

November 2009

Welcome to the Centre for Design's quarterly e-newsletter:

As another year draws to a close, you are invited to catch up with some of the latest activities here at the Centre for Design. RMIT University now has a new look for research centres, so watch this space for a new look newsletter in the next issue. In the meantime, if you are keen to see it in action, contact us for a copy of our Review 2008-9, or it is available to download at our website at www.rmit.edu.au/cfd/about.

Once again, we have had a year of growth in both activity and in the range of research topics we are involved with in our efforts to contribute to knowledge, possibilities and policies for environmentally sustainable futures. In order to continue this next year, we are now taking stock of research needs across the life cycle assessment, built environment and product design and consumption groups and developing new research project ideas for next year. If you have research ideas or project needs feel free to contact us.

Best wishes,

Ralph Horne, Director, Centre for Design

In this issue:

Sustainable Built Environments P2 - 5

- Green Loans
- The Accelerating Sustainable building in the Local Government Sector (ASB) project
- UNESCO Conference Report
- National Heritage and Sustainability Project – Commercial Buildings
- National Heritage and Sustainability Project – Residential Buildings
- Green Building and Design Conference 2009 – Green Materials

Climate Change and Social Context P6 - 7

- Sustainability Precincts Knowledge Bank

- Carbon Neutral Communities
- Landlord Research
- Greener Houses, Growing Greener Neighbourhoods project
- Urban Infrastructure

Life Cycle Assessment P8

- Life Cycle Assessment course – 25th and 26th November 2009
- Aluminium Can Group LCA
- Australian Dental Association literature review

Sustainable Products and Packaging P9

- Areli Avendano PhD update
- 'Integrating Sustainability' workshop

Resources Online P10

Staff @ CfD P10

About cfd @ RMIT e-news

Issue No. 14, November 2009 © Centre for Design at RMIT University. cfd @ RMIT e-news is distributed quarterly by the Centre for Design at RMIT University, **Director:** A/Prof Horne +61 3 9925 3485. **Editors:** N McGrath, R Scasni, R Horne, A Carre and U Iyer-Raniga. **Contributors:** R Horne, U Iyer-Raniga, R Evans, J Wong, G Di-Mauro Hayes, K Rosenberg, A Strempele, C Maller, S Lockrey, A Avendano, A Kroen, N Willand, and H Freeman. **Disclaimer:** The Centre for Design at RMIT or any of the contributors and authors can give no assurance that the information supplied in this document is accurate or complete for your purposes and no legal responsibility is accepted for any errors or omissions or misleading statements in that information caused by negligence or otherwise. If you'd like to be added or removed from the Centre for Design at RMIT's mailing list, please contact nicole.mcgrath@rmit.edu.au.

Sustainable Built Environments

Green Loans

As you may know from previous newsletters and updates, the Centre for Design (CfD) has been involved in the development of the Green Loans program from its very early stages. CfD initially completed extensive research as well as coordinating a series of related external research programs for the Green Loans program, and subsequently designed and coordinated the creation of a software tool used to direct assessments, calculate environmental impacts, and provide appropriate recommended actions to householders. Included in the tool is a function to produce a tailored report for each household, showing their individual current environmental impact and the benefits they may achieve through house and behavioural changes.

There are now over 1,200 registered Green Loans Assessors working throughout the country. Between them, more than 30,000 assessments have been completed to date, and this figure increases by 3-4,000 each week.

For further information, please contact Karen Rosenberg: karen.rosenberg@rmit.edu.au.

The Accelerating Sustainable building in the Local Government Sector (ASB) Project

The ASB Project research has highlighted risk-averse cultures as a significant barrier to innovation for sustainable buildings. The same research has also identified success factors from case studies of Councils who are delivering sustainable built environments. In essence, creating an innovation culture becomes a focus for delivering sustainable built assets. The ultimate aim is sustainability embedded throughout Local Government operations.

The ASB Project was a dynamic research process; applying adaptive learning principles through participatory research to overcome risk-averse cultures within Local Government. Additionally, the ASB Project sought to extend understanding of barriers and opportunities through a review of current case studies against the emerging success factors identified through the project.

