low embodied energy building materials, while the Net Zero Emissions Home sets out to be self-sufficient in water and energy. All homes comply with Landcom’s universal housing principles and are asthma friendly. The Net Zero Emissions Home meets the Australian Standard for Adaptable Housing standard. The homes are complemented by an integrated landscaping strategy and self-guided sustainability tour. The Ecoliving Display Village opened to the public on 4 February 2012. Through this project, Landcom is educating the building industry on sustainable design and construction and informing consumers about sustainability in their home, leading to a greater uptake of sustainability options by the industry. Clarendon Homes has taken the knowledge gained from this project and applied it in their business by offering Six-Star Energy Packages for their mainstream housing range. Landcom hopes this is the first of many transformations in the marketplace.

Keywords: sustainable project homes, net zero emissions home, sustainable materials, universal housing, sustainability in practice.

1. Introduction

Project home builders are a major contributor to the mainstream of housing in Australia. Display homes are the principal marketing medium for project builders as they allow people to touch, feel and experience the design, its construction, materials and finishes. Consumers invariably buy the home designs, facades and features that have been displayed in these display homes.

When left to operate without intervention, the housing industry prefers to continue with well-known housing designs and formulas because these are less risky. However, this approach to housing delivery entrenches existing practices, encourages conservatism and discourages innovation. Conventional display home villages reinforce this conservative approach. The displayed homes are ‘safe’ in their design and are geared to appeal to the lowest common denominator.
Consumers wanting to explore new options in sustainable living are poorly served by this model. There is evidence that the majority of the community strongly supports energy efficiency (Auspoll, June 2001). However, sustainable project homes are largely inaccessible to the mass market, ultimately meaning that a consumer’s desire to build a ‘sustainable home’ often invokes the need for bespoke designs delivered at significant marginal cost. This does not encourage replication of sustainable design and construction principles across the project home building industry.

There have been a few attempts in the project home industry, particularly in recent times, to build sustainable display homes beyond current compliance levels. These include the 9 star Harmony 9 by Mirvac Homes in Melbourne (Mirvac, 2011), the 8 star Zero Emissions Home by Henley Homes in Melbourne (CSIRO, 2008), the 8 star Jade 808 by Jade Projects/Think Brick in Perth the 9 star Jade 909 by Right Homes/Jade Projects in Perth (Jade Projects, 2011), the 6 star Aquarius by Cosmopolitan Homes in Sydney (Cosmopolitan, 2011) and the 7 stars Future Range of homes by Burbank Homes (Burbank, 2011). Harmony 9 and the Zero Emissions Home are prototype demonstration projects and not for sale to the public.

In summary, however, it can be said that sustainable project homes are still not in the domain of most project builders, particularly large volume builders, and thus are still largely inaccessible to the mass market.

2. **Aim of the Ecoliving Display Village Project**

Landcom was concerned that inherent conservatism in the project home building industry, in addition to poorly informed consumers, was preventing the industry innovating at a time when leadership on sustainable living was needed.

Landcom determined that the only way to rectify this problem was to work with a large project home builder to design and build a display village with a number of homes which showcased sustainable design, construction and living options in order to ensure that sustainable initiatives are buildable and repeatable in the project home market. After a competitive tendering process, Clarendon Homes was selected to be Landcom’s partner.

Three sustainable homes with ambitious and varying levels of sustainability targets were designed for The Ponds in north western Sydney. The first home is one step above compliance and demonstrates better practice. The second home goes one step higher again and focuses on environmentally friendly materials. Finally the third home achieves net zero emissions and a neutral water balance. All three homes are small, asthma friendly and built to universal design principles, with the last home also being compliant with the code for
adaptable housing (AS 4299). The finished homes operate as display homes, allowing the public and the home building industry to walk through the homes and experience them. The Ecoliving Display village was officially launched to the public on 4 February 2012.

