



Sustainable
Communities
and Waste

National Environmental Science Program

Sustainable Communities and Waste Hub

An integrated approach to delivering
sustainable communities focusing on future
jobs and prosperity



MONASH
University



SWINBURNE
UNIVERSITY OF
TECHNOLOGY

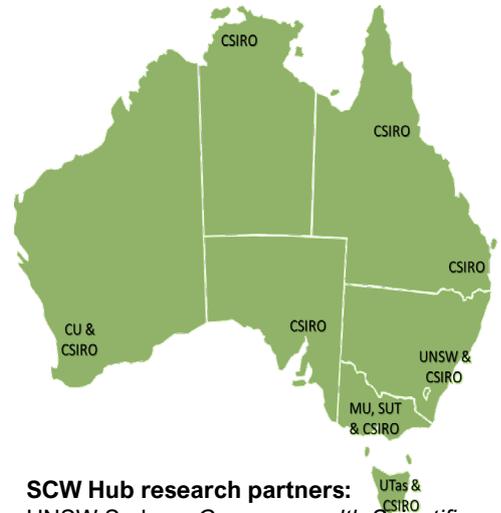


Sustainable Communities and Waste Hub

Hub Overview

The Sustainable Communities and Waste (SCaW) Hub is a consortium comprising six world-class research institutions led by UNSW Sydney. It is part of the second phase of the Australian Government's National Environmental Science Program (NESP), designed to deliver practical environment outcomes through almost 400 successful science projects.

Under the auspices of the Department of Agriculture, Water and Environment (DAWE), this NESP Hub is a space to collaborate for academics, government, industry, and the community with the shared objective of enhancing environmental and community outcomes and reducing negative waste impacts.



SCW Hub research partners: UNSW Sydney, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Monash University (MU), Swinburne University of Technology (SUT), Curtin University (CU), and the University of Tasmania (UTAS).

Our vision:

- Create more sustainable communities and reduce waste impact through innovative, participatory, and circular-based planning, design and supply-chains.
- Transforming waste materials via new science to form the foundation of scalable and local waste to value solutions that are industry, end user focussed.
- Embracing reconciliation and greater caring for our unique ecosystems by working with our First Peoples to build enduring relationships and sustainable communities.
- Improving environmental outcomes through better management of waste, pollution and air quality.
- Increased prosperity and jobs creation by aligning and boosting Australia's recycling and manufacturing capacity.

ULTIMATE VISION

Sustainable Communities and Waste Impact Management

Healthy, resilient, connected and prosperous urban, regional and Indigenous communities with net-zero impact on the environment

SC & W HUB OBJECTIVES

Circular Economy Transformation

Co-create actionable knowledge, decision tools, methods and data for transformation towards circular economies and better environments in Australian cities and regions

Jobs and thriving communities - Value from waste - Reduced environmental impact

IMPACT PRIORITY AREAS	Sustainable People-Environment Interactions	Reduce Impact of Plastics and Other Materials	Management of Waste, Substances and Pollutants	Improved Air Quality, Forecasting and Assessment	Waste Management Mission
APPLIED AND FOUNDATIONAL RESEARCH, SOLUTIONS, EVIDENCE, SYNTHESIS AND DECISION TOOLS	<ul style="list-style-type: none"> Indigenous Knowledge and Methodologies Water Sensitive Design People-Species Interactions Urban Heat Mitigation and Nature-Based Solutions National Datasets and Tools Living Labs 	<ul style="list-style-type: none"> Effective Recycling of Problematic Waste Reuse, Re-Design, Remanufacturing Decentralised Manufacturing through Microfactories Marine Debris High Value Products from Waste e.g. Sensors Microfactories™ 	<ul style="list-style-type: none"> Reducing Impact of Chemical and Heavy Metals Waste-water Treatment Technologies New Standards and Methodologies Environmental Contamination Technologies Sensor for Real time Data Modelling 	<ul style="list-style-type: none"> Meaningfully Disseminate Air Quality Forecasts and Data Transfer International Air Quality Science to Australia Better Planning Tools Living Labs Air Quality Monitoring Digital Platforms Real Time Data Predictive Modelling 	<ul style="list-style-type: none"> Collaboration across each NESP hub Waste reduction Increased use of recycled materials Benefits of sustainable materials management Demonstration initiatives
CAPABILITIES & ENGAGEMENT	Behaviour change • Policy analysis • Waste technologies Pathway modelling • Socio-technical systems • Urban design and economics Integration science • Environmental science • Ecology • Community co-creation • SDGs Green chemistry • Manufacturing • Planetary health • Interface with Government, Industry, and Research				

Research Impact Priorities (IPs)

The SCaW Hub works closely with DAWE and our many partners to identify priorities and co-design a national research program. These shared outcomes, to be delivered locally through our urban and regional networks, are to be developed with support by numerous industry groups, State and local governments, and people living in urban regional and Indigenous communities across Australia.