The ASB Project was funded through the Victorian Government's Sustainability Fund under the Victorian Local Sustainability Accord.

Where are we at?

The ASB Project is in its final stages. The four participating Councils have nearly finalised their interventions and have presented the outcomes to date at the ASB Forum in August 2009. The Councils plan to report on the impact

their implemented interventions have had on Council practices by November this year.

Direct opinions and participation from participating Councils have contributed to the project – participatory action research 'in action'. Practitioners involved in delivering and managing built assets and/or involved in energy, water and waste deliverables were consulted and included local government Facilities Managers, ESD Officers, Project Managers, Accountants, Engineers, Service Providers, CEOs and Councillors.

Sustainable Building in the Local Government Sector - key research outcomes

The ASB Project has identified the importance of practitioner-lead solutions for improving practices in Local Government. However there are some success factors in creating space that delivers positive outcomes diverging from the status quo.

These include:

- Cross discipline teams supported by structured expertise
- Dedicated time for reflection and legitimised space for conversations
- Recognising complex decisions within parameters of positive sustainable outcomes

Other key research outcomes include Councils having access to quality data and measures of their performance. Council practitioners expressed a strong desire for benchmarks and targets to assist policy directions and implementation.

Relevance and accessibility of information was found to be critical for practitioners in their complex decision making processes. Councils delivering successful sustainable built assets were asked to provide the 'story' that underpinned the sustainable outcome. Sharing these stories along with outcomes enabled others to apply the success factors relevant for their own particular Council. Critically, intervention was required to elicit the stories, as it appears that success factors are not automatically shared unless specifically required or requested. This is in contrast to the technical and operations achievements which are much more commonly shared, particularly in the public realm.

"The process has been really important. Getting all the people involved in sustainable buildings together, to share and discuss the issues – has been important, or more important than the outcomes and the paper report." [Libby Hynes, Darebin Council].



Sustainable Built Environments continued

The ASB Forum

The ASB Forum on August 25 2009, sought to replicate some of the 'success factors' of the key research outcomes, namely:

- Cross discipline teams supported by structured expertise
- Dedicated time for reflection and legitimised space for conversations

Additionally, the forum aimed to showcase the intervention stories of the participating Councils. A panel with diverse expertise spoke to the question 'what does it take to improve practices in Local Government?' which constituted the "Ideas Stimulation" section of the program. As the MC, Mike Hill suggested, it was "ambitious and dangerous, but provided the controversy and lateral thinking for input into the World Café sessions."

Lastly, the 'World Café' or working groups were set the task of responding to the same question, 'what does it take to improve built environment practices for sustainable Local Government assets?' The "Ideas Generation" workshops were asked to focus on issues within the control of Councils, along with one grand idea to enable change.

After robust debate and consideration of views, the main themes emerging from the Forum were:

- ESD must be embedded in business as usual and from onset of all projects
- Holistic, life-cycle costing and analysis is important (not 'simple' sustainability assessment)
- Data, benchmarks and targets are needed (eg Green star rating for Council buildings and sustainable accounting)
- Accessible information to support decision making case studies and communication (eg, data, measures, new technologies, flagship buildings and transparent case studies)

Lastly, forum participants were asked to synthesise all the ideas generated from the World Café, nominating the highest impact actions. The ideas that received the highest number of endorsements were:

- Consolidating research on significant factors inhibiting and supporting innovation cultures
- Flagship buildings demonstrating leadership for community, industry and business as well as providing case studies for other Councils

- A living information source for fast-tracking to sustainable buildings as base-line delivery, and to support complex decision making needs of Local Government practitioners
- Senior leadership for sustainability

In Summary

Local Governments deliver a wide range of services including waste, street lighting, transport infrastructure, libraries, events, parks and recreation, and health care from pre-natal through to aged. Local Government is the level of government most closely sited to their demographic and consequently, hugely accountable to their community. Unlike much of business and industry, Local Government is fixed geographically and generally must manage their assets through entire lifecycles. Management of the built environment therefore, must take a much more holistic approach than most business and industry mandate. Conversely, the political and community accountability can, for many Councils, contribute to risk-averse cultures that are the very antithesis of the innovation cultures they need to most efficiently deliver services for long-term economic, community and environmental benefit.

