

Authors: Ms Lauren Christie, Sustainability Scientist
Co-Authors: Mr Albrecht Stoecklein, Business Developer, Science & Technology.,
Mr Roman Jaques, Senior Sustainability Scientist.
Presenter: Mr Roman Jaques, Senior Sustainability Scientist
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BRANZ Ltd

Private Bag 50 908, Moonshine Road, Judgeford, Porirua City, New Zealand.

Phone: +64 4 237 1170, Fax: +64 4 237 1171.

Emails: LaurenChristie@branz.co.nz, RomanJaques@branz.co.nz.

The Eco-Design Advisor: an Independent Resource for the Building Industry

The Eco Design Advisor (EDA) is a project currently being trialled by BRANZ Ltd with funding and support from Building Research, the Foundation for Research, Science and Technology (FRST), local government (Waitakere City, Hamilton City and Kapiti Coast District Councils), and the Ministry for the Environment (MfE). The EDA operates from council, providing free, easily accessible, personalised and independent information on any environmental design issue to both homeowners and designers/tradespeople.

The three primary functions the EDA fulfils are:

1. A free supply of information
2. Facilitation between client, designer and tradespeople
3. Networking between stakeholders and sustainability resources.

The EDA program was designed to address the three main obstacles of sustainable design which previous research identified. These were: that there is no stage at which the home owner is directly prompted to make decisions regarding sustainability; that there is a lack of specific technical information and advice; and finally, that there is a lack of industry expertise combined with a general reluctance to implement sustainability features.

An important part of this project is to assess through surveys the attitudinal and behavioural impact on designers and tradespeople, and hence any on-rolling benefits from the EDA project. Evaluation surveys will be conducted with homeowners, designers, tradespeople and council members in order to assess the success of this project and how it could be improved for future use past the 10 month pilot initiative. The results will assess the success and viability of this programme in terms of its value and effectiveness as a tool for the building industry. This paper outlines the research leading to the development of the scheme, the implementation and the methodology for analysing its effectiveness, and its planned future growth.

1. Introduction, Background & Objectives

1.1 Problem Statement

Previous research funded by the Foundation for Research, Science and Technology (FRST) and conducted by BRANZ on Zero and Low Energy Houses (ZALEH) (Stoecklein, Zhao, Christie & Skumatz, 2005) and by Victoria University on homeowner sustainability decision-making (Christie & Stoecklein, 2005) has highlighted that there are three main obstacles currently towards sustainable design. One of the reasons that more people do not make eco-friendly choices when building a new home is that homeowners tend to opt-out of discussions about eco-friendly construction practices and leave eco-design decisions up to their designer or builder. This places the responsibility largely on the builder or designer to understand and implement eco-design issues and options.

The second obstacle that this previous research revealed was that there is a lack of accessible technical information available to those homeowners with an interest in eco-design issues and that designers and tradespeople generally lacked expertise in eco-friendly design. Thirdly, a lack of industry expertise combined with a general reluctance to implement sustainability features means that support for interested parties is generally not available.

Although exploratory, findings from this research also implied that people were more influenced by personal and first-hand sources (for example, from their own experience or friends/neighbours) compared to other marketing sources (Christie et al, 2005). Other research also emphasises the importance of educators and experts in helping people understand concepts and overcome barriers, instead of just relying purely on facts, figures and information (Fernholz, Howe, Bowyer and Wenban-Smith, 2006).

The concept of the Eco Design Advisor (EDA) was based on these findings in an attempt initiated by BRANZ Ltd to address these obstacles. The EDA is part of a larger programme by BRANZ Ltd to make the findings of sustainability research available to builders, designers and members of the public. Soon after the launch of the programme, these obstacles and proposed solutions for them were also supported by an independent New Zealand research report prepared for Auckland City Council and BEACON Pathway Limited (Easton, Mead, Trenouth, Young Cooper, Fullbrook, & Arnold, 2006). Recommendations from the report that are addressed by the EDA programme include for example (Easton et al, 2006):

- “Free design review for sustainable buildings;
- Provision of dedicated staff support for sustainable building to provide advice and information;
- Provision of education/information on sustainable building in Auckland City including funding opportunities;
- Active promotion of current sustainable building ratings tools such as TUSC and the Green Homes Scheme;
- Actively promoting to applicants for building and resource consent a simple checklist of ways to make their homes more sustainable”.

1.2 Eco Design Advisor Pilot Scheme

The EDA programme is currently funded by the Ministry for the Environment, Building Research, the Foundation for Research, Science and Technology and the participating councils. The aim of the project is for 3 EDAs to provide free, customised, face-to face advice on housing-related sustainability matters to prospective home builders, renovators, designers, trades-people and other community members. At present, the scheme is in the pilot stages with three EDAs appointed working out of Kapiti Coast District, Hamilton City and Waitakere City Councils. The scheme also forms an important component in the wider sustainability strategies and range of programmes run by each of the three councils. The pilot programme will run for ten months.

