NATIONAL ENERGY RESOURCES AUSTRALIA
Creating connections for growth

Embracing innovation and technology

to drive the future of Australia's energy resources sector

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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

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Our vision:

Australia as a global energy powerhouse:

a sought-after destination for investment and the leading source of knowledge and solutions.

We need to extend the innovation boundary

1

The safe zone

Look internally, improve margins and keep cash coming in

2

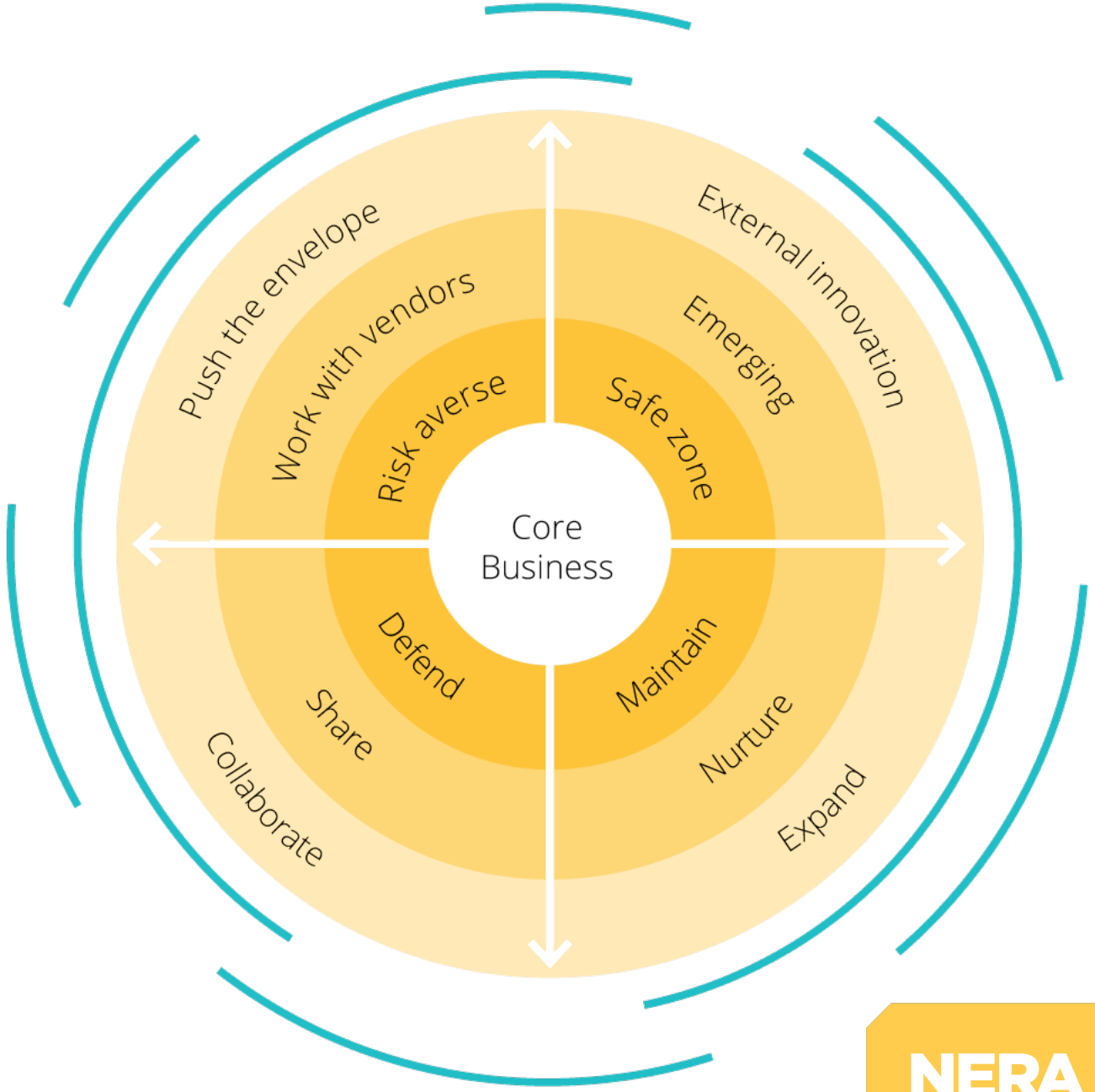
Emerging innovation

Work with vendors, extend collaboration externally and create new value

3

External innovation

Engage with multiple external knowledge experts, use technology to verify and de risk adoption of innovation



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Technology impacting industry

