Oil & Gas Transitions

Norwegian Oil and Gas Transition:

Building Bridges Towards a Carbon Neutral Future

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Funded by:
KR FOUNDATION
Laudes Foundation

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About this report

This report was written by the University of Oslo as part of the Oil and Gas Transitions (OGT) programme, which is co-led by Climate Strategies (CS) and the Stockholm Environment Institute (SEI). OGT is an evidence-based programme which aims to generate evidence and co-produced pathways for policy action to accelerate oil and gas just transitions in the UK/Scotland, Denmark and Norway. The report identifies the current state, opportunities and barriers for a just transition of the oil and gas sector in Norway, as well as the key stakeholders and their views on the transition. The findings will serve as inputs for the co-production of just transition pathways and international blueprints for oil and gas transitions in upcoming stages of the programme. The statements herein do not directly represent the views of CS, SEI, the funders of the programme or other members of the OGT consortium.

For more information visit: www.oilandgastransitions.org.

Suggested citation: Szulecki, K., Chitra, A., Harald, D., Houeland, C., Jordhus-Lier, D. (2021). Norwegian Oil and Gas Transition: Building Bridges Towards a Carbon Neutral Future. University of Oslo.

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Executive Summary

The oil and gas (O&G) sector is a major source of Norway's national wealth and a pillar of its robust welfare state. At the same time, it makes a significant contribution to the global climate crisis. The oil and gas industry makes up 28% of the country's total greenhouse gas emissions, the second-highest source after transport, and this is only counting emissions from production on Norwegian territory, not life-cycle emissions.

As the recent Production Gap Report 2021 attests, there is growing incompatibility between the global emissions reductions targets capable of stabilising dangerous climate change and the extraction of fossil fuels. In this context, the Norwegian political and business debate is visibly changing. Norway's 2021 general election campaign, hailed as the first "climate vote" in Europe, galvanised the public by making climate pledges and the future of oil and gas key topics for discussion, and forcing all political parties and interest groups to take a stance. However, it is questionable whether the main goal should be to manage the decline of oil and gas or climate-related economic risks. If the future beyond 2050 is going to be net-zero, then **relying on the fossil fuel sector as a pillar of Norway's economy and society is unsustainable in the long run and carries significant risks that Norwegian decision makers need to mitigate.**

In this report, we analyse the current situation in the O&G sector using up-to-date statistics and reports to map the landscape and key stakeholders and to provide background on the macroeconomic and socio-political issues at stake. Drawing on the analysis of party programmes, media coverage and interviews, we also lay out the current state of the political debate on the O&G transition, highlighting the main division lines among stakeholders that must engage in constructive dialogue to solve this complex political problem. We also map the position of industry associations and trade unions, the latter being key players in the Norwegian context.

Norway is highly dependent on oil and gas and while this is especially true for regions such as Rogaland, the impact of a rapid transition will be felt throughout the country. Oil is also important for Norway's national identity, making the phase-out proposal politically controversial and sensitive. This report identifies two coalitions of political actors: one siding up with the interests of the industry and the other focusing on the need for climate action. Following the recent election, the pro-industry coalition is stronger, boasting 136 seats in the Norwegian parliament against the pro-climate coalition's 32. However, internal dynamics within the Labour Party, which secured the most seats in parliament, alongside the pivotal role of the pro-environmental Socialist Left and other parties, whose support the minority government will need, may unlock opportunities to start a gradual transition in the sector. The first issue will be that of new licences for oil and gas exploration.

Although the oil and gas transition in Norway is politically divisive, almost all stakeholders agree on its key elements. These include the development of offshore wind, carbon capture and storage (CCS) and hydrogen as alternative technologies. What the stakeholders differ on are the speed and sequence of the transition, and the role of regulatory limitations on oil production as a means to achieve it. Attempts to engage in cross-sectoral dialogue have been made by both the pro-industry and the pro-climate coalitions, but they have rarely managed to cross the main division line.

The report identifies four plausible paths that Norway may follow, each associated with different risks and opportunities. These paths are shaped by political choices, but also external forces beyond the control of Norwegian stakeholders. We argue that a cross-sectoral dialogue connecting actors across the political divide can generate transition scenarios that are resilient to external risks by taking the ultimate need for decarbonisation and a just transition as reference points on which all stakeholders can agree. The project's next steps will be to nurture such dialogue, build trust and draw lessons from the experience of other North Sea countries.