Using district council premises as a base for the EDA to work out of was chosen primarily because of the potential for close co-operation with the local councils in terms of council education, influencing urban planning and streamlining compliance for new technologies. It also allows for the possibility to target people at the earlier stages of the design process, before important long-term decisions have been made. The EDAs are not fixed to the council premises however as they regularly make site/home visits (much like the concept of mobile bank lending manager) depending on the client's requirements. The integration with the local councils will also ensure that advice is tailored to support long-term sustainable local planning strategies.

It is hypothesised that the outcome of these consultation services will be manifold and includes:

- Improved understanding of the basic concepts of sustainably by both the homeowner and industry in general;
- Reduced “fear” threshold for designers and tradespeople;
- A significantly improved and strengthened network within the building industry on sustainable design ;
- Significantly improved (in terms of resource use and health issues) building designs being constructed, benefiting not only individual home owners, but the wider community as a whole;
- Three EDA’s significantly trained in all areas of well-targeted, practical, achievable eco-design concepts and implementation;
- A wealth of information for the building, local government and related industries and organisations on the motivation aspects of sustainable design (both the principles and use of the most appropriate tools and information).

2. Implementation of the Scheme

The current EDAs were selected based on a combination of their design experience, environmental understanding and interpersonal/communication skills. A key criterion for their selection was an enthusiasm and passion for sustainability in the built environment.

2.1 Eco Design Advisor Training

In order to guarantee the provision of high quality service provided by the advisors, BRANZ is providing ongoing support through its scientific staff and through access to a range of tools including technical literature and design assistance tools such as ALF3 (for thermal design), the Green Home Scheme (environmental whole building rating tool) and others. In addition, periodic workshop training sessions are also held to review issues revealed and continue the professional development of the advisors. These focus on specific applications of technologies and incorporate site visits to demonstrate how principles discussed work in practice. Less formal fortnightly conference calls between the three EDAs and BRANZ staff are also conducted to ensure communication is maintained and information shared.

2.2 The Advisory Process

It is expected that the advisors conduct approximately 100 full consultations and 250 short consultations per year. In addition the Eco Design Advisor proactively promotes sustainability matters in presentations to industry groups and other stakeholders. Each full consultation will generally be between one and four hours long, whereas short consultations usually take about 20-30 minutes. Short advice may also be given if the client has a discrete question.

The EDA can respond directly to any real or perceived obstacles in the sustainable design process. Because of its flexible nature the service can support any aspect of sustainability design decisions with advice customised to the client's circumstances. These will include aspects of energy efficiency and generation, water management, material choices, indoor air quality, waste management, recycling and site layout.

Immediately after the meeting with the client, the EDA records details of what was discussed. This is entered into a scoring spreadsheet which is based on the BRANZ Green Home Scheme. The purpose of this is for later analysis and for the EDAs reference should the client request further consultations.

Approximately 2-3 months after each consultation, feedback forms to evaluate the success of the scheme are administered by BRANZ staff (see Section 3 below). There are different versions of these surveys for homeowners and designers.

3. Analysis and Evaluation

This project includes an extensive evaluation component. Our expectation is that the EDA will lead to a measurable improvement of the sustainability performance of current building projects in the council coverage area.

A range of measurable success criteria have been developed including quantifiable targets such as:

- Number of client consultations;
- Service satisfaction feedback (surveyed);
- Number and type of implemented sustainability technologies;
- Sustainability improvement impact;
- Value perceived by the council and other involved parties;
- Marketing/branding success for the EDA programme and participating partners;
- Increase of sustainability solutions which are proactively offered and recommended by designers and trades people;

Evaluations are conducted throughout the advisory phase, with the EDAs required to report fortnightly on their activities to BRANZ. The results of these reports immediately feed back into ongoing programme improvement.

The programme as a whole will finally be evaluated on the basis of the previously defined success criteria, as well as on the cost effectiveness of this intervention scheme compared to other possible intervention measures.

3.1 Attitude and Behaviour Change Survey

The scheme's impact on the design community will be evaluated using a set of surveys. Each recipient of a consultation is being asked to participate in a follow-up evaluation which measures how the EDA has changed their attitudes and design processes. This component of the scheme evaluation is critical since even small changes in designer and industry behaviour will have important long-term impacts.

Values and attitudes are defined as belief systems. More specifically, an enduring emotional, motivational, perceptual and cognitive belief system is considered to be an attitude whereas a value is an organisation of beliefs which imply a preference for a behaviour norm (Kerlinger, 1972).