OPTIMISE TODAY

- Asset performance
- Asset operation and maintenance
- Data-driven opportunities
- Enhance well deliverability
- Supply chain
- Skills
- Industry–research collaboration

ADAPT FOR TOMORROW

- Deploy innovative tech
- Remote operations
- Automation
- Efficient decommissioning

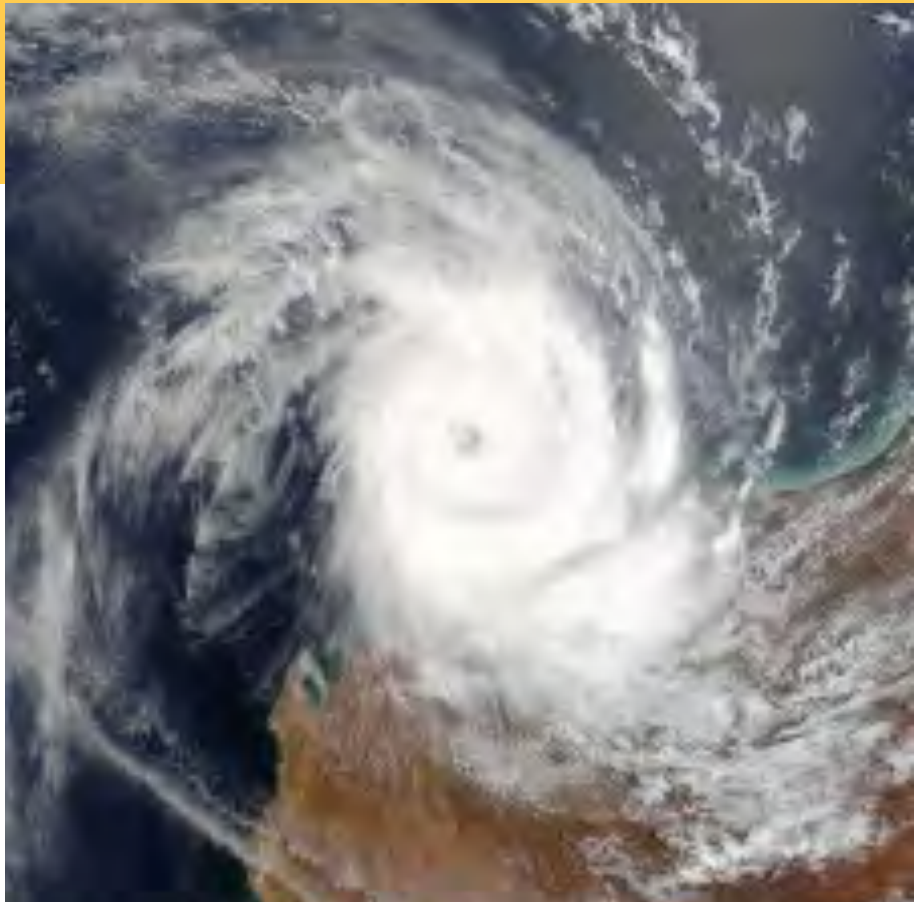
TRANSFORM THE FUTURE

- Low carbon
- Hydrogen
- Reusable infrastructure
- Transfer skills
- Artificial intelligence

Tropical Cyclone Reanalysis

For a better understanding of cyclone risk

Collaboration Partners:
BoM, NERA, Shell, Woodside, Chevron



Industry Problem

Improve the quality of historical tropical cyclone (TC) data to enhance understanding of the risk profile for new and existing offshore infrastructure.

Project Summary

The objectives of the Project were to produce a TC database for the Australian region (southern hemisphere between longitudes 90 and 160°E) covering the period from 1981 onwards, that has the following attributes:

1. provides a complete record of position, intensity and wind structure (eye size, radius to maximum winds, radius to gales, storm and hurricane force winds in quadrants);
2. has improved homogeneity compared to the existing Australian TC Database (BT);
3. is fit-for-purpose for use in the assessment of historical TC risk in the Australian region; and
4. demonstrates an objective TC reanalysis methodology that can be applied globally.

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NERA Project Spotlight: Exmouth Integrated Artificial Reef

Enhancing marine ecosystems through offshore decommissioning

The Exmouth Integrated Artificial Reef was successfully installed in July 2018 and is the **largest purpose-built reef in the Southern Hemisphere** and the first of its kind in Australia.