Introduction

Vast oil and gas resources with a low carbon footprint, good storage capacity for CO_2 and opportunities for mineral resources on the seabed mean that the Norwegian shelf is well positioned for the future energy transition. However, **domestic emissions reductions** which is the most important measure of climate action - **have been modest if not marginal**. As one analyst recently noted, over the last three decades Norway has cut its emissions by 3.2%, but over the next three decades "we will [have to] cut just about everything" and this "will affect all areas of society".[1]

A fundamental starting point regarding domestic emissions reductions is the share of renewables in the energy mix. At 75%, Norway had the second highest renewables share in Europe in 2019, compared to 37% in Denmark and 12% in the UK. The use of fossil fuels is also very limited in Norway's residential heating. Thus, **the low hanging fruits of domestic reductions are not present in Norwegian energy consumption.** It is the production of oil and gas on the Norwegian Continental Shelf (NCS) that makes a significant contribution to the country's CO_2 emissions. Unfortunately, it makes an even more significant contribution to the Norwegian economy and welfare.

Norway seeks **to portray itself as a green superpower** and a climate policy champion abroad. However, its efforts to cut domestic greenhouse gas emissions since the signing of the Kyoto Protocol have been limited.[2] As the global climate protection regime focuses on emissions 'at the exhaust pipe', the domestic oil and gas (O&G) sectors have not been at the centre of the national climate debate, which has primarily targeted the decarbonisation of e.g. transport and climate change mitigation and adaptation efforts in the global South (the protection of rainforests). Over the past decade, the idea to end oil and gas production in Norway has been portrayed as political fiction. The popular TV series "Occupied", for instance, depicts a landslide victory of the Green Party and a new prime minister deciding to stop all petroleum production with immediate effect.

This report provides an overview of the Norwegian oil and gas industry. Section 1 maps the policy landscape and the current market structures. It lists the key actors involved in the petroleum activities, as well as the governance and political contestation related to the sector. Section 2 explains the role of the oil and gas sector in the Norwegian economy, clarifying the scale of the challenge brought by the energy transition and highlighting the most vulnerable groups that will be affected. Finally, Section 3 maps the most important arguments in the policy debate listing key issues and positions. This part focuses on political parties as the most important players to steer any possible change in the petroleum sector.

In terms of **methodology**, the first two sections are based on a desktop analysis of existing documents, reports and secondary literature, whereas Section 3 draws on the team's own research, including the study of political party programmes, an extensive media search and 16 interviews with trade union representatives.[3]

Our conclusion is that currently Norway's efforts for a 'just transition' are limited, and there is an urgent need for dialogue not only within the sector, but also across the most important divide between pro-industrial and pro-climate interest groups. The new political situation after the September 2021 elections provides the opportunity for a constructive start of this process, beginning from the issue that needs to be tackled first: new exploration licenses.

[1] Mariana Mazzucato and Rainer Kattel, 'Waking the Norwegian Green Giant', Project Syndicate, 2021, https://www.project-syndicate.org/commentary/use-norway-sovereign-wealth-fund-for-green-transition-by-mariana-mazzucato-and-rainer-kattel-1-2021-05?barrier=accesspaylog.

[2] Dagbladet, 'Norge har sovet i timen'.

[3] The reason for this differentiated research strategy is that policymakers and political parties, as well as industrial associations and environmental NGOs, are prominent and visible actors whose opinions on the O&G sector transition can be found in openly available sources, while the voice of the sector's workers is not always heard in the broader public debate.

1. Overview of the Norwegian oil and gas sector

1.1 Value chain, technologies and innovation

Norway is a small player in the market of crude oil, as **production** covers about 2% of the global demand. As for natural gas, its production covers only approximately 3% of the global demand,[4] but Norway is the third largest exporter in the world, behind Russia and Qatar, and supplies between 20 and 25% of the gas consumed in the EU.[5] Almost all oil and gas produced on the Norwegian shelf is exported, and combined, these fossil fuels represent about half of the total value of the national goods' exports. This makes **oil and gas the most important export commodities in the Norwegian economy.**[6]

The largest player in the sector is still the partly state-owned oil company Equinor (until 2018 known as Statoil). However, a large number of Norwegian and foreign companies are involved in different activities along the value chain: from exploration to production, transportation, refining, distribution, as well as service-provision both in Norway and abroad (see Section 1.3).

