

Cluster isn't a dirty word:

How innovative business models are
changing the collaboration landscape
across Australia's energy resources
sector

Miranda Taylor, NERA CEO

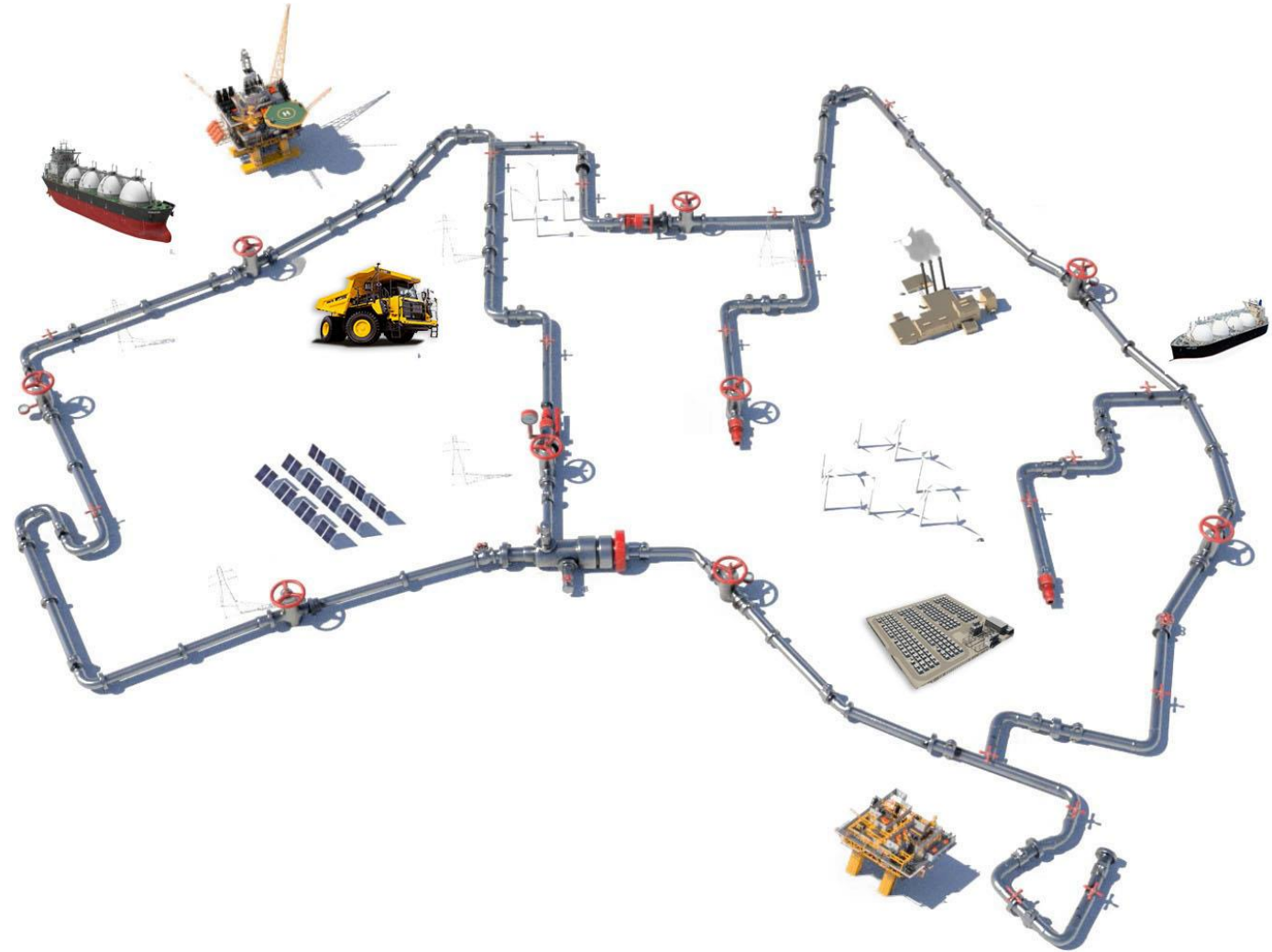
NERA NATIONAL
ENERGY RESOURCES
AUSTRALIA

