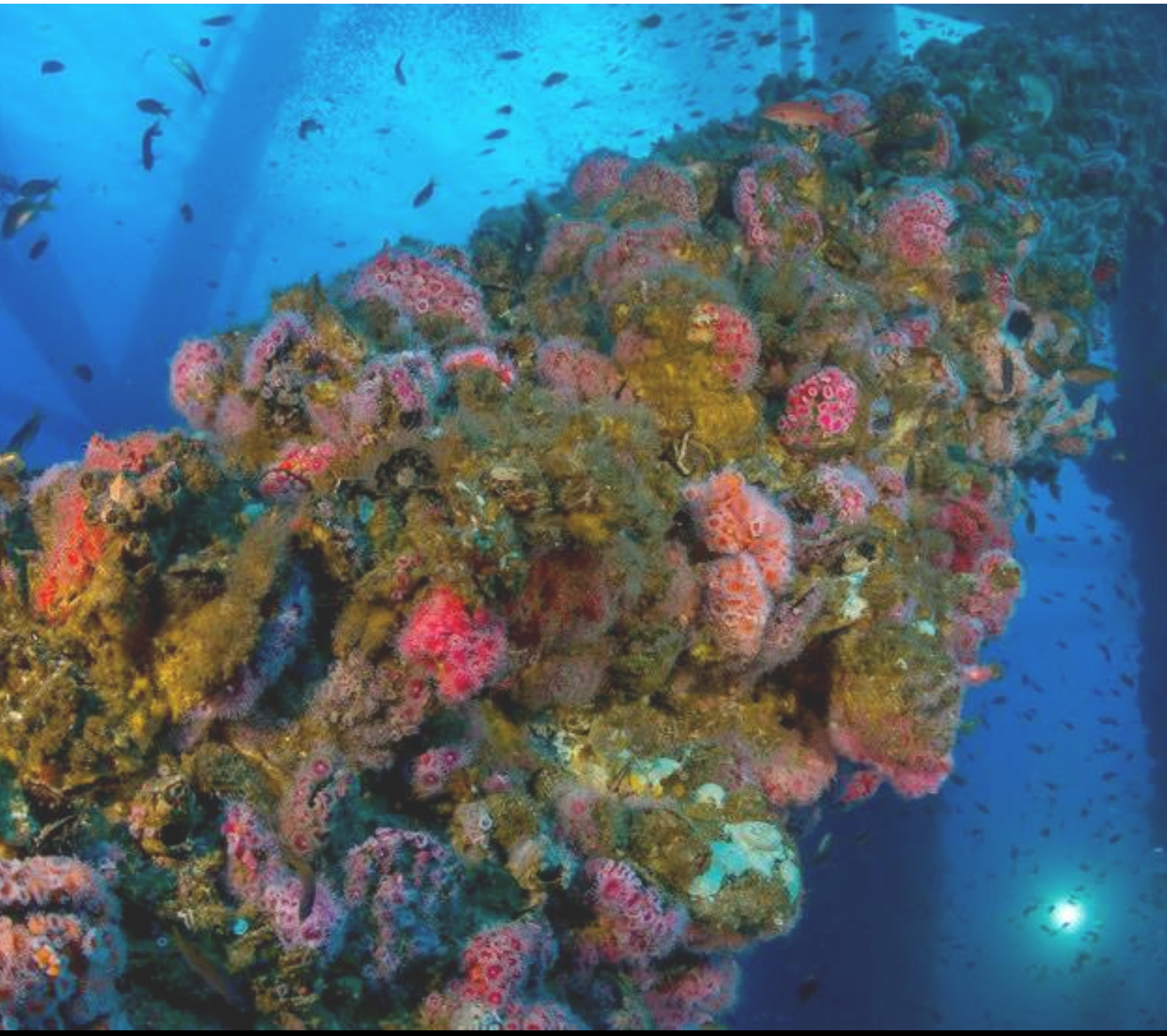

# Policy change in offshore decommissioning governance: Dealing with environmental politics and coping with ecological uncertainty

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15th February 2019
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# Policy change in offshore decommissioning governance: Dealing with environmental politics and coping with ecological uncertainty

A comparative study of offshore oil and gas in the Dutch North Sea and Australian Commonwealth Waters

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# Abstract

Decommissioning, or the end-of-life phase, of offshore oil and gas structures has increasingly become a topic of interest as more structures are nearing the end of their productive life. Decommissioning activities are complicated operations with different environmental, technical, economic, and safety aspects to consider, which potentially present many economic and ecological opportunities. Yet, we know remarkably little about the environmental impacts of offshore structures and decommissioning thereof on the marine environment. This ecological uncertainty is vitally important in the governance process, particularly in regard to how a variety of management options are negotiated and decided upon in processes of environmental politics. In addition, the decommissioning discussion is a politically potent topic as stakeholders adopt a variety of decommissioning discourses based on their interpretation of what constitutes a responsible approach to decommissioning. This also leads stakeholders to cope with ecological uncertainty and interpret scientific information in certain ways. This thesis addresses how environmental politics and ecological uncertainty may lead to the stabilization or destabilization of policy arrangements by performing a comparative assessment of decommissioning governance approaches in the Netherlands and Australia. I have drawn on theories of Governance and Policy Arrangements and developed a novel framework for classifying decommissioning discourses. Despite the very different physical and political environments in the Netherlands and Australia some similarities were observed with regards to the effect of environmental politics and ecological uncertainty on policy change, which arguably could carry through to policy arrangements elsewhere in the world. In order to reach transparent, participatory, and consensus-bases decommissioning governance, some degree of governance reform is required. This study concludes with suggestions of what such governance reform might look like in order to reach good governance for offshore decommissioning.

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# List of abbreviations

| | |
|---|---|
| **AIMS** | Australian Institute for Marine Science |
| **ALARP** | As Low As Reasonably Practicable |
| **APPEA** | Australian Petroleum Production & Exploration Association |
| **BAT** | Best Available Techniques |
| **BEP** | Best Environmental Practice |
| **CSIRO** | Commonwealth Scientific and Industrial Research Organisation |
| **DEE** | Commonwealth Department of Environment and Energy |
| **DG ENER** | Directorate-General for Energy of the European Union |
| **DG ENV** | Directorate-General for Environment of the European Union |
| **DG MARE** | Directorate-General for Maritime affairs and fisheries of the European Union |
| **DIIS** | Commonwealth Department of Industry, Innovation and Science |
| **DMIRS** | Western Australian Department of Mines, Industry Regulation and Safety |
| **DOI-CRC** | Decommissioning Offshore Infrastructure Cooperative Research Centre, proposed Australian research initiative |
| **EA&CP** | Dutch Ministry of Economic Affairs and Climate Policy |
| **EBN** | Energie Beheer Nederland, a company which invests in the Dutch oil and gas industry on behalf of the Dutch government |
| **EC** | European Commission (also referred to as the European Union) |
| **EIA** | Environmental Impact Assessment |
| **eNGO** | Environmental non-government organization |
| **EP** | Environment Plan |
| **EPBC** | Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 |
| **EU** | European Union (also referred to as the European Commission) |
| **I&WM** | Dutch Ministry of Infrastructure and Water Management |
| **IMO** | International Maritime Organization |
| **INSITE** | INfluence of man-made Structures In The Ecosystem, a major scientific project initiated and facilitated by Oil & Gas UK (the industry representative in the UK) |
| **IRG** | Independent Review Group |

| | |
|---|---|
| **LiNSI** | Living North Sea Initiative, a North Sea wide, science-based, multi-stakeholder program supported by the oil and gas industry of the North Sea |
| **MA** | Multi-criteria decision Approach |
| **MOU** | Memorandum of Understanding |
| **NDRI** | National Decommissioning Research Initiative, a scientific research initiative initiated and facilitated by NERA |
| **NERA** | National Energy Resources Australia, a government funded 'Oil, Gas and Energy Resource Growth Centre' |
| **NIOZ** | Royal Netherlands Institute for Sea Research |
| **NOGEPA** | Netherlands Oil and Gas Exploration and Production Association |
| **NOPSEMA** | Commonwealth National Offshore Petroleum Safety and Environmental Management Authority |
| **NWO** | Netherlands Organization for Scientific Research (Nederlandse Organisatie voor Wetenschappelijk Onderzoek) |
| **NWA** | Dutch National Research Agenda (Nationale Wetenschapsagenda) |
| **OPGGSA** | Commonwealth Offshore Petroleum and Greenhouse Gas Storage Act 2006 |
| **OSPAR** | Convention for the Protection of the Marine Environment of the North-East Atlantic |
| **P(SL)A** | Western Australian Petroleum (Submerged Lands) Act 1982 |
| **PAA** | Policy Arrangements Approach |
| **SDA** | Environmental Protection (Sea Dumping) Act 1981 |
| **SLA** | Service Level Agreement |
| **SOP** | Standard Operating Procedure |
| **SSM** | Dutch State Supervision of Mines |
| **UN** | United Nations |
| **UNCLOS** | United Nations Convention on the Law of Sea 1982 |
| **WAMSI** | Western Australian Marine Science Institute |
| **WWF** | World Wildlife Fund |

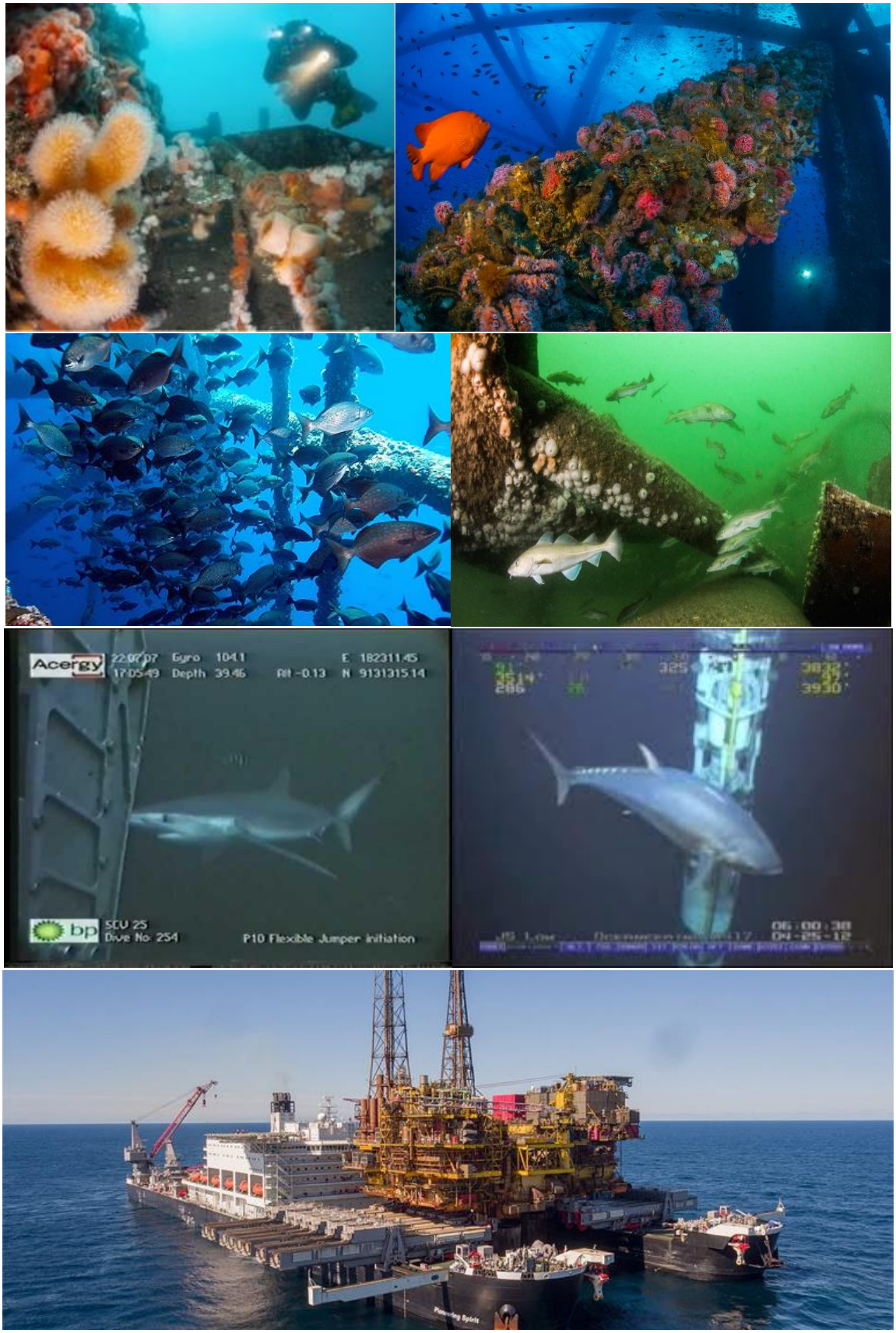


*Figure 1.1 – A, B, C) Various sponges an corals growing on steel jackets (respectively Coolen & Jak, 2018; Platko, 2016; Burlingham, 2012) D) cod, which is an economically important species, around an offshore structure (Kuyvenhoven, 2018), E, F) ROV footage of shark and tuna, which are ecologically important species, around an offshore structure (respectively BP, n.d.; Oceaneering, n.d.), G) the Pioneering Spirit, the largest decommissioning vessel in the world, lifting a platform's topside (Shell UK, n.d.).*

# 1. Introduction

## *1.1. The newly emerging field of offshore decommissioning*

### 1.1.1. A wave of opportunities

Around the world there are more than 7000 offshore oil and gas structures in over 53 countries (Lakhal et *al*., 2009; Techera & Chandler, 2015). In the next few decades, more and more of these structures will reach the end of their operational life and will need to be decommissioned (Day & Gusmitta, 2016). These upcoming decommissioning projects present both ecological and economic opportunities. Though many people are aware of what offshore rigs look like above the surface, many are unaware of the ecosystems which evolve on and around offshore oil and gas structures throughout their operational life below the surface. Depending on the age of the structure and the successional stage of the ecosystem these may include abundant benthic communities (fig. 1.1A&B), schools of fish (fig. 1.1C&D), and even top predators such as sharks and tuna (fig. 1.1E&F). These ecosystems may present a great ecological opportunity for marine ecosystem enhancement or restoration. Especially in highly degraded areas, leaving certain structures in place may provide an opportunity to improve environmental conditions. Innovative approaches, such as building artificial reefs from old rigs, have already taken shape. Additionally, an economic opportunity is presented for the offshore services sector in developing technologies and techniques for decommissioning (Cullinane & Gourvenec, 2017). The offshore services sector may want to advance their vessels (fig. 1.1G), tooling, disposal facilities, and trained workforce for offshore decommissioning (Crager, 2015; Cullinane & Gourvenec, 2017), with the prospects of being able to export their skills, capabilities, and experience to decommissioning projects around the world and potentially to contribute to economies (Crager, 2015; EBN, 2017; Cullinane & Gourvenec, 2017). Hence, the upcoming decommissioning projects represent a carte blanche for innovative thinking, new technologies and collaborative approaches (Cullinane & Gourvenec, 2017). A new field emerges within the oil and gas industry as the wave of opportunities that come with it are zealously explored.

### 1.1.2. The concept of decommissioning

The word ‘decommissioning’ often still gets used interchangeably with words as ‘abandonment’ and ‘removal’. However, the concepts and resonance behind these words are different. Abandonment has the connotation that a structure will be permanently disused and left; removal has the connotation that a structure will be removed completely. Decommissioning essentially could refer to either or neither of these approaches, as it refers to any approach leading to the disuse of old oil and gas structures. Unfortunately, abandonment and/or removal are primarily used to describe the end-of-life phase of an oil or gas structure, instead of the broader concept of decommissioning. For example, the word decommissioning does not occur in any international treaties or laws, or in the Schumberger Oilfield Glossary (Techera & Chandler, 2015). It is therefore important, in the context of this study, to define precisely what is meant with decommissioning and to define a certain taxonomy of the different approaches to decommissioning.

For the purpose of this study, ‘decommissioning’ is defined as the management of wastes at the end-of-life phase of oil or gas structures, such as obsolete topsides, decks, jackets, footings, subsea manifolds, and pipelines, and drill cuttings and other debris which might have accumulated on the seafloor during the operational phase of a structure (See Annex I on p. 77 for definitions of these technical terms). Other wastes that should be considered when thinking about decommissioning are

those originating from the vessels carrying out the decommissioning, and chemical and radioactive wastes.

There are many forms of decommissioning, mainly because of the wide array of types of structures out there. Essentially, as can be seen in fig. 1.2, every structure is different and therefore requires its own customized approach to decommissioning. For the purpose of this study the primary consideration is whether a structure will be completely removed, partially removed, or left in place. Each of these decommissioning options and their sub-divisions comes with different environmental, technical, economic, and safety aspects to consider, which may also vary per individual structure (Henrion et *al*., 2014; Fowler et *al*., 2014; Day & Gusmitta, 2016). For example, a concrete gravity platform will require different decommissioning approaches than a steel jacket or a subsea structure, and will also present very different technical, safety, and environmental challenges.

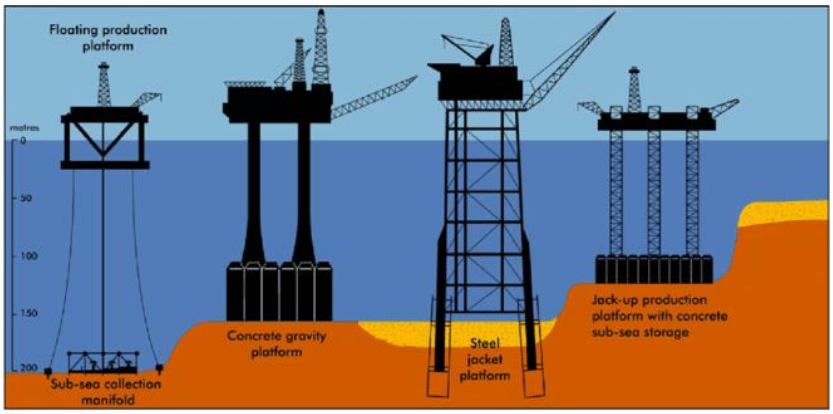


*Figure 1.2 – Illustration showing different types of offshore oil and gas structures (adapted from Ayadi & Mohamed Ali (2013)).*

## *1.2. Problem definition*

### 1.2.1. Removal yes or no?

With all these different approaches to decommissioning an important discussion has taken shape asking what can be considered as an appropriate approach to decommissioning. As mentioned earlier, each decommissioning option comes with different environmental, technical, economic, and safety aspects to consider. For some of these aspects it is relatively easy to determine whether a certain approach is appropriate or not. For example, decommissioning projects should always be technically feasible; costs of projects should always be minimalized; and safety of operations should always be guaranteed. These considerations all steer the decision-making process. But one aspect we know particularly little about is the environmental aspect of decommissioning. While some preliminary science has emerged over the past years of the environmental effects of different offshore decommissioning methods (e.g. Neira, 2005; Lakhal et *al*., 2009; Claisse et *al*. 2015; Fuji, 2016; Chandler et *al*., 2017; Rouse et *al*., 2018), a lot of ecological uncertainty remains. This makes it unclear what might constitute an environmentally responsible approach to decommissioning. The lack of knowledge on the environmental impacts of offshore structures and decommissioning thereof on the marine environment is vitally important in the governance process, particularly in regard to how alternative management options are negotiated and decided upon. But as argued by Kahan et *al*. (2012), “a high level of numeracy is no guarantee that people’s assessments of environmental risks will be closer to the scientific consensus”, indicating that people’s own interpretation of what

constitutes an environmentally responsible approach to decommissioning plays an important role. As a result a decommissioning discussion emerges which is primarily political: removal yes or no?

While some argue that offshore structures are unnatural additions to the marine environment and should be removed, others recognize an opportunity for ecosystem enhancement or restoration. For example, it has been suggested that structures that are left in place or disposed of elsewhere on the sea floor could become refuges for many (threatened) organisms and help to re-populate the local fish and/or invertebrate populations, by functioning as artificial reefs (Neira, 2005; Lakhal et *al*., 2009; Claisse et *al*. 2015; Fuji, 2016; Rouse et *al*., 2018). What is more is that large-scale social movements, such as ecological modernization and sustainable development have put emphasis on reducing wastes and sharing resources (Arts & Leroy, 2006). In the case of offshore structures and decommissioning thereof, this has led to ideas of re-using and re-cycling obsolete offshore structures (Techera & Chandler, 2015; NOPSEMA, 2017; EBN, 2017; Nexstep, 2018a). For instance, structures may be re-used for marine research facilities, renewable energy technologies, aquaculture, or tourism, or be re-cycled in younger platforms (Chandler et *al*., 2017; Buck & Langan, 2017).

As a result of these new decommissioning narratives and the lack of environmental knowledge, environmental politics and ecological uncertainty may have a major impact on the stabilization or destabilization of existing policy arrangements, potentially leading to major policy changes. It is therefore all the more important to find a way to deal with environmental politics and cope with ecological uncertainty so as to govern offshore decommissioning in as careful a way as possible. In order to do so a thorough understanding of offshore decommissioning policy arrangements and how they are influenced by dynamics of environmental politics and ecological uncertainty is required.

### 1.2.2. Offshore decommissioning governance

Traditionally, the governance of oil ang gas activities has been predominantly state-led. More recently, government agencies have started to consult the oil and gas industry when drawing up national regulatory frameworks (Hamzah, 2003). Moreover, the offshore oil and gas sector has seen the emergence of public-private partnerships, where the public and private sectors work together due to collective interests, such as the environmentally responsible governing of oil and gas. Globally there is a large amount of fragmented policy frameworks governing oil and gas activities, making it hard to navigate the complex regulatory landscape (Techera & Chandler, 2015). Decommissioning is only covered to very limited extent in international conventions and laws, presumably due to the lack of attention that has been paid to decommissioning in the past. The international regime regarding offshore decommissioning is ambiguous, uncomprehensive, and outdated, leaving most of the decommissioning policy- and decision-making to the national governments (Hamzah, 2003; Lyons, 2014; Techera & Chandler, 2015). This implies that there are many different approaches to decommissioning governance. Of course, the varying political and policy contexts in individual countries has great effect on how the newly emerging field of decommissioning is governed and how policies are put into practice. While there is a precedence for complete removal in the international arena, national governments have applied this precedence to varying degrees within their jurisdictions. Varying from the United States' 'Rigs-to-reefs' approach to the strict removal policy in European countries bordering the North Sea. It is therefore expected that environmental politics and ecological uncertainty are dealt with in different ways and can result in stabilization or destabilization of existing decommissioning policy arrangements in different countries.

### 1.2.3. Building on international experiences

While some countries, such as the United States and the United Kingdom, are already experienced in decommissioning and have established elaborate policy frameworks (Techera & Chandler, 2015), other countries, such as the Netherlands and Australia, have a younger oil and gas industry and are thus less experienced in this field (EBN, 2017; NOPSEMA, 2017). These less experienced countries are in a favorable position as they can build on international experiences and learn from challenges previously dealt with by other countries rather than reinventing the wheel.

Comparative studies such as this one may aid in identifying how different policy arrangements deal with a range of decommissioning narratives and uncertainties. It is important to draw comparisons between countries that show variance between them. If we only look at governance questions within a single country, then any answer to these questions may be incomplete or incorrect, as it only applies to that single country (Peters, 2000; Crabbé & Leroy, 2008). The same aspects that appear to be associated with failure in one country may appear to be associated with success in another (Peters, 2000). Therefore, when carrying out comparative case studies we do not only provide a deeper understanding of processes of decommissioning governance in a particular country, but we can also formulate more general conclusions about decommissioning governance (Peters, 2000; Crabbé & Leroy, 2008). A comparison between the Dutch and Australian approaches to offshore decommissioning will be interesting and informative due to the similar, young age of their offshore oil and gas industries, yet they are subject to very different institutional, policy, and political contexts. The Netherlands is subject to the very strict regime in the North Sea, while Australia's regime is much more flexible. A comparison between the two will therefore very clearly show how different processes of politics and policy-making can lead to very different governance approaches to dealing with a range of decommissioning narratives and uncertainties. Both countries recognize the importance of learning from international experiences in offshore decommissioning in order to determine what approaches have and have not been successful and for what reasons (EBN, 2017; NOPSEMA, 2017). Other comparative studies have already been carried out with the United States, the United Kingdom, and other Northern European countries with tentative recommendations as result (e.g. Athanassopoulos et *al*., 1999; Techera & Chandler, 2015).

## *1.3. Research objective and research questions*

The research objective of this study is to investigate how ecological uncertainty and environmental politics can lead to policy change in offshore decommissioning policy arrangements. This objective will be reached by comparing case studies of Dutch and Australian governance approaches and identifying structural elements (e.g. legislative frameworks, stakeholder interactions, etc.) which stabilize or destabilize these offshore decommissioning policy arrangements. Due to the comparative nature of this study, I will also be able to draw more general conclusions on how policy change can occur in offshore decommissioning policy arrangements and provide recommendations on how to deal with environmental politics and cope with ecological uncertainty. In order to reach the objective, the following research questions and sub-questions are asked:

- How do ecological uncertainty and environmental politics lead to policy change in the offshore decommissioning policy arrangements of the Netherlands and Australia? (chapters 4 & 5)
    - How do interactions within policy arrangements structure decommissioning governance in the Netherlands and Australia?

