University of South Australia

Barbara Hardy Institute

Research Report

2011

Great Research into Sustainability

Foreword

The Barbara Hardy Institute was formally created in 2011. The institute, like many institutes before it around the world, was not created in a vacuum. The catalyst for its formation was the recognition that there was a great deal of important research in the area of *sustainability* within the Division of Information Technology, Engineering and Environment and, more widely, at the University of South Australia. Researchers had formed into various research concentrations, including centres and institutes (and centres within institutes). Over the past 15 years there has been growing local, national and international recognition of these researchers and the university, in areas including sustainable energy, transport systems, urban ecology, planning and construction, sustainable agriculture, mathematical modelling and education in sustainability. The creation of the Barbara Hardy Institute has enabled all these diverse topics in the *science of sustainability* to be drawn together, to create a focus in the area and, most importantly, to interact with each other.

The institute was officially launched on November 30th. At the launch we demonstrated our overt commitment to multidisciplinary research, linking our researchers and producing large-scale projects, with new initiatives to harness and build on our research strengths. As an example of our collaborative approach we released the book '*Creating Sustainable Communities in a Changing World*', the summation of the research of the institute's leading scholars. We also announced new Icon Projects that bring our researchers together, with external collaborators, to help create a sustainable future.

This 2011 Research Report is the summation of all the research activity of the members of the Barbara Hardy Institute in its formative year. It demonstrates that the institute is a powerful collection of scientists and researchers with a commitment to a wide range of research topics, methodologies and approaches. We are passionately committed to developing the next generation of researchers by supporting and supervising students in many PhD programs across the university. We release our research findings through many avenues, including books, research journals, conferences and popular media. The institute is funded from a diverse array of sources and is growing through the development of new projects and the recruitment of new members. Through our research we are actively engaged with both the scientific and academic communities on the one hand and government, industry and the wider community on the other.

The 2011 Barbara Hardy Institute Research Report is, therefore, more than a catalogue of research outcomes. It is the foundation document for an institute which will continue to grow and develop, supporting the research of its members and large-scale projects that will impact the world. Therefore, the report is both a measure of achievement and a springboard to greater things. I consider myself to be most fortunate to participate in such an important and exciting venture.

Prof. Chris Daniels
Institute Director

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Our mission...

...to provide leadership in research and engagement with industry, government and communities to create integrated structural, technological and behavioural solutions for sustainably managed communities and natural environments.

1. Executive Summary

The Barbara Hardy Institute is one of six research institutes at the University of South Australia, with researchers from many disciplinary backgrounds. As an institute, our research is focussed on the sustainability of our communities. A multidisciplinary approach utilises the different skill-sets and methodologies of our scientists, engineers and social scientists. Our research is strongly aligned with the university's recognised areas of research strength.

2011 was a year of transformation with the establishment of the Barbara Hardy Institute through the merger of the *Institute for Sustainable Systems and Technology* and the *Barbara Hardy Centre for Sustainable Urban Environments*. The new institute was officially launched in November, showcasing our research to over 400 invited stakeholders. Our research philosophy has been firmly grounded in a project-based approach, driven by our researchers. We established programs of large-scale Icon Projects and targeted Foundation Programs, with a re-organised administration team to direct and support the growth of the institute around research quality, quantity, scale, focus and impact.

In 2011 we laid the groundwork for many future projects. For example, the institute was involved in the formation of two new Cooperative Research Centres (CRCs). The *CRC for Low Carbon Living* and the *Automotive Australia 2020 CRC* will see over $1million of additional research income for the institute per annum for seven years. Our first Icon Project commenced in collaboration with the *Zero Waste Centre of Sustainable Design*, based on building technologies for sustainable urban densification. We also began the development of a dedicated *Contract Research and Consultancy Unit* to build on our extensive and sought-after technical and advisory services for industry.

As a world-class institute that demonstrates relevance, excellence, engagement, innovation and reputation, the Barbara Hardy Institute is well poised to develop our 'young', energetic and committed members into the next generation of researchers and leaders. In 2011 our researchers continued to do what they do best… ***great research into sustainability!***

1.1 2011 Institute Snapshot

Membership	
Full members	50
Associate members	21
Affiliate members	22
Professional staff	7
Administrative staff	4
Research students	134
TOTAL	**238**

Publications	
Books	3
Edited books	2
Book chapters	35
Refereed journal articles	65
Refereed conference papers	48
Other publications	4
TOTAL	**157**

Income	
Australian Competitive Grants	$1,019,000
Other public sector grants	$665,000
Industry and international research income	$337,000
CRC income	$286,000
Consultancy income	$315,000
Other internal and external income	$768,000
TOTAL	**$3,390,000**

2. Introduction: Why have an Institute?

Research concentrations provide scale and focus for the research effort and output of the University of South Australia (UniSA) and support the research of UniSA's best researchers. The university is recognised for its research links with industry and the application of knowledge to solve contemporary problems. Research and research education takes place within a cohesive structure under well-defined policies and procedures guided by an international best-practice framework. UniSA's research concentrations strategy (ReNEW) guides the development of research concentrations to focus research strengths and support researchers.

The most significant of the university's research concentrations are its institutes, of which there are six. The institutes are based within, and supported by, university divisions. Most of the members of the Barbara Hardy Institute are from the Division of Information Technology, Engineering and Environment (ITEE), however, the institute includes members from several other divisions (see Section 5: Membership). Institutes also interact with university schools (the primary teaching units), through frameworks of cooperation, to develop the teaching-research nexus.

2.1 What the University wants from an Institute

The university expects each of its institutes to deliver outstanding research in its area of expertise. Scale and focus varies from institute to institute depending on each particular mission, structure and membership. However, a world-class institute must demonstrate:

- **Relevance**

  The mission of an institute must align with the core research strengths and approaches of the university and its host division. The recent Excellence in Research for Australia (ERA) review of research has identified areas of research strength within UniSA that are at or above world-class standard. The ERA review also identified areas of research within UniSA with the potential to become world class. Institutes need to support and develop both the recognised and potential areas of strength to support and enhance the focussed growth of UniSA's research profile.

- **Excellence**

  An institute must be able to demonstrate that its research is of the highest standard. Demonstrating excellence can be through (but not limited to) attracting prestigious grants and awards, publishing in the very best journals, attracting world-class researchers to the institution, and creating high-value patents and intellectual property.

- **Engagement**

  An institute needs to support and engage its membership to energise their research effort. It must also engage and attract external stakeholders with real world problems and issues. An institute must deliver its research to the wider community (including government, industry and the general audience) to enable its research discoveries to be rapidly implemented.

- **Innovation**

  An institute must produce research that is clearly recognisable as new, different, and exciting. Research can be innovative by demonstrating new methodologies (including multidisciplinary approaches), tackling new or unsolved problems, and by engaging partners and stakeholders who might otherwise not participate in university-driven research.

- **Reputation**

  The name of an institute must be recognised locally, nationally and internationally for its excellent research in a recognised field. A reputation for supporting and conducting outstanding research in a designated field of strength within the university will help attract outstanding researchers, research partners and finance for research, thereby growing UniSA's reputation for undertaking outstanding research and development.

2.2 What the University wants from the Barbara Hardy Institute

From the perspective of the Barbara Hardy Institute, the university also expects:

1. A clear focus of activity;
2. Credibility as indicated by well-cited academic outputs;
3. Visibility and a high profile within government, industry and community;
4. Global networks to attract new researchers and research support;
5. Strong engagement and investments with stakeholders to deliver research outputs;
6. Sustained growth in grants, external income and all forms of peer acknowledgement;
7. Visionary leadership demonstrating scale and focus;
8. Recognition and fostering of emerging talent;
9. A vibrant internal culture; and
10. Open accountability.

The university also expects the institute to build on its strengths and those of the Division of ITEE and the university itself. The strengths of the Barbara Hardy Institute are:

- **Multidisciplinary membership**
  Members from 11 schools/units (see Section 5: Membership) across the university provide outstanding opportunities for multidisciplinary projects and growth in many areas of research around sustainability.

- **Institutional commitment**
  The institute is supported financially by the university, through Research and Innovation Services (RIS), and the Division of ITEE. Institutional support is also provided through various administrative units, including: Finance, HR, Marketing and Development, Facilities Management, Information Strategy and Technology Services, Enterprise Development (ITEK), UniSA International, and the Graduate Research Centre.

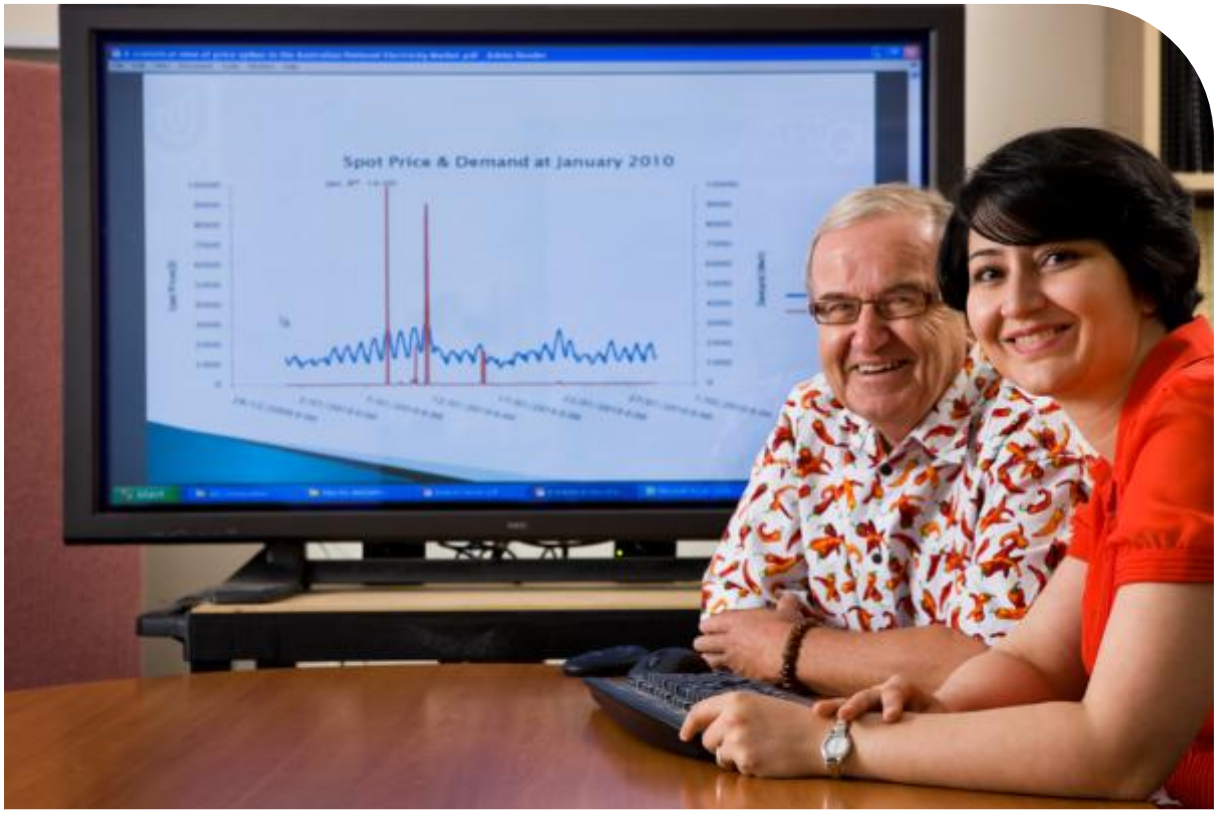
- **Stakeholder support**
  The research of the institute is focussed on real-world problems, tackled in partnership with government, industry and NGOs, locally, nationally and internationally. This *partnership* approach to tackling practical problems is the standout characteristic of this institute.

2.3 What an Institute gives its University and its Members

The Barbara Hardy Institute must provide support, encouragement and opportunity to its members to develop their research activities, profile, quality and quantity of research within the focus and mission of the institute. As a recognised leader of research into sustainability, the institute provides opportunities to:

- Conduct globally significant research;
- Collaborate internally, nationally and internationally;
- Engage stakeholders and build partnerships;
- Attract investment and recognition;
- Produce research involving its members that is beyond the scale possible for individuals or small groups to achieve;
- Engage in multidisciplinary research projects;
- Enable members to increase their intellectual and technical skill sets;
- Build on research strengths with collaborators and research students; and
- Work collaboratively to improve research facilities and equipment.

The institute provides administrative support for its members, including assistance with HR, financial and project management, as well as marketing support. Moreover, the institute provides targeted funds and mentoring through its Foundation Programs (see section 3.5) to assist members in securing grants, career development, research student supervision and disseminating their research. Membership of the institute, and, in particular, taking on leadership roles, provides opportunities for career advancement and promotion.



2.4 History: Building an Institute

The Barbara Hardy Institute was not created at a single point in time for a specific reason. Rather, the institute has grown and developed from a number of previous organised research groups that undertook research into various aspects of sustainability. The timeline provided below gives a history of the development of the antecedent research concentrations.

1984 The Agricultural Engineering Research Group was formed by Director Terry Riley and John Fielke and in 1986 was renamed the Agricultural Machinery Research and Design Centre. The group evolved out of a need in industry for quality research and development into the engineering aspects of agriculture and the processes of adding value to agricultural products.

1992 The Transport Systems Centre was formed with Director Michael Taylor. The centre focused on strategic and applied research, consultancy, and postgraduate and undergraduate teaching, seeking long-term solutions to problems of transport and logistics.

1993 The Centre for Building and Planning Studies was formed with Director George Zillante. The centre was established to provide resources and opportunities for research into the planning, design and development functions of government, industry and community. It also developed an expert advisory consultant service to the building and planning industry.

1995 The Centre for Industrial and Applied Mathematics was formed with Director Jerzy Filar. Its focus was specialist mathematical research and consulting, with an emphasis on mathematical and computer modelling techniques.

1996 The Sustainable Energy Centre was formed with Director Wasim Saman, with an emphasis on developing and promoting systems and technologies which contribute to climate change mitigation and adaption. It focused on energy demand-side management and renewable energy applications.

2002 Leaders of the centres started planning to form a research institute.

2003 The Institute for Sustainable Systems and Technologies Initiative was formed through the University of South Australia Emerging Thematic Priorities Scheme. The leaders were Michael Taylor (2003) followed by Wasim Saman and Jerzy Filar (2004-2005).

2006 The Institute for Sustainable Systems and Technologies (ISST) was launched, incorporating the centres. The founding Director was Wasim Saman.

2007 The Centre for Building and Planning Studies joined the Institute for Sustainable Systems and Technologies.

2009 The Barbara Hardy Centre was formed with Director Chris Daniels. It was focussed on the sustainability in cities, the conservation of biodiversity and the maintenance of the natural processes that sustain life. Centre research was underpinned by community participation and education.

2009 Michael Taylor was appointed Director of the Institute for Sustainable Systems and Technologies.

2009 The Regional Sustainability Centre, located at Whyalla Campus, was formed as part of the Institute for Sustainable Systems and Technologies, with Director Farid Christo. Establishment of the centre was in response to a projected increase in demands for energy and water resources in regional South Australia.

2010 The Centre for Industrial and Applied Mathematics formed another research concentration with Director Vladimir Ejov with some members remaining within the Institute for Sustainable Systems and Technologies.

2011 Launch of the Barbara Hardy Institute, November 30th, Adelaide

In 2011 the Barbara Hardy Centre amalgamated with the Institute for Sustainable Systems and Technologies, forming the Barbara Hardy Institute, with Chris Daniels as its Director. The Barbara Hardy Institute was officially launched on November 30th in the Adelaide Hilton's Grand Ballroom. The launch highlighted the institute's activities in research, education and community engagement. It was also the culmination of many months of work by institute members who contributed to:

- A multidisciplinary book about sustainability, *Creating Sustainable Communities in a Changing World* (see section 6.4: Publications);
- A video about sustainability and the institute, at: unisa.edu.au/barbarahardy/video; and
- A new website, at: unisa.edu.au/barbarahardy.

The event was in three sessions: two sessions of symposium presentations and then a final session including the video launch and an industry presentation. It showcased our research to over 400 invited stakeholders.

2.5 Our Patron: Dr Barbara Hardy AO

The mission, aims and goals of the Barbara Hardy Institute reflect those of its patron, Dr Barbara Hardy AO. Barbara is an inspirational advocate for the natural environment and sustainable living. Since the early 1970s, she has championed a multitude of environmental and educational initiatives. She has been a Commissioner of the Australian Heritage Commission, President of the National Parks Foundation of South Australia (now the Nature Foundation SA), Founding President of the Investigator Science and Technology Centre and Chairperson of the South Australian Landcare Committee among a number of other roles.

Barbara Hardy holds a science degree and two honorary doctorates. She was appointed an Officer of the General Division of the Order of Australia (AO) in 1987 and has received numerous awards, including: the Advance Australia Award 1991, SA Great Award 1992, Institution of Engineers Medal 1992, ABC Eureka Award for the Advancement of Science 1994 and was named South Australian Citizen of the Year in 1996. She is now a Companion of the Institution of Engineers Australia and a Fellow of the Australian Institute of Energy.

Barbara has a long and valued association with the University of South Australia. She was a founding board member of the Institute for Sustainable Systems and Technology from 2006 to 2009 and in 2009 became patron of UniSA's Centre for Sustainable Urban Environments: The Barbara Hardy Centre. In 2011, Barbara became patron of the Barbara Hardy Institute. Through our research, the institute champions her vision for the 'widespread adoption of sustainable principles and environmentally correct practices'.

3. Structure of the Institute

During 2011 the institute was restructured (Figure 1). The new structure was developed to help support research and to achieve its mission, recognising that the institute must:

- Have a clear and transparent strategy for growth;
- Have a culture and research profile that identifies and knows its strengths and limitations;
- Use internal funding to support research growth;
- Deliver **multidisciplinary large-scale research projects** from within the Barbara Hardy Institute with allied organisations; and
- Develop programs that assist its members with their research growth and activity.

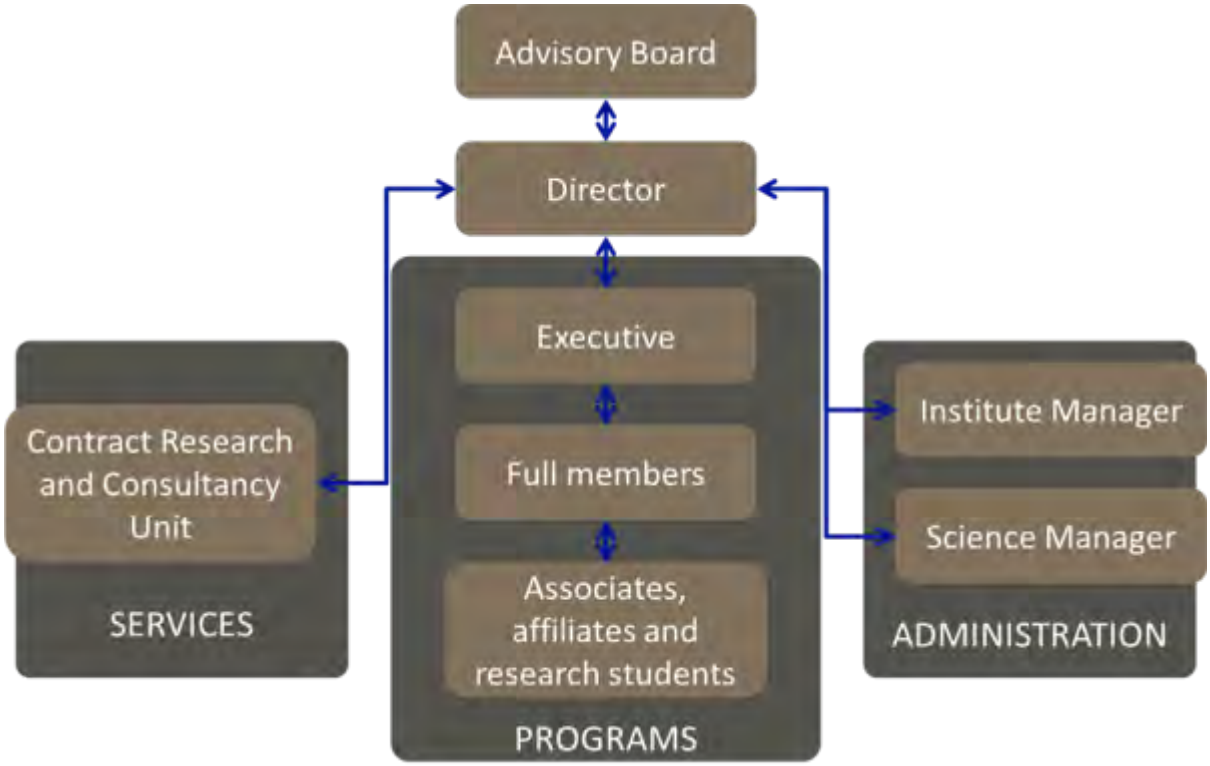


Figure 1. Organisational structure of the institute.