Industry Growth Centres

- Industry led and independent
- Build sector productivity & competitiveness
- Through lighthouse projects — R&D and Innovation to demonstration and commercialisation
- Build SME/supply chain capabilities and capacity, supported by skills
- Connected to global export markets



**NERA's
vision:
Australia as a
global energy
powerhouse**



NERA's collaborative projects

Western Australia

1. **Tropical Cyclone Reanalysis** - Industry: Oil & Gas (Conventional)
2. **Exmouth Integrated Artificial Reef** - Industry: Oil & Gas (Conventional)
3. **TASER Subsea Test Structure** – Industry: Oil & Gas (Conventional)
4. **LNG Futures Facility** – Industry: Oil & Gas (Conventional)
5. **Baseline Characterisation of the North Perth Basin** - Industry: Oil & Gas (Unconventional & Conventional)
6. **Blacktip Wellhead Platform** - Industry: Oil & Gas (Conventional)
7. **Beneficiation** - Industry: Uranium
8. **Optimisation of the Metallurgical Flowsheet** - Industry: Uranium
9. **HyJump – Understanding Hydrate Risk in Subsea Jumpers** - Industry: Oil & Gas (Conventional)
10. **Integration of Image Recognition Technology into water hull cleaning tool** – Industry: Oil & Gas (Conventional)
11. **Subsea Innovation Cluster Australia (SICA)** – Industry: Oil & Gas (Conventional)
12. **Core Innovation Hub** - Industry: Sector wide
13. **Virtual Operating Environment** - Industry: Oil & Gas (Conventional)

South Australia

14. **Automating Groundwater Compliance Monitoring** - Industry: Uranium
15. **Radiological Risk Assessment Tools** - Industry: Uranium

Northern Territory

16. **High Speed Metal 3D Printing for the Supply Chain** - Oil & Gas (Conventional)



New South Wales

17. **Machine learning-based sub-surface geological model** - Industry: (Coal)
18. **Scheduling system for coal export terminals** – Industry: (Coal)

Queensland

19. **Zero Emissions Coal Technology** - Industry: Coal
20. **Hybrid CSG Wellsite Power** - Industry: Oil & Gas (Conventional)
21. **Unlocking the Toolebuc Formation** - Industry: Oil & Gas (Unconventional)
22. **New Geostatistical Technique (Petrel plug-in)** - Industry: Oil & Gas (Unconventional)
23. **Identifying Different Sources of Methane in Groundwater** - Industry: Oil & Gas (Unconventional)
24. **Converting Tight Contingent CSG Resources** - Industry: Oil & Gas (Unconventional)
25. **Resetting our understanding of the Great Artesian Basin** - Industry: Oil & Gas (Unconventional)
26. **Diagnostic Acoustic Sensing for coal resource exploration**: Coal
27. **CSG Wellhead Compression**: Industry: Oil & Gas (Conventional)
28. **Enhancing Well Deliverability**: Industry: Oil & Gas (Conventional)

Multi-State

29. **Bioremediation of Contaminated Sites** - Industry: Oil & Gas (Conventional)
30. **Centralised Environmental Plans for Seismic Operations** - Industry: Oil & Gas (Conventional)
31. **SME Innovation Vouchers** – Industry: Sector wide
32. **SMART Australia** – Industry: Sector wide
33. **Decommissioning Initiative** - Industry: Oil & Gas (Conventional)
34. **Open Innovation Platform** – Nureka - Industry: Oil & Gas
35. **Ocean Energy cluster** – Industry: Oil & Gas

Through industry collaboration and innovation NERA is helping:



Grow Australia's oil and gas industry
into a global energy powerhouse



Lead the global digital and automation
technology race and build equivalent
METS sector for oil and gas



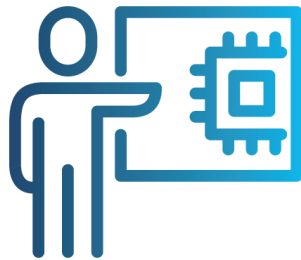
Transition to low carbon future



NERA's Sector Competitiveness Plan:



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







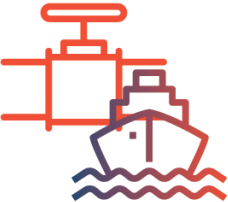
Sets out a strategic road map over a 10-year horizon



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



Through collaboration we can maximise the value of our sector

	 Gross Value Add*	 Direct Employment**
	OIL AND GAS \$31.7 billion	20,900 jobs
	PETROLEUM EXPLORATION \$0.9 billion	8,300 jobs
	PIPELINE AND TRANSPORT \$0.2 billion	400 jobs

Total Gross Value Add*

\$55.1 billion

Total Direct Employment**

85,900 jobs

Notes

* Gross value add in current prices, \$AUD, 2016/17 Source: ABS (2017) Australian System of National Accounts, Catalogue no. 5204.

** Four-quarter average to August 2016/17. Not further defined (nfd) employment apportioned to relevant categories. This does not include employment through the value chain e.g. contractors/service/technology sector supporting energy resources. Source: ABS (2017) Australian Labour Market Statistics, cat. no. 6291.0.55.003

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*** Source: IBISWorld Industry Report B0808: Uranium Mining in Australia

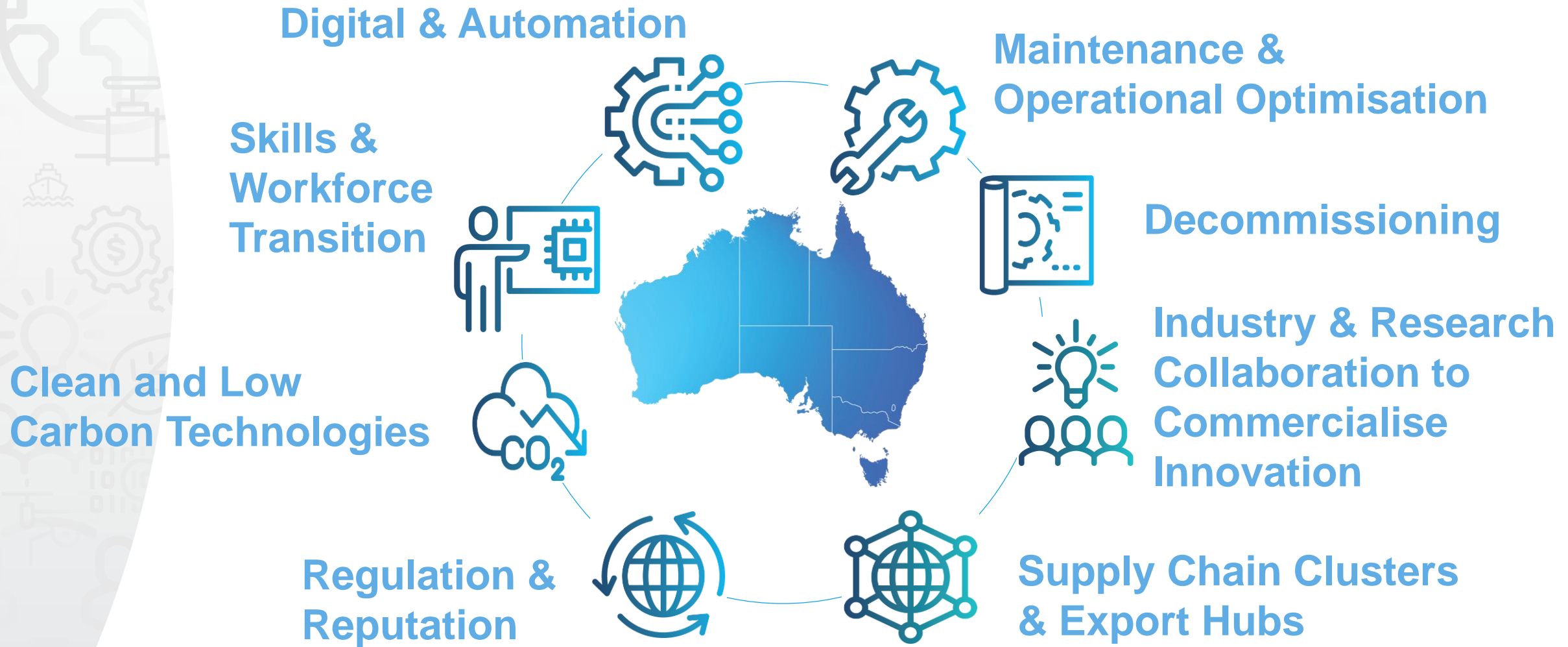


Australia has developed one of the strongest natural gas industries in the world

x10 High value industry

Every job in the oil and gas industry sustains another 10 jobs elsewhere in the economy

