CENTRE OF DECOMMISSIONING AUSTRALIA

Global Review of Decommissioning Planning and Execution Learnings

Executive Summary

Acknowledgements

These valuable reports, which help to build a solid foundation for the ongoing development of an Australian decommissioning industry, have been made possible through the following contributions.

This report and its associated materials were produced by Advisian Pty Ltd who leveraged their global decommissioning network to bring together such a meaningful piece of work.

CODA is very grateful to BHP, Chevron Australia, ExxonMobil, Santos, Vermilion Oil and Gas Australia and Woodside for their financial contribution and the technical guidance and insights provided by their decommissioning teams through the development of these reports.

These reports, and indeed CODA itself would not have been possible without the financial support and leadership of NERA (National Energy Resources Australia).

CODA would additionally like to acknowledge the contributions of all of the individuals and companies who provided their input to the data contained in this report. These insights have made the report all the more valuable.

Disclaimer

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Introduction

Australia's oil and gas industry has been operating for decades and an increasing degree of infrastructure is approaching end of its productive life. Under Australian law, companies must remove all equipment installed in the ocean unless they can demonstrate that alternative decommissioning approaches pose equal or improved outcomes and are acceptable.

Australia is expected to spend approximately US $40.5 billion on full removal of all equipment installed offshore, with a rapidly increasing workload between 2020 and 2030. Australia's inventory includes diverse assets in State and Commonwealth offshore waters:

- 1,008 wells to be plugged and abandoned (including removal of the trees) split across platform wells (59%), subsea development wells (30%) and subsea exploration and appraisal wells (11%);
- 57 fixed facilities (inclusive of 237,000 tonnes of topsides and 518,000 tonnes of substructures);
- 11 floating facilities (7 FPSOs, 2 FSOs, 1 FLNG and 1 semi-submersible);
- 82 export and inter-field pipelines (with an overall installed offshore length of 4,960 km);
- 205 infield flowlines (1,700 km overall excluding jumpers and spools);
- 130 static umbilicals (approximately 1,500 km overall excluding flying leads);
- 535 additional subsea structures (e.g. manifolds, pipeline termination structures, etc) to be lifted; and
- 126 flexible risers and dynamic umbilicals associated with floating facilities, which will be laid on the seabed following removal of the associated facility.

CODA was established as a joint initiative between NERA (National Energy Resources Australia) and BHP, Chevron Australia, ExxonMobil, Santos, Vermilion Oil and Gas Australia and Woodside to deliver a transformational approach to late-life asset planning and decommissioning execution. To provide long term support to the growth of Australia's decommissioning sector CODA registered as an independent entity in late 2021.

CODA initiated three studies to establish a foundation understanding of opportunities for collaboration, innovation, and efficiency in decommissioning that support the CODA objectives. These studies are:

1. Understanding the opportunity for local disposal and recycling pathways.
2. A global review of decommissioning planning and execution learnings.
3. Development of a decommissioning innovation and technology roadmap.

The three projects were executed in parallel ensuring a consistent, integrated approach through systematic communication between the study teams.

This report summarises the outcomes of the study initiated by CODA to undertake a global review of decommissioning planning and execution learnings.

Purpose and objectives

This report seeks to provide an understanding of how global efficiencies have been realised in decommissioning relating to early planning for design and execution, and also effective utilisation of the long-term approval window in terms of innovation, collaboration and technologies.

The objective of this report is therefore to identify key learnings arising in comparable jurisdictions, which could be applied in the Australian context to inform improved design of planning and execution. Specifically, the purpose of the Project is to inform CODA and the broader Australian decommissioning industry on:

- Proven outcomes e.g. approaches, initiatives or projects that have contributed to improved outcomes in other jurisdictions to plan and execute decommissioning.
- Innovative and opportunistic approaches to decommissioning activities, or the application of new technologies.
- Examples of positive regulatory approval outcomes that have been achieved through collaboration and efficiency.
- Risks which have been identified in comparable jurisdictions relating to decommissioning planning and execution.
- International experience with full removal or in-situ decommissioning of infrastructure, and the instruments and evidence that support these decision-making frameworks.
- International experience with the process of relinquishing a petroleum title, including associated requirements and precedents or case studies relating to long-term monitoring of in-situ assets.