    - How do the Netherlands and Australia deal with environmental politics and cope with ecological uncertainty?
- How are the offshore decommissioning policy arrangements different or similar in the Netherlands and Australia? (chapter 6)
- What general insights do the observed decommissioning governance regimes provide on policy change as a result of ecological uncertainty and environmental politics, and what recommendations can be made on how to deal with environmental politics and cope with ecological uncertainty? (chapter 7)

### *1.4. Study outline*

Chapter 2 will explain the key concepts, theories and analytical tools used to carry out this study. By forming the theoretical basis for this study, this conceptual framework will be used to answer the research questions in a structured way. The conceptual framework consists of theories of governance, the Policy Arrangement Approach (PAA) by Arts & Leroy and colleagues (2006), a novel framework for categorizing decommissioning discourses, and theories on policy change. Then, chapter 3 briefly describes the research methods used in this study and outlines the limitations which are inherent to these methods.

Chapter 4 and 5 provide an analysis of the Dutch and Australian case studies respectively. Here, the PAA and the framework for categorizing decommissioning discourses will be used to determine how ecological uncertainty and environmental politics stabilize or destabilize offshore decommissioning policy arrangements in the Netherlands and Australia, and how ecological uncertainty and environmental politics are dealt with. Next, chapter 6 compares the two case studies in order to identify the similarities and differences between them, which will lead to a clear picture of how different policy arrangement processes can lead to stabilization or destabilization of the policy arrangement in response to environmental politics and ecological uncertainty. Lastly, following the comparison chapter 7 provides more general conclusions and recommendations with regard to dealing with environmental politics and coping with ecological uncertainty.

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# 2. Conceptualizing Decommissioning Governance and Policy Change

There are some key concepts and theories, which are required to be understood in order to answer the research questions. This section explains those concepts and theories by forming a conceptual framework for this study. The concepts, theories and analytical tools described in this chapter include; the concept of Governance, theories on Institutionalization and Policy Arrangements, the Policy Arrangements Approach, and theories on policy change. Combined they form the analytical basis that is used to understand and analyze the influence of environmental politics and ecological uncertainty on the stability or instability of offshore decommissioning policy arrangements.

## *2.1 The Concept of Governance*

The concept of Governance refers to "sustaining coordination and coherence among a wide variety of actors with different purposes and objectives such as political actors and institutions, corporate interests, civil society, and transnational organizations" (Peters, 2000). In other words, in a governance regime a group of actors pursue a collective interest by working together and sharing responsibilities.

To understand the concept of governance allows us to understand the dynamics of policy-making and politics, in order to; get insight in new ways of steering by government and non-government actors, to understand changes in institutional contexts of policy and politics, and to understand differences in institutional contexts of policy and politics (van Leeuwen & van Tatenhove, 2010). In terms of this thesis, the concept of governance will be used to understand Australian and Dutch institutional settings of policy and politics, in response to large-scale structural processes of political modernization (i.e. large-scale changes in structural social processes) and daily governance practices within the policy domain (i.e. small-scale daily interactions between new and old discourses and actors). Additionally, the concept of governance will be used to identify on how policy change occurs in offshore decommissioning governance, taking into account environmental politics and ecological uncertainty.

Traditionally, governance was exclusively associated with the government of nation states, and the governments capacity to impose rules and regulations on, for example, the oil and gas industry. However, the institutional strength of the nation state has been challenged from several different sources, which has resulted in the erosion of political power and the destabilization of the traditional state-led governing mechanisms (Kersbergen & van Waarden, 2004). But the locus of governance has been changing in two distinct ways. Firstly, governing is increasingly becoming a multi-level matter, where international, regional, national, and local levels all play a role (Stoker, 1998; van Leeuwen & van Tatenhove, 2010). This is observed, for instance, in the North Sea oil and gas industry where regional governance organizations such as the European Union and OSPAR have emerged. Additionally, governing is no longer always a matter of governments alone, but is increasingly becoming a matter of governance networks which include both state and non-state actors (Stoker, 1998; van Leeuwen & van Tatenhove, 2010). Other actors, such as industry representatives, NGOs, and the scientific community may be involved in policy-making processes.

Applying the concept of governance to offshore oil and gas platform decommissioning, offshore decommissioning governance can be defined as the policy-making processes and power relations at several levels of government, and with various non-state actors, in order to govern offshore decommissioning activities and their consequences (van Leeuwen & van Tatenhove, 2010). Due to the above-mentioned shifts in the locus of governance, the governance of offshore decommissioning

activities can take on a wide variety of forms, from more traditional state-led to a governance network approach. Additionally, certain types of governance may result in the inclusion or exclusion of certain actors in policy arrangements, which in turn influences how the decommissioning problem and possible solutions are framed. In other words, how different narratives related to decommissioning are represented.

Furthermore, decommissioning governance experiences added complexity due to the inherent complexity of decommissioning activities and the numerous uncertainties involved. As Ounanian et *al*. (2018) argues, complexity and uncertainties stem from interlinked natural-technical-social systems. Uncertainty relates not only to scientific knowledge and the marine system around an offshore structure, but also to societal perspectives of those involved in decommissioning activities. Uncertainty is vitally important in governance processes, particularly in regard to how alternative management options are negotiated and decided upon. Analyses of decommissioning governance should therefore explicitly consider uncertainties related to scientific knowledge and numerous (opposing) societal perspectives in order to encourage communication about uncertainties and conceive of strategies to deal with them in the decommissioning governance setting (Ounanian et *al*., 2018).

The overarching question coming out of these developments is what new forms and shapes decommissioning governance can and should take given the influence of environmental politics and ecological uncertainty. In decommissioning governance, a collective interest is often hard to define due to different, and often contradicting, views on what is a legitimate approach to offshore decommissioning and the ecological uncertainty that is involved. This is reflected in the ongoing offshore decommissioning discussion. It is therefore important to identify how environmental politics and ecological uncertainty shape offshore decommissioning policy arrangements, so as to better define the collective interest. In order to do so the Policy Arrangements Approach, developed by Arts & Leroy and colleagues (2006), will be used as an analytical framework.

## *2.2 The Policy Arrangements Approach*

The Policy Arrangements Approach (PAA) is an analytical tool, developed by Arts & Leroy and colleagues (2006), which will be used to analyze differences between the Netherlands and Australia in their broad, structural policy and political contexts, and their respective daily offshore decommissioning governance practices. The PAA is built around the concepts of institutionalization and policy arrangements (Arts et *al*., 2006).

Institutionalization refers to the gradual stabilization or renewal of broad, structural policy and political contexts and daily offshore decommissioning governance practices (Arts & Leroy, 2006). Development of routines, fixation of patterns, rules and interactions are all part of the institutionalization process. In the marine environmental policy domain, it implies the development of relatively stable and predominant social definitions of marine environmental problems and their solutions. Institutionalization can also refer to the organizational aspect of how a marine environmental issue should be governed, which relates to the stabilization of stakeholder interaction or collaboration towards structuring and approaching marine environmental issues (van Tatenhove et al., 2000).

A Policy Arrangement is defined as “the temporary stabilization of the content and organization of a certain policy domain” (Van Tatenhove et *al*., 2000). The structuring of the content and organization of a particular policy domain eventually results in practical applications of policies on the ground (van

Tatenhove et *al*., 2000). Therefore, policy arrangements can be considered the embodiment of institutions in practice, expressed in the temporary stabilized rules, interactions and narratives that shape a certain policy domain, which then in turn shapes the behavior of stakeholders (Liefferink, 2006).

The PAA analyses policy arrangements using the four dimensions of 'rules of the game', 'actors', 'resources and power', and 'discourses'. Each of which will be further explained below. As is shown in Fig. 2.1, the interconnectedness of the four dimensions can be visualized by a tetrahedron, where each corner represents one dimension. The tetrahedron shows that any change in one of the dimensions may result in a change in other dimensions. Liefferink (2006: p. 48) gives the following examples: '*the introduction or withdrawal of new resources (e.g. subsidies, knowledge, skills) may attract new actors, exclude others or instigate new coalitions; or, new ideas may enter the tetrahedron through the dimension of discourse, such ideas/concepts may mobilize new types of expertise or legitimacy, in other words new resources, or form the nucleus of new actor coalitions*'. In order to fully understand the dynamics of the PAA tetrahedron each dimension should be examined in more detail.

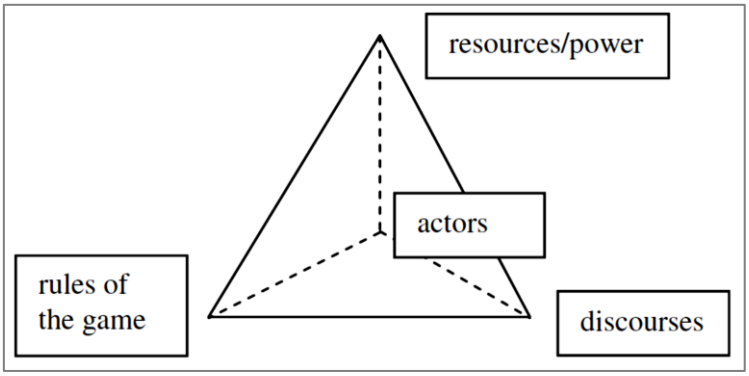


*Figure 2.1 - The tetrahedron, symbolizing the interconnectedness of the four dimensions of a policy arrangement (Liefferink, 2006).*

### Rules of the game

The rules of the game define the policy arena in which policy processes will take place. Rules of the game are the mutually agreed formal procedures of decision making and implementation and informal routines of interaction within policy arrangements (Liefferink, 2006). They present opportunities and constraints for actors to act and use their resources within the policy domain, and thereby determine the means by which actors can reach a desired policy outcome. The rules of the game can be divided in formal and informal rules of the game (Arts et *al*., 2000; Liefferink, 2006). The former represents fixed and authorized rules, such as laws, regulations, conventions, standards, guidelines, procedures of decision making an implementation, etc., which actors are obliged to follow (Arts et *al*., 2000; Liefferink, 2006). The latter describes flexible and unpredictable rules, such as codes of conduct, routines of interactions, norms, informal agreements about division of tasks, etc., which are generally accepted in the predominant political culture (Arts et *al*., 2000; Liefferink, 2006). Combined the formal and informal rules of the game lead to a certain degree of formality in a policy arrangement (Liefferink, 2006). The degree of formality in a policy arrangement may be important to consider in the comparative analysis of the Netherlands and Australia, in order to determine how to guide and optimize offshore decommissioning governance. In this study of offshore decommissioning policy arrangements in the Netherlands and Australia, the rules of the game dimension investigates the formal and informal rules for offshore decommissioning policy arrangements, and how these may change as a result of the recent decommissioning debate.

### Actors

The actors involved in a policy arrangement, and the coalitions they form, can be categorized as governmental (state) and non-governmental (industry, scientific community, eNGOs and other non-state players) stakeholders. In general, there is one policy discourse and set of rules which dominate the policy domain. While some actors are likely to support this predominant policy culture, others may oppose it either actively or passively. Actors who are proactive within the policy arrangement and are able to make significant changes, can be classified as a policy entrepreneur. A policy entrepreneur is able to overcome policy obstacles within the domain by introducing existing policy alternatives or developing new ones, while simultaneously navigating the push and pull factors of the political arena (Arnouts, 2010). On the other hand, there might be actors who are not actively participating in the policy arrangement even though they might hold significant power to influence the arrangement. These actors are often overlooked leading to potential destabilization when these actors do eventually start to actively participate. For instance, eNGOs are not always active on all environmental issues but have considerable discursive power to influence policy arrangements nonetheless by mobilizing the public. This is of particular importance when eNGOs oppose the predominant policy culture in terms of destabilization of policy arrangements.

The actors dimension has a particularly strong connection with the rules of the game dimension of the policy arrangement (Liefferink, 2006). The rules determine which actor has authority over whom and assign responsibility of certain tasks to the different actors, in other words they establish certain interaction rules. In this study of offshore decommissioning policy arrangements in the Netherlands and Australia, the actors dimension will provide insight into the actors involved in offshore decommissioning policy arrangements, and how these may change as a result of the recent decommissioning debate.

### Resources and power

Resources describe the tools that are available to an actor and that give them power to influence policy outcomes. For example, these can be authority, knowledge, expertise, or money. The division of resources between actors leads to differences in power and influence (Liefferink, 2006). As described by Deden (2010) 'power refers to the capability of an actor to deploy and mobilize their resources, and influence describes the success of these resources in driving policy outcomes'. To have power or influence within a policy arrangement is an important trait for actors as it enables them to achieve desired policy outcomes. Aside from being able to influence policy outcomes and steering political decisions, actors can also use their power and influence to frame policy issues, set agendas or change the rules of the game (Arts et *al*., 2000).

Different types of power arise when the resources and power dimension interacts with the other dimensions. Firstly, when interacting with the rules of the game dimension, resources can result in regulatory power when an actors influence over other actors through the formal or informal rules of the game. Secondly, when interacting with the actors dimension, resources can result in relational power as the resources of one actor may overpower the resources of another actor. Lastly, when interacting with the discourse dimension, resources can result in discursive power which will be explained later. In this study of offshore decommissioning policy arrangements in the Netherlands and Australia, the resources and power dimension will investigate the resources and powers that are available to actors, how these can be used to influence the policy process, and how these may change as a result of the recent decommissioning debate.

### Discourses

For this study it is crucial to understand the dimension of policy discourses. Discourses entail the views held and narratives adhered to by actors: their norms, values, definitions of problems, and approaches to solutions (Liefferink, 2006). Discourses of offshore decommissioning are an important factor which shape how decommissioning activities are governed, as they determine how actors define problems and solutions. Policy discourses are especially important in regard to the environmental aspect of decommissioning due to the inherent complexity and uncertainty in knowledge on their physical causes, occurrence and solutions. Discourse coalitions deal with this environmental complexity and uncertainty in different ways, which ultimately affects decision making (Ounanian et *al*., 2018). It is important to realize that some policy discourses may be in disagreement or opposing each other. On the one hand, uncertainties on environmental aspects, and on the other hand, the many stakeholders that try to give meaning to the idea of environmentally responsible decommissioning, result in a multitude of offshore decommissioning discourses. Analysis of the different discourses present in the decommissioning policy arrangement will be helpful to make sense of the recent offshore decommissioning debate.

Of course, the discourse dimension also interacts with the other dimensions. We may try to identify the underlying discourses of the rules of the game. Policy discourses may deal with general ideas about governance, i.e. about the relationships between and the share of responsibility of state, industry and other actors (Liefferink, 2006). When these ideas of governance are solidified in the rules of the game they may also be referred to as rules of governance. In relation to the dimensions of actors and resources, actors assuming the same discourses may form coalitions and combine their resources to obtain a common objective. Additionally, discourse coalitions can draw on their resources to make themselves legitimate and persuasive, or in other words, to gain discursive power (Ounanian et *al*., 2018). In this study discourses are analyzed to investigate the predominant discourses of the offshore decommissioning policy arrangements in the Netherlands and Australia, and alternative decommissioning discourses arising from the ongoing decommissioning debate. Next, these alternative discourses are used to investigate how they support, or are in conflict with, the predominant policy discourse and how they might affect the policy arrangement in the Netherlands and Australia. The following paragraph conceptualizes the various new and old discourses that exist within the current offshore decommissioning debate.

### Limitations of the PAA

An important limitation of the PAA is that it was designed for post hoc analysis of stability and change within a policy arrangement. However, in this study the observed offshore decommissioning policy arrangements are still in the process of establishing and changing as a result of environmental politics and ecological uncertainties. This makes it very difficult to make statements about the future potential of certain decommissioning policies.

## *2.3 Conceptualizing discourses of offshore decommissioning*

Actors within policy arrangements set certain priorities on why and how to decommission offshore structures. The way these actors define offshore decommissioning through decommissioning discourses affect the outcomes and possibilities for governing decommissioning activities. The predominant discourses have the potential to determine the rules of the game and the availability of resources (Ounanian et *al*., 2018). Ounanian et *al*. (2018) developed a framework in order to

conceptualize discourses of marine ecosystem restoration, which was adapted for the purpose of this thesis to conceptualize discourses of offshore decommissioning (Fig. 2.2).

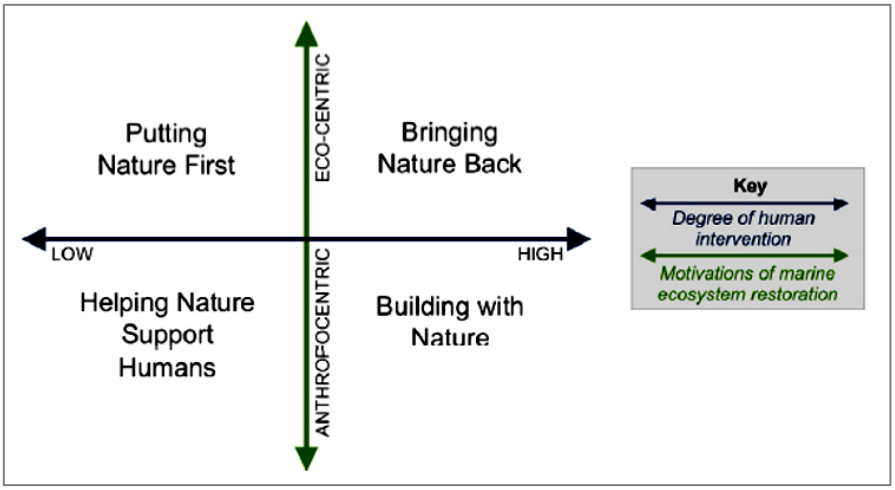


*Figure 2.2 – Conceptual model of discourses of marine ecosystem restoration, built on two dimensions: the degree of human intervention (High to Low) and (2) motivations of marine ecosystem restoration (Eco-centric or Anthropocentric). The resulting four marine ecosystem restoration discourses are: 'Giving Back to Nature', 'Bringing Nature Back', 'Helping Nature Support Humans', and 'Building with Nature'. (Ounanian et al., 2018)*

The original framework is built on two dimensions: (1) the degree of human intervention (High to Low) and (2) motivations of marine ecosystem restoration (Eco-centric or Anthropocentric). The first dimension, on the x-axis, focusses on "how, and to what degree humans intervene in order to restore degraded ecosystems" (Ounanian et *al*., 2018). The second dimension, on the y-axis, focusses on "the motivation of why and for whom marine ecosystem restoration should take place" (Ounanian et *al*., 2018). The underlying motivation of marine ecosystem restoration is sub-divided in two categories: "adopt responsibility on behalf of the ecosystem and its constituent species (eco-centric) or primarily serve the interests and needs of people (anthropocentric)" (Ounanian et *al*., 2018). Combining the two dimensions, a conceptual framework is created, distinguishing four ideal-typical discourses of marine ecosystem restoration ('Putting Nature First', 'Bringing Nature Back', 'Helping Nature Support Humans', and 'Building with Nature'), each emphasizing distinct problems and solutions (Ounanian et *al*., 2018).

To adapt the original framework to conceptualize discourses of offshore decommissioning the first dimension was changed to; (1) the degree of removal (non-removal to removal). This was done because in the context of offshore decommissioning it is not always clear what exactly is considered a human intervention, i.e. what is natural and what is artificial (Jørgensen, 2009). On the one hand, it could be presence itself of a man-made structure, but on the other hand it could be the decommissioning activity that is considered the human intervention. Indeed, this is also one of the sources of differences between certain decommissioning discourses. For the purpose of this thesis the decommissioning activity is considered to be the human intervention, as it is assumed that the ecosystem will have reached a new equilibrium over the lifetime of the offshore structure and the decommissioning activity will disrupt this equilibrium. By changing the dimension to the degree of removal it becomes clear what is meant, while still showing polarity between the two opposing decommissioning options. The second dimension remains the same as in the conceptual model by Ounanian et *al*. (2018) but 'marine ecosystem restoration' is substituted with 'decommissioning'; (2)

motivations of decommissioning (Eco-centric or Anthropocentric). After all, decommissioning can be considered a form of marine ecosystem restoration. Combining these two dimensions results in four distinct discourses in offshore decommissioning (fig. 2.3). The first two discourses remain the same as in the original framework. However, their meanings are slightly changed in order to better fit the topic of offshore decommissioning. Furthermore, the

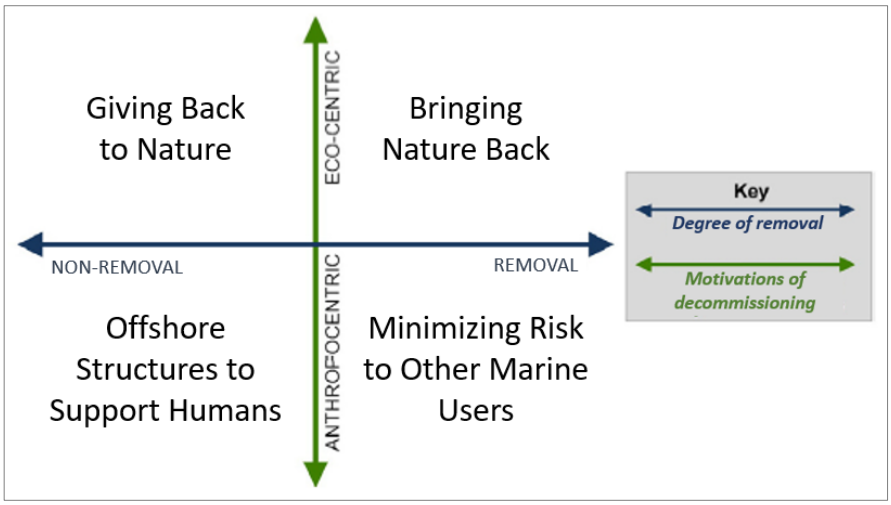


*Figure 2.3 – Conceptual model of discourses of offshore decommissioning, built on two dimensions: (1) the degree of removal (non-removal to removal and (2) motivations of decommissioning (Eco-centric or Anthropocentric). The resulting four offshore decommissioning discourses are: 'Giving Back to Nature', 'Bringing Nature back', 'Offshore Structures to Support Humans', and 'Minimizing Risks to Other Marine Users'. (adapted from Ounanian et al., 2018)*

It should be noted that these discourses are not necessarily mutually exclusive but could be compatible enough to be assumed simultaneously. For example, one particular international guideline firmly assumes the discourse of Minimizing Risks to Other Marine Users, however it allows an artificial reef approach (i.e. non-removal) given an unobstructed water column of 55 meters is assured (Lyons, 2014). This shows that, often we can find policy arrangements which compromise between multiple discourses. On the other hand, some discourses are less compatible with each other. For example, assuming the Bringing Nature Back discourse prevents one from also assuming an Offshore Structures to Support Humans discourse, because Bringing Nature Back implies complete removal under any circumstances and thus does not allow for (partial) non-removal under Offshore Structures to Support Humans. It is therefore important to consider the discourses presented in this conceptual model to be potentially compatible and not necessarily exclusive, as it affects how actors interact within a policy arrangement.

### 2.3.1. Minimizing Risks to Other Marine Users

Starting in the lower, right quadrant of Fig. 2.3, the Minimizing Risks to Other Marine Users discourse is typified by a high degree of removal and an anthropocentric motivation for decommissioning. Management strategies that are rooted in this discourse include; the removal of jackets because they form a navigational hazard for the shipping industry; or the removal of a subsea pipeline because it forms a safety hazard for the beam trawling fishing industry. For example, off the coast of the Australian state Victoria a lot of beam trawl fishing takes place and there have been instances where beam trawlers catch on subsea oil ang gas structures like wells and pipelines (interview state government, 2018). According to this discourse, structures which are disused should be removed to

the extent that navigational and safety hazards to other marine users are reduced. Besides, obsolete offshore structures left in place unnecessarily take up marine space which could be utilized by other marine space users. Minimizing Risks to Other Marine Users is often about protecting assets which may have primary benefits for other marine users, such as vessels or other equipment. Higher degrees of removal are likely to result in higher costs, making the distinction between who wins and who loses central in decommissioning governance. In addition, there are also businesses emerging from this paradigm with supply chain and marine engineering companies looking to capitalize by providing specialized decommissioning services, which may signal the incoming wave of decommissioning investors and private companies. Some examples include; companies like Maersk Decom; or the Pioneering Spirit, the largest marine vessel in the world which was purposely built to remove large offshore oil and gas platforms.

