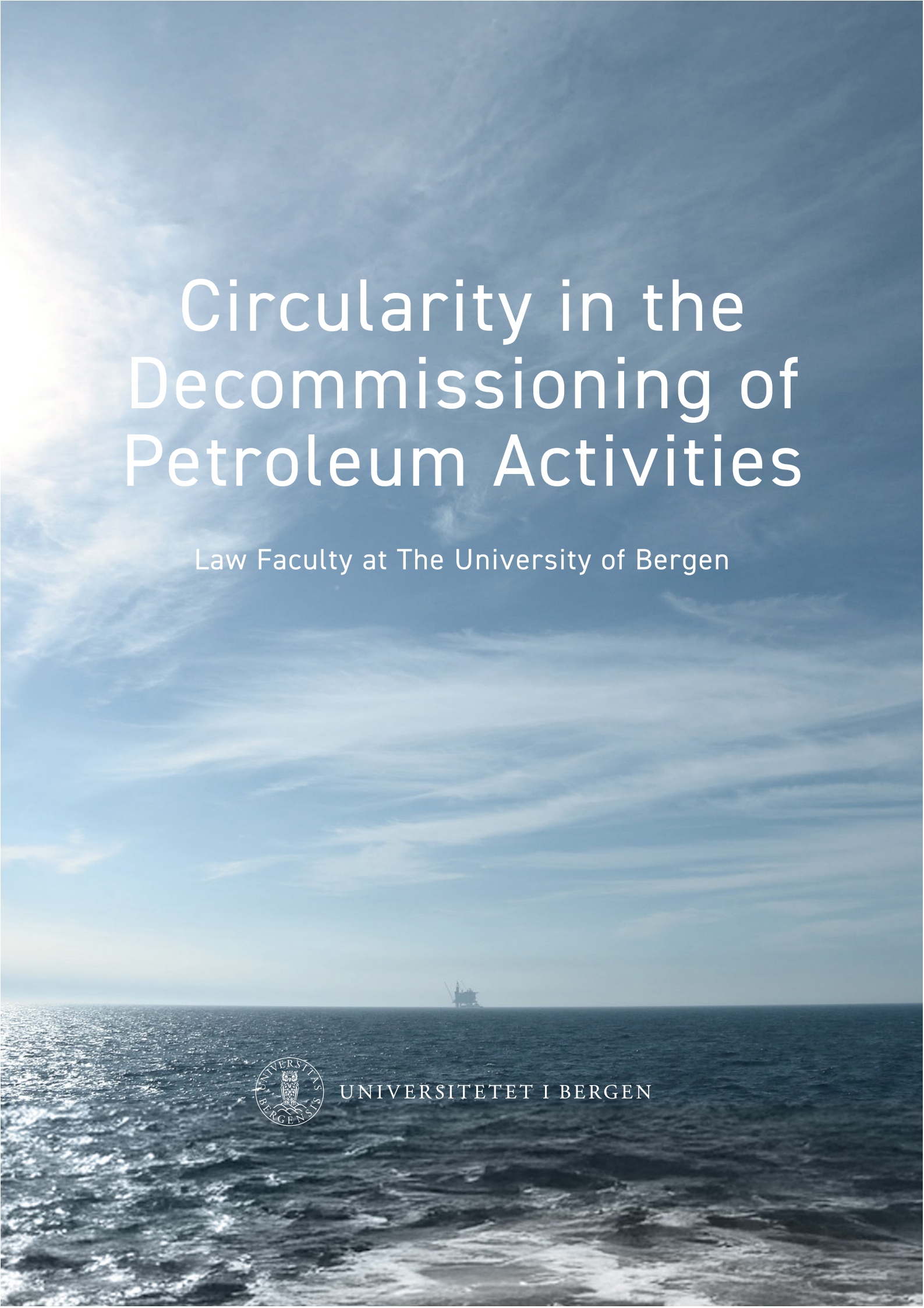

Circularity in the Decommissioning of Petroleum Activities

Law Faculty at The University of Bergen

UNIVERSITETET I BERGEN

Circularity in the Decommissioning of Petroleum Activities
Report

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Summary of the Report

To achieve the goals of energy transition and reduced resource consumption, increased circularity is necessary. The topic of this report is how the current Norwegian regulatory framework contributes to circularity in the decommissioning of petroleum activities, and how the framework can be amended to better promote circularity in the future. The focus is on offshore petroleum installations, but the report also considers other types of installations, such as offshore wind turbines-

Norway and other countries are bound by international agreements that, among other things, require more or less complete cleanup following offshore petroleum activities, prohibit the dumping of petroleum installations at sea or parts of installations onshore without adequate waste management systems, and set limits on the transport of hazardous waste and cross-border waste shipments. These obligations are important for a comprehensive understanding of how the regulatory framework influences the degree of circularity in decommissioning processes.

Several other countries have more mature petroleum activities on their continental shelves than Norway. Their experiences are reflected in the national regulatory frameworks relevant to the decommissioning of petroleum activities. By comparing the regulations of different countries, valuable cross-border learning can be achieved, enhancing the understanding of how regulatory frameworks should be designed to promote greater circularity in petroleum decommissioning. The report therefore examines how the United Kingdom, Australia, and the Netherlands have structured their decommissioning regulations and what incentives for circularity exist within their frameworks. It is worth noting that while both the EU and Norway have circular economy strategies, there are few concrete requirements for circularity in petroleum regulation.

An analysis and comparison of the regulatory frameworks in Norway and the three other countries have made it possible to identify the following key challenges for circularity in the existing Norwegian regulatory framework:

Focus on circularity: Few concrete requirements in the regulatory framework.

Liability rules: Secondary liability after transfer hinders reuse, particularly for new industries. This is reinforced by uncertainty about the duration of such liability.

- Export control: Strict regulations limit the possibility of selling equipment to potential buyers.
- Economy: Circularity is often more expensive than disposal or the use of new materials, partly due to technological and tax-related requirements.
- Secondary market: Lack of facilitation of a market for used materials and components.
- Contracts: Strict contractual terms and trade secrets hinder the sharing of information necessary for reuse

The report provides the following recommendations:

- Increased knowledge base: Knowledge about decommissioning and various methods must be improved. This can, among other things, be achieved by creating a platform for information sharing, similar to the Dutch Nexstep.

- Update the regulatory framework: Clarify liability rules, incorporate the waste hierarchy, introduce requirements for reuse where appropriate, and establish transitional arrangements for reusable materials. Legislation concerning decommissioning should be update for the purpose of strengthening circular economy, enhancing cooperation between stakeholders both in public administration, in the petroleum business, and other private businesses, and developing markets and standards for reuse.

- Reduce documentation requirements: Introduce certification systems for reusable materials where possible, without compromising safety.

- Review export control: Ensure awareness of the regulatory framework and the limitations it imposes so that these can be taken into account in decommissioning planning.

- Strengthen cooperation: Develop collaborative platforms between authorities and industry, inspired by the British and Dutch models

- Further develop the secondary market: Public authorities may contribute to developing a market for rese by increasing its demand for reused materials. Technical standards should facilitate efficient reuse. A joint digital platform for buying and selling should be established

This could contribute to reduced resource consumption, lower emissions, and increased value creation in the transition to a green industry.

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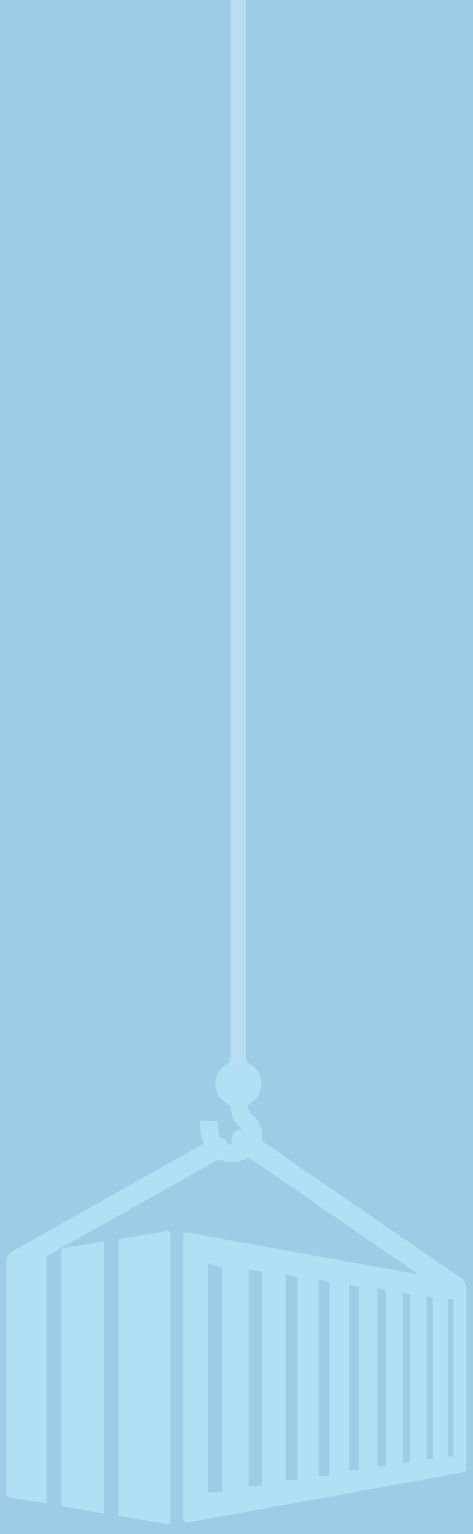

1 Introduction

1.1 Mandate

This report concerns the regulatory framework related to the decommissioning of petroleum activities. It focuses on legal barriers and incentives regarding the disposal of petroleum installations in ways that promote sustainable decommissioning alternatives The purpose of this report is to improve the understanding of the legal framework conditions and the economic incentives provided by the regulations for circularity in the decommissioning of offshore petroleum installations. The report has been drafted on a North Sea and in particular Norwegian context. However, it is our ambition that these lessons learnt may be used elsewhere.

Ambitious goals have been set nationally and internationally to reduce the environmental footprint of human activity. A circular economy—with low waste production and a high degree of reuse of old materials—is a key component in achieving these goals. This is emphasised in the EU's Circular Economy Strategy.[1]

The Norwegian regulatory framework for circularity is underdeveloped—both in general and specifically in relation to the petroleum sector. Neither the Norwegian National Strategy for a Green Circular Economy from 2021,[2] nor the Norwegian Government's Action Plan for a Circular Economy from 2024–2025,[3] propose solutions or signalize policy ambitions to the regulatory challenges in this sector.

On 14 March 2024, the Norwegian Government published a new Action plan for a Circular Economy.[4] The background for the development of the action plan is the lack of resource reuse in Norwegian society. The Plan aims to contribute to a rapid transition to a circular economy.[5] This report is part of the development the government is pursuing through the action plan, but it concerns a different value chain than the seven the government has defined as prioritised.[6]

In the North Sea, several installations will reach the end of their production period in the coming years.[7] At the same time as these installations must be decommissioned, the Norwegian petroleum industry is to reduce its greenhouse gas emissions by 40-50 percent.[8] Currently, the recycling rate of offshore oil and gas infrastructure is very high. For example, industry practice in the North Sea shows a recycling rate of 95–98% for installations. Recycling is mostly done by melting of metals. It is also possible to increase recycling levels by recycling new materials, such as insulation. However, recycling involves resource use related to i.e. remelting. To date, reuse of installations and parts of them remain limited, despite theoretical applications within and outside offshore energy. Increased reuse and circular economy practices—where materials are reused with less

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[1] European Commission, *A New Circular Economy Action Plan: For a Cleaner and More Competitive Europe*, COM(2020) 98 final.
[2] https://www.regjeringen.no/contentassets/f6c799ac7c474e5b8f561d1e72d474da/t-1573n.pdf Ministry of Climate and Environment and Ministry of Trade, Industry and Fisheries, *National Strategy for a Green, Circular Economy*, 2021.
[3] https://www.regjeringen.no/contentassets/0173313ba73941c6b5072c5a0ee27434/no/pdfs/handlingsplan-sirkulaer-okonomi.pdf Norwegian Government, Action Plan for a Circular Economy 2024–2025 (2024).
[4] Norwegian Government, Action Plan for a Circular Economy 2024–2025 (2024).
[5] Norwegian Government, Action Plan for a Circular Economy 2024–2025 (2024).
[6] Norwegian Government, Action Plan for a Circular Economy 2024-2025 (2024), p. 25 ff.
[7] See i.a. https://www.sodir.no/en/facts/production/shutdown-and-removal/responsible-removal-of-old-facilities/ and https://www.norskpetroleum.no/en/developments-and-operations/cessation-and-decommissioning/. An overview of the installations that are to be removed can be found in Annex 1.
[8] The industry has committed to a 40% reduction through an industry agreement and climate strategy that has been established between the authorities and the parties in the industry. The Parliament increased a target to a 50% reduction in the tax package, which the industry now follows.

transformation—are central measures for achieving societal goals of reduced resource consumption.

Achieving the highest possible degree of reuse and recycling of decommissioned installations and equipment will be an important contribution to meeting goals related to both circularity in general and reduced greenhouse gas emissions from the petroleum sector. Regulations and market systems will significantly influence how successful the transition to a more resource-efficient green industry will be.

This report examines how much room the current Norwegian regulatory framework for decommissioning petroleum activities allows for circularity in the decommissioning of offshore petroleum installations on the continental shelf. It presents proposals for improving the regulatory framework and offers more concrete recommendations on how authorities should proceed to facilitate environmentally sound disposal of petroleum installations.

The aim of this report is to present knowledge about the current situation and thereby contribute to the development of a legal framework that balances the interests of industry stakeholders with overarching societal concerns.

1.2 What does the report concern?

The work on the report has been based on the challenges highlighted by existing academic literature, representatives of the petroleum industry consulted during the research. Many of these challenges stem from public law requirements, such as those related to the transfer of liability upon the sale of installations, VAT and tax rules, and export controls. In addition, there are limitations on the freedom of action of the owner and operator, which may arise from agreements with, for example, the company that built or supplied equipment to the installation.

This report is largely directed at infrastructure scheduled for removal in the coming decades, meaning primarily petroleum installations. However, it may also be relevant for more modern structures, such as offshore wind turbines that are starting to being deployed in the North Sea. Circularity begins already at the design stage,[9] and the challenges associated with removing decommissioned petroleum installations may hopefully highlight some lessons that emerging industries can also benefit from.

The regulatory framework for decommissioning petroleum activities is to deal with different priorities and interests that do not always align with one another. In addition to climate and environmental concerns, one must also consider the safety of personnel involved in the decommissioning work, other marine industries such as fishing and shipping, and sound socio-economic principles. A key objective should be to identify solutions that can support several of these considerations simultaneously, so that they reinforce rather than hinder one another.

A central challenge in promoting circularity in decommissioning processes is that choosing reuse yields lower returns. This report does not address the potential for developing new technologies that could make the decommissioning process more efficient.

Only structures above the seabed are addressed in this report. This means that subsurface installations (wells) and structures along the seabed (pipelines and cables) are not within the scope of this report.

1.3 Terminology

Terminology related to circularity is not used consistently. Broadly speaking, one can distinguish between, on the one hand, recovery and recycling—which involve extensive reprocessing of used materials—and, on the other hand, reuse.

Reuse can be divided as follows:

- *Reutilisation* means using something again in the same way as before. This is the most efficient way to reutilise resources, as it involves minimal alteration. There are several examples of topsides being reutilized on another platform in the Dutch sector.

- *Repurposing* means using what already exists in a different way. For example, steel plates can be removed and reused elsewhere without reprocessing. The same applies to large parts of the equipment on an installation. Another example is the use of oil and gas topsides to allocate hydrogen production through an electrolyser – something that is

9 See NORSOK S-003 and Offshore Norge Guideline 147.

currently being tested in Europe.[10] Repurposing, in almost all cases, requires more resources than reutilisation, as the installation must be dismantled into smaller parts and transported to different users. Often, the installation must also be brought onshore to carry out the necessary work for repurposing. There is also a risk that modification work may damage other parts of the installation, rendering them unusable.

- *Upcycling* is a form of repurposing that results in a product of higher quality or value than the original. The distinction between reutilisation, repurposing, and upcycling is not always clear. In this report, we use the term reuse to cover all three. By "new use", we refer to all forms of reuse or recycling.

The difference between reutilisation, repurposing and upcycling is not always clear. We have chosen to use "reuse" as a common term for the three. The term "new use" will be used to refer to all kinds of reuse or recycling.

Reuse can be achieved, for example, by repairing, renovating, or transferring objects or materials to new purposes, thereby reducing the number of new products that need to be manufactured. Typical candidates for reuse in the petroleum industry include engines, valves, and pumps. Pipes, plates, and beams can also be reused, typically by onshore industries with lower documentation and quality requirements. Reuse is far more energy-efficient and cost-effective than recycling, but also much more challenging.

1.4 How do the laws of other countries influence Norwegian regulations?

The international community and global relations have increasingly become more regulated. It is no longer possible to develop solid national rules and guidelines without knowledge of the international framework and comparative perspectives. Increased understanding of the connection between national and international regulations is essential for identifying the best solutions. In this report, the regulatory frameworks of Australia, the United Kingdom, and the Netherlands have been compared with that of Norway. These countries all have relatively large offshore petroleum industries but differ in their experiences with decommissioning petroleum activities and the development of regulations governing such activities.

What they have in common is that they have significantly more mature fields than Norway, and therefore more installations that have already ceased production. The Dutch offshore petroleum industry operates close to shore, in shallow waters, and from small installations, whereas the United Kingdom, like Norway, has large installations in deep waters far from land. Australia also has large installations in deep waters that are older than those in Norway. The country has also undergone a very interesting development in the years following the Hunter Report. Where there was previously little oversight of whether operators cleaned up after themselves, a powerful system is now being developed to ensure that cleanup requirements are met.

It is important to be aware that there is a different legal context in, for example, the Australian legal system. The English legal system places great emphasis on "title," meaning the right to use a defined part of the continental shelf. This contrasts with the Norwegian approach of licenses, which are permits for extraction and not tied to real property in the same way. Additionally,

[10] Diomidis Afentoulis, Torhild Nordtveit, Ignacio Herrera Anchustegui, *Repurposing Offshore Oil and Gas Infrastructure for hydrogen production*, in: Reuven Fleming, *Regulating Hydrogen in Europe*, Oxford University Press, exp. 2026.

societal differences may mean that a regulation that works well in Australia may not work as effectively here, due to different adjacent legal rules, cultural norms, or practices.

1.5 How can Regulations be used to Facilitate the Desired Development?

This report addresses issues related to how regulatory frameworks can be used to promote circularity. In other words, circularity is the goal, and legislation is the means.

