

# Sustainable Development Technologies and Systems Enabling Capability Platform

Professor Gary Rosengarten

**Countdown to 2030: Challenges for the SDGs**  
15/3/2022

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What's next...



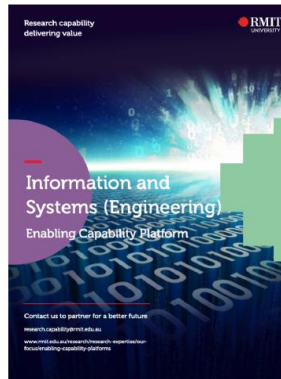
# RMIT Enabling Capability Platforms (ECPs)



8 cross-disciplinary platforms with  
>1500 researchers and industry  
participants

Almost 40 collaborative research  
networks

- Building, harnessing and deploying strategic capability to address major problems and capture opportunities that are relevant to industry, society and the environment
- Drive innovation and translation of research that creates value and leads to impact
- Maximise engagement, collaborations and partnerships



# ECP Leadership Team 2022



**Professor Xavier Mulet**  
Advanced Materials,  
Manufacturing & Fabrication ECP



**Professor Naomi Stead**  
Design & Creative Practice ECP



**Professor Matt Duckham**  
Information and Systems  
(engineering) ECP



**Professor Lisa Given**  
Social Change ECP



**Professor Gary Rosengarten**  
Sustainable Development  
Technologies & Systems ECP



**Professor Lauren Rickards**  
Urban Futures ECP



**Professor Anne-Laure Mention**  
Global Business Innovation



**Distinguished Professor  
Magdalena Plebanski**  
Biomedical & Health Innovation ECP

# Universities and SDGs

<https://www.rmit.edu.au/about/our-values/sustainability>

Research on the SDGs  
Interdisciplinary and  
transdisciplinary research  
Innovations and solutions  
National & local  
implementation  
Capacity building for  
research



Education for sustainable  
development  
Jobs for implementing  
the SDGs  
Capacity building  
Mobilising young people



Public engagement  
Cross-sectoral dialogue  
and action  
Policy development and  
advocacy  
Advocacy for sector role  
Demonstrate sector  
commitment

Governance and  
operations aligned with  
SDGs  
Incorporate into  
university reporting

# We are getting pulled!

## Responding to demand

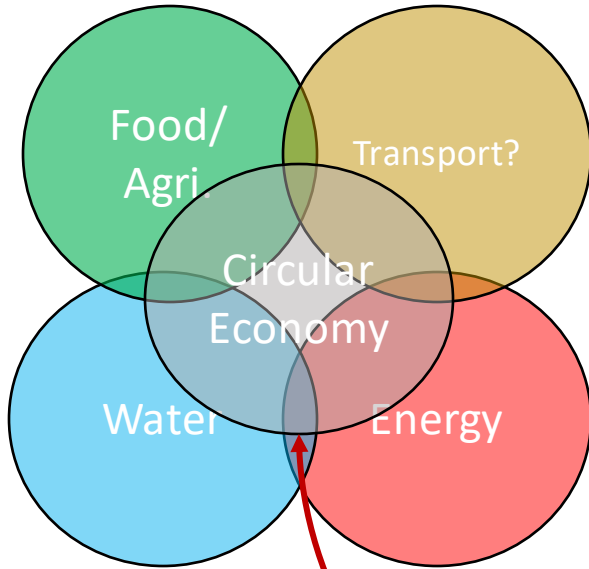
We are close to the tipping point of our natural ecosystem due to