### 2.3.2 Offshore Structures to Support Humans

In the lower, left quadrant of Fig. 2.3, Offshore Structures to Support Humans is characterized by a low degree of removal and an anthropocentric motivation. Management measures which are rooted in this discourse include artificial reefing for fish stock recovery purposes, or re-purposing of structures for other economic activities. Artificial reefing projects characterized by Offshore Structures to Support Humans are created in the hopes that particular commercially or culturally significant species will regenerate or to otherwise provide benefits for humans. For example, the Exmouth artificial reef project in Western Australia held the goal of creating recreational fishing and employment opportunities (NERA, 2018a). Re-purposing projects characterized by Offshore Structures to Support Humans are intended to re-use existing offshore structures for different economic activities, such as for renewable energy technologies, aquaculture, tourism, or marine research facilities (Lyons, 2014; Chandler et *al*., 2017; Buck & Langan, 2017). Hereby a new (recycled) life is found for existing oil and gas structures (World Energy Council, 2017). Ultimately the structures that are (partially) left in place are intended to support human benefits, often under the banner of social movements such as Ecological Modernization and the Blue Economy. Secondary, more eco-centric goals may be expressed in decommissioning projects categorized as Offshore Structures to Support Humans, such as increased biodiversity or recycling and re-use of materials, but the narrative of these projects pre-dominantly emphasize direct benefits to humans. Artificial reefing and re-purposing projects characterized by the Offshore Structures to Support Humans discourse bring a range of socio-economic challenges, such as conflicting stakeholder interests or transfers of liability, which make stakeholder engagement and cooperation central in decommissioning governance.

Particular uncertainties arise within projects characterized by Offshore Structures to Support Humans, especially when it comes to artificial reefs. These are substantial knowledge gaps and unpredictability regarding the effectiveness of artificial reefs as well as their most suitable locations, especially considering the complexity of marine ecosystems with confounding variables and cumulative and interactive effects (Ounanian et *al*., 2018). The results in ambiguity regarding the value of artificial reefs for fishing and the local community and where they ought to be located. These situations highlight the importance of stakeholder engagement and cooperation for knowledge production and deliberative governance (Ounanian et *al*., 2018). Additionally, the challenge of monitoring and enforcement should be considered when establishing governance arrangements around artificial reefing projects.

### 2.3.3 Giving Back to Nature

Moving on to the upper, left corner of Fig. 2.3, Giving Back to Nature supports a low degree of removal and an eco-centric motivation. It is argued that offshore structures provide ecosystem enhancement benefits or biodiversity enhancement (Lyons, 2014). Management measures which can be categorized in this discourse also includes artificial reefing or otherwise leaving in place of offshore and subsea structures. What distinguishes Giving Back to Nature from Offshore Structures to Support Humans is that projects characterized by Giving Back to Nature typically have ecosystem-level conservation goals. Accordingly, this discourse likely includes prohibition of certain human activities on and around structures left in place. The eco-centric motivations of this discourse are highlighted, for example, by prohibitions which aim at protecting threatened species or species that are non-commercially relevant. The suggested establishment of no-take-zones on artificial reef structures exemplifies the Giving Back to Nature discourse. Questions of compensation or dispensation should also be considered when establishing governance arrangements in order to manage the social, economic, and cultural disruptions felt in response to certain prohibitions (Ounanian et *al*., 2018). Additionally, under this paradigm removal of obsolete structures may be negatively perceived as the removal activity itself may have a negative impact on the marine environment; for instance, when explosives are used to dismantle jackets; or benthic communities are disturbed when a pipeline is taken out.

As with the Offshore Structures to Support Humans discourse, there are uncertainties and unpredictability associated with the Giving Back to Nature discourse. Knowledge gaps and unpredictability regarding the adaptability and survival of species can challenge these initiatives when effects of climate change and commercial fishing pressure on fish stocks accumulate and cause stress to the ecosystem around an offshore structure. Additionally, there is a discussion of the effectiveness of decommissioned structures in enhancing biodiversity. The questions being asked are whether man-made structures really enhance biodiversity or just aggregate fish from the surrounding environment (e.g. Neira, 2005; Fuji, 2016; Rouse et *al*., 2018)? Or will an ecosystem remain productive after topsides are removed (interview research community, 2018a; interview research community, 2018d)?

### 2.3.4 Bringing Nature Back

Lastly, in the upper, right corner of Fig. 2.3, the Bringing Nature Back discourse is typified by a high degree of removal and an eco-centric motivation for decommissioning. This discourse is often assumed by the more eco-centric marine conservationists and eNGOs. The presence of offshore structures is considered a human intervention, changing in-faunal conditions and disturbing the pre-rig ecosystem equilibrium, and should therefore be removed when obsolete. The whole or partial non-removal of disused offshore structures is equated to ocean dumping (Hamzah, 2003). Additionally, it is argued that obsolete offshore oil and gas structures may hold toxic substances, such as oil or gas residue, and should thus be removed because may cause marine pollution or otherwise be harmful to the marine environment (Lyons, 2014). Management measures within this discourse include the complete removal of all structures and restoring of the area to pre-rig conditions.

Again, this discourse is associated with particular uncertainties. More than any other discourse, Bringing Nature Back is dealing with major knowledge gaps. The big question within Bringing Nature Back remains: bringing nature back to what? More often than not pre-rig conditions are unknown as baseline studies are not common in the offshore oil and gas industry. Again, the importance of stakeholder engagement and cooperation for knowledge production is highlighted.

## *2.4 Policy change*

The interconnectedness of the four dimensions shows that any change in one of the dimensions may result in a change in other dimensions of the policy arrangement, and ultimately in a change in how a policy domain is governed. It is important to note that, although they may seem solid and fixed, policy arrangements and institutions are always temporarily stable and gradually change or develop over time. Both structural changes in society and changes in day-to-day governance practices affect policy arrangements and institutions. Policy change, as a result of environmental politics and environmental uncertainty can be analyzed using the concepts of political modernization, duality of structure, and policy renewal.

### 2.4.1 Political modernization in relation to governance

Societal change is explained by the concept of political modernization, which Arts et *al*. (2006) define as "structural processes of changing interrelations between state, industry and civil society, and new conceptions and practices of governance". In other words, political modernization is a change in the setting in which different societal groups (state, industry, civil society) shape a policy domain by distributing resources, creating rules and assuming discourses. Gradual developments within society can be analyzed using the concept of political modernization. Different phases of political modernization can be distinguished over time. Each phase is often characterized by dominant views about politics, policy, interactions between societal groups, as well as views on the role of science and technology in governing environmental policy domain (Arts et *al*., 2006). Over time these views gradually change in response to all sorts of social, economic and political processes, resulting in new views about politics, policy, interactions between societal groups, and the role of science and technology. This illustrates that the process of political modernization is a long-term phenomenon causing structural transformations across entire policy domains. This results in new modes of governance (Arts et *al*., 2006; van Tatenhove et *al*., 2000).

A typical process of political modernization within the environmental policy domain is the shift from 'government to governance' (Kersbergen & van Waarden, 2004). Firstly, governance is increasingly becoming a multi-level matter, with new modes of governance spanning across all levels of government: international, national, regional. Renewal of government institutions may be caused by a plethora of phenomena, such as deregulation, decentralization, interactive policy-making, or contract management (Arts & Goverde, 2006). Secondly, governance is increasingly becoming a multi-stakeholder matter and consequently the collaboration between societal groups is emphasized (Arts and van Tatenhove, 2006). Other examples of political modernization processes are large-scale social movements, such as ecological modernization and sustainable development. To conclude, as a consequence of all kinds of social, economic and political (political modernization) processes, new relationships are coming into being between state, industry and civil society, new power relationships arise between these societal groups, and new modes of governance are conceptualized (Arts et *al*., 2006, p. 97).

### 2.4.2 Duality of structure

Political modernization results in a two-way transformation process, which is referred to as a duality of structure (Fig. 2.4) (Arts & Van Tatenhove, 2006). First of all, political modernization as a structural process manifests itself in day-to-day governance practices as new modes of governance bring about new forms of interaction, new resources, and new discourses. Conversely, changes in daily governance practices also contribute to, or constrain, the process of political modernization (Arts & Van

Tatenhove, 2006), by determining which actors are involved, the rules by which they play, distributing resources, and shaping the pre-dominant discourse.

The duality of structure implies that small change developments, such as policy entrepreneurs, are also able to influence a seemingly stable policy arrangement. Hence, in order to understand stability and change in a policy arrangement both long- and short-term socio-political interactions are important to consider within the environmental policy domain (Arts et *al*., 2000), as is illustrated in Fig. 2.4. Both political modernization and daily governance practices cause re-institutionalization of social and political structures (institutions) over time. All these interactions meet at the level of the policy arrangement and result in policy renewal over time.

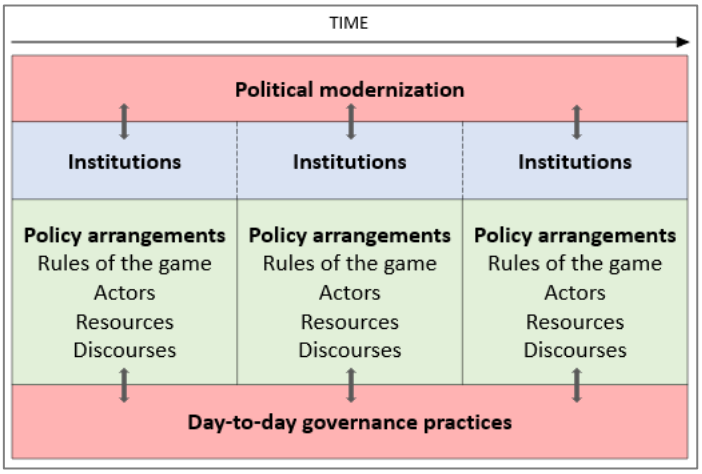


*Figure 2.4 – Interplay between main theoretical concepts of Governance in the duality of structure (adapted from Deden, 2006).*

### 2.4.3 Policy renewal

As political modernization and re-institutionalization takes place the transformation of policies follows. Arts & Leroy (2006) identified three types of environmental policy innovation or change;

1. the (partial) integration of existing, juxtaposed policy arrangements;
2. the discursive and/or organizational renewal of existing policy arrangements; and
3. the introduction of new policy arrangements.

Different questions maybe be asked resulting from each type of environmental policy change. The integrated of existing, juxtaposed policy arrangements raises the question of how, in a new socio-political context, these existing policy arrangements relate to each other (Arts & Leroy 2006). Old policy arrangements might show overlap or contrast each other, presenting a challenge for policy makers to merge these arrangements. The discursive and/or organizational renewal of existing policy arrangements leads to the question of whether a discursive renewal has had institutional effects and vice versa (Arts & Leroy 2006). For instance, discursive renewal might lead to new buzzwords (e.g. 'rigs-to-reefs' in the offshore decommissioning domain) which might not have a place yet in institutionalized arrangements, as old institutions continue business as usual. Policy renewal in this category may be the modernization of legislations, regulations, policies, etc. The introduction of new policy arrangements, such as integrated region-oriented policy, corporate environmental management, target group policy, lead to the question of whether these are able to institutionalize and to accomplish policy goals within the new socio-political context (Arts & Leroy 2006).

Finally, for this thesis it is important to note that political modernization and policy renewal proceed in uneven tempos and follow different patterns in different countries (Arts et *al*., 2006). For instance, the Netherlands has been influenced by evolving European Union rules, also referred to as Europeanization (Liefferink, 2006), whereas Australia is more influenced by internal dynamics of policy and politics, i.e. the interaction between federal and state or territory governments (Glazewski & Haward, 2005). This study will look at the concepts of governance, policy arrangements, and policy change within the offshore decommissioning domain in the cases of the Netherlands and Australia, in order to investigate how environmental politics and ecological uncertainty lead to policy change in offshore decommissioning policy arrangements.

# 3. Research methods

The type of research conducted during this study project was a set of comparative case studies. The case studies were intended to provide a deeper understanding of processes of decommissioning governance, which could not have been provided by carrying out, for example, a theoretical study of decommissioning governance. The case studies of Australia and the Netherlands were specifically chosen because of their very different approaches to decommissioning governance. Because the Netherlands and Australia are subjected to very different political and policy arrangements it was interesting to see why and how this results in the different approaches to decommissioning governance. Additionally, it was interesting to see if the challenges and successes experienced in decommissioning governance in one country could be avoided or implemented in another country despite their different institutional, political and policy contexts.

In order to carry out the comparative case studies, various methods of data collection were used. First, a literature review was carried out using multiple online libraries and the Wageningen University libraries. This was used to develop the conceptual framework described in the next chapter and was used to further determine which the institutional settings and policy-making processes are at work in each case. Secondly, other formal and informal texts were analyzed, such as legal documents, online webpages, consultancy reports, etc. These were used to illustrate any coalitions, discourses, rules of the game and power relations which are present in each case. Thirdly, a number of semi-structured interviews were carried out in the Netherlands and Australia with industry and government representatives, and members of the research community. These were used to understand coalitions, discourses, power relations, and policy-making processes in further detail. Interviews were conducted through verbal and/or written communication. A list of all interviews conducted during this study can be found in Annex II (p. 78), and a sample of interview questions can be found in Annex III (p. 79). Interviewees were selected from four societal groups, i.e. government, industry, research community and eNGOs. All interviewees were selected because they have relevant experience in the field of offshore decommissioning. In Australia 5 interviews were conducted (2 government, 1 industry and 2 research community). In the Netherlands 4 interviews were conducted (1 government, 1 industry and 2 research community).

Validity of the data gathered for this study was assured by accessing data and other information from a wide variety of sources and interviewing a wide variety of stakeholders. Through this method of data triangulation, it was ensured that; all the relevant parties are well represented in this study, conclusions are as objective as possible, and used information is accurate. In addition, due to the comparative nature of this study, it was able to draw more general conclusions on governance and decommissioning theory.

Reflecting on these research methods some limitations can be identified. Due to the limited time available for this study I was forced to conduct only a limited amount of interviews. Although the interview respondents formed a representative selection of actors within the policy arrangements in the Netherlands and Australia, it must be noted that the policy domain encompasses many more stakeholders, interesting alternatives and initiatives, and perspectives regarding offshore decommissioning. For instance, it has been suggested to me to interview representatives of the service sector and although this sector is indeed an important part of the decommissioning discussion, they were not included here. Further research should also incorporate decommissioning discourses

within this sector and other sectors, such as offshore wind energy, in order to increase representativity. Furthermore, it must be noted that discourse analysis was a major part of this study's research method. The interpretation of opinions and perspectives is inherent to this type of research method. Although, the aim was to give results as balanced and objective as possible subsequent to stakeholder interviews, one must remember when reading this study there is a possibility of biased stakeholder opinions and perspectives and biased interpretations of these.

# 4. Offshore Decommissioning Governance in the Netherlands

## *4.1. The Dutch context*

The Netherlands has produced offshore oil and gas from their shallow Continental Shelf since the late 1960s. Since then a vast network of pipelines, platforms, and subsea structures has been developed to extract oil and gas and transport it to shore. It currently consists of roughly 150 offshore platforms and nearly 5,000 km of pipelines (fig. 4.1) (interview industry, 2018b). The marine environment in the Dutch North Sea is quite homogeneous and mostly comprises of sandy bottoms. This is the result of extensive and intensive bottom trawling fisheries that have taken place in the past, which have wiped out the once diverse benthic ecosystem of the North Sea. Due to the shallow depth of the Dutch North Sea most platforms are supported by steel jackets. Over the next decades it is expected that an increasing number of oil and gas fields will reach the end of their economic life cycle, given the maturity of many offshore fields and current low commodity prices (NOGEPA and EBN, 2017; EBN, 2018). Simultaneously, the Dutch economy is undergoing an energy transition due to big shifts in environment and climate change concerns of the public. It is therefore expected that the input of the oil and gas industry to the energy mix will decline over the next decades (EBN, 2017). Accordingly, the Dutch government aims for a $CO_2$-neutral energy supply by 2050.

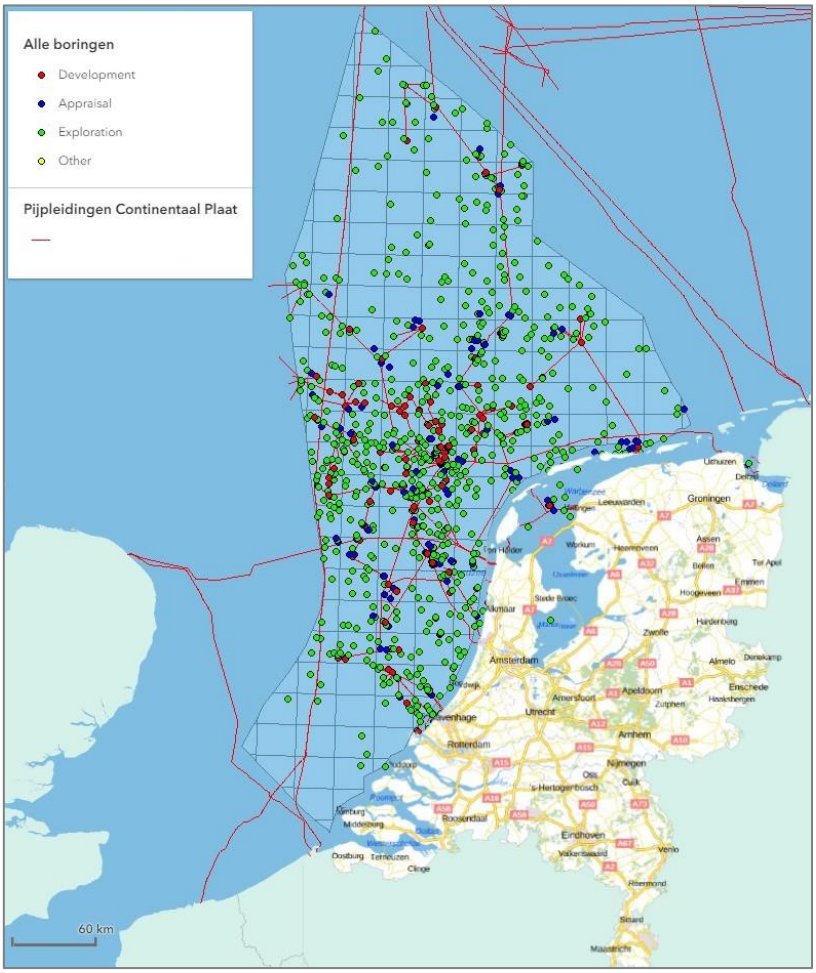


*Figure 4.1 - Overview map of oil and gas structures and pipelines in the Dutch North Sea. Red and blue dots indicate offshore facilities and red lines indicate subsea pipelines. (adapted from NLOG, 2018)*

But of course, the Dutch portion of the North Sea is only a small part of the whole. Within the relatively small geographical space of the North Sea other countries with offshore oil and gas industries, such as the United Kingdom, Norway, Denmark, and France are dealing with the same challenges that come with offshore decommissioning. Because of these countries' commonalities in dealing with offshore decommissioning and their geographic confinement to the North Sea they are often grouped together. Collaboration and exchange of knowledge and expertise with regards to offshore oil and gas activities between these countries is therefore common (Hamzah, 2003; Eco-Effective Strategies, 2018; INSITE, 2018). Furthermore, these countries are subject to the same strict regional legislation and the European Commission is also likely to influence these countries and how they deal with offshore oil and gas activities in the same way.

In this chapter I will be examining offshore decommissioning governance in the Netherlands. In particular I will be looking at the current policy arrangement with respect to the ongoing offshore decommissioning discussion regarding environmental politics and ecological uncertainties. In order to gain a deeper understanding of the Dutch approach to offshore decommissioning governance, given the emergence of new discourses and with regards to ecological uncertainties the following sections will analyze the current policy arrangement and institutionalization thereof using the four dimensions of the Policy Arrangements Approach tetrahedron. Following this analysis, I will be looking at structural elements (e.g. legislative frameworks, stakeholder interactions, etc.) which have a stabilizing or destabilizing effect on the Dutch decommissioning policy arrangement.

## *4.2. Rules of the Game*

As discussed in the conceptual framework for this thesis, the rules of the game outline certain rules of governance, roles and interaction rules of the main actors, and allocate certain powers to actors (Liefferink, 2006). Formal rules of the game may be in the form of laws, regulations, conventions, standards, guidelines, procedures of decision making and implementation, etc., which together form the legislative and regulatory framework. Informal rules of the game may be in the form of codes of conduct, routines of interaction, norms, informal agreements about divisions of tasks, etc.

### 4.2.1. The regulatory framework

The regulatory framework for offshore decommissioning in the Netherlands is made up of international, regional, and national laws and regulations; a set of formal written rules of the game. Table 4.1 outlines the extensive regulatory framework which, to a certain degree, defines decommissioning problems and solutions, divisions of roles between actors, and other rules. It is important to note that the word 'decommissioning' is not used in any of the main international legislation; although the need to deal with obsolete offshore platforms and infrastructure is referred to (Techera & Chandler, 2015). There is a lack of international law that deals specifically and only with the offshore oil and gas industry, let alone the decommissioning phase.

At the international level, the framework comprising of UNCLOS, the Dumping Regime, and the IMO guidelines (table 4.1) favors complete removal of obsolete structures but does not prohibit in-situ decommissioning. However, there are restrictions, under the Dumping Regime and the IMO Guidelines, and in-situ decommissioning must meet certain requirements including being approved by the relevant national jurisdiction (table 4.1; Techera & Chandler, 2015). While the IMO Guidelines provide some prescriptive measures as a means to reduce navigational risks, the international regime is mostly objective based when it comes to environmental aspects of decommissioning. For example,

UNCLOS states that coastal states must assess the potential effects of planned activities on the marine environment and coastal states are required to 'adopt laws and regulations to prevent, reduce and control pollution of the marine environment' (UNCLOS, 1982, art. 208) arising from offshore activities within their jurisdiction, but provides no further prescription of how this might be achieved (table 4.1; Techera & Chandler, 2015).

*Table 4.1 – Overview of the regulatory framework of the Dutch decommissioning policy arrangement which defines decommissioning problems and solutions, divisions of roles between actors, and other rules.*

| | |
|---|---|
| **International** | *UN convention on the Law of the Sea 1984* (UNCLOS)<br>UNCLOS determines the sovereign rights of coastal nation States to extract natural resources from its continental shelf. UNCLOS states that any installations on the continental shelf which are obsolete must be entirely removed and removal of installations or structures in the Exclusive Economic Zone of a coastal State should take into account generally accepted international standards established by the competent international organization (UNCLOS, 1984, art. 60). In addition, UNCLOS requires nation States to adopt laws and regulations to prevent pollution from dumping at sea and requires national laws to be no less effective than global rules and standards in this regard (UNCLOS, 1984, art. 208 & 210). (APPEA, 2016 unless otherwise indicated)<br><br>*London (Dumping) Convention 1972 & Protocol 1996* (Dumping Regime)<br>The Dumping Regime broadened the definition of "dumping" to include requirements for decommissioning of offshore platforms and infrastructure. The International Maritime Organization (IMO) is responsible for administering the London Protocol. (APPEA, 2016 unless otherwise indicated)<br><br>*Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and Exclusive Economic Zone 1989* (IMO Guidelines)<br>The IMO is the competent organization for the purposes of Article 60 of UNCLOS. The IMO Guidelines set out a minimum standard for nation states to adopt (Techera & Chandler, 2015). Although the IMO Guidelines should be taken into account under UNCLOS, they do not have the status of international law and are not binding for the Netherlands as a signatory to UNCLOS. (APPEA, 2016 unless otherwise indicated) |
| **Regional** | *Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)*<br>The OSPAR *Decision 98/3* requires all disused offshore structures to be completely removed and equates the (partial) non-removal of disused offshore installations to ocean dumping (Hamzah, 2003). Exceptions are possible for concrete gravity based structures and steel jackets with a weight of more than 10,000 tons in air. Conditions for exceptions relate to technical feasibility, safety, environmental risks and costs. Structures that may serve a new legitimate purpose are not considered 'disused'. The new owner of a repurposed structure takes over the responsibility for future decommissioning. Additionally, the OSPAR *Guidelines on Artificial Reefs in relation to living marine resources* (1999) prohibited the use of 'non-virgin' (i.e. re-used) materials in the construction of artificial reefs, effectively banning rigs-to-reefs (Jørgensen, 2012). |
| **National** | *Mijnbouw Wet (Mining Act):*<br>The Mining Act governs all offshore mining activities within the Exclusive Economic Zone and Environmental Impact Assessments are part for of the licensing process under the Mining Act. The Mining Act requires mining installations, including offshore structures, to be completely removed after use including all materials near the mining location. The mining site should be restored. Pipelines can be left in place provided they are cleaned, secured and regularly surveyed. The Mining Act is administered by the Ministry of Economic Affairs and Climate Policy (EA&CP). (NOGEPA & EBN, 2017)<br><br>*Wet Algemene Bepalingen Omgevingsrecht (General Provisions Act Wabo):*<br>The General Provisions Act Wabo governs the physical environmental aspect all offshore oil and gas activities within the 12 nautical mile zone and Environmental Impact Assessments are part for of the licensing process under the General Provisions Act Wabo. The General Provisions Act Wabo does not give any specific requirements for offshore decommissioning. The General Provisions Act Wabo is administered by Ministry of Infrastructure and Water Management (I&WM). (Rijkswaterstaat, 2019) |

The North Sea applicable OSPAR Decision 98/3 and Guidelines on Artificial Reefs in relation to living marine resources are more explicit and much more stringent than the international regime. They give more prescriptive requirements, such as the complete removal obligation and exceptions for large concrete gravity platforms which are technically not feasible to remove (table 4.1, p. 32). These prescriptive requirements form a very clear-cut blanket policy with complete removal as the primary obligation, allowing very little flexibility with regards to alternative decommissioning approaches (Jørgensen, 2012). On the whole, the OSPAR is driven by the ecosystem approach (OSPAR Commission, 2018), as is reflected by the eco-centric motivations for decommissioning and the OSPAR's alignment with the Bringing Nature Back discourse. Additionally, members of the OSPAR agreement have the general obligation to apply the precautionary principle, the polluter pays principle, best available techniques (BAT) and best environmental practice (BEP) (OSPAR Commission, 2018). But it is important to realize that each of these principles could be interpreted differently by different discourse coalitions. For example, under the Bringing Nature Back discourse BEP would be considered the ecological restoration to pre-rig conditions (i.e. removal of offshore structures), while under the Giving Back to Nature discourse BEP would be considered as ecological restoration by enhancing biodiversity (i.e. leaving offshore structures and their ecosystems in place).