Information highlighting the various sustainability features of the homes help increase consumer awareness, permitting consumers to have a more informed and knowledgeable conversation with builders and suppliers about improving sustainability performance in their own homes (a bottom-up approach). Clarendon Homes offers the Eco Living Display Homes, and variants of them, as homes in their suite of designs for construction across their business operation (a top-down approach).

The intellectual property jointly developed by Landcom and Clarendon Homes through this project will be made available to the project home building industry with the aim of increasing uptake by the industry of more sustainable building designs and building practices. Ultimately, the project hopes to mainstream the concept of sustainability resulting in:

- a better informed building industry,
- better house designs
- better informed consumers and
- greater uptake of sustainable living options by consumers

The following sections of the paper describe the design of the Ecoliving Display Village including the various sustainability features of the three display homes as well as the methods and processes involved in achieving these outcomes. The paper also reviews and discusses the successes and failures encountered to date, in order to offer suggestions and examples for others wishing to explore similar collaborations aimed at implementing sustainability in mass housing.

3. Approach

*The project objectives and site*

Four high quality prime location home sites were set aside by Landcom at The Ponds, in north western Sydney for an Ecoliving Display Village comprising three display homes and a car park. The homes were intended to demonstrate innovative design, materials and products that would reduce the operational and embodied environmental impact of a project home, as well as showcase the best practice approaches to universal and asthma friendly design. The homes were also intended to shift the focus from quantity of space to quality of space, thus showcasing smaller, smarter and more efficient homes. Landcom intended to maximise
exposure of the village to potential purchases as well as the wider community through innovative marketing, communications and education options, including costs and cost savings.

Tender process and conditions
The successful builder, Clarendon Homes, was chosen via a rigorous three stage tendering process. The first stage of the tendering process began with Landcom inviting an expression of interest (EOI) from builders in NSW to partner with them to build the Ecoliving Display village. Four builders were successful at this stage. These builders were then asked to respond to an RFP (Request for Proposal) detailing the project objectives, design brief, and other requirements and conditions. The proposal had to include:

- House 1 designs, specifications and cost.
- A statement of design intent including specifications for Houses 2 & 3 and
- A delivery and marketing strategies for the whole village.

Two proponents were shortlisted at this stage. They were then required to prepare a presentation on their proposal to Landcom. Clarendon Homes was ultimately selected as the successful builder partner. The project was designed by Landcom to run in four discrete stages:

- **Pre design phase:** Clarendon would submit a completed design and lump sum Design & Construct (D&C) price for House 1. At this stage Landcom also invited an expression of interest (EOI) from suppliers of sustainable materials and products with the aim of short listing these for consideration in Houses 2 & 3, in conjunction with Clarendon.

- **Detailed design phase:** Any agreed design refinements or amendments would be made to House 1 before construction. Design of Houses 2 & 3 needed to involve an architect and also needed to include the consideration of the materials shortlisted in the supplier EOI. A construction budget for Houses 2 & 3 was established at this stage and Clarendon would receive and agreed management fee for this phase of the project. The copyright of the designs would be with Landcom, but licensed to Clarendon during the life of display village after which it would be jointly held by both parties.

- **Construction phase:** Clarendon would act as a building contractor to construct House 1 with Landcom paying progress payments as the land owner. For Houses 2 & 3, Clarendon would act in the capacity of a construction manager receiving a
construction management fee from Landcom, plus reimbursements for all costs (suppliers, consultants, subcontractors) associated with the construction and delivery of the homes on their lots including the landscaping.

- **Village Operation phase**: Clarendon would be responsible for managing all the operations of the display homes for the life of the display village (2 years) and would also the ongoing operation and maintenance of the display village. Clarendon would offer the display homes to consumers to be constructed on their land and may include several of the innovative and sustainable options. A marketing strategy including a communications and education strategy would be agreed upon by Landcom and Clarendon.