- Climate change
- Pollution
- Destruction of natural resources and biodiversity

### At a glance – Australia’s Plan



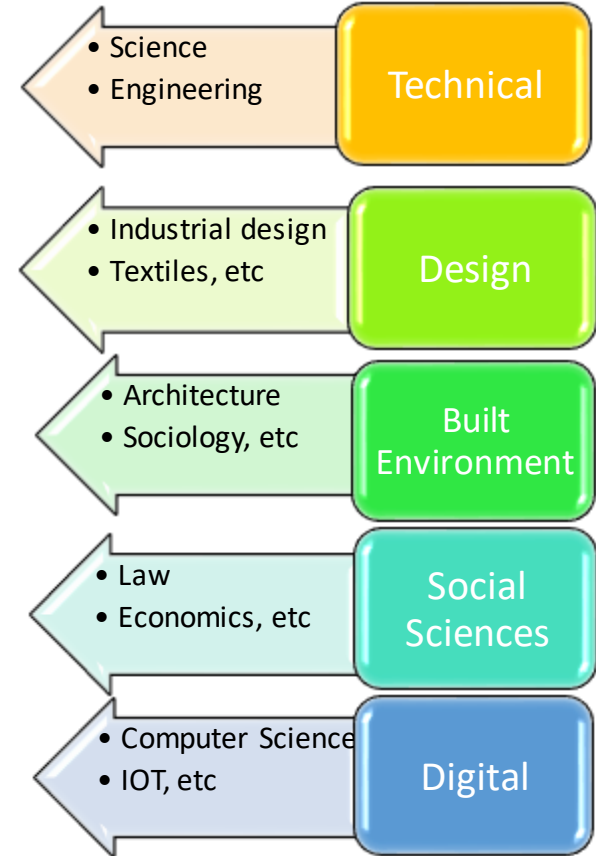
# Thematic sectors /applications



## Barriers

- Available technology
- Policy
- Technology adoption/ human behaviour
- Cost/economics
- Legalities
- Information dissemination
- Data

## Capability Inputs



# Current externally funded initiatives

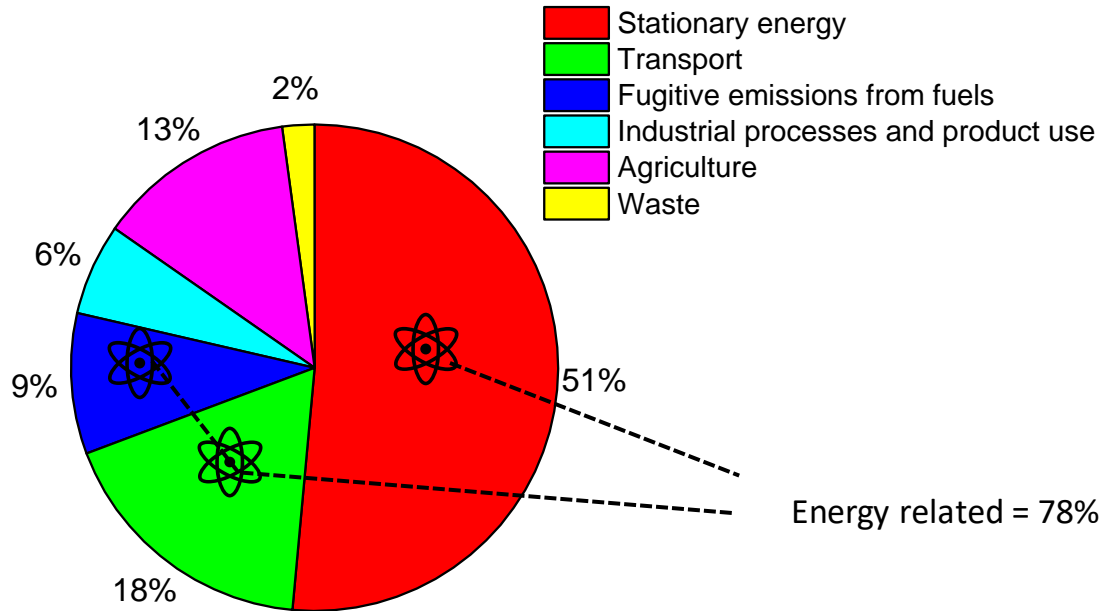
Name	Contacts	Theme	Website link
Transformation of Reclaimed Waste Resources to Engineered Materials (ITRH)	Prof Sujeeva Setunge	Circular Economy	<a href="http://tremnetwork.com/">http://tremnetwork.com/</a>
Biosolids ITTC	Prof Andy Ball	Water	<a href="https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/arc-training-centre-for-the-transformation-of-australias-biosolids-resource">https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/arc-training-centre-for-the-transformation-of-australias-biosolids-resource</a>
Fight Food Waste CRC	Assoc Prof Karli Verghese	Food and Agriculture	<a href="https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/fight-food-waste-crc">https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/fight-food-waste-crc</a>
Food Agility CRC	Prof Peter Fairbrother, Prof Harsharn Gill, et al	Food and Agriculture	<a href="https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/food-agility-crc">https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/food-agility-crc</a>
Future Fuels CRC	Prof Jan Hayes	Energy Safety	<a href="https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/future-fuels-crc#:~:text=RMIT%20will%20contribute%20solutions%20to,by%20Associate%20Professor%20Jan%20Hayes">https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/future-fuels-crc#:~:text=RMIT%20will%20contribute%20solutions%20to,by%20Associate%20Professor%20Jan%20Hayes</a>
ARC Centre of Excellent Exciton Science	Prof. Salvy Russo	Energy	<a href="https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/arc-coe-exciton-science">https://www.rmit.edu.au/research/centres-collaborations/multi-partner-collaborations/arc-coe-exciton-science</a>
Reliable Affordable Clean Energy for 2030 CRC	Prof Gary Rosengarten	Energy	<a href="https://www.racefor2030.com.au/">https://www.racefor2030.com.au/</a>
Centre for New Energy Technologies	Brendan McGrath	Energy	<a href="https://c4net.com.au/">https://c4net.com.au/</a>
Various VHESIF grants	Usha, Brendan, Madi, Lauren	Circular Economy , Energy, Transport	

