



Capability Statement

UOW Blue Energy Futures Lab

The ocean presents opportunities for sustainable economic growth, particularly in industries related to clean energy. Consequently, it is crucial to conduct evidence-based research that informs fair and efficient energy transformation in line with blue economy principles, ensuring equitable access to clean energy for all.

At the University of Wollongong (UOW), we apply a comprehensive research approach to explore all facets of energy transformation, from social and economic factors to technical aspects. As an anchor institution in the Illawarra region, UOW actively promotes regional collaboration and champions the shift from carbon-intensive industries to innovative, clean manufacturing and energy production, driving dynamic and sustainable economies.

UOW's research capabilities reflect the interdisciplinary nature of our research collaborations. We unite researchers from a growing cross-section of the University, including the:

- [Australian National Centre for Ocean Resources and Security](#)
- [Australian Centre for Culture, Environment, Society and Space](#)
- [UOW Energy Futures Network](#)
- [Sustainable Buildings Research Centre](#)
- [Australian Power Quality Research Centre](#)
- [ARC Training Centre in Energy Technologies for Future Grids](#)
- [Faculty of Business and Law](#)
- [School of Earth, Atmospheric and Life Sciences](#)
- [Faculty of Engineering and Information Sciences](#)

The UOW Blue Energy Futures Lab, represented by these diverse research entities, stands as a beacon of innovation, collaboration, and dedication to advancing sustainable energy solutions.

We are an interdisciplinary research team focused on the emergence of new offshore sustainable industries, such as offshore wind and aquaculture. Expertise across the group includes law, social sciences, policy, economics, engineering, business, data science and analytics, and marine sciences. This collaboration of researchers is well-positioned to offer authoritative guidance to government agencies, utilities, regulatory bodies, equipment suppliers, and communities.

Blue energy blends clean energy innovations with blue economy principles, promoting sustainable resource use and conservation. This mix not only advances the use of environmentally friendly energy but also encourages sustainable coastal development, ensuring a balanced coexistence between human activities and marine ecosystems.

The Blue Energy Futures Lab is affiliated with UOW Energy Futures Network. This network supports research into renewable energy systems and integration, power systems, sustainability (including building design), power quality and reliability, battery energy storage and management systems, distributed energy generation, micro-grids, infrastructure modelling and economics, and R&D leading to a more hydrogen-intensive economy. The concept of the blue economy seamlessly integrates with clean energy initiatives, particularly in the context of offshore wind projects.

Our work is grounded in respectful acknowledgement of the critical role that First Nations communities must play in sustainable transitions. We endeavour to continually recognise and respect that our research is being carried out on Aboriginal Country, encompassing both land and sea. We ensure that this profound connection is always reflected in the decisions we make and in the way we conduct our research.

UOW prioritises engagement with Indigenous Knowledge into our research practices by actively seeking collaboration with local First Nations communities, Indigenous leaders, and researchers.

This has led to the Blue Futures Translational Research Initiative, which explores how communities respond to emerging offshore industries, such as wind energy and aquaculture. It involves collaboration between ANCORS, Aboriginal organisations and industry partners from across the South Coast.

HOLISTIC APPROACH TO SOLUTIONS

The Australian Centre for Culture, Environment, Society and Space (ACCESS) has research strengths in regional economic transformation, human-environment relations, environmental, urban and regional governance, and social and cultural relationships with oceans and coastal regions. A long-term commitment to research in the Illawarra-Shoalhaven has enabled ACCESS to build trusted relationships in the region for over a decade and work with local communities to respond to the opportunities and challenges of sustainable regional transitions.

The Australian National Centre for Ocean Resources and Security (ANCORS) has strengths in several research areas, including ocean governance, human relationships with oceans and coasts, the impact of values and connections to the sea on social perceptions and the acceptability of offshore developments (referred to as Social Licence to Operate), maritime law, and the role of legal and regulatory processes in facilitating sustainable transitions.

UOW's Faculty of Business and Law (BAL) has strengths in accounting, law, regulatory frameworks, and economics, while the Sustainable Buildings Research Centre (SBRC) has research strengths in exploring solutions that address the challenge of transforming our buildings and built environment into sustainable, resilient and effective places in which people live and work.

ACCESS, our School of Business and ANCORS have a track record in high-impact research that examines the social dimensions of energy transitions, local jobs and supply chains, economic and social impact assessment, and ocean accounting.

UOW's School of Earth, Atmospheric and Life Sciences (SEALS) primarily focuses on environmental sciences research and teaching. Its interdisciplinary approach and expertise can also play a crucial role in advancing research related to ocean energy transformation, aligning with the broader goals of sustainable resource utilisation and conservation.

UOW's Faculty of Engineering and Information Sciences (EIS) is renowned for our dedication to cutting-edge research, robust partnerships with industry and government stakeholders, and a commitment to innovative pedagogical methods. This puts UOW at the forefront of shaping the future of sustainable energy through offshore wind technology.

Our Schools – encompassing the School of Civil, Mining, Environmental and Architectural Engineering, School of Computing and Information Technology, School of Electrical, Computer and Telecommunications Engineering, School of Mathematics and Applied Statistics, and the School of Mechanical, Materials, Mechatronic and Biomedical Engineering – foster interdisciplinary collaboration to provide a holistic approach to offshore wind technology research and development.

Our research strengths are further fortified by distinguished centres of excellence, including the:

- [Australian Power Quality Research Centre](#): specialising in power quality, reliability, and renewable energy systems
- [National Institute for Applied Statistics Research Australia](#): dedicated to innovative statistical methods
- [Sustainable Buildings Research Centre](#): addressing sustainability and resilience in building environments
- [SMART Infrastructure Facility](#): where experts converge to tackle infrastructure and energy challenges
- [Steel Research Hub](#): supporting sustainable steel manufacturing
- [Centre for Medical Radiation Physics](#): advancing semiconductor detectors for clinical and high-energy physics applications

Research within UOW Energy Futures has a proven track record of developing and commercialising new technology, such as the development of the Hysata hydrogen production electrolyser.

The Australian Power Quality Research Centre is an internationally recognised centre of excellence which supports research, education and consulting in distribution and transmission system power quality, reliability and renewable energy systems. The ARC Training Centre in Energy Technologies for Future Grids is addressing complex challenges in the growth of renewable energy.

Furthermore, world-class education at UOW caters to the evolving workforce demands of emerging industries like offshore wind and aquaculture, playing a critical role in training the skilled professionals that will be required to develop, assess and monitor such emerging industries.

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