CRC LCL Node of Excellence in “High Performance Architecture” (UNSW)

Dr Lan Ding
UNSW Australia

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The Node of Excellence in ‘High Performance Architecture’ aims to drive innovation in the design, planning and management of high performance buildings and cities.

Our vision is:

• To achieve excellence in high-performance buildings and cities research;
• To establish long term partnerships with governments and industries;
• To foster frontier research collaboration with international and national institutes;
• To facilitate a future research institute in High Performance Architecture areas.
Research Collaboration

UNSW Node Government and Industry Steering Committee

- UrbanGrowth NSW
- City of Sydney
- AECOM
- Brookfield Multiplex
- CSR
- HASSELL
- PIDCOCK - Architecture + Sustainability
- etc

UNSW Faculties

- Built Environment
- Engineering
- Science
- Business
Research Themes

Frontiers of High Performance Architecture Research

- Inhabitants
- Integrated Design
- Materials
- Emerging Technology
- Urban Design
- Policy

Research Themes
- IEQ, Productivity, and Health
- Integrated Design Solutions for High Performance Buildings
- High Performance Materials
- Regenerative Buildings
- Intelligent & Adaptive Buildings
- Emerging Low Carbon Technologies for Building Design & Retrofit
- Micro-climate Performance of Urban Design & Buildings
- Urban Resilience
- Policy Interventions

Node PhD/Master Research
- Productivity, Health, Management and Policy

Integrated Design Solutions, Retrofit, and Materials

Urban Micro-Climate Mitigation through Architecture/Urban Design/Infrastructure

Urban Resilience
Mike Roberts  
PhD Candidate

Supervisors:  
• Dr Anna Bruce  
• A/Professor Iain MacGill

Opportunities for Increasing Deployment of Photovoltaic on Multi-Unit Residential Buildings in Australia

Research Questions

1. What is the scale and nature of the opportunity for PV deployment on Australian apartment buildings and what are the barriers?

2. What are the household, network and societal benefits of different technical arrangements for deploying PV (and storage) on apartment buildings?

3. How can different technical, financial, governance and regulatory arrangements increase deployment and realise the potential benefits of apartment PV?
Node of Excellence Postgraduate Students

William Craft
Master by Research Candidate

Supervisors:
• Dr Lan Ding
• Scientia Professor Deo Prasad
• A/Professor Lester Partridge
• Professor Dennis Else

Development of Regenerative Design Principles for Building Retrofit

Research Questions
1. How can regenerative design outcomes be implemented into building retrofits?
2. What are the building retrofit design principles for improving the connections between human and natural systems within the built environment?
Heriyanto
PhD Candidate

Supervisors:
• Scientia Professor Veena Sahajwalla
• Dr Farshid Pahlevani

Glass Recycling for Waste Reduction in Built Environments

Research Question/Issue
The amount of waste glass from building demolition is increasing worldwide which implies that from environmental, economic and social viewpoints, there is a need to prevent this trend by recycling. Generally, glass itself can be recycled endlessly, however factors like impurities/additives, contaminants, and processing method limit the recyclability of the corresponding glass. The different properties of the processed glass result in different melting point and strength which if mixed with the raw materials in glass production will cause defect in the final product. Thus, there is a necessity to modify and treat the waste glass into a product that can be used in further manufacturing.
Node of Excellence Postgraduate Students

Samiul Amin
PhD Candidate

Supervisors:
• A/Professor Alistair Sproul
• Dr Anna Bruce


Siliang Yang
PhD Candidate

Supervisors:
• Dr Francesco Fiorito
• Scientia Professor Deo Prasad

Smart Facade Design and BIPV
Node of Excellence Postgraduate Students

Samin Mazban
PhD Candidate

Supervisors:
• Dr Lan Ding
• A/Professor Francesco Fiorito

Optimisation of Façade Design of Single-Sided Ventilated Residential Buildings

Claudio Diaz Sandoval
PhD Candidate

Supervisors:
• Dr Paul Osmond
• Dr Ivan Cole

Potential of Building Envelope Evaporative Cooling with Rainwater for Thermal and Environmental Performance of Buildings and Cities in the Humid Tropics
Assessing the Thermal Performance of Green Infrastructure on Urban Microclimate