3.1 Administration

3.1.1 Institute Manager and Administration Team

The restructure of the institute has required changes to the roles of the administration team. Previously, the team was distributed across two campuses (Mawson Lakes and City East) to provide personal assistants and secretarial support for the leaders of the initial founding research groups. All staff are now located at Mawson Lakes to co-ordinate the activities of the institute as a whole. They operate as a team, performing necessary administrative duties and providing support for Foundation Programs, Icon Projects, and other cross-institute activities like symposia and publications.

Institute Manager

Duties include: daily operation of the institute and overall management of the administration team, OHSW, strategic budgeting, management of institute finances, and approvals for expenditure including travel, as well as liaising with HR for all employment needs. In future, the Institute Manager will be responsible for developing and operating the Contract Research and Consultancy Unit (see section 3.2) and for producing a Procedures Manual for the institute.

Senior Academic Services Officer

Duties include: assisting the Institute Manager with budgeting, finance and other operational and compliance duties; institute data collection and providing support to the Advisory Board and Executive meetings. In future, the Senior Academic Services Officer will also be responsible for website and social media content and support stakeholder engagement in Icon Projects.

Academic Services Officer

Duties include: publications collection, administration of visiting scholars, handling research student enquiries, casual contract requests and general administration. In future, the Academic Services Officer will have a greater role in the management of the institute's data management, including the membership database (Appendix 1) and administration of adjunct deeds and volunteer agreements.

Personal Assistant

Duties include: management of invoicing, financial administration (including credit card reconciliation and overall compliance), as well as reporting, communications and assisting the director as required. In future, the Personal Assistant will also be responsible for creating and updating institute flyers, brochures and posters in collaboration with the divisional marketing team.

3.1.2 Science Manager

As part of the institute's program to connect with stakeholders and the wider community, we have appointed a Science Manager. Duties of the Science Manager are to effectively display the institute's research to stakeholders and community and to assist institute members to effectively utilise a wide range of media to deliver their research. The Science Manager is responsible for: developing and maintaining the institute website and social media (see section 6.5.3), production of multidisciplinary publications (e.g. *Creating Sustainable Communities in a Changing World*), event management (e.g. symposia and launches), development and implementation of practical engagement activities (e.g. *Be a Beachcomber*, with DENR and the SA Museum), and managing book sales (951 sold during 2011). Where appropriate, the Science Manager also acts as spokesperson for the institute in the media. In future, the Science Manager will be responsible for disseminating the results of Icon Projects through a range of publications and media.

3.2 Contract Research and Consultancy

The Barbara Hardy Institute runs extensive and sought-after technical and advisory services for government and industry. A significant amount (about 33%) of our research activities and 22% of our income are devoted to contract research, consulting, testing and evaluation. In 2011 we began the process of developing a *Contract Research and Consultancy Unit* to streamline the administration of this work. Many of our researchers conduct this kind of work. Some of our strengths are:

The Sustainable Energy Industry Support Centre

We provide independent advice, physical testing, product development and computer modelling. Researchers are working on projects to commercialise solar heating and solar cooling systems.

The Regional Sustainability Centre (Whyalla)

We work closely with regional industries and communities on developing practical solutions and strategies for sustainable management and utilisation of resources, such as energy, water and waste.

The National Laboratory for Transport Network Analysis (NLTNA)

We have state-of-the-art computer hardware and software products for traffic simulation, transport network modelling, signalised intersection design and analysis and related urban traffic issues.

Engineering for Sustainable Agriculture

We undertake research and development in mechanisation and cleaner production processes for agriculture and related industries.

3.3 Advisory Board

Research concentrations at UniSA benefit greatly from advisory boards that assist in their development. These boards are comprised of relevant research leaders within the university and individuals from appropriate and relevant government and industry. Our Advisory Board is appointed by the Pro Vice Chancellor of the Division of ITEE. The Advisory Board meets at least four times per year. The 2011 board consisted of:

- Mr Richard Thomson (Chair, external);
- Mr Martin Thomas (Former Chair, external);
- Mr Mark Goldsmith (external);
- Mr Alan Branch (external);
- Prof. Barry Brook (external);
- Prof. Caroline McMillen (Deputy Vice Chancellor & Vice President: Research & Innovation);
- Prof. Andrew Parfitt (Pro Vice Chancellor: ITEE);
- Prof. Jill Slay (Dean of Research: ITEE); and
- Prof. Chris Daniels (Institute Director).

3.4 Executive and Foundation Programs

The Barbara Hardy Institute is managed by an Executive group chaired by the Institute Director. The Executive has permanent members with defined responsibilities and also includes the champions of institute Icon Projects (see Tables 1 and 2). The Executive represent and champion the Barbara Hardy Institute both internally and externally. The Executive meets monthly.

The roles of the Executive are to:

- Co-ordinate and manage the strategic and operational plans of the institute;
- Undertake a specific role within the institute:
    - Liaise with a specific school to promote the teaching-research nexus; and/or
    - Take responsibility for the conduct of a specific Foundation Program.

We have developed six Foundation Programs to address the most important internal benchmarks for the Barbara Hardy Institute:

- Increases in research income (particularly in Categories 1 and 4);
- Increases in high-quality publications;
- Increases in membership;
- Improvement in the recruitment of excellent research students;
- Improvement in facilities to enhance research;
- Expansion of multidisciplinary, Icon Projects; and
- Engagement with schools.

Also, as a developing research concentration, the majority of the Barbara Hardy Institute's members are relatively junior in terms of their research career. The institute has a number of emerging leaders and talented junior researchers. Hence, the Foundation Programs are designed to support researchers individually and to encourage collaboration (Table 1). The programs are developed under the supervision of a senior and successful academic from the institute.

Table 1. Foundation Programs	
Program	**Executive member**
Category 1 and 4 funding development	Wasim Saman
Early career and associate researcher development	Rocco Zito
Fellowships and internationalisation	Farid Christo
Teaching-research nexus and attracting research students	John Fielke
Public profile	Chris Daniels
Facilities and infrastructure	George Zillante

Table 2. Additional Executive responsibilities	
Program	**Executive member**
Institute Director	Chris Daniels
Institute Manager	Susan Corbisiero
Icon Project Champions	John Boland Chris Daniels Steffen Lehmann Phil Weinstein
School liaison, School of Natural and Built Environments	Jon Kellett
School liaison, School of Advanced Manufacturing and Mechanical Engineering	Peter Majewski
School liaison, School of Mathematics and Statistics	Peter Pudney

4. The Philosophical Research Direction for the Institute

When considering the research philosophy that underpins an institute, there are a number of models to choose from. It is vital when selecting the operational model that the leadership consider the constitution of the membership, the breadth of research methodologies employed, the topics examined and the central core that binds the research into a meaningful unit. The Barbara Hardy Institute undertakes research into sustainability from a wide range of approaches and with many different methodologies. There are four models to choose from:

1. **Highly focused, single-topic driven**
   The members of the Barbara Hardy Institute and their diverse research areas do not support this type of highly focused philosophy. This approach could turn away many good researchers if they do not 'fit' within the chosen topic. Further, this approach does not encourage multidisciplinary research projects.

2. **Multiple topics of research, clustered into semi-independent groups that operate autonomously**
   This structure existed previously with the six research groupings (see section 2.4: History). With such a structure, silos can develop and it is difficult to establish multidisciplinary research projects. In addition, semi-independent groups often operate under strong leaders and it can be difficult for more junior members to receive opportunities to demonstrate their leadership skills.

3. **Top-down and topic-driven, where researchers fit into themes**
   This approach can create a strong institute if the leaders determining the research areas are internationally renowned, intimately understand all aspects of the field, and also generate high levels of funding to support the research. However, such a plan also requires most staff to change research direction and/or leave the institute because it does not offer the opportunities they particularly want. As a result good researchers can be lost.

4. **Project driven, determined by the research of its members**
   In this research philosophy the researchers themselves determine the projects and take responsibility for the funding and the conduct of their research. By opening up the institute around the very broad topic of 'sustainability' we can welcome all good researchers with an interest in the area and support quality research on any topic within the theme. It also encourages the natural formation of teams around the interests and opportunities discovered by the members. This approach in turn allows for initiative and the demonstration of leadership.

We have chosen Option 4 as our institute research philosophy.

4.1 A Project-Driven Ethos

For a project-driven philosophy to operate, it must have a few clear driving rules. These rules are:

- **A simple, shared vision: 'sustainability'**
  All projects must consider some aspect of sustainability.

- **Researcher-driven research, not topic-driven**
  The researchers themselves come up with the research projects from their own research areas. The projects must involve the best possible science.

- **Allows for different skill sets and methodologies**
  Multidisciplinary teams are encouraged (particularly for Icon Projects) especially across schools and even divisions. The institute will actively support good quality multidisciplinary research and also encourage all members to continually expand their intellectual and technical skill sets.

- **Foundation Programs: structural support to encourage and develop research capability**
  As a project-driven research philosophy is dependent on the research skills of the academics, the institute must put most of its resources into supporting the continual learning and improvement of its membership. Hence, the Foundation Programs are an essential supporting component to this philosophy.

- **Icon Projects: a plan to build research – quality, quantity, scale, focus and impact**
  Selected, competitive, high-profile, multidisciplinary projects will greatly increase the reputation of the institute. They will engage a large number of institute members and be constructed by the best researchers in the institute. Hence, winning and successfully conducting an Icon Project will be of enormous assistance in promotion and career advancement at the higher levels.

- **A tiered approach towards research**
  By grouping projects into low (3) and middle (2) 'tiers', research scale and focus can be managed and developed regardless of the topic. Icon Projects constitute the top tier (1).

- **Develop the next generation of researchers**
  The Barbara Hardy Institute has only a few very senior research leaders. A project-driven philosophy, supported by Foundation Programs to develop research skills, will aid in the internal development of the next generation of leading researchers.

5. Membership

The Barbara Hardy Institute has 238 members (Figure 2). Academic members are classified into three categories (according to the UniSA research concentration development strategy ReNEW). Accordingly, our membership is:

- **50 full members:**
  - Academics at UniSA who contribute at least 30% of their workload to research at the institute and have produced at least five research outputs in the last three years;
  - Early Career Researchers (ECRs); and
  - Research-only staff employed by the institute.
- **21 associate members:**
  - Members of other research concentrations who contribute to research at the Barbara Hardy Institute; and
  - Researchers who do not produce enough research outputs to be considered a full member.
- **22 affiliate members:**
  - Adjunct UniSA researchers aligned with the institute; and
  - External members who work in areas of direct relevance for the research concentration.

In addition, the institute has:

- **134 HDR research students** (higher degrees by research, e.g. PhD or Masters by Research);
- **7 professional and research support staff** (to avoid double-counting, two professional staff are not counted here as they are enrolled and counted as research students); and
- **4 administration staff**

Membership in the Barbara Hardy is primarily derived from ITEE but individual members also come from another 5 divisions/units (Figure 3). A total of 11 schools/units are represented (Figure 4).

Membership by member category

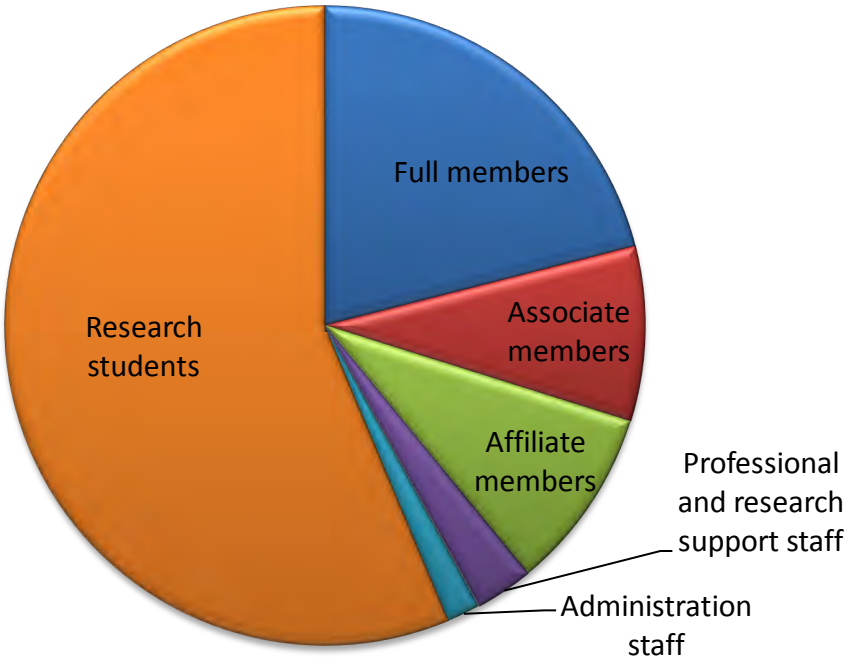


Figure 2. Membership by member category (using ReNEW categorisation).

Research membership by division

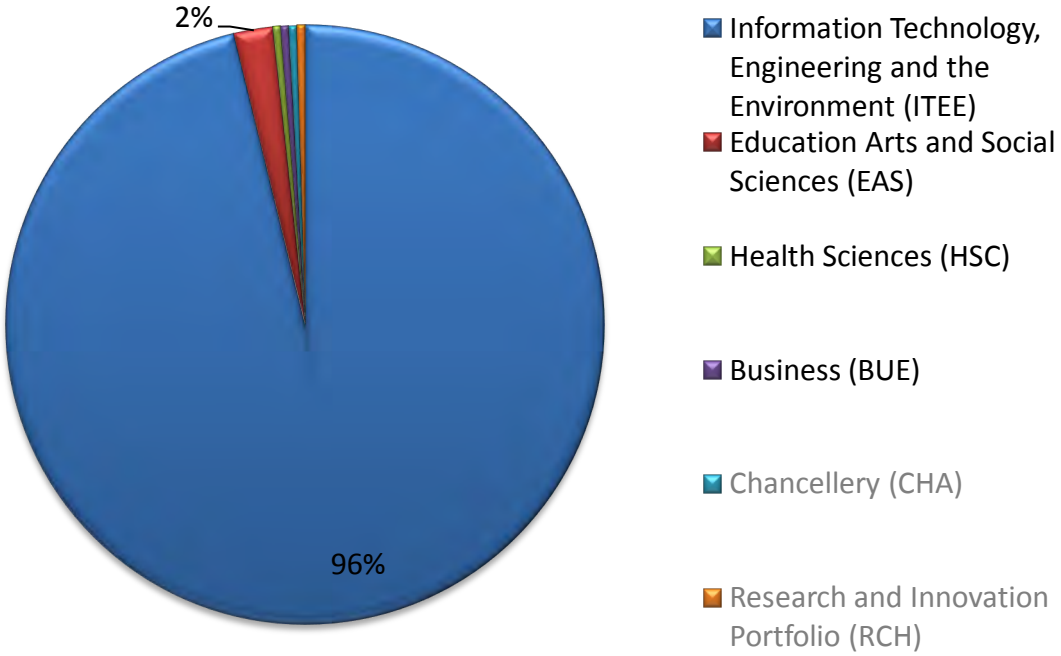


Figure 3. Research membership by university division (ITEE, EAS, HSC, BUE). Members from other units are included (CHA, RCH) in grey font.

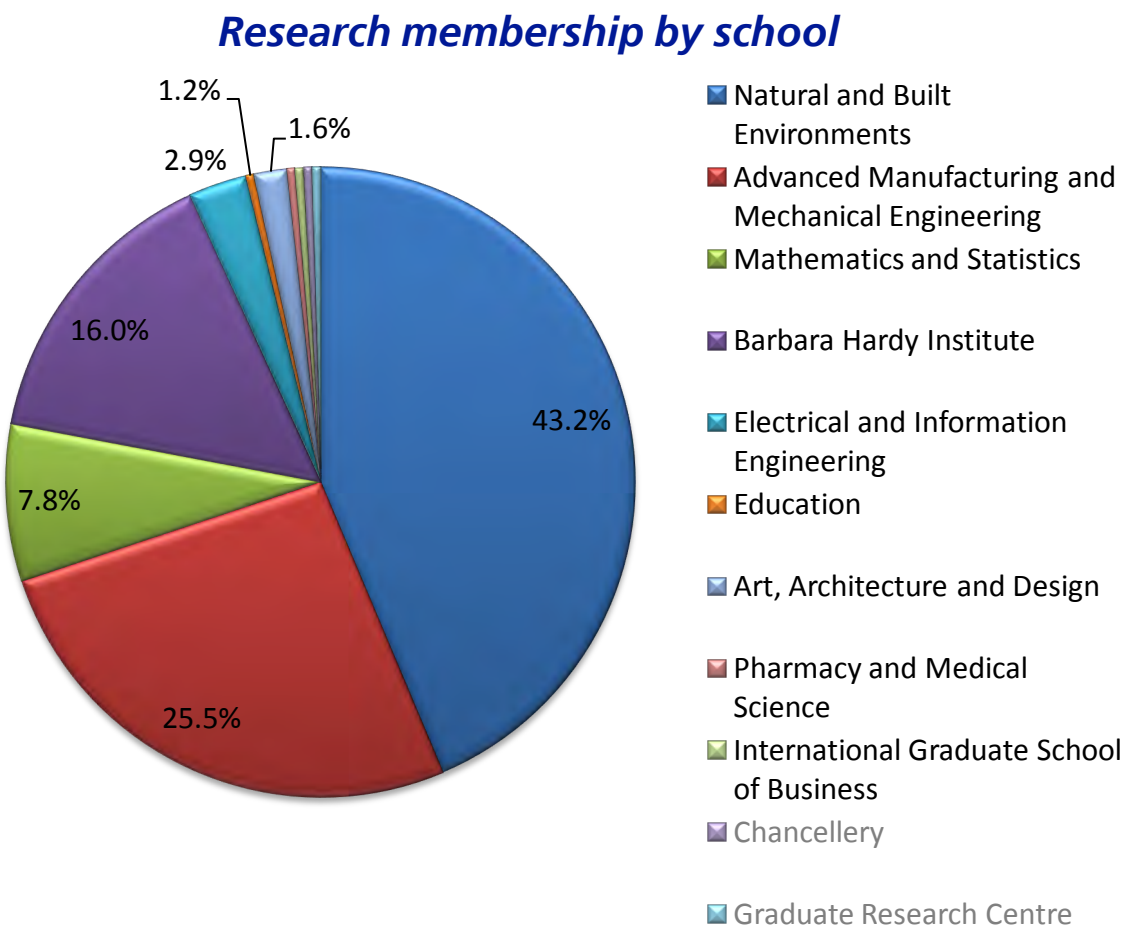


Figure 4. Research membership by university school. Members from other units are included (Chancellery and Graduate Research Centre) in grey font.

Table 3. Membership of the Barbara Hardy Institute researchers by division and school

Type	Division of Information Technology, Engineering and the Environment					Division of Education Arts and Social Sciences				Division of Health Sciences		Division of Business		Chancellery	Research and Innovation Portfolio	TOTAL
	NBE	AME	MAT	BHI	EIE	CIL	EDS	EOR	SLL	HLS	PMB	CMR	GSB	CHA	GRC	
	School of Natural and Built Environments	School of Advanced Manufacturing and Mechanical Engineering	School of Mathematics and Statistics	Barbara Hardy Institute	School of Electrical and Information Engineering	School of Communication, International Studies and Languages	School of Education	EAS Division Office Research Education	School of Art, Architecture and Design	School of Health Sciences	School of Pharmacy and Medical Science	School of Commerce	International Graduate School of Business	Chancellery	Graduate Research Centre	
Full	23	11	2	12	0	0	1	0	0	0	0	0	0	0	1	**50**
Associate	11	0	2	5	1	0	0	0	1	0	1	0	0	0	0	**21**
Professional & research support	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	**7***
Affiliate	7	2	1	10	1	0	0	0	0	0	0	0	0	1	0	**22**
Past	*1*	*0*	*2*	*2*	*1*	*1*	*0*	*1*	*0*	*1*	*0*	*1*	*0*	*0*	*0*	***10***
Research students	58	45	9	2	5	0	0	0	3	0	0	0	1	0	0	**123**
Research students - completed	3	3	5	0	0	0	0	0	0	0	0	0	0	0	0	**11**
TOTALS (not including Past Members)	**102**	**62**	**19**	**35**	**7**	**0**	**1**	**0**	**4**	**0**	**1**	**0**	**1**	**1**	**1**	**234**

School Membership	NBE	AME	MAT	BHI	EIE	CIL	EDS	EOR	SLL	HLS	PMB	CMR	GSB	CHA	GRC
	43.6%	26.5%	8.1%	15.0%	3.0%	0.0%	0.4%	0.0%	1.7%	0.0%	0.4%	0.0%	0.4%	0.4%	0.4%

Division Membership	ITEE	EAS	HSC	BUE	CHA	RCH
	96.2%	2.1%	0.4%	0.4%	0.4%	0.4%

* To avoid double-counting, two professional staff are not counted here as they are enrolled and counted as research students.