"Opportunities for embedding sustainability into Local Government operations must respond to issues particular to the sector", [Forum workshop participant].

There remains some high impact opportunities for working with Local Government practitioners to improve sustainability outcomes in the built environment. These include:

- Creating formal time and space for reflection, sharing and learning
- Facilitating cross-discipline teams within adaptive learning environments
- Developing an accessible, user friendly, up to date, credible, centralised and independent source of data, information and case studies on sustainable built environment technical and social resources
- Leveraging from current communities of practice and adaptive learning networks.

For further information, please contact Robyn Evans, ASB Project manager: robyn.evans@rmit.edu.au and visit www.rmit.edu.au/cfd/asb.

Sustainable Built Environments continued

UNESCO Conference

Dr Usha Iyer-Raniga presented a peer refereed paper, jointly co authored with Robyn Evans at the 5th Dubrovnik Conference on Energy, Water and Environmental Systems for Sustainable Development, held in Dubrovnik from September 30 – October 5 2009. The paper, titled: *Accelerating the uptake of sustainable buildings for local government: An Australian Study* focused on the initial stages of the ASB project leading to Milestone 1 and 2 Reports.

Through participatory action research, the ASB project has developed interventions and trialled a practice improvement program with four participating councils in Victoria. The immediate aim of the project was for local government practitioners to develop a community of practice to share knowledge and experience in sustainable built asset management. The long term aim of this research was to identify ways practitioners in local government can provide sustainable outcomes for their own council's built environment, focusing on areas within the control of practitioners.

This paper presented the findings of the initial scoping study and the pilot interventions leading to the practice improvement program. The paper was well received by the participants of the Conference.

If you would like a copy of the paper, please contact Usha Iyer-Raniga on usha.iyer-raniga@rmit.edu.au

National Heritage and Sustainability Project – Commercial Buildings

The aim of the project is to provide empirical research evidence in the form of a comparison between life cycle energy, greenhouse gas emissions, water and other environmental impacts of five different types of heritage-listed commercial buildings compared to contemporary examples. The project will model the impact of common interventions to improve environmental performance for the selected case studies in each of the eight jurisdiction's capital cities of the Heritage Councils from the Australian States and Territories.

The objectives of the project are:

- to inform the public of ways in which the retention and adaptation of buildings of cultural heritage significance can contribute to environmental sustainability
- to identify the quantum of embodied energy contained in typical building types
- to provide information to allow building designers, specifiers and owners to make more informed judgements about the sustainability legislative requirements for existing buildings
- to provide evidence that building surveyors and other regulators can use when considering Alternative Solutions to the Deemed-to-Satisfy Provisions of the Building Code of Australia
- to provide comparisons between different industry standard sustainability analysis and modelling methodologies as applied to heritage buildings
- to encourage imaginative, performance based design solutions to improve the environmental sustainability of the existing building stock

National Heritage and Sustainability Project – Residential Buildings

The original project brief was to develop environmental assessment from a range of residential buildings in Australia with heritage values. Fourteen heritage residential buildings from all States and Territories and New Zealand have been chosen, except buildings in South Australia and the ACT. The aim of the project is to provide empirical research evidence in the form of a comparison between life cycle embodied and operational energy performance, greenhouse gas emissions, water and other environmental impacts of a range of heritage building designs compared to 'improved' retrofitted designs where heritage values are preserved.