Since the beginning of Norwegian oil operations in 1970, almost half of total recoverable resources on the Norwegian Continental Shelf have been exploited.[7] In terms of volume, at the turn of the century gas production started gradually catching up with oil production, which was declining. However, as the Johan Sverdrup field went into operation in 2019, crude oil is expected to reclaim a larger share of the total output.

Table 1: Norwegian Oil and Gas Sector in numbers. Sources: 1 Norsk Petroleum (2020), 2 Norwegian Petroleum Directorate (2021). 3 Worldometer data (2016), 4 World Economy (2019), 5 IEA (2019), 6 Naturvernforbundet (2021).

Number of exploration wells	**Total: ca. 1170 (31 new in 2020)** North Sea: 700+, Norwegian Sea: 250+, Barents Sea: ca. 120
Crude oil production in 2020 [1]	98.4 Sm3
Crude oil production forecast for 2025 [1]	120 Sm3 ↑
Natural gas production in 2020 [1]	113.2 Sm3
Natural gas production forecast for 2025 [1]	115.4 Sm3 ↑
Oil production in barrels per day (July 2021) [2]	2 035 000
Natural gas liquids production in barrels per day (July 2021) [2]	272 000
Oil Consumption in barrels per day [3]	204 090
Net oil exports in barrels per day (in 2016) [3]	1 384 574
Petroleum sector's contribution to GDP (2021) [1]	14 % ↓
Domestic energy supply from oil (2019) [5]	4685 ktoe - ↓
Domestic energy supply from gas (2019) [5]	4959 ktoe - stable
Norway's total GHG emissions [5]	36.04 Mt CO_{2e} (+31% since 1990)
GHG emissions from the oil and gas sector [1]	12.5 Mt CO_{2e}
Estimated GHG emissions from Norwegian produced oil and gas [6]	Ca. 500 Mt CO_{2e}

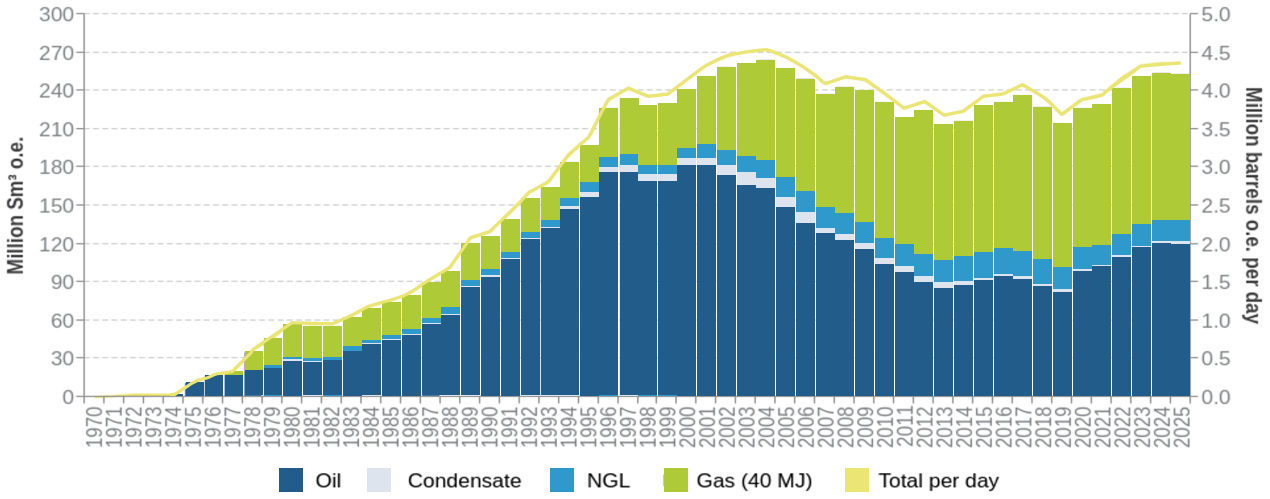
[4] Norsk petroleum, 'Eksportverdier og volumer av norsk olje og gass', Norskpetroleum.no, accessed 3 June 2021, https://www.norskpetroleum.no/produksjon-og-eksport/eksport-av-olje-og-gass/.