As can be seen in table 4.1 (p. 32), the Dutch Mining Act is very prescriptive and mimics OSPAR legislation, but also references to general Environmental Impact Assessment (EIA) guidelines set by the EU. In the Netherlands the extraction of oil and gas requires EIA's to be carried out (Noordzeeloket, 2018). As explained by Hamzah (2003), "The EIA is a process for anticipating the effects on the environment caused by a development. The objective of the EIA is to incorporate environmental considerations into the project planning and design stages, to ensure best environmental practice is followed. The EIA process also provides for an early airing of the concerns of stakeholders, which must be adequately addressed. Through an EIA it is possible to ensure that planned activities are in line with company policy and legislative requirements". Within the 12 nautical mile zone the EIA is part of the licensing process under the General Provisions Act Wabo, administered by the Ministry of I&WM. Outside the 12 nautical mile zone, in the Exclusive Economic Zone, the EIA is part of the licensing process under the Mining Act, administered by the Ministry of EA&CP. Additional subsea infrastructure, such as pipelines, fall under the Mining Act. The Ministry of EA&CP and Ministry of I&WM adjust their legal frameworks to one another as much as possible in order to form a more streamlined legislative framework (Noordzeeloket, 2018). The removal of disused platforms and pipelines is also included in the Mining Act, (Noordzeeloket, 2018), however no EIA is written specifically for the decommissioning phase (interview industry, 2018b). Attention is paid to the decommissioning phase in the original EIA, giving a rough outline of plans for decommissioning but not providing much detail (interview industry, 2018b).

Because the regulatory framework is so prescriptive and fixed there is generally no need for informal rules of the game to compliment the formal rules of the game. As a result there is little room for deliberation between stakeholders and only a limited amount of stakeholders are actively involved which are the governing party and the party being governed, i.e. the government and the industry respectively.

### 4.2.2. The European Union

Even though the European Union is not actively participating in the offshore decommissioning policy arrangement in the Netherlands, they should be considered in this analysis as they have the potential to become part of Dutch policy-making in the future as a result of Europeanization (Hamzah, 2003).

As the EU is increasingly adopting EU-wide policies in many different policy domains, there have been previous instances where the EU has influenced policy decisions in industry sectors, such as oil and gas, and shipping (van Leeuwen, 2010). It is important to note that in these cases the national government and the industries have both seen a decrease in authority when it comes to the development of European policies (van Leeuwen, 2010).

Currently, the EU is in the final stages of developing a Hydrocarbons best available techniques reference (BREF) document; a document outlining norms for best available techniques (BAT) in hydrocarbons industries (European Commission, 2018). The BREF is not linked with any of the EU's legal documents and thus does not have a legal basis. It would therefore not a part of the formal regulatory framework. However, as the OSPAR requires signatories to apply BAT, the Hydrocarbons BREF may bring added value by identifying and establishing EU-wide BAT (European Commission, 2018). The Hydrocarbons BREF is also intended to address the oil and gas industries environmental risks and impacts (European Commission, 2018), but it is unlikely to explicitly cover best environmental practices (BEP). Similar to the international regulatory framework for offshore decommissioning, the Hydrocarbons BREF is unlikely to cover decommissioning extensively as it is a general document covering multiple industries and all phases of hydrocarbon exploitation.

Depending on what the BREF defines as BAT for offshore decommissioning, and what this implies in terms of environmental risks and impacts, it can either reinforce or undermine the OSPAR Decision 98/3 and favor or disfavor the Dutch energy transition. Of course, this all depends on whether the Hydrocarbons BREF will indeed institutionalize as EU-wide BAT.

### *4.3. Actors*

#### The government sector

There are a number of government actors that are involved in the regulation of offshore decommissioning activities in the Netherlands, spread across multiple levels of government. Fig. 4.2 gives an overview of the structure of government agencies which are relevant for offshore decommissioning.

At the international level, the United Nations (UN) is the umbrella organization which administers legislation relevant to offshore decommissioning. Among other things, it requires national laws to be no less effective than internationally accepted rules and standards with regards to the removal of offshore structures. For one such international standard the UN legislation refers to the International Maritime Organization (IMO). The IMO is a specialized sub-organization of the UN with 'the responsibility for the safety of shipping and the prevention of marine and atmospheric pollution by ships' (IMO, 2019). Furthermore, at the regional level, the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) also works under the umbrella of the UN and their relevant legislation, especially those regarding global and regional cooperation for the protection and preservation of the marine environment. OSPAR has particularly strict regulations with regards to the removal of obsolete oil and gas structures in the North Sea. Signatories to the OSPAR Convention include countries with oil and gas industries in the North Sea, including the Netherlands, the United Kingdom, Norway, and Denmark. Additionally, the European Union has several directorate-generals which could intersect with the offshore decommissioning discussion. A directorate-general is an administrative branch which is dedicated to a certain policy domain, which can essentially be compared to ministries or departments within the national government. In particular the Directorate-

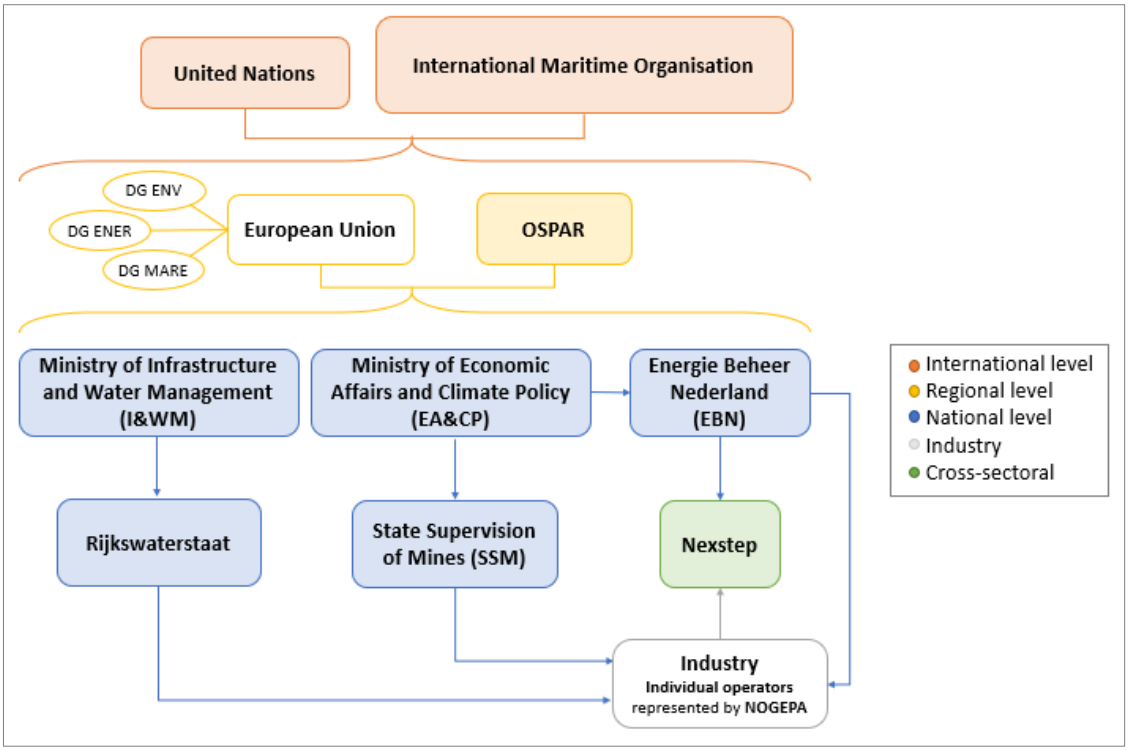


*Figure 4.2 - An overview of the structure of the government sector in the Netherlands, showing the different actors and the linkages between them. Lines indicate paths of interaction between different actors.*

General for Environment (DG ENV), the Directorate-General for Energy (DG ENER), and the Directorate-General for Maritime affairs and fisheries (DG MARE) could be of relevance. At present none of these DGs, nor the European Commission itself, are actively participating in the offshore decommissioning policy arrangement in the Netherlands. Nonetheless they are important to note as they have the potential to become part of Dutch policy-making in the future as a result of Europeanization.

At the national level of government, the Ministry of Economic Affairs and Climate Policy (EA&CP) administers the main legislation relevant to the offshore oil and gas industry and gives final approvals for oil and gas activities offshore. The Ministry of EA&CP is advised in their decision-making by the relevant government administrator; the State Supervision of Mines (SSM). SSM has an advisory role and is responsible for the inspection and enforcement of permit conditions. In addition to the Ministry of EA&CP, the Ministry of Infrastructure and Water Management (I&WM) also administers legislation that is relevant to the offshore oil and gas industry. The Ministry of I&WM is advised in their decision-making by Rijkswaterstaat. Like SSM, Rijkswaterstaat is responsible for the inspection and enforcement of permit conditions, however Rijkswaterstaat also plays an advisory role towards many other government administrators as it is a larger organization with ample in-house knowledge and expertise (interview government, 2019).

Apart from the conventional government departments and administrators another government actor is particularly active in the offshore decommissioning policy arrangement in the Netherlands. Energie Beheer Nederland (EBN) is a company which invests in the Dutch oil and gas industry on behalf of the Dutch government (EBN, 2018). The Ministry of EA&CP is EBN's sole shareholder and receives all profits made by EBN. In 2016, EBN set-up a Masterplan for Decommissioning & Re-use in cooperation with industry representatives. The aim of the masterplan was to initiate a coordinated response to

the upcoming decommissioning wave in the Netherlands (EBN, 2017). EBN's masterplan also defined and detailed what an industry-wide approach could look like along with the preliminary steps to be taken in such an approach (EBN, 2017). One of the recommendations made in the Masterplan for Decommissioning & Re-use was to establish a national platform in order to facilitate a coordinated response. Consequently in 2017, Nexstep, the National Platform for Re-use & Decommissioning, was established as a joint initiative of the Dutch government and the Dutch oil and gas industry (fig. 4.2). Nexstep aims to 'stimulate and facilitate the Dutch agenda for re-use and decommissioning of oil and gas infrastructure' with the aim to create minimum environmental impact, among other things (Nexstep, 2018a).

### The oil and gas industry

As the entity being regulated, the offshore oil and gas industry constitutes a crucial group of actors. Individual oil and gas companies operating in the Dutch part of the North Sea include; Engie, Total, Vermillion, etc. These companies interact individually with the relevant government organizations, but are also collectively represented by the Netherlands Oil and Gas Exploration and Production Association (NOGEPA). NOGEPA also provides oil and gas companies with standards and guidelines and contributes to research where it is relevant and where it helps the industry. With regards to offshore decommissioning NOGEPA plays an active role as EBN's partner in Nexstep (fig. 4.2).

### The research community

There are various actors in the Dutch research community that work on environmental aspects of offshore decommissioning, including Royal Netherlands Institute for Sea Research (NIOZ), Wageningen Marine Research, and Wageningen University. Ecological research undertaken by these organizations mostly involves stock-taking of current environmental conditions around offshore structures, such as fish communities and benthic assemblages on and around structures. Often such research is done through international coordinated research initiatives. It is widely recognized that there is a large knowledge gap regarding the impacts of man-made structures and decommissioning thereof on the marine environment. This limited environmental knowledge will undoubtedly compromise the veracity and sound basis of decommissioning plans and even of the OSPAR's strict legislation. Yet, research organizations such as the ones mentioned above are not systematically included in the policy arrangement in order to address this knowledge gap. The knowledge gap and coordinated research initiatives will be discussed in the 'Resources and power relations' section (p. 41). Besides ecological research there is also extensive technical and economic research being carried out by Dutch research organizations, however this is beyond the scope of this study. Hence, from here on 'the research community' is considered as only ecological research(ers) and organizations.

### Environmental non-government organizations

Environmental non-government organizations (eNGOs) that are operative in the Netherlands include Stichting De Noordzee, Waddenvereniging, WWF, Greenpeace, etc., however these are not active participants in the decommissioning policy arrangement in the Netherlands. Nonetheless, they are important to consider because once the topic of offshore decommissioning catches the public eye these eNGOs will very likely join the discussion actively. The influence that eNGOs may have in the decommissioning policy arrangement will also be discussed in the 'Resources and power relations' section (p. 41).

## *4.4. Decommissioning Discourses*

The actors involved in the Dutch offshore decommissioning policy arrangement all have their own views on how offshore decommissioning problems and solutions should be defined. Actors assuming the same discourses may, perhaps inadvertently, form discourse coalitions. Using the data collected in this study through interviews, document analysis, and literature review the discourses assumed by each group of actors and the possible discourse coalitions formed by shared discourses was visually mapped out as in fig. 4.3, by means of the conceptual framework for categorizing offshore decommissioning discourses.

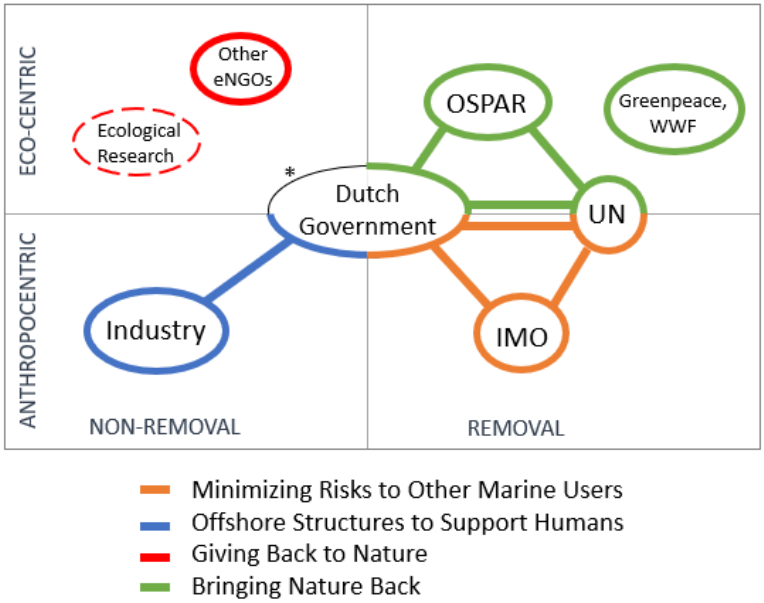


*Figure 4.3 – Discourses assumed by each sector in the Dutch offshore decommissioning policy arrangement and possible discourse coalitions formed by shared discourses. The dashed circle for Ecological Research indicates this group of actors predominantly aligns with the Giving Back to Nature discourse, but there are individuals within this group who might firmly assume other discourses or actively try to remain neutral. *the Dutch government does not assume the Giving Back to Nature discourse.*

**Bringing Nature Back**

In fig. 4.3, the upper right quadrant shows the actor groups which align with the Bringing Nature Back discourse. In Europe common practice is to ban all alternative decommissioning options, i.e. the required degree of removal is complete removal. Under OSPAR legislation motivations for decommissioning are eco-centric because non-removal is equated to ocean dumping and after removal operators are required to restore the area to pre-rig conditions, aligning with the Bringing Nature Back discourse (fig. 4.3). In addition, UN legislation also requires complete removal as its base case and includes eco-centric objectives, such as the prevention, reduction and control of pollution of the marine environment, alongside more anthropocentric objectives. Hence the UN is considered to align with both the Bringing Nature Back and Minimizing Risks to Other Marine Users discourses (fig. 4.3). As a signatory to OSPAR and applicable UN legislation the Dutch government has agreed to adopt this legislation, thereby also (perhaps inadvertently) adopting the OSPAR and UN narratives of Bringing Nature Back and Minimizing Risks to Other Marine Users (fig. 4.3).

Furthermore, most large and influential eNGOs, such as Greenpeace and WWF, have traditionally had one prominent discourse in relation to offshore decommissioning. While protesting the Brent Spar decommissioning project in 1995 Greenpeace firmly assumed the Bringing Nature Back discourse, using slogans as "*The sea is not a dustbin*" and "*Save the North Sea*". More recent statements by Greenpeace representatives indicate that Greenpeace has not deviated from this discourse. The eNGO wants to stick to the basic principle of international legislation that requires complete removal, as spokesman Tom Grijsen explains in a newspaper article: "*It would be a shame to rebuke the [OSPAR*

*98/3] agreements. That puts us on an inclined plane. The rules are good and there are already exceptions: for example, if removing, causes new damage*" (Speksnijder, 2017). Pavel Klinckhammers, campaign manager Oceans at Greenpeace, states in another article: "*The companies have agreed, have reserved money for this, so for us it is a bit absurd to leave those platforms because it is supposedly good for the environment*" (de Bar, n.d.). According to the article, Lies van Nieuwerburgh, program leader for Knooppunt Waddenzee at the Waddenvereniging shares this opinion: "*The poles and constructions are not an area-specific material and therefore do not belong in the sea, even though a number of scientists argue that the constructions locally increase biodiversity*" (de Bar, n.d.). Hence, once the topic of offshore decommissioning catches the public eye again, it seems likely that these eNGOs would assume the Bringing Nature Back discourse (fig. 4.3, p. 37). There are also eNGOs who seem to align more with the eco-centric narrative of the Giving Back to Nature discourse, which will be discussed later.

### Minimizing Risks to Other Marine Users

The lower right quadrant in fig. 4.3 (p. 37) shows the actor groups which align with the Minimizing Risks to Other Marine Users discourse. Internationally, under UN and IMO legislation, motivations for decommissioning are anthropocentric because the UN and the IMO require structures to be removed to the extent that navigational and safety hazards are reduced aligning more with the Minimizing Risk to Other Marine Users discourse (fig. 4.3, p. 37). Additionally, as stated by Wim van Urk, head of the Dutch delegation in OSPAR, marine space in the Dutch North Sea is intensively used (e.g. major shipping routes, fishing grounds, offshore renewables) and removal of oil and gas structures will allow for more efficient use of this marine space (interview government, 2019). Especially considering the eventual phasing out of fossil fuels in the energy mix on account of the ongoing energy transition in the Netherlands (interview government, 2019). Furthermore, Wim van Urk argued that oil and gas structures and their surrounding ecosystems are merely pinpoints within the vast space of the North Sea and ecological benefits likely will not outweigh the societal costs (interview government, 2019). This indicates that the Dutch government also aligns with the Minimizing Risk to Other Marine Users discourse (fig. 4.3, p. 37). By adopting the international legislation and regulation, the Dutch government also adopts the international narrative of Minimizing Risk to Other Marine Users (fig. 4.3, p. 37).

### Offshore Structures to Support Humans

Next, in the lower left box in fig. 4.3 (p. 37), the actor groups adopting the offshore Structures to Support Humans narrative are shown. The Dutch government and industry actors form a coalition looking at the re-use or re-purposing of offshore structures under the banner of the Energy Transition. NOGEPA and other industry actors are actively involved in Nexstep, where, together with EBN, they aim to 'stimulate and facilitate the Dutch agenda for re-use and decommissioning of oil and gas infrastructure' (Nexstep, 2018a). As explained by Aart Tacoma, Secretary of Environmental Matters at industry representative NOGEPA, *"At the moment [...], we look a lot at re-use and re-purposing. How could we use oil and gas infrastructure in this transition? We want to make a meaningful contribution to the energy transition"* (interview industry, 2018b). Re-use and re-purposing of offshore oil and gas structures for renewable energy industries is intended to support society in making the energy transition and maintain energy security in a renewable way (Nexstep, 2018a). In other words, Nexstep's motivations for decommissioning under the narrative of the Energy Transition are primarily anthropocentric, aligning with the Offshore Structures to Support Humans discourse, at least for as far as the international and national legislative and regulatory frameworks allow it (fig. 4.3, p. 37).

Although some European countries are developing their own narrative, like the Dutch with their Energy Transition, they have remained muted in the regional decommissioning discussion. It is unclear why, but presumably this is because of political pressure from other North Sea countries to conform with OSPAR (interview government, 2019). After all, the Netherlands was part of, and had a say in, the establishment of OSPAR Decision 98/3. Additionally, the issue of offshore decommissioning might not be perceived as pressing enough to advocate for policy alternatives (interview government, 2019). Especially, since there is still so much ecological uncertainty, policy-makers potentially do not see a strong enough motive to support a policy change.

At the same time, the oil and gas industry is cautious to assume non-removal discourses. As Aart Tacoma states; *"We will not promote to leave structures because it would be better for the environment. That message would be coming from the wrong party"*, continuing *"If researchers say that, then it has much more weight, because they approach this from a very different angle and try to find an optimal scenario from a sustainability and environment perspective. We would immediately be suspected of wanting to save costs. We want to stay away from that"* (interview industry, 2018b). Reputation and the social license to operate seem to be playing a big role here and might even present a barrier to industry actors when participating in the offshore decommissioning discussion.

### Giving Back to Nature

Finally, fig. 4.3 (p. 37) shows the actor groups which align with the Giving Back to Nature discourse in the upper right corner. As mentioned earlier, some eNGOs seem to align with the eco-centric narrative of the Giving Back to Nature discourse. For example, in Nexstep's 2018 decommissioning report, Floris van Hest, director of Stichting de Noordzee says: "*From an ecological point of view, the re- use of the oil and gas infrastructure for new purposes may offer benefits, because we prevent the environmental impact of new construction and the decommissioning of installations*" (Nexstep, 2018b). This indicates that Stichting de Noordzee is less opposed to alternative decommissioning approaches than bigger eNGOs like Greenpeace and WWF, aligning more with the Giving Back to Nature discourse (fig. 4.3, p. 37).

Furthermore, among actors in the ecological research community there seems to be a convergence towards the Giving Back to Nature narrative. According to one paper by Fowler et *al*. (2018), which surveyed opinions on decommissioning among environmental experts, '94.7% of experts (36 out of 38) agreed that a more flexible case-by-case approach to decommissioning could benefit the North Sea environment' and 'partial removal options were considered to deliver better environmental outcomes than complete removal for platforms'. Accordingly, most ecological research undertaken in the Netherlands and other North Sea adjacent countries focusses on the ecosystem and biodiversity effects that offshore structures could have if left in place, which aligns with the Giving Back to Nature discourse (fig. 4.3, p. 37). For example, the objectives of some research initiatives were to investigate the effects and connectivity of offshore structures and to assess the ecological value of structures left in place (Eco-Effective Strategies, 2018; INSITE, 2018). In contrast, there are also groups of individuals within the research community who firmly adopt the Bringing Back to Nature discourse as their narrative, however this narrative is extremely underrepresented in the ecological research which is carried out in practice. That is in the sense that most ecological research involves stocktaking of ecosystems on offshore structures rather than assessments of in-fauna and pre-rig conditions.

At the same time, the research community is cautious to assume any discourse, with the intent to remain neutral. As remarked by Jan de Leeuw, board member of a large scale North Sea

decommissioning research initiative, it is not up to the scientists to make or influence any policy decisions, but to provide policy-makers with knowledge for sound decision-making (interview research community, 2018c). Within the research community there seems to be a disconnect between ecological research and policy-making. Researchers do not intend to suggest whether structures should be left in place or not. However, simply because of the type of research being conducted, i.e. stocktaking assessments of established ecosystems around offshore structures, inadvertently the research community predominantly aligns with the Giving Back to Nature discourse (fig. 4.3, p. 37).