**Research Question**

*What types, extension, mix and spatial distribution of Green Infrastructure (GI) are more effective in providing cooling benefits on Urban Microclimates (UMC)?*

*Which methods and parameters are more appropriate to assess the thermal performance of GI at local/precinct scale?*

**Supervisors:**
- Dr Paul Osmond
- Professor Alan Peters
- Dr Matthias Irger
- Dr Paola Favaro

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Carlos Bartersaghi Koc
PhD Candidate

Node of Excellence Postgraduate Students

25/07/2016
Adriana Sanchez
PhD Candidate

Supervisors:
- Dr Paul Osmond
- Scientia Professor Deo Prasad
- Dr Jeroen van der Heijden

Urban Sustainable Resilience: A Policy Framework

Research Question
- What are the characteristics of resilient cities and policy that are sustainable over time?
- What conditions are needed to achieve sustainable resilience?
- What are the drivers, implementation enablers and gaps, and governance tools which are important for the successful implementation of a sustainable resilience urban policy?
- What indicators can be used to evaluate and compare sustainable resilience policies across cities, states and countries?
Node of Excellence Postgraduate Students

Sardar Masud Karim
PhD Candidate

Supervisors:
• Professor Susan Thompson
• Dr Peter Williams

Co-Benefit of Low Carbon Policies in the Built Environment:
An Investigation into Adoption of Co-Benefits in Australian Local Government

Research Questions

- Has Australian local government adopted a co-benefits approach in their low carbon policies? If so, to what extent?
- What considerations guide policymakers in planning for low carbon policies? How do these considerations generate co-benefits?
- What interventions are necessary to plan, generate and purposefully promote co-benefits in local government policy processes?
Zichao Meng  
PhD Candidate

Supervisors:
• A/Professor Alistair Sproul

CSR House Monitoring and Modelling

Jonathan Fox  
PhD Candidate

Supervisors:
• Professor Alan Peters
• Dr Paul Osmond

The Effects of Facades on Outdoor Microclimate

Christian Criado-Perez  
Master by Research Candidate

Supervisors:
• Professor Karin Sanders
• Dr Dan Caprar

Closing the Loop: Evidence-Based Decision-Making
Acknowledgement

UNSW Node Government and Industry Steering Committee
• David Tow, UrbanGrowth NSW (Chair)
• Chris Derksema, City of Sydney
• Professor Dennis Else, Brookfield Multiplex
• A/Professor Lester Partridge, AECOM
• Caroline Pidcock, PIDCOCK - Architecture + Sustainability
• Brett Pollard, HASSELL
• Ray Thompson, CSR
• Justin Shupe, UrbanGrowth NSW

CRC for Low Carbon Living (CRCLCL)
• Scientia Professor Deo Prasad, CEO
• Emeritus Professor Denny McGeorge, Education Leader
• Ms Jillian Bywater, Project Coordinator

UNSW Representatives and Supervisors
• Professor Helen Lochhead Built Environment
• Professor Alan Peters Built Environment
• Professor Mat Santamouris Built Environment
• A/Professor Francesco Fiorito Built Environment
• Dr Philip Oldfield Built Environment
• Dr Paul Osmond Built Environment
• Professor Susan Thompson Built Environment
• Dr Anna Bruce Engineering
• Professor Iain Macgill Engineering
• A/Professor Alistair Sproul Engineering/CRCLCL
• Professor Richard Stuetz Engineering
• Dr Uttra Benton Science
• Scientia Professor Veena Sahajwalla Science

Dr Lan Ding (UNSW Node Leader)
Senior Lecturer, UNSW
Lan.Ding@unsw.edu.au

To find out more, contact:
CRC for Low Carbon Living Ltd
www.lowcarbonlivingcrc.com.au
Room 202-207, Level 2
Tyree Energy Technologies Building
UNSW Sydney NSW 2052 Australia