[5] Norsk petroleum, 'Eksportverdier og volumer av norsk olje og gass', Norskpetroleum.no, accessed 3 June 2021, https://www.norskpetroleum.no/produksjon-og-eksport/eksport-av-olje-og-gass/.

[6] Norsk petroleum, 'Eksportverdier og volumer av norsk olje og gass', Norskpetroleum.no, accessed 3 June 2021, https://www.norskpetroleum.no/produksjon-og-eksport/eksport-av-olje-og-gass/.

[7] Norsk petroleum, 'Produksjonsprognoser', Norskpetroleum.no, accessed 3 June 2021, https://www.norskpetroleum.no/produksjon-og-eksport/produksjonsprognoser/.

Figure 1: Historical and expected production in Norway, 1970-2025 Source: Norsk Petroleum



Exploration activities on the NCS have primarily taken place in the **North Sea** where around 770 wildcat wells have been drilled since 1966.[8] There has been significantly less activity in the **Norwegian** and **Barents Sea**, with about 270 and 130 drilled wildcat wells, respectively. The Norwegian Petroleum Directorate has estimated the undiscovered resources on the NCS at approximately 3.9 billion Sm^3 recoverable oil equivalents, meaning that approximately half of the remaining resources on the NCS have yet to be proven.[9] Almost 65% of these undiscovered resources are thought to be in the Barents Sea, making the area highly relevant in the discussion on the future of the Norwegian oil industry. So far, only the area south of the so-called "ice line" (74º 30 'N) is open for petroleum activities.[10]

The limited flexibility and regional concentration of oil and gas assets is amplified by critical **infrastructure.** Eight years after the discovery of the Ekofisk field, the first **gas pipelines** from the NCS to Europe were set in operation. Today, the gas transport system consists of a network of pipelines corresponding to the distance between Oslo and Bangkok.[11]

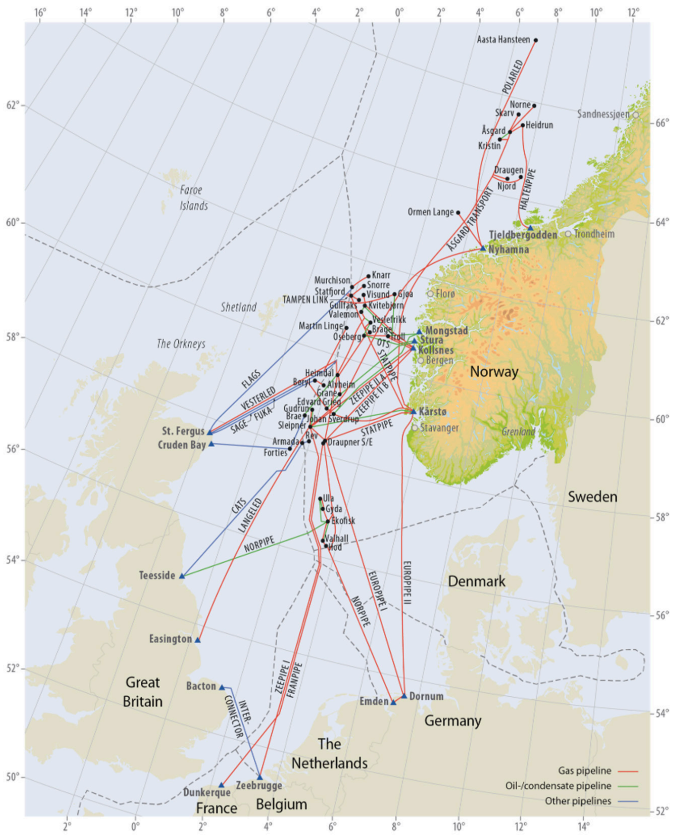
[8] Norsk petroleum.

[9] Norsk petroleum.

[10] Norsk petroleum, 'Aktivitet per havområde'.

[11] Norsk petroleum, 'Rørtransportsystemet - Norskpetroleum', Norskpetroleum.no, accessed 3 June 2021, https://www.norskpetroleum.no/produksjon-og-eksport/rortransportsystemet/.

Figure 2: Pipelines on the Norwegian continental shelf. Source: Norsk Petroleum



In several oil fields, the crude oil is loaded directly onto **tankers**, and transported to a delivery point on land. In 2018, 20% of Norwegian crude oil was transported via pipeline and 80% by tankers.[12] Equinor operates about 100 tankers on the NCS.[13] The oil pipelines, most of which operated by Equinor, are connected to onshore facilities.