**Who is framing the decommissioning discussion?**

As mentioned before, the research community actors and eNGOs are not actively involved in the policy arrangement. Consequently, the decommissioning discussion is mainly being framed by government and industry actors. Fig. 4.4 shows the representation of discourses in the Dutch policy arrangement if the actor groups which are not actively involved are not included. The figure shows a picture of complete removal, in line with the international and regional legislative frameworks. Furthermore, we know that the national government and industry form a discourse coalition through Nexstep under the banner of the energy transition, but due to the strict regulations under OSPAR neither government nor industry have the flexibility to decide on alternative decommissioning approaches (Osmundsen & Tveteras, 2003). Additionally, both governmental actors and industry actors encounter some barriers which withhold them from explicitly voicing their narrative (i.e. political and reputational risk barriers). Ultimately, the strict OSPAR regulations steer the predominant decommissioning discourse in the Netherlands more towards the Bringing Nature Back discourse.

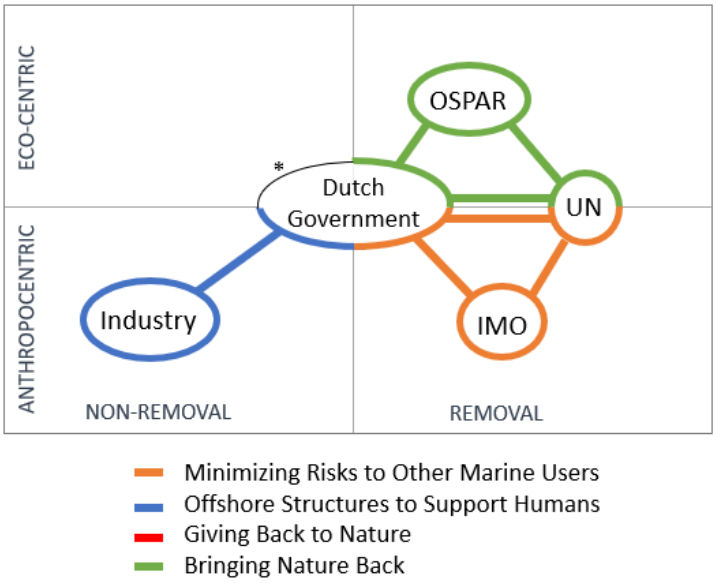


*Figure 4.4 – Discourse representation in the Dutch policy arrangement, excluding the actor groups which are not actively involved. *the Dutch government does not assume the Giving Back to Nature discourse.*

## *4.5. Resources and power relations*

As discussed in the conceptual framework (chapter 3), resources describe the tools that are available to an actor and that give them power to influence policy decisions. To have power or influence within a policy arrangement is an important trait for actors as it enables them to achieve desired policy outcomes which fit with their assumed discourses. Aside from being able to influence policy decisions

and steering political decisions, actors can also use their power and influence to frame policy issues, set agendas or change the rules of the game (Arts et *al*., 2000).

### Discursive power

Although eNGOs are not actively participating in the policy arrangement they need to be considered due to their great discursive power. By mobilizing the public and potentially threatening the industries reputation and social license to operate eNGOs have the power to influence policy decisions. It is important to ensure the consultation and decision-making processes are transparent and relevant resources (i.e. knowledge and information) are available, in order for eNGOs to be able to engage in meaningful informed discussions. One famous example where this did not happen was the decommissioning of the Brent Spar. If detailed information on the decommissioning project, and specifically the environmental aspects, would have been verified and made available to eNGOs and discussed with them as the project progressed, perhaps the decommissioning plans for the Brent Spar would have been accepted; or perhaps the operators could have developed a more acceptable plan given the concerns of the public (Wilkinson et *al*., 2016).

### Government steering capacity

The resources and power available to governments determines to what extent the state has the political and institutional capacity to steer its oil and gas industry and the offshore decommissioning policy arrangement (Hirst, 2000). While international legislation by the UN and IMO allocates certain decision-making powers to national governments, the much stricter regional framework of the OSPAR limits the flexibility that national governments have to develop their own approaches to offshore decommissioning (Osmundsen & Tveteras, 2003). Governance of the oil and gas industry is traditionally a process of close cooperation between the government and the industry (van Leeuwen, 2010), due to the high inter-dependencies between the government and the industry, such as tax revenues, licenses to operate, knowledge, and energy security. Consequently, also decommissioning plans are developed in negotiation with operators and the relevant government ministries and administrators. As a result of the strict OSPAR legislation, negotiations of decommissioning plans in the Netherlands are not about assessing the viability of an array of decommissioning options, but rather it is about finding an acceptable method of removing a structure by default (interview research community, 2018d). Submitted decommissioning plans are assessed by the State Supervision of Mines, but final approval is given by the Ministry of Economic Affairs and Climate Policy (interview industry, 2018b). Consequently, the national government is still left in charge of steering the oil and gas industry and other influential actors by defining objectives and setting priorities, but the rules of the game are predominantly set by OSPAR. The national government therefore does not have the prerogative to decide whether to completely remove a structure or not (Osmundsen & Tveteras, 2003).

### Ecological knowledge resources

It is recognized that there is a large knowledge gap regarding the impacts of man-made structures, and decommissioning thereof, on the marine environment. Over the past eight years several coordinated research initiatives have taken shape across European research community with the aim to address this knowledge gap and thus gaining resources in the form of knowledge, starting with the Living North Sea Initiative (LiNSI) in 2010. LiNSI was a North Sea-wide, science-based, multi-stakeholder program intended to explore the prospects of restoring the North Sea ecosystem using alternative decommissioning approaches (Eco-Effective Strategies, 2018). The initiative led to

preliminary conclusions and helped to acknowledge the knowledge gap and perhaps also gained academic interest for offshore decommissioning (Eco-Effective Strategies, 2018; interview research community, 2018d).

Successively, in 2012, a larger, more in-depth scientific project was initiated and facilitated by Oil & Gas UK (the industry representative in the UK) aimed at addressing the knowledge gap and improving scientific knowledge on ecosystems surrounding offshore structures in the North Sea (European Marine Board, 2017). The project, INfluence of man-made Structures In The Ecosystem (INSITE), was intended to provide independent evidence-based scientific knowledge and information needed by stakeholders to better understand the influence of man-made structures on the ecosystem of the North Sea (INSITE, 2018; Bakke et *al*. 2018). Phase 1 of the INSITE project, which has now come to a close, involved research being undertaken by universities and independent research organizations across Europe, among which the Dutch organizations mentioned previously. Results from INSITE Phase 1 suggest that offshore structures are not likely to have a negative impact on the North Sea ecosystem, and locally may even have positive effects with regards to biodiversity and connectivity (interview research community, 2018c; Bakke et *al*. 2018), while complete removal decommissioning activities do seem to have a negative effect on the local benthic community. These results are underpinned by the aforementioned paper by Fowler et *al*. (2018), which found that a majority of experts considered partial removal options to deliver better environmental outcomes than complete removal.

INSITE Phase 1 also recognized the limited access to data collected by the industry, such as ROV footage and imagery, and the lack of data sharing among industry and research actors. As part of INSITE Phase 1, the INSITE Data Initiative by the University of Edinburgh has worked on improving data sharing among industry and research actors, which resulted in an online database and a better understanding of data sharing challenges and opportunities for environmental management of oil and gas decommissioning in the North Sea (Murray et *al*., 2018). Conceptualization of INSITE Phase 2 is currently in progress, although Phase 2 will be focused on the decommissioning policy arrangement in the UK, rather than the regional context. In the Netherlands a comparable project, named North Sea in Transition, is in its pre-proposal stage with the Dutch public funder for scientific research; the Netherlands Organization for Scientific Research (NWO). The North Sea in Transition project intends to use knowledge acquired from INSITE Phase 1 as a valuable resource to build upon while applying it to the Dutch political and policy context.

It is important to note that the ecological knowledge resources generated by the research community remain largely unused, as the research community is not actively involved in decommissioning policy- and decision-making.

## *4.6. How environmental politics and ecological uncertainty stabilized the policy arrangement*

The analysis above of the four dimensions (i.e. rules of the game, actors, discourses, resources and power) of the Dutch offshore decommissioning policy arrangement gave a detailed picture of stakeholder interactions and policy dynamics. The following sections will examine how these interactions and dynamics may have stabilized or destabilized the Dutch offshore decommissioning policy arrangement, specifically with regards to how environmental politics and ecological uncertainty are dealt with.

### 4.6.1. A regional blanket policy for complete removal

In the Dutch decommissioning policy arrangement, daily interactions between government and industry actors and other day-to-day governance practices have developed into stable patterns. The demarcation of the decommissioning problem, viable solutions, the interactions and share of responsibilities between actors, and the rules of the game are all demarcated and agreed upon by the group of actors who are framing the decommissioning discussion, i.e. the government and industry actors depicted in fig. 4.4 (p. 40). With its eco-centric complete removal discourse of Bringing Nature Back, the OSPAR dominates the Dutch policy arrangement. Consequently, the decommissioning problem is delineated as an ecological problem; the solution to this problem is alleged to be the complete removal of structures. As a signatory to OSPAR the Dutch government is required to adopt the blanket policy for complete removal. One outcome of adopting a strict regional policy framework is that governance is shifted from national government to regional government (i.e. from the Dutch government to the OSPAR commission). As a result, much of the government's decision-making prerogative regarding decommissioning is fixed in the regional rules of the game. In other words, the government's authoritative power is decreased.

### 4.6.2. A closed policy community

As mentioned previously there is close cooperation between the governmental actors and the industry, as industry actors are consulted when national regulatory frameworks are drawn up. The interaction between government and industry actors is regulated through formal negotiations, approvals, permits. Final decommissioning policies and decisions are made by Dutch government actors, but as a signatory to OSPAR much of this prerogative and authoritative power is transferred to the regional level of government (i.e. the OSPAR Commission). Besides these no other actors with interests in offshore decommissioning (i.e. the research community and eNGOs) are included in the decommissioning policy- and decision-making process. Resulting in a closed policy community consisting of government actors at international, regional, and national levels and industry actors (as depicted in fig. 4.4, p. 40). Ultimately, this leads to a one sided framing of the decommissioning discussion, from defining decommissioning problems and solutions, to defining the interactions and share of responsibilities between actors and the rules of the game. As a result, the framing of the decommissioning discussion within the closed policy network is skewed towards complete removal, which is not representative of the complete range of decommissioning discourses that are assumed.

Additionally, the research community has relevant resources which, as a result of being excluded from the policy community, are not considered or utilized by policy-makers. That is, essential ecological knowledge, which is required to address ecological uncertainties and held by the research community, is not considered by policy-makers. Arguably, most decommissioning policies in this case are agreed upon for purely political reasons, much like the OSPAR Decision 98/3 which was established after the Brent Spar controversy without any prior environmental knowledge on offshore structures and decommissioning thereof (Osmundsen & Tveteras, 2003; interview research community, 2018c).

### 4.6.3. Barriers to policy change

While the Dutch policy arrangement is quite stable, there are some aspects in the policy arrangement which would be expected to lead to stakeholder conflicts and potentially policy change. In contrast with the predominant discourse of Bringing Nature Back, some actors are recognizing the eco-centric and anthropocentric opportunities of leaving structures in place, e.g. the industry, the research community, and some eNGOs (fig. 4.3, p. 37). For instance, the energy transition resulted in an Offshore Structures to Support Humans discourse coalition between the government and industry (fig.

4.3, p. 37), which has institutionalized to some degree through the establishment of the National Platform for Re-use & Decommissioning; Nexstep. However, as long as the OSPAR Decision 98/3 remains in place organizations such as Nexstep will need to operate within the rules of the blanket policy, meaning that ultimately all structures must be removed after all. Furthermore, actors within the research community seem to converge towards the Giving Back to Nature narrative, with decommissioning experts agreeing 'that a more flexible case-by-case approach to decommissioning could benefit the North Sea environment' and considering 'partial removal options … to deliver better environmental outcomes than complete removal for platforms' (Fowler et *al*. 2018). One would expect that the institutionalization of Nexstep and the increasing support for alternative decommissioning options would result in stakeholder conflicts and potentially policy renewal, however this is not the case.

Despite these trends there seems to be no lobby for policy renewal regarding the strict rules of the game. This is due to certain barriers withholding potential policy entrepreneurs from initiating policy change. Firstly, both governmental actors and industry actors encounter some political and reputational risk barriers, which withhold them from explicitly voicing their preferred decommissioning narrative. The Dutch government has remained muted because they have substantial precedents to conform with OSPAR regulations, such as their decreased authoritative power as a result of OSPAR regulations, political pressure from surrounding countries, and the intention to not seem opportunistic in terms of the economic benefits that non-removal might bring. Similarly, in the case of industry actors, pushing for policy changes might form a threat to their reputation and/or social license to operate, as was also discussed in the Decommissioning Discourses section (p. 39). Additionally, the available ecological knowledge to support non-removal options are not considered significant enough by members of the policy community, and hence it does not seem pressing enough to advocate for policy alternatives. In the case of research community actors there is a perceived disconnect between ecological research and policy-making, and an intent to remain neutral in the decommissioning discussion, as was also discussed in the Decommissioning Discourses section (p. 39). Ironically, the research community has come up with some innovative policy alternatives, such as an ecosystem fund maintained from industry cost savings of alternative decommissioning projects like artificial reefing (interview research community, 2018c).

Perhaps if there was a strong enough lobby from an assemblage of potential policy entrepreneurs the Dutch policy arrangement might skew to dispute OSPAR's blanket policy and become more representative of the actual distribution of decommissioning discourses among stakeholders. But this seems unlikely as there is little communication, participation, and deliberation between stakeholder groups outside the core policy community. Without any policy renewal or a push from potential policy entrepreneurs, the blanket policy of complete removal is likely to stay in place, and it seems unlikely that any additional exemptions will be made from the OSPAR Decision 98/3. The offshore decommissioning policy arrangement in the Netherlands is therefore considered stable.

### 4.6.4. Conclusion

The preceding analysis of the Dutch policy arrangement has shown that the policy arrangement is strongly stabilized by dynamics of environmental politics. Due to the closed policy community consisting of government and industry actors only a narrow range of interests is represented in decommissioning policy-making. Policy change is unlikely due to strong discursive power from stakeholders aligning with the predominant Bringing Nature Back discourse, but political pressure and reputational risk also play a role in preventing potential policy entrepreneurs from initiating policy

renewal. Additionally, ecological uncertainties are not addressed by policy-makers as the research community and their knowledge resources are not included in the closed policy community.

# 5. Offshore Decommissioning Governance in Australia

## *5.1. The Australian context*

In the 1960s, the first offshore petroleum infrastructure in Australian waters was constructed in the Bass Strait, between the states of Victoria and Tasmania (Chandler et *al*., 2017). Throughout the 1980s other areas in Australian waters were also developed, such as Australia's largest oil and gas reserves, the North West Shelf, in front of the state of Western Australia and the Northern Territory (Chandler et *al*., 2017). As can be seen in fig. 5.1 the bulk of offshore oil and gas structures are located on the North West shelf and South Eastern Bass Strait. Since then the Australian oil and gas industry has grown significantly and today Australia is one of the world's leading liquefied natural gas exporters (Chandler et *al*., 2017). Various types of offshore infrastructure have been installed in Australian waters, ranging from concrete gravity platforms to fixed steel jacket platforms to floating production facilities, together with associated equipment such as pipelines and other subsea structures (DIIS, 2018a). As stated by the Department of Industry, Innovation, and Science; *'The nature and makeup of the infrastructure varies considerably between fields and depends on factors such as field size, field type (i.e. oil or gas), water depth and distance from other infrastructure. Each piece of infrastructure can present its own unique decommissioning challenges due to the combination of infrastructure type and its location in the surrounding environment*.' (DIIS, 2018a). Much of the early infrastructure is now approaching the end of its life and will require decommissioning soon (Chandler et *al*., 2017). Australia

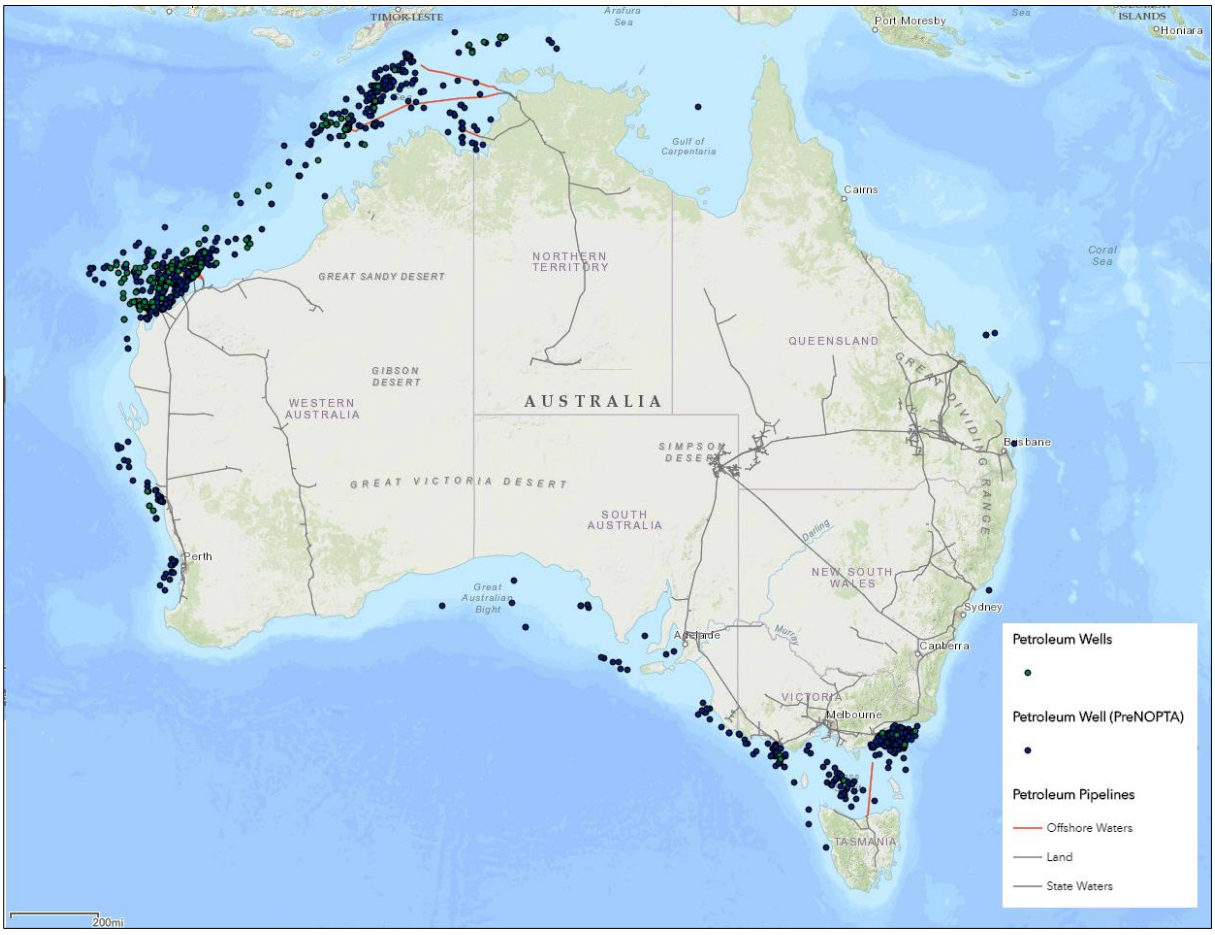


*Figure 5.1 - Overview map of the 2015 Offshore Petroleum Acreage Release. Blue and green dots indicate petroleum wells. Red lines indicate subsea pipelines. (Source: NOPTA, 2018)*

has a comprehensive regulatory framework in place that aims for all oil and gas activities to be conducted in a safe and environmentally responsible manner (DIIS, 2018a), yet little attention is paid to the decommissioning phase of oil and gas projects in this framework. To date a number of smaller projects have been decommissioned under this framework, however the framework has not yet been subjected to larger, more complex decommissioning projects (DIIS, 2018a).

More and more attention is being drawn to the issues of offshore decommissioning in Australia, and a recognition of environmental and material disposal challenges (Cullinane & Gourvenec, 2017). The industry-led organization National Energy Resources Australia (NERA) highlighted the necessity for Australia to build capability in the decommissioning phase of projects, describing this phase as "*a looming threat, or an opportunity*". The Department of Industry, Innovation and Science also states, "it is prudent and timely to review Australia's decommissioning framework to clarify and make any necessary improvements" (DIIS, 2018b). Over the coming years decisions will increasingly need to be made about Australia's approach to the governance of offshore decommissioning (Chandler et *al*., 2017; Cullinane & Gourvenec, 2017).

In this chapter I will be examining offshore decommissioning governance in Australia. In particular I will be looking at the current policy arrangement with respect to the ongoing offshore decommissioning discussion regarding environmental politics and ecological uncertainties. In order to gain a deeper understanding of the Australian approach to offshore decommissioning governance, given the emergence of new discourses and with regards to ecological uncertainties the following sections will analyze the current policy arrangement and institutionalization thereof using the four dimensions of the Policy Arrangements Approach tetrahedron. Following this analysis, I will be looking at which structural elements (e.g. legislative frameworks, stakeholder interactions, etc.) which have a stabilizing or destabilizing effect on the Australian decommissioning policy arrangement.

## *5.2. Rules of the game*

As discussed in the conceptual framework for this study, the rules of the game outline certain rules of governance, roles and interaction rules of the main actors, and allocate certain powers to actors (Liefferink, 2006). Formal rules of the game may be in the form of laws, regulations, conventions, standards, guidelines, procedures of decision making and implementation, etc., which together form the legislative and regulatory framework. Informal rules of the game may be in the form of codes of conduct, routines of interaction, norms, informal agreements about divisions of tasks, etc.

### 5.6.1. The Australian government structure

In order to understand the rules of the game it is important to understand the basic structure of Australia's government and the particular challenges it presents. Australia has existed as a federation of six internal states and two territories since 1901. A federation is a political system in which the general government (i.e. central or federal government, or in the case of Australia; the Commonwealth) is combined with separate regional governments (i.e. state or territorial governments). The Commonwealth of Australia Constitution Act 1900 allocates specific powers to the Commonwealth (the federal level of government) and residual powers to the states (Evans & Bailey, 1997; Chandler et *al*., 2017). In the offshore setting, the area extending from three nautical miles offshore to the edge of the continental shelf, including the Exclusive Economic Zone, is under the jurisdiction of the Commonwealth, and commonly referred to as Australian Commonwealth Waters

(Techera & Chandler, 2015). The area extending from three nautical miles offshore to the coast line is under the jurisdiction of the adjoining state or territory, and commonly referred to as Coastal Waters.

The federal structure of the Australian government may present some issues in the regulation of offshore decommissioning (Chandler et *al*., 2017). The traditional three nautical mile offshore separation between the Commonwealth and state authority requires close cooperation between the two, with the potential consequence that different, and possibly conflicting objectives are pursued by governments within their respective jurisdictional zones (Evans & Bailey, 1997). Therefore, in Australia, the offshore oil and gas industry is regulated under a cooperative government model that is based on complementary Commonwealth and state legislation (Evans & Bailey, 1997). This is often termed 'mirror' legislation because the governments on both sides of the three nautical mile jurisdictional boundary are reflecting each other (Evans & Bailey, 1997). Mirror legislation is aimed to reduce the overall regulatory burden associated with the offshore jurisdictional boundary (DIIS, 2018b).

### 5.6.2. The regulatory framework

The regulatory framework for offshore decommissioning is made up of international, national and state or territory laws and regulations; a set of formal written rules of the game. Table 5.1 (p. 49) outlines the regulatory framework which, to a certain degree, defines decommissioning problems and solutions, divisions of roles between actors, and other rules. Like the Dutch policy arrangement, the word 'decommissioning' is not used in any of the main international legislation and there is a lack of international law that deals specifically and only with the decommissioning in the offshore oil and gas industry.

Identical to the Netherlands, Australia is subject to decommissioning rules under UNCLOS, the Dumping Regime, and the IMO Guidelines. Recall that while the IMO Guidelines provide some prescriptive measures, the international regime is mostly objective based when it comes to environmental aspects of decommissioning.