Regulations can provide incentives for or mandate desired actions, or prohibit actions that are not wanted, thereby promoting political objectives—such as circularity. However, there are limits to how far circularity can be advanced through regulation.

Firstly, circularity will always depend on the availability of the necessary technology, making it practically possible to reuse what is no longer needed in its current form. A well-designed regulatory framework can facilitate the development and adoption of such technology. Conversely, regulation can hinder progress by setting boundaries that make it impossible or unprofitable to develop new technologies or implement new solutions.

Secondly, circularity cannot be the sole consideration guiding regulatory development. Personal safety, economic factors, local environments, and other concerns must also be considered. A key question for policymakers is to what extent environmental and economic considerations are currently aligned in legislation, and whether it is possible to coordinate them in a way that avoids negative impacts on one concern in favour of another. This assessment involves considering how far economic burdens can be placed on private actors who are or have been involved in petroleum activities. This report is intended to provide a basis for a debate on how circularity can move from being a desirable aspiration to becoming one of the objectives embedded in the regulatory framework.

Thirdly, national regulations must be adapted to the obligations the state has undertaken through international agreements. This will be discussed further in Chapter 4.2.

Lastly, one must be aware of what can realistically be achieved through regulation, and of how rules must be designed to have the desired effect in practice. The regulatory framework is general and sets the boundaries for private activity in the petroleum sector. Each individual operator or owner must make decisions for their own installation. Weighing objectives against each other to establish balanced rules is a task for the policy and law makers.

2

2 What is Circularity?

2.1 The Waste Hierarchy is the Starting Point

Circularity can be illustrated using the waste hierarchy, also known as the waste pyramid. The pyramid outlines how one should proceed to minimise both the generation of waste and the use of natural resources. The preferred solution—waste prevention—is at the top. Ideally, this goal should be achieved, but if that is not possible, the next level may be relied upon, which is (preparing for) reuse. The subsequent levels are material recycling, energy recovery, and final disposal.

This hierarchy is incorporated into both Article 4 of the EU Waste Framework Directive and national legislation. Although these regulations do not regulate petroleum activities directly, they make part of the complete legal rules for circularity.

European Commission: https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

2.2 What are the Goals and Ambitions for Circularity?

The goals set in relation to circularity influence which policy instruments are employed. When interpreting legislation related to circularity, it is therefore relevant to understand the extent to which lawmakers a actively promoting circularity, and how long such efforts have been underway.

2.2.1 Circularity Goals in the EU

The EU established a Circular Economy Strategy as early as December 2015.[11] This Strategy included a comprehensive action plan with 54 measures to promote a circular economy. The first part of the EU's Green Growth Strategy—also known as the European Green Deal—was presented by the European Commission in December 2019.[12] The Green Growth Strategy is a broad set of policy instruments aimed at addressing climate and environmental challenges across policy areas,

[11] European Commission, *Closing the loop - An EU action plan for the Circular Economy*, COM(2015) 614 final, 2015.
[12] Halleraker, J. H., *EU's green growth strategy*, Store norske leksikon.

contributing to the implementation of the UN's 2030 Agenda and Sustainable Development Goals. The strategy includes several concrete action points, including "An Industrial Strategy for a Clean and Circular Economy."[13]

The ambitions comprise a climate-neutral EU by 2050, with less pollution, better protection of health and the environment, improved quality of life, healthy ecosystems, preservation of biodiversity, and clean and secure food and energy. The Green Deal is also intended to give European businesses and industry a competitive edge and to create new green jobs. This ambition to reach climate neutrality by 2050 has been enshrined in the EU Climate Law of 2021.[14]

The transition to a circular economy is a key prerequisite for achieving the EU's goal of keeping resource consumption within the planet's limits. As part of the efforts to facilitate a reduction in resource use, the EU in 2020 presented an action plan with overarching goals and measures ("New Circular Economy Action Plan"). The action plan also included a guiding timeline that makes the plan more targeted and concrete.

The European Commission has since followed up with several legislative proposals in resource-intensive sectors such as textiles, construction, electronics, and plastics. The EU has also proposed changes to waste management regulations and has initiated a process to revise the EU Waste Framework Directive. The aim of this revision is to reduce the amount of waste in line with the circular economy action plan. The proposed changes include specific targets for waste reduction, extended producer liability, and improved separate waste collection.

We have not been able to identify specific circularity targets related to the decommissioning of petroleum activities within the EU.

2.2.2 Circularity Goals for Decommissioning in Norway

In Norway, increasing circularity in society is a political goal, and the Norwegian Environment Agency frequently refers to the waste hierarchy.[15] EEA-relevant EU regulations based on the waste hierarchy have been implemented in Norwegian law.[16] However, since the begging of the 2020-decade further push has come in this arena.

In 2021, the Norwegian Government established a National Strategy for a Green, Circular Economy. The Strategy focuses on making the economy more resource-efficient and sustainable, and emphasises collaboration between authorities, industry, and society to achieve these goals. Emphasis is also placed on measuring the progress and results of measures to increase circularity

In 2024, the government followed up with an Action Plan for Circular Economy . The key focus areas in this plan are research and innovation, economic instruments, public procurement, regulations, and digitalisation. Like the strategy, the action plan emphasises cooperation between public authorities, industry, and society to achieve a more circular economy.

[13] European Commission, *Closing the loop - An EU action plan for the Circular Economy*, COM(2015) 614 final, 2015.
[14] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'). In July 2025, the European Commission proposed an amendment to the EU Climate Law, setting a 2040 EU climate target of 90% reduction in net greenhouse gas emissions, compared to 1990 levels, see: EU Climate Law: new way to reach 2040 targets - European Commission.
[15] I.a. Norwegian Environment Agency: *Analysis of measures for increased rates of municipal waste for preparation of reuse and recycling in Norway*, 2021, p. 12 and the Agency's Waste Guidance to the Municipalities.
[16] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

Yet, neither the National Strategy for a Green, Circular Economy nor the Action Plan provides solutions to the regulatory challenges the petroleum sector faces or highlights specific paths for the sector, and in particular for decommissioning.

Section 5-3(1) of the Petroleum Act allows for decommissioning solutions that promote circularity, but there are no provisions in the Norwegian petroleum regulations that directly promote circularity.

2.2.3 Circularity Goals for Decommissioning in the UK, the Netherlands, and Australia

The United Kingdom, the Netherlands, and Australia are all working to promote circularity on a general level, though they employ somewhat different approaches.

The United Kingdom aims to keep materials in circulation for recycling and reuse. This involves generating as little waste as possible and making the best possible use of all resources, in line with the waste hierarchy. Since 2018, the UK has had its own Circular Economy Action Plan, which includes research initiatives, economic instruments, and regulations for sustainable and circular products and value chains.[17]

The stated goal in the UK Environment Act is to help halve the amount of residual waste per person by 2042, in addition to achieving net-zero emissions by 2050 under the Climate Change Act. In November 2024, the UK government established a working group ("Circular Economy Taskforce") to serve as an independent advisor to the Government in the development of a circular economy strategy for England.[18] The Scottish Government has prioritised eleven measures to promote the development of a circular economy,[19] and Wales has had a circular economy strategy since 2019.[20]

The waste hierarchy is highlighted in sections 6.2 and 6.6 to 6.9 of the 2018 UK Guidance Notes for Decommissioning of Offshore Oil and Gas Installations and Pipelines.[21] Section 1.3 states that OPRED (Offshore Petroleum Regulator for Environment and Decommissioning) must ensure that disposal is carried out in accordance with the waste hierarchy.

The British Petroleum Policy has been heavily influenced by the Wood Report on maximising economic recovery from the UK petroleum sector (2013–2014). Since then, profit maximisation has been a leading consideration in the development and enforcement of petroleum regulations. The report led to the MER (Maximum Economic Recovery) strategy. For a time, economic considerations were almost entirely dominant in decommissioning work on the UK continental shelf. In recent years, however, environmental concerns have gained increasing importance.

As part of the follow-up to the Wood Report, the Oil and Gas Authority (OGA) was established as a new, independent public body responsible for ensuring a favourable investment environment in the British petroleum sector.

While originally the legal framework for decommissioning in the United Kingdom had a focus on its economic impact on operators and the state, in recent years, environmental and climate

[17] Department for Environment, Food & Rural Affairs, *Our waste, our resources: A strategy for England,* HM Government, 2018. A report on the implementation of the strategy was released in 2024.
[18] UK Government (2024), *Circular Economy Taskforce*.
[19] Environment and Forestry Directorate, *Scotland's circular economy and waste route map to 2030*, Scottish Government, 2024.
[20] Welsh Government, *Beyond Recycling: A strategy to make the circular economy in Wales a reality*, 2021.
[21] Department for Business, Energy and Industrial Strategy, *Offshore oil and gas decommissioning: Guidance notes,* HM Government, 2018 (Guidance Notes 2018).

concerns have gained increasing importance. More concretely, in 2021, the OGA presented its Decommissioning Strategy (the OGA Strategy), which addresses regulatory challenges driven by the increasing age of installations on the UK continental shelf. The document outlines political ambitions related to decommissioning activities and clarifies links to goals for reducing climate change, increasing MER, and promoting circular solutions.

When it comes to circularity, the OGA Strategy emphasises the value that lies in reuse of decommissioned petroleum infrastructure. This approach is in line with general targets for energy transition and supports the British measures to reduce climate change. The Strategy explicitly states that: « [c]ircular economy opportunities are emerging, offering the potential to reuse or re-purpose infrastructure that would previously have been destined for decommissioning. However, maritime restoration when a field has ceased production by decommissioning infrastructure is likely to remain the conclusion for most of the UKCS oil and gas infrastructure».[22]

The Strategy clarified "that net zero is part of MER in the Central Obligation and embedding this change throughout the Strategy in relevant Supporting Obligations and economic definitions".[23]

In 2022, the name of OGA was changed to the North Sea Transition Authority (NSTA), as part of what was described as a natural development toward a greater focus on ensuring sufficient petroleum supply to the market and managing the energy transition.24 At the same time, it was emphasized that the NSTA continues to operate according to the same values as before—namely, maximizing economic recovery.25

A key goal of the OGA Strategy is to ensure that decommissioning is carried out cost-effectively and in line with the UK's net zero targets for 2050. The strategy emphasizes the value of promoting MER and the goals of the energy transition, particularly opportunities for reuse in carbon capture and storage (CCS) and hydrogen production.

The strategy also encourages knowledge sharing among actors on the continental shelf, not only to provide a better basis for decision-making, but also to stimulate innovation and growth, and to prevent unnecessary resource use in the planning and execution of decommissioning projects.

Australia does not explicitly follow the waste hierarchy but has regulations related to waste reduction and recycling that roughly correspond to the principle, as set out in the Commonwealth government's Recycling and Waste Reduction Act 2020. However, these are more of an area of interest among many rather than binding rules. The country aims to double circularity by 2035, including through transforming how resources are used, reused, and regenerated across the entire economy.[26] This is expected to lead, among other things, to a 14% reduction in emissions. The strategy supports Australia's climate policy in the same way that the EU's climate strategy highlights circular economy as an important contribution to achieving climate goals.

In December 2024, the Australian Government's Department of Industry published a roadmap for decommissioning Offshore energy resources, including petroleum and wind activities.[27] The

[22] The OGA Strategy (2021), p. 2.
[23] Official website for the OGA Strategy, https://www.nstauthority.co.uk/regulatory-information/regulatory-framework/the-oga-strategy/.
[24] https://www.nstauthority.co.uk/news-publications/oil-and-gas-authority-changes-name-to-north-sea-transition-authority/
[25] Ibid., Andy Samuel, North Sea Transition Authority Chief Executive.
[26] Department of Climate Change, Energy, the Environment and Water, *Australia's Circular Economy Framework: Doubling our circularity rate,* Australian Government, 2024. https://www.dcceew.gov.au/sites/default/files/documents/australias-circular-economy-framework.pdf
[27] Department of Climate Change, Energy, the Environment and Water, *Australia's Offshore Resources Decommissioning Roadmap*, Australian Government (Australia's Roadmap), 2024.

roadmap is based on five action points covering efficiency, collaboration, safety, social aspects, and environmental protection. The aim is to develop a decommissioning market that is economically profitable without compromising safety and the environment. This must include assessments of how to best utilize the resources contained in the installations to be decommissioned.

Australia stands out because the country does not have regulations on third-party access to infrastructure. On the contrary, competition laws can hinder third parties from gaining access to infrastructure owned by others. This has led, in many cases, to the construction of more infrastructure than strictly necessary, which contributes to an increased need for decommissioning. That said, there is a legal provision that allows authorities to require operators to make greater use of wells than the license holder desires. The provision also allows for the possibility of mandating third-party access to infrastructure, although this is very rare in Australia. To date, the provision has never been used.

Through the 2024 roadmap, the Australian authorities have clearly expressed their awareness that future decommissioning activities in the petroleum sector will generate large volumes of recyclable and reusable materials. They have also stated their intention to ensure that the waste management industry has sufficient capacity to make use of these materials. Although it is clear that the roadmap promotes an aim to achieve the most environmentally friendly decommissioning possible, it does not mention specific measures to move further up the waste hierarchy.

Centre of Decommissioning Australia (CODA) has investigated the possibilities for "the establishment of a decommissioning receival and dismantling yard for offshore oil and gas assets" in Western Australia,[28] and "ports and supporting industries in the Northern Territory that could support the receival, dismantling, recycling, and disposal of offshore oil and gas assets as part of the decommissioning process".[29] These studies show that the country is set on finding the most suitable solution for sustainable decommissioning.

Australia's commitment to developing a forward-looking decommissioning industry is also evident in its stated desire to collaborate with other countries that have more experience in decommissioning, in order to learn from their experiences and share its own. Norway is mentioned in the roadmap, but cooperation with the United Kingdom is expected to play a greater role following the signing of a bilateral agreement between the two countries, to promote petroleum decommissioning.

The Netherlands has included circular economy principles in its national legal framework for nearly 40 years and aims to achieve a fully circular economy by 2050.[30] Current legislation requires that waste management plans be developed in accordance with the hierarchy outlined in Article 10.4 of the Dutch Environmental Management Act.[31] The practical effect of this hierarchy has, as of 1 January 2024, been clarified in the new Environment and Planning Act.[32]

[28] https://www.decommissioning.org.au/wp-content/uploads/2024/02/A9334-CODA-WA-Decommissioning-Hub-Location-Study-Report-Public.pdf
[29] https://www.decommissioning.org.au/wp-content/uploads/2025/07/coda-northern-territory-decommissioning-location-study-public-report.pdf
[30] See https://www.decommissioning.org.au/wp-content/uploads/2024/02/A9334-CODA-WA-Decommissioning-Hub-Location-Study-Report-Public.pdf. The hierarchy was first suggested by Dutch MP Lansink in 1979. Today, the hierarchy and net zero goals follows from the EU' Green Deal.
[31] Wet Milieubeheer.
[32] Omgevingswet.

The Dutch Government launched its National Circular Economy Programme 2023-2030, highlights four key actions to achieve a fully circular economy by 2050 as possible:

1. Reduce the use of raw materials
2. Substitute raw materials
3. Extend product lifespans
4. Ensure high-quality processing

The strategy is accompanied by specific subgoals.[33]

The Dutch Mining Act (Mijnbouwwet, MBW), which regulates extraction of petroleum from the ground at sea, does not mention the Waste Hierarchy. The goal of increasing reutilisation and repurposing to reduce both waste and costs is addressed in the Masterplan for Decommissioning and Re-Use. This plan was developed by the Dutch state-owned oil company Energie Beheer Nederland (EBN) in collaboration with Nogepa/Element NL and IRO, representing the operators and the service industry, respectively.

2.2.4 What Should be the Targets for Circularity in Decommissioning?

Through concrete goals that relate to the established goals, one may incentivise transformation and thereby help reduce waste and pollution, open new economic opportunities in recycling and reuse, and create more jobs. Goals and measures will also help defining what is required to meet the industry's target of a 50% reduction in greenhouse gas emissions by 2030 and near-zero emissions by 2050.

Goals set the basis for developing measures. In setting goals and measures, policy makers should keep in mind the distinction between measures aimed at decommissioning of existing infrastructure versus decommissioning of infrastructure that is not yet built.

We will make suggestions for measures in the final chapter of this report. However, we can already now propose some goals that should be kept in mind both when reading this report and when working with circularity more broadly.

[33] Read more about the goals here: Circular Dutch economy by 2050 | Circular economy | Government.nl.

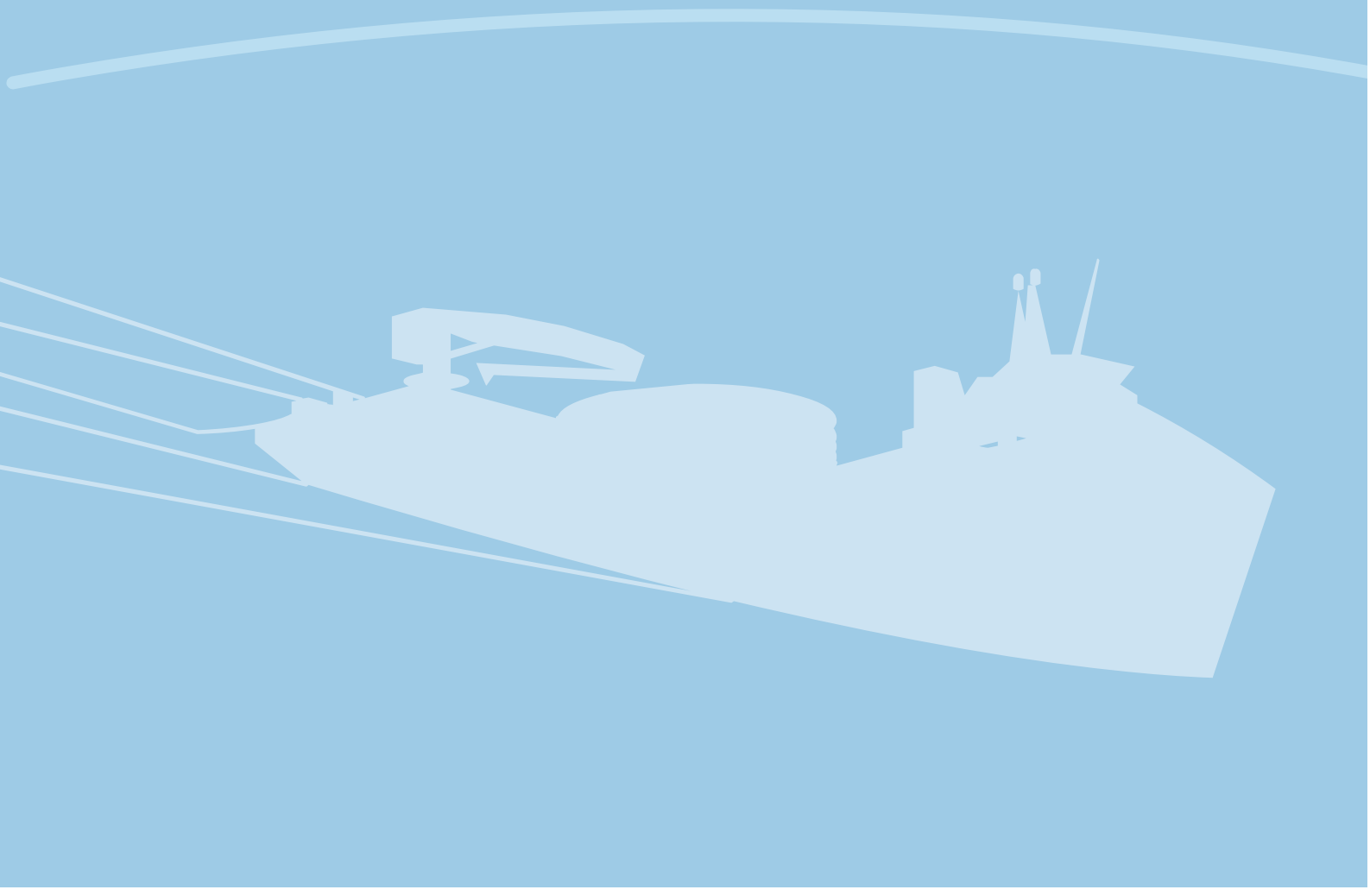
Proposed Concrete Goals:

- Develop National Circularity Strategies:
  Create national strategies for decommissioning that include circularity as a core component and facilitate collaboration, synergies, and an efficient market (with demand).