For further information please contact Dr James Wong: james.wong@rmit.edu.au

Sustainable Built Environments continued

Green Building and Design Conference 2009 – Green Materials

The 7th Green Building and Design Conference 2009, hosted by the Centre for Design and the School of Property, Construction and Project Management, was a success by any measure. Architects, academics, local councillors, politicians, project managers, post-graduate students and representatives of the manufacturing industry came together to share their knowledge – and sometimes frustration – about defining, selecting and applying 'green materials' in the built environment. A choice of nine site visit tours, workshops and networking drinks supported the practical transfer of know-how and strengthened the discourse on sustainability between the various disciplines in the building industry.

On the premise that operational energy demand in buildings approaching zero is possible and achievable through intelligent design (cf. CSIRO's AusZEH initiative, Mirvac's Harmony 9 home and Grocon's Pixel building), the properties of the building materials as the next step towards greater sustainability in buildings were explored. The coherent and well rounded program with local and international speakers covered a range of topics from carbon mitigation and the effect of the proposed Carbon Pollution Reduction Scheme to smart and alternative building materials. Chemical emissions from

building products, the recyclable house and prefabrication were just other few issues investigated at the event. One theme clearly emerged: the consensus of all actors in the industry on the key role of Life Cycle Assessment in the decision making process. An early design and decision making tool for building materials was called for and the Centre for Design's Building Materials Assemblies Scorecard (BAMS) was mentioned several times.

Running the conference as a webinar for the first time this year added to the success of the event. "The conference was great! I was very impressed with how well the online participants were integrated into the conference," exclaimed an online participant from NSW. Thanks to the RMIT technical team, the conference was thus able to reach interested parties all over Australia while reducing its footprint significantly.

We should also like to thank the conference sponsors, the Australian Government Department of the Environment, Heritage, Water and the Arts (DEHWA), Sustainability Victoria and the Heritage Council for their generous support.

If you have missed the conference and should like to purchase the handbook and proceedings of the Green Building and Design conference 2009, please contact Nicola at nicola.willand@rmit.edu.au.



Climate Change and Social Context

Sustainability Precincts Knowledge Bank

Sustainability Victoria (SV) is currently running two programs under the general title of *Sustainable Precincts* which encourage the development of more sustainable precincts and communities. The programs called *Smart Energy Zones*, support projects that demonstrate innovative demand and supply side energy solutions, and *Zero Emission Neighbourhoods*, which showcase innovative water, waste, transport and energy solutions.

As part of this initiative the Centre for Design is developing a Knowledge Bank which will include research reports, case studies, fact sheets, service providers and links. This material will provide SV's partners within planning, industry and government with the information, expertise and resources necessary to:

- Encourage the development of more sustainable precincts and communities;
- Promote good practice communities; and
- Improve the uptake of sustainable practices in urban development.

The project will last for one year and at present is in the scoping stage. This includes a literature review and meetings with SV staff and representatives of the client groups to ascertain the types of item which will be required in the resource.

For further information please contact Ralph Horne: ralph.horne@rmit.edu.au.

Carbon Neutral Communities

The research team of the Carbon Neutral Communities (CNC) project is currently analysing data from household interviews and practitioner workshops that were conducted during the last few months. The findings from these will be used to advance the 'CNC framework' which has been developed from a literature review and a desktop analysis of programs promoting energy conservation and efficiency largely through approaches to behaviour change. The results of the data collection will help to refine the framework and to develop potential steps for an implementation of the framework into actual programs.

The interviews and workshops have concentrated to a large part on social practices of households and the project team is aiming to understand to what extent a practice approach can assist rendering behaviour change programs more effective. First findings from this phase of the project will be presented end of November at the Asia-Pacific Science, Technology and Society Network Conference 2009 in Brisbane.

For further information please email: annette.kroen@rmit.edu.au

Landlord Research

The Victorian Government has contracted CfD to undertake research into the drivers, attitudes and barriers to 'green' investment by landlords of private rental properties in Victoria.

Stage 1 of this research is now complete; during this qualitative component, a series of interviews were conducted with landlords and real estate agents to explore their approaches to property management and upgrading. Outputs of Stage 1 include a background paper, which summarises the private residential rental sector and the issues associated with environmental upgrading of the existing stock including the legislative, taxation and policy frameworks within which private rental housing is provided; and a draft report on the data collection and analysis.