Collaboration and innovation ecosystem helping the sector prepare for tomorrow



Advantages of clusters and collaborative business models

New Knowledge & Capabilities

New Product Development

New businesses

Public and private investment

Build on competitive advantage

Collective marketing to global mkts

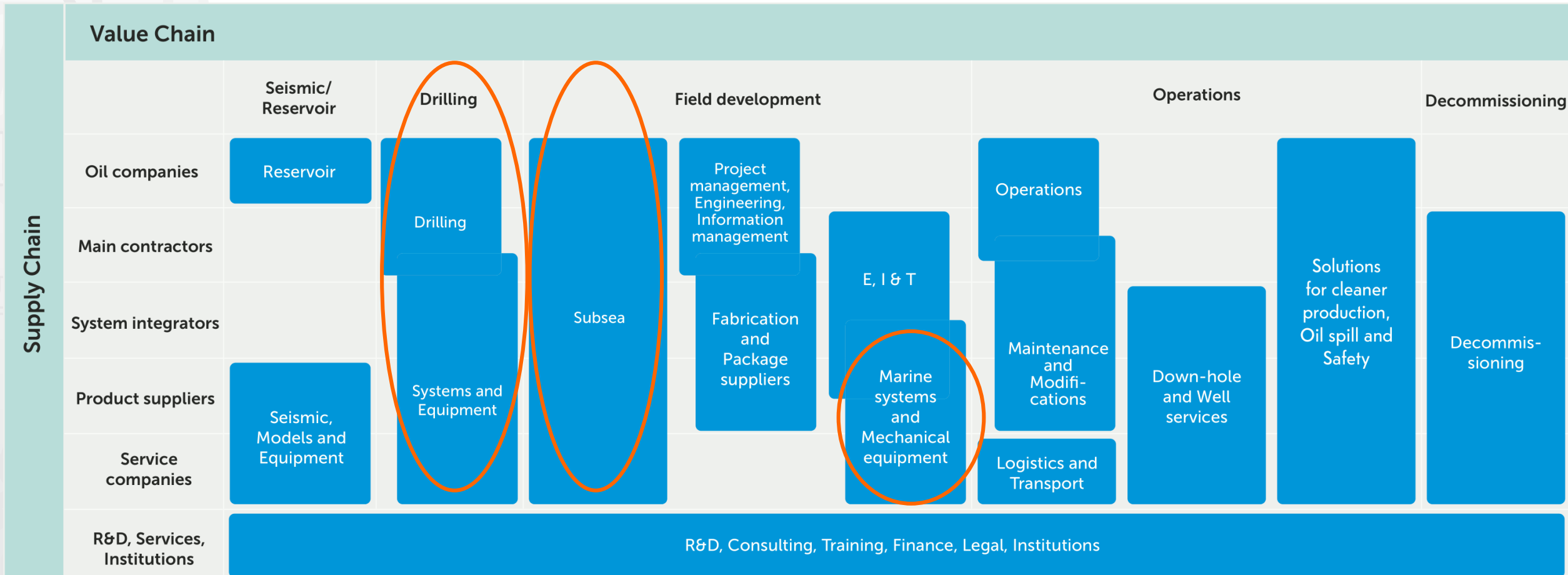
Sustainability

What are others doing ??