The Barbara Hardy Institute has research members from a wide range of academic positions. Figure 5 demonstrates that the majority of staff are at junior or middle ranks (Research Associate/Research Fellow/Senior Research Fellow and Lecturer/Senior Lecturer). Being composed of primarily an academically '*young*' membership provides the Barbara Hardy Institute with great opportunities for growth in the coming decade. A project-driven philosophy supported by practical training programs will provide many opportunities to support the research and technical development of these staff.

Of our 93 researchers, 26 can be classified as senior researchers (Associate Professor or Professor). The need to identify and develop the next cohort of leaders from within our membership is evident. There is also great scope for recruiting leaders in several fields within sustainability to provide immediate on-ground leadership and mentoring and to further establish the research credentials of the institute, in areas such as:

1. Science communication/education/consultation;
2. Natural Resource Management;
3. Climate change adaptation;
4. Renewable energy;
5. Transport; and
6. Planning and construction.

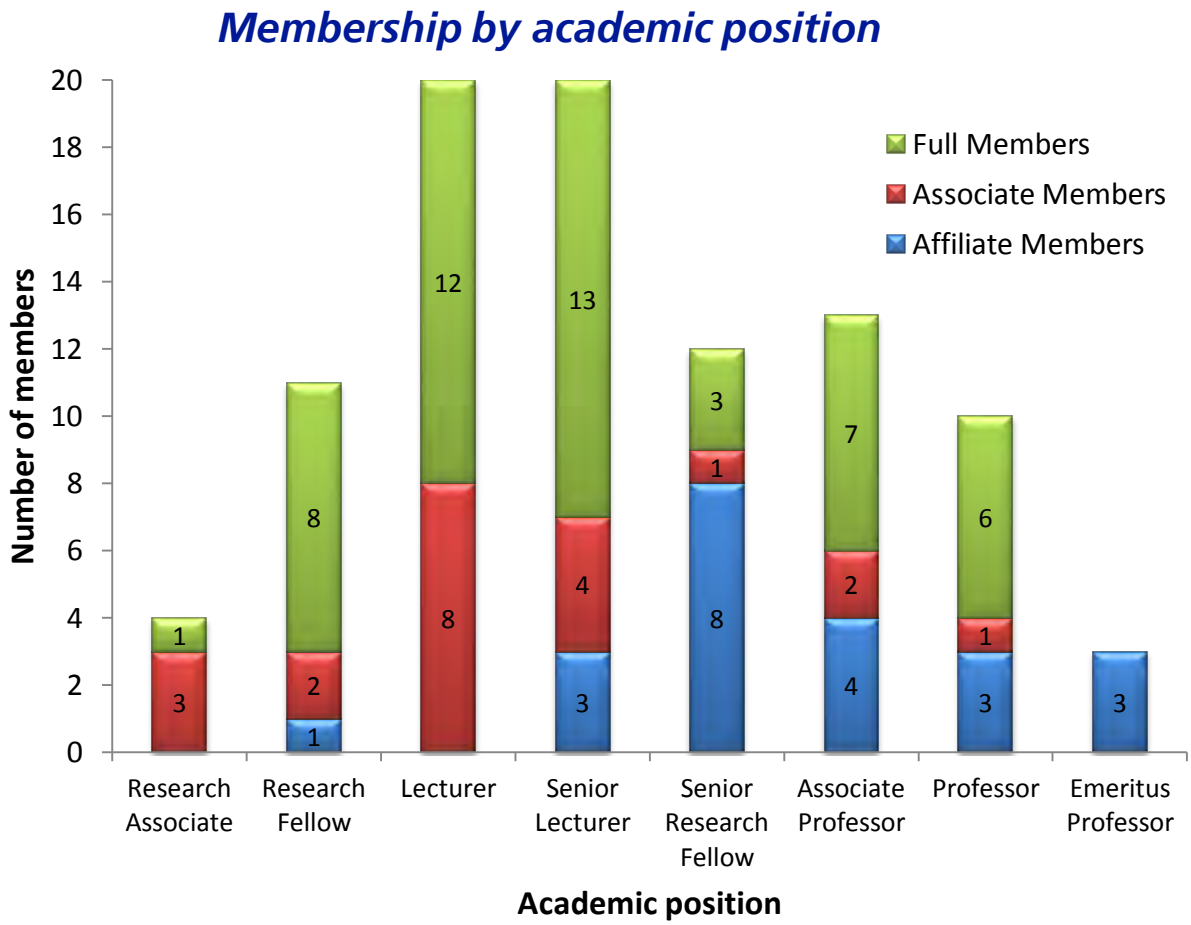


Figure 5. Membership categories by academic position.

5.1 Research Students

Research students (or HDR students – completing a higher degree by research) are often described as the 'engine room' of research in tertiary institutions. Research students:

1. Support the research activities of academic and research-only staff;
2. Generate research outputs;
3. Undertake contract research, improving connections with government and industry; and
4. Generate significant income and prestige for the university.

In addition, postgraduate education is a vital component of the tertiary education process as many students go on to take up academic positions around the world, and their training in research methodology is handed down to the next generation of students, thereby contributing to the social and technological development of the world community.

In 2011, the Barbara Hardy Institute had 134 research students supervised by its members, with 11 completing their degrees (Appendix 1 contains a full list). A further three students have completed their degrees but are awaiting conferral, so will officially graduate in 2012. Figure 6 shows that our research students were based in six schools, primarily Natural and Built Environments (59), Advanced Manufacturing and Mechanical Engineering (46) and Mathematics and Statistics (10).

The institute has many students from overseas. In 2011, almost 50% of our research students were international students (Figure 7). Further, of the 68 Australian students, 37 were born in a country other than Australia. Students (both Australian and international) were born in 35 countries, primarily Australia, Malaysia, Indonesia, China, India, Bangladesh and Thailand.

An analysis of the 'consumed load' of our continuing research students (presented in Figure 8) demonstrates that the institute has many continuing students (over 60%) who have completed more than two years of their program. In order to assist research students to complete their degrees the Foundation Program for the teaching/research nexus is focussed on creating a specialist position, in collaboration with associated schools, to assist in thesis writing and with English as a second language.

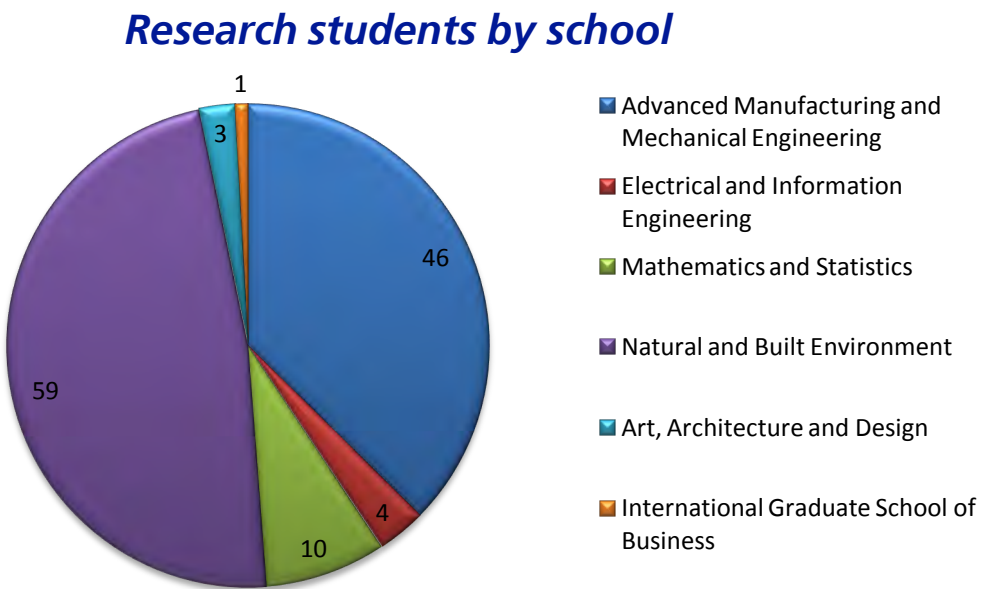


Figure 6. Location of research students by school.

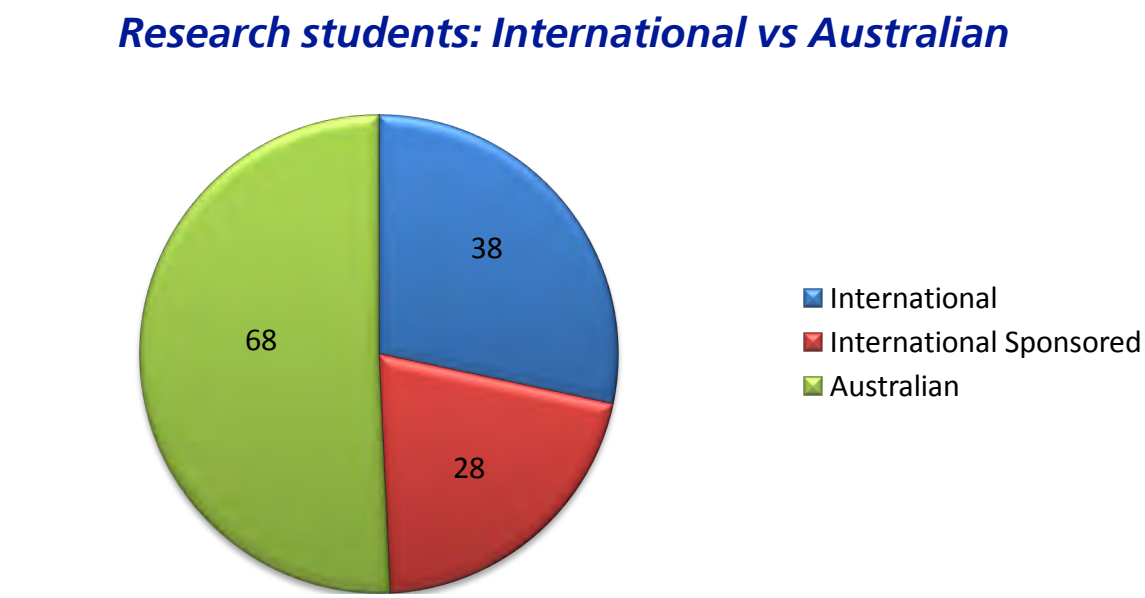


Figure 7. International versus Australian research students, including students who completed in 2011. Note: some international students are sponsored by their government or country.

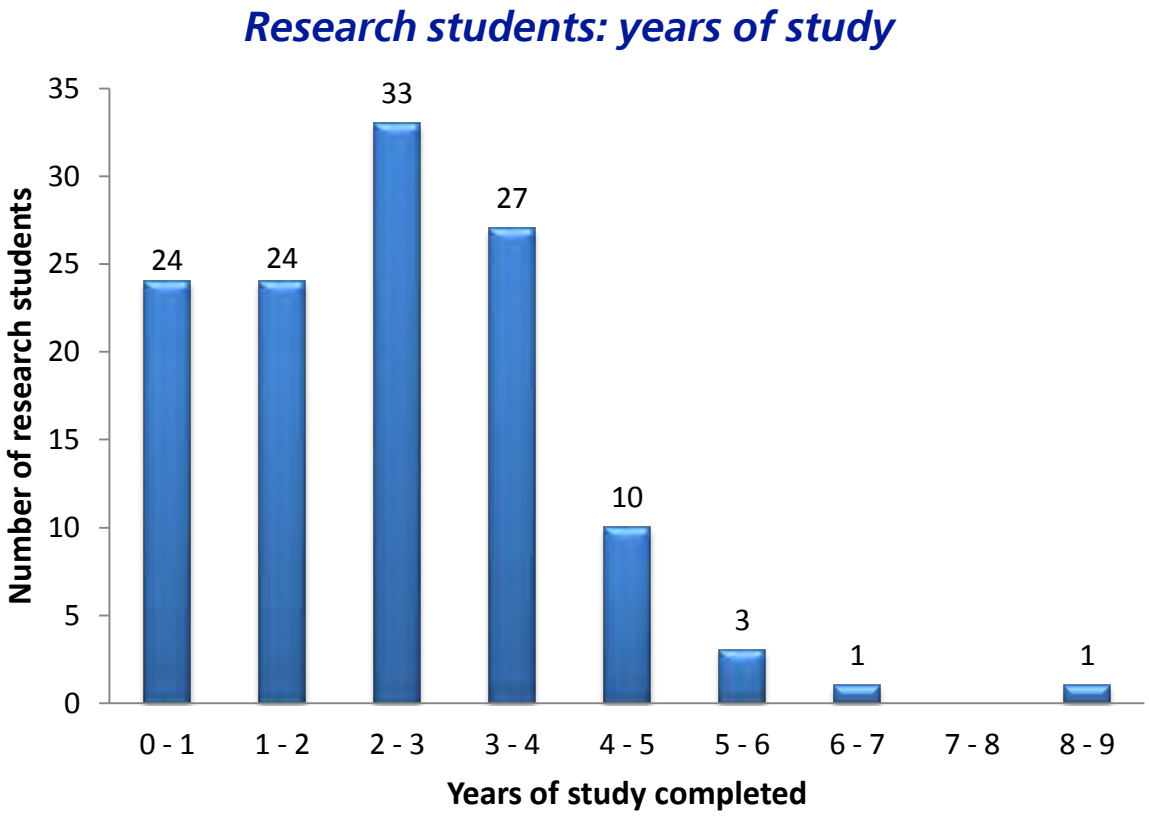


Figure 8. Distribution of continuing students by consumed load (the number of years of study completed).

6. Research

6.1 Fields of Research

We have used two methods to understand the various fields of research of our members. First, we used an external appraisal that was conducted as part of the Excellence in Research in Australia (ERA) initiative. Second, we have used keywords that describe our research.

Our research is strongly aligned with the university's recognised areas of research strength. Recently the Australian Research Council (ARC) undertook a major review of research in Australian higher education institutions, called ERA. As part of that process all research activity was divided into 22 'divisions', each given a 2-digit Field of Research (FoR) code. These codes and divisions are based on the classification system that the Australian Bureau of Statistic uses for classifying research – *the Australian and New Zealand Standard Research Classification* (ANZSRC) 2008. Australian higher education institutions were required to categorise their research according to this system, with each researcher classified in up to 3 ERA divisions. The ARC then evaluated the research, based on four indicators: quality, quantity, application and recognition. Research at each institution was then ranked by ERA discipline as:

ERA ranking 5.	Research that is **well above world standard**
ERA ranking 4.	Research that is **above world standard**
ERA ranking 3.	Research that is **at world standard**
ERA ranking 2.	Research that is **below world standard**
ERA ranking 1.	Research that is **well below world standard**

UniSA submitted its research in 14 of the 22 divisions and was ranked at world standard or above in 10 of these divisions**.** At the Barbara Hardy Institute, 75.7% of our ERA division classifications were ranked at or above world standard (Figure 9). Moreover, the research of our members contributed to 6 of the 10 ERA divisions where the university is considered at or above world standard. Table 4 presents our research foci classified by ERA divisions and how they were ranked.

Members doing world standard research

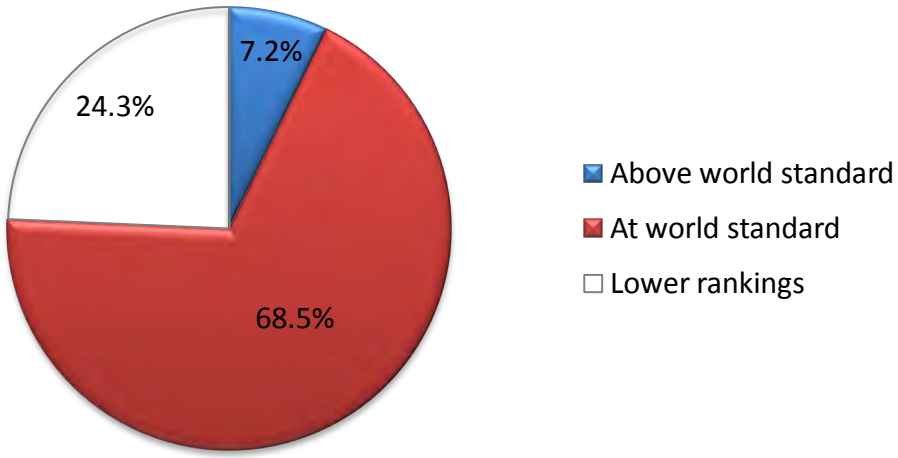


Figure 9. The ERA standards of research conducted by our members, showing that **over three-quarters of our research is at or above world standard**. *Note: only full and associate members are included as affiliate members are not allocated FoR codes as they are not employed by the university.*

Table 4. Our research by ERA divisions		
ERA code	**ERA Field of Research**	**Full and associate members contributing**
Above world standard (ERA ranking 4) – 8 researchers		
05	Environmental Sciences	8
At world standard (ERA ranking 3) – 76 researchers		
01	Mathematical Sciences	5
09	Engineering	32
11	Medical and Health Sciences	2
12	Built Environment and Design	36
18	Law and Legal Studies	1
Lower rankings (ERA rankings 1 and 2) – 27 researchers		
02	Physical Sciences	1
04	Earth Sciences	4
06	Biological Sciences	3
08	Information and Computing Sciences	1
13	Education	3
14	Economics	1
15	Commerce, Management, Tourism and Services	7
16	Studies in Human Society	7

The same process was also conducted for more specialised topics – the ERA divisions were sub-categorised into 'groups'. Each ERA group has a 4-digit code, again following the ANZSRC 2008 system. The first two digits reveal the ERA division. There are 157 ERA groups. UniSA received a ranking of at or above world standard in 25 ERA groups. At the Barbara Hardy Institute, we contributed to 14 of the ERA groups ranked world standard or above for UniSA. Further, 50% of our ERA group classifications were ranked at or above world standard. Table 5 presents our research foci classified by ERA groups and how they were ranked.

These results confirm that Barbara Hardy researchers contribute to a very large number of general (ERA divisions) and specialised (ERA groups) fields of research. The different fields of research are highlighted in the diversity of key-words used by members of the institute (Table 6, where each researcher has 4 key-words to describe their research). There are therefore outstanding opportunities to:

1. Develop more fields of research to reach *world standard*;
2. Progress fields of research that are already *world standard* to *above world standard*;
3. Progress the field of research that is already *above world standard* to *well above world standard*; and
4. Conduct truly multidisciplinary research – as we have such a broad range of research expertise and a common focus: great research into sustainability!

Table 5. Our research by ERA groups		
ERA code	**ERA Field of Research**	**Full and associate members contributing**
Above world standard (ERA ranking 4) – 15 researchers		
0502	Environmental Science and Management	8
0906	Electrical and Electronic Engineering	1
0912	Materials Engineering	1
0914	Resources Engineering and Extractive Metallurgy	5
At world standard (ERA ranking 3) – 41 researchers		
0102	Applied Mathematics	6
0904	Chemical Engineering	4
0905	Civil Engineering	10
1116	Medical Physiology	1
1117	Public Health and Health Services	1
1205	Urban and Regional Planning	13
1301	Education Systems	1
1503	Business and Management	3
1506	Tourism	1
1801	Law and Legal Studies	1
Lower rankings (ERA rankings 1 and 2) – 56 researchers		
0299	Other Physical Sciences	1
0406	Physical Geography and Environmental Geoscience	4
0603	Biological Sciences	3
0801	Artificial Intelligence and Image Processing	1
0901	Aerospace Engineering	1
0909	Geomatic Engineering	1
0910	Manufacturing Engineering	3
0913	Mechanical Engineering	6
1201	Architecture	5
1202	Building	16
1204	Engineering Design	2
1302	Curriculum and Pedagogy	1
1303	Specialist Studies in Mathematics	1
1499	Other Economics	1
1507	Transportation and Freight Services	2
1599	Other Commerce, Management, Tourism and Services	1
1604	Human Geography	5
1605	Policy and Administration	1
1606	Studies in Human Society	1

Table 6. Our research by keywords			
Keyword	**Full and associate members contributing**	**Keyword**	**Full and associate members contributing**
engineering	28	environment	15
energy	14	urban	14
construction	13	transport	13
modelling	11	planning	10
building	8	mathematics	8
design	8	management	8
manufacturing	6	mechanical	6
intelligent systems	5	ecology	5
geographical information systems	5	soil	4
education	4	project management	3
agriculture	3	policy	3
surveying	3	economics	3
rural	3	water	3
civil	3	automation	2
tourism	2	statistics	2
architecture	2	materials	2
geology	2	park	2
biology	2	thermal storage	2
housing	2	rail	2
communication	2	robotics	2
logistics	1	aerodynamics	1
law	1	geomorphology	1
wildlife	1	physiology	1
geotechnical	1	curriculum	1
health	1	legislation	1
cartography	1	automotive	1
digital image processing	1	insects	1
mountain ranges	1	solar	1
epidemiology	1	transformer	1
imagery	1	climate	1
building	1	gender	1
systems	1	communities	1
TREV/solar	1	technology	1
ethnography	1	thermal	1
space	1	adaptation	1
computing	1	oil	1

6.2 Multidisciplinary Research

For the institute to establish a reputation for high-quality research into sustainability it must produce multidisciplinary and transdisciplinary research. Multidisciplinary research allows researchers from different disciplines to work together while still retaining their individual disciplinary approaches. Transdisciplinary research creates new fields by merging two or more disciplines. In these latter cases the emerging field is significantly different from the original creating disciplines. Both types of research have the advantage of creating a research output that is greater (more significant) than the sum of the component parts. Transdisciplinary research produces new and exciting areas of research and will be illustrated through our Icon Projects. Multidisciplinary research has the advantage of retaining the core disciplines so research growth in these specialities can be recognised and measured (e.g. by the ERA initiative). The book *Creating Sustainable Communities in a Changing World* is a multidisciplinary project which can act as a benchmark for growth and as an opportunity for the next generation of researchers to display their research.