- Increase Recycling Rates:
  The recycling rate for materials from decommissioned platforms is already 95–98% in terms of weight and aligns with the EU's circular economy principles and Norway's sustainability obligations. Nevertheless, efforts should be made to further reduce the amount of waste sent to landfill or energy recovery. One should aim to reuse everything that is no hazardous waste that cannot be recycled.

- Increase Reuse:
  Reuse decommissioned infrastructure for alternative purposes, such as renewable energy projects, artificial reefs, or carbon capture and storage (CCS).

3



3 Decommissioning and Circularity

3.1 What is the Future Cleanup Requirement for Petroleum Activities?

It is expected that in the coming years there will be a sharp increase in the decommissioning of oil and gas installations in the waters of Northern Europe. The same goes for the rest of the North Sea and Australia, as well as many other places.

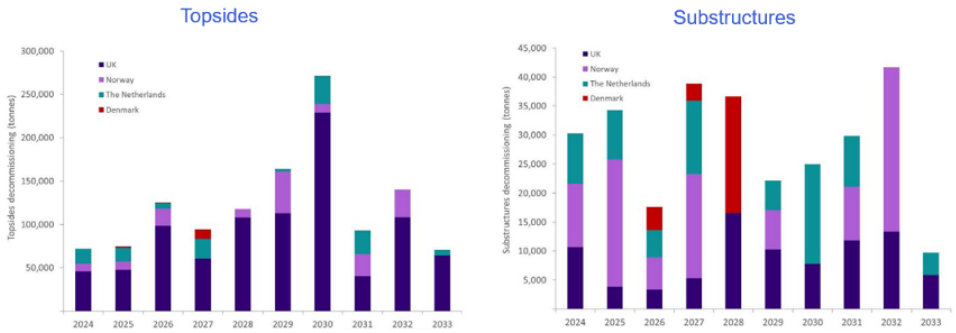


Figure 1: Overview of the expected need for removal of installations up to 2033. Source: OEUK Decommissioning Report 2024.

The installations to be removed are large, complex structures containing significant amounts of equipment and materials, designed to withstand extreme weather conditions. This is especially true for installations on the Norwegian and British continental shelves, where the installations are placed at greater depths and have been designed to endure the harshness of the North Sea.[34] It is expected that approximately ten additional installations will reach the end of their operational life on the Norwegian shelf before 2030, with a similar number expected in the British sector. Danish and Dutch installations are generally smaller and located in shallower waters closer to shore.

Most of the installations are made of carbon steel, although other materials are also used. The removal of a total of five condeep installations has been approved but not yet carried out on the Norwegian and British shelves. It is expected that approximately ten additional installations will reach the end of their operational life on the Norwegian shelf over the next decade, with a similar number expected in the British sector. For steel installations weighing over 10,000 tonnes, the numbers are somewhat lower. The depth at which these installations are located ranges from 66 to 330 metres, with most situated between 100 and 150 metres.

The need for decommissioning petroleum activities is increasing on the Norwegian shelf. Other countries, such as the Netherlands, the United Kingdom, and Australia, have more experience than Norway in decommissioning offshore petroleum infrastructure. The Netherlands has already decommissioned 60% of its offshore wells[35] and removed 25% of all offshore installations. Currently, a further 15% are in the process of being removed.[36] The United Kingdom has removed, all in all, 230 assets, of which four gravity-based concrete platforms, two jack up platforms with a concrete base, and two large and 79 small steel platforms.

[34] van Nuffel m.fl., Study on Decommissioning of offshore oil and gas installations: a technical, legal and political analysis - Final report, EU Commission, 2021, s. 23-24. In contrast, for the Netherlands, see EBN, *Focus on Dutch Oil & Gas*, 2015, p. 42.
[35] Nexstep Re-use & Decommissioning report 2024, 'Responsible decommissioning' (Nexstep 2024), p. 24.
[36] Nexstep 2024, p. 31.

3.2 What Opportunities for Circularity Exist in the End-of-Life Phase?

Operators' choices in relation to decommissioning are guided by what is technically possible and economically feasible.[37] A number of factors influence the final decision. For instance, finding alternatives for new use the older the installation is. When assessing which solutions to choose, consideration must be given to safety, environmental, and economic factors.[38] Environmental considerations suggest aiming as high as possible in the waste hierarchy, while economic considerations indicate limiting resource recovery efforts to cases where it is financially viable. It should be noted that not only the direct economic gain, but also the impact on the company's and the industry's reputation, may be relevant. In practice, the latter may result in environmental considerations being given relatively greater weight.

New disposal solutions are constantly being developed. This includes innovative ways to dismantle various elements in the structural framework so that they can be reused individually rather than being melted down, as well as the development of the ability to move increasingly larger elements. When larger elements can be moved, the possibility of using them as they are in other locations increases.

In some cases, the technology required to reuse all or parts of an installation in a sound manner is lacking. For example, no good solutions have yet been found for the reuse of insulation materials. Even where circular solutions exist, various factors may lead the party responsible for decommissioning an installation not to choose those options.

Some operators and owners of installations wish to allocate as many of the costs associated with decommissioning an installation as possible to the period before production on the installation ceases. This creates a better balance in the accounts. On the other hand, it is likely that decommissioning will become less expensive if postponed, as improved or more cost-efficient technology may be developed. Thus, it may be considered practical to delay decommissioning. However, postponed decommissioning that leads to the shutdown of an installation exposes it to quality degradation, which is undesirable from a circularity perspective. Admittedly, many installations are already so old that they are not suitable for reuse or repurposing, but any new use requires the highest possible material quality. In practice, decommissioning is often postponed by extending the operational period, either by prolonging the original activity or by initiating new activities. This approach can prevent loss of quality and maintain some income. The alternative is to shut down the installation but delay its removal. In addition to the loss of quality, this would result in a situation where the operator no longer receives income from the installation but remains liable should any financial loss or environmental damage occur as a result of it.

Once the decommissioning work has commenced, it will be difficult to coordinate the progress of the operation with a potential recipient of reusable materials, as it depends on the availability of appropriate equipment and personnel, as well as favourable weather conditions. This means that timing considerations often pose an obstacle to reuse. Once a component has been removed from the installation, it will, if intended for reuse, have to be stored. Storage is both expensive and risky.

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[37] See Gordon et al., *UK Oil and Gas Law. Current Practice and Emerging Trends*, vol. 1 Resource Management and Regulatory Law, pp. 394 7 I-1205.

[38] See Section 5-3, first paragraph, first sentence of the Petroleum Act: "technical, safety, environmental and economic aspects as well as to consideration for other users of the sea" (translation: https://www.sodir.no/en/regulations/acts/act-29-november-1996-no2.-72-relating-to-petroleum-activities).

Therefore, it is necessary that the recipient is ready to receive what is to be reused when it becomes available.

Individual design of both entire installations and components can make reuse difficult. Even though adaptations can be made to enable reuse, there is a risk that the cost becomes so high that it is difficult to carry out the reuse project.

Additionally, in some cases, it may be uncertain what the most environmentally friendly solution is. It is not helpful to establish rules that do not take these conditions into account. Operators must make the best possible choices based on the information available. The assessment of what is the best solution must include several considerations. In addition to considering the realities, this formulation allows the Ministry to adapt the decision on the decommissioning plan to the situation at the time the decision is made, rather than the situation when the law was enacted. The possibility to set conditions for the decision, as stated in the second paragraph, makes it possible to make adjustments in the decision to promote various considerations, such as circularity.

3.3 What Disposal Options are Available for a Facility that has Ceased its Petroleum Production?

3.3.1 Alternatives for New Use

Different technical solutions can be placed higher or lower in the waste hierarchy. In the following, we will explain various alternatives for using all or some parts of an installation, and how these choices affect the level of waste hierarchy one reaches.

One can distinguish between three types of decommissioning practices in terms of how the much is removed. Complete removal is the main rule under OSPAR, UNCLOS, and the London Convention. This alterative suggests attempting to remove all traces of human activity to achieve a clean seabed.

Partial removal means, for example, that parts of the substructure are left in place because removing them is too risky, demanding, expensive, or extensively affects the marine environment in a negative manner. The Conventions contain conditions for leaving elements in place.

Lastly, the installation may be left in place, either as is or tipped over. This may allow for using the installation in connection with offshore wind parks, the installation of electrolysers for hydrogen production, or as an artificial reef. Sheer abandonment, which is common in the Gulf of Mexico,[39] is not permitted under any of the relevant regulatory frameworks applicable in Norway. If one does not remove the installation, the purpose should be that it is to be used for something else. Transforming rigs to artificial reefs is common in the USA.[40] OSPAR prohibits circumvention of the dumping ban by turning installations into artificial reefs[41]. Through Agreement 2012-03 to OSPAR, guidelines have been set that suggest that artificial reefs can only be created if it can be

[39] https://www.nrdc.org/bio/rebecca-loomis/study-shows-14000-unplugged-oil-and-gas-wells-gulf-mexico
[40] https://www.bsee.gov/what-we-do/environmental-compliance/environmental-programs/rigs-to-reefs
[41] Annex II art. 5 and Annex III art. 8.

demonstrated that the result will be a net positive for the environment.[42]

3.3.2 New Use of All or Parts of an Installation

3.3.2.1 New Use in Practice

In some cases, the entire topside of an installation can be reused by moving it to another substructure. This has been done wholly or partially on fifteen Dutch substructures. One topside has been reused twice.[43] Some modifications must be made to fit the topside to the new substructure, and the relocation involves some cost. However, these are small investments compared to other alternatives.

On the Norwegian continental shelf, deep waters, rougher seas, and larger installations make it more difficult to reuse entire installations after the Dutch model. More common is the reuse of equipment or parts of an installation no longer used for petroleum production. In a recent Norwegian project, a cement unit with a high-pressure pump, plate coolers, a man-overboard boat (MOB boat), electronic components that are no longer in production (such as microchips), kitchen equipment, and exercise equipment were reused. The equipment was removed while the installation was still manned, but after petroleum production had ceased.

In this example, all recipients were petroleum installations operated by the same operator as the installation being decommissioned. This made reuse easier, as it avoided the contractual difficulties that can arise and the risk involved with such a transaction. Reuse internally in a company also reduces the risk of resource-intensive disputes in the future, as the same operating company must bear any losses regardless.

3.3.2.2 Other Uses

Finding other uses at the same location is among the most environmentally friendly solutions. This avoids energy being spent for relocating the installation, albeit some emissions will still be associated with the conversion process. Normally, this involves using the installations for industries other than petroleum, as otherwise it would be a matter of extending the production period. There are current discussions on using petroleum facilities as bases for producing electricity using, for example, wind turbines or wave power plants, or hydrogen through electrolysis, or for extracting geothermal heat. It is also often better in terms of resource use to move the installation and use it elsewhere than to dismantle it. Admittedly, installations are usually so old when production ends that they are not suitable for such reuse.

Under the Norwegian Petroleum Act, the decommissioning plan may include other uses. However, the framework does not directly support or promote such use. The incentive for reuse lies in the ability to postpone removal costs and it is left to the operator's discretion.

[42] OSPAR Guidelines on Artificial Reefs in relation to Living Marine Resources 4.13.
[43] https://www.nexstep.nl/re-use/past-projects/.

The disadvantage of reuse is usually that one is not released from the removal obligation, as parts or the full infrastructure is still at sea (see section 5.2 of the Norwegian Petroleum Act). This applies even if an installation is repurposed for, for example, wind power, wave power, or geothermal energy, so that petroleum activities no longer take place on the installation and it falls outside the scope of the Petroleum Act. Albeit postponement of cost is beneficial, the risk will still deter operators and owners of such reuse.

The Netherlands has regulated reuse and circularity at the end of petroleum activities in the MBW Article 44b. Article 44.1, first sentence, first alternative, states that the Minister (i.e., the Ministry) may grant an exemption from the requirement to prepare and implement a removal plan if an installation is to be wholly or partially reused. This is thus a dispensation from a regulatory requirement. The dispensation may be granted with conditions (Article 44b.1, second sentence) and may be withdrawn if it no longer has the desired effect (Article 44b.2). In this way, the Netherlands has opened the possibility to set aside the main rule of removal if it aligns with the waste hierarchy. The fact that dispensations can be withdrawn must mean that the license holder is not released from liability for the installation until it is removed, like in Norway. The exemption applies even if another operator is to take over the use of the remaining parts of the installation. In that case, the new operator assumes the removal obligation (MBW Article 44c).

Furthermore, MBW's Article 135 allows the Ministry to 'split' the license and make it possible to continue operations in one part of a field while decommissioning another part, or to change the use of parts of the installations in a field.

The British OGA Strategy makes it clear that no decommissioning may take place until the owners and operators of the infrastructure have "ensured and can demonstrate that all viable options for continued use of the infrastructure, including reuse or repurposing for CO_2 storage, have been adequately considered".[44] Furthermore, the 2018 OPRED Guidance Notes state that "OPRED wishes to promote reuse of installations when it is practical and cost-effective, and the decommissioning plan must show that the opportunity for reuse has been explored and discussed with OGA (NSTA), which will then provide input to OPRED."[45] In other words, there is an expectation (and perhaps a de facto obligation) to assess whether it is possible to use installations in other ways on the British Continental Shelf.

The Australian Petroleum Act indicates that a decommissioning plan shall concern disposal or other use.

If the plan concerns other use, the decommissioning plan is considered implemented when the new use has commenced. This may affect the subjective liabilities, which we will return to in the next section.

The Australian offshore petroleum regulator NOPSEMA (National Offshore Petroleum Safety and Environmental Management Authority) refers to installations that are "no longer in use."[46] This wording may indicate that any use is sufficient to postpone the obligation to remove the installation. At the same time, the removal deadlines set by NOPSEMA are clearly linked to the end date of petroleum production.[47] This is in line with the wording in OPGGSA 527(2). The exception in (6) does not mention repurposing.

3.3.3 Material Recycling and Reuse

Material recycling involves parts of the installation being melted down or otherwise reduced to a more basic structure that can be used as raw material to create something new. In the disposal of petroleum installations, recycling significantly contributes to reducing the amount of waste from the installation, as large parts of the installation are suitable for recycling.

As mentioned, material recycling of metal is currently the most common use of offshore platforms that are no longer used in petroleum activities, typically covering 94–98% of the installation's weight. Recycled steel can be produced with up to 72% lower energy consumption than new production from iron ore. Ore production usually relies on coal power. For copper and aluminium, the energy savings are approximately 85% and 95%, respectively. The energy savings and GHG mitigation are naturally greatest if the recycling of material is carried out using renewable energy. The energy savings and GHG mitigation are naturally greatest if the recycling of material is carried out using renewable energy. Additionally, there is less environmental disruption since new raw materials do not need to be extracted.

Recycling comes with its own challenges. Material recycling requires significant resources. Melting down metal requires a lot of energy to reach sufficiently high temperatures. In addition, the

[44] The OGA Strategy, p. 9.
[45] Guidance Notes 2018, p. 27.
[46] NOPSEMA, Planning for proactive decommissioning, 2024 (NOPSEMA 2024), multiple locations.
[47] See, for example, the figure in NOPSEMA 2024, p. 8.

installation must be transported to shore, dismantled, sorted, and transported to the smelting facility. Thus, while recycling uses less energy than producing the same amount of material from new raw materials, the overall energy consumption can be reduced further through increased reuse, as this reduces the resource use associated with recycling.

The carbon steel used in installations is of very high quality, even after the installation has stood in the sea for several decades. There are examples where used pipes from offshore petroleum installations have had higher quality than newly purchased pipes used for piling in a land-based construction project. The challenge is to find good solutions to create a strong secondary market and make reuse economically viable.

More unfrequently, the reuse has happened outside the petroleum industry. Examples include the use of lifeboats and MOB boats as recreational boats, use of auxiliary engines or turbines for educational purposes in schools, and placement in museums. There are also some examples of upcycling, such as converting survival suits into bags or donating curtains to arts and crafts education in schools.

3.3.4 Changed Quality Requirements

Equipment on petroleum installations must meet requirements set out in the regulations. The purpose of these rules is to achieve a satisfactory level of safety in light of technological developments. The rules are developed as new technology becomes available and knowledge about the negative effects of existing solutions emerges.

In some cases, new requirements are only introduced for new equipment. This means that equipment already installed on an installation can remain as is. However, if one were to install it anew on another installation or in another location, the new requirement will apply. While this avoids the need to replace relatively new equipment, it creates a barrier to reusing older equipment that does not meet the new requirements.

The rationale behind these limitations is that considerations of circularity cannot justify compromising safety. Nevertheless, the authorities should keep the potential for reuse in mind when developing regulations. By allowing the use of older equipment on new installations, even if the equipment does not meet the latest regulatory requirements, greater reuse can be facilitated. Moreover, this approach encourages operators to accept such reuse within their internal standards, provided that it complies with public regulations.

3.4 What Practical Challenges Hinder Circularity?

3.4.1 The Time Aspect

One of the challenges for reuse is the short time window from when equipment becomes available on the donor installation to when a potential recipient installation is identified and able to commit to receiving the reused equipment. If one wants to reuse critical components, it must be possible to use the components on the donor installation as long as they are needed there, without the recipient installation having to wait for the components. Any downtime due to missing components would be too costly. The same often applies if components must be stored temporarily, especially if they must be brought ashore or are very large. Temporary storage requires preservation of the components in addition to storage capacity.

