



CENTRE OF
DECOMMISSIONING
AUSTRALIA

Centre of Decommissioning Australia

Decommissioning in Victoria

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This paper has been prepared in confidence for the office of The Honourable Madeleine King, Minister for Resources and Minister for Northern Australia as a briefing document to provide insights and possible context for decommissioning opportunities in Victorian.

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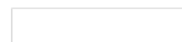
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Revision History

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P1	First draft	s22	

OVERVIEW

The Centre of Decommissioning Australia (CODA) was established in 2021 as a fully independent not for profit organisation working to build Australia's decommissioning industry as one that has the local skills, capabilities and capacity to execute as much of the emerging volume of onshore and offshore decommissioning activity in a safe, efficient and environmentally sensitive manner. CODA is headquartered in Perth, Western Australia with a national scope and is using its position as a trusted independent connector to promote opportunities in decommissioning and to build an increasingly rich domestic and international network of relationships that can be leveraged in support of our domestic needs.

CODA's studies conducted in 2021¹ and 2022² indicate that over the coming decades there is up to USD40.5 billion of decommissioning activity in Australian waters. The majority of this material is located off coastal WA, followed by Victoria with the second largest volume and the balance located of the Northern Territory. This volume presents a significant opportunity for businesses in these states and territory to participate in the work. However, this participation will, in part, be contingent on having local support and commitment around areas such as access to appropriate local facilities where the decommissioned and removed equipment can be landed for dismantling, with the dismantled materials then entering the reuse, recycling or, where necessary, disposal value chains.

Through the work of NOPSEMA, the offshore regulator, in issuing general direction notices to a number of operators, instructing them to accelerate their decommissioning plans, there is currently a significant surge in decommissioning activity which in turn is putting both additional pressure as well as presenting clear opportunities to the organisations that provide services to these operators. Alongside these general directions are several other "business as usual" decommissioning campaigns in Australian waters.

CODA's research in 2021 indicate that decommissioning activities this decade represent around 50 percent of the total anticipated offshore decommissioning works to fully retire all or Australia's active offshore oil and gas facilities. This decommissioning works is estimated to cost around US\$40.5 billion in total, with around half of that spend on well closure (plug and abandonment) and the balance on the removal of infrastructure.

It is worth noting that decommissioning on this scale is new to Australia. We have only undertaken small decommissioning campaigns in the past which have relied on international services and skills with much of the removed equipment either being exported once removed or sent to landfill. The evolving regulatory and community expectations along with the scale of the emerging volumes of work mean that much of this new work is expected to be executed domestically, with removed equipment looking to be landed on Australia's shores for cleaning,

¹ <https://www.decommissioning.org.au/work/offshore-oil-and-gas-decomissioning-liabilty-australia/>

² <https://www.decommissioning.org.au/work/understanding-the-opportunity-for-local-disposal-and-recycling-pathways/>

dismantling and recycling, which therefore presents a significant opportunity to build local capability.

Current activity and general directions³

Australia's offshore decommissioning activity is a mix of planned, 'naturally occurring' works alongside work which has been brought forward through the issuing of general directions by NOPSEMA. This mix means that unlike several other global jurisdictions, Australia has a high level of clarity over its decommissioning work for much of this decade. Following is a list of the current active general directions associated with decommissioning across Australia's offshore facilities.

- ENI Australia Woollybutt⁴ (WA)
- ESSO Australia (Vic)⁵
- BHP Billiton (now Woodside) Stybarrow (WA)⁶
- BHP Billiton (now Woodside) Minerva (Vic)⁷
- BHP Billiton (now Woodside) Griffin (WA)⁸
- Cooper Energy, Basker Manta Gummy (Vic)⁹

Alongside these general directions are a number of other ongoing decommissioning campaigns¹⁰, such as Santos campaign associated with Mutineer Exeter¹¹

Decommissioning phases

To understand where the opportunities associated with decommissioning present it is worth considering the phases of decommissioning. Decommissioning is broken into several stages which, at a high level, can be considered as follows:

- **Well plug and abandonment (P&A)** – in this phase technologies are deployed to remove internal materials, flush then permanently plug wells that have been used to access the hydrocarbon reservoirs. Typically, this work is executed from a rig or similar platform that is mobilised from a global market to undertake the work in Australia. Small volumes of removed materials are produced during this process that require disposal

³ <https://www.nopsema.gov.au/offshore-industry/directions-notices-and-alerts/published-directions-and-notices>