The book *Creating Sustainable Communities in a Changing World* is a 30-chapter book published by Crawford House Publishing. All but two of the 50 authors are members of the Barbara Hardy Institute (the exceptions were a local and an international collaborator). Chapters were single authored or produced by teams. The book enabled the membership to display their *individual* views on sustainability and the direction *their* fields are going. However, it also enabled our membership to see their research as part of a greater landscape.

6.3 A Three-Tier Approach to Projects

The breadth of individual topics and opportunities in sustainability are enormous. Our institute cannot hope to tackle them all, but we can:

- Do what we do well—and always strive to do it better;
- Link the projects and topics within the institute and with our partners;
- Identify opportunities for collaboration around methodologies and approaches within the institute and with our partners; and
- Identify where we should be directing our future research efforts.

To achieve these ends we must also view research projects in terms of their scale and focus. A three-tiered hierarchical model will be used to develop the research profile of the institute (Figure 10): projects are allocated to tier 1, 2 or 3 with consideration of scale and focus in addition to traditional measures of research such as quality and quantity. The institute will also actively encourage good projects to grow from tier-3 to tier-1.

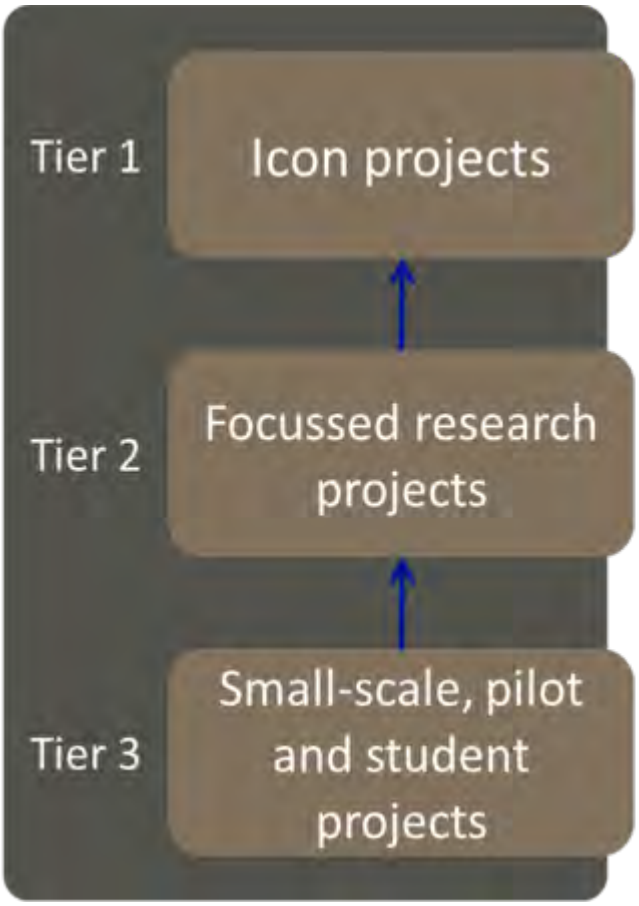


Figure 10. A three-tier approach to research projects.

6.3.1 Tier 1: Icon Projects led by Champions

The institute will support a number of Icon Projects per year up to a value of $50,000 each. These projects will be inclusive, large-scale and have significant impact. Projects will be merit selected by the Executive. Icon Projects will be led by the best researchers in the institute. They will be developed with performance indicators, against criteria including:

1. Multidisciplinarity or transdisciplinarity;
2. Building partnerships;
3. External funding;
4. Engaging many Barbara Hardy Institute researchers;
5. Multiple research outputs;
6. Industry and community engagement;
7. Industry and community profile;
8. Scale, focus and impact; and
9. Quality and quantity of research.

Icon Projects for 2011/2012

1. ### Sustainable in-fill development using low-carbon CLT prefabrication: adaptation for the Australian context

   Project champion: Steffen Lehmann

   This innovative Icon Project, run in collaboration with the *Zero Waste SA Research Centre for Sustainable Design and Behaviour* (sd + b) will investigate how to enhance the sustainability of urban in-fill developments in Australian cities, by introducing cross-laminated timber (CLT) construction technology for multi-storey residential buildings as an alternative to traditional approaches of urban densification. The research seeks to establish how the use of timber can promote environmentally beneficial construction systems, as well as the development of low carbon precincts that facilitate material waste reduction and recyclability. The outcomes of this work will include design testing and fire testing of prototypes to evaluate the required transformation of the Australian building/construction and development sectors. It also has the potential to transform the market and change the way we design and build inner-city infill urban developments in Australia.

2. ### Towards electricity without fossil fuels: finding the best mix of renewables, demand management and storage

   Project champions: John Boland and Philip Weinstein

   Australia's use of fossil fuels is unsustainable. Thirty-six percent of our fossil fuel consumption is used to generate electricity, and our demand in this matter is increasing. We need to design and transition to a future where electricity is generated primarily from renewable energy sources. This Icon Project's research will develop the knowledge and tools required to design and optimise a system composed of a mix of generation technologies, including solar thermal, solar photovoltaic and wind. Variability of renewable energy sources will be overcome using a combination of reserve capacity, spatially diverse generator locations, energy storage and management of demand to match supply. This project will progress the issue of a sustainable energy supply into the future, both in a technological sense and also from the social perspective, to provide Australians with affordable, reliable, clean electricity in a context of environmental sustainability.

3. ### Adelaide: Fire and Natural Hazards

   Project champion: Chris Daniels

   This Icon Project will produce the third book in a series focussed on the Adelaide environment and how people interact with it. The first two books were *Adelaide: Nature of a City* and *Adelaide Water of a City*. The new book will focus on the natural environmental events and characteristics that shape the community. These issues include fire, earthquake, flood (sea and rainfall), drought, climate change, disease, plague, pestilence, poisonous and venomous animals and plants. It will also contain information about the effects of population growth and resource limitation on the Adelaide community. The goal of this multidisciplinary work is to inform the community and government and private sectors on issues such as: creating environmentally relevant communities, risk management, energy management and disaster planning.

6.3.2 Tier 2: Key Researchers leading Focused Research Projects

Tier-2 research projects are the mainstay of university research. In 2011 the Barbara Hardy Institute conducted 24 tier-2 projects (a list of projects and project partners is provided in Appendix 2 and is regularly updated on the Barbara Hardy Institute website). Tier-2 research projects have the following characteristics:

1. Usually the research of our senior members (Assoc Prof/Prof);
2. Well funded; usually category 1 grant funded research (nationally competitive grants), or a significant component of a CRC;
3. Focussed on a specific topic or area;
4. Undertaken by a small group or an individual with external partners;
5. Produce many quality research outputs (e.g. research papers/products/symposia);
6. Produce quality research students and support junior research fellows; and
7. May be part of an ongoing research program that lasts for many years.

During 2011 the institute was involved in the formation of two new CRCs. The *CRC for Low Carbon Living* and the *Automotive Australia 2020 CRC* will see over $1million of additional research income for the institute per annum for seven years. These CRCs will contain a number of new tier-2 projects.

6.3.3 Tier 3: Small-Scale, Pilot or Student Research

Tier-3 research is small-scale research, including contract research, consultancies and testing or evaluation services. We had just over 50 projects in this category in 2011. Tier-3 projects have the following characteristics:

1. Small-scale;
2. Produces a limited number of publications;
3. Mostly funded by category 2 (public sector grants) and 3 (industry and international research income);
4. Includes pilot and non-core research;
5. Can have significant impact as individual pieces of research;
6. Often only lasts for a short period (a year); and
7. May lead to tier-2 projects.

6.4 Research Publications

Research publications are sorted into a range of categories against the HERDC (Higher Education Research Data Collection) guidelines. Funding comes to the university and hence to the institute on the basis of the recognised quality of the research publications. The university submits the final list to the Department of Innovation, Industry, Science and Research (DIISR) where it is used as part of the calculation for university funding. In 2011, institute members produced 157 research publications. A full list of publications is provided in Appendix 4. Figure 11 shows a breakdown of these publications by the following categories (the underlined categories are particularly important for research funding calculations):

- Authored Research Books (category A1)
- Authored Other Scholarly Books (category A2)
- Edited Scholarly Books (category A3A)
- Book Chapters (category B)
- Refereed Journal Articles (category C1)
- Refereed Conference Papers (category E1)
- Edited Refereed Conference Proceedings (category E4A)
- Non-refereed Conference Papers (category E2)

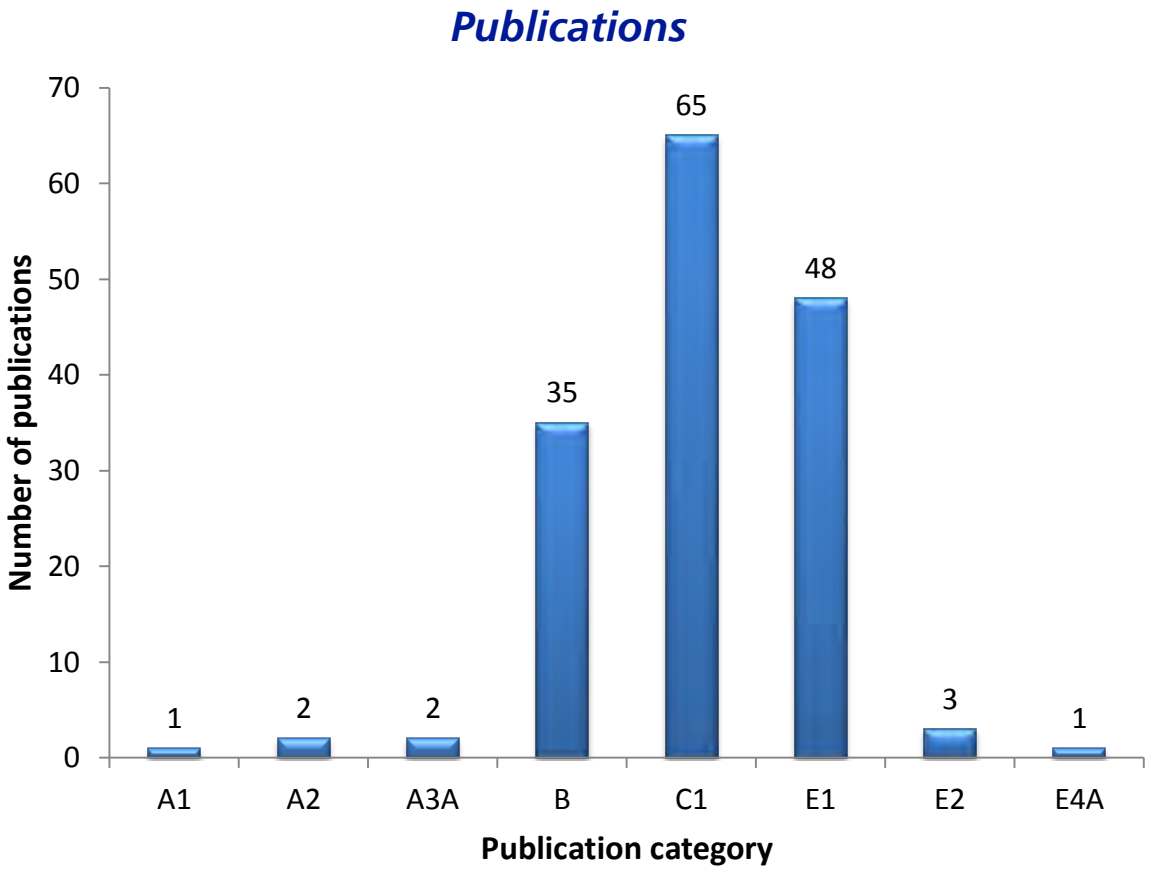
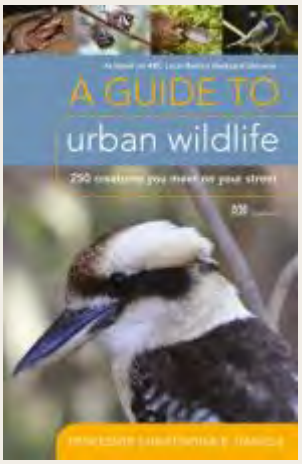
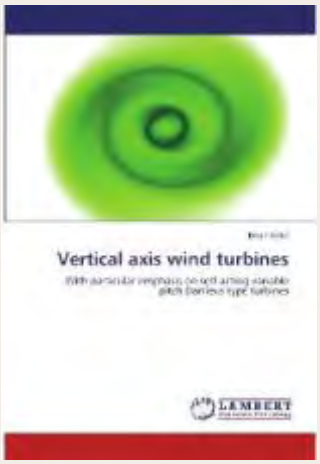


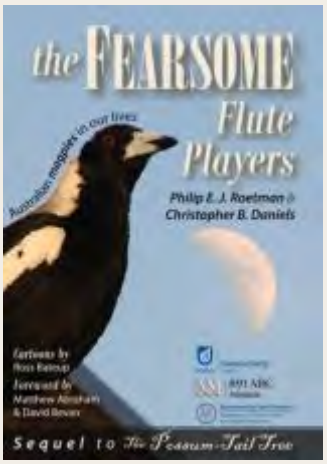
Figure 11. Research publication by all members of the institute.

Our 2011 books

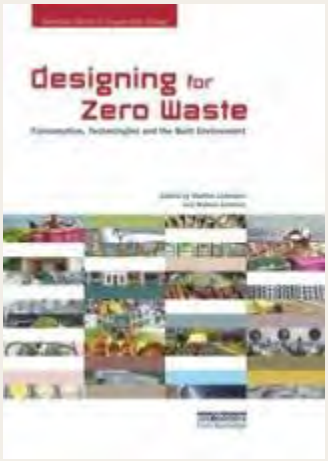
Authored Books (A1 and A2)







Edited Books (A3A)



6.4.1 Publication Highlights

Publication highlights include six books and 65 refereed journal articles produced in 2011. The books, three authored books and three edited volumes, are pictured above. The book '*Creating Sustainable Communities in a Changing World*' contains 28 chapters by 50 authors – 48 of the authors are institute members. The book '*Designing for Zero Waste*' was produced in 2011 but will count as a 2012 publication. It contains five chapters by members of the Barbara Hardy Institute. Regarding refereed journal articles, of particular note are two in the prestigious journal *Nature* (one of which provided the cover illustration for the journal).

6.5 Other Research Activity

6.5.1 Presentations

During 2011 members of the institute delivered 149 presentations, including conference presentations, seminars, forums, workshops, public talks and symposia contributions (Figure 12). A full list of presentations is provided in Appendix 3. Note that presentations at conferences which are published in conference proceedings are listed in Appendix 4: Publications. Our presentations were at local, national and international events (Figure 13).

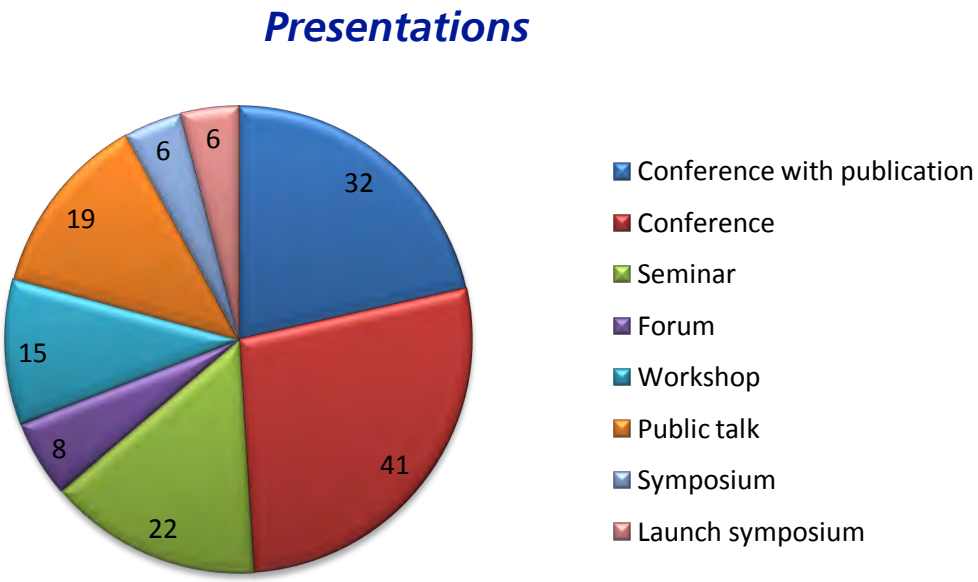


Figure 12. Different types of presentations.

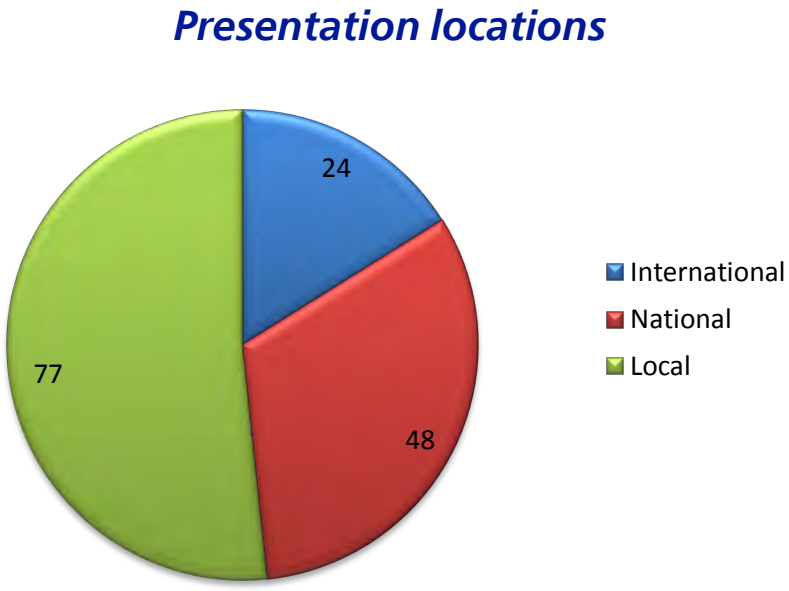


Figure 13. Locations of presentations.

6.5.2 Honours and Awards

Barbara Hardy Institute members received 14 honours and awards in 2011. The awards are:

Dr Yousef Amer

Best Paper Award

The 2011 Ascilite Conference, held 4-7 December in Hobart, Tasmania, focused upon the use of technology to enhance the teaching, learning and student experience in tertiary education. Dr Amer received the Best Paper Award for his paper, 'Changing demands, changing direction'.

Mr Stephen Berry

Vice Chancellor and President's Scholarship

Mr Berry received a Vice Chancellor and President's Scholarship as one of the top seven PhD candidates across the entire university. His research is focussed on the technical and economic feasibility of applying a net zero carbon standard to new housing.

Dr Kathryn Davidson

Early Career Researcher Award

The Early Career Researcher Award celebrates a researcher's contribution to the Division of Information Technology, Engineering and the Environment of the University of South Australia. The Division bestowed this award upon Dr Davidson in recognition of her high level research performance and achievements.

Assoc. Prof. John Fielke

UniSA Citation for Outstanding Contributions to Student Learning

The University of South Australia awarded John Fielke this citation in recognition of his 'excellence in teaching engineering drawing that engages students with contemporary curriculum and uses e-portfolios as a tool for student self-reflection and feedback'.

Mr Philip Roetman and Prof. Chris Daniels

National Earthwatch/Rio Tinto Citizen Science Award

The Earthwatch/Rio Tinto Citizen Science Award recognises individuals or groups whose outstanding environmental research directly involves, educates and inspires the Australian community. Mr Roetman and Prof. Daniels were awarded a finalist prize for their promotion of Citizen Science in the community.

Mr Philip Roetman and Prof. Chris Daniels

UniSA Chancellor's Awards for Community Engagement

Mr. Roetman and Prof. Daniels' Citizen Science program, run through the Barbara Hardy Institute, was commended through the University of South Australia's Chancellor's Awards for Community Engagement.

Mr Philip Roetman

Royal Society of South Australia Student Prize

The Royal Society of South Australia is a Learned Society whose interest is in Science, particularly, but not only, of South Australia. Each year, postgraduate students in the natural sciences throughout South Australia are invited to present their research at an ordinary meeting of the society. Mr. Roetman was awarded second prize for his presentation.