Time use is difficult to regulate legally. This is partly because the decommissioning plans for the donor installation cannot be adapted to all possible reuse opportunities. Another important factor is that weather in the North Sea can hinder the planned execution of operations, either directly or by delaying necessary equipment from another project. Lifting capacity, which will be addressed below, also plays a role here.

3.4.2 Adaptation for New Use

Equipment intended for reuse must be prepared in various ways. The preparations depend on the type of new use in question. In cases of repurposing, the work will be less extensive than for reuse and material recycling.

If the installation is to be reused in its current location, it must be restored to the condition agreed upon with the new operator. All decommissioning requirements under the petroleum decommissioning regulations must be fulfilled. For example, components must be cleaned of radioactive waste and other pollution. Additionally, the operator must ensure that equipment protected by trade secret clauses is removed or otherwise made inaccessible to the new operator. Reuse in other locations, in addition to the mentioned requirements, involves relocation. Especially if the item to be moved is too heavy for the installation's own platform crane, this can incur significant costs due to the need to engage heavy-lift vessels.

3.4.3 Lifting Capacity

Removal of all or parts of an installation requires access to lifting vessels with sufficient lifting capacity. Currently, Pioneering Spirit, with a lifting capacity of 48,000 tons, is the largest lifting vessel in the world. The vessel has, among other things, lifted the production unit on Yme, an oil and gas field in the southeastern part of the Norwegian sector of the North Sea,[48] The operator, Repsol, describes the project like this: "We have turned a decommissioning project into a producing asset which will create jobs and value for the society".[49] On the Norwegian and British continental shelves, several installations exceed the capacity of Pioneering Spirit, and many

[48] https://www.norskpetroleum.no/en/facts/field/yme/.
[49] https://www.repsol.no/en/our-activity/production-development/yme/index.cshtml

installations weigh over 10,000 tons. By comparison, Nexstep expects that most lifts in the Dutch sector in the future will be under 1,000 tons, with none exceeding 7,000 tons.[50]

At the same time, a large number of large Norwegian and British installations are scheduled for removal in the coming years. Careful planning will be necessary to ensure sufficient lifting capacity is available for these tasks. Several factors make planning difficult when it comes to lifting capacity.

Capacity is limited, especially because large lifts can only be performed in sufficiently good weather. Additionally, it is risky to build too many new lifting vessels with adequate capacity, as overcapacity can lead to significant financial losses. Therefore, a suitable number of lifting vessels is desirable. The downside to limiting the number is that there will be no alternatives if a vessel must be taken out of service or is delayed on another assignment. These challenges are difficult to regulate but must be considered when planning the disposal of installations. Insufficient lifting capacity can negatively affect the rate of reuse and repurposing, as installations may need to be dismantled more extensively to be removed from the field, or shut down for a period, which can lead to quality degradation.

Lifting capacity can be particularly challenging in Australia, due to the fleet typically being based in the Northern Hemisphere. Cooperation between multiple operators may help bring vessels to Australian waters.[51] When lifting vessels travel to other parts of the world, a similar problem may arise in the North Sea.

[50] Nexstep, *Re-use & Decommissioning report – Innovation and collaboration 2020*, p. 31.
[51] Australia's Roadmap, p. 16.

3.4.4 Reception Facilities

Installations that are to be removed from the continental shelf and not reused elsewhere must be handled at approved facilities. These facilities are located on land and are therefore regulated by rules applicable to land territory, which in Norway means the Planning and Building Act and the Pollution Control Act.

Currently, the capacity of existing demolition facilities is sufficient for the demand from the Norwegian sector. Barely 50% of the capacity for handling offshore installations has been exceeded. As more installations reach the end of their life, there is a risk that capacity will become insufficient, at least periodically. Additionally, large installations, such as Statfjord A, are planned to be removed in a single lift and brought ashore. This means that the work of demolishing the topside will require a great deal of space on land, as the entire topside must be accommodated, along with space to work around it.

As with lifting vessels, it is essential to avoid overcapacity. Planning of capacity levels must be left to the reception industry. Authorities can facilitate this by adapting planning and building regulations to make it possible to obtain permits for building new or expanding existing reception facilities with minimal bureaucracy and time consumption.

Another element to consider is that part of the surplus capacity is linked to seasonal variations, as decommissioning work in the North Sea can only be carried out during the summer months. In the future, larger transport vessels may make it possible to perform some work in the North Sea during winter when there are a few days of good weather, as a single lift can be completed quickly enough to bring the installation ashore before the weather changes. Other alternatives may include expanding operations to similar tasks, such as ship decommissioning.

A possible solution to prevent large fluctuations between over- and undercapacity would be a common decommissioning market for the North Sea, so that installations across the region can be taken to the most suitable reception facility regardless of the country in which it is located. This would promote efficient decommissioning, resulting in lower costs and likely faster operations. This, however, faces some challenges.

First, there are challenges due to the ban on transporting waste intended for landfill/final treatment across national borders, which was introduced in the first Regulation on shipment of waste ((EU) 1013/2006). If installations are considered waste, it will be difficult to transport them to other countries. Through the second cross-border regulation, (EU) 2024/1157, the EU has sought to address some of the obstacles that arose when the first cross-border regulation was introduced. This topic will be addressed in section 4.1.7.3.

Second, competition is to lead to efficiencies, but also to job losses in places where decommissioning and processing of the materials will no longer be conducted.

3.4.5 Should Disposal be Left to the State?

A radical proposal that has been previously suggested is to assign liability for the disposal of installations to a state-owned company. This would in theory make it easier to adapt projects so each other, thereby reducing the abovementioned problems relating to timing. In the preparatory works, decisive weight was placed on the fact that operators know the installations best, and the liability was assigned to them. In a time when it is increasingly common to delegate decommissioning work to specialized companies, this argument is less convincing. Operators could still be required to cooperate with the public company to ensure the best possible disposal of the installation. The Petroleum Act already provides the state with the authority to take over installations when the license period expires. If there is reason to believe that a joint decommissioning company could create better coordination between different projects and thereby increase the potential for reuse and repurposing, this would be a strong argument for establishing such a company. However, this must be investigated further. At first glance, several factors suggest that such a company may not have the desired effect. For example, a state-owned decommissioning company would not have control over refurbishment and new construction projects or projects outside the oil industry that could be recipients of components or entire installations. Furthermore, one must consider the risk that people who have worked on petroleum decommissioning for a long time may prefer to stay with their current employer in other roles rather than take a job in a new state-owned company. This would result in a significant loss of expertise that would take a long time to recover.

4

4 What are the Legal Frameworks for the Termination of Petroleum Activities?

4.1 International Rules

4.1.1 How do International Agreements Influence Norwegian Law?

Norway and other states have entered into international conventions which govern directly or indirectly the national decommissioning framework of oil and gas installations. In this chapter, we will first examine relevant international rules, including relevant EU regulations. These rules, together with the circularity goals discussed in Chapter 3, will set the framework and guidelines for national regulations.

In our analysis, we focus on rules that influence national regulations related to decommissioning and the circular economy. The aim is not to provide an exhaustive overview of all international rules that may be relevant to the topic. Instead, we wish to centre on the fact that national authorities have limited freedom to establish rules for decommissioning and that these international rules serve as a starting point for more detailed national regulations.

We will present the various national regulations related to the decommissioning of petroleum activities in Norway, the United Kingdom, the Netherlands, and Australia. We will look at the main rules regarding decommissioning, how the regulations affect the decommissioning processes and cooperation with authorities, and whether and how the regulations in the different countries facilitate a circular economy in the decommissioning process.

4.1.2 Table over Relevant International Rules

Regulation	Relevant provisions	Text	Scope/ member states
UNCLOS	Art. 60.3	Any installations or structures which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards established in this regard by the competent international organization. Such removal shall also have due regard to fishing, the protection of the marine environment and the rights and duties of other States. Appropriate publicity shall be given to the depth, position and dimensions of any installations or structures not entirely removed.	Global, USA excluded for UNCLOS part 11.
IMO Resolution A.672(16)	Annex	Removal requirements with exceptions under points 2 and 3.	
OSPAR	Article 2.1 (a)	General obligation for member states to take all possible steps to prevent and eliminate pollution. They shall take necessary measures to protect the maritime area from harmful effects of human activity for the sake of human health and to protect marine ecosystems. Where practicable, they shall also restore areas that have been severely affected by human activity.	Atlantic Ocean (Norway, UK, Netherlands)
Decision 98/3	Article 2 and 3	As a general rule, "[t]he dumping, and the leaving wholly or partly in place, of disused offshore installations within the maritime area is prohibited". Exceptions apply to steel installations weighing more than 10,000 tons, concrete installations, and concrete anchor foundations.	
London Convention	Art. IV	Prohibition against the dumping of waste at sea unless specifically permitted in accordance with the annexes to the convention.	Netherlands, Norway, Australia, UK, and USA, amongst others
London Protocol (1996)	Art. 1 no. 4	Dumping is defined as "any abandonment or toppling at site of platforms or other man-made structures at sea, for the sole purpose of deliberate disposal". Reuse and repurposing may be excepted under Article 1(4.2).	

Basel Convention	art. 4.5	Prohibition against exporting hazardous waste to countries that are not parties to the convention.	Netherlands, Norway, Australia, UK, and USA, amongst others
EU legislation	-	No explicit regulation of decommissioning after petroleum activities.	EU, EEA if relevant to the EEA Agreement

4.1.3 UNCLOS

The United Nations Convention on the Law of the Sea (UNCLOS) regulates navigation and economic activity on the high seas and the rights of coastal states in their adjacent maritime zones. The convention was adopted in 1982 and entered into force in 1994.[52] Large parts of the UNCLOS are considered customary international law.

The figure below illustrates the different maritime jurisdictional zones of coastal states based on the rules of the Law of the Sea Convention.

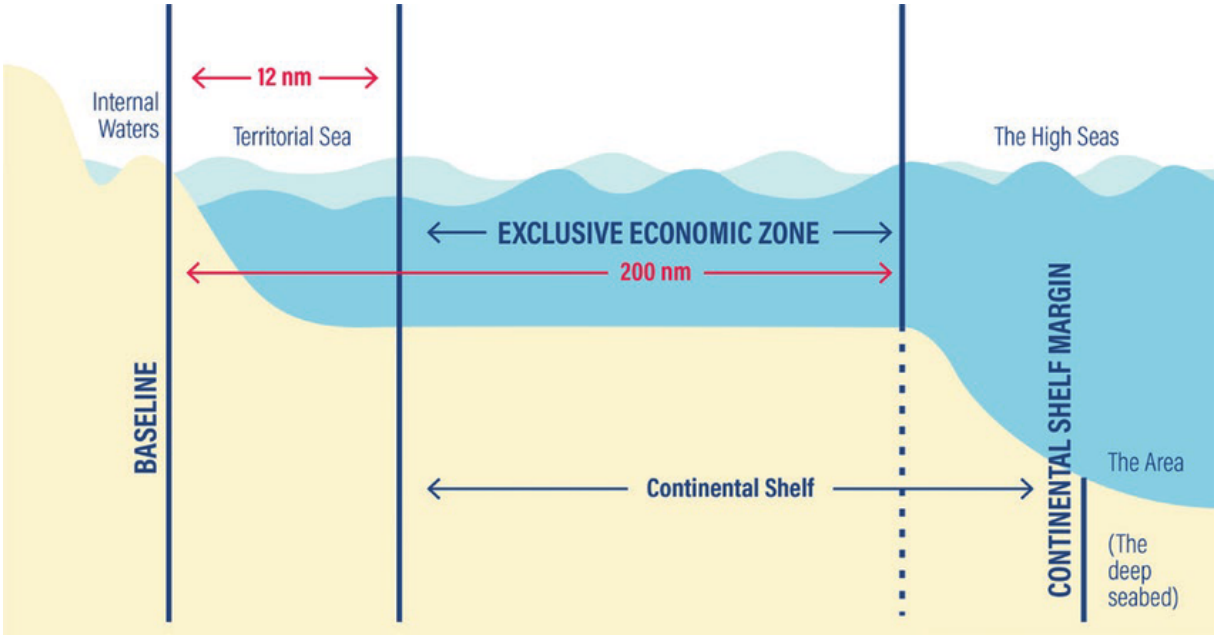

Figure 2: Maritime jurisdictional areas. Source: Norwegian Polar Institute

UNCLOS governs the distribution of rights and obligations on and in the sea. The Convention establishes an obligation to protect the marine environment from pollution and degradation, and a right to conduct research on the High Seas. Among these, UNCLOS requires states to ensure the decommissioning of offshore installations that are abandoned or no longer in use. This forms the

[52] The convention is the result of work that began in 1956, when the UN held its first law of the sea conference in Geneva. It has been ratified by 178 UN member states, the observer state Palestine, the Cook Islands, Niue, and the EU.

basis for corresponding rules in national legislation. This requirement was originally connected with navigation safety, yet fisheries and environmental concerns must also be considered.

The central provision for the decommissioning of offshore petroleum installations is Article 60.3, second to last sentence, as quoted above.

The International Maritime Organization (IMO) has been designated as the supervisory body for UNCLOS. The IMO has adopted Resolution A.672(16) of 1989 on the removal of offshore installations and structures. This resolution provides guidelines and standards for the removal of offshore installations and structures on the continental shelf and in the exclusive economic zone. While these guidelines are authoritative, they are not binding. The guidelines include a general rule of complete removal, with exceptions for large concrete structures, demand that removal must be carried out safely, and that partially abandoned structures must have a minimum clearance depth of 55 meters from sea level at lowest astronomical tide. This last point is linked to the purpose of the UNCLOS requirement to ensure safe navigation.

4.1.4 The London Convention and Protocol

Several measures have been taken to prevent petroleum installations from becoming marine waste. The London Convention (1972) was one of the first international instruments aimed at preventing the dumping of waste at sea. In practice, the London Convention has now been replaced by the Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol, 1996), which entered into force in 2006 and was initially intended only as a supplementary protocol.[53] The IMO administers both the Convention and the Protocol. IMO administers both the Convention and the Protocol.

The London Protocol introduced the environmental precautionary principle as a fundamental approach to regulating marine waste.[54] This included a ban on all forms of abandonment of petroleum installations at sea. Exceptions can still be made. These rules are reflected in national legislation. The conditions for exceptions are not as specific as those under OSPAR. In addition, the protocol requires thorough assessment and formal authorization before leaving something in place and encourages cooperation between countries to protect the marine environment. The OSPAR Convention, which will be addressed in section 4.1.5, is an example of such a regional agreement.

[53] https://www.imo.org/en/KnowledgeCentre/ConferencesMeetings/Pages/London-Convention-Protocol.aspx

[54] https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/London%20Convention%20timeline%20infographic_concise%20version%20%2816-09-22%29.pdf

4.1.5 The OSPAR Convention and Decision 98/3

The Oslo-Paris Convention, officially the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), is a binding regional legal agreement for the protection of the marine environment in the North-East Atlantic.[55] OSPAR covers all human activities except fisheries and shipping. Unlike UNCLOS, OSPAR is focused on environmental protection and is not limited to ship-based activities, as MARPOL is. Concerning decommissioning, OSPAR has the broadest substantive scope but applies only to the North-East Atlantic, meaning neither Australia nor the USA is bound by it.

OSPAR is a framework convention that is further developed through the OSPAR Commission. The OSPAR Commission has the authority to adopt legally binding decisions and non-binding recommendations to the states. Legally binding decisions can only be adopted with no dissent. The Norwegian Environment Agency is the administrative authority for OSPAR in Norway and is responsible for following up on the work of the OSPAR Commission. Decision 98/3 is particularly relevant for cleanup after petroleum activities.

OSPAR Convention Article 2.1(a) establishes a general obligation for member states to take all possible measures to prevent and eliminate pollution to protect marine ecosystems and human health. Where practicable, they must also restore areas that have been severely affected by human activity.

Article 2.4 further states that state measures must be implemented in such a way that they do not increase pollution of the sea outside the maritime area or of other parts of the environment. This cannot be interpreted as OSPAR being an obstacle to conduct decommissioning and clean up after petroleum activities, as clarified in Article 2.5. However, the OSPAR Convention requires that an

[55] The OSPAR Convention was adopted in 1992 and merges the Oslo Convention of 1972 on marine dumping and the Paris Convention of 1974 on land-based sources of marine pollution. OSPAR comprises 15 countries and the EU, and entered into force in March 1992. The countries that have acceded to the OSPAR Convention are Belgium, Denmark, Finland, France, Ireland, Iceland, Luxembourg, the Netherlands, Norway, Portugal, Spain, the United Kingdom, Switzerland, Sweden, and Germany. The agreement consists of a main part with general provisions, along with five annexes regulating pollution from land-based sources, dumping and incineration at sea, pollution from offshore sources, monitoring, and biodiversity. Its scope covers the North-East Atlantic, which is divided into five regions. Regions I and II apply to Norwegian waters.

assessment must be made of how best to protect the environment when considering which measures to take in connection with the decommissioning of petroleum activities.

For the decommissioning of Petroleum Activities, the decommissioning provision in Decision 98/3 is of particular interest.[56] Article 2 of Decision 98/3 establishes that, as a general rule, "it is prohibited to dump or leave wholly or partially decommissioned offshore installations in the maritime area". Norwegian legislation is aligned with this. The starting point for a disposal process is that when the use of an installation ends, upon this happening, the installation must be disposed of and the area cleaned up. The same applies under British and Dutch law. While Australia is not obligated to follow OSPAR, it has similar regulations.

Article 3 of Decision 98/3 allows for exceptions allows for exceptions that may permit the installation to be left in place (fully or partially). This may apply to the removal requirement for steel installations weighing more than 10,000 tons, concrete installations, and concrete anchor foundations. Norway has exercised this right twice. One instance was to allow the Ekofisk tank and the protective wall to remain on the field. The other was in connection with the removal of the Frigg field. The Frigg field is so far the largest field on the Norwegian continental shelf where decommissioning of installations has been completed. By 2010, the extensive decommissioning work on the field was completed.

For such exceptions, a consultation process must be carried out, cf. OSPAR Decision 98/3 Articles 9 and 10. This must be done after a national process has been completed. The figure below illustrates the overarching process in Norway.