CfD has now commenced preparatory work on the second stage of research, which will involve a large-scale quantitative study to validate and expand upon the findings of the initial qualitative research.

For more information about this project please contact: Ralph.Horne@rmit.edu.au or Anna.Strempel@rmit.edu.au.

Greener Houses, Growing Greener Neighbourhoods Project

CfD has been contracted by the North East Neighbourhood House Network to evaluate its *Greener Houses Growing Greener Neighbourhoods* (GHGGN) project. The GHGGN project is funded by Sustainability Victoria through the Sustainability Fund.

The project aims to turn five neighbourhood houses into 'EcoLiving' demonstration centres, through which the communities that use and visit the houses can learn about sustainable living. Teams of 10-15 volunteers based at each neighbourhood house are learning about sustainability through training sessions and experiential learning, and are developing retrofit plans to improve the buildings' environmental performance. Over the coming months, volunteers and project staff will work with neighbourhood house managers and local government to implement the retrofit plans.

The CfD will evaluate two components of the GHGGN project: the retrofit and volunteer programs, as follows:

1. *Building retrofit program*
CfD staff will conduct pre- and post-retrofit sustainability assessments for each building, using the new Green Loans Home Sustainability Assessment tool (developed by the CfD for the Australian Government). This part of the project will also include bill data analysis, to monitor any changes to energy and water use resulting from the GHGGN project.

Climate Change and Social Context

2. *Volunteer program*
This component of the evaluation project will explore the effectiveness of, and document the learnings from, the recruitment, training and ongoing participation of volunteers in the GHGGN project. In addition, the CfD will assist GHGGN project staff to develop a framework for documenting the strategies and processes employed to deliver the project.

For further information on the GHGGN evaluation project please contact Anna Strempel anna.strempel@rmit.edu.au

Urban Infrastructure

'The Practice of Going Green': Empirical research on households who renovate to improve the environmental performance of their home

Undertaking home renovation is often complex and traumatic, but remains nonetheless a ubiquitous phenomenon amongst homeowners. Home renovators who wish to reduce the environmental impact of their home encounter further layers of complexity. Increasingly, opportunities to improve a dwelling's environmental performance are perceived to present themselves in the course of major home renovation projects, giving rise to what we argue is a new actor group: 'green renovators'. During extended interviews and walk-through tours of their dwellings, 16 self-identified green renovators in Melbourne discussed their ideas and concerns about energy and water use; their planned, current or recent renovations; and their daily practices and routines. The study is now in the final stages of write-up, with two journal articles currently in draft form. Findings recently presented at the Australian Institute of Geographer's Conference in Cairns revealed that undertaking a 'green renovation' involves added complexity and negotiation with building industry professionals and that 'green renovators' have adopted a more vocal position than conventional home improvers, yet their practice remains largely conventional.

The research has led to a detailed focus on embedded household practices that involve energy and water use, such as washing, cleaning and eating. The project will continue along these lines in 2010, with the specific inclusion of households from diverse cultural backgrounds.

For further information, please contact Dr Cecily Maller: cecily.maller@rmit.edu.au

Urban Infrastructure Symposium: A conversation amongst researchers

The Urban Infrastructure (UI) Programme of RMIT's Global Cities Institute held a symposium exploring various issues relevant to global cities, including the material geographies of households, urban transport and policy, and sustainability of the urban built form on the 11th September, 2009. A number of presentations were given at the Melbourne campus by UI researchers funded through the 2008 Seed Fund Programme, followed by a lively discussion amongst presenters and audience members. Presentations included:

- *Dr. Ruth Lane, Senior Lecturer, Global Studies, Social Science and Planning - Infrastructure and the Reuse of Household Goods*
- *Assoc. Prof Ralph Horne, Director, Centre for Design, Leader GCI Urban Infrastructure Programme - Households, Home Improvements & Sustainability*
- *Dr. Guy Johnson, Research Fellow, Global Studies, Social Science and Planning - Homelessness: An Overview of Current Projects*
- *Dr. Prem Chhetri, School of Management - A Large Scale Urban Model: Challenges & Future Directions*
- *Assoc. Prof Chris Hudson, School of Media and Communication - Urban Development & New Spatial Practices in Chongqing*