⁴ <https://www.nopsema.gov.au/sites/default/files/2021-03/A762863.pdf>

⁵ <https://www.nopsema.gov.au/sites/default/files/2021-06/A783674.pdf>

⁶ <https://www.nopsema.gov.au/sites/default/files/2021-09/A781218.pdf>

⁷ <https://www.nopsema.gov.au/sites/default/files/2021-09/A781846.pdf>

⁸ <https://www.nopsema.gov.au/sites/default/files/2021-09/A781707.pdf>

⁹ <https://www.nopsema.gov.au/sites/default/files/2021-09/A800345.pdf>

¹⁰

https://info.nopsema.gov.au/home/approved_projects_and_activities?utf8=%E2%9C%93&keyword_search=decommissioning

¹¹ https://info.nopsema.gov.au/environment_plans/572/show_public

through cleaning then either sale for scrap or refurbishment into alternate products or spare parts.

- **Facility removal** – in this phase topside facilities are flushed and removed along with supporting structures such as jackets also being either fully or partially removed. These activities heavily rely on access to marine vessels such as heavy lift cranes and barges to remove large modules weighing thousands of tonnes which are then transported to a shore facility for cleaning, dismantling and sorting before either being placed into recycling pathways (for the majority of materials) or disposal in the case of contaminants and non-recyclable materials.
- **Subsea cleaning** – in this phase subsea equipment such as flexible and rigid pipelines, anchor chains, cables and other decommissioned subsea equipment is removed and returned to shore for processing alongside the facility equipment in similar facilities and to similar standards.

Each of these phases presents a different set of opportunities at a local business and skills development level. Well P&A is significantly expensive but many of those costs are associated with the cost of the vessel and specialist crew, with the vessels almost exclusively being sourced internationally. However, the facility and subsea equipment removal and then landing and processing offer significant state and national opportunities should Australian industry along with governments at the federal and state/territory level move quickly enough.

BUILDING AUSTRALIA'S DECOMMISSIONING INDUSTRY

As discussed above, Australia is presented with a significant opportunity. If exploited early and in a collective and holistic manner, this could establish a new industrial sector. This emerging decommissioning industry, while developed to execute work on oil and gas infrastructure could grow to encompass the end of operations treatment of numerous other industrial activities. Volumes of removed materials from this work could become large scale feedstock for new Australian industries such as green steel and specialist plastics manufacturing.

Beyond their use for decommissioning, the development of necessary coastal infrastructure required for decommissioning works could also then transition to that needed for emerging industries such as offshore wind.

A national holistic start

Decommissioning is a national opportunity requiring a national overview along with state and regional specialised work. This outside in approach will avoid overlap and is anticipated to facilitate the growth of the most efficient and effective national capability to undertake localised work. Without a national, long-term view there is risk of over investment in some areas, duplication, and loss of efficiency. However, this national view must also consider local needs.

Studies

CODA was formed to pursue a holistic, whole of country and whole of industry approach to developing Australia's decommissioning industry. This required some initial work to identify the size, scale and timing of the opportunity which took the form of CODA's 2021 decommissioning liability study¹². The findings from this study rapidly became the default quoted numbers around decommissioning and have set the scene for much of the discussion. We then built on this with three additional pieces of work, looking at a technology roadmap¹³, global best practice in planning and execution¹⁴ and, disposal and recycling pathways¹⁵. These studies give CODA and its partners a solid insight into the needs of this growing industry.

Capability mapping

Alongside the four studies, CODA is also developing an online capability directory (due for release in April 2023) where companies working in or offering services into the decommissioning industry can showcase their capabilities and find one another. This visibility of capability is critical in a growing sector to avoid unnecessary investment in developing solutions that already exist, to find genuine service sector gaps and to allow companies to collaborate.

Forward lookahead

Visibility of future work is critical to the service sector for investment in future capacity. Similarly, for the operators, knowing what the plans are of their peers can allow them to collaborate on mobilisation of the very costly international vessels, driving down execution costs and allowing more continuity of work.

To enable the development of a meaningful forward lookahead, CODA is in discussions with the ACCC seeking an opinion or ruling to allow CODA to host such data for sharing between operators as well as aggregating it to the service sector.