Additionally, OSPAR has issued a "Guidance on the application of OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations" of 2024, going into further details concerning the different procedures.[57]

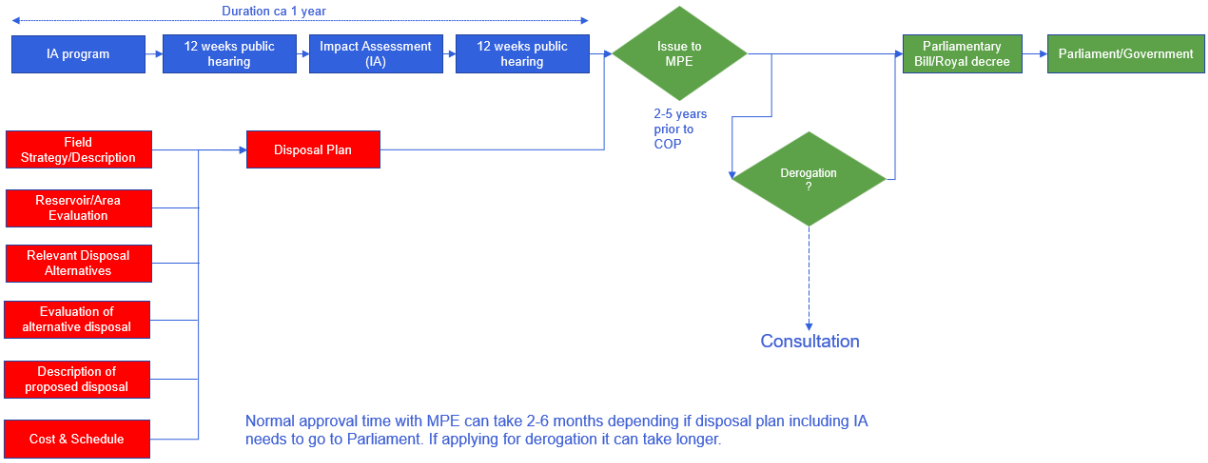

Figure 3: Overview of the legal process related to decommissioning in Norway.

[56] Decision 98/3 was adopted in Sintra, Portugal, in 1998, and entered into force on 9 February 1999. Link: 1998-OSPAR-Decision-98-3.pdf (nus.edu.sg).
[57] https://www.ospar.org/documents?v=57729

4.1.6 The Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes signed in 1989 and in force since 1992.[58] A draft protocol on liability and compensation was signed in 1999 but has not yet entered into force.[59] The "Basel Ban", introduced into the Convention in 2019 as an amendment, prohibits the export of hazardous waste from OECD and EU countries to countries that are not members of the OECD or EU.[60]

The purpose of the Basel Convention is to minimize the transport of hazardous waste and to ensure that toxic waste is, as far as possible, handled within national borders. It does so by controlling the transboundary movement of hazardous waste. This is to prevent the transfer of hazardous waste from wealthy to poorer countries that lack adequate infrastructure for safe waste management. Any transport of hazardous waste requires prior consent from the receiving country. There is also a requirement for environmentally sound management of hazardous waste.

The Basel Convention has some links with decommissioning activities. If a platform contains hazardous waste, the Basel Convention may affect the possibility of reuse in other countries – or make it impossible. This is because the reuse would depend on the consent of the receiving country and whether transport to that country is permitted.

4.1.7 EU Legislation

4.1.7.1 General

EU legislation has a significant impact on the legal situation in Norway, the United Kingdom, and the Netherlands, which are respectively a member of the EU internal market through the EEA Agreement, a former EU member, and a current EU member. Australia is neither part of the EU nor the EEA and is therefore not required to comply with EU law. Since the UK left the Union, it is unclear to what extent the country will continue to implement legislation corresponding to EU rules.

A large number of EU legal acts may affect decommissioning operations in the North Sea. Some of them, according to Norwegian authorities and their interpretation of Article 126 of the EEA Agreement, do not apply on the Norwegian continental shelf because the EEA Agreement is limited to the territories of the member states. This, however, is disputed. In any case, parts of the legislation will apply once installations are brought ashore or whenever the activity takes place in the "territory" of Norway.

We will not enter into this applicability discussion in Norway but still point out the legislation that might apply in decommissioning operations on the Norwegian Continental Shelf. We will review some of them in detail. Additionally, the following can be mentioned:

- Directive 2013/30/EU on the safety of offshore oil and gas operations: This directive sets requirements for the prevention of major accidents and the limitation of their consequences if they occur.

[58] Norway acceded to the convention in 1990.
[59] https://www.basel.int/theconvention/overview/liabilityprotocol/tabid/2399/default.aspx
[60] https://www.basel.int/Implementation/LegalMatters/BanAmendment/Overview/tabid/1484/Default.aspx

- Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive): This directive requires that projects likely to have significant environmental effects, including oil and gas projects, undergo an environmental impact assessment.
- Directive 2004/35/CE on environmental liability: This directive establishes a framework for liability related to the prevention and remediation of environmental damage, including that which may arise from oil and gas activities.
- Directive 94/22/EC on the conditions for granting and using authorisations for the prospection, exploration and production of hydrocarbons: this directive sets the minimum licensing requirements for oil and gas activity and prompted the revision of the Petroleum Act in 1996.

4.1.7.2 The Waste Directive

Waste legislation is relevant to the decommissioning of petroleum activities because it sets limits on what can be done with materials that cannot be reused in any way. Stricter waste regulations can be expected to increase the cost of disposal compared to finding new uses. The directive is considered relevant to the EEA agreement and has been implemented into Norwegian law.The Waste Directive is part of the EU's efforts to promote a circular economy and reduce the environmental impact of waste management.[61] It establishes the framework for waste management in the EU. Key concepts such as waste, recycling, and disposal are defined in the directive. This is important to ensure a common understanding of and approach to waste management across the EU.[62] The Waste Directive also requires member states to develop waste management plans in line with the waste hierarchy and provides rules on producer liability and separate collection.

4.1.7.3 Cross-Border Regulations

As mentioned in 3.4.4, a new cross-border regulation on shipments of waste was adopted in 2024. The aim of Regulation (EU) 2024/1157 is to make it easier to transport waste within the Union. This means that waste trade may be a part of the EU internal market. This Regulation on shipments of waste also seeks to promote circular use over landfill disposal.[63] At the same time, it aims to reduce even further the possibility of moving waste out of the market, which after Brexit includes transport to the United Kingdom. To date, there is little practice when it comes to applying the regulation due to its recent date of enactment. However, the Norwegian Parliament has adopted amendments to the Act 13 March 1981 No. 6 on Pollution Control to provide the legal basis for implementing the new regulation.[64] The regulation limits the ability to send waste intended for final disposal across national borders in line with the directive.

[61] Directive 2008/98/EF.
[62] In a 2025 doctoral dissertation from Luleå University, Oskar Johansson points out that the strict rules governing what is classified as waste under the directive can, in some cases, make it more difficult to move materials up the waste hierarchy.
[63] https://www.miljodirektoratet.no/ansvarsomrader/internasjonalt/eu-regelverk/eu-regelverkliste/eu-regelverk/?id=32024R1157
[64] https://www.stortinget.no/no/Saker-og-publikasjoner/Vedtak/Beslutninger/Lovvedtak/2024-2025/vedtak-202425-051/

4.2 Requirements for Decommissioning Plans: Norway, the United Kingdom, the Netherlands, and Australia

4.2.1 What is a Decommissioning Plan?

4.2.1.1 Requirement for a Decommissioning Plan

All countries share the requirement for a decommissioning plan. The purpose of such a plan is to enable the recipient to assess whether the plan is feasible. Thus, it is appropriate to describe the plan as an application that must contain sufficient information for the recipient to process it.[65] The assessment may relate to technological, economic, and legal constraints. The specific design of the plan and the process for its approval and implementation vary. These differences, along with varying administrative practices, reflect different priorities and result in different roles for environmental and circularity considerations in practice.

4.2.1.2 Contents of the Plan

All the countries compared require a two-part plan that is to cover all the important aspects of the choice of decommissioning methods.

In Australia, operators must submit a WOMP (Well Operations Management Plan) and an EP (Environment Plan). The WOMP provides information on how the licensee plans to plug the well and is not directly relevant to the topic of this report. An Australian EP does not differ significantly from the decommissioning plan required by the European countries, despite the name suggesting a greater focus on the environment.

The European countries require a plan for the decommissioning process.

Norway additionally requires an impact assessment. The impact assessment and cost estimates aim to shed light on the likely outcomes. A comprehensive impact assessment that, in addition to economic impacts, considers how the decommissioning will affect other users of the sea and the environment, may help identify alternative solutions. [66]

In the UK, a Decommissioning Program must be drawn up in accordance with OGA Guidance Notes, Chapter 6. The requirement to prepare a decommissioning plan is set out in Part 29 of the UK Petroleum Act. A list of what the plan must contain is set out in Part 29.4 of the Petroleum Act. A detailed list can be found in the OGA Guidance Notes, section 6.4. Among other things, operators must submit an overview of environmental considerations for the measures proposed by the operator. The environmental assessments must comply with the OGA Guidance Notes, Chapter 12. They are simpler than an environmental impact assessment under the Environmental Impact Assessment Directive (2014/52/EU, amending 2011/92/EU). [67] The purpose of the process is to help the operator find the disposal option that best promotes safety, the environment, technology, society, and economics.[68] A comparative assessment shall also be made for pipelines and any drill cuttings or infrastructure elements that one wishes to leave behind, to provide a basis for

[65] Petroleum Act § 5-1 (1), fourth sentence; see § 5-1 (1), final sentence, which provides the legal basis for requesting supplementary information; cf. Public Administration Act § 17 (1), first sentence.
[66] Sjå Offshore Norway's handbook Impact assessment for offshore decommissioning.
[67] OGA Strategy, 12.4 ff.
[68] OGA Strategy, chapter 4.

assessing the advantages and disadvantages of different solutions.[69] The process shall be transparent, and all assessments shall be documented.

In the Netherlands, the requirement to draw up a closure plan (Verwijderingsplan) is set out in Article 44.3 of the MBW. The plan must provide the information necessary for the ministry to make an informed decision on the closure procedure, as well as a timetable and cost estimate.[70] A comprehensive list of requirements for the content of the closure plan is set out in Article 40c of the Mijnbouwbesluit. The list includes, among other things, the methods to be used, how the seabed will be restored to its original condition as far as possible, including what the final result will be, how material will be removed and disposed of, and any future use of the area and new use of material that is not to be removed.

The table below provides an overview of the relevant legal bases in each country and the requirements for the content of decommissioning plans:

Country	Legal Basis	Key Content of the Decommissioning Plan
Norway	Petroleum Act § 5-2, cf. § 5-1 (1) fourth sentence; Petroleum Regulations § 45 (1)	decommissioning plan "the information and assessments deemed necessary to make a decision" on disposal. This includes "technical, safety, environmental, and economic aspects and the interests of other users of the sea." impact assessment: "economic and environmental aspects," emission-reducing measures, and measures to reduce "any damage and inconvenience."
Netherlands	MBW art. 44; Mijnbouw-besluit art. 40c	The information necessary for the minister to decide whether to approve the removal application. The licensee must submit a plan for removing the installation, including contaminated materials and other substances how the removal will be carried out, and the expected cost.
United Kingdom	Petroleum Act; 2018 Guidance Notes, Annex C	The Act requires a timeline for the decommissioning, the measures to be taken, and the intended final state. The Guidance Notes require: • a list of all equipment on the installation; • a disposal plan for each item, aiming for the highest possible level in the waste hierarchy;

[69] Guidance Notes 2018, punkt 6.15 and 10.5, 11.2, and 1.12, 7.12 and Annex A, OSPAR Decision 98/3, also see https://oeuk.org.uk/product/guidelines-for-comparative-assessment-in-decommissioning-programmes-issue-1/.
[70] Nexstep (2024).

		• a plan for meeting waste management requirements; • an explanation of cleaning methods for hazardous substances (e.g., radioactivity) • an explanation of the use of natural resources and energy in recycling, repurposing, and reuse
Australia	Environment Regulations § 10A and OPGGS Sec. 572	The plan must state how an unused installation will be removed, include an overview of all inventories with expected service life, and an assessment of all risks associated with the removal. The level of detail must be sufficient for NOPSEMA to assess compliance with the regulations.

4.2.2 What Deadlines Apply to Decommissioning Plans?

The deadlines for submitting and implementing decommissioning plans vary between countries. The implementation deadline is not necessarily regulated directly but is, of course, influenced by the point in time at which the operator or owner is required to submit the decommissioning plan.

Norway and the UK have relatively similar deadlines—two to five years and three to six years, respectively, before the planned decommissioning date. The final deadline, two to three years before decommissioning, means that one can expect the plan to be approved before the cessation date. This may contribute to increased efficiency, as it allows for a reduction in the time between shutdown and completed disposal, and enables the shutdown and maintenance of the installation to be adapted to its intended future use. Parts intended for reuse must be preserved differently from those that are to become waste. In the Netherlands, however, the ministry becomes involved only after production at the installation has ceased. The license holder must notify the ministry within four weeks after operations have ceased at a petroleum installation. Unless the shutdown is temporary, the license holder shall submit the decommissioning plan for approval within one year after operations have been terminated, cf. MBW Article 44.3. Nevertheless, decommissioning work must commence, including cleaning pipelines and preparing the installation for disposal or repurposing, as soon as production has been shut down. Otherwise, the installation is placed in "lighthouse mode," whereby the need for inspection and maintenance is minimised.[71]

In Australia, there are no fixed deadlines. This is due to the "title" system, which requires an application every five years to continue using the area for the next five years. These applications must include plans for the upcoming period, meaning that decommissioning must increasingly be addressed toward the end of the lifetime of the asset and connected with the renewal of the 'title'. In line with NOPSEMA's more proactive approach in recent years,[72] a planning model has been proposed. This assumes that all wells must be plugged within three years after production stops, and all infrastructure must be removed within five years from the same date.[73] Otherwise, the rule is that decommissioning planning should begin with the field development plan, required under

[71] Nexstep 2024, p. 31.
[72] See below, section 4.2.3.3.
[73] NOPSEMA 2024, section 5.2.

Part 4 of the Offshore Petroleum and Greenhouse Gas (Resource Management and Administration) Regulations.[74]

The approach adopted in Australia, of pursuing continuous decommissioning work from the outset, is likely an effective way to ensure the highest possible degree of circularity when installations are to be disposed of. It provides the clearest possible framework for the planning of decommissioning activities. At the same time, there must be flexibility to amend the plan in order to adapt it to technological innovations relevant to the decommissioning process. New technology introduced after the plan has been approved may enable an increase in the level of reuse. This is reflected in the Norwegian regulation: In Norway, the rule previously required that the decommissioning plan had to be submitted at a later stage.[75] However, it was concluded that it is more economically sound for the plan to be submitted early enough to allow work to commence immediately after production has ceased.[76] The British authorities, too, are eager to promote early planning to make the decommissioning process more cost-effective and efficient.[77]

If a scheme similar to the Australian model is to be introduced in other countries, it must be noted that for installations that have already passed half of their operational lifetime, it will not be possible to implement such a continuous decommissioning process. Moreover, countries outside the British legal tradition do not operate with "titles," and therefore alternative legal and technical solutions must be employed.

A draft decommissioning plan may serve as a basis for discussions between operators and the authorities on how to achieve solutions that promote broader societal interests, such as circularity, environmentally friendly practices, and the development of new jobs in the North Sea.

4.2.3 What is the Process Surrounding a Decommissioning Plan?

4.2.3.1 What are the Authorities to Evaluate?

In all countries, the decommissioning plan must be submitted by the party responsible for the installation (i.e. the operator) and approved by the regulator. This arrangement ensures that states

[74] NOPSEMA 2024, section 5.3.
[75] Petroleum Act 1985, Section 30(5): "… within two years after the use of the installations has permanently ceased, or in any case within two years after a licence has expired, [the authorities may] require that the installations be wholly or partly removed …".
[76] Ot.prp. nr. 43 (1995–1996), pp. 13–14 and the OGA Strategy 2021, Chapters 4.1 and 4.2.2.
[77] The OGA Strategy 2021, Chapters 4.1 and 4.2.2.

can maintain control over decommissioning activities while the liability for carrying them out (and how) remains with private parties. In practice, the decommissioning plan is an application that must be approved by the authorities.

The approval process may follow two main approaches. The first involves regulations that set out minimum requirements which the decommissioning plan must meet in order to be approved. The rules may also indicate what the legislator wishes to be included. This is the Norwegian approach, and in accordance with the Norwegian model of function-based legislation. The second possible approach entails that the authorities do not merely assess whether the operator has chosen a sufficiently good solution, but whether it has chosen the best solution. In recent years, Australia has moved in the direction of such a process. For this type of process to be sufficiently predictable, it must be clear what factors will be emphasised in the assessment and what weight they will be given. This can be particularly challenging when the advantages or disadvantages of a solution are difficult to quantify, such as environmental impacts.

4.2.3.2 Norway

In Norway, the Ministry of Energy is responsible for the decommissioning process. This is the same Ministry that operators usually interact with, meaning they are well acquainted with each other. Operators report that the Ministry has a strong understanding of the market in which they operate. A risk with this close relationship is that the Ministry may develop a fundamental trust in the operators, leading it to overlook potential improvements or flaws in draft decommissioning plans. We cannot see that this is a practical problem as it is today.

The Norwegian Environment Agency (NEA) also plays an important role in the decommissioning of petroleum activities through the consultation process of the impact assessment which is part of the decommissioning plan. However, it only has an advisory role in relation to the decommissioning plan, as it serves as a consultation body. It is the Ministry of Energy who takes the final decision on the decommissioning plan and the NEA is not part of this decision. Yet the operators must attain approval from the NEA before implementing the measures described in the decommissioning plan. There is a risk that the Ministry may approve a plan that presupposes measures that the NEA cannot approve without exceeding the limits of its authority. Moreover, the NEA lacks the familiarity with the petroleum industry that the Ministry of Energy has, so that it does not keep a running dialogue with the petroleum business.

The effect of these factors appears to be that the agency is more often forced to impose requirements rather than engage in dialogue with operators to arrive at environmentally sound solutions that are not overly intrusive. Operators have expressed a desire for better cooperation with the Environment Agency so that all parties can work together to promote the most environmentally friendly decommissioning possible on the Norwegian continental shelf. The Environment Agency has also expressed a desire to play a more central role in the development of decommissioning plans. This is clearly stated in the report M-1952 “Miljøaspekter ved avsluting av petroleumsvirksomhet – forvaltningspraksis og kunnskapsstatus», which was published by the NEA in 2021.[78]

[78] M-1952

4.2.3.3 Australia

Australia's NOPSEMA (the National Offshore Petroleum Safety and Environmental Management Authority) is responsible for offshore petroleum activities.[79] NOPSEMA is an independent regulatory body. It accounts, but does not report, to the Minister for Industry, Science and Resources. NOPSEMA is the sole environmental authority for offshore energy activities. This means that environmental protection is a central part of NOPSEMA's mandate, and that no other public agencies are responsible for environmental concerns in the Australian offshore petroleum sector. Nevertheless, the overarching minister leads a department that is more focused on resource utilization.

