

SUBMISSION

Submission to the Department of Industry, Science and Resources

**Submission to the *Roadmap to
Establish an Australian
Decommissioning Industry for
Offshore Oil and Gas* consultation**

20 October 2023

The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

Responsible decommissioning of offshore oil and gas infrastructure is an important aspect of the energy transition, ensuring obsolete infrastructure is managed in an environmentally responsible manner. If handled well, there is significant opportunity in this decommissioning process for Australian businesses supported by Government commitment. However, regulatory complexities, competition for investments and talent, and geographic variations present challenges to crafting a simple approach. To support Australian industry to take advantage of this phase as an opportunity, Australia will need to address environmental and technical nuances, explore a range of approaches, update how decisions are made, and coordinate workforce development.

The rate of decommissioning is expected to accelerate as Australia moves away from its reliance on fossil fuels. This will require new technologies, investment in skills development, environmental management and deep collaborations between researchers and industry. Each individual decommissioning plan might be viable on its own, but the national strategy should ensure there are sufficient and appropriately skilled workers, and evidence through research, to support a national environmentally sound decommissioning sector. ATSE advocates for a research and development-informed roadmap, emphasising strong links between industry and research to help recognise opportunities in the decommissioning industry that can benefit from innovative approaches and technologies. A plan for the growing decommissioning industry should also seek to provide skilled employment opportunities, including for workers displaced by the energy transition.

ATSE makes the following recommendations:

Recommendation 1: Actively promote and support the development of the decommissioning industry by providing an evidence-based, consistent policy framework that encourages investment and innovation.

Recommendation 2: Require decommissioning projects to engage with Traditional Owners of affected waters and nearby lands.

Recommendation 3: Prioritise research and development for safety and corrosion control in long-term decommissioning of radioactive material and set stringent standards for minimal impact on marine life.

Recommendation 4: Collaborate with industry and research to develop engineering and maintenance guidelines for reusing or repurposing offshore oil and gas infrastructure.

Recommendation 5: Include a national strategy to develop a skilled workforce for the growing offshore decommissioning industry within this roadmap.

Recommendation 6: Involve Aboriginal and Torres Strait Islander communities and Traditional Owners for respectful, community-focused decommissioning industry development.

Driving economic transformation through sustainable decommissioning

As Australia shifts to renewable energy, significant numbers of offshore oil and gas facilities are expected to be decommissioned over the next 50 years. National Energy Resources Australia has forecast that, in Australia, 136 fixed facilities (including pipelines) will need to be decommissioned over the next 50 years, at an estimated cost of AUD\$63.6 billion (Australasian Centre for Corporate Responsibility, 2023). This monumental task includes up to 55,000 kilometres of pipeline in the Asia-Pacific (MacIntosh et al., 2022), with almost half of this work to occur in the Northern Carnarvon basin in Western Australia.

The expected cost of decommissioning is not all sunk cost: it may also represent an investment in an emerging industry. A key advantage of developing a decommissioning industry lies in its potential to advance adjacent and complementary sectors. Existing infrastructure such as pipelines can be repurposed for use in a decarbonised economy, for example, to export low-carbon alternatives such as hydrogen or ammonia (an option currently being explored in Germany). Although there are potential opportunities to developing a decommissioning industry, the sector faces challenges in attracting investment and talent as other industries shifting towards sustainability and decarbonisation compete for these same resources.

To overcome the challenges and capitalise on the opportunities presented by sustainable decommissioning, close collaboration between industry stakeholders and the Australian Government is essential. The Government can create an enabling environment through supportive policies and regulatory frameworks that encourage investment and innovation. At the same time, industry players can contribute their expertise and resources to drive the development of the sector. This collaboration will not only facilitate the establishment of a thriving decommissioning industry but also foster the growth of interconnected industries, such as offshore wind power generation, which share common marine engineering expertise, ensuring ongoing employment and igniting new projects.

While recent efforts have mandated responsible decommissioning, several challenges persist. These include the absence of a comprehensive overview of offshore assets, uncertain decommissioning timelines, and substantial projected liabilities until 2050 (Australian Centre for Corporate Responsibility, 2023). Given the state and costs associated with aging offshore facilities, it is crucial to extend and refine the recent decommissioning reforms through collaborative efforts involving researchers, industry stakeholders, and policymakers. This approach will ensure that best practices are balanced with economic feasibility and promote a sustainable decommissioning industry.

In developing the decommissioning industry, the Australian Government should embed requirements for consultation with Traditional Owners. Decommissioning projects should engage with Traditional Owners of waters and nearby lands to ensure that their perspectives and knowledge are considered, and to avoid damaging culturally important sites. This is particularly important considering Traditional Owners may not have been consulted when the original projects were designed and constructed. This will help ensure that the decommissioning industry is developed in a manner that is respectful of Aboriginal and Torres Strait Islander peoples' rights and interests, and that the industry contributes to the economic and social development of their communities.