**Table 1: The Brief (original)**

<table>
<thead>
<tr>
<th></th>
<th>House 1 (Benchmark Home)</th>
<th>House 2 (Greencycle Home)</th>
<th>House 3 (Net Zero Emissions Home)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>House theme</strong></td>
<td>Current industry best practice</td>
<td>Recycled and renewable materials</td>
<td>Off the grid services – energy, water and waste</td>
</tr>
<tr>
<td><strong>Design Intent</strong></td>
<td>Existing builder design modified to meet objectives</td>
<td>Heavily modified existing builder design/new design</td>
<td>New builder compact design (small lot)</td>
</tr>
<tr>
<td><strong>The Ponds DCP/guidelines</strong></td>
<td>compliant</td>
<td>compliant</td>
<td>Compliant where possible (non-compliance needs to be justified)</td>
</tr>
<tr>
<td><strong>Target family</strong></td>
<td>Intergenerational/blended family, 2 parents, 2 teenagers &amp; grandparents</td>
<td>Traditional family, 2 parents, 2 kids</td>
<td>Empty nesters/retirees</td>
</tr>
<tr>
<td><strong>NatHERS/ACCURATE</strong></td>
<td>6 stars minimum</td>
<td>6 stars minimum</td>
<td>8 stars minimum</td>
</tr>
<tr>
<td><strong>BASIX</strong></td>
<td>Energy 60% minimum Water 70% minimum</td>
<td>Energy 60% minimum Water 70% minimum</td>
<td>Energy 100% minimum Water 100% minimum</td>
</tr>
<tr>
<td><strong>Social Initiatives</strong></td>
<td>Affordable, Landcom Universal Housing guidelines, Asthma friendly</td>
<td>Landcom Universal Housing guidelines, Asthma friendly</td>
<td>Single storey, compliance with AS 4299 Class C for adaptable housing, asthma friendly</td>
</tr>
<tr>
<td><strong>Architectural Style</strong></td>
<td>Range of styles to meet needs of different market sections</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>House Size</strong> (excluding patios, veranda, alfresco)</td>
<td>240m² total (200m² living + 40m² garage)</td>
<td>170m² total (130m² living + 20m² garage + 20m² carport)</td>
<td>125m² total (100m² living space + 23m² garage)</td>
</tr>
<tr>
<td><strong>Accommodation</strong></td>
<td>4 bed, possibly 2 storeys or 2 dwellings in one</td>
<td>3 bed + multi/sitting space, single storey</td>
<td>2 bedrooms, single storey</td>
</tr>
<tr>
<td><strong>Car accommodation</strong></td>
<td>Double garage</td>
<td>Single garage and carport</td>
<td>Single garage + stacked space</td>
</tr>
<tr>
<td><strong>Budgeted base price (incl. garage &amp; carport but excl. agreed optional extras)</strong></td>
<td>$290,000 total $1200/m²</td>
<td>$260,000 total $1500/m²</td>
<td>$230,000 total $1800/m²</td>
</tr>
</tbody>
</table>
**Modifications to original objectives**

Some of the original objectives were modified along the process to take account of new opportunities. House 2’s theme was changed to environmentally friendly materials to take it beyond simply recycled and renewable products in order to acknowledge and address the diverse impacts of materials. House 2’s thermal performance target was also raised to 7 stars in order to create progression in levels from House 1 to House 3. Similarly House 3’s theme was changed to Net Zero energy and water to acknowledge the fact that ‘off the grid’ has marginal relevance in urban areas where centralised grids and back up supplies are generally assured. Net zero waste was changed to waste minimisation as early investigation of black water technologies revealed that these systems would not be practical. The BASIX 100 Energy and Water targets were also modified to 100% Energy and Water sufficiency since early testing on BASIX and discussions with the BASIX team revealed that 100% is not achievable within the framework of the tool. A separate modelling system was used to achieve these targets (explained below).