At the national level, legislation and regulation is also mostly objective based regarding the environmental aspects of decommissioning. In Australia, environmental risks of offshore decommissioning are taken into account through the Environment Regulations accompanying the OPGGSA (table 5.1, p. 49). Under the Environment Regulations, titleholders are required to submit an Environment Plan (EP) as part of their proposal for a decommissioning project, in which they describe environmental risks and how the titleholder intends to manage those risks (interview state government, 2018). The development and eventual approval of EP's is crucial for the environmental outcome of a decommissioning project. EP's also need to be reproduced for the relevant state governments, taking into account their relevant legislation. On the basis of the EP the relevant government administrators determine the 'acceptability' of the proposed decommissioning plan, by applying the 'As Low As Reasonably Practicable' (ALARP) principle. ALARP means that a titleholder "*must show through reasoned and supported arguments that there are no other practical measures that could reasonably be taken to reduce risks further*" (NOPSEMA, 2017). However, it is not clearly described what criteria will be taken into account, nor what weight will be given to each criterion, to determine the 'acceptability' of an EP (interview research community, 2018b). This creates uncertainty for the industry when drafting the EP. It might even discourage industry actors from choosing an in-situ decommissioning option all together and just go with the base case of complete

*Table 5.1 – Overview of the regulatory framework of the Australian decommissioning policy arrangement which defines decommissioning problems and solutions, divisions of roles between actors, and other rules. (APPEA, 2016 unless otherwise indicated)*

| | |
|---|---|
| **International** | *UN convention on the Law of the Sea 1984* (UNCLOS)<br>UNCLOS determines the sovereign rights of coastal nation States to extract natural resources from its continental shelf. UNCLOS states that any installations on the continental shelf which are obsolete must be entirely removed and removal of installations or structures in the exclusive economic zone of a coastal State should consider generally accepted international standards established by the competent international organization (UNCLOS, 1984, art. 60). In addition, UNCLOS requires nation States to adopt laws and regulations to prevent pollution from dumping at sea and requires national laws to be no less effective than global rules and standards in this regard (UNCLOS, 1984, art. 208 & 210).<br><br>*London (Dumping) Convention 1972 & Protocol 1996* (Dumping Regime)<br>The Dumping Regime broadened the definition of "dumping" to include requirements for decommissioning of offshore platforms and infrastructure. The International Maritime Organization (IMO) is responsible for administering the London Protocol.<br><br>*Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and Exclusive Economic Zone 1989* (IMO Guidelines)<br>The IMO is the competent organization for the purposes of Article 60 of UNCLOS. The IMO Guidelines set out a minimum standard for nation states to adopt (Techera & Chandler, 2015). Although the IMO Guidelines should be considered under UNCLOS, they do not have the status of international law and are not binding on Australia as a signatory to UNCLOS. |
| **National** | *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGSA)<br>The OPGGSA is the main piece of legislation governing the offshore petroleum industry. OPGGSA contains a general requirement for a titleholder to remove "all structures that are, and all equipment and other property that is, neither used nor to be used in connection with the operations" (OPGGSA, 2006; Section 572(3)). OPGGSA is subject to directions by the responsible government administrators. These directions could permit the partial removal or leaving equipment or other property in-situ if it is not being used or to be used by a titleholder. However, this provision is also subject to any other provision of the OPGGSA or regulations made under the OPGGSA.<br><br>*Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (*Environment Regulations)<br>Under the Environment Regulations, the relevant government administrator determines the acceptability of a decommissioning proposal through its acceptance of an Environment Plan (EP) prepared by the titleholder. The EP must demonstrate to government administrators that the environmental impacts and risks of the activity will be reduced to "as low as reasonably practicable" (ALARP).<br><br>*Environment Protection (Sea Dumping) Act 1981* (Sea Dumping Act)<br>The Sea Dumping Act enshrines the Dumping Regime in Australian legislation. Under the Sea Dumping Act, any proposal to dump a platform or other man-made structure at sea must be assessed. This assessment must include evaluation of alternatives and waste management and minimization options and must also consider potential impacts on the marine environment and other users. The Sea Dumping Act is administered by the Commonwealth Department of Environment, and Environmental (DEE) and proposed plans are assessed by relevant government administrators.<br><br>*Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)<br>The EPBC Act provides for the environmental impact assessment and approval of proposals that may involve significant impact to a matter of National Environmental Significance. Projects assessed and approved under the EPBC Act will be subject to commitments made by the proponent and conditions that may have been imposed by the relevant Environment Minister. |
| **State** | State legislation applying to offshore petroleum facilities located in State waters generally mirrors the Commonwealth OPGGSA. For example, in Western Australia the *Petroleum (Submerged Lands) Act 1982* (P(SL)A) mirrors the Commonwealth OPGGSA. State environmental regulations concerning petroleum facilities have much in common but are not identical in content nor in how these regulations are administered. |

removal (interview industry, 2018a; interview research community, 2018b). On the other hand, the Australian regime does offer the industry a lot of flexibility with regards to how they want to decommission. Essentially titleholders can design an entire decommissioning project without much government prescription to worry about (interview state government, 2018).

Besides the lack of clarity surrounding environmental legislation and regulation, there is also a lot of uncertainty surrounding legislation and regulation of long-term liability (interview state government, 2018; interview federal government, 2018; interview industry, 2018a; interview research community, 2018b). Although this does not directly concern environmental issues arising from decommissioning, it does affect how government and industry actors make decisions which ultimately affect environmental outcome. The big question currently being asked in Australia is who should ultimately take on liability when environmental issues arise after an approved decommissioning project has been completed? The OPGGSA does not answer these questions. In order to illustrate the issue, imagine the following example; a titleholder decides to carry out an in-situ decommissioning project and creates an artificial reef after government approval. Years later a fishing vessel's beam trawler catches on the reef, creating significant damage, destroying multiple habitats, and destabilizing the reef. Under the current rules of the game it is not clear who takes on liability in this situation. It could be the government, the titleholder, or maybe even the fishing vessel. Of course, the government wishes not to take on liability in order to protect tax payers from having to pay for decommissioning activities and their potential future impacts on the environment. On the other hand, if long-term liability is assigned to the industry this could discourage titleholders from choosing alternative decommissioning options as the cost of long-term liability might outweigh the environmental benefits in the titleholders' decision. After all, it would be easier to remove all structures from the title area, and have liability cease with that (interview research community, 2018a; interview industry, 2018a). Additionally, it should be recognized that if this is the case it might be so that not much environmental research will take place in the preparation of an EP, because the base case of complete removal would be accepted by relevant government agencies regardless (interview research community, 2018a).

### 5.6.3. Informal negotiations

Due to the lack of detail in the formal rules of the game, details of the approval process and decommissioning projects are mostly discussed informally through dialogue between the relevant government administrator and industry actors (interview state government, 2018; interview industry sector, 2018a). This phase can be viewed as a feedback mechanism for the industry to get government input before formally submitting an EP and is about finding social and political agreement on a detailed plan which meets legislative and regulatory requirements (interview federal government, 2018). This includes a discussion of how environmental and other risks can be reduced to ALARP. As suggested before, the informality of this feedback mechanism and the lack of government prescription allows for a lot of flexibility in designing decommissioning projects (interview state government, 2018; interview industry, 2018a). The decommissioning game shifts from being formal to being a game of negotiations and stakeholder power. This can be in the form of routine interactions, norms and expectations between government and industry, mutual agreements, etc. Furthermore, the negotiation phase is part of the day-to-day governance practices that over time may institutionalize through policy renewal processes. There is a general lack of transparency in this process (interview research community, 2018a; interview research community, 2018b), however stakeholder involvement and input is sought after through comparative assessments and public consultations during and after the development of the EP. For example, titleholders are also expected to consult

with relevant stakeholders when developing an EP (Environment Regulations, 2009; DIIS, 2018a; DMIRS, 2017).

## *5.3. Actors*

### The government sector

There are a number of government actors that are involved in the regulation of offshore decommissioning activities in Australia, spread across multiple levels of government. Fig. 5.2 gives an overview of the structure of government, showing the different actors, the legislation they administer, and the linkages between them, using Western Australia as an example at the State level.

At the international level, the United Nations (UN) is the umbrella organization which administers UNCLOS. Among other things, it requires national laws to be no less effective than internationally accepted rules and standards with regards to the removal of offshore structures. For one such international standard the UN legislation refers to the International Maritime Organization (IMO). The IMO is a specialized sub-organization of the UN with 'the responsibility for the safety of shipping and the prevention of marine and atmospheric pollution by ships' (IMO, 2019). The IMO administers the Dumping Regime and the IMO Guidelines.

At the Commonwealth level of government, the Commonwealth Department of Industry, Innovation and Science (DIIS) administers the OPGGSA in Commonwealth Waters. In addition to DIIS the Department of Environment and Energy (DEE), administers the EPBC and SD Acts which also interface with the regulation of offshore decommissioning. Offshore titleholders require separate EP approvals from DIIS and DEE under the Environment Regulations and the EPBC and SD Act respectively (DIIS, 2018a). Additionally, they need EP approvals from the relevant state or territory departments which administer mirror legislation. For example, in Western Australia the Department of Mines, Industry Regulation and Safety (DMIRS) is responsible for administering the P(SL)A in its Coastal Waters. But again, at the state or territory level there may be other government departments which administer additional applicable legislation. Thus, with regards to administering legislation applicable for decommissioning, the structure of government is quite fragmented, and some degree of administrative streamlining is required, as was intended by adopting mirror legislation. However, as can be seen in fig. 5.2, the industry is still left having to deal with a multitude of government departments and administrators, requiring EP approvals from each.

By means of overcoming regulatory issues associated with the offshore jurisdictional boundary and improving cooperation between the Commonwealth and state or territory governments the OPGGSA outlines the concept of Joint Authorities. Generally, a Joint Authority for a state or territory consists of one responsible Commonwealth Minister and one responsible State or Territory Minister (Commonwealth of Australia, 2006). The Joint Authority performs administrative duties and gives approvals in consultation with the respective Commonwealth and state or territory departments and other relevant government administrators. By creating this partnership between the Commonwealth and state governments, jurisdictional issues associated with the federal government structure of Australia are overcome by both governments sharing the benefits of policy-making in both Coastal Waters and Commonwealth Waters (Evans & Bailey, 1997).

The Joint Authority and their respective departments are advised in their decision making by relevant government administrators. The National Offshore Petroleum Safety and Environmental Management

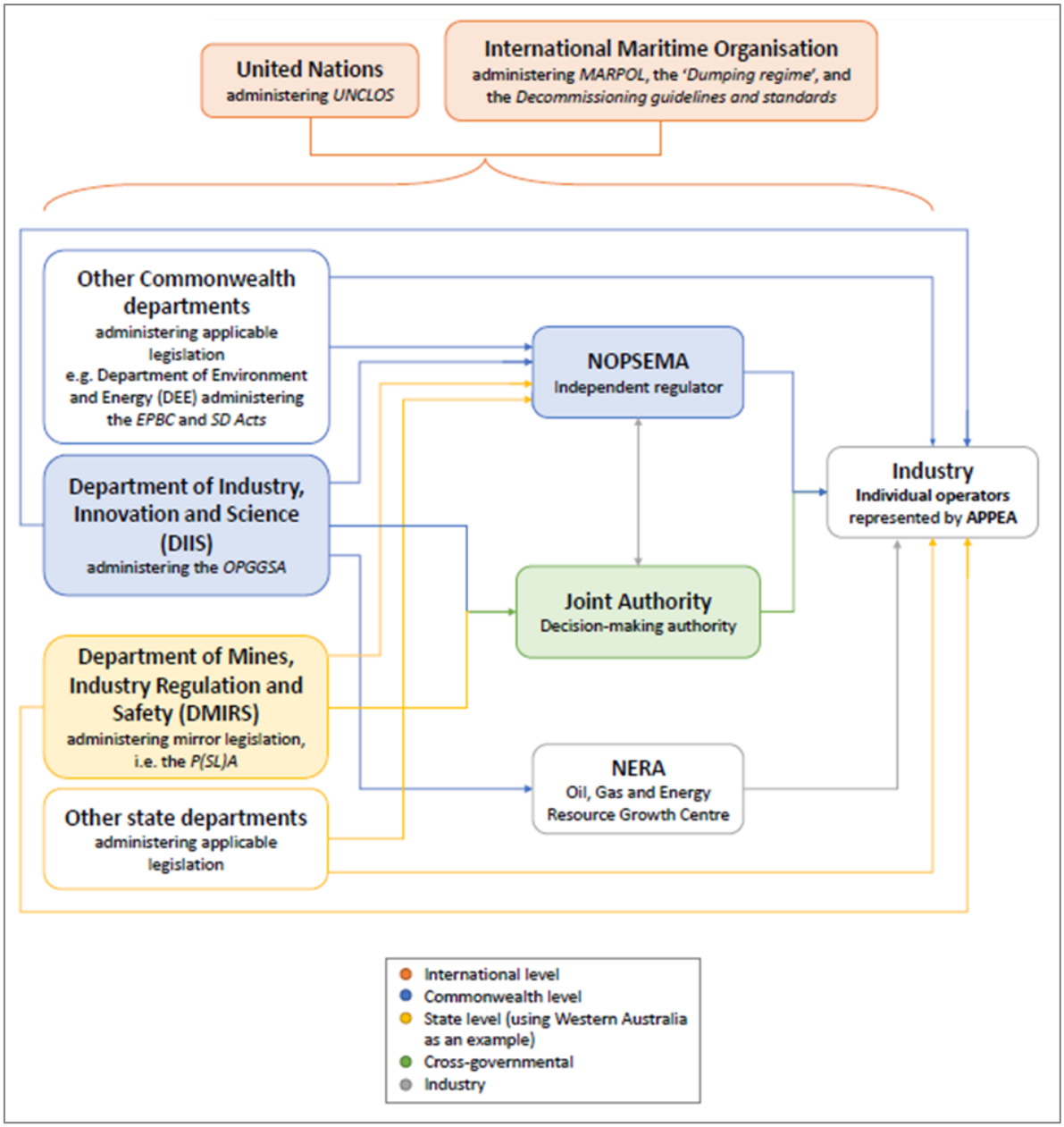


*Figure 5.2 – An overview of the structure of decommissioning governance in Australia, using Western Australia as an example at the state level of government. Bold lettering indicates different actors and italic lettering indicates formal legislation. Lines indicate paths of interaction between different actors.*

Authority (NOPSEMA) is one such government administrator. NOPSEMA has functions and powers conferred to it under the OPGGSA and its regulations (NOPSEMA, 2018). The OPGGSA provides that NOPSEMA is the government administrator for health, safety and environmental management of oil and gas activities in Commonwealth Waters (NOPSEMA, 2018). Additionally, NOPSEMA assesses titleholders' decommissioning plans to determine whether environmental risks have been appropriately identified and will be managed to levels that are 'acceptable' and reduced to ALARP (DIIS, 2018a). Subsequently, it provides these assessments and advise to the relevant Joint Authorities and their departments for formal approval (or disapproval). NOPSEMA also provides assessments and advice regarding environmental risks to DEE and other relevant state or territory government departments (NOPSEMA, 2018).

### The oil and gas industry sector

As the entity being regulated, the offshore oil and gas industry constitutes a crucial group of actors. They are also shown in fig. 5.2. Individual oil and gas companies operating in Commonwealth waters include; Chevron, BHP, ExxonMobil, Quadrant, Shell, BP, etc. These companies interact individually with the relevant national and state government departments, but are also collectively represented by the Australian Petroleum Production & Exploration Association (APPEA). APPEA has roughly sixty member companies that are active oil and gas explorers and producers in Australia (APPEA, 2018). APPEA runs a decommissioning committee which seeks to coordinate companies and ensure that decommissioning is done according to best practice (interview industry, 2018a). For this purpose, APPEA has published their *Offshore Oil and Gas Decommissioning Decision-making Guidelines* in 2016. The guideline acts as a manual for companies to navigate the complex regulatory landscape of Australia, but also to outline what the industry would like the government to consider with regards to management and regulation of decommissioning (APPEA, 2016).

The government funded 'Oil, Gas and Energy Resource Growth Centre', National Energy Resources Australia (NERA) (also shown in fig. 5.2) aims to build collaborative networks among the industry (NERA, 2018b; DIIS, 2018c). As will be further explained later, NERA is currently initiating a research initiative aimed at addressing the knowledge gap.

### The research community

In this case study, like in the Dutch case study, 'the research community' is considered as only ecological research(ers) and organizations. Research into environmental effects of offshore decommissioning activities is still in its infancy in Australia. This limited environmental knowledge compromises the veracity and sound basis of comparative assessments and eventual Environment Plans (interview research community, 2018a). However, there are various actors in the Australian research community that do some work on offshore decommissioning, including; the Australian Institute for Marine Science (AIMS), the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and the Western Australian Marine Science Institute (WAMSI). Additionally, some universities also have staff working on decommissioning such as Curtin University, the University of Western Australia's Oceans Institute, and the University of Western Australia's Centre for Mining, Energy and Natural Resources Law. It is clear from their bodies of work on offshore decommissioning that these organizations hold a lot of potential to address the knowledge gap. However, these research organizations are not systematically included in the policy arrangement, and to date there have been no coordinated research initiatives in Australia.

### Environmental non-government organizations

Environmental non-government organizations (eNGOs) that are operative in the Australia include The Nature Conservancy, WWF, Greenpeace, etc., however these are not active participants in the decommissioning policy arrangement in Australia. Nonetheless, they are important to consider because once the topic of offshore decommissioning catches the public eye these eNGOs will very likely join the discussion actively. At present eNGOs can get involved though the public consultation processes of the government and industry separately to raise their concerns. However, these organizations currently do not seem to have the appropriate resources and expertise to engage in meaningful discussions on the topic of offshore decommissioning (pers. comm. eNGO, 2018a; interview research community, 2018a). The influence that eNGOs may have in the decommissioning

policy arrangement are similar as in the Netherlands and will also be discussed in the 'Resources and power relations' section (p. 57).

### *5.4. Discourses in the offshore decommissioning debate*

The actors involved in the Australian offshore decommissioning policy arrangement all have their own views on how offshore decommissioning problems and solutions should be defined. Actors assuming the same discourses may, perhaps inadvertently, form discourse coalitions. Using the data collected in this study through interviews, document analysis, and literature review the discourses assumed by each group of actors and the possible discourse coalitions formed by shared discourses was visually mapped out as in fig. 5.3, by means of the conceptual framework for categorizing offshore decommissioning discourses.

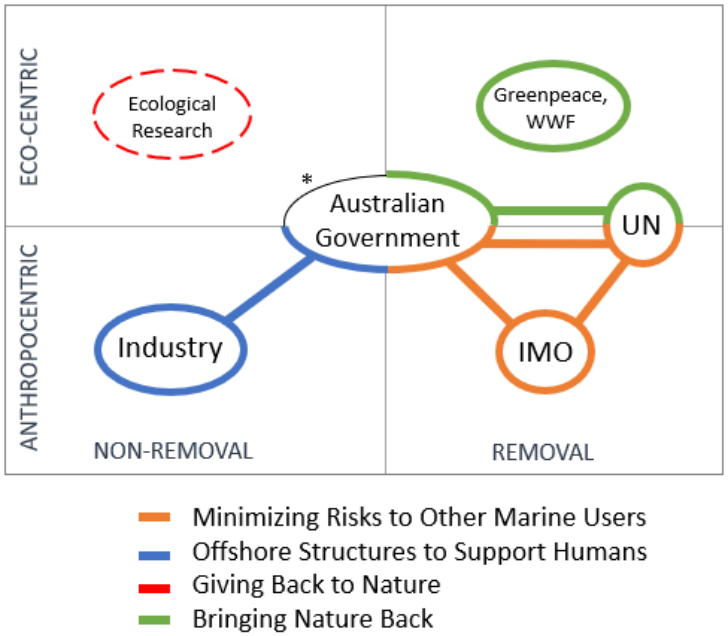


*Figure 5.3 – Discourses assumed by each sector in the Australian offshore decommissioning policy arrangement and possible discourse coalitions formed by shared discourses. The dashed circle for Ecological Research indicates this group of actors predominantly aligns with the Giving Back to Nature and Offshore Structures to Support Humans discourses, but there are individuals within this group who might firmly assume other discourses or actively try to remain neutral. *the Australian government does not assume the Giving Back to Nature discourse.*

#### Minimizing Risks to Other Marine Users

The lower right quadrant in fig. 5.3 shows the actor groups which align with the Minimizing Risks to Other Marine Users discourse. Representation of this discourse within the Australian policy arrangement is comparable that of the Dutch Policy arrangement. Under UNCLOS and the IMO guidelines, motivations for complete removal are mainly anthropocentric as the main argument for removal is the minimization of navigational and safety hazards, aligning with the Minimizing Risk to Other Marine Users discourse (fig. 5.3). Apart from its more anthropocentric objectives, UNCLOS also includes eco-centric objectives, such as the prevention, reduction and control of pollution of the marine environment. Hence it is considered UNCLOs also to some extent aligns with the Bringing Nature Back discourse. The Commonwealth has expressed its wish to adhere to these international obligations by adopting complete removal as its base case (DIIS, 2018b; interview federal government, 2018). Thereby, the Australian government also adopts the international narrative of Minimizing Risk to Other Marine Users (fig. 5.3).

#### Offshore Structures to Support Humans

In the lower left box in fig. 5.3 the actor groups adopting the offshore Structures to Support Humans narrative are shown. The offshore oil and gas industry has anthropocentric motivations for non-

removal decommissioning options for social and economic reasons (interview research community, 2018a; interview research community, 2018b). For instance, one of the main arguments for building artificial reefs has been for the benefit of local communities, as exemplified by the following statement by NERA regarding their Exmouth Artificial Reef project; '*Integrated Artificial Reefs provide multiple benefits to their communities through habitat enhancement and restoration, as well as recreational fishing, diving and employment opportunities'* (NERA, 2018a). At the same time, artificial reefing and other alternative decommissioning options may reduce costs of the decommissioning phase and gain operators a social license to operate. This indicates the industries disposition to assume the Offshore Structures to Support Humans discourse (fig. 5.3, p. 54). The Australian government leaves their regime flexible enough for industry actors to carry out alternative decommissioning activities, such as artificial reefing or in-situ decommissioning. Both federal and state government representatives have expressed their interest in and support of alternative decommissioning approaches, for as far as they are allowed by the international and national legislative and regulatory frameworks, and as long as they are believed to result in better outcomes than the base case of complete removal (DIIS, 2018b; interview federal government, 2018; interview state government, 2018). By allowing and supporting non-removal options, perhaps unintentionally, the government also aligns with the Offshore Structures to Support Humans discourse (fig. 5.3, p. 54). Unsurprisingly, the industry-led research initiative by NERA has also adopted anthropocentric objectives to examine the potential benefits that offshore structures might provide for other industries and society, next to more eco-centric objectives (interview industry, 2018a).

Nevertheless, Andrew Taylor, decommissioning project director at NERA, highlighted that industry actors recognize that each offshore structure is different and will require a customized decommissioning approach (interview industry, 2018a). Ultimately, not every structure will qualify for (partial) non-removal options. At the same time, long-term liability issues seem to present a barrier to industry actors when participating in the offshore decommissioning discussion, as the prospect of retaining liability discourages them from selecting non-removal options. Industry actors are therefore inclined to go with complete removal approaches after all, despite industry motivations being predominantly rooted in the Offshore Structures to Support Humans discourse.

### Giving Back to Nature

Next, fig. 5.3 shows the actor groups which align with the Giving Back to Nature discourse in the upper right corner. The research community is yet to be systematically included in the Australian offshore decommissioning policy arrangement, but discourses regarding the topic can already be identified in some individual research projects. Similar to what was observed in the Dutch policy arrangement, the research focus in Australia lies on stock-taking and preserving the ecosystems that have established on offshore structures over the course of their productive life. In an interview one researcher stated that "*when we say [environmental] impact we always talk about removing the [flora and fauna] that is on [offshore structures], but we don't talk about the in-fauna having the right to come back*" (interview research community, 2018a), suggesting that the research community predominantly aligns with the eco-centric Giving Back to Nature discourse (fig. 5.3, p. 54).

At the same time, similar to the Dutch research community, there are groups of individuals within the Australian research community who align more with the Bringing Back to Nature discourse, however this narrative is extremely underrepresented in the ecological research which is carried out in practice; i.e. most ecological research involves stocktaking of ecosystems on offshore structures rather than assessments of in-fauna and pre-rig conditions.

### Bringing Nature Back

Finally, fig. 5.3 (p. 54) shows the actor groups which align with the Bringing Nature Back discourse the upper right quadrant. Again, representation of this discourse within the Australian policy arrangement is comparable to that of the Dutch Policy arrangement. Major eNGOs, such as Greenpeace and WWF, adopt the Bringing Nature Back discourse (fig. 5.3, p. 54), giving public statements such as; "... years of campaigning that have brought about international rules protecting our marine environment from discarded oil rigs. The basic principle that our seas cannot be used as the junkyard of the oil industry has prevailed" (Greenpeace UK, 2017). However, like the research community, most eNGOs are not active participants in the decommissioning policy arrangement in Australia, and these eNGOs currently do not seem to have the appropriate resources and expertise to engage in meaningful discussions on the topic of offshore decommissioning. There were no statements from other eNGOs found which are directly related to offshore decommissioning other than Greenpeace's statements.

Additionally, the Australian government also adopts the UNCLOS narrative of Bringing Nature Back by adhering to its eco-centric objectives, as discussed previously.