IP1: Sustainable people-environment interactions – SUT, UTAS and MU led

Our research will generate the evidence base to support policy, planning, design, and management for sustainable urban and regional development across diverse social and ecological contexts. Our research will respond to Goal 1 of Australia's Strategy for Nature: to connect all Australians with nature. We will adapt the emerging Nature-based Solutions approach to the Australian context to solve societal challenges such as mitigating urban heat, liveability and improving health and wellbeing through urban greening, water sensitive urban design, fostering human-species coexistence and green job creation. We will weave and integrate scientific, local and indigenous knowledge and methodologies to support transitions to a more inclusive and just society, with improved environmental outcomes.



IP2: Reduced impact of plastics and other materials – UNSW and CU led

Guided by and informing the National Waste Policy, we will focus on local management solutions for problematic plastic and other waste materials. This includes low value plastics, packaging materials, soft plastics, multilayered polymer board, textiles, glass, paper, agriculture waste and tyres. Embedded in circular economy principles, our research will go beyond materials recycling to product and waste reuse, repurposing, re-design and remanufacturing. Catalysing end markets, we will drive innovation for increased manufacturing from recycled materials, both boosting Australia's manufacturing sector, jobs and prosperity, while reducing the impacts on the environment and communities.



IP3: Management of hazardous waste, substances and pollutants – CSIRO and MU led

Our research will minimise environmental and human health impacts through the assessment and prevention of contaminant releases, effective pollution management and appropriate reuse of chemical components and waste. We will define points of entry and waste contributions to pollution in the Australian environment, including for emerging chemicals of concern, and create new technologies to detect hazardous pollutants and to understand the modes of action, organism types, the challenges of mixtures, as well as acute and chronic effects.



IP4: Improved air quality, forecasting and assessment – CSIRO and UTAS led

While air quality in Australia is generally very good, we continue to see significant health impacts from bushfire smoke, planned burns, wood-heaters, and local industrial pollution. Government departments responsible for air quality, fire and public health urgently need better information. The effective dissemination of information to the public is also critical, as highlighted during the recent 2019/20 bushfires when the public was unable to interpret air pollution information nor understand the implications for their health.



IP5: Waste impact management mission – CSIRO and MU led

The Hub will also lead, across the four Hubs created under NESP second phase, the coordination for a ‘waste impact management’ functional mission to support decision maker policy development, program management and regulatory processes in both marine and terrestrial environments for the NESP.



Achieving our vision

The SCaW Hub will enable a systemic, transformative response to Australia’s waste and pollution challenges by integrating key research fields, including ecology, engineering, environmental monitoring, public health, data science, technology, behavioural change, environmental economics, business innovation, regional and urban planning. Governance, community participation and Indigenous knowledge will underpin our approach. We will co-create actionable knowledge, methods, tools and data for transformation towards circular economies and better environments in Australian cities and regions.

There are many opportunities for connecting science and learning across projects within our Hub, building on our extensive experience in delivering research with impact. For example, we will use our Living Laboratories portfolio to accelerate innovation to form a network of ‘living labs’ as places where industry, society and researchers meet to test and demonstrate new ideas and prototypes of social and innovative solutions. New technologies and end user focussed, real-world solutions such as MICROfactorie™ technologies will be tested to help deliver practical outcomes in metro, regional and rural locations.

Hub leaders

<ul style="list-style-type: none">• Hub leader – Laureate Prof Veena Sahajwalla (UNSW)• Hub manager – Scientia Prof Deo Prasad (UNSW)• Senior Indigenous facilitator – Prof Marion Kickett (CU)• Knowledge broker – Dr Dave Kendal (UTAS)• Data wrangler – A/Prof Brigid Van Wanrooy (SUT)• Communications and media – Stuart Snell (UNSW)• UNSW node leader – Scientia Prof Deo Prasad• CSIRO node leader – Mr Guy Barnett• Curtin node leader – Prof Greg Morrison• Monash node leader – Prof Rob Raven• Swinburne node leader – Prof Marcus White• UTAS node leader – Dr Dave Kendal (UTAS)	<ul style="list-style-type: none">• Impact Priority 1 – Prof Niki Frantzeskaki (SUT)• Impact Priority 1 – Prof Cathy Wilkinson (Monash)• Impact Priority 1 – Dr Dave Kendal (UTAS)• Impact Priority 2 – Laureate Prof Veena Sahajwalla (UNSW)• Impact Priority 2 – Prof Marion Kickett (CU)• Impact Priority 3 – Dr Greg Davis (CSIRO)• Impact Priority 3 – Dr Mitzi Bolton (MU)• Impact Priority 4 – Dr Melita Keywood (CSIRO)• Impact Priority 4 – A/Prof Fay Johnston (UTAS)• Impact Priority 5 – Dr Heinz Schandl (CSIRO)• Impact Priority 5 – A/Prof Ruth Lane (MU)
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More information

UNSW SCaW Hub information

<https://www.smart.unsw.edu.au/research-programs/sustainable-communities-and-waste-hub-nesp2>

DAWE’s Hub webpage

<http://www.environment.gov.au/science/nesp/hub-sustainable-communities-waste>

Hub queries

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