For further information, please contact Associate Professor Ralph Horne: ralph.horne@rmit.edu.au

Life Cycle Assessment



Life Cycle Assessment course – 25th and 26th November 2009

Life Cycle Assessment is an internationally recognised approach to evaluating the potential environmental impacts of products and services. LCA looks at environmental impacts from raw materials extraction and processing through to end-of-life. The application of life cycle thinking is a fundamental approach when considering sustainability and its relationship to production and consumption. An LCA can be done at many levels - from small LCA projects completed in less than one day to provide internal advice on a design project; through to detailed public studies that may take up to 12 months to complete.

The Centre for Design's next two-day LCA Introduction course is being held on Wednesday November 25 and Thursday November 26. The LCA course is a detailed introductory course starting from the basics of LCA and then providing participants with practical experience. Participants have the opportunity to work with LCA and gain an appreciation for the major methodological issues to be worked through when reading, reviewing or undertaking LCA. For further information and to enrol, please go to: <http://www.shortcourses.rmit.edu.au>.

Aluminium Can Group LCA

The draft report for the Aluminium Can Group LCA project has been completed and will be reviewed shortly by the peer review committee. The report details an updated life cycle inventory for an aluminium can, and also compares the can to other similar packaging formats (glass and PET) across their respective life cycles. The project has been supported by interested stakeholders, with updated figures being supplied for each stage of aluminium production, from the extraction of bauxite and the production of alumina through to the manufacture of the can sheet. The can manufacturers have also provided information relating to the formation and delivery of the can. The intention of the study is to provide the updated life cycle inventory dataset for an aluminium can manufactured in Australia.



The document will be able to assist with internal decision making and provide consumers with information regarding the environmental profile of each of the packaging materials. The study is also intended to be communicated to researchers, consultants, packaging manufacturers and members of the public with an interest in LCA and sustainability.

For further information, please contact Andrew.Carre@rmit.edu.au.

Australian Dental Association literature review

The Dental Association of Victoria approached the Centre for Design to determine the feasibility of switching from standard petro-chemical based plastics used in dental practices to biodegradable plastics. After initial discussion and scoping, it was decided to conduct a literature review focussing on the differences between both types of plastics, in particular, the respective environmental impacts of each. The study was intended to help the Australian Dental Association consider the environmental impacts of a potential change from petro-chemical based plastics to biodegradable starch based plastics.

From a strictly environmental assessment perspective, the studies found that biodegradable plastics were fairly comparable to their petrochemical based alternatives; however there were various factors that were found to influence the results (including practices and process methods in manufacturing and end of life scenarios). In most cases there was not a clear difference between the two options when being assessed against the specific criteria. The Dental Association will be able to use the document for guidance on issues relating in part to their sustainability strategy.

For further information, please contact Andrew.Carre@rmit.edu.au.

Sustainable Products and Packaging

Areli Avendano's PhD update



Areli's PhD research "Investigating the role of design for packaging sustainability within the food and beverage industry", has reached the final stages and it is expected to be submitted by January 2010. A major assumption of this research is that design professionals do have a role in actualising 'sustainability' through their practice; yet, a fundamental review of the design thinking process is needed.

Through a series of interviews conducted among those involved in the packaging design process currently undertaken within the packaging industry as well as design experts, the role of design is discussed from a 'sustainability' point of view. This allowed for a better understanding of how the packaging solutions are generated as well as identifying essential requirements and trade-offs in the process.

The research outcome takes the form of a critical reflection of which essential transformations are required in both the design thinking processes and practice as well as in the industry context to effectively move from 'green' solutions to ones that are the result of an exhaustive understanding of the implications of what is "designed".