**Project management**

The project began in April 2010 soon after the announcement of the successful builder. The Benchmark Home opened in June 2011. The Greencycle Home opened in October 2011, and the Net Zero Emissions Home opened in February 2012. Landcom and Clarendon appointed dedicated project managers to ensure that the sustainability, cost and time objectives were met. Regular weekly meetings were conducted between Landcom and Clarendon as well as between Clarendon’s various departments.

**Design process**

An integrated design process (Lohnert et al., 2003) was employed for the project in order to achieve a high performing and cost effective design. A project team involving Landcom, Clarendon (sustainability, estimating, construction & marketing representatives) and external consultants/specialists (brought in at appropriate times) was formed. In addition Clarendon worked closely with its suppliers and manufacturers to choose the right products and materials. In the pre design stage, a design charrette was held for the Greencycle and Net Zero Emissions Homes, chaired by a facilitator in which objectives, schematic design concepts, methods, budgets and construction methods were agreed upon. The project team met time to time at key points from then on to ensure all various objectives were being met continuously.
**Thermal performance evaluation**

Currently in Australia second generation software such as BERS Pro, ACCURATE and FirstRate are permitted for thermal modelling for regulatory purposes. Considering the time constraints, simplicity of project homes and ease of use of the software, BERS Pro Version 4.1 was used as the preferred software to model all the three homes. The project home industry allows the choice of any house on any block. With this fact in mind, the homes (with the exception of the Net Zero Home) were rotated through eight orientations and then mirrored and rotated again in the eight orientations to ensure that the homes would achieve the thermal performance objectives in most orientations. The Net Zero Home was modelled only in one orientation (with the PV system facing North) and then similarly for mirror the reversed version. The modelling was carried out by an ABSA (Association of Building & Sustainability assessors) accredited assessor and reviewed by an ABSA approved assessor.

**Assessing Material Impacts**

The materials impact assessment was carried out by external consultants only for the Greencycle Home as its theme was material impacts. However, the lessons from that process were used to inform choices for the other two homes. A semi quantitative method was agreed by the project team as the best method. See {Figure 1.} (Simpson & Kelly, 2011).

**Figure 1: Materials assessment methodology**

![Materials assessment methodology diagram](image)
In the first stage, the house was modelled for greenhouse gas emissions associated with major assemblies using Landcom+Kinesis’ PRECINX™ Embodied Energy Module (which is part of the PRECINXTM engine). The home with standard Clarendon specifications was used to establish a baseline. This assisted in establishing the share of various building elements towards the total Greenhouse gas impact of the home, which then allowed the largest contributors to be isolated. This allowed for a decision framework based on best value for money.

From here, alternative materials were suggested to lower the impact of these largest contributors. A qualitative assessment of other impacts was also carried out at this stage. These major assembly alternatives were then optimised for thermal performance. Specific products & suppliers within these material categories were chosen on the basis of qualitative assessment of environmental impacts. Most other materials and products used in the home were also considered for impacts and assessed by this qualitative method and wherever practical and cost effective, alternative products were adopted.

In order to assist systematic decision making, a master spread sheet was prepared of all the elements of the home along with a list of products and suppliers used currently by Clarendon including any eco products they offered. These were supplemented by Landcom’s EOI suppliers and their products. Other good environmental alternatives identified by project team members and consultants were also included in this database. The order of priority for decision making was Clarendon suppliers first, Landcom EOI suppliers second, and lastly other suppliers if any. This method resulted in time and cost savings while achieving good environmental outcomes. New products and suppliers then went through Clarendon’s procurement criteria before being accepted and adopted.

Assessing Universal Housing/Adaptable Code provisions
All the homes were evaluated for compliance with Landcom’s Universal Housing Guidelines and the Net Zero Emissions Home with AS 4299 Code for Adaptable Housing by access consultants.

