

NERA : National Energy Resources Australia

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Australian Government
Department of Industry,
Innovation and Science

Industry
Growth
Centres

ADVANCE AUSTRALIA FURTHER

Why industry growth centres?

- Industry-led and independent
- Drive productivity and competitiveness
- Trusted brokers of innovation
- Transfer investment in knowledge and capabilities into commercial value and capacity here in Australia
- Connect to global export markets



NERA



Our vision:

**Australia as a global energy powerhouse:
a sought-after destination for investment and
the leading source of knowledge and solutions.**

KNOWLEDGE PRIORITIES

Enhance skills and business capabilities
to support automation and digitisation



Build talent and enable effective
collaboration and innovation



Pursue a sustainable and
low carbonenergy future



Understand and unlock
Australia's resources base



Develop new market
and business models



Commercialise
technology and research



Enhance efficiency in
operations and maintenance



Optimise the
regulatory framework



87 Project partners

- Natural degradation of hydrocarbons – field testing & research
- International Program – SMART Australia
- Accelerator Program – RISE WA Cohort
- SME Innovation Vouchers
- Ocean Energy Cluster – cluster members
- Centralised Environmental Plans for Seismic Operations
- Decommissioning Initiative
- Tropical Cyclone Reanalysis
- Exmouth Integrated Artificial Reef
- Living Lab Subsea Test Structure
- LNG Futures Facility
- Unlocking Marginal Uranium Deposits
- Hydrate Risk in Subsea Jumpers
- Integration of Image Recognition Technology into water hull cleaning tool
- Subsea Innovation Cluster Australia
- CORE Innovation Hub
- EX-rated Robotic Crawler
- Abrasive Slurry Jet Injection
- Wireless Industrial Sensor Environment Program
- WA Data Science Innovation Hub
- HyFast – predicting hydrate blockages
- Open Innovation Platform
- Diagnostic Acoustic Sensing for coal resource exploration – research

15 Project partners

- Automating Groundwater Compliance Monitoring – field trial and regulatory engagement
- Radiological Risk Assessment Tools
- Hybrid CSG Wellsite Power – design & build
- Decommissioning Initiative

8 Project partners

International

- Metal 3D Printing – testing, application & research in Darwin
- Centralised Environmental Plans for Seismic Operations
- Decommissioning Initiative

7 Project partners

Northern Territory

23 Project partners

Queensland

- Hybrid CSG Wellsite Power – Installation in Roma
- International Program – SMART Australia
- Accelerator Program – RISE QLD Cohort
- SME Innovation Vouchers
- Automating Groundwater Compliance Monitoring – design & manufacture of prototype
- Unlocking the Toolebuc Formation – research
- New Geostatistical Technique (Petrel plug-in) – research
- Identifying Different Sources of Methane in Groundwater – research
- Converting Tight Contingent CSG Resources – research
- Resetting our understanding of the Great Artesian Basin – research
- Diagnostic Acoustic Sensing for coal resource exploration – field trial
- CSG Wellhead Compression
- Enhancing Well Deliverability
- Machine learning driving future geological models

16 Project partners

New South Wales

- Machine learning driving future geological models
- Natural degradation of hydrocarbons – field testing
- Ocean Energy Cluster – cluster member
- Automating Groundwater Compliance Monitoring – manufacturing of sensors
- Scheduling system for coal export terminals
- Unlocking Marginal Uranium Deposits – research
- Tropical Cyclone Reanalysis
- SME Innovation Vouchers