### Who is framing the decommissioning discussion?

At the present time the decommissioning discussion is framed by only a few actors (interview research community, 2018a). Research community actors and eNGOs are not actively involved in the policy arrangement making the decommissioning discussion a one sided argument from the industry and government (interview research community, 2018a). In general, perception of environmental risks and the rules of governance are quite anthropocentric in Australia (interview research community, 2018b). Fig. 5.4 shows the representation of discourses in the Australian policy arrangement if the actors which are not actively involved are not included. Indeed, this shows a very anthropocentric picture. Moreover, we know that formally the national government has the prerogative to make decommissioning policies and decisions, however the Commonwealth government only outlines broad objective- and performance-based requirements such as the ALARP principle, the 'acceptability' of Environment Plans, and the requirement to satisfy NOPSEMA. These objectives are so broad that they do not provide any definitions of problems and approaches to solutions, leaving the responsibility

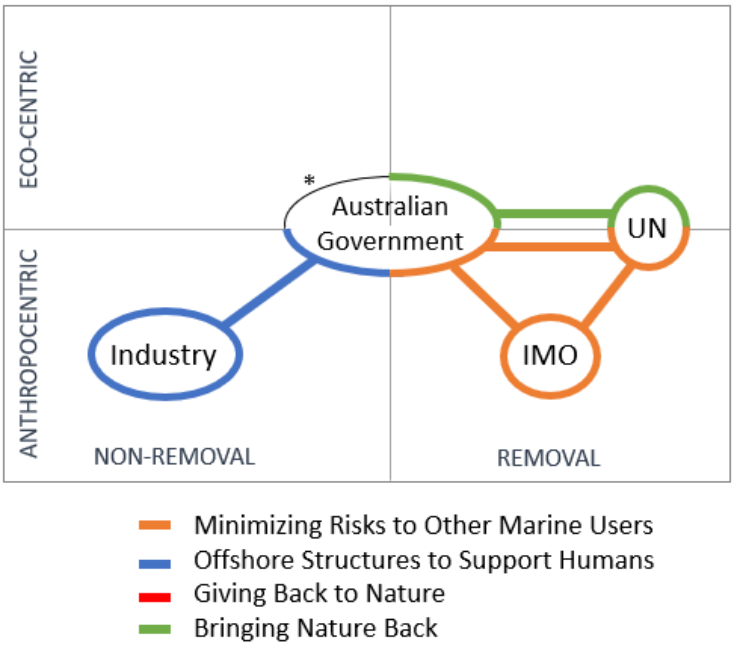


*Figure 5.4 – Discourse representation in the Australian policy arrangement, excluding the actors which are not actively involved. *the Australian government does not assume the Giving Back to Nature discourse.*

to define these entirely to the industry without much guidance as to what is expected of them. Ultimately the industry has quite some steering capacity by controlling what information enters the negotiation space. In theory this would make the predominant decommissioning discourse in Australia the Offshore Structures to Support Humans discourse. Except as a consequence of long-term liability issues the industry is discouraged from choosing alternative decommissioning options as the cost of long-term liability might outweigh the environmental benefits in the titleholders' decision. This skews the predominant decommissioning discourse in Australia more towards complete removal, in line with the international narrative of the Minimizing Risks to Other Marine Users discourse.

### *5.5. Resources and power relations*

As discussed in the conceptual framework (chapter 3), resources describe the tools that are available to an actor and that give them power to influence policy decisions. To have power or influence within a policy arrangement is an important trait for actors as it enables them to achieve desired policy decisions. Aside from being able to influence policy decisions and steering political decisions, actors can also use their power and influence to frame policy issues, set agendas or change the rules of the game (Arts et *al*., 2000).

#### Discursive power

Like in the Dutch case, eNGOs are not actively participating in the Australian policy arrangement, even though they have a strong discursive power. Without transparency in the development of Environment Plans and access to relevant information eNGOs are not able to engage in a meaningful informed discussion. Additionally, given the uncertainty around how approvals are granted, eNGOs and the Australian public in general have very little legal standing to oppose government administrators' decisions (interview research community, 2018b). Detailed information on a decommissioning proposal, and specifically the Environment Plan, and its content should be verified and made available to eNGOs and discussed with them as plans develop. eNGOs were intended to be included in the DOI-CRC which might have helped to promote open dialogue and transparency between stakeholders, and maybe even collaborations.

#### Government steering capacity

The resources and power available to governments determines to what extent the state has the political and institutional capacity to steer its oil and gas industry and the offshore decommissioning policy arrangement (Hirst, 2000). International legislation by the UN and IMO allocates decision-making powers to national governments. In other words, formally the decision to decommission or not is the prerogative of the government (Hamzah, 2003). However, the lack of clarity and ambiguity of the Australian government towards governing offshore decommissioning activities leaves the responsibility to define problems and approaches to solutions to the industry.

Formally, industry actors have no decision-making power, however through the informal negotiation process prior to approval of a decommissioning project, the industry can influence ultimate outcomes by utilizing its resources, such as data, knowledge and expertise. Titleholders are solely responsible for scoping out the best decommissioning option and formulating an Environment Plan (DIIS, 2018b). Companies either have in-house expertise or hire expertise through a third-party contracting agreement with specialist contractors in order to carry out environmental impact assessments, comparative assessments and stakeholder consultations for preparation of an Environment Plan (interview state government, 2018; interview industry, 2018a). The information in their reports feed the project proposal that enters the negotiation space. As stated by Wilkinson et *al*., (2016); "It may

then be difficult for the regulating agency, [in this case NOPSEMA and relevant government departments], to judge the veracity of such complex reports". Ultimately, the industry has quite some steering capacity, rather than the government.

### Ecological knowledge resources

The inherent complexity of decommissioning activities brings numerous uncertainties which form a knowledge gap in the Australian offshore decommissioning policy arrangement, where knowledge, as a resource, is scarce. As mentioned previously, research into environmental effects of offshore decommissioning activities is still in its infancy in Australia. The knowledge gap is just starting to get acknowledged by key governmental and industry actors and concepts of coordinated research initiatives such as in the Netherlands are just recently starting to emerge. NERA is currently setting up an industry-led research initiative very similar to the North Sea INSITE project, except with a slightly broader scope than the strictly ecological INSITE project. The National Decommissioning Research Initiative (NDRI) aims to understand impacts of man-made structures and decommissioning thereof on the marine environment, impacts of contaminants and material degradation, the potential benefits that structures might provide for other industries and society, etc. (interview industry, 2018a). The research project is intended to address the knowledge gap and eventually to provide a good scientific basis for decision-making (interview industry, 2018a). The NERA decommissioning research project has mobilized and aligned industry actors towards a common research goal (interview industry, 2018a).

Prior to NERA's decommissioning project there was an attempt to set up a similar initiative with an even larger scope; namely the Decommissioning Offshore Infrastructure Cooperative Research Centre (DOI-CRC) (interview research community, 2018b). The DOI-CRC intended to include actors from all sectors and disciplines in order to create a cooperative network (DOI-CRC, 2016). Such an initiative would have mobilized and united all relevant stakeholders, including other industries an eNGOs. The DOI-CRC initiative did not come into existence due to shortcomings in funding.

Apart from the lack of coordinated research initiatives there is limited access to real data, much like what was experienced during the North Sea INSITE project. This is in part due to the remoteness of offshore structures in Commonwealth Waters, but also due to the strict limitations by offshore operators on physical access to offshore structures (interview research community, 2018a). Individual operators have large amounts of data available, such as ROV footage and imagery, sometimes going back in time for multiple decades (interview research community, 2018a; interview industry, 2018a), but even access to this collected data is limited. However, according to APPEA, offshore operators seem willing to collaborate with researches under conditions (interview industry, 2018a). Data, as a resource, is crucial in order to perform baseline studies and pilot studies and in order to build a good scientific basis for decision-making, but under current conditions this resource goes unused.

## *5.6. How environmental politics and ecological uncertainty destabilized the policy arrangement*

The analysis above of the four dimensions (i.e. rules of the game, actors, discourses, resources and power) of the Australian offshore decommissioning policy arrangement gave a detailed picture of stakeholder interactions and policy dynamics. The following sections will examine how these interactions and dynamics may have stabilized or destabilized the Australian offshore

decommissioning policy arrangement, specifically with regards to how environmental politics and ecological uncertainty are dealt with.

### 5.6.1. A case-by-case approach

Unlike the Netherlands, Australia has adopted a case-by-case approach to decommissioning, with complete removal as its base case. However, because Australian government actors refrain from explicitly assuming any discourses the underlying rules of governance are unclear. In particular there is a lot of uncertainty in the approval process. Instead of clearly stating what is expected of the industry when decommissioning, the rules of the game state general phrases, such as "to the satisfaction of NOPSEMA" and "as low as reasonably practicable". Such phrases are intentionally ambiguous as the general phrases do not mean anything in law, although it provides government and industry actors a certain comfort level through regulatory flexibility (Hamzah, 2003). Unlike in the Netherlands, the Australian regime offers the industry a lot of flexibility with regards to how they want to decommission. At the same time, as identified in the DIIS (2018b) discussion paper, the Commonwealth wants to ensure the regime "remains sufficiently flexible to meet the evolving technical challenges and opportunities associated with decommissioning as they arise and encourage innovation and continuous improvement". However, on the other hand, there are various barriers which seem to discourage industry actors from choosing alternative decommissioning options. First of all, since complete removal is the base case, industry actors know that removing a structure will require a lot less paper work (in the form of EPs, EIAs and comparative assessments) and is sure to be approved by joint authorities and relevant government departments. Secondly, like in the Netherlands, the Australian industry in subject to discursive power from eNGOs, which forms a reputational risk barrier for choosing alternative decommissioning options. And lastly, issues of long-term liability in the regulatory framework discourage industry actors from choosing alternative decommissioning options as the cost of long-term liability might outweigh the environmental benefits in a titleholders' decision.

### 5.6.2. A closed policy community

Similar to the governance regime in the Netherlands, the Australian decommissioning policy sees a close cooperation between the government and the industry. But unlike in the Netherlands the prerogative to make decommissioning policies and decisions is still with the national government (as opposed to a regional governmental body like the OSPAR Commission). Apart from industry actors being consulted when national regulatory frameworks are drawn up, they also have steering capacity regarding ultimate decommissioning decisions. As mentioned previously, industry actors are solely responsible for scoping out decommissioning options and control what information enters the negotiation space. Despite the policy- and decision-making authority and steering capacity lying with the government and the industry respectively, the predominant decommissioning discourse in Australia is still skews towards the international narrative of Minimizing Risks to Other Marine Users. This is presumably a result of the barriers discussed above which discourage industry actors from choosing alternative decommissioning options.

Besides the actor groups discussed above, no other actors with interests in offshore decommissioning (i.e. the research community and eNGOs) are included in the decommissioning policy- and decision-making process. Resulting in a closed policy community consisting of government actors at international and national levels and industry actors (as depicted in fig. 5.4, p. 56). Ultimately, this leads to a one sided framing of the decommissioning discussion, which is quite anthropocentric, from

defining decommissioning problems and solutions, to defining the interactions and share of responsibilities between actors and the rules of the game. This framing is does not represent the complete range of decommissioning discourses that are assumed by stakeholders. Additionally, this closed policy community disregards valuable and important resources held by excluded actor groups, such as the research communities potential to address ecological uncertainties and eNGOs' discursive power to countermand decommissioning decisions.

### 5.6.3. Ongoing policy change

Decommissioning policy- and decision-makers in the Australian offshore decommissioning policy arrangement have become increasingly aware of legislative gaps. As a result, Australia is currently undergoing processes of policy renewal with regards to offshore decommissioning. Two major policy changes can be observed: Policy modernization and streamlining, and the conceptualization of new policy concepts.

Firstly, the Australian government is currently going through a large-scale review process of the legislative and regulatory framework for the oil and gas industry, both at the federal level and in some states and territories. The framework has not undergone any such review previously (interview research community, 2018b; interview federal government, 2018; interview state government, 2018). Part of this process is to collect all pieces of legislation relevant to offshore oil and gas which are scattered across government departments and to combine them into one comprehensive piece of legislation (interview state government, 2018). In terms of the three types of environmental policy innovation or change identified by Arts & Leroy (2006) this would fall under the integration of existing juxtaposed policy arrangements. The aim is to get rid of overlap in petroleum acts, but also to fill in legislative gaps. An example of such a legislative gap is the issue of long-term liability, i.e. liability after completion of decommissioning is not clearly allocated under the current framework. Additionally, in line with the second type of environmental policy innovation or change identified by Arts & Leroy (2006), the discursive and/or organizational renewal of existing policy arrangements, legislation are intended to be modernized (wording, meanings, new concepts of decommissioning, etc.) and the administrative process is intended to be streamlined (interview federal government, 2018; interview state government, 2018). However, it is likely that ambiguous phrases such as "to the satisfaction of NOPSEMA" and "as low as reasonably practicable" will remain due to the regulatory flexibility they provide.

Secondly, as a means of dealing with some of the short comings of the current policy arrangement some new policy arrangements could potentially be introduced, which is in line with the third type of environmental policy innovation or change identified by Arts & Leroy (2006). For example, as stated in the DISS discussion paper (2018b) the decommissioning debate has led the government and industry "to work towards ensuring new infrastructure is intelligently designed to facilitate modular removal at the end of its useful life". This may lead to new policies requiring future oil and gas structures to be designed with eventual decommissioning in mind, i.e. easily decommissioinable offshore structures. Another example is a new policy tool is coming into conceptualization in Western Australia aimed at resolving the issue long-term liability. Western Australia's Department of Mines, Industry Regulation and Safety is looking at creating a pooled fund for the offshore oil and gas industry, based on WA's mining rehabilitation fund (interview state government, 2018). This fund would be backed by the industry through the payment of levies or bonds and would be used on a contingency basis. The pooled fund would be managed by a treasury with clear rules and guidelines about how money is drawn and used to remediate (interview state government, 2018). Depending on the rules

and guidelines of such a fund, this new policy tool might make alternative decommissioning options more attractive for industry actors to explore in the development stage of the Environment Plan, because it reduces the costs of long-term liability. For now, however, the pooled fund for offshore decommissioning is merely a concept and has not been institutionalized yet. This is an example of policy entrepreneurs potentially offering a policy innovation.

### 5.6.4. Conclusion

The preceding analysis of the Australian policy arrangement has shown that the policy arrangement is currently undergoing lots of policy change, however due to the closed policy community consisting of government and industry actors only a narrow range of interests is represented in decommissioning policy- and decision-making. Although policy modernization and streamlining, and the conceptualization of new policy concepts may address the legislative gaps associated with a case-by-case approach, they do not address the environmental politics outside of the closed policy community, i.e. the decommissioning discourses adopted by other stakeholders like the research community and eNGOs, neither do they address any ecological uncertainties.

# 6. Comparison of policy arrangements in the Netherlands and Australia

## *6.1. Differences in the physical environment*

It is important to be aware of the differences between the Dutch North Sea and Australian Commonwealth Waters in the physical environments. Recall from chapter 1 that every structure and its surrounding environment are different and therefore requires its own customized approach to decommissioning. In other words, there is no 'one-solution-fits-all' approach to decommissioning. The physical environment dictates what type of structures are in place, but also what decommissioning solutions can be considered.

The Dutch North Sea is very shallow and nowadays mostly consists of mostly homogeneous sandy bottoms as a result of extensive and intensive bottom trawling fisheries that have taken place in the past, which have wiped out the once diverse benthic ecosystem of oyster and mussel reefs. Additionally, the Dutch North Sea is geographically considerably smaller than Australia's Commonwealth Waters. Marine space in the Dutch North Sea is also much more intensely used, considering the multitude of industries making use of the small marine space and the Port of Rotterdam at its doorstep (interview research community, 2018c). Due to the shallow depth of the Dutch North Sea most platforms are supported by steel jackets, which are relatively easy to remove in terms of technical feasibility (e.g. compared to a concrete gravity structure). Furthermore, a vast network of pipelines and other subsea structures is in place.

In contrast, Australia's Commonwealth Waters are mostly deep and include a wide variety of climates from tropical to temperate, resulting in heterogeneous substrates ranging from coral reefs to rocky bottoms to sandy bottoms. Furthermore, the above surface conditions vary greatly; from the stormy Bass Straight to the relatively calm Indian Ocean. Therefore, a wide array of types of offshore structures can be found in Australia's Commonwealth Waters, some of which may require more complex decommissioning operations. There are also long stretches of pipelines in place, however, unlike the network of pipelines in the Dutch North Sea which transport petroleum to subsea manifolds, these are intended to transport petroleum from remote platforms directly to shore. Additionally, the remoteness of structures also plays a role in decommissioning operations.

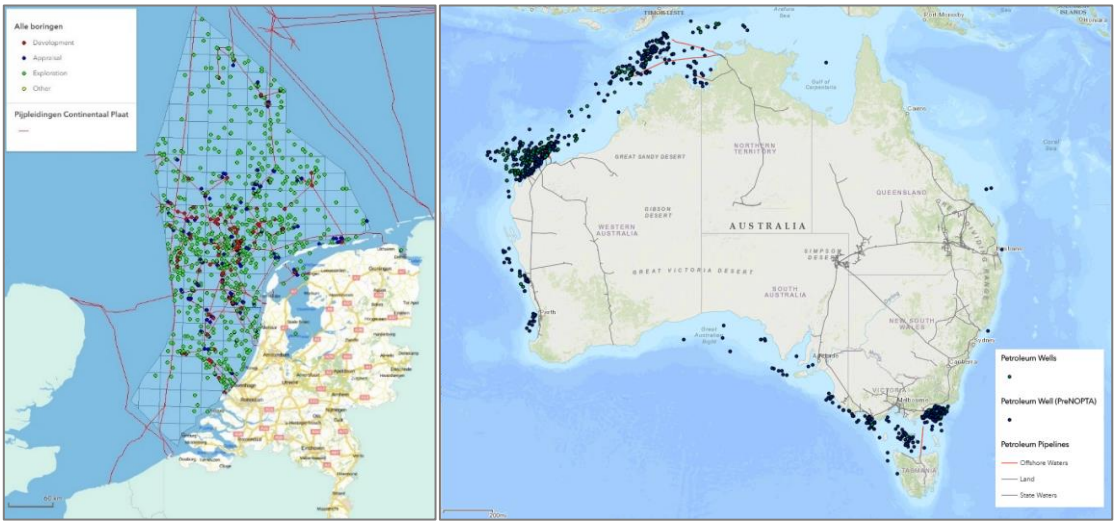


*Figure 6.1 - Overview maps of oil and gas structures and pipelines in the Dutch North Sea and Australian Commonwealth Waters. Proportions are roughly 1:5.5.*

## *6.2. Differences in the political environment*

It is also important to be aware of the differences between the Dutch North Sea and Australian Commonwealth Waters in the political environments. The political context in which offshore decommissioning policy arrangements institutionalize affect how this institutionalization is steered, particularly because the international regime regarding offshore decommissioning is ambiguous, uncomprehensive, and outdated, leaving most of the decommissioning policy- and decision-making to the national governments (Hamzah, 2003; Lyons, 2014; Techera & Chandler, 2015). The varying political environments in individual countries, such as multi-level political contexts and processes of political modernization, has great effect on how the newly emerging field of offshore decommissioning is governed.

### 6.2.1. Multi-level political contexts

Multi-level politics refers to the multiple layers of government and how they relate to one another. There are some stark differences between the Dutch and Australian multi-level political contexts with regards to governing offshore decommissioning.

As mentioned previously, the Dutch North Sea is confined to a relatively small geographic area, which is immediately adjacent to other jurisdictions. Collectively these different jurisdictions in the North Sea are facing the same offshore decommissioning challenges, due to their confinement to the same physical environment and geographical space, i.e. the North Sea. Furthermore, these countries are subject to the same decommissioning regulations under OSPAR. In addition, the European Union (EU) is also likely to influence decommissioning policy- and decision-making in the Netherlands and other North Sea jurisdictions, with previous involvement of the EC in offshore oil and gas legislation and a Hydrocarbons BREF in development. Ultimately, in regards to decommissioning, the Netherlands is mainly dealing with multi-level political interactions outside its national jurisdiction (i.e. through OSPAR and the EU).

In contrast, Australia mainly deals with political interactions within its national jurisdiction (i.e. interactions between federal, state and territory governments) (Glazewski & Haward, 2005). They face other challenges such as the sharing of policy-making responsibilities between different levels of government through the Joint Authorities.

### 6.2.2. Political modernization

Recall that Arts et *al*. (2006) defined political modernization as “structural processes of changing interrelations between state, industry and civil society, and new conceptions and practices of governance”. The Netherlands experiences political modernization in the form of regionalization. Processes of regionalization have resulted in a shift of governance from national government to regional government (i.e. from the Dutch government to the OSPAR commission). For the Dutch government this means a loss in authoritative power and when it comes to making decommissioning policies and decisions. Australia experiences political modernization in a different way. The informal negotiation process and flexibility of the regulatory framework result in a shift of governance from national government to a more interactive form of governance between government and industry actors. However, unlike in the Netherlands the prerogative to make decommissioning policies and decisions is still with the national government. Importantly, as stated by Kersbergen & van Waarden (2004), “[Shifts in governance] tend to have significant consequences for the governability, accountability, responsiveness and legitimacy of governance institutions.

## *6.3. Differences and similarities between the Dutch and Australian policy arrangements*

Keeping in mind the policy arrangement analyses of chapter 4 and 5 and the differences discussed above, I can now compare the policy arrangements of the Netherlands and Australia in order to determine the similarities and differences in how environmental politics and ecological uncertainty effect the stability of each policy arrangement. One broad difference is the type of policy that is in place. While the Netherlands applies a blanket policy, Australia applies a case-by-case approach. A similarity is that both policy arrangements are governed by a closed policy arrangement with specific groups of actors framing the policy discussion and making policy decisions. What is interesting is that as a result of these differences and similarities, the policy arrangements experience varying degrees of (in)stability in response to environmental politics and ecological uncertainty. Lastly, the two policy arrangements have a similar way of coping with ecological uncertainty.

### 6.3.1. Blanket policy vs. case-by-case approach

To start with, one major difference between the Dutch and Australian case studies is the type of policy that is in place. While the Netherlands applies a blanket policy, Australia applies a case-by-case approach. The blanket policy in the Netherlands categorically excludes (partial) non-removal decommissioning options under OSPAR Decision 98/3 and the OSPAR Guidelines on Artificial Reefs (Jørgensen, 2012). These regulations, agreed upon after the Brent Spar controversy, have firmly placed the Dutch policy arrangement in the Bringing Nature Back discourse. Because of this categorical exclusion and the discursive power within the Bringing Nature Back discourse has essentially stagnated the decommissioning discussion in the Netherlands and led to a disregard for any other decommissioning discourses. In contrast, the case-by-case policy approach in Australia does allow for all decommissioning options to be considered. The flexible regulatory framework with a base case for complete removal offers the industry a free rein for designing decommissioning projects without much prescriptive measures from the government. However, in practice it seems like the base case of complete removal is still favored over other options. The analysis of the Australian policy arrangement revealed barriers which prevent alternative decommissioning options from being considered in decisions. Firstly, discursive power from eNGOs plays a significant role, as reputational risks and threats to the social license to operate discourage industry actors from choosing decommissioning options rather than the base case of complete removal. Secondly, legislation and regulation of long-term liability currently discourage industry actors from choosing alternative decommissioning options as the cost of long-term liability might outweigh any potential environmental benefits in their decision. As a result, obsolete structures are viewed as liabilities rather than assets. Lastly, the ambiguity in the rules of the game in combination with the base case of complete removal result in a barrier for choosing alternative options. Due to the ambiguous rules of the game industry actors are left in the dark with regards to (environmental) requirements of alternative decommissioning plans, and at the same time the complete removal is the most likely option to get approved by joint authorities and relevant government departments. Inherently, industry actors are discouraged from considering alternative decommissioning options. Overall, both policy arrangements are clearly skewed towards complete removal regardless of the type of policy in place.