Energy & Water Modelling
The Benchmark Home and Greencycle Home were modelled on BASIX by an ABSA accredited assessor and reviewed by an ABSA approved assessor. The Net Zero Emissions Home was modelled using energy and water models prepared by external consultants as the in-built limitations of BASIX (in relation to assumptions about energy and water consumption
and trade-off between different energy sources) restricted its use for achieving net zero emissions and water effectively.

4. House designs and key features
This section provides only the key features of the homes. Further details can be obtained from the Landcom’s Ecoliving website – [www.ecolivingdisplayhomes.com.au](http://www.ecolivingdisplayhomes.com.au).

**Benchmark Home** (261.7m², 28 squares, for 12.5 x 30m zero lot)

*General:* Modest yet efficient and affordable two storey 4 bedroom home that goes one step beyond compliance to demonstrate better practice. The contemporary design features an open plan design, adequate cross flow ventilation and solar access. This home is a “good neighbour” with its upper floor to the front half of the house which allows solar access to its neighbour.

- Zoning door to informal living areas
- Porch to laundry for sheltered outdoor clothes drying
- Low-E glazing to ground floor
- Gas cook top and oven
- 3 panel solar hot water system
- Timber/plastic composite decking
- Finger jointed pine skirtings, architraves, door frames & jambs
- 5000lt rainwater tank
- 3 star low flow showerhead (6 L/min)
- Low pile nylon carpet
- Fans
**Greencycle Home** (187.6m², 20 squares, for 12.5 x 30m zero lot)

**General:** Small yet efficient contemporary single storey 3 bedroom home that produces 30% less greenhouse gas emissions from materials than a similar typical project home. All living and sleeping areas are adjacent to private open space and with good solar access. Moveable screens to the sitting room increase the flexibility of the living areas.

- Green concrete
- Recycled cardboard and bamboo bench tops in kitchen and bathrooms
- Timber frames with part Eco bricks and mostly timber cladding
- 100% recycled concrete slab membrane
- Timber frames to windows and glazed doors
- E0 mdf for joinery
- Bamboo flooring
- Grid connected 1.5kW PV system
- Hot water recirculating pump

**Net Zero Emissions Home** (Single storey, 2B, 162.8m², 17 squares, for 10.8 x 30m zero lot)

**General:** Very small yet extremely efficient and innovative contemporary single storey 2 bedroom home that showcases excellence in sustainability. This self-sufficient home is also an adaptable house with a flexible plan that allows the free flow of space between living areas, outdoor and garage to create spacious entertaining spaces when needed.

- Reverse brick veneer walls
- Double glazed Low E windows and glazed doors
- Grid connected 4.5 kW PV system
- 10,000 litre concrete underground rain water tank connected to all hot water and potable water and garden
- On site grey water recycling system connected to laundry, toilets and garden
- LED lighting
- Energy efficient split air conditioners
- Adaptable kitchen and bathroom
- On site organic waste recycling linked to productive gardens

**Landscaping of the whole village**

A key feature of this Ecoliving Village, distinguishing it from other similar projects around the country, is that it is a village designed as one integral site. The homes and landscaping integrate with each other. The landscaping is as much a learning experience for the customer as the homes. The innovative design of the village includes a display which takes customers on a journey through the homes and the gardens highlighting sustainability features along the way. Each home has its own themed garden. The Benchmark Home garden is water-wise and requires no watering other than from natural rain. The Greencycle Home has a tropical themed garden and uses water that has been captured and held on site by a series of water features. The Net-zero garden is productive and edible. It is designed to provide a healthy home-grown source of food throughout the year.

5. **Training, education and communication**

Education within Clarendon was just as important as educating the customers. It was one of the author’s observation when visiting some of the sustainable display homes (mentioned in the Introduction) that the sales staff did not appear to be knowledgeable or passionate about the features of the home and directed the author to “see the website” for information. Qualitative research has also identified that training and knowledge of sales staff is a key barrier impeding progress to sustainable solutions in the residential sector (Divakarla, 2004). Thus Clarendon’s sales staff was provided extensive sustainability training to make them aware of the sustainability features in each home ensuring effective communication to customers.