Prof. Wasim Saman

Supported Researcher of the Year

The Supported Researcher of the Year award celebrates a researcher's contribution to the Division of Information Technology, Engineering and the Environment of the University of South Australia. The Division ITEE bestowed this award upon Prof. Saman in recognition of his high number of publications and Category 1 research income.

Dr Alpana Sivam

Chancellor's Awards for Community Engagement

Dr Sivam received a Commendation in the Chancellor's Awards for Community Engagement at the University of South Australia for urban design projects in three Local Government Areas as part of her Sustainable Urban Design Workshop course.

Mr Steven Tay

DAAD Research Grant for Doctoral Candidates and Young Academics and Scientists

The research grants by the German Academic Exchange Service (DAAD) provide young foreign academics and scientists with an opportunity to carry out a research project at a German higher education institution or non-university research institute. Mr Tay was awarded 2,100 Euros for his CFD modelling for an integrated wall system, a concept created by Fraunhofer Institute for Building Physics and under patent application. A joint journal paper will be written after the completion of the research as a direct result of this collaboration.

Prof. Michael Taylor

William Young Award

Prof. Taylor was awarded the William Young Award as an alumnus of Monash University for his exceptional service to the transport industry.

Prof. Michael Taylor

Institute of Transportation Engineers (ITE) Contribution to the Transport Profession Award

Prof. Taylor was bestowed with this prestigious award in recognition of his achievements and contributions throughout his career to the transport profession.

Prof. Michael Taylor, Dr Rocco Zito and Dr Nikolaos Vogiatzis

Australian Museum Eureka Prizes

Prof. Taylor and Doctors Zito and Vogiatzis were finalists in the Australian Museum Eureka Prizes. The Australian Museum annually rewards excellence in the fields of research and innovation, leadership and commercialisation, school science and science journalism and communication.

Dr Brian Webby

Chancellor's Award for Community Engagement

Dr Webby was recognised as part of the teaching and administration team from the Centre for Regional Engagement that was awarded first place in the Chancellor's Award for Community Engagement.

6.5.3 Website and Social Media

During 2011, with the merger of the *Institute for Sustainable Systems and Technologies* and the *Barbara Hardy Centre*, the new institute required a new website and social media outlet. These were made live in October:

- **Website (Figure 14):**
  The website contains details of our researchers, research capabilities and research projects. It also contains information for the wider community, including regularly-updated news and events, and is an online outlet for institute book sales. Growth in web visits has been strong, with more activity in the first two months than the combined totals of the two amalgamated research concentrations (Figures 15 and 16).
  http://www.unisa.edu.au/barbarahardy/

- **Facebook page:**
  The facebook page contains some general information about the institute and is regularly updated with research news, selected announcements and information about upcoming events.
  https://www.facebook.com/#!/pages/Barbara-Hardy-Institute/203019063082671

Figure 14. The homepage of the Barbara Hardy Institute website.

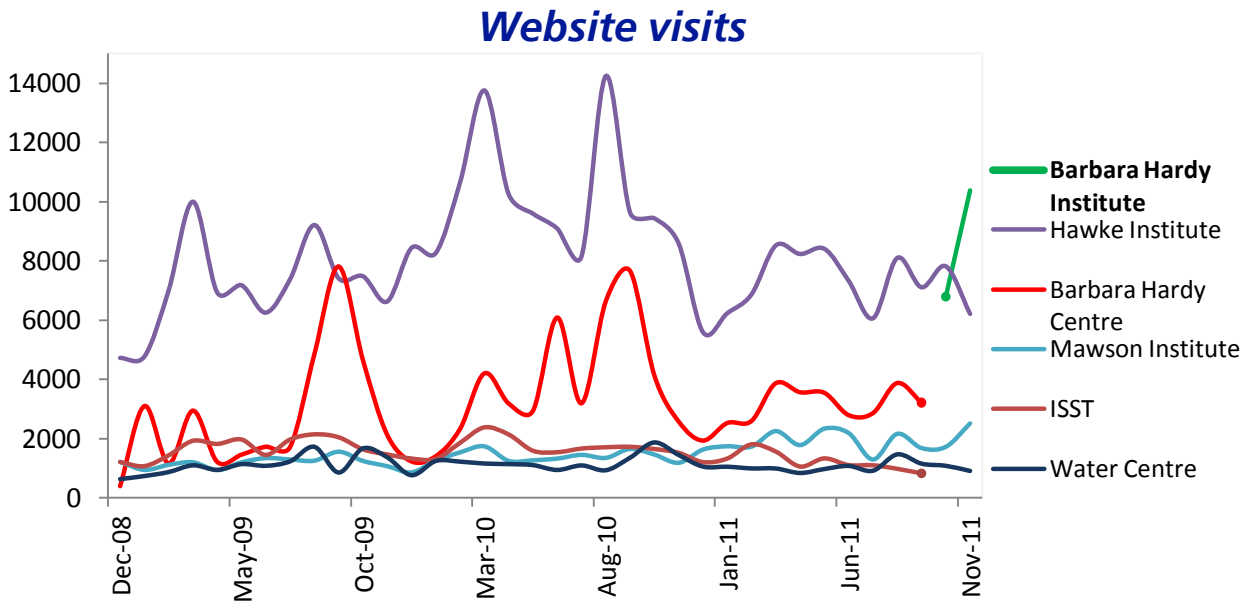


Figure 15. Visits to the Barbara Hardy Institute website, compared to other research concentrations, note that the ISST and Barbara Hardy Centre are now closed.

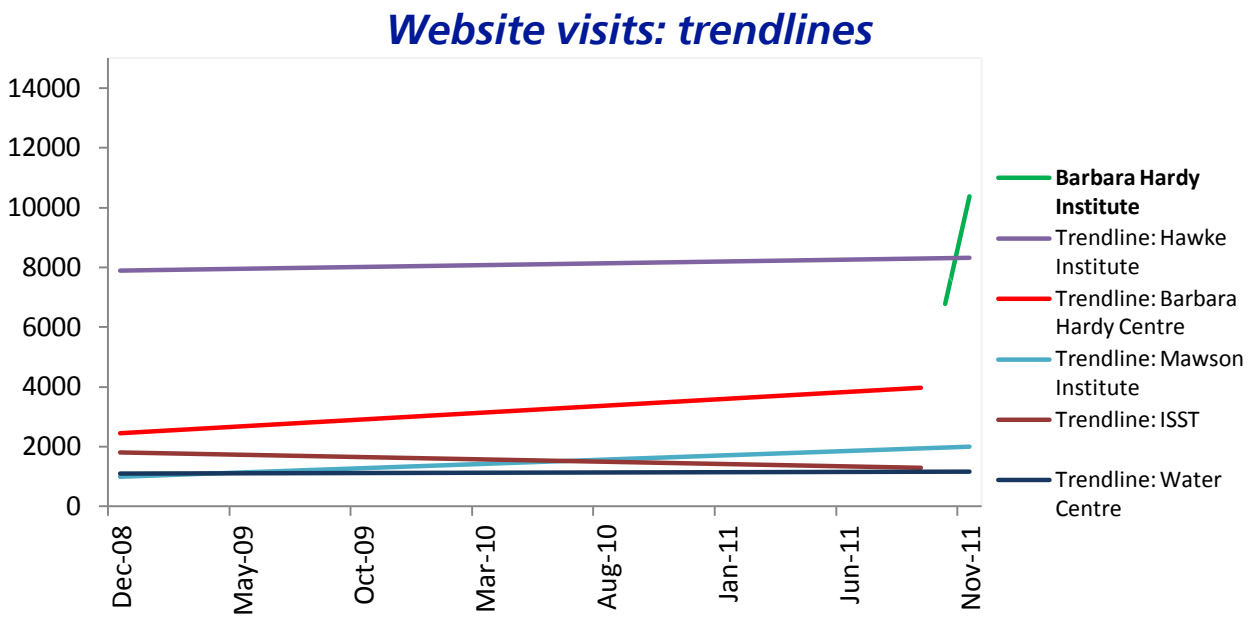


Figure 16. Visits to the Barbara Hardy Institute website, compared to other research concentrations (trendlines).

7. Revenue

In 2011 the Barbara Hardy Institute received just over $3,390,000 in revenue. Figure 17 presents a breakdown of this revenue. University grant income is divided into four major categories:

Category 1. Australian Competitive Grants
Category 2. Other public sector grants
Category 3. Industry and international research income
Category 4. CRC income

Other important income is received for consultancy work and the institute is supported by the university (internal revenue). In 2011 we laid the groundwork for many future projects, including the formation of two new Cooperative Research Centres (CRCs). The *CRC for Low Carbon Living* and the *Automotive Australia 2020 CRC* will see over $1million of additional research income for the institute per annum for seven years.

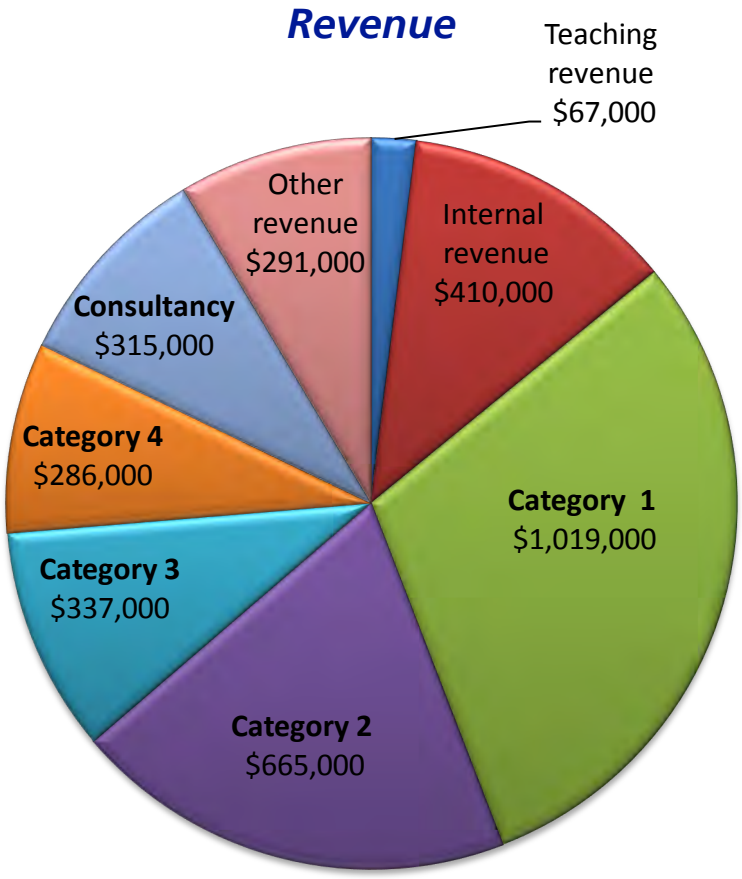


Figure 17. A breakdown of revenue.

Appendix 1. Members

Full members		
AsPr Kazem Abhary	Dr Andrew Allan	Dr Yousef Amer
Dr Saiful Bari	Dr Martin Belusko	Prof John Boland
Mr David Bruce	Dr Francesco Bruno	Dr Don Cameron
Ms Pei Ru Chao	Dr Nicholas Chileshe	Dr Keri Chiveralls
AsPr Farid Christo	Mr Jeremy Coggins	Prof Chris Daniels
Dr Kathryn Davidson	Dr Jack Desbiolles	AsPr John Fielke
Dr Nicholas Holyoak	Dr Hung Yao Hsu	Dr Sadasivam Karuppannan
AsPr Jonathan Kellett	Dr Sang-Heon Lee	Prof Lee Luong
Dr Tony Ma	Dr Romeo Marian	Prof Julie Mills
Dr Sev Nagalingam	Mr Timothy O'Leary	Dr Sofia Orre
Dr Kathy Paige	Dr Johannes Pieters	Dr Peter Pudney
Dr Stephen Pullen	Dr Mizanur Rahman	Dr Raluca Raicu
Dr Tom Raimondo	Dr Matthew Rofe	Prof Wasim Saman
Dr Chris Saunders	Dr Alpana Sivam	Dr Sekhar Somenahalli
Prof Michael Taylor	Dr Delene Weber	Prof Phil Weinstein
Dr Ke Xing	Dr Wen Long Yue	AsPr George Zillante
Dr Rocco Zito	Dr Jian Zuo	

Associate members		
Dr Manju Agrawal	Dr Amie Albrecht	Dr Sam Ali
Dr Sam Baroudi	Dr Mark Bishop	Dr Ian Clark
Mr Paul Corcoran	Mr Karl Hornlund	Dr Greg Johnston
Dr Barb Koth	Prof Steffen Lehmann	Mrs Virginia Mehrtens
Dr Asef Nazari Ganjehlou	AsPr Sandra Orgeig	Dr Julia Piantadosi
Dr Barbara Ridley	Dr Mark Shelbourn	Ms Liz Smith
Mr Branko Stazic	Dr Nikolaos Vogiatzis	Dr James Ward

Affiliate members		
Ms Elizabeth Ampt	Mr John Apelbaum	Dr Ray Brindle
Prof John Cann	Dr Roger Clay	Dr Barry Cooper
Prof Glen D'Este	Prof Stephen Hamnett	Prof Phil Howlett
AsPr Jim Jago	Dr Brian Kirke	Prof David Lee
Dr Stewart Martin	Dr David Ness	Ms Monica Oliphant
Dr John Pockett	Mr Ian Ridgway	Prof Terry Riley
Dr John Rolls	Prof Derek Scrafton	Dr Sandra Taylor
Dr Jeremy Woolley		

Professional and research support staff*		
Mrs Violeta Babovic	Mr Andrew Burge	Mr Raymond Liddle
Miss Michelle Philp	Mr Dean Thiele	Dr Roger Webby
Dr David Whaley		

** To avoid double-counting, two professional staff are not counted here as they are enrolled and counted as research students: Mr Philip Roetman Mr Ivan Iankov.*

Administration staff		
Ms Susan Corbisiero	Ms Hannah Thwaites	Mrs Kylie Fairbank
Ms Elena Del Moral		

Casual staff		
Mr Rami Al-Dirini	Mr Anthony Carter	Mr Mohammad Hamkar
Ms Pegah Haseli	Ms Anna Leditschke	Prof David Lee
Mr Patrick Miller	Mr Lachlan Mudge	Mr Graeme Quick
Mr Mark Western	Mr Ivan Zanatta	Mr Lui Zanatta

Research students: 2011 graduates		
Mrs Hamideh Anjomshoa	Mr Ali Eshragh Jahromi	Mr Behnam Fahimnia
Ms Cathryn Hamilton	Mrs Siti Ishak	Miss Susan Kim
Mr Kim Lai	Mr Scott Mackenzie	Mr Behzad Motevallian
Mr Thanh Hai Phan	Mrs Roslina Zakaria	

Research students: continuing		
Mr Khalid Abd	Miss Zarina Abu Hassan	Mr Adnan Abu-Ajamieh
Mrs Nadereh Afsharmanesh	Ms Sherin Ahamed	Mr Reazul Ahsan
Mr Ali Al Maliki	Mr Salim Al Mamary	Mr Alemu Alemu
Mr Saad Al-Sharrah	Mr Atiya Al-Zuheri	Mr Martin Anyi
Mr Paul Atem	Mr Abdel Azam	Mr Zainul Baharuddin
Mr Justin Beck	Mr Stephen Berry	Mr Nicholas Berry
Miss Mary-Anne Binnie	Ms Sara Browning	Mr Thanya Chanprasopchai
Mr Paul Corcoran	Ms Jianqiang Cui	Mr Hari Dharmawan
Miss Jantanee Dumrak	Ms Merinda Edwards	Mr Sleiman Farah
Mr Mohammad Firmansyah	Ms Gabriele Fitzgerald	Miss Sally Freeman
Mr Alaa Gabr	Mr Stamen Gadzhanov	Ms Mel Gale
Mr Siddharth Gaurav	Mr Michael Geen	Mr Mehdi Ghanbari
Mr Mahdi Gholoum	Mr Mohamad Sufian Hasim	Mr Bo He
Mr Jing Huang	Mr Fashui Huang	Mr Bin Huang
Mr A'Zizan Hussain	Mr Alan Hutchings	Mr Ivan Iankov
Mr Andi Idhan	Mr Asif Iqbal	Ms Susan Irvine
Miss Mabel John	Mr Tim Johnson	Mr Muhamad Kamaruzaman
Mr Mohd Iqbal Khan	Mr Ali Khosravani Goshtasb	Mr Swee Kuik
Mr Abdullatif Lacina Diaby	Mr Wing Yiu Lai	Mr PeiLin Li
Mr Dong Lin	Miss Maria Louter	Mr Jennifer Macdonald
Mr Wayan Mahmudy	Mr Michael Malouf	Mr Md. Abdul Matin
Mr Maqsood Memon	Miss Li Meng	Ms Diana Mohamad
Mr Abdullah Zawawi Mohamed	Mr Nasrul Amri Mohd Amin	Mrs Wan Mohd Yusof
Mr Nicola Mosca	Mr Ramadas Narayanan	Mrs Namrata Nath
Mr Wun Ng	Mr Phong Nguyen	Mr Jason Nissen
Mr Timothy O'Leary	Mr Aaron O'Malley	Mr Jing-Hong Pai
Mr Nicholas Palousis	Ms Sheryn Pitman	Mr Arnold Platts
Mr Andrew Plumridge	Mr Keyvan Pourhassan	Mr Jaruwit Prabnasak
Mrs Tri Anggraini Prajnawrdhi	Mr Hari Prasetyo	Mrs Pregiwati Pusporini
Mr Abu Taher Md. Zillur Rabbi	Mr Ahmed Ranesh	Miss Julie Riordan
Mr Phillip Roach	Mr Philip Roetman	Ms Lovisa Rosnas
Mr Shekh Rubaiyat	Mr Idris Saad	Mr Nasser Saber
Ms Mirfath Shafeeq	Mr Shane Sheoran	Miss Xia Shi
Mr Morteza Shokri Ghasabeh	Mr Alexander Sims	Mr Ali Solhjou
Mr Branko Stazic	Miss Chansiri Suksri	Miss Jintawadee Suksri
Miss Susi Susilawati	Ms Gertrude Szili	Mr Nguan Tay
Mr Ming Teng	Ms Paraskevi Thomas	Mr Alexander Townsend
Mr Mustafa Ucgul	Mrs Bala Indu Wadhawan	Mr Andrew Wheeler
Mr Craig Wightman	Mr Anthony Wood	Ms Kyra Wood
Mr Gusri Yaldi	Mr Manamperi Yalegama	Ms Juan Yang
Mr Lujing Yang	Mr Izzuddin Zaman	Mr Ning Zhou

Appendix 2. Tier 2 Projects

Australian partner organisations (tier 2 projects)		
Industry	**Government**	**Academia**
Australian Centre for International Agricultural Research	Agriculture Western Australia	Queensland University of Technology
Australian Institute of Building (AIB)	AutoCRC	University of Adelaide
Australian Institute of Building Surveyors (AIBS)	Bureau of Meterology (BoM)	University of Queensland
Australian Institute of Refrigeration, Airconditioning and Heating (AIRAH)	Campbelltown City Council	University of Sydney
Australian PV Association (APVA)	CRC for National Plant Biosecurity	University of Western Australia
Australian Rail Track Corporation	CRC for Rail Innovation	
Australian Solar Institute	City of Onkaparinga	
Commercialisation Connections	City of Playford	
Energy Partners	City of Salisbury	
Epuron	CSIRO	
Hodgkison Architects	Department for Families and Communities (DFC)	
Horwood Bagshaw	Department for Transport, Energy and Infrastructure	
Royal Institution of Chartered Surveyors (RICS)	Department of Agriculture and Food (WA)	
Rural Solutions SA	Department of Climate Change and Energy Efficiency (DCEE)	
South Australian Department of Trade and Economic Development	Department of Employment, Economic Development and Innovation (DEEDI)	
South Australian No-Till Farmers Association (SANTFA)	Department of Health	
South Australian Research and Development Institute (SARDI)	Department of Planning and Local Government	
TTG Transportation Technology Pty Ltd	Department of the Premier and Cabinet	
Uniting Care Australia	Industry and Investment NSW	
Western Australian no-till farmers association (WANTFA)	Land Management Corporation	
	Planning SA	
	Town of Gawler	
	Zero Waste SA	