### 6.3.2. Closed policy communities

In both case studies it was observed that a similar group of actors are framing the decommissioning discussion and making decommissioning policies and decisions (fig. 6.2, p. 65). Because there is no

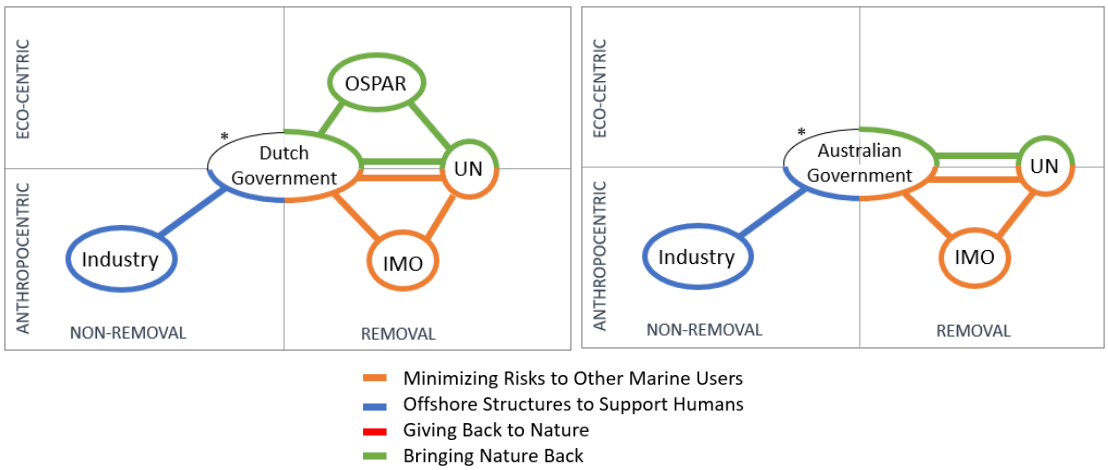


*Figure 6.2 – Comparison of the discourse representation in the Dutch and Australian policy arrangements, excluding the research community and eNGOs which are not actively involved. *the Dutch and Australian governments do not assume the Giving Back to Nature discourse.*

active participation from or consultation with potential policy entrepreneurs in decommissioning policy- and decision-making, such as the research community and smaller eNGOs aligning with the Giving Back to Nature discourse, the closed policy communities consist of government and industry actors. This implies that policy change will not occur until it is initiated by members of the policy community, or as previously suggested by a strong lobby from actors outside the policy community. However, in the Netherlands there were various barriers observed for government and industry actors to advocate for non-removal discourses, and in Australia similar barriers were observed which discourage government and industry actors from choosing alternative decommissioning options. As a result, the predominant decommissioning discourse is skewed towards non-removal in both cases, regardless of the type of policy in place. At the same time, a lobby from actors outside the policy community seems unlikely. First of all, the topic of decommissioning is not always perceived as pressing enough to advocate for policy alternatives (i.e. eNGOs and some members of the research community): Second, the ecological knowledge available is still considered too scarce and/or not significant enough by other actors outside the policy community (i.e. members of the research community): And lastly, some research community actors argue that the research community ought to remain neutral in the decommissioning discussion, as researchers should simply provide policy-makers with knowledge for sound decision-making without making or influencing any policy decisions. Since there is no push for policy change from inside or outside the policy community, in both cases it seems unlikely the policy arrangements will fundamentally change due to environmental politics and ecological uncertainty. Yet, in Australia ongoing policy change was observed.

### 6.3.3. Varying degrees of policy change

Despite the very similar policy communities, the Dutch and Australian case studies showed varying degrees of policy change. As was observed in the Dutch case study there can be barriers preventing policy renewal from taking place and thereby preventing a policy arrangement from moving from a blanket policy towards a case-by-case approach. These barriers included political and reputational risk barriers, which create substantial precedents for actors from all sectors to conform with OSPAR regulations. In other words, these barriers firmly stabilize the Dutch policy arrangement. Political barriers included the decreased authoritative power of the national government and political pressure from surrounding countries to follow OSPAR regulations. Noticeably, these political barriers are specific to the multi-level political context in the Netherlands. Reputational risk barriers included the

intention to not seem opportunistic in terms of the economic benefits that non-removal might bring and the threat to the industry's social license to operate. Discursive power from eNGOs, particularly the ones aligning with the predominant narrative under OSPAR (i.e. the Bringing Nature Back discourse), plays a significant role in forming these reputational risk barriers. Similar reputational risk barriers were observed in the Australian case study, yet in Australia policy change is occurring.

The policy change observed in the Australian policy arrangement included the modernization and streamlining of the regulatory framework and the conceptualization of new policy concepts. These policy changes are occurring because the current framework in place is uncomprehensive and outdated. However, although these changes are necessary, they are aimed at addressing legislative gaps and challenges related to the federal structure of the government and not at addressing the environmental politics and ecological uncertainty of offshore decommissioning. In other words, the outcomes of these policy changes will not affect the way in which decommissioning interests are represented in the policy arrangement, nor will it change the way in which ecological uncertainty is dealt with. With regards to environmental politics and ecological uncertainty, the Australian policy arrangement is therefore still quite similar to the Dutch policy arrangement, despite offering significantly more flexibility.

### 6.3.4. Coping with ecological uncertainty

The way in which policy-makers and other members in a policy arrangement engage with scientific information and cope with ecological uncertainty is extremely important to how a variety of management options are negotiated and decided upon in processes of environmental politics. In both case studies a detrimental lack of ecological knowledge and data was observed, leading to ecological uncertainty. A logical first step to deciding upon a variety of decommissioning options is to address this knowledge gap, which is currently being done to varying degrees in the two case studies. The Netherlands seems to be one step ahead in this game. Essentially, offshore decommissioning research in Australia lacks behind the North Sea by about 4 years. The Netherlands (in cooperation with other North Sea countries) has already explored the impacts of man-made structures and decommissioning thereof on the marine environment through the coordinated research initiative; INSITE. While on the other hand, in Australia NERA's National Decommissioning Research Initiative (NDRI) is only now taking shape in order to try and address these questions. Outcomes from INSITE, i.e. localized benefits to the marine ecosystem, may give an indication of what might also be found in Australia. However, given the stark differences in environment, conclusions drawn from environmental research on man-made structures in the North Sea may not necessarily be transferrable to the context of the Australian Commonwealth Waters. Furthermore, it became evident from both case studies that data accessibility and data sharing in the oil and gas industry presents an obstacle for scientific research to be conducted. Murray et *al*. (2018) identified obstacles which may play a role, including; confidentiality concerns, monitoring gaps (i.e. data has never been collected), and data that is difficult to access, collate, and/or process. In most Australian cases the remoteness of some structures may also play a role (interview research community, 2018a; interview industry, 2018a). Murray et *al*. (2018) continues to conclude that data accessibility and the process of data sharing could be streamlined by drafting "standardized contracts, Memorandum of Understanding (MOU), Service Level Agreements (SLA), and Standard Operating Procedure (SOP) documentation for data sharing and research collaboration between oil and gas operators and research institutions". Additionally, open access repositories for environmental data from the oil and gas industry have been suggested as a promising solution (Murray et *al*., 2018).

While the research communities in both case studies are trying to address to knowledge gap, Millner & Ollivier (2016) argue that scientific information alone is unlikely to be sufficient to lead to policy change. It remains unclear whether research initiatives, such as INSITE and NERA's NDRI, and improved data sharing will be able to play a more formal role in offering decommissioning policy- and decision-makers an informational basis in the future. First of all, due to the closed policy community in both cases there is no active participation from the research communities in policy- or decision-making, and their ecological knowledge resources largely remain unused. Secondly, while most policy- and decision-makers may have access to scientific information, their adopted decommissioning discourse and perception of environmental issues lead them cope with and interpret this information in certain ways, which in turn may result in biases and informational distortions in policy and decision processes (Doeleman, 1997; Millner & Ollivier, 2016). Group interactions, such as within the closed policy communities in the Netherlands and Australia and the discourse coalitions shown in fig. 6.2 (p. 65), can reinforce these biases (Doeleman, 1997; Millner & Ollivier, 2016). Millner & Ollivier (2016) describe 'Selective responses to new information' and 'inattention to information' as mechanisms which may interfere with the informational inputs to environmental policy- and decision-making. First of all, actor's responses to new ecological knowledge may vary depending on whether the information conflicts with their prior environmental values. For example, confirmation bias causes actors to "put too much weight on information that confirms their prior beliefs and too little weight on information that conflicts with them" (Millner & Ollivier, 2016). Second, actors may not pay attention to all the scientific information at our disposal (Doeleman, 1997; Millner & Ollivier, 2016). This may be the case in the Dutch policy arrangement as it might seem futile to some actors to explore environmental benefits of in-situ decommissioning while a strict complete removal policy is in place; or in the Australian policy arrangement as the limited amount of available information seems inconclusive or insufficient.

Overall, the cases explored in this study suggest that ecological uncertainty with regards to decommissioning does not lead to the stabilization or destabilization of a policy arrangement per se, as environmental politics plays a bigger role in the decommissioning discussion than the need to cope with ecological uncertainties.

# 7. Conclusions and recommendations

**Conclusions**

This study has looked at case studies of offshore decommissioning governance in the Dutch North Sea and the Australian Commonwealth Waters in order to investigate how environmental politics and ecological uncertainty may lead to policy change in offshore decommissioning policy arrangements and how environmental politics and ecological uncertainty might be dealt with. Chapter 4 and 5 answered the first research question of this study and its sub-questions:

- How do ecological uncertainty and environmental politics lead to policy change in the offshore decommissioning policy arrangements of the Netherlands and Australia?
    - How do interactions within policy arrangements structure decommissioning governance in the Netherlands and Australia?
    - How do the Netherlands and Australia deal with environmental politics and cope with ecological uncertainty?

Subsequently, chapter 6 compared the two case studies in order to answer the second and third research questions:

- How are the offshore decommissioning policy arrangements different or similar in the Netherlands and Australia?
- What general insights do the observed decommissioning governance regimes provide on policy change as a result of ecological uncertainty and environmental politics, and what recommendations can be made on how to deal with environmental politics and cope with ecological uncertainty?

A detailed picture was painted of the stakeholder interactions and policy dynamics within these policy arrangements. The Netherlands case study showed a stable blanket policy which categorically excludes non-removal decommissioning options. Additionally, due to a closed policy community not all stakeholders were actively involved in policy- and decision-making. The Australian case study showed a more flexible case-by-case policy approach which does allow for non-removal but does adopt a complete removal as its base case. Various barriers result in actors being discouraged from choosing alternative decommissioning options. Again in this policy arrangement not all stakeholders were actively involved in policy- and decision-making due to a closed policy community. Overall, while the Dutch policy arrangement is firmly stable, the Australian policy arrangement is undergoing policy renewal. Multi-level politics, reputational risks, (absence of) lobbies, and discursive power play a big role in the stability of the Dutch and Australian policy arrangements.

Comparison of the two case studies resulted in more general conclusions regarding how environmental politics and ecological uncertainty may lead to policy change in offshore decommissioning policy arrangements. First of all, this study implies that the type of policy in place does not influence the (in)stability of a policy arrangement. With regards to dealing with environmental politics and coping with ecological uncertainty it was observed that both policy arrangements, regardless of the type of policy in place, are quite stable in the way in which decommissioning interests are represented and ecological uncertainty is dealt with. Second, it was found that environmental politics plays a bigger role than the need to cope with ecological uncertainties in both policy arrangements. Environmental politics, in the form of multi-level politics,

reputational risks, (absence of) lobbies, and discursive power, are key in shaping decommissioning policy arrangements, whereas ecological uncertainty does not lead to the stabilization or destabilization of a policy arrangement per se.

An important question that remains is; what policy changes may lead to good governance for offshore decommissioning? Or better yet, what is good governance for offshore decommissioning? In order to answer this question it is important that we, as a society, decide on our collective objective for the decommissioning of offshore structures. On the one hand, we can accept removal requirements and adapt industry assets accordingly, i.e. design offshore structures with eventual decommissioning in mind. Or, on the other hand, we can adapt industry assets in order to embrace the ecological opportunity they bring, i.e. design offshore structures for multi-use purposes. Either way, given the controversial and political nature of the decommissioning discussion, it is important to keep the policy arrangement open and transparent to all stakeholders and interactions between stakeholders should to some degree be consultative, deliberative, and participatory. Together, we need to question how any prospective decommissioning developments will fit in current decommissioning governance regimes, and how to reform these regimes in order to reach society's collective objectives for offshore decommissioning. The following recommendations will explore good governance practices for offshore decommissioning and give an idea of what such reform might look like while referencing a range of studies which outline possible steps to be taken.

### Recommendations

Good governance is a subjective concept and can mean different things to stakeholders with varying norms, values, definitions of problems, and approaches to solutions. However, generally good governance is defined to be (among other things) transparent, participatory, and consensus oriented (Asaduzzaman, 2017). In order to apply good governance principles, offshore decommissioning policy- and decision-makers will need to consider and engage with the full range of decommissioning interests, and ideally decommissioning policies and decisions are backed by science. Decommissioning policies and decisions which do not make use of the available ecological knowledge resources (i.e. active involvement of the research community) are easily debunked as a legitimate decommissioning policies and decisions. Additionally, without active involvement of eNGOs and other stakeholders decommissioning policies and decisions are unlikely to lead to publicly acceptable outcomes. One should remember that decommissioning is by its very nature a controversial and political topic, with many different objectives, interests, and scientific knowledge represented, or misrepresented.

For instance, as we saw in the Dutch case study, due to ecological uncertainty, any kind of blanket policy cannot be scientifically justifiable at this point. In addition, the OSPAR regulations were not agreed upon in a transparent, participatory, and consensus oriented manner. In other words, not all decommissioning narratives were taken in to account. In fact, there seems to be some sort of scientific consensus that partial removal options may deliver better environmental outcomes than complete removal options, since offshore structures provide habitat and refuges for many (threatened) species and may help to re-populate the local fish and/or invertebrate populations. Categorical exclusion of (partial) non-removal decommissioning options under OSPAR Decision 98/3 and the OSPAR Guidelines on Artificial Reefs is therefore not a legitimately grounded policy. Others might argue that these environmental benefits are unlikely to outweigh the societal costs, such as the navigational hazard for the shipping industry or the imposition on fishing grounds, especially in an environment such as the North Sea where waters are shallow and intensively used. It is important to realize that a blanket policy is not bad governance per se. As long as, the policy was agreed upon in a transparent,

participatory, and consensus oriented manner, and ideally scientifically justifiable, a blanket policy might actually provide an elegant and simple solution to governing offshore decommissioning.

Focusing on the case-by-case policy approach; we can ask the question what this type of decommissioning policy should look like in order to result in legitimate decommissioning decisions? The Australian case study provided an example of some strengths and weaknesses of a case-by-case approach regarding good governance. Firstly, it was identified that the Australian case-by-case policy is missing some test of how environmental factors are balanced against other factors should be included in decommissioning policies and decisions. Instead ambiguous and general expressions are used rather than prescriptive measures (e.g. "to the satisfaction of NOPSEMA", "acceptability" of EPs, and ALARP). This uncertainty in the decision-making process has important consequences for the transparency of the policy approach. Systematization and standardization of the decision-making process may offer a solution. Standardization or systematization of the decision-making process would result in justifiable and substantiated decisions while allowing explicit assessment of the link between environmental aspects and other aspects. Fowler et *al*. (2014), Na et *al*. (2017) and McCann et *al*. (2017) outline a Multi-criteria decision Approaches (MA) and a decision support model respectively as means of approaching decision-making in a legitimate way. The MA by Fowler et *al*. (2014) was specifically intended for offshore decommissioning by "evaluating and comparing alternative decommissioning options across key selection criteria", including environmental criteria, and "The MA structures the decision problem, forces explicit consideration of trade-offs and directly involves stakeholder groups in the decision process". Additionally, an MA will allow for transparency of the decision-making process, provided that the MA and its outcomes are openly shared with stakeholders. All of which would help to legitimize decommissioning decisions. McCann et *al*. (2017) takes the MA one step further in their decision support model by also considering different stakeholders' perspectives regarding the value and importance of various aspects (particularly the environmental aspect). This would also harness the good governance principles of participation and consensus orientation. In other words, it considers the stakeholders' different decommissioning discourses. In addition to structuring the decision problem this approach can help a diverse group of stakeholders to reach some sort of consensus on decommissioning decisions (McCann et *al*., 2017).

Next, we can look at the policy communities which were observed in both case studies. Inherently, these closed policy communities are not transparent, participatory, and consensus oriented, and therefore cannot be considered as good governance. Given the controversial and political nature of the decommissioning discussion, it is recommended to keep the policy arrangement open and transparent to all stakeholders where the nature of interaction amongst actors is more consultative, deliberative, and participatory (Fowler et *al*., 2014; Ounanian et *al*., 2018; Business Review Webinars, 2019). As described by House & Howe (1998, p93) such an approach entails the following: *"Include conflicting values and stakeholder groups. Make sure all major views are sufficiently included and represented. Bring conflicting views together so there can be deliberation and dialogue about them among the relevant parties. Bring the interests of beneficiaries to the table if they are neglected".* Rather than a policy community this would create an issue network where a wider range of interests and values are represented, ultimately leading to more legitimate decommissioning policies and decisions. Such an issue network also nicely combines with the Multi-criteria decision Approach (MA) and decision support model discussed previously, as these offer a guiding framework for actors to adhere to. Provided of course that each stakeholder within the issue network also has input into such a framework. For example, Fowler et *al*. (2014) suggested "To deal with knowledge gaps concerning

environmental impacts of decommissioning, … expert opinion [should] feed into the MA approach until sufficient data become available". In addition to leading to publicly acceptable decommissioning solutions, an issue network will help in actively addressing the knowledge gap, and appropriate use of ecological knowledge resources.

Finally, in order for policy- and decision-makers to cope with ecological uncertainty, Wilkinson et *al*. (2016) suggested an Independent Review Group (IRG) of independent experts to be set up in order to provide greater transparency and confidence in the outcome of decommissioning policies and decisions, again alluding to more participatory and deliberative approaches, i.e. good governance practices.

To conclude, this thesis provided interesting lessons about the dynamics between policy change, environmental politics, and ecological uncertainty, using a novel framework for categorizing decommissioning discourses which could be used in further research. As this kind of study is relatively new further research will be required in order to gain a deeper understanding of the general conclusions presented in this study. Keeping in mind these lessons about the dynamics between policy change, environmental politics, and ecological uncertainty we can start to think about how current decommissioning regimes might change going forward, or how current decommissioning regimes may be steered towards good governance principles. Again, it is important to keep in mind that good governance is a subjective concept and as a society we need to decide on our collective decommissioning objective in order to move forwards and create positive policy change.

I would like to end this thesis with a final word on the relevancy of this study to the offshore oil and gas sector and other, younger, offshore sectors. Despite very different physical and political environments, some similarities were observed between the Dutch and Australian case studies, which arguably could carry through to policy arrangements elsewhere in the world as well, such as the barriers to policy change observed in both cases. Therefore, the conclusions of this study may be broadly applicable in other countries as well. Furthermore, this study is especially relevant as more offshore sectors are emerging which require the installment of offshore structures. I argue that the decommissioning discussion currently playing out in the offshore oil and gas sector will eventually pave the way for decommissioning within other offshore sectors, such as offshore wind or offshore carbon capture and storage. Therefore, I urge policy-makers and stakeholders alike to view the current offshore decommissioning discussion as an important learning experience for future decommissioning in other parts of the world, and in other offshore sectors, rather than delaying the development of good governance regimes for decommissioning by sticking to a one sided narrative of complete removal.

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# Annex I – Definition of technical offshore platform terms

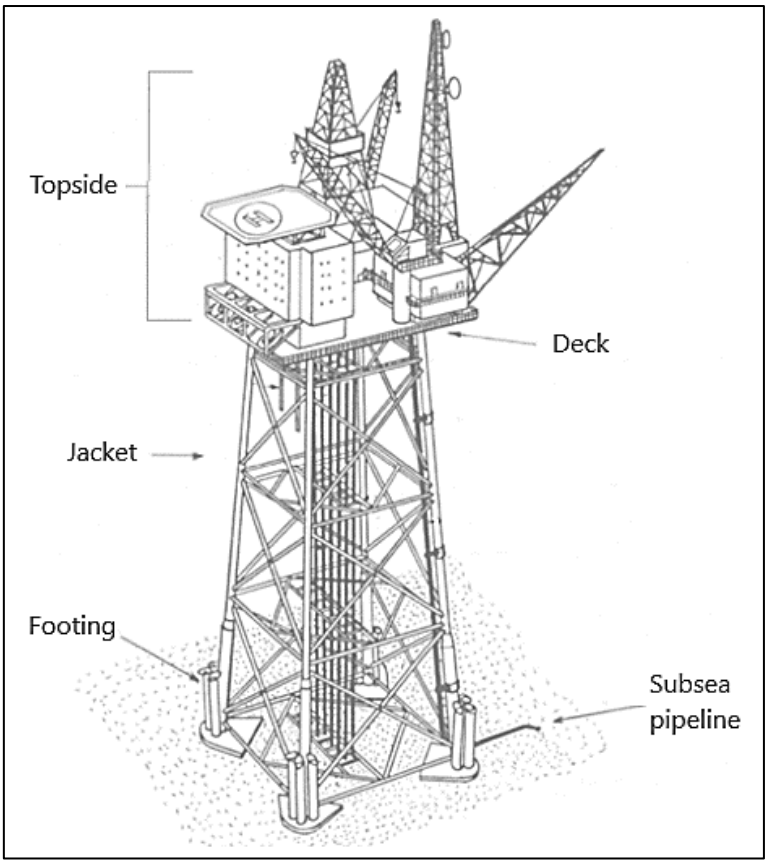


*Figure I* – Illustration showing the different parts of an oil or gas structure that may be decommissioned (adapted from DrillingFormulas.com (2017)).

**Topside:** The facility above the water surface which holds the operation control system and equipment (OilfieldWiki, 2019).

**Deck:** Horizontal surface above the water surface which supports the drilling rigs, production facilities and crew quarters (OilfieldWiki, 2019).

**Jacket:** Vertical sections made of tubular steel members which support the deck and topside (OilfieldWiki, 2019).

**Footing:** The foundations of an offshore platform usually (partially) embedded in the seafloor (OilfieldWiki, 2019).

**Subsea manifold:** Subsea manifolds are used to gather production or to inject water or gas into wells and are installed on the seabed within an array of wells (OilfieldWiki, 2019).

**Pipeline:** A tube or system of tubes used for transporting crude oil and natural gas from the field or gathering system to the refinery (Schlumberger Oilfield Glossary, 2019).

**Drill cuttings:** Small pieces of rock that break away due to the drilling activity (Schlumberger Oilfield Glossary, 2019).

# Annex II – A list of interviews

*Table II.I – List of semi-structured interviews undertaken with relevant stakeholders in Perth (Australia) between 22/10/2018 and 25/10/2018, and in the Netherlands between 03/12/2018 and 22/01/2019.*

| **Reference** | **Sector** | **Institution** | **Contact person(s)** |
|---|---|---|---|
| (interview state government, 2018) | Government | Western Australian Department of Mines, Industry Regulation and Safety | Mr. Jason Medd |
| (interview federal government, 2018) | Government | Commonwealth Department of Industry, Innovation and Science | Ms. Anneke van der Weyde |
| (interview government, 2019) | Government | Dutch Ministry of Infrastructure and Water Management | Mr. Wim van Urk |
| (interview industry, 2018a) | Industry | Australian Petroleum Production & Exploration Association / National Energy Resources Australia | Mr. Andrew Taylor |
| (interview industry, 2018b) | Industry | Netherlands Oil and Gas Exploration and Production Association | Mr. Aart Tacoma |
| (interview research community, 2018a) | Research community | University of Western Australia Oceans Institute / Australian Institute of Marine Science | Dr. Dianne McLean & Dr. Marie-Lise Schläppy |
| (interview research community, 2018b) | Research community | University of Western Australia Centre for Mining, Energy and Natural Resources Law / University of Western Australia Oceans Institute | Mr. John Chandler & Ms. Erika Techera |
| (interview research community, 2018c) | Research community | Royal Netherlands Institute for Sea Research / INSITE Independent Science Advisory Board | Dr. Jan de Leeuw |
| (interview research community, 2018d) | Research community | Wageningen Marine Research | Dr. Joop Coolen |

*Table II.II – Other forms of information exchange with relevant stakeholders.*

| **Reference** | **Sector** | **Institution** | **Contact person(s)** |
|---|---|---|---|
| (pers. comm. eNGO, 2018a) | eNGO | WWF Australia | Mr. Jim Higgs (contacted through e-mail) |

# Annex III – Sample of interview questions

## Environmental effects of offshore decommissioning activities and their uncertainties

- What are the main environmental effects to consider regarding offshore decommissioning activities?
- How are environmental effects (and their uncertainties) taken into account for the management of offshore decommissioning activities?
- How are decisions made when the environmental effects of offshore decommissioning activities are uncertain?
- ...

## Offshore decommissioning governance

- In short, can you explain the current offshore decommissioning governance regime (i.e. policies and politics) in the Netherlands/Australia?
- What are the strengths of the current offshore decommissioning governance regime?
- Which challenges exist in the current offshore decommissioning governance regime?
- ...

## Policy Arrangements

- Is the Dutch/Australian offshore decommissioning regime typically formal or informal? Please explain.
- Who are involved in the regulation of offshore decommissioning activities in the Netherlands/Australia?
- With whom (NGOs, industries, civil society, governments) does this institution interact when taking decisions on offshore decommissioning activities?
- Who has the knowledge and/or expertise required to deal with the environmentally responsible decommissioning of offshore structures?
- Who has decision-making power in the current offshore decommissioning governance regime?
- Can you describe the current offshore decommissioning debate?
- In the offshore decommissioning debate, what is the prevailing discourse on offshore decommissioning in the Netherlands/Australia?
- What constitutes an environmentally responsible offshore decommissioning approach?
- ...

## Political Modernization

- To what extent have international experiences and/or developments in offshore decommissioning affected the regulation of offshore decommissioning activities in the Netherlands/Australia?

## Policy Renewal

- How have new ideas of offshore decommissioning approaches, such as re-use and rigs-to-reefs approaches, affected the regulation of offshore decommissioning activities?
- Is the current offshore decommissioning governance regime accommodating to changes in the offshore decommissioning policy arrangement?
- What is your perspective of the current offshore decommissioning governance regime on a long-time period?
- ...