Regional needs and opportunities – Victoria

Decommissioning in Victoria has a different set of challenges and opportunities to those in other jurisdictions. The Bass Strait was one of Australia's first oil and gas precincts and has been producing energy since the '60's. Much of the aging infrastructure that enabled this

¹² <https://www.decommissioning.org.au/work/offshore-oil-and-gas-decommissioning-liability-australia/>

¹³ <https://www.decommissioning.org.au/work/development-of-a-decommissioning-innovation-and-technology-roadmap/>

¹⁴ <https://www.decommissioning.org.au/work/global-review-of-decommissioning-planning-and-execution-learning/>

¹⁵ <https://www.decommissioning.org.au/work/understanding-the-opportunity-for-local-disposal-and-recycling-pathways/>

production is now being decommissioned, particularly under the work being executed by Esso^{16 17}.

In its first stage this will involve the removal of some 12 steel platforms along with associated topsides and subsea infrastructure. To get the greatest efficiencies and opportunities from this work would involve landing the equipment into one or more facilities on the shores of the Bass Strait (either Victoria or Tasmania) where it would then be cleaned externally of marine growth and internally of any hydrocarbon associated residues. The cleaned equipment is then dismantled using highly mechanised techniques where materials and equipment are sorted for either recycling or refurbishment for resale with only small volumes of materials destined for disposal.

The dismantled materials are dominated by steels and ferrous followed by non-ferrous metals, polymers and plastics. The chief contaminants of concern are any mercury and similar heavy metals along with naturally Occurring Radioactive Materials (NORM's) that accumulate inside of equipment through the life of a facility. These contaminants require specialist management and generally transport to long term waste storage facilities.

With the contaminated nature of much of the removed equipment, it is important that any receiving facility be suitably designed and operated to prevent any environmental damage through the process. Such facilities are already operating in Europe but to date Australia does not have any such facility.

Facilities

Identifying and establishing a suitable facility to receive the removed equipment is critical to the state's ability to support a decommissioning industry, without such a facility there will remain a significant risk that removed equipment will be shipped interstate or even internationally for disposal. While the costs to build and operate the core facility will likely fall to a private enterprise there is opportunity for the state to support the development through grants or infrastructure provisioning.

Once such a facility is in place it will then act as a hub for the distribution of materials from the dismantling process as well as providing a healthy number of direct and indirect local jobs for the duration of the decommissioning works.

Strategic foresight in the development of this facility may also make it multipurpose for the assembly and deployment of offshore wind equipment and its maintenance and eventual decommissioning phases as well as for other as yet unforeseen marine opportunities.

¹⁶ <https://www.nopsema.gov.au/blogs/gippsland-basin-decommissioning-ep-now-available>

¹⁷ <https://www.exxonmobil.com.au/Energy-and-environment/Energy-resources/Upstream-operations/Decommissioning#OurongoingroleinGippsland>

Insight: CODA believes that both Esso and several of their potential sub-contractors have undertaken a lot of work to identify potential locations and their respective development needs but how connected any of this is to state strategy is unknown to us.

Recommended Action: investigate to understand the status of any plans for the development of a receival facility and understand how it could form part of a longer-term strategic plan for maritime industry for Victoria.

Technologies

Access to the necessary technologies to undertake every aspect of the decommissioning cycle will be needed for the work to be executed safely and efficiently. CODA's growing domestic and international network of connections combined with its capability directory (see above) will provide a significant accelerated position for this and enable greater visibility and therefore access to these solutions.

Insight: Discussions and research would suggest that most technology solutions exist to the known challenges in decommissioning, however, new solutions are emerging regularly and need to be proven before they can be adopted. If any of these were to emerge from Victorian businesses, support in their development would potentially allow them to be used locally as well as globally.

Recommended Action: Establish and maintain connections to CODA to leverage their networks and insights around best practice and technologies.

Skills

Decommissioning is a field that requires access to a broad spectrum of skills, from marine operations and well plugging through to the management and execution of onshore landing, dismantling, processing and environmental reporting. From a regional employment opportunity perspective, CODA's investigations in Europe indicate that a typical dismantling facility employs between 70 and 100 personnel in long term 5 days a week roles, ideally resident close to the facility. Also, there are clear benefits in such facilities employing personnel with experience in working in the oil and gas industry, whether on or offshore as these individuals are used to working with stringent safety protocols.

To understand better the skills needed for decommissioning CODA will shortly be initiating a study to begin to map skills with a view to developing a long-term skills strategy.