International partner organisations (tier 2 projects)		
Industry	**Government**	**Academia**
Mosul Society for Conservation Agriculture (Iraq)	Directorate of Agriculture (Iraq)	Cambodian Agricultural Research and Development Institute
National Agro-Industries Pty Ltd (India)	General Directorate of Agriculture (Cambodia)	Hamelmalo Agricultural College (Eritrea - Eastern Africa)
Nepal Agriculture and Environmental Forum (Nepal)	Ministry of Ariculture (Iraq)	Imperial College London (UK)
Shenzhen Jianyi International Engineering Consultants Ltd (China)		Institution for Agricultural Research and Higher Education (IRESA-Tunisia)
Theebo-Tech Pty Ltd (South Africa)		International Center for Agricultural Research in the Dry Areas (Syria)
		International Center for Agricultural Research in the Dry Areas (Tunis)
		International Rice Research Institute (Philippines)
		National Centre for Atmospheric Research (NCAR) (USA)
		National Institute for Agricultural Research (INRA-Morocco)
		Royal University of Agriculture (Cambodia)
		Technical Institute for Grain Crops (ITGC-Algeria)
		University of Mosul (Iraq)

Tier 2 projects			
Funding Body	**Investigators (Barbara Hardy Institute members shown in bold)**	**Project Title**	**Project Years**
Australian Research Council (ARC) Discovery Project	**John Boland**, **Jerzy Filar**	Strategic integration of renewable energy	2009-2011
Australian Research Council (ARC) Discovery Project	**Michael Taylor**	Dynamic vulnerability of urban road networks	2010-2012
Australian Research Council (ARC) Linkage Project	**Amie Albrecht**, **Phil Howlett**, Andrew Metcalfe, **Peter Pudney**, Roderick Smith	Saving energy on trains - demonstration, evaluation, integration	2011-2013
Australian Research Council (ARC) Linkage Project	**John Boland**, **Jerzy Filar**, **David Bruce**, Tom Wigley, Kathryn Ward, **Alex Townsend**	Unlocking the grid: the future of the electricity distribution network	2008-2011
Australian Research Council (ARC) Linkage Project	**Jon Kellett**, **Kathryn Davidson**, **David Ness**, Lou Wilson, **Alpana Sivam**, **Sadasivam Karuppanan**, **Stephen Pullen**, Peter Tisato	Integrated model for the assessment of urban sustainability	2008-2011
Australian Research Council (ARC) Linkage Project	**Michael Taylor**, **Stephen Hamnett**, **Li Meng**, **Andrew Allan**, AE Rix	The potential role of transit-oriented development in Australian cities: a critical assessment using a suburban rail corridor	2008-2011
Australian Research Council (ARC) Linkage Project	**George Zillante**, Lou Wilson, **Jian Zuo**, **Stephen Pullen**, **Jasmine Palmer**, Frank Schultmann, Jiayuan Wang	Re-considering sustainable building and design: A cultural change approach	2011-2013
Australian Centre for International Agricultural Research (ACIAR)	Colin Piggin, Atef Haddad, David Coventry, Abdul Sattar, **Jack Desbiolles**, Jay Cummins, Kadambot Siddique, Saleh Bader, Kasim Kasim	Development of conservation cropping systems in the drylands of northern Iraq (administered via University of Adelaide)	2008-2011
Australian Centre for International Agricultural Research (ACIAR)	Geoff Beecher, David Johnson, Seng Vang, Chuong Sophal, Ngin Chhay, **Jack Desbiolles**, Scott Justice	Improved rice establishment and productivity in Cambodia and Australia (administered via Industry and Investment NSW)	2009-2014

Tier 2 projects (continued)			
Funding Body	**Investigators (Barbara Hardy Institute members shown in bold)**	**Project Title**	**Project Years**
Australian Centre for International Agricultural Research (ACIAR)	**Jack Desbiolles**, Jay Cummins, Colin Piggin, Mohammed ElMourid, Hakim Ben Aj Salah, Omar Zhagouane, Oussama ElGharras, ElKamil Tola, Woldeamlak Araia	Developing a regional Conservation Agriculture Hub for North Africa: scoping study assessment (administered via Rural Solutions SA)	2010-2011
Australian Centre for International Agricultural Research (ACIAR)	Jay Cummins, **Jack Desbiolles**, Mohammed ElMourid, Hakim Ben Aj Salah, Omar Zhagouane, Oussama ElGharras	Developing a regional Conservation Agriculture Hub for North Africa: Pilot phase (administered via Rural Solutions SA)	2011-2012
Australian Solar Institute (ASI)	**John Boland, Manju Agrawal**	Forecasting and characterising grid connected solar energy (administered via University of New South Wales)	2011-2014
Cooperative Research Centre – CRC for Rail Innovation	**Peter Pudney**, **Phil Howlett**	Train Planning R2.103	2008-2012
Cooperative Research Centre – AutoCRC	**Peter Pudney, Rocco Zito, Amie Albrecht**	Smart charging for electric vehicles	2009-2011
Cooperative Research Centre (CRC)	**Chris Saunders**	Measuring working airflow of aeration fans fitted to upright storage and silo bags	2008-2011
Commonwealth Scientific and Industrial Research Organisation (CSIRO) Fellowship	**Wasim Saman, John Boland, Barbara Pocock, Edward Halawa, Frank Bruno, David Whaley, Lachlan Mudge, Monica Oliphant**	Intelligent grid cluster	2008-2011
National Climate Change Adaptation Research Facility (NCCARF)	**Wasim Saman, Stephen Pullen**, **George Zillante**, **John Boland**, **Martin Belusko**	A framework for adaptation of Australian households to heat waves	2011-2013

Tier 2 projects (continued)			
Funding Body	**Investigators (Barbara Hardy Institute members shown in bold)**	**Project Title**	**Project Years**
Grains, Research and Development Corporations (GRDC)	**Jack Desbiolles**, **Andrew Burge**, **Dean Thiele**	Improvement of no-till farming through innovation in sowing, weed control, residue management and precision agriculture systems (administered via SANTFA)	2006-2012
Grains, Research and Development Corporations (GRDC)	**John Fielke**, **Jack Desbiolles**, **Andrew Burge**, **Chris Saunders**, **Dean Thiele**	Improving sowing system technologies for no-till cropping	2007-2011
Grains, Research and Development Corporations (GRDC)	**Jack Desbiolles**, **Dean Thiele**, **Andrew Burge**	Fungicide Control of Rhizoctonia (administered via SARDI)	2011-2013
Grains, Research and Development Corporations (GRDC)	**Chris Saunders**	A Scoping Study of Engineering Solutions for Plant and Soil Sensing using Infrared Technology	2011-2012
Grains, Research and Development Corporations (GRDC)	**John Fielke**, **Chris Saunders**, **Dean Thiele**, Graeme Quick, **Andrew Burge**	Mechanical Weed Seed Termination at Harvest	2011-2013
Grains, Research and Development Corporations (GRDC)	**John Fielke**, **Chris Saunders**, **Jack Desbiolles**, **Nick Berry**	Weed seed termination method at harvest	2010-2013
National Health and Medical Research Council (NHMRC) Project Grant	**Philip Weinstein**, Nicholas Fisk, Angus Cook, Mark Nieuwenhuijsen, Natasha Nassar, Annette Dobson, John Newnham, Carol Bower, Emily Fearnley	Study of birth defects from fetotoxic agents	2011-2014

Appendix 3. Presentations

This appendix includes conference presentations, seminars, forums, workshops, public talks and symposia. Note that presentations at conferences which are published in conference proceedings are listed in Appendix 4: Publications. Members of the Barbara Hardy Institute are shown in bold type.

Manju Agrawal

Volatility of wind energy using high frequency data. Modelling, Identification and Control, International Association of Science and Technology for Development (IASTED), 24-26 November, Phuket.

Manju Agrawal and **John Boland**

Wind energy volatility using high frequency data and a comparison with GARCH type models. International Federation of Operational Research Societies (IFORS) Conference, 10-15 July, Melbourne.

Reazul Ahsan, Sadasivam Karuppannan and **Jon Kellett**

A theoretical framework for analysing climate change impacts. 3rd World Planning Schools Conference, Australian and New Zealand Association of Planning Schools (ANZAPS), 4-8 July, Perth.

Alemu Alemu and **Steven Tay**

Experimental Investigation of an Integrated Wind Induced Ventilation and Evaporative Cooling System. International Solar Energy Society (ISES) Solar World Congress Conference, 28 August – 2 September, Kassel, Germany.

Paul Atem

Utilising Habermas' communicative planning action to better understand Sudanese refugees' social and economic housing situation in Australia. 3rd World Planning Schools Conference, Australian and New Zealand Association of Planning Schools (ANZAPS), 4-8 July, Perth.

Sam Baroudi and Randy R. Rapp

A project management approach to disaster response and recovery operations. Australasian Universities Building Educators Association (AUBEA) Conference, 27-29 August, Gold Coast.

Martin Belusko

The importance and real performance of insulation in low energy buildings. Barbara Hardy Institute Seminar, 30 May, Mawson Lakes.

Stephen Berry

Zero energy housing. Barbara Hardy Institute Launch Symposium 'Creating Sustainable Communities in a Changing World', 30 November, Adelaide.

John Boland (keynote speaker)

Climate statistics in energy meteorology. 4th PhD Symposium, University of Adelaide, 20 October, Adelaide.

John Boland

Greening the renovation. Barbara Hardy Institute Seminar, 29 June, Mawson Lakes.

John Boland (session chair and keynote speaker)

Modelling wind farm output volatility. University of Waterloo Institute for Sustainable Energy seminar, 1 September, Waterloo.

John Boland (session chair and scientific committee member)

A new model for forecasting solar energy. International Solar Energy Society (ISES) Solar World Congress Conference, 28 August – 2 September, Kassel, Germany.

Frank Bruno

Solar thermal power generation and storage. Barbara Hardy Institute Launch Symposium 'Creating Sustainable Communities in a Changing World', 30 November, Adelaide.

Farid Christo and Yeshayahou Levy

Flow and combustion characteristics of flameless combustion for gas turbines. 13th International Conference on Numerical Combustion, 27-29 April, Corfu Island.

Farid Christo

Flameless combustion for gas turbine. Defence Science and Technology Organisation (DSTO) Air Vehicle Division Workshop, Adelaide, 11 October, South Australia.

Barry Cooper

Australian Mining History Association (AMHA) National Conference, 12-18 September, Hahndorf.

Chris Daniels (keynote speaker)

Will the environment constrain population growth? Lessons from Adelaide. The Swaby Address, 2011 Australian Native Plant Society of Australia National Biennial Conference, 2-8 October, Adelaide.

Chris Daniels

Citizen Science: how Matt and Dave can help scientific research. Queen Adelaide Club, 27 May, Adelaide.

Chris Daniels

Citizen Science: how Matt and Dave can help scientific research. Field Geology Club of South Australia, 1 September, Adelaide.

Chris Daniels

Citizen Science: how Matt and Dave can help scientific research. Citizen Science Address, Royal Society of South Australia, Adelaide, South Australia, 9 June.

Chris Daniels

Citizen Science: how Matt and Dave can help scientific research. Friends of Walkerville Library, 2 June, Walkerville.

Chris Daniels

Citizen Science: how Matt and Dave can help scientific research. The Wark Institute Seminar, 19 May, Mawson Lakes.

Chris Daniels

Will the environment constrain population growth? Lessons from Adelaide. Cook Society, 19 April, Adelaide.

Chris Daniels

Will the environment constrain population growth? Lessons from Adelaide. History SA, Flinders University and University of South Australia, 18 October, Adelaide.

Chris Daniels

Will the environment constrain population growth? Lessons from Adelaide. Adelaide Rotary Club, 7 December, Adelaide.

Chris Daniels

Will the environment constrain population growth? Lessons from Adelaide. Friends of the Lower Field River AGM, 26 September, Hallett Cove.

Chris Daniels

What will Adelaide look like in 2020? - Stirring the possum. Stirring the Possum, Department of Environment and Natural Resources (DENR), 2 November, Adelaide.

Chris Daniels

Biodiversity: what is the biggest life-form? Citizen Science Address - Bellevue Heights Junior Field Naturalists, 31 March, Bellevue Heights.

Chris Daniels

Biology of Adelaide. NCCARF Workshop for Terrestrial Biodiversity in South Australia, National Climate Change Adaptation Research Facility (NCCARF), 8 February, Adelaide.

Chris Daniels and **Philip Roetman**

Be a beachcomber. SA Museum, Barbara Hardy Institute, 17 August, Adelaide.

Kathryn Davidson

What is sustainability and how we measure it? Barbara Hardy Institute Launch Symposium 'Creating Sustainable Communities in a Changing World', 30 November, Adelaide.

Jack Desbiolles

No-till seeding system considerations for improving crop residue handling. 2011 Grains Research Update - Farming to Potential, Grain Research and Development Corporation (GRDC), 9-10 February, Ballarat.

Jack Desbiolles

Heavy crop residue management and implications for seeding machinery. Yorke Peninsula Grower Update: Harvesting Potential 2011, Agricultural Bureau of South Australia, Yorke Peninsula Alkaline Soils Group, 16 February, Ardrossan.

Jack Desbiolles

Zero-till machinery. Zero Tillage Machinery Training Course, International Centre for Agricultural Research in the Dry Areas (ICARDA), 22-28 March, Aleppo, Syria.

Jack Desbiolles

Seed placement issues in no-till seeding systems. Crop Emergence and Seeder Evaluation Day, The Laura Agricultural Bureau; South Australian No-Till Farmers Association (SANTFA), 29 June, Gladstone.

John Fielke

Findings from the study tour of the Australian almond processing industry. Almond Board of Australia Advanced Productions Systems Workshop, 17 August, Adelaide.

Cathryn Hamilton, **Jon Kellett** and **Stephen Pullen**

Climate adaptation - learning from regional analogues. State Government of Queensland, 18 May, Caboolture.

Stephen Hamnett

Contestations and social construction of space. Placemaking in Asian Cities at the Asian Planning Schools Association (APSA) Congress, 20 September, Tokyo.

Mohamad Sufian Hasim, **Stephen Pullen** and **Alpana Sivam**

Comparative analysis of university websites for indicators of sustainability: Australia and Malaysia, Australasian Universities Building Educators Association (AUBEA) Conference, 27-29 April, Gold Coast.

Nicholas Holyoak

CUBE Transportation Planning Software Package. Barbara Hardy Institute Seminar, 17 March, Adelaide.

Nicholas Holyoak

Community travel preferences in Adelaide Northern Rail. Barbara Hardy Institute Seminar, 8 June, Adelaide.

Tim Johnson and **Don Cameron**

Trees, stormwater, soil and civil infrastructure: synergies towards sustainable urban design for a changing climate. International Conference of the International Society of Arboriculture, 23-27 July, Paramatta.

Tim Johnson, **Don Cameron** and Gregory Moore

Can permeable pavements reduce conflicts between tree roots and footpaths? International Public Works Conference, Institute of Public Works Engineering Australia, 21-25 August, Canberra.

Jon Kellett and **Stephen Pullen**
The Lifetime Affordable Housing Forum. Barbara Hardy Institute Seminar, 25 March, Adelaide.

Jon Kellett
Lifetime affordable housing. SA Planning Institute of Australia Regional Conference, South Australian Planning Institute of Australia, 6 October, Mount Gambier.

Jon Kellett, **Ivan Iankov**, **Jacqui Balston** and **Nikolaos Vogiatzis**
Local council infrastructure and climate change. The State of Australian Cities Conference, Australian Cities and Regions Network (ACRN), 29 November – 2 December, Melbourne.

Jon Kellett (keynote speaker)
Coincident agendas: climate change and sustainability. International Conference on the Built Environment in Developing Countries, Universiti Sains Malaysia (USM) and University of South Australia, 6 December, Penang.

Brian Kirke
There's water somewhere, sometimes… 2011 Meeting of the SA Alternative Technology Association, 21 February, Adelaide.

Brian Kirke
Poster: 'Early steps in proof of concept of the ring drive variable pitch wind turbine'. 8th Asia Pacific Conference on Sustainable Energy & Environmental Technologies (APCSEET), 10-13 July, Adelaide.

Brian Kirke
Renewable energy for desalination on a floating platform. 8th Asia Pacific Conference on Sustainable Energy & Environmental Technologies (APCSEET), 10-13 July, Adelaide.

Lisa Linell, Brad Hoekman, David Szilassy, Ann-Louise George, **David Lloyd**, Yvonne Zeegers, **Philip Roetman** and **Kathy Paige**
Operation Spider: what did the teachers learn, what did the students learn? South Australian Science Teachers Association (SASTA) Conference, 18-19 April, Adelaide.

Li Meng and **Philip Roetman**
Low Carbon Urban Features Colloquium, Zero Waste SA Research Centre for Sustainable Design and Behaviour, 19-20 May, Adelaide.

Li Meng
Discrete choice modelling for TODs, Barbara Hardy Institute Seminar, 22 June, Adelaide.

Julie Mills
I like the challenge: a study of women engineers who have stayed in the profession. International Conference of Women Engineers and Scientists, Women in Engineering National Committee, 19-22 July, Adelaide.

Julie Mills
Not all women leave: reflections on a cohort of stayers in civil engineering. American Society for Engineering Education (ASEE) Annual Conference, 26-29 June, Vancouver.

Julie Mills
The potential of BIM to facilitate collaborative AEC education. American Society for Engineering Education (ASEE) Annual Conference, 26-29 June, Vancouver.

Diana Mohamad and **Matthew Rofe**
Telecommuting's potential contribution to reducing traffic congestion: a Malaysian perspective. International Transport Research Conference: A Road Map for Safer Mobility, 12-14 April, Penang.

Nicola Mosca
Technologies for a better public transport system. Barbara Hardy Institute Seminar, 25 May, Adelaide.

Tim O'Leary

Australian residential building energy standard-setting, assessment and rating - A national response for 2010/2011 frameworks. 17th Pacific Rim Real Estate Society (PRRES) Conference, 16-19 January, Robina.

Tim O'Leary

Cost implications of 6 stars house energy rating. Association of Building Sustainability Assessors (ABSA) National Conference, 19-20 May, Melbourne.

Monica Oliphant (session chair)

Introduction to ISES Advancing Solar Energy Policy Award 2011. International Solar Energy Society (ISES) Solar World Congress Conference, 28 August-2 September, Kassel, Germany.

Jaruwit Prabnasak

Exploring the vehicle ownership in a mid-sized city of Thailand. Barbara Hardy Institute Seminar, 17 August, Adelaide.

Peter Pudney

Low energy transport, Barbara Hardy Institute Launch Symposium 'Creating Sustainable Communities in a Changing World', 30 November, Adelaide.

Peter Pudney

School Holidays workshops: electric cars and TREV - RiAus Science Exchange, Royal Institution, Australia (RiAus) - for the Australian Science Communicators, 29 April, Adelaide.

Stephen Pullen

Circulating resources, embodied energy and buildings. Barbara Hardy Institute Launch Symposium 'Creating Sustainable Communities in a Changing World', 30 November, Adelaide.

Stephen Pullen

Embodied energy of material in buildings. Barbara Hardy Institute Seminar, 6 July, Adelaide.

Stephen Pullen

Valuing the embodied energy of historic residential buildings. 45th Annual Conference of the Australian & New Zealand Architectural Science Association (ANZASA), 17-19 November, Sydney.

Raluca Raicu

On the evaluation of urban logistics intermodal terminal projects, 7th International Conference on City Logistics, Institute for City Logistics, 9 June, Mallorca.

Raluca Raicu

Helping to create attractive cities to live, visit, shop and do business, Workshop on Sustainable Urban Freight Solutions, Barbara Hardy Institute, 27 September, Adelaide.

Christian Reynolds

Sustainable behaviour around food waste, Barbara Hardy Institute Launch Symposium 'Creating Sustainable Communities in a Changing World', 30 November Adelaide, South Australia.

Barbara Ridley, **Jerzy Filar** and **John Boland**

Lebesgue integral inspired estimation of wind energy output. 19 Triennial Conference of the International Federation of Operational Research Societies (IFORS), 10-15 July, Melbourne.

Philip Roetman, **Chris Daniels** and **James Smith**

Citizen Science for research, education and community engagement. ASCSA monthly: Citizen science and attracting wildlife, Royal Institution for the Australian Science Communicators (RiAus), Royal Institution and Australian Science Communicators (SA Branch), 23 May, Adelaide.

Philip Roetman and **Chris Daniels**

The power of Citizen Science and the paradox of the possum. Butterfly Conservation SA Inc., 6 September, Adelaide.

Philip Roetman and Chris Daniels

Citizen Science for research, education and community engagement. Switching on to Science Conference, Department of Education and Children's Services (DECS), 1 September, Adelaide.

Philip Roetman and **Chris Daniels**

Citizen Science for research, education and community engagement. Heta Employment Training Seminar, 2 June, Adelaide.

Philip Roetman

Spider biology and ecology. Douglas Scrub Environmental Field Day, Girl Guides South Australia Inc., 4 May, Adelaide.

Matthew Rofe and Lee Lik Meng

'Planning' for transformative learning: reflections from an international field school. 3rd World Planning Schools Conference, Australian and New Zealand Association of Planning Schools (ANZAPS), 4-8 July, Perth.

Matthew Rofe and Rowena Butland

Boutiques hotels and the packaging of 'Asia' for tourist consumption: lessons from Siam Reap, Cambodia and George Town, Malaysia. 5th International Conference of the Built Environment in Developing Countries, 16-18 December, Penang.