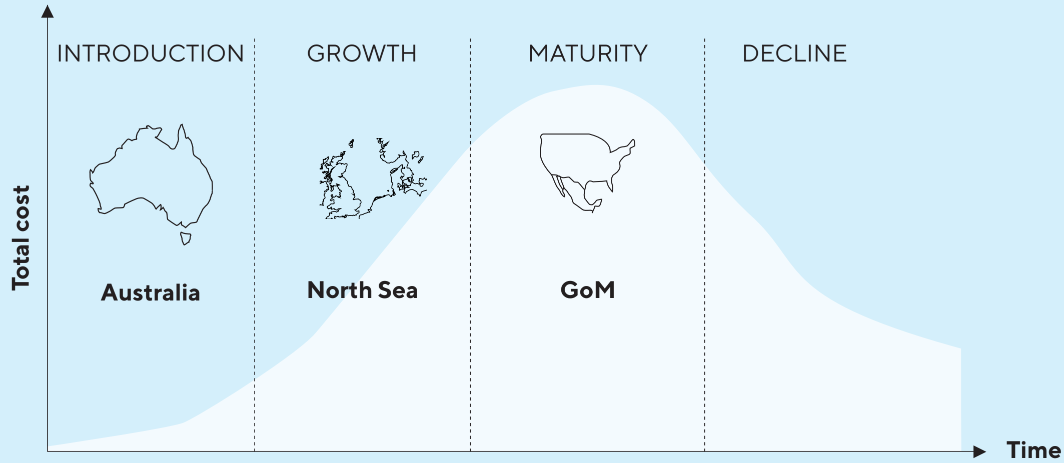
Key comparable jurisdictions

This report acknowledges that Australia is an emerging decommissioning market with a significant opportunity ahead to learn from mature industry in comparable global jurisdictions. The report has leveraged learnings and best practices from the offshore oil and gas industry, focusing on the North Sea and Gulf of Mexico (GoM) as mature markets.

The UK North Sea is by far the global leader in decommissioning commitments, accounting for 78% of the Europe workload (2020/21) and 41% of the global workload (2020/21). The UK North Sea and GoM markets combined represent 60% of the global decommissioning market as measured by offshore decommissioning commitments (2020/21) [source: Rystad Energy].

Figure 1 summarises the comparison between the fledgling Australian market, the growing North Sea market and the mature GoM market. The trends and practices (the knowledge base) from the North Sea and GoM mature regions may inform what will happen in Australia when decommissioning demand and expenditure increases. Cost efficiency opportunities should be realised from collaboration between the operators, supply chain and regulators and from economy of scale benefits. Australia should expect and promote an exponential increase in communication, competition and efficiency.

The focus on the UK North Sea and GoM jurisdictions has not precluded capturing learnings from other global jurisdictions.

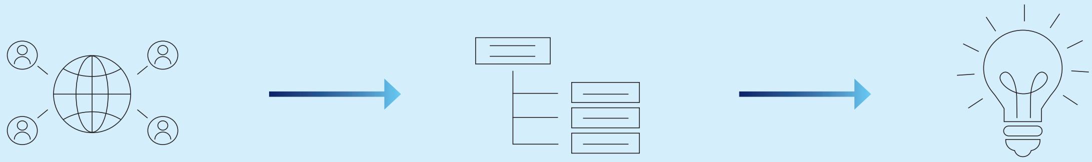


	Introduction	Growth	Maturity / Decline
Knowledge Base	Limited	Rising, including collaboration initiatives	Developed, shared knowledge
Supply Chain	Emerging, limited scale up	Commercial affiliation examples	Widespread development of competition
Cost	Expensive projects	Fit for purpose	Optimised, campaigns
Forecasting Accuracy	Low	Mid	High

Figure 1
North Sea and GoM decommissioning industry maturity comparison with Australia

Study approach

The study has been completed in three main sequential stages:



A jurisdictional subject matter expert (SME) review

Generation of a centralised 'lessons learned / best practice' register

Categorisation and ranking to determine value opportunities for Australia

Jurisdictional SME review & generation of register

Advisian accessed the combined global knowledge base of the Worley Decommissioning Consortium, which includes SMEs from Advisian, Worley and Vysus Group (who specialise in well plugging and abandonment (P&A)), and alliances with installation and implementation contractors. Advisian also reached out to an extended (external) global network of contacts covering operators, industry bodies, contractors and independent consultants for additional insights.

The review captured a significant repository of content which has been collated in an online, searchable 'best practice and lesson learned' register. As of May 2022 the register contains 144 distinct and fully populated entries. Each entry is fully catalogued by decommissioning phase, work breakdown structure (WBS), one of 8 strategic themes and 24 sub-topics, and origin. Each item is also supplemented with supporting attachments and/or references where applicable.