# Internal Centres/Groups/Networks

Name	Contacts	Theme	Website link
Water: Effective Technologies and Tools (WETT) Centre	Prof Jega Jegatheesan	Water	<a href="https://www.rmit.edu.au/research/centres-collaborations/wett-research-centre">https://www.rmit.edu.au/research/centres-collaborations/wett-research-centre</a>
The Aquatic Environmental Stress Research Group (AQUEST)	Prof Vincent Pettigrove	Water	<a href="https://www.rmit.edu.au/about/schools-colleges/science/research/research-centres-groups/aquatic-environmental-stress">https://www.rmit.edu.au/about/schools-colleges/science/research/research-centres-groups/aquatic-environmental-stress</a>
Sustainable Hydrogen Energy Laboratory (SHEL) Research Group	Ass Prof Bahman Shabani	Energy	<a href="https://www.rmit.edu.au/about/schools-colleges/engineering/research/research-groups/shel">https://www.rmit.edu.au/about/schools-colleges/engineering/research/research-groups/shel</a>
Green Engines Laboratory	Petros Lappas	Energy	<a href="https://www.industrysearch.com.au/green-engines-research-lab-an-asia-pacific-first/f/11875">https://www.industrysearch.com.au/green-engines-research-lab-an-asia-pacific-first/f/11875</a>
Sustainable Infrastructure and Asset Management Research Group	Prof Kevin Zhang	Circular Economy	<a href="https://www.rmit.edu.au/about/schools-colleges/engineering/research/research-areas/civil-and-infrastructure-engineering">https://www.rmit.edu.au/about/schools-colleges/engineering/research/research-areas/civil-and-infrastructure-engineering</a>
Recycled Concrete and Cementitious Materials Research Group	Prof Yufei Wu (School of Engineering)	Circular Economy	<a href="https://www.rmit.edu.au/news/all-news/2021/jan/new-tech-improves-sustainable-concrete">https://www.rmit.edu.au/news/all-news/2021/jan/new-tech-improves-sustainable-concrete</a>
Water Resources Management Group	Dr Muhammed Bhuiyan	Water	<a href="https://www.rmit.edu.au/research/centres-collaborations/wett-research-centre/research-areas/water-resources-and-management-and-water-quality">https://www.rmit.edu.au/research/centres-collaborations/wett-research-centre/research-areas/water-resources-and-management-and-water-quality</a>
Innovative Resources and Waste Technologies (iRWT) Group	Prof Srinivasan Madapusi, Assoc Kalpit Shah	Energy	<a href="https://www.rmit.edu.au/about/schools-colleges/engineering/research/research-groups/innovative-resources-and-waste-technologies-irwt">https://www.rmit.edu.au/about/schools-colleges/engineering/research/research-groups/innovative-resources-and-waste-technologies-irwt</a>
<a href="#">Energy@RMIT Network</a>	Prof Gary Rosengarten	Energy	<a href="https://www.rmit.edu.au/research/our-research/enabling-capability-platforms/information-systems-engineering/energy">https://www.rmit.edu.au/research/our-research/enabling-capability-platforms/information-systems-engineering/energy</a>
<a href="#">Transport@RMIT Network</a>	Prof Marta Poblet Balcell	Transport	<a href="https://www.rmit.edu.au/research/our-research/enabling-capability-platforms/urban-futures/transport-network">https://www.rmit.edu.au/research/our-research/enabling-capability-platforms/urban-futures/transport-network</a>
Climate Change Exchange	Dr Susie Moloney, Dr Bronwyn Lay		<a href="https://cur.org.au/project/the-climate-change-exchange/">https://cur.org.au/project/the-climate-change-exchange/</a> <a href="https://www.rmit.edu.au/research/centres-collaborations/centre-for-environmental-sustainability-and-remediation">https://www.rmit.edu.au/research/centres-collaborations/centre-for-environmental-sustainability-and-remediation</a>
Environmental Monitoring Facility	Prof Andrew Ball	Water	
MicroGrid Facility	Brendan McGrath	Energy	No RMIT website