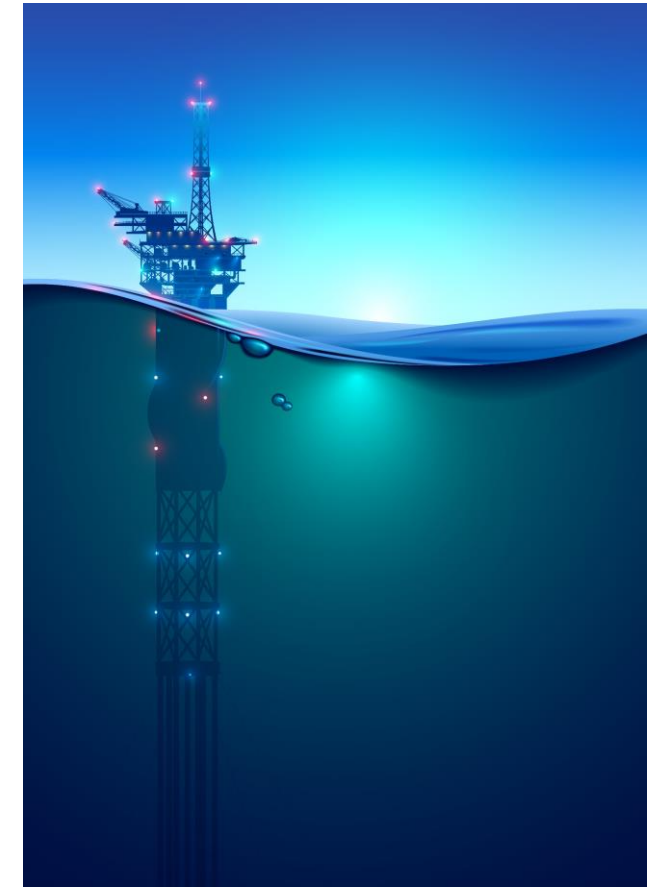
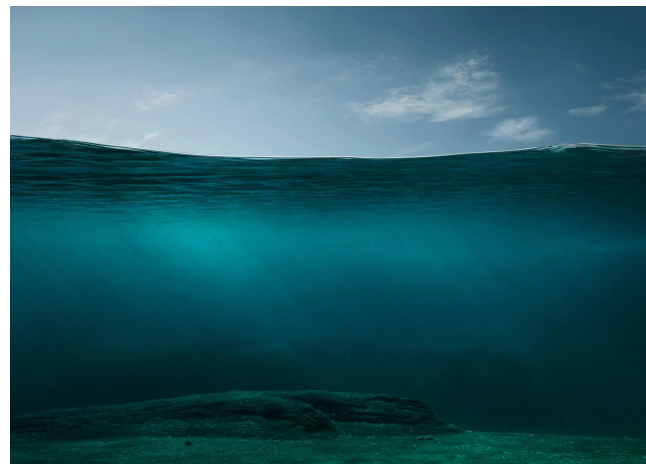


**NORWEGIAN
INNOVATION
CLUSTERS**

Since the early 2000s, Norway has had a strategy to strengthen industry clusters through a national cluster programme and to date has supported more than 70 cluster projects.



Spotlight on NERA's Subsea cluster and collaboration projects





Subsea Innovation Cluster Australia (SICA)

NERA has helped form SICA – a unique business model created by the collaboration of Australian companies and research institutions who specialise in subsea Inspection Maintenance and Repair (IMR).

Impacts on industry:

- SICA can raise the profile of Australia's subsea industry regionally and globally.
- Member collaboration enables enhanced solutions.
- Provides enhanced access to government R&D funds.