The register is designed as an archive of learnings, best practices and innovative approaches from past and current international decommissioning projects which may have applicability to the Australian lookahead. Key insights gained during the register collation were:

- Approximately 65% of the register content originates from the UK North Sea. As a growth jurisdiction the North Sea is pro-active in terms of sharing emerging practices and approaches.
- A majority of the register content (>50%) pertains to learnings from the execute phase of facility removal, which is aligned to the study focus on project experience and case studies.
- Technical aspects of well P&A account for 20% of the register, noting that there are many more learnings captured under general management / planning aspects.
- The strategic themes of 'planning for decommissioning' (strategy / efficiency) and 'process and guidance' (regulations / governance) are assigned to approximately 50% of the entries.
- By far the dominant sub-topic represented is 'clearly defined strategy and contingency planning before cessation of production (CoP)' accounting for 16% of the register entries.

Prioritisation

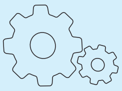
The content held in the best practice and lessons learned register has been ranked to identify high priority learnings. The ranking process differentiated entries by scoring the allocated topic, at a high level, in terms of the perceived value to the local industry and the perceived 'applicability' in the Australian context. The scoring was facilitated through an online survey completed by 13 stakeholders including CODA, operators and Worley (Australia based) decommissioning personnel covering offshore construction, safety, environment, social, subsea and floating systems.

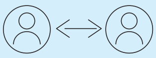
Table 1 shows the outcome of the process. The ranking identified 8 sub-topics, under 5 strategic themes as a priority for CODA attention. The best practice and lesson learned register contains 57 separate entries which are categorised under these priority themes and sub-topics, covering a wide range of key learnings and value creation opportunities.

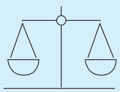
Priority	Strategic theme	Sub-topic	Register entries
HIGH	Commercial transformation	Enabling decommissioning at scale (e.g. campaigns)	7
	Planning for decommissioning	Clearly defined strategy and contingency planning before CoP	23
	Process and guidance	Regulatory process(es) that support efficient decommissioning	4
		Fit for purpose guidance and expectations	6
		Enhanced governance of the decom. option decision framework	5
	Safety risk reduction	Promotion of safer and more efficient methods	8
		Instilling a decommissioning mindset and strong safety culture	2
	Circular economy	Development of a competitive and sustainable local disposal market	2

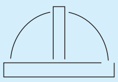
Table 1 I High priority decommissioning topics

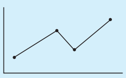
Based on the high priority register entries a high level 'action plan' is proposed for the attention of the overall decommissioning industry, with the potential for CODA to lead the implementation of the plan. The action plan is summarised as 5 key initiatives, which are intended to be starting points for further development.

1  Build a collaborative culture, improve data transparency, and align activities to enable decommissioning at scale.

2  Facilitate a structured engagement framework using knowledge transfer, benchmarking and continuous improvement to promote timely planning of decommissioning activities.

3  Work across the stakeholder suite to ensure that the Australian regulatory process supports the delivery of efficient decommissioning.

4  Encourage operators and the supply chain to integrate decommissioning into 'business as usual', driving safer outcomes through project and workforce continuity.

5  Raise awareness of global trends and challenges placing a stress on the decommissioning market, and provide clearer forecasts expedited through data tools that are accessible to the supply chain.

Next steps

Through the execution of this study, it was clear that the global decommissioning industry has an established culture of sharing accrued knowledge. It is important that this is encouraged and developed in Australia. Mistakes and failures to plan and execute decommissioning in an optimal way are costly for the companies involved as well as the wider industry image. Best practice is constantly being revised and updated. Ensuring that the whole industry is aware of the latest practices will help reduce costs and build up the skill set of the industry.

The knowledge contained within this report and the register that has been developed is meant to inform interested parties, including those responsible for decision making around the decommissioning sector in Australia. There is urgency with a ramp-up in decommissioning activity forecast in the next decade. However, unlike construction projects, decommissioning projects allow time for engagement. There is adequate opportunity to leverage initiatives and approaches from more mature regions.

The register can therefore be used to springboard conversations across the full decommissioning supply chain.

Further reading

Executive summaries of the accompanying reports in this series as well as other CODA materials can be accessed via the CODA website at www.decommissioning.org.au.

The full version of this report as well as the other reports in the series is available to CODA partner members. To find out more email contact@decommissioning.org.au or visit the CODA website at www.decommissioning.org.au