John Rolls

The social science of climate change. Barbara Hardy Institute Seminar, 2 May, Mawson Lakes.

John Rolls

Human cognition of climate change threat and the implications for the communication of climate risk. Australasian Campuses Toward Sustainability (ACTS) Conference, 28 September, Adelaide.

John Rolls

Unfit for task - human cognition of threat and the political psychology of climate change. Unfit for Task Forum, Adelaide Festival of Ideas, 9 October, Adelaide.

Wasim Saman

Renewable energy certificates: impact of installation parameters of solar water heathers on collected solar energy. Barbara Hardy Institute Seminar, 16 May, Mawson Lakes.

Wasim Saman, **Lachlan Mudge**, **David Whaley** and Edward Halawa

Sustainable housing in Australia: monitored trends in energy consumption. International Conference on Sustainability in Energy and Buildings (SEB'11), KES International, 1-3 June, Marseilles.

Chris Saunders

Development of mechanical methods of destroying weed seeds at harvest namely the Harrington Seed Destructor. Minnipa Agricultural Centre(MAC) Annual Field Day, 26 September, Minnipa.

Derek Scrafton

Public transport: rhetoric and reality. Barbara Hardy Institute Seminar, 6 July, Adelaide.

Alex Sims

Dangerous sports – driving in a bushfire. Barbara Hardy Institute Seminar, 12 October, Adelaide.

Alpana Sivam and **Sadasivam Karuppannan**

Internationalisation of Australian urban and regional planning education. 3rd World Planning Schools Conference, University of Western Australia and Australian and New Zealand Association of Planning Schools (ANZAPS), 4-8 July, Perth.

Branko Stazic

Microsimulation and SCATS. 1st International Workshop on Traffic Data Signal Analysis, Barbara Hardy Institute, 11 August, Adelaide.

Branko Stazic

The use of SIDRA in traffic signal optimisation. SIDRA Lecture and Road Safety Audit, 19-20 September, Khon Kaen.

Branko Stazic

Urban sense - a new way of detecting traffic. Barbara Hardy Institute Seminar, 23 November, Adelaide.

Chansiri Suksri

Advanced traffic signal analysis. Barbara Hardy Institute Seminar, 26 October, Adelaide.

Jintawadee Suksri

Sustainable urban freight distribution. Barbara Hardy Institute Seminar, 14 September, Adelaide.

Susilawati

Travel variability modelling. Barbara Hardy Institute Seminar, 20 July, Adelaide.

Steven Tay, **Frank Bruno** and **Martin Belusko**

Experimental validation of a CFD and a **ε***- NTU model for tubes in a large PCM tank.* ISES Solar World Congress Conference , International Solar Energy Society (ISES), 28 August – 2 September, Kassel.

Michael Taylor

Project 2: an infrastructure audit. Human dimensions of TREND, University of Adelaide and Premiers Science and Research Fund (PSRF), 6 April, Adelaide.

Michael Taylor

Human dimensions of TREND. 5th Australian Climate Change Adaptation Research Network for Settlements and Infrastructure (ACCARNSI) ECR Forum, 11-13 May, Sydney.

Michael Taylor

Measuring and assessing travel time reliability. Hong Kong Transportation Science Society's Symposium on Latest Directions in Transportation Research, 2 June, Hong Kong.

Michael Taylor (keynote speaker)

The state of play in traffic microsimulation modelling. Australian Institute of Traffic Planning and Management (AITPM) Workshop on 'Microsimulation for Sustainable Communities', 12 August, Melbourne.

Michael Taylor (keynote speaker)

Transport research in Australia - a personal history. Australian-French Symposium on Transportation Research, 19-21 September, Brisbane.

Michael Taylor (keynote speaker)

Mobility research at UniSA: ITS, TTR and EVs. Australian-French Symposium on Transportation Research, 19-21 September, Brisbane.

Michael Taylor (keynote speaker)

Australian research funding schemes. Australian-French Symposium on Transportation Research, 19-21 September, Brisbane.

Michael Taylor

*Traffic data mining and analysis in Adelaide. Measuring and assessing travel time reliability.*2nd International Workshop on Traffic Data Collection and its Standardisation, 22-23 September, Brisbane.

Nikolas Vogiatzis, **Mr Branko Stazic**, **Susilawati**, **Michael Taylor** and **Dr Rocco Zito**

History of the Nexus database - launching the Nexus database to the world. Using the Nexus database in operational and policy research. First International Workshop on Traffic Data Signals Analysis, Barbara Hardy Institute, 11 August, Adelaide.

Indu Wadhawan

Optimal trip sequences for transporting grain from silos. Australia and New Zealand Industrial and Applied Mathematics (ANZIAM) Conference, 31 January, Glenelg.

Indu Wadhawan

Mathematics PhD Symposium, Barbara Hardy Institute Seminar, 20 October, Adelaide.

Indu Wadhawan

10th Engineering Mathematics and Applications Conference, Engineering Mathematics Group, 4-7 December, Sydney.

Brian Webby

Poster: Analysis of wind data to inform strategic decisions regarding a solar array. International Solar Energy Society (ISES) Solar World Congress Conference, 28 August – 2 September, Kassel.

Delene Weber

Towards a transdisciplinary approach to natural resource management: can GIS play a role? 17th International Symposium on Society and Resource Management, International Association for Society and Natural Resources, 14-17 June, Sabah.

David Whaley

Real energy performance of low energy houses: analysis of 12 month measured Lochiel Park Village Data, Barbara Hardy Institute Public Talk, 21 March, Mawson Lakes.

David Whaley

Lochiel Park training session. Barbara Hardy Institute Workshop, 9 August, Campbelltown.

Gusri Yaldi

Some important factors to refine the testing performance of neural network. Barbara Hardy Institute, 31 August, Adelaide.

Wen Long Yue

Further study of Gap Acceptance. Barbara Hardy Institute Seminar, 9 November, Adelaide.

Wen Long Yue

Road safety audit training course. Barbara Hardy Institute Workshop, 14-17 November, Adelaide.

Rocco Zito

The future of electric vehicles in Australia. Barbara Hardy Institute Seminar, 3 August, Adelaide.

Appendix 4. Publications

This appendix includes publications by members of the Barbara Hardy Institute in 2011. In order to recognise affiliation with the institute, author names are formatted thus:

- **Full members: bold and underlined;**
- **Associate members: bold and grey;**
- **Affiliate members: bold;**
- ***Research students: bold, underlined and italicised; and***
- Not affiliated: regular formatting.

Authored Research Books (category A1)

Kirke, B. 2011. Vertical axis wind turbines: with particular emphasis on self-acting variable pitch Darrieus type turbines, Lambert Academic Publishing, Germany.

Authored Other Scholarly Books (category A2)

Daniels, C.B. 2011. *A guide to urban wildlife: 250 creatures you meet on your street*, Harper Collins, Sydney.

Roetman, P.E.J. and **Daniels, C.B.** 2011. *The fearsome flute players: Australian magpies in our lives*, Crawford House, Adelaide.

Edited Scholarly Books (category A3A)

Liu, M.M., **Ness, D**. and Haifeng, H. (eds) 2011. *The green economy and its implementation in China*, Enrich Professional, Singapore.

Roetman, P.E.J. and **Daniels, C.B.** (eds) 2011. *Creating sustainable communities in a changing world*, Crawford House, Adelaide.

Book Chapters (category B)

Berry, S.R. and **Saman, W.Y.** 2011. 'Zero-energy housing', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 149-158.

Boland, J. and **Agrawal, M.** 2011. 'Ecological Footprinting: what is means and how to put the concept to best use', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 63-75.

Bruno, F., **Saman, W.Y**. and Liu, M. 2011. 'Concentrated solar power generation and high-temperature energy storage', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 159-170.

Chileshe, N. 2011. 'Delivering sustainability through construction and project management: principles, tools and practices', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 111-118.

Clark, I. and Zeegers, Y. 2011. 'Education for sustainable development: improving curriculum design in higher education', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 225-232.

Davidson, K. 2011. 'Can we measure sustainability?', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 5-11.

Hamilton, C.M. 2011. 'Local capacity for carbon reduction', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 21-30.

Holyoak, N. 2011. 'Sustainable transport planning and urban communities', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 129-134.

Kellett, J. and **Hamnett, S.** 2011. 'Responding to a changing climate', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 13-20.

Kellett, J. and **Rofe, M.** 2011. 'Urban open space and health: the evidence base', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 199-206.

Koth, B. 2011. 'Behaviour change and the tourism springboard to sustainability', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 217-223.

Lehmann, S. 2011. 'Developing a prefabricated low-carbon construction system using timber for multistorey inner-city housing', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 43-53.

Lehmann, S. 2011. 'Green urbanism: holistic pathways to the rejuvenation of mature housing estates in Singapore', in T. Wong and B. Yuen (eds), *Eco-city planning: policies, practice and design*, Springer, Dordrecht, 151-180.

Lehmann, S. 2011. 'Zero waste and zero emission cities: transforming cities through sustainable design and behaviour change', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 31-41.

Majewski, P., **Luong, L.**, **Xing, K.** and **Amer, Y.** 2011. 'Sustainability of industry-scale nanomanufacturing', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 171-177.

McArthur, L.C., **Boland, J.** and Tiver, F. 2011. 'Optimisation problems in the management of indigenous plant populations under grazing pressure', in R. Boucekkine, N. Hritonenko and Y. Yatsenko (eds), *Optimal control of age-structured populations in economy, demography and the environment*, Routledge (Taylor and Francis), London, 253-276.

Mills, J.E., Tran, A.L.H., **Smith, E.J.** and **Ward, J.** 2011. 'Educating engineers for sustainable practice', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 233-238.

Ness, D. 2011. 'Ascending Jin Shan together: standing higher, looking far, we can achieve a green economy and more', in M.M. Liu, D. Ness and H. Haifeng (eds), *The green economy and its implementation in China*, Enrich Professional, Singapore, 359-378.

Oliphant, M. 2011. 'Energy, energy efficiency and renewable energy in China in the context of the 11th and 12th five-year plans', in M.M. Liu, D. Ness and H. Haifeng (eds), *The green economy and its implementation in China*, Enrich Professional, Singapore, 245-258.

Paige, K. and **Lloyd, D.** 2011. 'Educating for sustainability: a vehicle for engaging primary and middle education students in science', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 239-247.

Pudney, P.J. 2011. 'Low-emission mobility', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 135-140.

Pullen, S. 2011. 'Circulating resources, embodied energy and buildings', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 55-62.

Raicu, R. 2011. 'Meeting the needs of our future cities for goods movement', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 141-147.

Reynolds, C.J., **Boland, J.**, Thompson, K. and Dawson, D. 2011. 'An introduction to the waste input-output model: a methodology to evaluate sustainable behaviour around (food) waste? ', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 77-85.

Roetman, P.E.J. and **Daniels, C.B.** 2011. 'The benefits of citizen science in research, education and community engagement', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 249-260.

Rofe, M., ***Mohamad, D.*** and Marzuki, A. 2011. 'The complexities of social sustainability: balancing tradition and change in a UNESCO World Heritage site', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 95-101.

Rofe, M. and Winchester, H. 2011. 'Marketing a sustainable rural utopia: the evolution of a community festival', in C. Gibson and J. Connell (eds), *Festival places: revitalising rural Australia,* Channel View, Bristol, 194-208.

Rosnäs, L.M., ***Louter, M.M.C.J.***, **Orre-Gordon, G.U.S.** and **Weinstein, P.** 2011. 'Health benefits of healthy ecosystems', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 189-197.

Sivam, A. and **Karuppannan, S.** 2011. 'The myth of affordable housing and sustainable urban development', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 103-109.

Sivam, A., **Karuppannan, S.** and Singh, K. 2011. 'An overview of the Gulf Countries' construction industry', in S.D. Brunn (ed.), *Engineering Earth: the impacts of megaengineering projects (volume 2)*, Springer, Dordrecht, 819-838.

Taylor, M.A.P., **Zito, R.** and **Philp, M.** 2011. 'Sustainable transport, travel demand management, and electric', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 119-128.

Taylor, S.G., ***Roetman, P.E.J.*** and **Daniels, C.B.** 2011. 'Urban biodiversity', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 179-187.

Weber, D.L. 2011. 'Beyond nature conservation: the importance of parks to a sustainable society', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 207-215.

Wilson, L. and **Chiveralls, K.** 2011. 'Social inclusion, climate change and sustainable communities', in P.E.J. Roetman and C.B. Daniels (eds), *Creating sustainable communities in a changing world*, Crawford House, Adelaide, 87-93.

Zuo, J., **Zillante, G.** and Zhao, Z. 2011. 'Chinese construction industry: governance, procurement and culture', in S.D. Brunn (ed.), *Engineering Earth: the impacts of megaengineering projects (volume 2)*, Springer, Dordrecht, 839-850.

Refereed Journal Articles (category C1)

Abbott, B., Lugg, R., Devine, B., Cook, A. and **Weinstein, P.** 2011. 'Microbial risk classifications for recreational waters and applications to the Swan and Canning Rivers in Western Australia', *Journal of Water and Health*, 9(1): 70-79.

Albrecht, A., Panton, D. and Lee, D. 2011. 'Rescheduling rail networks with maintenance disruptions using Problem Space Search', *Computers & Operations Research*.

Anyi, M. and **Kirke, B.** 2011. 'Evaluation of small axial flow hydrokinetic turbines for remote communities', *Energy for Sustainable Development*, 14(2):110-116.

Anyi, M. and **Kirke, B.** 2011. 'Hydrokinetic turbine blades: design and local construction techniques for remote communities', *Energy for Sustainable Development: The Journal of the International Energy Initiative*, 15(3): 223-230.

Arnold, R.G., Heyworthz, J., Sáez, A.E., Rodriguez, C., **Weinstein, P.**, Ling, P. and Memon, S. 2011. 'The status of water and sanitation among Pacific Rim nations', *Reviews on Environmental Health*, 26(1): 17-30.

Ayre, M., **Mills, J**. and Gill, J. 2011. 'Two steps forward, one step back: women in professional engineering in Australia', *International Journal of Gender, Science and Technology*, 3(2):.293-312.

Belusko, M., **Bruno, F.** and **Saman, W.** 2011. 'Investigation of the thermal resistance of timber attic spaces with reflective foil and bulk insulation, heat flow up', *Applied Energy*, 88(1): 127-137.

Bray, D., **Taylor, M.** and **Scrafton, D.** 2011. 'Transport policy in Australia - evolution, learning and policy transfer', *Transport Policy*, 18(3): 522-532.

Brown, G. and **Weber, D.** 2011. 'Public participation GIS: a new method for national park planning', *Landscape and Urban Planning*, 102(1): 1-15.

Bruno, F. 2011. 'On-site experimental testing of a novel dew point evaporative cooler', *Energy & Buildings,* 43(12): 3475-3483.

Butler, C.D. and **Weinstein, P.** 2011. 'Global ecology, global health, ecohealth', *EcoHealth*, 8: 253-254.

Cameron, D. 2011. 'Estimation of foundation management and design of footing systems on reactive soils for the effects of trees', *Australian Geomechanics*, 46(3): 97-113.

Cameron, D. and ***Gabr, A.*** 2011. 'Comparison of specifications for recycled concrete aggregate for pavement construction', *Journal of ASTM International*, 8(10): 1-15.

Carver, S., Goater, S., Allen, G.R., Rowbottom, R.M., Fearnley, E. and **Weinstein, P.** 2011. 'Relationships of the Ross River virus (Togoviridae: *Alphavirus*) vector, *Aedes camptorhynchus* (Thomson) (Diptera: Culicidae), to biotic and abiotic factors in saltmarshes of south-eastern Tasmania, Australia: a preliminary study', *Australian Journal of Entomology*, 50(4): 344-355.

Castell, A., **Belusko, M.**, **Bruno, F.** and Fabra, L.F.C. 2011. 'Maximisation of heat transfer in a coil in tank PCM cold storage system', *Applied Energy*, 88(11): 4120-4127.

Christo, F. 2011. 'Numerical modelling of wind and dust patterns around a full-scale parabolic solar dish', *Renewable Energy*, 39(1): 356-366.

Coggins, J. 2011. 'From disparity to harmonisation of construction industry payment legislation in Australia: a proposal for a dual process of adjudication based upon size of progress payment claim', *Australasian Journal of Construction Economics and Building*, 11(2): 34-59.

Cook, A.G., deVos, A.J.B.M., Pereira, G., Jardine, A. and **Weinstein, P.** 2011. 'Use of a total traffic count metric to investigate the impact of roadways on asthma severity: a case-control study', *Environmental Health*, 10: 52.

Davidson, K. 2011. 'A typology to categorise the ideologies of actors in the sustainable development debate', *Sustainable Development*, DOI: 10.1002/sd.520.

Davidson, K. and Venning, J. 2011. 'Sustainability decision-making frameworks and the application of systems thinking: an urban context', *Local Environment*, 16(3): 213-228.

Davidson, K. and Wilson, L. 2011. 'Australia's progress undefined: a critical review of measures of Australia's progress', *Australian Journal of Public Administration*, 70(1): 47-57.

Dean, J., van Dooren, K. and **Weinstein, P.** 2011. 'Does biodiversity improve mental health in urban settings?', *Medical Hypotheses* 76(6): 877-880.

Derne, B.T., Fearnley, E.J., Goater, S., Carter, K. and **Weinstein, P.** 2011. 'Ciguatera fish poisoning and environmental change: a case for strengthening health surveillance in the Pacific?' *Pacific Health Dialog*, 16(2): 99-108.

Derne, B.T., Fearnley, E.J., Lau, C.L., Paynter, S. and **Weinstein, P.** 2011. 'Biodiversity and leptospirosis risk: a case of pathogen regulation?', *Medical Hypotheses*, 77(3): 339-344.

Drysdale, M., Ljung Bjorklund, K., Jamieson, H.E., **Weinstein, P.**, Cook, A. and Watkins, R.T. 2011. 'Evaluating the respiratory bioaccessibility of nickel in soil through the use of a simulated lung fluid', *Environmental Geochemistry and Health*, 34(2): 279-288.

Gabr, A . 2011. 'Comparison of specifications for recycled concrete aggregate for pavement construction', *Journal of ASTM International*, 8(10): 1-15.

Gehling, J.G., **Jago, J.B.**, Paterson, J.R., García-Bellido, D.C. and Edgecombe, G.D. 2011. 'The geological context of the Lower Cambrian (Series 2) Emu Bay Shale Lagerstätte and adjacent stratigraphic units, Kangaroo Island, South Australia', *Australian Journal of Earth Sciences*, 58(3): 243-257.

Goater, S., Cook, A., Hogan, A., Mengersen, K., Hieatt, A. and **Weinstein, P.** 2011. 'Strategies to strengthen public health inputs to water policy in response to climate change: an Australian perspective', *Asia-Pacific Journal of Public Health*, 23: 7S-13S.

Goater, S., Derne, B. and **Weinstein, P.** 2011. 'Critical issues in the development of health information systems in supporting environmental health: a case study of ciguatera', *Environmental Health Perspectives*, 119: 585-590.

Hall, P.A., McKirdy, D.M., Halverson, G.P., **Jago, J.B.** and Gehling, J.G. 2011. 'Biomarker and isotopic signatures of an early Cambrian Lagerstätte in the Stansbury Basin, South Australia', *Organic Chemistry*, 42: 1324-1330.

Hambling, T., **Weinstein, P.** and Slaney, D. 2011. 'A review of frameworks for developing environmental health indicators for climate change and health', *International Journal of Environmental Research and Public Health*, 8(7): 2854-2875.

Huang, B., **Xing, K.**, **Abhary, K**. and Spuzic, S. 2011. 'Investigation of roll pass optimal design on IGA', *Advanced Material Research*, 211-212: 195-199.

Hung, N.T., Ikeda, H., Kuribayasi, K. and **Vogiatzis, N.** 2011. 'Reducing the network load in CREPEnvironment', *Journal of Information Processing*, 19: 12-24.

Jago, J., Bentley, C.J. and Cooper, R.A. 2011. 'A Cambrian Series 3 (Guzhangian) fauna with *Centropleura* from Northern and Victoria Land, Antarctica', in J.R. Laurie, J.R. Peterson and G.A. Brock (eds), *Cambro-Ordovician Studies IV. Memoirs of the Association of Australasian Palaeontologists*, 42: 15-35.

Jago, J. and **Cooper, B.** 2011. 'The Emu Bay Shale Lagerstätte: a history of investigation', *Australian Journal of Earth Sciences*, 58(3): 235-241.

Jardine, A., Corkeron, M. and **Weinstein, P.** 2011. 'Dryland salinity and vector-borne disease emergence in southwestern Australia', *Environmental Geochemistry and Health*, 33(4): 363-370.

Karuppannan, S. and **Sivam, A.** 2011. 'Social sustainability and neighbourhood design: an investigation of residents' satisfaction in Delhi', *Local Environment*, 16(9): 849-870.