Measuring knowledge, values, attitudes and behaviours is very important to any social marketing scheme such as this one, mainly because even though a person may express importance or concern towards eco-designs, these values and attitudes are not necessarily evident in their actual behaviours or final decisions (Kollmuss & Agyeman, 2002; Blake, 1990; Frankel, 1992; Marcell, Agyeman, & Rappaport, 2004).

Human behaviour underlies a number of problems relating to the lack of eco-design decisions in buildings. Therefore, in order to bring about a positive transformation a significant behavioural change needs to occur (Fernholz et al, 2006). The purpose of the survey evaluations is to gather information on what behaviour and attitude change has occurred as a direct result of this scheme towards eco-design.

The research design for the evaluation survey is based on a case control method so that the changes caused directly by the EDA can be assessed. That is, designers who did not have contact with the EDA will also be surveyed acting as the control group for designers who did see the EDA. The same also applies for the homeowner sample.

Evaluations are expected to begin in March 2007 when a substantial sample size should have been reached. A sample size of at least 50 is to be achieved for each of the five groups: designers who saw an EDA; designers who did not see an EDA; homeowners who saw an EDA; homeowners who did not see an EDA or designer; homeowners who saw a designer (who saw the EDA) but not the EDA directly themselves.

3.2 Improvements to the Built Environment

Another part of the project analysis and evaluation is the technologies that were discussed and implemented as recorded by the EDAs after every consultation. Each of the consultations is recorded using a customised scoring system which is loosely based on the New Zealand Green Home Scheme (GHS). A score is calculated for each design as it was initially intended, the design including the EDA's recommendations and the design including the actual implemented changes. This allows comparing the actual impact of the consultation in a very direct and transparent way.

While the GHS type analysis does have a large focus on energy and water aspects (for example thermal performance, appliance resource use and water economy issues), it does however allow for other important aspects (for example spatial efficiency and health) and for any eco-issues which have not been included in it. The spreadsheet and evaluation forms will then also be compared to assess the differences between stated values and attitudes, and the actual observed behaviours.

4. Discussion

4.1 Outcomes and Benefits

It is expected that the EDA scheme will have three main outcome benefits. Firstly the Advisor will have a direct impact on the sustainability level of the houses on which they provide direct advice. Secondly, the EDA will become a contact point for the industry and promote and educate designers and trades-people, thus having a multiplier effect for future developments by these industry stakeholders. Over time, as more designers are aware of the EDA service, they can alert homeowners about these options well before the building consent stage. Thirdly, the EDA will function as a tangible focus point within the community with possible local sustainability public relation campaigns designed around the role.

The tangible outcomes of this project are improvements to the sustainability performance of the housing stock which are in general of a permanent nature (insulation, building design, material choices, water conservation, etc.). In addition to these direct benefits an ongoing benefit is achieved through the up-skilling of industry members who were involved in the advisory process. In this respect the project functions as a customised, very practical training opportunity for the building industry, potentially yielding long-term benefits.

It is expected that the demand for the services and the uptake of the technical solutions will grow over time throughout the project. Historically councils were involved in the design process very late in the consent process, however all three councils currently involved are committed to shift their involvement towards the early draft design stages and therefore welcome the opportunity to offer and promote the eco-design services. It is expected that over time the design industry will proactively seek advice from the EDAs in the early design stages.

4.2 Progress to Date

The response from both industry and the public has been extremely encouraging so far. As one of the EDAs has commented "*I feel that there is a real 'buzz' out there for sustainable design*". At the time of writing, the scheme had been only operational for four months. As expected a lot of the time has been focused towards general marketing to the different sector groups. The amount and length of consultations has steadily been increasing however with a diverse range of questions being asked in regards to all stages of the design process.

The kit-set of resources and tools that is available for the EDAs and for handing out to clients is being fine-tuned continuously with feedback from the EDAs. It is expected that this will be an ongoing process for this first pilot year.

A website has also been set up at www.ecodesignadvisor.org.nz. A forum on the website for the EDAs, homeowners and designers to communicate is proposed as a future development with the schemes growth.

4.3 Lessons Learnt So Far

As this is a pilot project many lessons have been learnt so far as described below.

Sorting out legal issues such as liability cover proved to be a lengthy task at first especially due to:

- the number of parties involved (BRANZ, Councils and the individual EDAs) and
- the different requirements and policies of each of the three councils.

While the Councils were generally very welcoming about the whole process, there have been small logistical issues with for example computer services, IT issues, marketing techniques and personal support, which have proven to be challenging at times. As the different councils all had their own individual systems and processes, this proved even more difficult and the individual EDAs had to be treated on a case-by-case basis.

The initial training course and subsequent meetings have been very useful not only from the EDAs perspective, but also because of the value from the feedback provided and issues raised which are helping to continually develop and improve the scheme. As previous research has suggested (Christie et al, 2005) the initial enquiries are mostly cost driven. This was especially evident when Waitakere City Council announced they were waiving the minor plumbing and drainage building consent fee that applies for retrofitting solar water heating. This initiated a barrage of calls with people wanting more information on solar water heating. At the time of writing, calls were still

coming in regularly about solar water heating with Mr. Braxton (*Eco Design Advisor at Waitakere City Council*) using this opportunity to initiate conversation about other sustainability aspects.