Landcom conducted a site tour for 70 builders mid-way through the construction of the Net-zero home to demonstrate some of its unique features and educate them on the design
and construction of all three homes. Council staff was also part of this tour to encourage them to think beyond current regulations which contribute to stifling innovation in the market.

Site tours and technical presentations to schools and TAFE were conducted to share the learnings on this project and encourage students to incorporate sustainability into their designs.

The industry and customers have also been exposed to the Ecoliving Display homes through wide coverage the initiative has received in the print media. Particular effort has been made to target papers and magazines read by the general community and potential mainstream project home buyers.

An Ecoliving website (www.ecolivingdisplayhomes.com.au), fact sheets and explanatory brochures have been created by Landcom to educate consumers and the building industry about the homes and their benefits. These have been distributed at the sales centre and are also available on the Ecoliving website. There is also extensive and easily understandable signage within the display homes. Paybacks on various sustainability options have been prepared to investigate the relative costs and cost savings of the various sustainability features.

*Paybacks on energy*

A cost benefit analysis of the energy measures was undertaken of all the 3 homes, comparing each home with its more standard traditional Clarendon version. The calculation uses very conservative assumptions about the metering arrangements for the solar PV system.

The energy improvements on the Benchmark home achieve 1.9 tonnes (20%) reduction in greenhouse gas emissions at an additional cost of $9,500 compared to the standard traditional home. The measures do not save money overall with savings on energy bills of about $650 and the additional repayment on the extra capital of $765. This amounts to an overall relatively small additional cost of about $100 per year on average and a simple payback period (i.e. how long it takes to repay the extra capital from annual savings on energy bills) of 14 years.

The energy improvements on the Greencycle home achieve 2.7 tonnes (40%) reduction in greenhouse gas emissions at an additional cost of $11,400 compared to the traditional home. The measures do not save money overall with savings on energy bills of about $700 and the additional repayment on the extra capital of $900. This amounts to an overall additional cost of about $200 per year on average and a simple payback period of 15 years.
The energy improvements on the 8 star Net Zero Emissions home achieve 7.5 tonnes (-20%) reduction in greenhouse gas emissions at an additional cost of $45,400 compared to the traditional home. The measures do not save money overall with savings on energy bills of about $1640 and the additional repayment on the extra capital of $3661. This amounts to an overall additional cost of about $2021 per year on average. The simple payback period is 25 years. Investigation into improving this cost benefit ratio revealed that a 7.5 star version of the home can achieve 0.3 tonnes (net zero emissions) reduction in greenhouse gas emissions while being cost neutral with annual energy savings of just over $1500 compared to additional repayments of $1500. The additional cost is nearly half of the original cost and the payback period is less than half of the original.

The cost benefit ratio for all the homes would be significantly better if there were better metering arrangements and if the energy measures became normal practice in Clarendon home building (with better volume pricing).

Marketing & sales
All homes in the Ecoliving Display Village are being marketed with standard Clarendon specifications as well as with the Eco package and other traditional upgrade options (facades, plan options, specification options). Clarendon has also released 6 star packages on 6 of their popular home designs along with the launch of the Benchmark Home.

Sales staff report that since the opening of the Benchmark home in June 2011, there has been considerable traffic through the display home, increasing with the opening of each home. There has been genuine buyer interest in the Benchmark home and Greencycle home.

6. Successes, Challenges and Lessons Learnt
Successes
- Clarendon-Landcom partnership worked better than expected as the interests of both parties, particularly in relation to cost effectiveness and affordability, were aligned.
- Having a dedicated project manager within Clarendon and Landcom was essential and assisted greatly in delivery of the project on time and within budget.
- There are various ways to achieve sustainability objectives, particularly with material selection. Establishing and clarifying the objectives (including hierarchy of importance) early (through workshops) with all stakeholders helped deliver the project within a short time-frame.
Releasing 6 star packages on its popular designs at the launch of the Benchmark Home was a good strategy by Clarendon which is getting some market traction already. Other builders have followed suit shortly after.