SUBSEA
INNOVATION
CLUSTER



AUSTRALIA

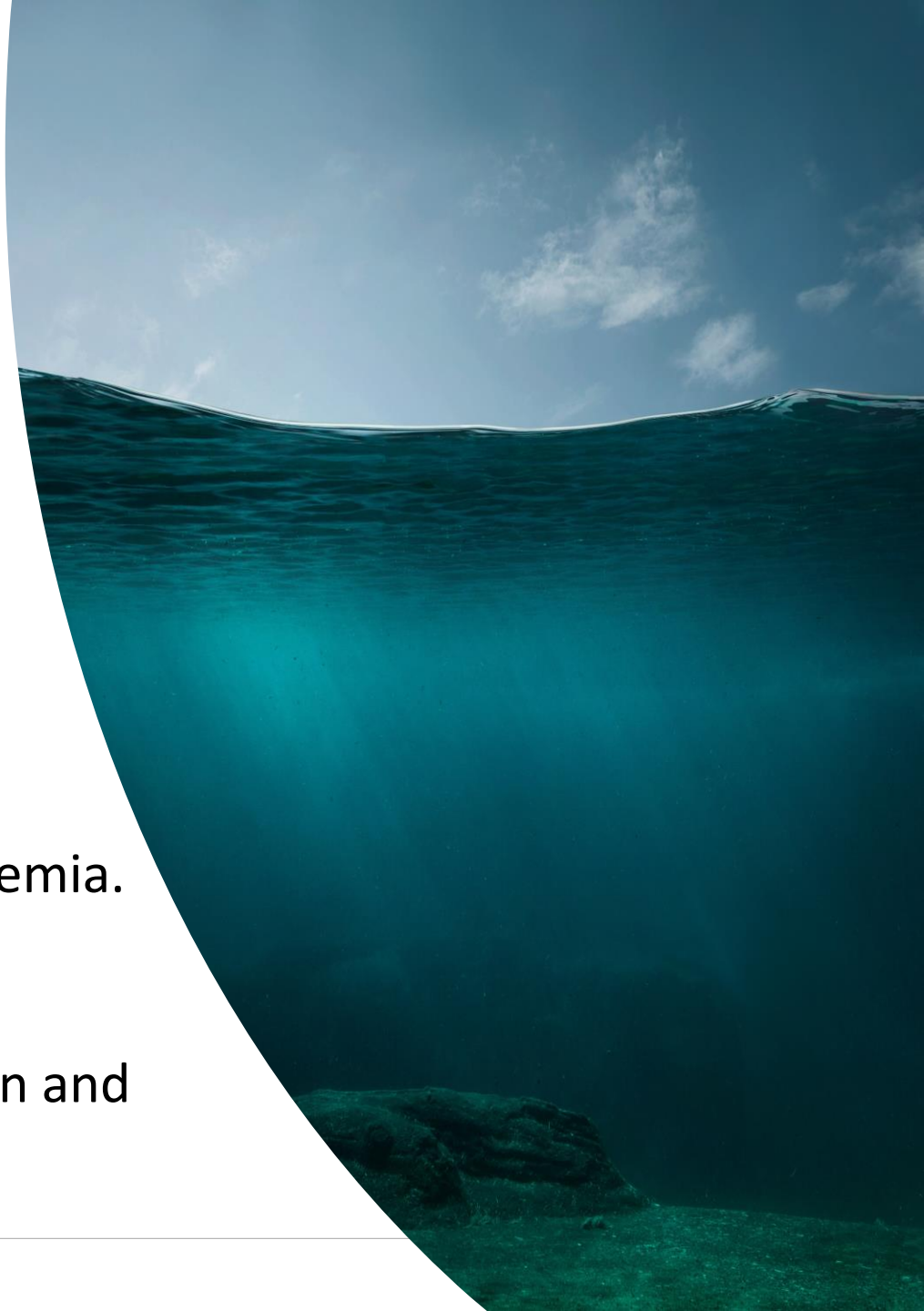


Ocean Energy Cluster

NERA is helping form an emerging new Cluster focussed on ocean energy with +20 members drawn from across Australia and overseas.

Impacts on industry:

- Structured collaboration between entrepreneurs, industry, research & academia.
- Strong collaboration with international centres of expertise.
- A non-partisan entity driving collaboration and innovation.