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Ensuring world-class safety standards

Suitable and safe decommissioning options vary depending on the type of infrastructure, social licences, safety and the surrounding environment. There is a lack of comprehensive knowledge regarding the impact of factors like the burial of infrastructure in sandy or sedimentary environments and the long-term effects on steels exposed to tidal zones (Melchers & Tan, 2023). Understanding the different factors that affect short-term vs long-term corrosion is an example of a factor essential for assessing abandoned pipelines and offshore infrastructure. Understanding these factors is essential for assessing and mitigating potential risks and ensuring decommissioned structures' long-term safety and integrity. For long-term corrosion assessments, the most important considerations are the average seawater temperature and the potential for calcareous deposition¹.

Another critical aspect of decommissioning in the oil and gas industry is the mitigation of fugitive emissions, which requires further geological assessments and remediation measures. While the current understanding of hydrocarbon contaminants is comprehensive, limited knowledge exists regarding Naturally Occurring Radioactive Material (NORM) contaminants, which usually arise from uranium and thorium decay (MacIntosh et al., 2022). Such contamination will depend on the surrounding environment, infrastructure and operational practices. Exposure to these radioactive materials is a relatively understudied area but some limited research has identified potential effects on egg production for marine arthropods, a key food species for many fisheries, creating a potential flow on effect for human consumption. NORM containment standards must be imposed for the decommissioning industry to ensure environmentally responsible decommissioning. Operators are advised to demonstrate minimal environmental impact and risks, emphasising the need to assess and quantify such effects when first submitting decommissioning plans to NOPSEMA.

Corroded pipelines contribute to sediment contamination, posing risks to organisms in contact with petroleum sediment-associated contaminants. Adding to the complexity is the effectiveness of current technology to assess, address and monitor hazardous substances or contaminants in situ. Existing technology may not be sufficient to address the challenges associated with in-situ decommissioning, and more targeted research and development as part of this roadmap is needed to improve our understanding of the risks and develop effective strategies for mitigating them. To inform in-situ decommissioning strategies, interdisciplinary collaboration among experts in marine biology, engineering, law, social science, and health is essential.

¹ Calcareous deposition: refers to the accumulation or deposition of calcium carbonate (CaCO₃) or similar minerals in various forms, such as limestone or chalk, in natural environments especially in aquatic settings.

Recommendation 3: Prioritise research and development for safety and corrosion control in long-term decommissioning of radioactive material and set stringent standards for minimal impact on marine life.

Maximising reuse and repurposing

A number of opportunities exist for repurposing decommissioned offshore oil and gas platforms that can reap both economic and environmental benefits. Examples include building offshore wind farms, creating major aquaculture projects, fostering artificial reefs, or supporting recreational fishing (Watson et al., 2023), or either partially or completely removing the infrastructure. Repurposing existing infrastructure, augmenting infrastructure to change its purpose, or partially deconstructing and moving to new sites, all come with unique technical challenges. A common challenge is determining the safe life for the use of materials and structures beyond their initial design expectations – including ensuring that the infrastructure doesn't break into pieces and fall into the water. It is also essential to assess how changing seabed profiles and properties may affect the stability of the infrastructure over time.

Repurposing decommissioned offshore structures requires new or amended engineering designs and maintenance plans to ensure their suitability and safety for their intended new uses. For example, in repurposing as artificial reefs, designs need to be adjusted for ecological benefits while ensuring their structural stability – and care must be taken to ensure underwater structures do not pose a safety risk to ocean traffic. Plans must consider the inevitable degradation or collapse of these structures over time. Utilising international engineering standards and best practices for the reuse of offshore infrastructure is critical to ensure repurposing is safe and long-term. It is important to consult with industry and experts to create guidelines that foster the growth of reusing and repurposing as part of decommissioning activities.

Recommendation 4: Collaborate with industry and research to develop engineering and maintenance guidelines for reusing or repurposing offshore oil and gas infrastructure.

Promoting skills development and job opportunities

Oil and gas decommissioning activity in the coming decade and the ongoing demand of onshore decommissioning offers a significant opportunity for Australian industry. To capitalise on this opportunity and promote the development of a sustainable domestic decommissioning sector, it is imperative to cultivate a local workforce equipped with the requisite skills. Failing to proactively address the existing skill gaps could pose challenges in securing adequately trained personnel, resulting in escalated project costs and project delays.

The Centre of Decommissioning Australia, in collaboration with the Western Australian Government, is undertaking a nationwide decommissioning skills review (CODA, 2023). They aim to assess the gaps in essential skills and competencies necessary for the safe and efficient execution of present and future decommissioning projects, both onshore and offshore. By identifying these skill deficiencies, the study will establish the groundwork for a cohesive strategy aimed at enhancing decommissioning skills within Australia. Developing a decommissioning workforce is a challenge that extends beyond regional boundaries and will require national coordination, which could be directed by Jobs and Skills Australia. Developing this workforce can create opportunities for greater participation from Aboriginal and Torres Strait Islander communities.

Recommendation 5: Include a national strategy to develop a skilled workforce for the growing offshore decommissioning industry within this roadmap.

Recommendation 6: Involve Aboriginal and Torres Strait Islander communities and Traditional Owners for respectful, community-focused decommissioning industry development.

ATSE thanks the Department of Industry, Science and Resources for the opportunity to respond to the Roadmap to Establish an Australian Decommissioning Industry for Offshore Oil and Gas consultation. For further information, please contact academypolicyteam@atse.org.au.

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