Kellett, J. 2011. 'More than a roof over our head: can planning safeguard rooftop resources?', *Urban Policy and Research*, 29(1): 23-26.

Kellett, J. 2011. 'The Australian quarter acre block: the death of a dream?', *Town Planning Review*, 82(3): 263-284.

Kirke, B. 2011. 'Tests on ducted and bare helical and straight blade Darrieus hydrokinetic turbines', *Renewable Energy*, 36(11): 3013-3022.

Kirke, B. and Lazauskas, L. 2011. 'Limitations of fixed pitch Darrieus hydrokinetic turbines and the challenges of variable pitch', *Renewable Energy*, 36(3): 893-897.

Lau, C. and **Weinstein, P.** 2011. 'Flooding and infectious disease in rural children: can intervention mitigate predicted increases in disease burden?' *International Public Health Journal*, 2(4): 393-404.

Lau, C.L., Dobson, A.J., Smythe, L.D., Fearnley, E.J., Skelly, C., Clements, A.C., Craig, S.B., Fuimaono, S.D. and **Weinstein, P.** 2011. 'Leptospirosis in American Samoa 2010: epidemiology, environmental drivers, and the management of emergence', *The American Society of Tropical Medicine and Hygiene*, 86(2): 309-319.

Lee, M.S.Y., **Jago, J.B.**, García-Bellido, D.C., Edgecombe, G.D., Gehling, J.G. and Paterson, J.R. 2011. 'Modern optics in exceptionally preserved eyes of Early Cambrian arthropods from Australia', *Nature*, 474(7353): 631-634.

Liu, M., **Saman, W.** and **Bruno, F.** 2011. 'Validation of a mathematical model for encapsulated phase change material flat slabs for cooling applications', *Applied Thermal Engineering*, 31(14-15): 2340-2347.

McKirdy, D.M., Hall, P.A., Nedin, C., Halverson, G.P., Michaelsen, B.H., **Jago, J.B.**, Gehling, J.G and Jenkins, R.J.F. 2011. 'Paleoredox status and thermal alteration of the lower Cambrian (Series 2) Emu Bay Shale Lagerstätte, South Australia', *Australian Journal of Earth Sciences*, 58(3): 259-272.

Meng, Q., ***Zaman, I.***, Hannam, J.R., Kapota, S., **Luong, L.**, Youssf, O. and Ma, J. 2011. 'Improvement of adhesive toughness measurement', *Polymer Testing*, 30: 243-250.

Mills, D.J., Lau, C.L., Fearnley, E.J. and **Weinstein, P.** 2011. 'The immunogenicity of a modified intradermal pre-exposure rabies vaccination schedule-A case series of 420 travelers', *Journal of Travel Medicine,* 18(5): 327-332.

Mills, D.J., Lau, C. and **Weinstein, P.** 2011. 'Animal bites and rabies exposure in Australian travellers', *Medical Journal of Australia*, 195(11-12): 673-675.

Mills, J. 2011. 'Reflections on the past, present and future of women in engineering', *Australasian Journal of Engineering Education*, 17(3): 139-145.

Milne, F.H., Judge, D.S., Preen, D.B. and **Weinstein, P.** 2011. 'Early life environment, life history and risk of endometrial cancer', *Medical Hypotheses*, 77(4): 626-632.

Narayanan, R., **Saman, W.**, White, S.D. and Goldsworthy, M. 2011. 'Comparative study of different desiccant wheel designs', *Applied Thermal Engineering*, 31(10): 1613-1620.

Orgeig, S., Morrison, J. and **Daniels, C.** 2011. 'Prenatal development of the pulmonary surfactant system and the influence of hypoxia', *Respiratory Physiology & Neurobiology*, 178(1): 129-145.

Paterson, J.R., García-Bellido, D.C., Lee, M.S.Y., Brock, G.A., **Jago, J.B.** and Edgecombe, G.D. 2011. 'Acute vision in the giant Cambrian predator *Anomalocaris* and the origin of compound eyes', *Nature*, 480: 237-240.

Rofe, M.W. and Stein, L. 2011. 'Shedding new light on Adelaide? Intersections between urban design projects and city marketing', *Journal of Urban Design*, 16(3): 321-338.

Rowlands, I.J., **Weinstein, P.**, Nagle, C.M., Spurdle, A.B. and Webb, P.M. 2011. 'Season of birth and risk of endometrial cancer', *Asian Pacific Journal of Cancer Prevention*, 12(5): 1193-1196.

Sivam, A., **Karuppannan, S.** and Davis, M.C. 2011. 'Stakeholders' perception of residential density: a case study of Adelaide, Australia', *Journal of Housing and the Built Environment*, 1-22.

Speldewinde, P.C., Cook, A., Davies, P. and **Weinstein, P.** 2011. 'The hidden health burden of environmental degradation: disease comorbidities and dryland salinity', *Ecohealth*, 8(1): 82-92.

Weinstein, P., Judge, D. and Carver, S. 2011. 'Biological and cultural coevolution and emerging infectious disease: Ross River virus in Australia', *Medical Hypotheses*, 76(6): 893-896.

Williams, S., Nitschke, M., Sullivan, T., Tucker, G.R., **Weinstein, P.**, Pisaniello, D.L., Parton, K.A. and Bi, P. 2011. 'Heat and health in Adelaide, South Australia: assessment of heat thresholds and temperature relationships', *Science of the Total Environment*, 414: 126-133.

Yuan, X. and **Zuo, J.** 2011. 'Pricing and affordability of renewable energy in China - a case study of Shandong Province', *Renewable Energy*, 36(3): 1111-1117.

Yuan, X., **Zuo, J.** and Ma, C. 2011. 'Social acceptance of solar energy technologies in China-End users' perspective', *Energy Policy*, 39(3): 1031-1036.

Zaman, I., Le, Q.H., Kuan, H.C., Kawashima, N., **Luong, L.**, Gerson, A. and Ma, J. 2011. 'Interface-Tuned epoxy/clay nanocomposites', *Polymer*, 52(2): 497-504.

Zhao, Z.Y., **Zuo, J.**, Fan, L.L. and **Zillante, G.** 2011. 'Impacts of renewable energy regulations on the structure of power generation in China - a critical analysis', *Renewable Energy*, 36(1): 24-30.

Zhao, Z.Y., **Zuo, J.**, Feng, T.T. and **Zillante, G.** 2011. 'International cooperation on renewable energy development in China - a critical analysis', *Renewable Energy*, 36(3): 1105-1110.

Refereed Conference Papers (category E1)

Abhary, K, ***Huang, B*** and **Xing Ke.** 2011. 'Scheduling and performance evaluation of robotic flexible assembly cells under different dispatching rules'. *2011 International Conference on Mechanical, Industrial and Manufacturing Engineering*, Australia.

Alemu, A.T., **Saman, W.** and **Belusko, M.** 2011. 'A coupled building ventilation and thermal model incorporating passive airflow components', *Proceedings of the 12th Conference of the International Building Performance Simulation Association*, 14-16 November, Sydney, 86-93.

Allery, M. and **Koth, B.** 2011. 'Engaging with Skippy and friends: the wildlife feeding phenomenon', in M.J. Gross (ed.), *CAUTHE 2011 National Conference: Tourism - Creating a Brilliant Blend*, 8-11 February, Adelaide, 14-28.

Ayre, M., **Mills, J.** and Gill, J. 2011. 'Not all women leave: reflections on a cohort of stayers in civil engineering', *2011 American Society for Engineering Education Annual Conference*, 26-29 June, Vancouver, 15376-15389.

Ayre, M., **Mills, J.** and Gill, J. 2011. 'I like the challenge: a study of women engineers who have stayed in the profession', *15th International Conference of Women Engineers and Scientist*, 16-19 July, Adelaide, 1-10.

Azizian Marzuki, N.A.M.H. and **Rofe, M.W.**, 2011. 'Nature-based tourism development in Northern Peninsula Malaysia: an analysis of tourism potential and constraints', *Refereed Proceedings of World Planning Schools Congress,* 4-8 July, Perth.

Baharuddin, Z.M., **Sivam, A.**, **Karuppannan, S.** and **Daniels, C.** 2011. 'Urban parks in Kuala Lumpur: biodiversity and design challenges', *Proceedings of the 3rd World Planning Schools Congress: Planning's Future-Future Planning - Planning in an Era of Global (Un)Certainty and Transformation*, 4-8 July, Perth, 1-18.

Chanprasopchai, T., **Saman, W.** and **Halawa, E.** 2011. 'Experimental performance of a low flow rate regenerator of a solar liquid desiccant cooling/dehumidification system', *Proceedings of the 2011 International Conference on Alternative Energy in Developing Countries and Emerging Economies*, 25-26 May, Songkhla, Thailand, 218-224.

Christo, F. 2011. 'Combustion modelling of JP10 in a Scramjet Engine', *Proceedings of the 3rd Asia-Pacific International Symposium on Aerospace Technology,* 28 February – 3 March, Melbourne, 1-10.

Christo, F. and Levy, Y. 2011. 'Flow and combustion characteristics of a flameless combustor for gas turbine', *Proceedings of the 13th International Conference on Numerical Combustion*, 27-29 April, Corfu, CP004.

Coggins, J. 2011. 'Harmonisation of construction industry payment legislation in Australia - a survey of construction lawyers', Proceedings of the 36th *Australasian University Building Educators Association (AUBEA) Conference*, 27-29 April, Bond University, Queensland, 146-169.

Freeman, S. and **Holyoak, N.M.** 2011. 'Vulnerability analysis of macroscopic and mesoscopic road networks', *Proceedings of the 34th Australasian Transport Research Forum*, 28-30 September, Adelaide.

Goshtasb, A.K., **Desbiolles, J.** and **Fielke, J.** 2011. 'Opportunities for improving the performance of single disc seeders in sticky soil conditions', *Proceedings of the 2011 Society for Engineering in Agriculture Conference: Diverse Challenges Innovative Solutions*, 28 September, Gold Coast, 256-265.

Hasim, M.S., **Pullen, S.** and **Sivam, A.** 2011. 'Comparative analysis of university websites for indicators of sustainability: Australia and Malaysia', *Proceedings of the 36th Australasian University Building Educators Association (AUBEA) Conference – Getting a building degree - the end of the beginning?*, 27-29 April, Gold Coast, 131-145.

Henderson, M.R. and **Rofe, M.W.** 2011. 'Regionalism, regions and transition: the 30 year plan for Greater Adelaide and conflict in the Barossa Region', *Refereed Proceedings of the State of Australian Cities Conference*, 30 November-2 December, Melbourne.

Jaensch, A., **Zuo, J.** and **Chileshe, N.** 2011. 'Risk management in civil construction projects – from cost estimating perspective', in S. Han, S. Davis, X. Wang, J. Kim and D. Carmichael (eds), *Proceedings of the 4th International Conference on Construction Engineering and Project Management (ICCEPM-2011*), 16-18 February, Sydney, paper S5-2.

Jin, X.-H., Liu, C., **Zuo, J.** and Zhang, G. 2011. 'Exploring potential success factors for procurement of privately financed infrastructure', in S. Han, S. Davis, X. Wang, J. Kim and D. Carmichael (eds), *Proceedings of the 4th International Conference on Construction Engineering and Project Management (ICCEPM-2011*), 16-18 February, Sydney, paper S4-4.

Kellett, J., **Ness, D.**, ***Hamilton, C.***, **Pullen, S.** and Leditschke, A. 2011. 'Learning from regional analogues', *Proceedings of the 3rd World Planning Schools Congress: Planning's Future-Future Planning - Planning in an Era of Global (Un)Certainty and Transformation*, 4-8 July, Perth.

Koth, B. 2011. 'Personal values and the ecological worldview of civil engineering and environmental science students', *Proceedings of the 22nd Annual Conference for the Australasian Association for Engineering Education*, 5-7 December, Fremantle, 62-68.

Koth, B. 2011. 'Travel coaching: commuter evaluations of behaviour change dialogue sessions', *Proceedings of the 34th Australasian Transport Research Forum*, 28-30 September, Adelaide.

Koth, B. and **Weber, D.** and Russell, D. 2011. 'Join the queue: the difficulty of engaging rural communities in park-based volunteerism', *Proceedings from the ICWES15, 15th International Conference for Women Engineers and Scientists*, 19-22 July, Adelaide, 1-10.

Kuik, S.S., **Nagalingam, S.V.** and **Amer, Y.** 2011 'A framework of product recovery to improve sustainability in manufacturing', *International Conference on Mechanical, Industrial and Manufacturing Engineering (MIME)*, 15-16 January, Melbourne, 230-233.

Kuik, S.S., **Nagalingam, S.V.** and **Amer, Y.** 2011. 'Criticality of product recovery management in sustainable supply chain', *International Conference on Mechanical, Industrial and Manufacturing Engineering (MIME),* 15-16 January, Melbourne, 225-229.

Ma, T. and Beh, P.H.W. 2011. 'Guaranteed maximum price contracting - a qualitative study in South Australia', *Proceedings of the 36th Australasian University Building Educators Association (AUBEA) Conference - Getting a building degree - the end of the beginning?*, 27-29 April, Gold Coast, 86-96.

Ma, T. and Xin, H.H. 2011. 'Early contractor involvement - South Australian experience', *Proceedings of the 36th Australasian University Building Educators Association (AUBEA) Conference – Getting a building degree - the end of the beginning?*, 27-29 April, Gold Coast, 76-84.

Matin, M.A., **Desbiolles, J.** and **Fielke, J.** 2011. 'Measuring furrow properties in rotary strip-tillage systems', *Proceedings of the 2011 Society for Engineering in Agriculture Conference: Diverse Challenges Innovative Solutions*, 28 September, Gold Coast, 468-478.

Matin, M.A., **Fielke, J.** and **Desbiolles, J.** 2011. 'Improving furrow backfill in rotary strip-tillage systems', *Resilient Food Systems for a Changing World: Proceedings of the 5th World Congress of Conservation Agriculture*, 26-29 September, Brisbane, 122-123.

Meng, L., **Holyoak, N.** and **Taylor, M.** 2011. 'Increasing the patronage of Adelaide's Northern Rail Corridor', *Proceedings of the 34th Australasian Transport Research Forum*, 28-30 September, Adelaide, 1-15.

Mills, J. and ***Macdonald, J***. 2011. 'The potential of BIM to facilitate collaborative AEC education', *Proceedings of the 2011 American Society for Engineering Education Annual Conference*, Vancouver, 26-29 June.

Prasetyo, H., **Luong, L.** and **Lee, S.H.** 2011. 'Integrated production-and-delivery cycle model for a three-echelon supply chain system', *Proceedings of the 2011 International Conference on Mechanical, Industrial, and Manufacturing Engineering*, 15-16 January, Melbourne, 69-72.

Pusporini, P., **Abhary, K.** and **Luong, L.** 2011. 'Introducing environmental aspects into lean six sigma concept for sustainable product development: a literature survey', *The 12th International Conference on Quality in Research*, 4-7 July, Bali, Indonesia, 1800-1804.

Rahman, M.M., **Cameron, D.A.** and ***Azam, A.H.*** 2011. 'Properties of recycled demolition waste for pavement construction', *International* and *Conference on Advances in Geotechnical Engineering*, 7-9 November, Perth, 393-399.

Solhjou, A.A., **Fielke, J.** and **Desbiolles, J.** 2011. 'Effect of narrow opener geometry on lateral surface soil movement and implications for no-till seeding', *Resilient Food Systems for a Changing World: Proceedings of the 5th World Congress of Conservation Agriculture*, 26-29 September, Brisbane, 167-168.

Solhjou, A.A., **Fielke, J.** and **Desbiolles, J.** 2011. 'Effect of rake angle on soil movement induced by narrow point openers', *Proceedings of the 2011 Society for Engineering in Agriculture Conference: Diverse Challenges Innovative Solutions*, 28 September, Gold Coast, 433-442.

Suksri, J., **Raicu, R.** and **Yue, W.L.** 2011. 'Potential urban freight distribution strategy: a case study of Adelaide, South Australia', *Proceedings of the 9th International Conference of Eastern Asia Society for Transportation Studies*, 19-23 June, Jeju, Korea, 8: 123-138.

Suksri, C., **Taylor, M.** and **Yue, W.L.** 2011. 'Exploring a traffic analysis approach for a signalised intersection under high throughputs in Adelaide CBD', *Proceedings of the 9th International Conference of Eastern Asia Society for Transportation Studies*, 19-23 June, Jeju, Korea, 9: 1527-1542.

Suksri, C., **Taylor, M.A.P.** and **Yue, W.L.** 2011. 'Exploring stop-line traffic flows at signalised intersections in the Adelaide CBD', *Proceedings of the 34th Australasian Transport Research Forum*, 28-30 September, Adelaide.

Susilawati, S., **Taylor, M.A.P.** and **Somenahalli, S.V.C.**, 2011. 'Modelling urban travel time variability with the Burr regression technique', *Proceedings of the 34th Australasian Transport Research Forum*, 28-30 September, Adelaide.

Szili, G. and **Rofe, M.**, 2011. 'Perspectives on becoming New Port: a discursive account of stakeholder opinions in renaming of Port Adelaide', *Refereed Proceedings of the State of Australian Cities Conference*, 30 November-2 December, Melbourne.

Ucgul, M., **Fielke, J.** and **Saunders, C.** 2011. '3D discrete element model simulation of a sinkage test', *Proceedings of the 2011 Society for Engineering in Agriculture Conference: Diverse Challenges Innovative Solutions*, 28 September, Gold Coast, 497-505.

Ucgul, M., **Saman, W.** and **Fielke, J.** 2011. 'Modeling and evaluation of the solar still integrated greenhouse desalination systems', *Proceedings of the 2011 Society for Engineering in Agriculture Conference: Diverse Challenges Innovative Solutions*, 28 September, Gold Coast, 484-496.

Weber, D. 2011. 'Beyond nature conservation: the importance of parks to a sustainable society', *Proceedings from the ICWES15, 15th International Conference for Women Engineers and Scientists*, 19-22 July, Adelaide, 1-10.

Weber, D. and Brown, G. 2011. 'Responding to climate change: use of public participation GIS to understand preferences of Adelaide park visitors', *Proceedings from the ICWES15, 15th International Conference for Women Engineers and Scientists*, 19-22 July, Adelaide, 296-305.

Yaldi, G., **Taylor, M.A.P.** and **Yue, W.L.** 2011. 'Forecasting origin-destination matrices by using neural network approach: A comparison of testing performance between back propagation, variable learning rate and levenberg-marquardt algorithms', *Proceedings of the 34th Australasian Transport Research Forum, 28-30 September*, Adelaide.

Zhang, F., **Zuo, J.**, **Pullen, S.** and **Zillante, G.** 2011. 'Searching for knowledge in the construction extension to the PMBOK Guide (third edition)', in S. Han, S. Davis, X. Wang, J. Kim and D. Carmichael (eds), *Proceedings of the 4th International Conference on Construction Engineering and Project Management (ICCEPM-2011*), 16-18 February, Sydney, paper S3-4.

Zhuge, Y and **Mills, J**. 2011. 'Modelling of multi-panel transmission tower retrofitted with leg reinforcement', *21st Australian Conference on the Mechanics of Structures and Materials*, 7-10 December, Melbourne, 673-678.

Zuo, J., Wilson, L., **Pullen, S.** and **Zillante, G.** 2011. 'Corporate social responsibility in construction – a critical literature review', in S. Han, S. Davis, X. Wang, J. Kim and D. Carmichael (eds), *Proceedings of the 4th International Conference on Construction Engineering and Project Management (ICCEPM-2011*), 16-18 February, Sydney, paper S15-1.

Zuo, J., Jin, X.-H. and McDonald, M. 2011. 'Relationship-based procurement methods for public infrastructure - the way forward', in S. Han, S. Davis, X. Wang, J. Kim and D. Carmichael (eds), *Proceedings of the 4th International Conference on Construction Engineering and Project Management (ICCEPM-2011*), 16-18 February, Sydney, paper S4-3.

Edited Refereed Conference Proceedings (category E4A)

Mills, J. and Gravina, R. (eds) 2011. 'ICWES15, Proceedings of 15th International Conference of Women Engineers and Scientists', *Engineers Australia*, Adelaide.

Non-refereed Conference Papers (category E2)

Johnson, T. 2011. 'Trees, stormwater, soil and civil infrastructure: synergies towards sustainable urban design for a changing climate', *2011 Conference Proceedings from International Society of Arboriculture,* 23-27 July, Sydney.

Johnson, T.P., **Cameron, D.** and Moore, G. 2011. 'Can permeable pavements reduce conflicts between footpaths and tree roots?', *International Public Works Conference*, 21 August, Canberra.

Pudney, P., **Howlett, P.**, **Albrecht, A.**, Coleman, D., Vu, X. and Koelewijn, J. 2011. 'Optimal driving strategies with intermediate timing points', *Proceedings of the 2011 International Heavy Haul Association Conference: Railroading in Extreme Conditions*, 19-22 June, Calgary.

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