The Australian authorities have previously left much of the responsibility for developing decommissioning plans to the operators. NOPSEMA reviewed submitted plans to ensure they were adequate but has not taken an active role in shaping their content. This is now changing, as NOPSEMA is set to take a more leading role through several initiatives outlined in the NOPSEMA Strategy 2024–2029 (p. 10). Previously, the two parts of the decommissioning plans were submitted to separate divisions within NOPSEMA. These divisions worked independently, with some input from the environmental division. Today, there is a desire for greater collaboration to achieve a holistic assessment of the entire decommissioning plan. However, NOPSEMA 2024 does not include references to circularity. NOPSEMA is working toward an approach more similar to the British model and envisions that decommissioning planning should be part of the entire lifecycle of the installation:[80]

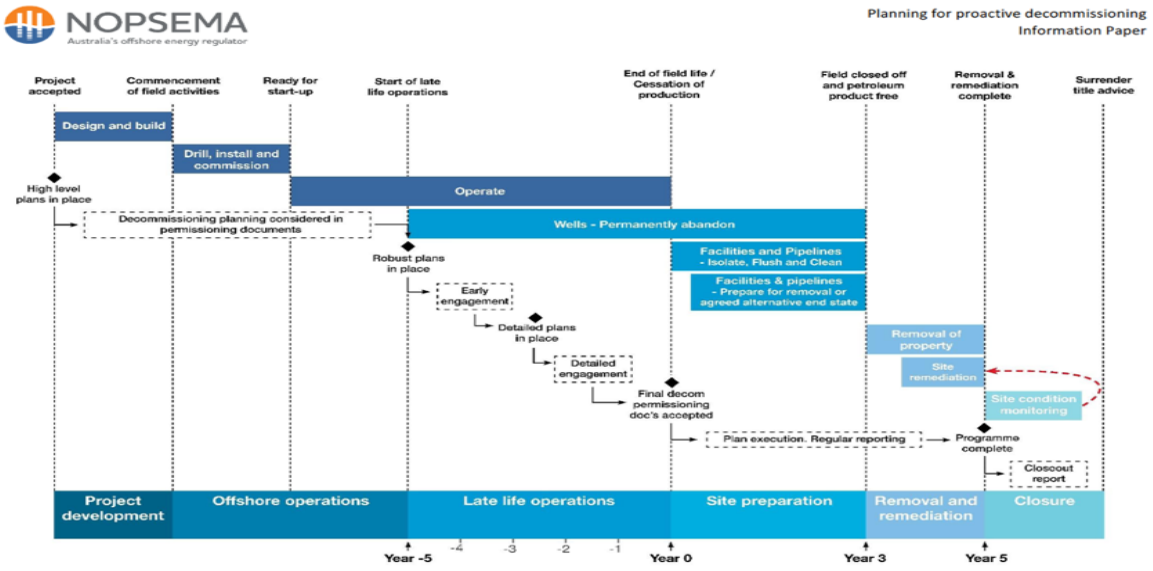

Figure 2 – Planning for proactive decommissioning over the life cycle of a petroleum project

4.2.3.4 The Netherlands

The Netherlands, like Australia, has a "one-stop shop. The Ministry of Finance is solely responsible for processing decommissioning applications for petroleum activities, both onshore and offshore. The Ministry of the Environment is not involved at all, unless the installation is to be reused or merely partly removed. In such cases, the Ministry of Finance will discuss the matter with the

[79] The Offshore Infrastructure Regulator (OIR), which is part of NOPSEMA, regulates offshore wind energy.
[80] NOPSEMA 2024, p. 8. See also Banet, C., Regulating the reuse and repurposing of oil and gas installations, 2025 (https://blog.sintef.com/energy/regulating-the-reuse-and-repurposing-of-oil-and-gas-installations/): "Taking the example of North Sea countries, it appears that reuse is often addressed for the first time when the draft decommissioning plan is elaborated, which leaves a relatively tight window of opportunity to find reuse or repurposing options, if not already envisaged by the licensees and the owners."

relevant public authorities prior to making a final decision.[81] Unlike Norway, the UK and to some extent Australia, Dutch offshore installations are much smaller and closer to shore. This makes them easier to remove, and the need for individual adaptations and detailed project-planning is less than in Norway and the UK.

If the licence is held by several companies together, one of them will be pointed out as a point of contact for the authorities, despite all of them being jointly liable for decommissioning.[82]

4.2.3.5 United Kingdom

The UK has divided liability for decommissioning between OPRED (Offshore Petroleum Regulator for Environment and Decommissioning) and NSTA (North Sea Transition Authority). OPRED is part of the Department for Energy Security and Net Zero and has the authority to make binding decisions.

NSTA serves as an advisor to operators, OPRED, and the Secretary of State in the development of decommissioning plans, the assessment of whether a plan should be approved, alternatives to abandonment or demolition of installations, and minimizing decommissioning costs.

The legislation requires operators to engage in discussions with OPRED before submitting the decommissioning plan. These discussions continue throughout the development of the plan. The final plan is submitted after further discussions with OPRED.

OPRED and NSTA seem to have different approaches to cooperation with operators, likely due to their differing mandates and roles in the decommissioning process, as well as the fact that OPRED is more established and has therefore developed different routines.

The entire removal process can be illustrated as follows: [83]

[81] MBW art. 44.a.2
[82] MBW art. 22.
[83] Guidance Notes 2018, s. 21.

Stage 1 Early discussions	Stage 2 Planning & producing the Decommissioning programme	Stage 3 Submit the programme	Stage 4 Execution of the programme	Stage 5 Close out
Preliminary discussions with OPRED Possible option screening for pipelines Data & evidence collection & surveys	Detailed discussions with OPRED Assessment of options - Comparative Assessment or similar including assessment of risk Development & submission of consultation DP and Environmental Appraisal to OPRED and through consultation to other interested parties /public for consideration Derogation case - OSPAR consultation prior to final submission	Draft DP following comment resolution with OPRED Formal submission of the DP and approval under the 1998 Act	Commence main works Regular DP progress reports to OPRED Identify and discuss potential DP revisions	Close Out report & detail of all post DP surveys, within one year of full completion. Update OPRED with amendments to post DP monitoring plan Monitoring of site & site remediation as required Management plan for any infrastructure remaining in situ

Guidance notes 2018, p. 21.

4.2.3.6 Comparisons

Regardless of the deadlines for submission and the content of the plan, cooperation between the operator and the authorities is central to how well the decommissioning plan process promotes the best solutions, also regarding circularity. This cooperation is influenced by the distribution of liabilities and coordination among the relevant agencies, as the various interests that different administrative bodies are tasked with safeguarding can either reinforce or conflict with each other. In the relationship between the authorities and the applicant, the degree of discussion, guidance, and administrative discretion will determine how much the plan is developed, weaknesses are uncovered, and so on—and thus what outcomes the written rules may lead to. In this way, the process can be just as important for the actual incentives and barriers to circularity in the decommissioning process as more concrete requirements for reuse and similar measures.

In three of the four countries, the main liability for handling draft decommissioning plans lies with ministries whose core liabilities include energy, trade, or industry. One may still identify a line of development from Norway, where the ME makes decisions and the NEA is merely a consultative body, via, Australia, where NOPSEMA is the sole environmental regulator on the continental shelf, yet attached to the Ministry of Industries, to the British OPRED, which despite the MER strategy must be considered a sheer environmental agency. This structure does not necessarily hinder an environmentally oriented and innovative approach to petroleum decommissioning. However, it must be acknowledged that the way the work is organized can influence which fundamental considerations are given the most weight in regulatory development and legal practice. Each agency can be expected to prioritize the concerns it is mandated to promote and is most familiar

with. A salient example of governmental collaboration is the British model. The current institutional set up ensures that all relevant interests are represented by different agencies, but it also creates a risk of blind spots and unnecessary bureaucracy.

The way that NOPSEMA is organized allows Australia to offer a simpler process than Norway, in the sense that important environmental input is presented before the plan has been approved by the Ministry and sent for consultation rather than after this has been done. On the other hand, there is a risk that close ties between those responsible for resource management and those responsible for environmental protection in the process may result in environmental concerns being sidelined. Over time, this could lead to reduced public trust in the petroleum industry and its ability to responsibly manage the decommissioning after extraction activities.

That the system encourages early consideration of circularity is not the same as making circularity viable in each individual decommissioning case, nor does it ensure that the circularity achieved is optimal. Norwegian legislation is also not designed with the explicit aim of promoting the waste hierarchy.

The Norwegian petroleum industry has achieved high recovery rates and is working to increase them further. Norwegian petroleum regulations are also internationally recognized as a good framework, both in general and specifically in relation to decommissioning. Nevertheless, it may be possible to better adapt it to new expectations related to circularity.

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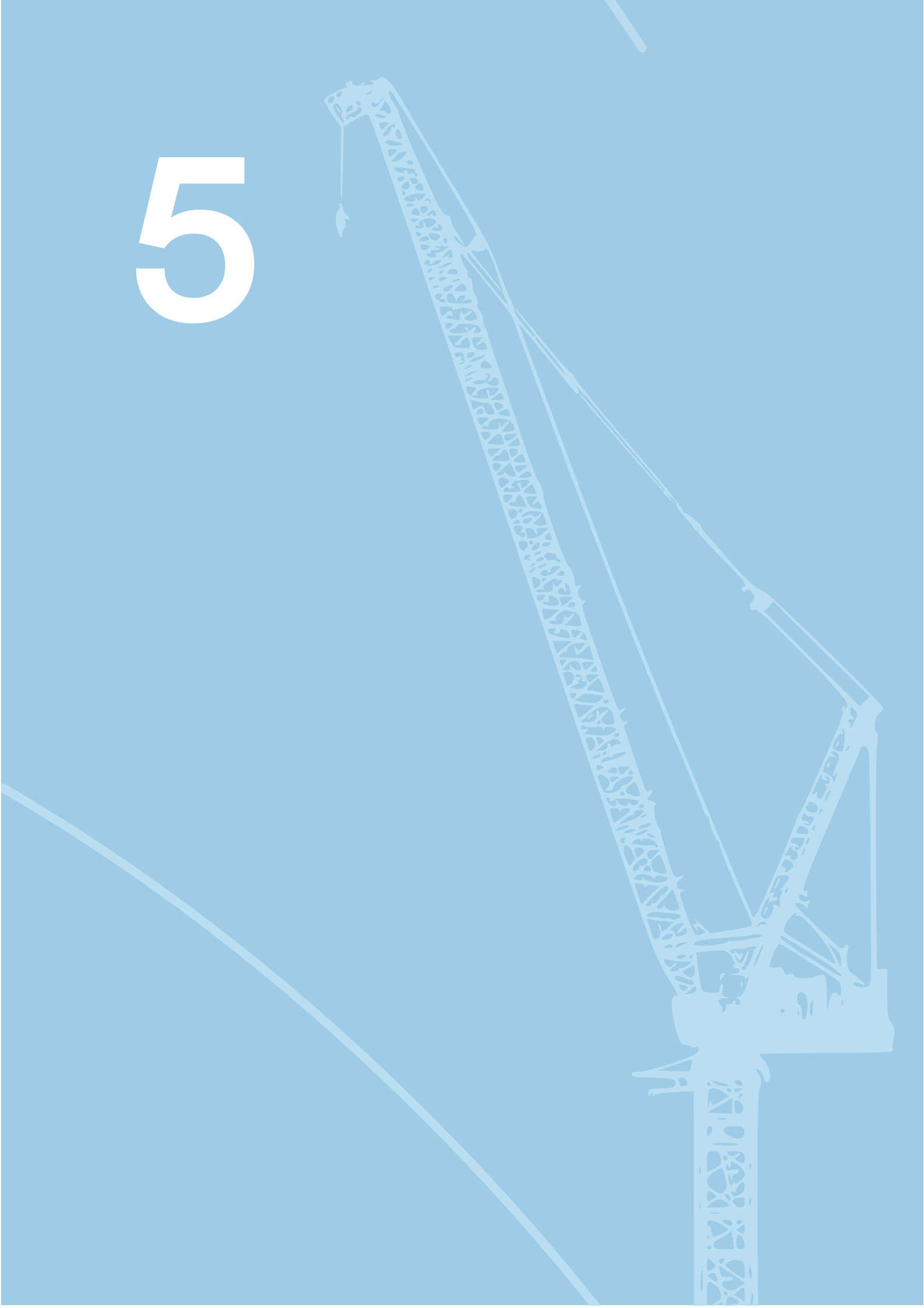


5 Regulatory and Other Barriers to Circularity

5.1 Legal Regulation of Circularity

In recent years, circularity has emerged as an overarching goal for society as a whole. In Norway, as well as in other countries and in the EU, general requirements for increased circularity have been introduced into various pieces of legislation. Nevertheless, this development has had little impact on the petroleum regulatory framework in Norway. In this sense, it is important to remark that the Petroleum Act states that the operator or owner of an installation "may" propose to repurpose the installation or parts of it for "other use", and it has done so since 1996, but there is no explicit requirement to assess alternative use, neither in the formal regulation nor in the soft law documents.

The same applies to the Netherlands. Dutch law also contains few requirements concerning circularity in connection with the decommissioning of petroleum activities, apart from the general provisions mentioned in section 2.2.3. At the same time, the Netherlands has a strong foundation for promoting circularity in practice through Nexstep. As previously mentioned, Nexstep functions as a kind of think tank that promotes innovation, effective regulation, and knowledge sharing related to decommissioning, repurposing, and reuse. In practice, Nexstep has proven to be an effective driver for developing new, environmentally friendly solutions for petroleum decommissioning.

In contrast, more efforts towards circularity are found elsewhere. For instance, an explicit requirement can be found in the UK Petroleum Act, section 29(2B)(a), which mandates that the NSTA must assess and advise on alternatives to abandonment or disposal of an installation, such as reuse. The operator cannot submit the decommissioning plan to OPRED for approval until consultations with the NSTA have been completed. However, the NSTA must still ensure that "the cost of carrying it out is kept to the minimum that is reasonably practicable in the circumstances" (2A)(b). Through the Decommissioning and Repurposing Taskforce (DaRT), whose main objective is to assist the industry in reducing the costs of decommissioning petroleum activities in an environmentally sustainable manner, the NSTA has developed a specialised body that facilitates effective solutions through cooperation between public and private actors.[84] The British petroleum industry operates under the 2018 Guidance Notes, which specifically refer to the waste hierarchy.[85]

In Australia, NOPSEMA's new approach involves a strong focus on circularity throughout the entire lifecycle of the installation, including decommissioning. A plan must always be in place for what to do with the installation or any components added to it from the moment the investment is made.

The overall impression, however, is that there are few legal provisions that directly require circular thinking—especially considering the strong societal focus on circularity. This report does not explore the reasons for this but instead highlights some legal rules that are not aimed at regulating circularity, yet still affect it.

[84] https://www.nstauthority.co.uk/about-us/north-sea-transition-forum-and-task-forces/decommissioning-and-repurposing-taskforce/
[85] See e.g. https://assets.publishing.service.gov.uk/media/5c00f3f3e5274a0fdaaaa0f7/Decom_Guidance_Notes_November_2018.pdf, p.27.

In the case of decommissioning, we have identified several legal barriers to reuse, especially when the recipient is a different operator. These include:

- Equipment intended for reuse must meet the regulatory requirements in force at the time of reuse. If new requirements have been introduced since the equipment was new, it may be costly or impossible to comply.
- If demands to use the best available technique (BAT) are interpreted too strictly, this may hinder reuse, because it in practice implies a requirement for newer technology than that available for reuse. In Norwegian law, the demands can be found in Pollutions Regulations chapter 36 annex II, cf. Pollution Act sec. 2.3, and in the framework regulations (rammeforskrifta) sec. 11.
- Tax rules may reduce the economic viability of reuse.

5.2 Who is Responsible for the Installation?

5.2.1 What is the Risk?

All man-made structures pose a risk of causing harm, whether environmental damage through pollution, or injury to people or economic loss. Placing an installation on the seabed in principle constitutes pollution under Section 6, first paragraph, no. 1 of the Pollution Control Act. The legislation nevertheless provides a legal basis for exempting petroleum installations from the prohibition against pollution.[86] This exemption applies only as long as a valid production license exists for the installation. An installation that is no longer in use will therefore constitute pollution. Examples of how an installation may cause economic damage include inadequate marking leading to a ship colliding with the installation, resulting in harm to the vessel, its cargo, or crew, or parts of the installation breaking loose and causing similar damage as drifting debris. For these reasons, it is in all cases required that someone bears responsibility for structures, including offshore petroleum installations.

This includes both liability for any damage that occurs and a duty to carry out decommissioning. The decommissioning obligation can be divided into three parts: an obligation to prepare a decommissioning plan, an obligation to implement the plan, and an obligation to cover the costs of preparing and implementing the plan.

5.2.2 What is the Main Rule for Risk Allocation?

Under Norwegian law, matters of liability are primarily regulated by the Petroleum Act. Regarding decommissioning liability arising from petroleum activities, Section 5-3, third paragraph of the Petroleum Act provides that "the transferring licensee shall be secondarily financially liable towards the other licensees [and the state] for the costs of implementing the decommissioning decision." In addition, Section 5-3, fourth paragraph of the Petroleum Act states that "the licensee and the owner are jointly obliged to ensure that the decommissioning decision is carried out, unless otherwise determined by the ministry." The Petroleum Act thus places both the financial and the practical responsibility for decommissioning on all those who have held rights in an installation that has completed its production. However, if the installation has been transferred to an acquirer conducting activities under the Offshore Energy Act, Section 6-2, second paragraph of

[86] Pollution Control Act Section 4, cf. Section 3(2)(3), cf. Petroleum Act Section 3-3, cf. Petroleum Act Section 7-6. See also Petroleum Act Section 10-1.

that Act specifies that the party carrying out the activity is responsible for preparing the decommissioning plan.