# Australian Emissions



Source (<https://www.energy.gov.au/publications/australian-energy-update-2019>):

Citation: Department of the Environment and Energy, Australian Energy Statistics, Table O, September 2019

# Opportunities in Energy: ?

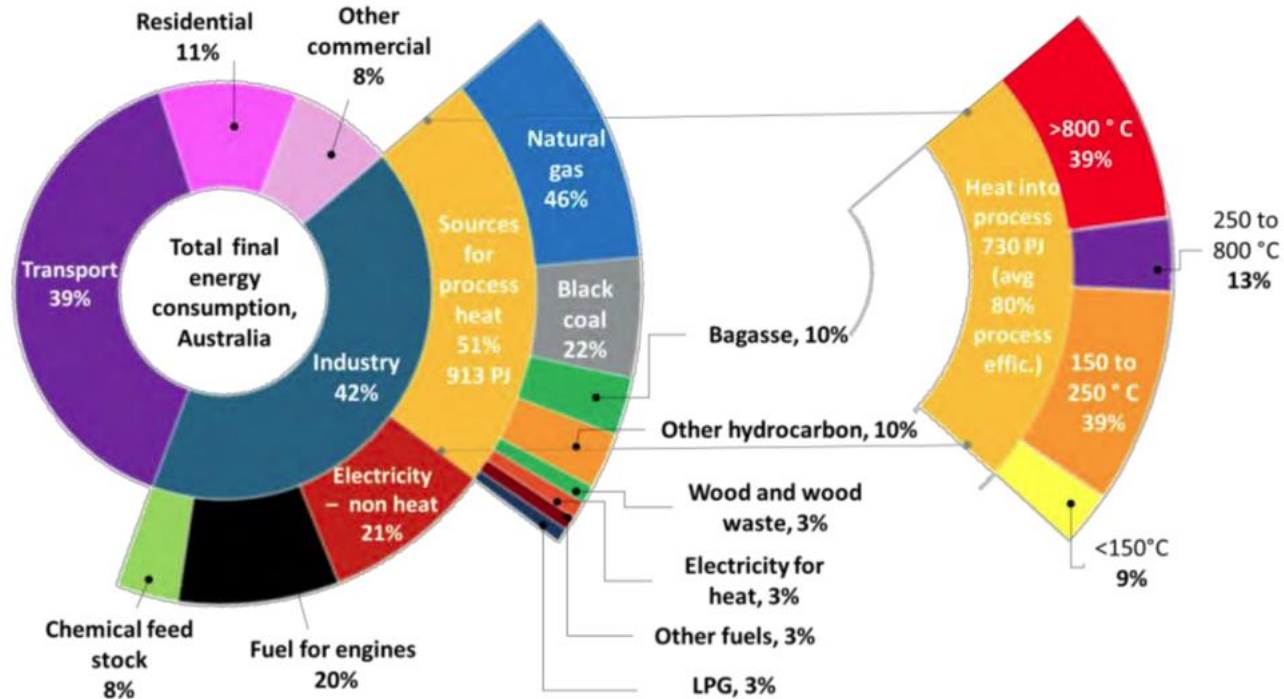


Image source: IT Power Australia (2019), Renewable energy options for Australian industrial gas users, ARENA

# Interdisciplinary Approach

## Truly sustainable buildings

- Designed for easy assembly and end of life disassembly
- Built with recycled thermally and optically responsive materials with low embodied energy
- Inherently sustainable transport options and infrastructure to support
- Internal fit-out made from sustainable materials
- Zero net operational energy usage, water usage, food waste
- Informed decisions using highly sensed technology, and human behaviour data
- Internal technology for thermal comfort, ventilation (pathogen spread minimisation)
- Digitisation for controls that learn to adapt
- Smart economic models that incentivise developers, owners and renters (eliminate energy poverty)