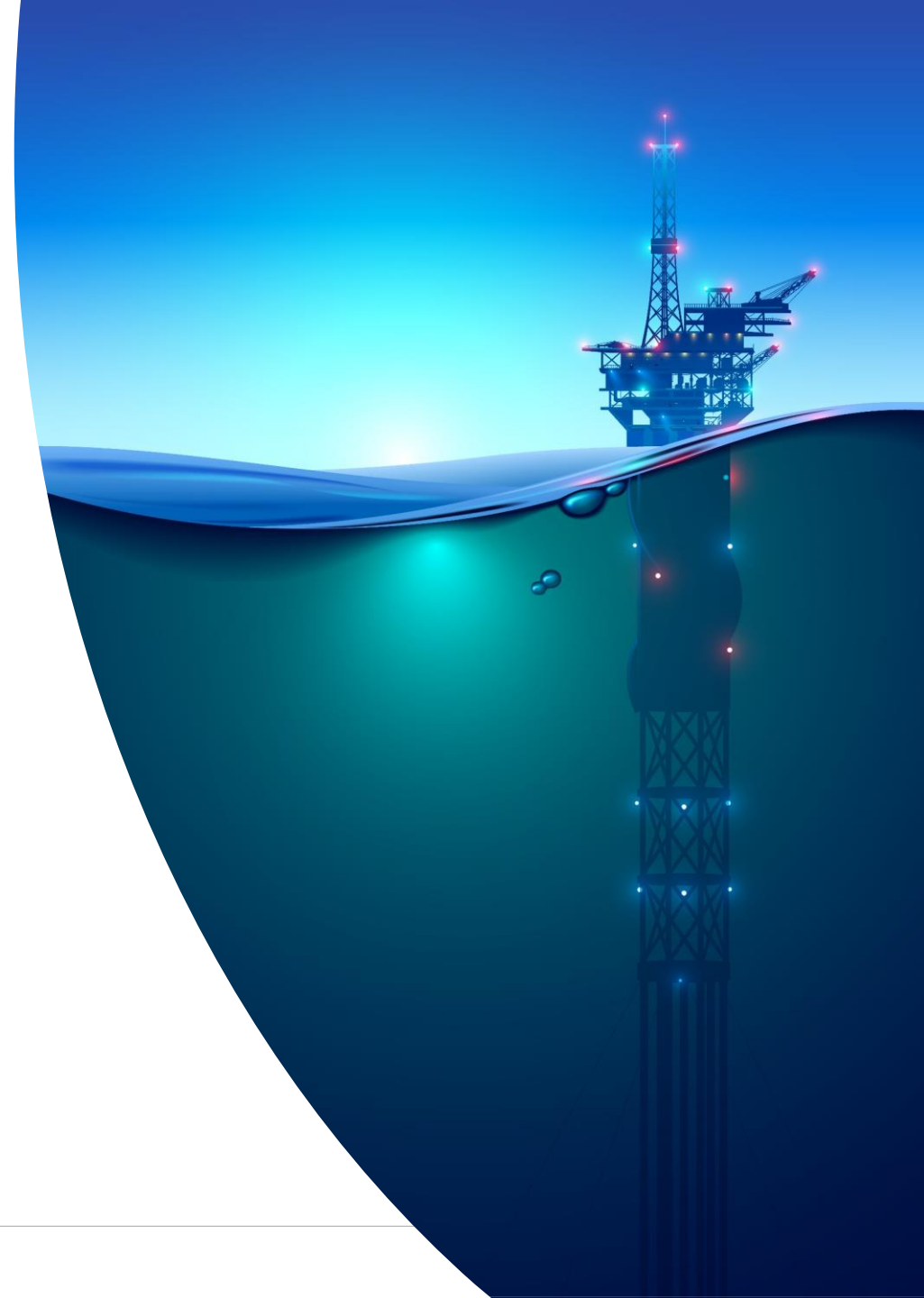


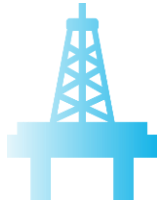
Managing hydrate risk in subsea jumpers (HyJump)

This project brings together research and industry to advance understanding of how and why hydrates form and block in subsea jumpers – a multi-million dollar challenge.

Impacts on industry:

- This project will assist energy producers reduce subsea design margins to deliver more efficient and more reliable operations.





Transforming Australia Subsea Equipment Reliability (TASER) Living Lab

TASER is a collaborative “living laboratory” to assess the effectiveness of innovative coatings, materials and technologies against marine organism growth on subsea equipment.

Impacts on industry:

- Sharing knowledge to improve subsea equipment.
- Reduce the requirement for costly and time-consuming interventions in Australia's challenging offshore warm water environment.
- Potential to offer significant cost savings to operators by maximising equipment reliability, availability and production uptime.





NERA

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Creating connections for growth

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