Thus, it is not decisive that the installation, after being repurposed for activities falling outside the scope of the Petroleum Act, is no longer used for petroleum activities and therefore falls outside the Act's scope, according to § 1-4, first paragraph, first sentence.[87]

Section 29(1) of the UK Petroleum Act provides that the state may hold a private party liable for removal. The parties who may be held liable are listed in § 30(1), which includes a wide range of entities.[88] A transferor can only be released from liability if the Secretary of State consents. Consent to be released from the decommissioning obligation pursuant a transfer of the license or the facility is only granted if the Secretary is satisfied that the transferee "has the capability, both technically and financially, to fulfil the decommissioning obligations."[89]

So far, this rule is similar to Norway's. However, the difference lies in the UK authorities' desire to promote activity that ensures maximum economic exploitation of petroleum fields based on the Maximising Economic Recovery mandate. By allowing some releases from liability in connection with the sale of installations, this goal may be facilitated. Therefore, in practice, releases from liability are more frequently granted than when compared to other jurisdictions, like Norway. If the Secretary of State has doubts about the transferee's ability to fulfil the obligations, the parties may still obtain consent if they enter into a binding agreement on financial security.[90]

Under Dutch law, the owners of each field are jointly responsible for decommissioning, pursuant to MBW Article 44c.1. The responsibility for removal lies with the last license holder. Dutch regulations allow for financial guarantees to be required for removal costs, such as bank guarantees, but it has not been common practice to make use of this provision.[91]

Since the state-owned company EBN typically owns 40% of Dutch petroleum fields, this means the state covers 40% of the decommissioning costs. However, the rest of the cost liability remains in private hands. It is estimated that the state covers around 73% of the costs as a result of tax regulations, etc.[92]

Australian authorities are working to ensure that private actors can be held financially responsible for decommissioning obligations, while also promoting better planning throughout the lifecycle of installations, increased innovation, and reduced decommissioning costs.[93] In recent years, Australia has made changes to emphasize that the liability for decommissioning lies with the holder of the "title," i.e., the owner or operator of the installation. Thereby, the Australian government is kept free of liability.

The implementation of decommissioning plans is today largely outsourced to specialised companies, particularly on the UK continental shelf, and is not carried out by the oil and gas operator itself. None of the legal frameworks examined prohibit this type of delegation of

[87] Proposition to the Odelsting. No. 43 (1995–1996), p. 23: 'The Petroleum Act will not apply to uses other than petroleum activities.'
[88] Gordon et al., UK Oil and Gas Law. Current Practice and Emerging Trends, vol. II Commercial and Contract Law Issues, p. 414.
[89] Gordon et. al., vol II, p. 414.
[90] Gordon et. al., vol II, p. 414.
[91] Mijnbouwwet artikkel 47, Drankier D, Roggenkamp MM. The Regulation of Decommissioning in the Netherlands: From Removal to Re-Use. In: Roggenkamp MM, Banet C, eds. *European Energy Law Report XIII*. European Energy Law Reports. Intersentia; 2020:289-306, DOI:10.1017/9781780689487.016, p. 301.
[92] Drankier D, Roggenkamp MM. The Regulation of Decommissioning in the Netherlands: From Removal to Re-Use. In: Roggenkamp MM, Banet C, eds. *European Energy Law Report XIII*. European Energy Law Reports. Intersentia; 2020:289-306, DOI:10.1017/9781780689487.016, p. 301.
[93] Road Map 2024.

responsibility, provided that the key criterion is that the decommissioning is conducted in a sound and proper manner by, or on behalf of, the licensee. However, an agreement transferring responsibility for the decommissioning cannot be invoked against the state.

5.2.3 How do Decommissioning Requirements Affect Circularity?

When it is not possible to be released from the decommissioning liability for an installation, this may reduce the willingness to transfer the installation to a new user, such as an offshore wind or hydrogen producer. Alternative industries on the continental shelf are all in an early phase, and it remains uncertain whether they will become profitable. Consequently, it is uncertain whether the new user will be able to cover the decommissioning costs when the time comes. The petroleum operator therefore risks retaining the decommissioning liability for an installation that has been used by others for many years.

It can be noted that by transferring the use of an installation to others, the operator may postpone the decommissioning work. Technological development will likely make decommissioning on the continental shelf easier, safer, and more cost-effective in the future. The operator will also profit from the sale of the installation. At the same time, however, retaining the financial liability entails a greater risk once the operator no longer has the revenues that the installation generated during its production period.

5.2.4 Can one Obtain Exemptions from the Liability?

There is legal basis to exempt the operator or owner from decommissioning liability under § 5-6 of the Petroleum Act and § 29 of the UK Petroleum Act. The basis is discretionary. However, the conditions for exemption are unclear.

Norwegian law does not provide a clear rule for releasing a party from decommissioning liability after transferring petroleum-related assets. The general rule on debtor substitution applies: the transferring debtor is only released with the creditor's consent. It may be unclear whether the Ministry has consented to release the transferor from removal liability when approving the transfer, unless the Ministry explicitly mentions the change of debtor. Although it is common in property transfers for the seller to be released from obligations related to the property, the Petroleum Act establishes a system with multiple jointly liable debtors. Based on the polluter-pays principle, it is not unreasonable that those who have benefited from the installation should also contribute to its removal. Therefore, it would not be surprising if the Ministry assumes that the parties remain jointly liable for the decommissioning obligation. Each transfer must be assessed individually to determine whether a release from liability has occurred. A legal amendment is not necessary, but it would be helpful if the Ministry clearly stated what it has consented to.

Another question is the timing of the release. Neither the general rules on debtor substitution nor the structure of the Petroleum Act prevent the Ministry from releasing the transferor from decommissioning liability at the time of transfer, as long as the transferee is known. Exemption can also be granted later, either during the preparation of the decommissioning plan or at another time.

Similar issues will arise in the laws of other countries, even though the rules on debtor substitution may be structured differently.

5.3 Export Control

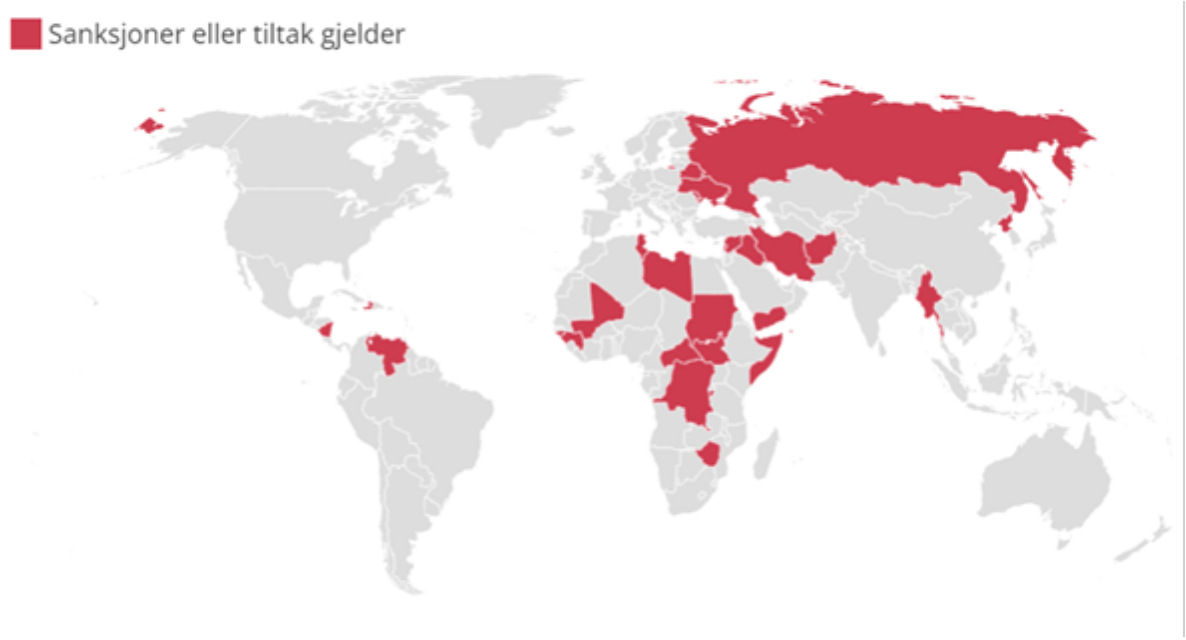
Export control regulations set limits on what can be exported from, say Norway, and to which countries. Among other things, they may prevent the export of equipment to for example Russia that could be used in the war in Ukraine. In practice, export control rules may hinder the reuse and recycling of materials from the petroleum industry by making it difficult or impossible to move materials out of Norway or sell them to the intended buyer.

The justification for export control lies in considerations of security policy and national safety. The system has existed in Norway since the post-war years, and it is a common practice through the world. Since 1950, Norway has participated in the Coordinating Committee for Multilateral Export Controls (COCOM). The members of this cooperation, Japan and the NATO countries except Iceland, agree to coordinate their rules for export control of strategically important goods, technologies, and services.

Nationally, the Export Control Act of 1987 provides the legal basis to prohibit the export of "goods and technology that may be significant for other countries' development, production, or use of products for military purposes or that may directly serve to enhance a country's military capability, and goods and technology that may be used to carry out acts of terrorism" without a license(§ 1 first paragraph, first sentence of the Export Control Act).

The Ministry of Foreign Affairs, which enforces the export control regulations, divides the countries of the world into four groups. The first two groups include countries that may receive weapons from Norway—this includes NATO countries. Countries in group 3 may receive other goods and technologies, excluding weapons, while countries in group 4—due to war, civil unrest, sanctions, or similar reasons—may not receive any goods or technologies. An updated overview of which

countries belong to which group can be found on the Ministry's website. Currently, sanctions and measures apply to 28 countries.



Some products and technologies commonly used in the petroleum industry may fall under the export control regime because they can also be used in military contexts. This includes, for example, electronics and gas turbines. Violating export bans can have serious consequences for the seller as this would constitute a breach of the Export Control Act. This also applies if the equipment or technology has been sold to an agent or other third party who then resells it to a buyer in a country subject to export control.[94] Export controls can therefore hinder reuse and repurposing in connection with the decommissioning of petroleum installations, because it may not always be possible to confirm that the product or technology will not be sent to a country subject to an export ban.

For Norway, participating in the COCOM cooperation is crucial for safeguarding national security interests and maintaining a reputation as a reliable trading partner among other COCOM participants. It is therefore unlikely that Norway will change its export control rules unilaterally to facilitate reuse of offshore oil and gas assets to be decommissioned. However, one could imagine allowing exports to all countries participating in the COCOM cooperation without obtaining a license based on §1 of the Export Control Act. This could have some advantages, but the licensing system also allows authorities to follow up if the boundaries set by law or the specific license are not respected. To some extent, this could be offset by a notification system, requiring suppliers to report to the Ministry of Foreign Affairs each time they export something that is or may be subject to export control.[95] It is also conceivable that the practical barrier could be reduced by making the rules more detailed, so that fewer products and technologies fall under export control.

[94] For example, the Export Control Act Section 5, first paragraph cf. second paragraph, and the Penal Code Section 15, see Ot.prp. nr. 22 (2008–2009) p. 495 and Prop. 64 L (2014–2015) p. 158.
[95] More on this can be found in Proposition to the Odelsting. No. 9 (1987–1988), Chapter 1.

By starting to plan early, one may reduce the negative impact of export control rules on reuse and repurposing in the petroleum sector. This may be done by, for instance, creating a better overview of what exists on the installation before the decommissioning work starts, and whether that equipment may legally be exported. The probability of finding a buyer is bigger if one has available a thorough overview at an early stage.[96]

5.4 Levelling the Cost Burden - High Costs and Governmental Support

States do not have the same investment interest when it comes to decommissioning activities as they do for petroleum excavation. License holders and installation owners have earned significant revenues from petroleum operations and are expected to pay for the decommissioning themselves. States will be obliged to pay at the same level as private parties when they are involved in petroleum businesses as owners.

However, it may still be desirable for states to contribute further financially to decommissioning to ensure the best possible execution of the process or to promote the exploitation of petroleum resources. State support schemes are often advantageous tax arrangements, and only rarely as direct investments.

The overarching purpose of taxation is to ensure sufficient revenue for the state to cover its expenses. Any reduction in tax rates effectively means a corresponding reduction in the services the state can offer its citizens, unless the reduced income may be outweighed by finding more efficient solutions. Tax cuts are made when policymakers believe the benefits outweigh the drawbacks of reduced state revenue and services. It is, in other words, a cost-benefit analysis. Tax rules are effective tools for influencing behaviour precisely because they can be designed to make

[96] Håkon Stalheim Meldahl, The Bergen Petroleum Law Symposium, 5 December 2024.

it economically beneficial to engage in desired behaviour—for example, reusing materials from an installation that has reached the end of its life.

In the cost benefit analysis, the state must value non-economic benefits such as circularity, not just the financial cost of reducing taxes. Reduced resource use—and thus reduced greenhouse gas emissions—has significant overall value. Finance Norway estimates that the cost of climate change to Norway will be around NOK 11 billion annually over the next 75 years, while Eurostat reported that the cost to the EU reached €60 million in 2021. However, these figures cannot be directly used when evaluating specific tax measures to "nudge" societal actors toward more environmentally friendly behaviour. Instead, one must assess the expected climate benefit of a specific measure against its cost to the state. Such analyses are not covered by the scope of this report.

In Norway and the Netherlands, support schemes must comply with EU state aid rules, which generally prohibit state aid that gives a market actor an advantage over others. However, the Climate, Environmental, and Energy Aid Guidelines (CEEAG), adopted in 2022, allow for (and facilitate) state aid to measures that promote the green transition.

Previously, both Norway and the UK offered tax relief for decommissioning expenses.[97] In 1986, Norway switched to what was effectively a grant scheme. The reason was that companies without sufficient tax liability in Norway would otherwise not be able to recover expenses they might be entitled to, which risked undermining full exploitation of petroleum fields.[98] The grant roughly corresponded to what companies could previously have received in tax deductions.[99] Changes within the tax system—such as tax relief for allocations to future investments and reassessment of previous years' tax settlements—were also considered, but the Ministry was highly critical of these solutions.[100] The grant law has now been repealed. Upon its repeal, it was established that "the state, upon termination of special tax-liable activity, shall pay the company the tax value of uncovered losses arising from expenses related to the removal of said installations."[101] The Petroleum Tax Act § 3(g) states that "no deduction shall be given for allocations to cover future expenses for the removal of installations used in extraction, processing, or pipeline transport."

Another aspect is that costs for decommissioning, even though they make out only a couple of thousandths of the income generated by a petroleum installation throughout its lifetime, are expenses with no prospects of future gain. This affects the possibility to level incomes and expenses.

The UK has retained a tax relief scheme. A mentioned, the country has also supported the transfer of aging installations to new owners to ensure optimal resource utilization from each field and well. One way to do this is by creating a system for transferring tax deduction rights. Tax deductions can be claimed for all taxes paid during the license holder's production period. This system meant that those who had operated a field for a long time had greater opportunities to claim tax deductions than those who had purchased the field from a previous license holder—a common practice on the UK Continental Shelf. To level this difference, the UK introduced the "transferable tax history" in 2018, allowing a seller to transfer the right to claim tax deductions for

[97] See, for Norway's part, NOU 1979: 43 Petroleum Act with regulations, p. 81, and Act of 25 April 1986 No. 11 concerning the allocation of expenses for the removal of installations on the continental shelf, cf. the Petroleum Act of 1985 § 30, which continued the provisions in Royal Decree of 9 April 1965 and Royal Decree of 8 December 1972 § 50 regarding the termination of petroleum activities.
[98] Proposition to the Odelsting No. 33 (1985–1986), p. 4 and point 9.1.
[99] Proposition to the Odelsting No. 33 (1985–1986), p. 5.
[100] Proposition to the Odelsting No. 33 (1985–1986), point 9.2 and 9.3.
[101] Proposition to the Odelsting No. 92 (2002–2003) Act relating to amendments to the Petroleum Tax Act etc.

previously paid taxes.[102] The scheme has by some been criticized as one of the most generous to oil companies in the world, with negative implications for the public budget.[103] Regarding decommissioning, it is expected that the UK government will end up covering around 45% of the cost. The UK also provides indirect state support by enabling trade with installations at the end of the lifetime.

The Dutch state participates in petroleum activities through the company EBN, which is a wholly state-owned enterprise. The company participates in petroleum operations as a regular company, meaning it has the rights and obligations that follow from its ownership share—typically 40%. In this way, the Dutch state is treated equally with other actors.

Australia does not provide direct support for decommissioning, but license holders can deduct the entire cost from their taxes.[104] The tax rate is 30%, meaning the Australian state effectively covers nearly one-third of the cost.[105] However, the regulatory framework does not have an explicit goal to reduce costs or increase revenues, as seen in Norway and the UK. Australia's reluctance to allow third-party access to infrastructure also means there is often more infrastructure than necessary. This contributes to higher decommissioning costs, as there is more to remove.

5.5 A Quick Note on Taxes and Incentives for Circularity

Adjusting tax regulations is more of an economic issue than a legal one. We will therefore not give specific advice on changing tax regulations but will limit ourselves to pointing out that in certain situations, a more environmentally oriented approach to tax regulations could lead to greater circularity in connection with the termination of petroleum activities. Reduced resource consumption, and thus reduced greenhouse gas emissions, will collectively be of great value. Finance Norway expects that the Norwegian costs of climate change will be around NOK 11 billion per quarter for the next 75 years, while according to Eurostat, the costs in the EU reached EUR 60 million in 2021. This suggests that the benefit of tax relief may be greater than the cost. However, this sum cannot be the reference when considering specific tax measures to "nudge" various social actors towards more environmentally friendly behaviour.[106] Instead, one must look at the expected climate gains from a specific measure and weigh them against the cost to the state. Such impact assessments are too extensive for a report such as this.

[102] https://assets.publishing.service.gov.uk/media/5a81ee27e5274a2e87dc03d3/An_outline_of_Transferable_Tax_History_web.pdf
[103] Boue, Juan Carlos (2018), The British model of petroleum governance from 1970-2018 - The UK North Sea as a Global Experiment In Neoliberal Resource Extraction.
[104] See https://www.ato.gov.au/businesses-and-organisations/gst-excise-and-indirect-taxes/petroleum-resource-rent-tax/work-out-prrt/prrt-deductible-expenditure.
[105] I.a. https://ieefa.org/resources/ieefa-australias-us405-billion-clean-bill-its-offshore-oil-and-gas-industry.
[106] See Thaler Richard H., Sunstein, Cass R, *Nudge*, Penguin Books Ltd (2021).

5.6 Development of Secondary Markets

5.6.1 The Need for Secondary Markets

Incentives or mandates to choose recycling over disposal, or reuse over recycling, will not in themselves achieve circularity. Circularity is achieved when someone making a new product actually uses reused materials instead of new ones.

Most parts and materials from petroleum installations that are reused today are reused within the petroleum industry, primarily within the same company. This is not negative in itself, but to achieve a higher degree of reuse and maximization of the value of these materials and components, the market for reused materials must be expanded. One rarely sees material go to other industries without being recycled instead of reused.

There is a growing interest for reusing petroleum installations or parts of them in new offshore energy projects, such as hydrogen production and transport, carbon capture and storage, offshore wind, or other uses. Onshore industries, however, may offer less potential or be less inclined to acquire materials or components from the petroleum sector. This may be due to a lack of incentives for this type of reuse in the regulatory framework, or because there might be fewer cost savings in reusing materials originally designed for offshore use, onshore.

In the following, we will highlight a few examples of regulatory barriers connected to the lack of secondary market development. Many more could likely be identified, but the aim here is to shed light on a type of challenge, not to provide an exhaustive overview.