'Integrating Sustainability' workshop

Stephen Clune, Simon Lockrey and Andrew Carre presented a hands on workshop 'Integrating Sustainability' to an audience of Melbourne business owners and managers as part of Design Victoria's Design Ready program.

The workshop was well received and focused on demystifying sustainability for business owners and managers. Sustainability is a term that has received unprecedented use in recent times, but the term is a source of confusion for some, and engaging with 'sustainability' in daily business practices requires clarification. The seminar positioned the various ways businesses may engage within the field of sustainability with integrity and in easy to comprehend terms. The workshop was supported by a range of best practice case studies drawing on the Centre for Design's extensive experience in the field of sustainability.

The Centre for Design presented a series of tools and strategies to enable a move from the rhetoric surrounding sustainability to informed action. Tools and strategies introduced include Input-Output analysis, to assist in framing a sound problem definition of 'un-sustainability'. As well as factor ten, MIPS (material Intensity per unit of service) and whole-systems-thinking which when matched with creative thinking, afford informed decisions making to move towards sustainability in both product development and business operations.

For more information on the content of the seminar please contact:

Stephen.Clune@rmit.edu.au or
Simon.Lockrey@rmit.edu.au.

Resources Online

Centre for Design at RMIT <http://www.rmit.edu.au/cfd>

Greenfly <http://www.greenflyonline.org/>

The federal government Green Loans program: www.environment.gov.au/greenloans

Staff @ CfD

Featured below is an existing member of the team, Nicola Willand, and a new addition to the Sustainable Products and Packaging team, Simon Lockrey:

Nicola Willand (Research Officer, Sustainable Built Environment)

Nicola joined the Centre for Design in 2007 as a Research Officer to work on various projects in the sustainable built environment group. Since then she has been leading the development and management of the Centre for Design's annual Green Building and Design conference. She has also been involved with research projects on eco-labels, energy and water efficient household behaviour, business planning incorporating sustainability and postgraduate course development for the RMIT School of Property, Construction and Project Management. She has a strong interest in the sustainability of building materials and environmental psychology.

Nicola is an internationally experienced and resourceful architect and energy consultant with a strong practical interest in sustainable design. During her studies at the University of the Witwatersrand, South Africa, she worked for the German Gesellschaft für Technische Zusammenarbeit (GTZ) on a squatter camp restructuring project in Dakar, Senegal, and in an architectural company in Tokyo, Japan. She has practiced her profession for 6 years in Johannesburg, South Africa, and Freiburg, Germany, where she was the leading designer in a multi-unit residential building in the Rieselfeld district, an internationally renowned sustainable neighbourhood development.

In 2006 she was accredited as a BAFA (Bundesamt fuer Wirtschaft und Ausfuhrkontrolle) energy consultant.

Before moving to Australia she ran her own architectural practice near Wiesbaden, Germany. Her projects explored energy-efficiency in the residential sector, integrating the most recent and economically viable technologies. Her own home, a low energy house in which she demonstrated these initiatives, won acclaim when it was selected for the "Tag der Architektur 2003", a day on which buildings of architectural merit are opened to the public. She published newsletters on natural insulation materials and on 'passive houses', and held a seminar on retrofitting of existing residential buildings according to the German energy rating system.

Nicola has been a judge for the Banksia Environmental Awards for the last three years.

Simon Lockrey (Research Fellow, Sustainable Products and Packaging)

Simon has recently joined the Sustainable Products and Packaging team at the Centre for Design as a Research Fellow. He has worked as a Product Design Engineer both in Australia and Europe for almost a decade. His work has crossed a large range of industries including consumer, medical, packaging, furniture and industrial products, with positions based at design consultancies, leading commercial interior furniture manufacturers, and multinational appliance companies. The products he has designed have been both 'small run' and 'mass produced', and his roles have covered all stages of the design process. He has utilised a plethora of materials and processes, in both design and manufacturing environments. The Dyson DC31 handheld vacuum is a recent example of Simon's work.

He comes to the Centre primarily focused on bringing practical experience to sustainability projects. He aims to engage industry, manufacturers and wider community sectors through research into sustainable product design principles.