3 Project partners

Australian Capital Territory

- Natural degradation of hydrocarbons – field testing

5 Project partners

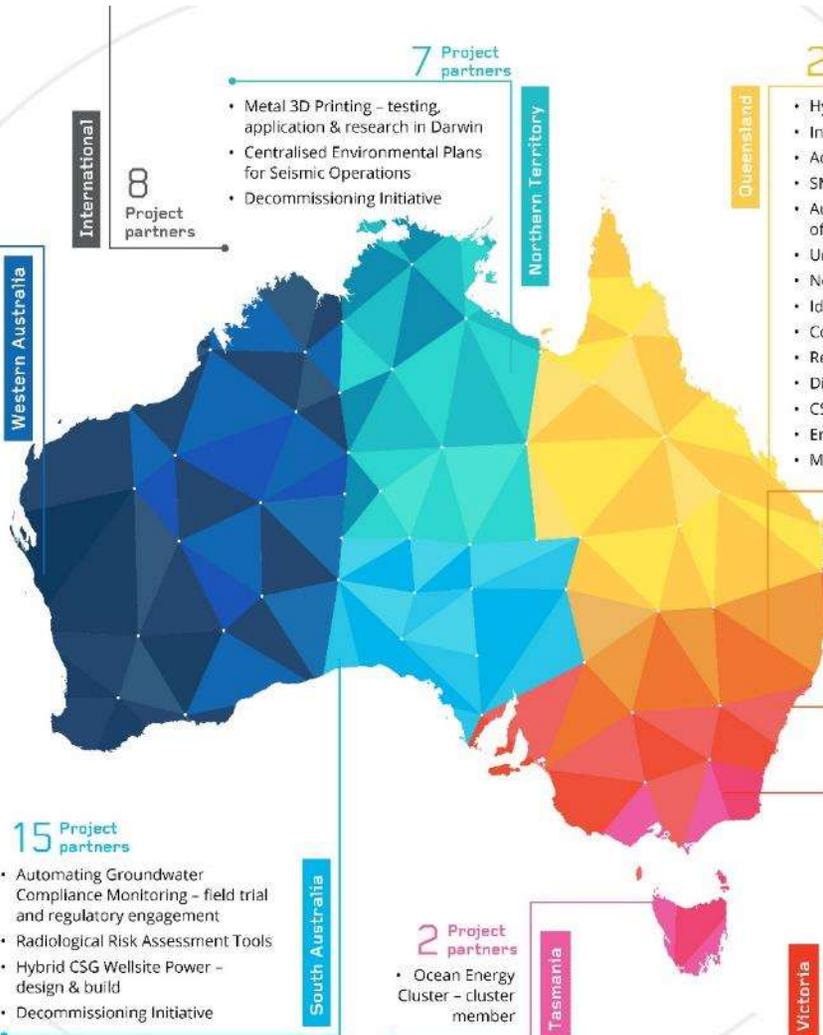
Victoria

- Natural degradation of hydrocarbons – field testing
- Metal 3D Printing – design & manufacture in Melbourne
- Automating Groundwater Compliance Monitoring – research
- Ocean Energy Cluster – cluster member
- Decommissioning Initiative

2 Project partners

Tasmania

- Ocean Energy Cluster – cluster member



NERA's Impact

\$15.6 million

NERA's collaborative project fund

+160

Project partners

\$10 billion

of value NERA is helping to unlock
to the Australian economy



SPEE3D - Metal parts in minutes

Collaboration Partners

SPEE3D, CDU, ConocoPhillips

Overview

- Supporting the development of a new high-speed, low-cost metal 3D printing technology
- 1000 times the speed of conventional metal 3D printing at a fraction of the cost
- Cold process - no melting, process very fast, no inert gases, argon or nitrogen