5.6.2 Public Procurement

It can be controversial to impose too many absolute requirements on buyers and sellers, partly because such requirements may be difficult to meet, and partly because a free market may develop better solutions on its own. At the same time, the EU has clearly stated that it will use public procurement regulations—which cover the majority of public sector purchases—to promote the green transition.[107] Public restrictions must therefore be put on public procurement rather than trade in general. The public sector, taken as a whole, is a major customer with significant potential to influence the market by setting requirements for suppliers. In general, suppliers only offer what customers demand. Private buyers will normally not have the opportunity to risk financial losses in order to promote new circular solutions, albeit some exceptions can be found. Therefore, it is important that the state contributes to the development of new markets for circular solutions by prioritizing them in public procurements.

The Fredriksen Committee, which has proposed a new procurement framework, pointed out that green procurement must be made easier. This aligns with the analysis from the Norwegian Agency for Public and Financial Management (DFØ): reuse requires competence. This means knowing that something is available in the market and being able to assess whether it is good enough. When the public sector is the customer, it is typically a contractor who purchases pipes from the petroleum industry. Contractors are often reluctant to try something new unless the customer insists.

[107] See NOU 2023: 16, p. 121.

Public procurement is carried out under the Public Procurement Act and its regulations, which are issued by the Ministry. Procurement is conducted by each individual organization. This means that the implementation level is far removed from those who design the rules. In some cases, the person technically responsible for a procurement will have specific expertise related to the item being purchased, but this is far from always the case. Time pressure is another factor. This makes it harder to carry out good, green procurements. It is difficult to set appropriate requirements for suppliers when one lacks sufficient knowledge of the subject.[108] We have found few municipal procurement guidelines that clearly promote circular solutions beyond what is already required by law, and only one of these includes clear, absolute requirements related to reuse.[109]

The Fredriksen Committee's mandate included measures to ensure that "public procurement in practice [should] contribute to a green circular economy."[110]

The committee points out that the Public Procurement Act already requires public entities to organize "procurement practices in a way that helps reduce harmful environmental impacts and promote climate-friendly solutions where relevant."[111] It has proposed standardized minimum requirements for certain environmental criteria to ease the burden on contracting authorities.[112] In addition, environmental product declarations could help buyers without specialized expertise. Production pipes are an example of equipment that could be suitable for such declarations.

The committee does not specifically mention reuse of materials from the petroleum industry as a source of reused materials. Nevertheless, it is clear that both the existing and proposed procurement regulations imply that the public sector should promote reuse of materials from the petroleum industry where appropriate.

However, there is a difference between promoting reuse in general and promoting reuse from a specific sector. If a contracting authority specifically requires that a supplier use reused materials from the petroleum industry, this could quickly lead to violations of competition rules, which are part of the procurement regulations. Still, the regulations could be used more actively to highlight the public sector's role in developing new markets. The procurement framework is designed to give new suppliers a chance, but this consideration could be better reflected in specific rules. For example, one could allow for additional points in bid evaluations if a supplier offers reuse of materials from what might be called new sources—i.e., new subcontractors or new industries, such as the petroleum sector.

Another issue is the extent to which delays should be allowed. Normally, a supplier must deliver within a certain deadline. This can be difficult for the petroleum industry to meet, due to unpredictable weather conditions in the North Sea. As long as late delivery is costly for suppliers, they will avoid such risks. One could imagine allowing more flexibility for delays without penalties for suppliers with a particularly green profile, but this could lead to unfair competition if Supplier A receives extra points for offering reused materials from the petroleum industry but later either has to deliver from a "regular" subcontractor or delivers late.

[108] NOU 2023: 26, section 14.1.5, p. 121.
[109] https://www.lillestrom.kommune.no/globalassets/pdf/planer-og-strategier/strategi-for-gronne-innkjop.pdf
[110] NOU 2023: 26, section 2.1.1.
[111] NOU 2023: 26, section 14.1.5, p. 121.
[112] NOU 2023: 26, section 14.1.5, p. 121.

The lack of standardized environmental declarations may also be a problem. The petroleum industry itself could contribute by developing a standard, but such a standard will not help unless it is accepted by the client. We will return to this in the next section. Standardized environmental declarations require detailed information on emissions and energy use. It would likely not be costly for the petroleum industry to provide these figures, as the EU already requires detailed greenhouse gas accounting in connection with decommissioning projects.

5.6.3 Construction Industry

The construction and civil engineering sector are a potential recipient of reused materials from the petroleum industry. For example, steel pipes retrieved from wells could be used for piling in new buildings or renovations. In such cases, it must be documented that the beams have "adequate properties that contribute to the building meeting the requirements in [...] [the Building Technical Regulations (TEK 17)]," cf. TEK 17 § 3-1.

TEK 17 specifies detailed requirements for certain building materials. Guidance documents are available on the Norwegian Building Authority's (DiBK) website to help identify documentation requirements for the type of material one wishes to supply. There are also requirements for preparing greenhouse gas accounts for materials, see TEK 17 § 17-1. The account must include emissions related to production and transport, emissions on the construction site, and emissions from maintenance and replacement if the lifespan is shorter than 50 years after installation.

TEK 17 is issued under the Planning and Building Act. Neither the consultation letter for the regulation nor the preparatory works for the Act mention reused materials. Circularity is generally absent from the consultation letter, and what is said in the preparatory works relates to planning for future reuse when building today.

The TEK 17 guidance, prepared by DiBK, also says little about circularity. Reuse of building materials is only mentioned on page 26, in connection with calculating the climate footprint under § 17. It states that one must include "emissions from processing the products so that they are suitable for reuse" and "transport emissions from storage or demolition site to the construction site." A 2018 report prepared for DiBK by Asplan Viak concluded that the environmental requirements in TEK could be better designed to promote sustainable resource use.[113] The report does not directly address the reuse of materials from other industries.

Taken together, these factors mean that the regulations provide no incentives or support for choosing reused materials from the petroleum industry. The focus of the regulations and related guidance is on preparing a new building for future reuse, not on reducing emissions during construction. There is a need for stronger positive support for reuse in both new construction and renovation of older buildings, from the petroleum industry and other sectors. In addition, reuse must be made easier. This includes the ability to assess, in a low-resource way, whether the quality of potential reused materials is sufficient.

[113] Asplan Viak/DIBK, Utredning av livsløpsbaserte miljøkrav i TEK, 2018, https://www.dibk.no/globalassets/02.-om-oss/rapporter-og-publikasjoner/utredning_av_livslopsbaserte_miljokrav_i_tek_asplan_viak_2018.pdf, p. 72.

The latter is already underway. Nordic Circles is a private company working to develop a circular economy. In collaboration with public and private partners, the company has developed a technical specification for the upcycling of maritime metals. This specification makes it possible to classify the quality of metal that has been used at sea. It is based on the Swedish Mechanical Engineering Association's standard Återbruk av stål i bärande konstruktioner – krav- & processbeskrivning, which has been further developed into a European standard: CEN/TS 1090-201. Another example is Bara Eiendom, who is constructing a new building using reused materials from the petroleum industry at Kronstad in Bergen. Finally, one can mention that aluminium from the Gyda platform was used to build a walkway in the Norwegian city Trondheim.

Nordic Circles AS relies on its technical specifications when upcycling materials from ships and oil rigs into diverse building products. Facsimile: https://www.nordiccircles.com/products

The oil production vessel "Curlew" is being reused by Bara Eiendom AS in the construction of a commercial building in Bergen and a multi-purpose hall in Oslo, Norway. Photo: AF Gruppen AS: https://www.estatenyheter.no/bara-eiendom-bergen/gjenbrukt-stal-fra-skip-blir-en-viktig-del-av-dette-bygget/463230 and https://www.afgruppen.no/presse/artikler-af-posten/2024/stal-fra-curlew-blir-brukt-i-flerbrukshall-i-oslo/

The aluminium from the Gyda Platform has now been given new life as a pedestrian bridge in Trondheim, Norway. Photo: Vegard Thorvaldsen/Statens vegvesen. https://www.hydro.com/en/global/media/news/2025/landmark-aluminium-bridge-built-with-recycled-materials-opens-in-norway/?fbclid=IwY2xjawNJseRleHRuA2FlbQIxMAABHs4aw_yTelcJQfaRx55m8VGxUXjidLZtkgG_cvwJ1im0mlfRhDrMvaoek1yE_aem_z453PN-yHJ0QBMNcX8_TSA

5.7 Lack of Collaborative Platforms

Both the Netherlands and the United Kingdom have developed collaborative bodies to promote effective solutions for the decommissioning of petroleum installations. These facilitate knowledge sharing and the exchange of best practices among industry stakeholders.

The Dutch Masterplan for Decommissioning and Re-Use included a proposal to establish a national platform for reuse and decommissioning. This platform has been established and is called Nexstep. Through Nexstep, which can be said to be a think tank for decommissioning partners in the Dutch petroleum industry, one ensures information spread, thereby enabling operators to attain updated knowledge on decommissioning solutions even before the application gets sent to the Ministry.

The UK has developed several working groups focused on decommissioning. One of these is the Decommissioning and Repurposing Taskforce (DaRT), which aims to contribute to more resource-efficient and environmentally friendly decommissioning. As the name suggests, reuse is a key part of the task force's work. DaRT can be compared to the Dutch Nexstep. Both public and private actors are members of DaRT. Overall, the UK appears to have policies and strategies that encourage authorities to facilitate and promote knowledge sharing to stimulate innovation and avoid duplication of effort.

Such a collaborative platform does not exist in Norway. In Norway, Offshore Norge represents the interests of private parties. There is no equivalent collaborative body involving public authorities, as in the Netherlands and the UK. Well-functioning communication channels have already been established. However, the mandates under which such formal working groups operate provide both an incentive and sufficient opportunity to work more systematically on developing decommissioning solutions that benefit both the environment and the economy.

In Australia, there are no collaborative groups equivalent to DaRT and Nexstep. However, NOPSEMA has become more proactive in recent years and increasingly challenges operators. For example, it can propose measures rather than merely assess whether the measures in a submitted decommissioning plan are adequate. In January 2024, NOPSEMA issued an information note on planning for proactive decommissioning.[114] In this way, NOPSEMA is taking on some of the roles that DaRT and Nexstep have in the UK and the Netherlands, respectively.

5.8 Contractual Limitations

The rules established by public authorities have limited scope. What is not mandatorily regulated by law or regulation can be governed privately. In the petroleum industry, as in other sectors, private regulation is highly significant—partly through internal company policies, and partly through agreements between private parties. An agreement is binding between the parties but not on third parties. If one party fails to comply with the agreement, they may be held liable by the other party, for example through claims for damages or restitution.

On the Norwegian Continental Shelf, the Norwegian Total Contract (NTK) dominates as the contractual framework of choice between the owner of an installation and the party or parties

[114] NOPSEMA 2024.

responsible for its construction. NTK governs the relationship between the client and the contractor for all installations on the Norwegian shelf. The agreement is governed by Norwegian law.

Part X of the NTK contract model regulates intellectual property rights and access to information. These provisions are of relevance when it comes to decommissioning matters. Clause 33.2 of NTK states that the contractor owns all information about the installation that the contractor has "made available," all information that builds upon that information, and all inventions the contractor has made in connection with the installation. The client, or the client's successor, may not share this information with others without the contractor's consent, unless one of the exceptions in clause 34 applies.

If an installation or parts of it are to be reused, the new owner must be able to access information about the installation. If not, it will be difficult to fulfil requirements set in both public regulations and private standards for safety and security, i.e. to document the suitability and well-functioning of units or parts of them. The same applies to demolition, as the party responsible must know, for example, whether the unit contains asbestos in order to ensure a safe working environment for workers.[115]

The design of the intellectual property clause in the NTK and other standard contracts means that consent from the owner of the information is required in order to share information with a potential acquirer of the entire installation or parts of it. Often, it will be difficult to identify the owner due to changes in the company structure of the owner, which have resulted in altered ownership relations. In such cases, there is no counterparty with whom one can negotiate to obtain an agreed exception to the clause. If a patent related to the installation exists, it will be possible to identify the patent holder through the Patent Register.

In the future, such issues could be resolved by introducing a time limit for ownership restrictions in new versions of the NTK, or by including reuse as one of the grounds for the right to share information otherwise covered by the clause. However, such a new clause must be drafted with caution to avoid a situation where a contractor's or manufacturer's competitors gain access to trade secrets by purchasing an installation or equipment from them.

Any such clause would, in any case, not solve the problem for installations that have already been built. The question that arises is whether it is legally possible to share the information with a purchaser of the whole or parts of the installation without obtaining the contractor's consent.

The NTK provides exceptions to the duty of confidentiality in certain cases. The most relevant of these, however, do not apply to the decommissioning phase. It is conceivable that the agreement could, in extreme cases, be modified under Section 36 of the Norwegian Contracts Act (Avtaleloven) concerning unreasonable agreements. In such a balancing of interests, weight may be given to the necessity of enabling decommissioning for reasons of both safety and environmental protection, and to the fact that installations several decades old no longer constitute technological innovations, meaning that trade secrets are, at least for parts of the

[115] The Petroleum Safety Authority (PSA) 2020, p. 32, points to the lack of "as built" documentation as a safety issue. PSA 2020, p. 38, states: "It is not uncommon that modules and structural elements have been modified over the years without this being documented." This means that the information available to a party taking over the installation is more extensive than is often assumed.

installations, no longer at stake. Nevertheless, the Supreme Court has set the threshold for modification under Section 36 so high that it cannot be considered likely that it will be applied. It is also unlikely that other contractual adjustment rules could be invoked.

Private parties cannot, by agreement, exempt themselves from a statutory obligation to share information. Currently, there are no legal provisions requiring the sharing of technical information about an installation, when necessary to enable circularity. A legislative amendment would take time to implement but would ensure that the necessary information is available, provided it exists. When drafting any such legislative proposal, attention must be paid to the requirements of the Trade Secrets Act, which implements Directive 2016/943. A well-designed legislative process could likely result in an effective rule on information sharing that does not infringe upon the contractor's rights under other legislation.

6

6 Summary and Recommendations

This report provides an overview of national and international legal instruments relevant to the decommissioning of petroleum activities and circularity. It also explains their relationship to practical and technical challenges and outlines how existing regulations partly hinder and partly fail to promote circularity in decommissioning, as well as provides a comparative analysis of how this is handled in the United Kingdom, the Netherlands, and Australia.

In general, the regulatory framework for all types of activities in Norway is underdeveloped. The state may, through various adaptations, to a greater extent facilitate circularity in the end-phase of petroleum activities.

We have several suggestions to the regulators to promote reuse:

- Update the regulatory framework
    - Clarify how long an owner or operator is responsible for the installation and what that liability entails.
    - Incorporate the waste hierarchy to raise awareness of circularity in the petroleum sector and other industries, e.g., by requiring actors to assess reuse more thoroughly.
    - Create transitional arrangements for reused materials when the equipment may not be installed on a new platform because new, stricter equipment requirements have been introduced.
    - Reduce documentation requirements for reused materials where possible without compromising safety for people and the environment. Ideally, a certification system for reused materials should be introduced.
    - Reassess the Export Control Act and how stringent the rules are for repurposing of offshore oil and gas parts of materials.
- Strengthened cooperation
    - Continuous development and reinforcement of cooperation between various public agencies, such as the Ministry of Energy and the Ministry of Climate and Environment, both between the agencies themselves and in relation to private actors in the preparation and approval of decommissioning plans.
    - Ensure that cooperation between private actors and public authorities is as effective as possible, with a focus on achieving the best possible outcome.

- Increased focus on circularity and further development of a market

    - Clarify that the decommissioning plan is an important tool for ensuring the best possible circularity solutions during decommissioning, including reuse, and ensure that these aspects are effectively considered when evaluating the decommissioning of petroleum activities.

    - Distinguish between reuse, repurposing, and upcycling where appropriate.

    - Assess and/or facilitate the possibility of reuse or repurposing of offshore energy infrastructure in public procurements where such components or elements may be relevant.

    - Ensure the development of technical standards that enable effective reuse, for example by updating TEK17.

    - Promote the establishment of an organisation whose main objective is to advance circularity in the decommissioning phase. The organisation must be adapted to Norwegian conditions but may draw inspiration from the Dutch Nexstep and the British DaRT.

Some potential measures lie outside the state's jurisdiction. Therefore, the industry can be encouraged to:

- Amend NTK

    - Include reuse as a valid basis for sharing information about installations.

    - Seek new insurance or financing solutions that reduce the risk associated with reuse. It is important to provide suppliers with incentives that allow for the reuse of equipment.

- Develop modular design

    - Develop standardised common solutions that make it possible to transfer equipment from one installation to another with minimal need for adjustments.

- Promote secondary markets by

    - identifying equipment and materials suitable for reuse and researching which industries could be good markets for selling them.

    - informing authorities about the need for public schemes that can enable effective reuse, e.g., by making it attractive for suppliers to repair and sell rather than sell new products.

    - making greater use of digital platforms, such as Offshore Norge's material management services for sharing and selling equipment and tools.

National Strategies

National strategies for petroleum decommissioning can make valuable contributions to achieving greater circularity. Currently, there are no strategies directly targeting the petroleum sector. The general strategies are not tailored to the specific conditions that apply to offshore petroleum activities. An additional consideration is that a new strategy could address not only the use of new materials suitable for future reuse but also the reuse of what we already have. The national strategy should at a minimum address the following points:

- Take a holistic view on decommissioning and circularity.
- Foster and support academic and applied research and development in decommissioning practices.
- Create a national centre for decommissioning practices based on a not-for-profit model that conducts training, research and outreach functions. Such national centre could be modelled after the Centre of Decommissioning Australia (CODA).
- Overcome the following challenges:
    - Unclear regulations – actors that are unsure of the applicable rules will choose the safest option.
    - Uncertain financial outlook – large potential costs may make operators and owners hesitant to transfer installations to new users, as the potential loss outweighs the expected gain. To increase circularity, there must be financial incentives for all parties. This underscores the importance of establishing a reuse market.
    - Practical barriers – even if obstacles can be overcome, the effort may cost more than the potential gain, reducing the willingness to carry out the task.
    - Uncertain returns – the risk of loss or lack of profit may be enough to deter actors from trying new circular measures.

It is important to recognize that the legal framework must apply to the reality that exists today. One must distinguish between what is achievable now and what may be achievable in the future. This means finding a balance between predictability and adaptability of the legal framework, and which may involve a combination of hard and soft law instruments. This is so because new technology will make circularity less resource-intensive in the future, and the spread of knowledge will make it easier to find the best solution for a decommissioning project.

Finally, establishing national strategies and facilitating increased recycling and reuse should be a goal in itself. Increasing circularity will contribute to greater circularity in the petroleum sector and thus reduce resource use for the benefit of society as a whole and contribute to the decarbonization of the sector.

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on behalf of Offshore Norge