Project Partners

- NERA
- Subcon
- BHP
- Recfishwest
- Curtin University

- Through NERA's funding and industry support and driven by WA SME Subcon's innovative technology and experience in subsea hydrodynamics and marine asset stabilisation, this 'rigs to reef' project has created an abundance of recreational fishing, tourism and employment opportunities for the Exmouth community.
- This project could positively influence environmental legislation and open up new possibilities to add to existing decommissioning avenues, creating a new market and business model for companies like Subcon to flourish from these innovative solutions.
- King Reef, positioned on a previously sandy barren seafloor, has already seen over 50 different species of fish call it home.

Impacts:

- Identifying opportunities for regulatory reform by allowing artificial reefs to be a viable option for the decommissioning of offshore infrastructure.
- Increased industry-research collaboration.
- Community and stakeholder benefits – social licence.

NERA project spotlight: TASER Living Lab

Collaborating to test ‘game-changing’ ways to maximise subsea equipment performance

4

test structures deployed in Australian waters

$165m

estimated savings per year across Australia by reducing interventions and vessel costs alone

- TASER is a collaborative ‘living laboratory’ to assess the effectiveness of innovative coatings, materials and technologies against marine organism growth on subsea equipment.
- Each test structure houses **183 individual samples** supplied by equipment vendors from across Australia and around the world.
- This project has the potential to deliver a **350:1 return on investment**.

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NERA project spotlight: Subsea Innovation Cluster Australia (SICA)

Forming the country's first energy resources cluster

- SICA is a unique business model created by the **coming together of Australian subsea tech innovators** to address challenges specific to the Australian oil and gas subsea industry.
- Through SICA, Australia has the potential to establish itself as the world leader in Inspection, Maintenance and Repair (IMR), with **future potential to expand its focus to other subsea sectors**, such as defence and offshore renewables.
- With the IMR sector expected to grow to $4.6 billion by 2020, SICA is ideally positioned to capitalise on this growth, showing what is possible when innovators come together.

38

members and counting

$4.6 billion

expected growth of Australia's IMR sector by 2020

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Australian Ocean Energy Cluster

- NERA is fast-tracking the formation of a Virtual Ocean Energy Cluster that will strengthen collaboration, accelerate innovation and increase the current market of Australia's ocean energy sector.

- The cluster — Australian Ocean Energy Group — facilitates industry collaboration of the ocean energy industry to create significant value for Australia.

- It is helping to grow the breadth and diversity of capabilities in Australian offshore services to support the sector to become more resilient to future market variations, as well as expanding market opportunities for cluster participants by providing a platform for cross-business, -industry and -cluster collaborations.

World-leading hull cleaning technology

Protecting our oceans and saving industry millions

Project Partners
- NERA
- CleanSubSea
- Curtin University

- WA-based marine innovative SME CleanSubSea is integrating image-recognition and AI technology into their Envirocart — one of the world's first in-water hull-cleaning systems to remove marine growth from ocean vessels.
- The technology is Australian owned and patented.
- Until now, industries have combated marine growth by dry-docking their fleets in Singapore.
- Through this project, the Envirocart can clean and scan a ship's hull simultaneously, detecting hull damage and defects while the vessel remains in the water.

Using innovation to tackle a multi-billion-dollar challenge

- No need for dry-docking in Singapore, reducing carbon emissions
- Applicable to multiple industries including defence, cargo and fisheries.

National Decommissioning Research Initiative (NDRI)

- NERA is leading the development of the National Decommissioning Research Initiative (NDRI) to improve community, regulatory and industry understanding of the impact of infrastructure on the marine environment.
- The NDRI has been formed to commission and publish independent scientific research to improve the understanding of the importance of infrastructure in the Australian offshore marine environment.
- NERA is facilitating development and delivery of the NDRI on behalf of eight industry partners. It will ultimately provide an independent evidence base to inform decommissioning decisions, comparative assessments and environmental impact assessments.

Research Program 1: Potential Impact of decommissioning O&G structures on life in the marine environment

- Habitat Value of O&G Structures
- Connectivity
- Biosecurity

Research Program 2: Potential contaminants released in the marine environment if structures remain in-situ

- Metal & non-metal degradation
- NORMs
- Mercury

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NDRI Priorities & Projects

- **The influence of O&G structures on life in the marine environment.**
- **The influence of O&G by-products on the marine environment**
- **The influence of material degradation processes over time.**

TOPIC	OBJECTIVE
Life in the marine habitat	To determine what organisms are inhabiting Australia's O&G infrastructure
Connectivity	To gain understanding of the impacts of decommissioning on ecological connectivity
Invasive Species	To improve understanding of whether leaving structures in place, or removing, increases the risk of IMS
Material degradation	To investigate the rates of O&G material degradation (metals and non-metals) in the oceans
By-products	Understand the risk and potential impact of by-products (NORMs and mercury) on the marine environment

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