Benefit/Impact

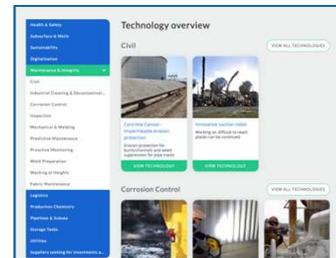
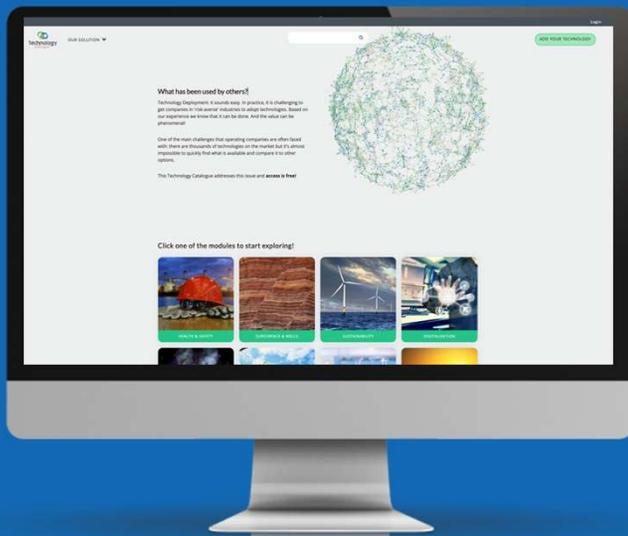
- The printer will enable environments to fabricate necessary parts on site and limit costly delays associated with downtimes that can be in the order of tens of millions of dollars.
- Australian-developed and Australian-owned, the technology is now benefitting multiple industries (defence and oil and gas) and is exported internationally.



Technology Catalogue

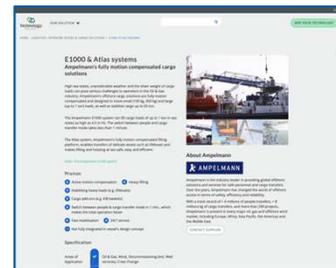
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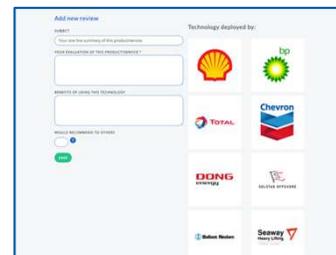
MODULES & SUBMODULES

Technologies are grouped in modules around specific business challenges & opportunities. Each module contains multiple submodules to ease navigation.



TECHNOLOGY PAGE

A page per technology summarising the technology, the pros and cons, specifications, deployment record and contact info.



REFERENCES & REVIEWS

Nothing gives more confidence to start using technology than deployment records and reviews by industry experts and end-users. This is particularly true in risk-averse industries.

Opportunities & Challenges

- Innovation is the key to lift production, reduce costs & optimize performance
- Transition to less carbon intensive energy sources — renewables
- Harness automation, digitalization, develop future workforce skills
- Improve supply chain integration



Global Energy Outlook

- Global primary energy demand will expand by 25% between 2017 & 2040 (International Energy Agency)
- Natural gas is expected to be the world's fastest growing fossil fuel — 2040 demand +45% to today
- Energy resources — exploration, development and consumption driven by global and domestic demand



Australia's Energy Resources Sector

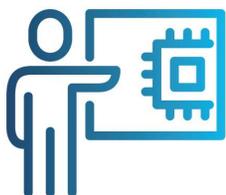
- Energy exports are forecast to be \$117B in 2019-20
- Australia's O&G industry is currently the world's largest exporter of LNG (although Qatar challenging)
- 16 nuclear reactors under construction in OECD countries
- Australian coal production expected to grow by 14.5% by 2040 to meet Asian demand



NERA's Sector Competitiveness Plan



Underpins efforts by the Australian energy resources sector to address productivity and competitiveness challenges



Sets out a strategic road map over a 10-year horizon



Identifies priorities for collaborative action and innovation required to enable the Australian energy resources sector to transform its productivity performance, compete globally and be sustainable



A plan for the future of Australia's energy resources sector

- Preparing Australia's Future Oil & Gas Workforce
- The drivers of the oil and gas workforce are highly volatile which makes prediction difficult.
- As an industry growth centre, NERA has a mandate to foster collaboration and innovation and help the energy resources sector respond to workforce trends.
- This Report is a step towards developing a common expectation about the skills needed in the oil and gas industry by 2030.
- www.NERA.org.au







NERA

NATIONAL
ENERGY RESOURCES
AUSTRALIA

Creating connections for growth

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