Insight: While not large-scale employers, decommissioning facilities will generate good numbers of skilled roles. With such facilities ideally located in reasonable proximity to the offshore facilities they are likely to be regional as opposed to metropolitan roles. Additionally, they are long term roles that will at least span the life of the decommissioning works and potentially roll into offshore wind or other activities.

Recommended Action: Consider engaging in some way with CODA on the execution and delivery of the skills study and longer term skills strategy as this is likely to be work of national and regional benefit.

Recycling

The decommissioning and dismantling process will generate significant volumes of valuable materials. These material streams will be dominated by steel and ferrous followed by non-ferrous, plastics and polymers. All these commodities, if carefully sorted and categorised are themselves valuable feedstock for other manufacturing processes. Internationally, such facilities are seeing between 97 and 98.5% of materials being recycled, numbers which should be achievable in Australia also.

Across Australia there are some disconnects between the locations of recycling facilities and the end users of the commodities generated¹⁸. This is expected to change as volumes increase and manufacturers recognise that feedstock may be available locally through facilities such as decommissioning yards.

Insight: Victoria has some advantages in the recycling value chain given its relatively large manufacturing base where many of the materials removed could become feedstock. Steel from the dismantling process would likely be consolidated and shipped to either Port Kembla, Whyalla or Newcastle.

Recommended action: Work closely with the operators and the owners of the dismantling facilities to understand the volumes and potential values of commodity streams developed through decommissioning then link these up with potential local consumers.

Connectivity

Decommissioning is a national, regional and global industry. Techniques, technologies, skills and insights are applicable in virtually every part of the globe. As such, skills and solutions developed or refined in Australia will have potential value elsewhere. Building and maintaining connections across the country, within Asia Pacific and globally will benefit everyone and need to be fostered and maintained.

Insight: there are strong drivers for decommissioning to be undertaken as cost efficiently as possible, it is a cost centre not a profit generator for the operators and for the service companies it will be very competitive. As such, it is a sector where everyone is more open to sharing than in competitive production spaces. This openness can help to build communities and share knowledge.

¹⁸ <https://www.decommissioning.org.au/work/understanding-the-opportunity-for-local-disposal-and-recycling-pathways/>

Recommended action: Continue to engage with CODA on connecting to the world of decommissioning. CODA is established and recognised internationally as building relationships between organisations involved in decommissioning, making them an easy partner for networks and knowledge.

Future industries

Decommissioning in Victoria will see a significant peak of activity in the second half of this decade, between 2025 and 2027. Esso will be undertaking large volumes of removal works alongside their ongoing plugging and abandonment work. This will likely result in large volumes of materials needing to be landed and processed on shore, and it is believed that ESSO are keen to execute as much of this work as possible in Victorian or Tasmanian ports. Victoria's ports are believed to be already busy, and many may not be suitable for all decommissioning works, as such either one or more existing ports may need to be modified or potentially even a new facility developed.

Once the Esso peak is passed (circa 2028) the facilities may become useful for assembly and deployment of offshore wind structures and their ongoing maintenance while also accommodating the long tail of ongoing decommissioning works.

The Bass Strait is also home to two concrete gravity structures operated by Esso. These structures may prove extremely difficult to remove and may be better considered to be left in place to provide base infrastructure to support either offshore wind or CCS infrastructure. {note, Esso will have to seek approval from NOPSEMA and the department of environment to be permitted to leave these in place}

Insight: Co investment in development of strategic facilities that could accommodate both decommissioning and offshore wind may be financially beneficial to both sectors.

Recommended action: Convene discussions between Esso, Offshore wind developers and government to discuss synergies.

SUMMARY

Decommissioning in Victoria, driven by the end of life of many Bass Strait facilities, will present a significant opportunity to develop local capacity. Unlike many other sectors, decommissioning is a known and committed task that must be undertaken. Exact scopes may vary as approvals are given around specific work but the base expectations remain the same. This profile is different to more emergent industries where there may be many variables that will determine final volumes and locations of work.

Active local support toward the execution of decommissioning could help to grow the industry in a more sustainable and cohesive manner, giving the best possible outcomes for all involved; optimal execution outcomes for the operators; business opportunities for service sector companies and; quality local employment for local communities.

It is hoped that this document proves useful as a background paper. CODA is deeply involved and committed to building Australia's decommissioning industry into one that can execute as much work locally, safely, efficiently and to the best environmental standards possible, employing local personnel and supporting the growth of local industries both for the decommissioning work and for subsequent recycling activity. CODA welcomes any interest to discuss future opportunities to engage and collaborate.



