

# The Australian Centre for LNG Futures

ARC Industrial Transformation Training Centre



THE UNIVERSITY OF  
**WESTERN  
AUSTRALIA**

Faculty of Engineering and  
Mathematical Sciences

**Our LNG research has a strong industry focus and aims to increase growth, productivity and capabilities in this key Australian industry.**

Through innovation and investment through partnership we are building on UWA's track record of LNG industry-aligned research. The Training Centre further fosters links with industry and promotes innovation and technology transfer. Key roles of the Training Centre include fostering stronger collaboration between researchers and industry and to train industry-ready PhD students.

Launched in 2016 the Australian Centre for LNG Futures (ACLNGF) is an Australian Research Council (ARC) Industrial Transformation Training Centre (ITTC) based at The University of Western Australia (UWA).

## Microscale LNG plant

The LNG Futures Facility is the flagship project for the ACLNGF. It will consist primarily of a microscale LNG plant capable of producing LNG at 10-tonne-per-day. It will be a fully functioning, complete LNG producing plant with the purpose of fulfilling research, training and technology demonstration objectives.



A globally unique platform to demonstrate new technologies in a live plant environment, this facility will enable rapid deployment and adoption of innovative solutions by Australian LNG producers, suppliers and consumers.

## International and national industry partners

Building on UWA's established relationships with industry, ACLNGF Partner Organisations include Chevron, Woodside Energy, Shell, Clough, GE Oil and Gas, Samsung Heavy Industries, Daewoo Shipping and Marine Engineering, Virtual Materials Group and Guodian, China.

## Global research network

Our global research network includes The University of Queensland, The University of Melbourne, The University of Adelaide, Curtin University, The Commonwealth Scientific and Industrial Research Organisation, Seoul National University, Northeastern University (China) and The University of Auckland (New Zealand).



**Australian Government**

**Australian Research Council**

## Training PhD students

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### ACLNGF – Industry mentoring program

Our mentoring program provides a great opportunity for industry to gain insights into relevant research and to provide real-world industry and career advice to researchers.

### PhD placements

We are actively seeking industry placements for Centre PhD Students. Our strategies endeavour to minimise industry time commitments and to provide access to extended research networks. A PhD student can provide current academic research insights, add real value and help find solutions to industry challenges.

## Key research areas

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### Optimising natural gas processing and LNG production

- Specialised measurement and modelling of thermophysical properties of LNG mixtures at high pressure and cryogenic temperatures
- Boil Off Gas in LNG storage and transportation
- Multiphase flow patterns inside process equipment for FLNG and LNG transportation
- In-situ measurements of LNG fluid compositions through advanced spectroscopy
- LNG Plant Layout Optimisation

### Flow assurance and subsea processing for reliable deepwater production

- Probabilistic hydrate formation risk
- Bio-compatible anti-agglomerants
- NMR online analysis of discharge water
- Reducing MEG use through under-inhibited operations

### Advanced gas separations and storage processes

- Advanced PSA processes for separating nitrogen and helium from natural gas
- Synthesising low cost zeolites from fly ash
- Synergistic carbon dioxide and water removal in FLNG operations



## Key facilities

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**Lab scale cryogenic distillation column;** at 50mm in diameter and two metres high the column replicates a key component of the LNG Plant. It allows validation of key process data to improve plant design and operation.

**Hydrate flow loop;** a one inch diameter, cooled, gas dominant, one-pass flow loop is designed to study the formation of gas hydrates in oil and gas pipelines.

**Micro mechanical force apparatus;** one of only three in the world the MMF enables researchers to study the interaction between droplets and particles of gas hydrates, water, oil and hydrate inhibitors.

**Lab-scale dual reflux pressure swing adsorption;** the custom designed system has two 50mm diameter and one metre long adsorption columns, precise instrumentation and a fully automated control system to test adsorption media and processes.

**High pressure visual autoclaves;** one and two inch high pressure, sapphire cells allow the visual study of gas hydrate formation and the effect of inhibitors and associated condensate compositions.

**Acoustic levitation facility;** integrated with Raman microscopy the acoustic levitator enables container-less experiments for advanced research into multi component, multiphase mixtures.



## Research leader

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Professor Eric May is the Chevron Chair in Gas Process Engineering at UWA. Eric has been conducting research in oil and gas engineering for over a decade, working in the areas of phase behaviour, separations, fluid properties and flow assurance. In 2012 he was awarded the Malcolm McIntosh Prize for outstanding achievement in science that advances, or has the potential to advance, human welfare or benefits society.

## Contact

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If you would like to partner with us or for more information visit our website or contact Centre Manager Leigh Hucker, [leigh.hucker@uwa.edu.au](mailto:leigh.hucker@uwa.edu.au)

## Faculty of Engineering and Mathematical Sciences

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