**Challenges**

- The multidisciplinary nature of the project involving the many consultants and parties, extensive documentation, non-standard design/materials/practices, approvals, ancillary work (such as education and communication) increased time pressures for project delivery.
- The integrated design process, with its cyclical and iterative method, created added layers of complexity that became difficult to integrate into the more linear and standard method of project home processes and delivery. This reinforces the need for effective communication and education internally i.e. Why are we doing what we are doing?
- Lack of competition of green product suppliers restricted competitive pricing and also left no alternatives as back-up which affected supply lead times.
- Multiple objectives (e.g. 6 star, 60% energy, asthma friendly, universal house, materials etc.), which sometimes conflict with each other, on a single house made it difficult to deliver, market and communicate each element effectively to mass market customers who are already overburdened with information. Single minded propositions or purposeful marketing works best.
- Ensure construction documentation is accurate and complies with as-built clearances when building an adaptable home.
- The desire to offer flexible options/packaging of the homes created disproportionate documentation requirements. This is often difficult for the customer to comprehend and also increases the chances of incorrect pricing/quoting by the home builder. However, not offering flexible options can make the Eco package inaccessible as some people may only be interested/can only afford to buy some features of the Eco package. There is a definite tension between offering a flexible Eco package and an affordable project home.
- Sales staff report that customers are frequently asking if the Benchmark home comes with a four bedroom option, and more astute buyers are able to make comparisons on the $/m2 construction price of this home relative to ‘typical’ project homes. This
suggests that selling smaller homes will pose a challenge, at least in a few years to come.

Lessons learnt

- Establishing consistent terminology and common language between all the various parties with varied backgrounds early on would have minimised confusion.
- Mini workshops within Clarendon (estimating, drafting and construction teams) assisted in building greater understanding of the project, contributing to greater ownership and efficiency.
- It is necessary to ensure trades/suppliers understand the scope of work so they quote correctly.
- Extra care needs to be taken to ensure that every change is documented and communicated to all relevant people along the chain to minimise/avoid the rippling effect of omissions and mistakes.
- Non-standard details should be investigated to a level of detail which permits accurate drafting, correct price estimating and correct construction.
- Good/comprehensive design checklists should be developed early in the process to ensure diverse objectives and requirements are met.
- Contrary to the common belief that design (for passive design) does not cost money, the Benchmark Home (traditional version) is $16,000 dollars more expensive than a similar sized and configured Clarendon design due to a more articulated footprint and form.

7. Conclusion

There have been some indications to date that support the contention the project is succeeding and that a degree of market transformation has already begun:

- Before the Ecoliving Display Village was completed, Clarendon Homes applied the knowledge gained from this Landcom-sponsored project and developed sustainability upgrades on six of its most popular conventional display home models demonstrating the ‘ripple effect’ of the project. Feedback from Clarendon sales staff also reveals customer requests for features such as eaves vents, or 7 star packages on other Clarendon designs they have chosen. Clarendon is also considering substituting some
of the materials used in its display villages that have been discovered through this project.

- Good traffic through the Ecoliving Display Village and sales office has been reported, in spite of the current downturn in the housing market, with quite a lot of interest from customers (and general community).

- The project has resulted in greater awareness, exposure and knowledge of sustainable design and construction within Clarendon and with suppliers and tradespeople associated with Clarendon. Most suppliers have actively participated in this project, with some being very proactive.

Positive intervention by Landcom in the project housing industry to initiate such a project, fund the construction of the village, and assist with research, marketing and education has definitely provided the much needed stimulus to enable a large project builder such as Clarendon to undertake this ambitious project.

References:


Mirvac (2011) www.mirvac.com/case-studies