5. The Future

This pilot project is due for completion at the end of September, 2007, after which BRANZ is planning to continue and extend the scheme to between 10 and 15 councils. There has already been a sizeable amount of interest expressed from other councils, charitable trusts and community organisations about the prospect of becoming involved with the next year of the scheme and meetings are currently underway to develop their involvement further.

The following diagram provides a picture of the planned growth strategy of the scheme.

Project Phase	Year
Pilot Phase: 3 Councils	Year 1 2006 - 2007
Objectives <ul style="list-style-type: none"> • Set up tools and administration system • Initial research and evaluation • Timeline and project expansion 	
↓	
Growth Phase: 10 - 15 Councils	Year 2 2007 - 2008
Objectives <ul style="list-style-type: none"> • Process streamlined • Training standardised • Public awareness at national level • Collection of representative up-to date market/industry intelligence • Statistically representative evaluation in respect to number of councils and extent of timeframe 	
↓	
Consolidation Phase: 25 Councils	Year 3 2008 -
Objectives <ul style="list-style-type: none"> • Mainstream awareness and acceptance by home owners and industry • Ongoing collection of representative up-to date market/industry intelligence for project partners • Continuous scheme refinement in response to Eco Design Advisor feedback loop • Transformation into a stable, self-sustaining, self-funding service 	

6. Conclusion

As the scheme is still very much in its early days little conclusive evidence can be presented; however the enthusiasm generated to date has been considerable with good support being provided from each of the stakeholders. The EDAs are also finding the response from industry and the general public to be very encouraging and enthusiastic: “*(Today) I met with 8 architects, who, whilst knowing a great deal about eco design, were really thrilled that there is now a position within council that specialises in this field (Ian Mayes, Eco Design Advisor at Hamilton City Council).*”

A range of media and marketing techniques are being used to publicise this service. These include for example: press releases, flyers/posters, website, radio and talkback shows, and stands at ‘Home and Garden’ events. Indicative feedback from the EDAs as to the success of the different marketing channels so far has been that the most effective system is talking directly to clients on a face-to-face basis: “*Probably the best bang for the buck is getting out there and talking to industry players at the highest level; (it) then filters down and out (from there.) (Fred Braxton, Eco Design Advisor at Waitakere City Council).*”

It is the core purpose of the EDA project to translate the research findings and applications through the EDAs to industry, designers and homeowners. With the project now established and already being used by designers, builders, developers and the general public alike, it can be inferred that this unique project will significantly increase the sustainability networks, education and long-term understanding of the industry making them more readily able to respond to the growing needs of homeowners.

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References

- Blake, J. (1999). *"Overcoming the 'value-action gap' in environmental policy: tensions between national policy and local experience."* Local Environment 4(3): 257-278.
- Christie, L., & Stoecklein, A. (2005). *'Sustainable Design Decisions: Processes, influences, values of the homebuilder'*. Architectural Science Association (ANZAScA), Wellington, 2005.
- Easton, L., Mead, D., Trenouth, C., Young Cooper, H., Fullbrook, D., & Arnold, P. (2006). *'Auckland City Council Sustainable Building Barriers and Incentives (Final Draft)'*. Report Prepared for Auckland City Council and Beacon Pathway Limited.
- Fernholz, K., Howe, J., Bowyer, J., & Wenban-Smith, M. (2006). *"An Introduction to Social Marketing: Potential applications for forestry"*. Dovetail Partners, Inc.
- Kerlinger, F. N. (1972). *"The Study and Measurement of Values and Attitudes"*. Education Resources Information Centre. Retrieved from:
http://eric.ed.gov/ERICWebPortal/Home.portal?_nfpb=true&_pageLabel=RecordDetails&ERICExtSearch_SearchValue_0=ED079618&ERICExtSearch_SearchType_0=eric_accno&objectId=0900000b800f6ce7. (Access date: 13/10/06.)
- Kollmuss, A., & Agyeman, J. (2002). *"Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behaviour?"* Environmental Education Research, 8(3): 239-260.
- Marcell, K., Agyeman, J., & Rappaport, A. (2004). *"Cooling the campus: Experiences from a pilot study to reduce electricity use at Tufts University, USA, using social marketing methods."* International Journal of Sustainability in Higher Education 5(2): 169.
- Stoecklein, A., Zhao, Y., Christie, L., and Skumatz, L. (2005). *"100\$ worth of Comfort: The Real Value of Energy Technologies"*, 2005 Architectural Science Association (ANZAScA), Wellington, 2005.