1.1.1I nnovation and alternative technological pathways

The government's attractive financing schemes have encouraged a wide range of climate-targeted investments in innovative energy technologies, primarily renewables. **Offshore wind power** has been touted as a means to reduce emissions of power supply on oil platforms. Building upon its strong maritime sector and its experience in the petroleum industry, the government believes that Norway has a competitive advantage in the development and installation of offshore wind power. In 2019, Norwegian companies operating in the offshore wind industry generated a turnover of just over NOK 11 billion (EUR 1.1 billion), a 50% increase from the previous year. 80% of turnover is linked to exports and activity abroad. Norwegian Energy Partners, an organisation that supports the internationalisation of Norway's energy industry, estimates that national companies will generate a turnover of NOK 50 billion from the offshore wind business in 2030. [14]

The biggest offshore wind project on the NCS, **Hywind Tampen**, the largest floating wind farm in the world, has been contracted to Aker Solutions by Equinor. The wind farm is supposed to supply the platforms Gullfaks A and Snorre A with 88 MW. This will reduce CO_2 emissions from the fields by about 200,000 tonnes per annum, potentially saving Equinor around NOK 200 million, given current carbon emission and quota prices. The installation and start-up are planned for 2022. Hywind Tampen is also a technology project for the further development of renewable power production. The project has received NOK 2.3 billion in investment from financial technology company Enova and 566 million from the NOx Fund (an environmental policy instrument set up in 2007). The ultimate goal of the project is to make this type of power production cost effective and competitive without subsidies.[15] As of now, no major offshore wind projects are expected to be completed before 2030 besides Hywind Tampen.[16] Equinor is also active outside the NCS, with the world's largest offshore farm on the British shelf and new projects in Poland.

An Equinor representative has said that while there is "great potential" for offshore wind expansion on the NCS, there is "no immediate need" for a large rollout from the perspective of the national energy system at this point (i.e. 2021), and only the electrification of transport and the development

[12] Norsk petroleum.

[13] Equinor, 'Shipping in Equinor - Shipping in Equinor - Equinor.Com', accessed 3 June 2021, https://www.equinor.com/en/what-we-do/shipping.html.

[14] Nærings- og fiskeridepartementet, 'Blått Hav, Grønn Fremtid', Rapport (Oslo, 6 August 2021), 31–32, https://www.regjeringen.no/contentassets/564afd76f1e34ccda982f785c33d21b9/no/pdfs/regjeringens-havrapport.pdf.

[15] Klima- og miljødepartementet, 'Meld. St. 13 (2020-2021). Klimaplan for 2021-2030', 165.

[16] NTB and Ine Andersen, 'NVE: Trolig ingen store havvindprosjekter før 2030', Teknisk Ukeblad, 12 April 2021, https://www.tu.no/artikler/nve-trolig-ingen-store-havvindprosjekter-for-2030/508993.

of energy intensive electricity-based sectors (including hydrogen) would change that.

Due to its proximity to the most important Norwegian industrial centres and their engineering know-how, the continental shelf is currently said to act as a "technology development laboratory".[17] However, there is already evidence that jobs are being relocated from oil and gas to the renewables industry in western parts of Norway, which is a positive signal for the labour dimension of the transition.[18]

In addition to progress in offshore wind development, petroleum companies have added **carbon capture and storage (CCS)** projects to their portfolios. Carbon capture has been operational on the Sleipner field since 1996.[19] In 2006 the government decided that the new gas power plant in Mongstad should have a test installation able to capture 100,000 tonnes of CO2 per year, while full-scale carbon capture capabilities had to be put in place for the whole plant by 2014.[20] Then Prime Minister Jens Stoltenberg referred to this project as Norway's equivalent of the Apollo mission's moon landing. In 2013, however, the plans for a full-scale CO2 treatment plant at Mongstad were abandoned as too expensive and difficult to realise.[21] The most notable new initiative in this area is now the **Longship CCS** project, proposed by the government in September 2020.

In processes that cannot be electrified, the use of **hydrogen** could contribute to decarbonisation. Domestically, the government views the most relevant applications of this technology in the maritime sector, heavy goods transport and industrial manufacturing.[22] Equinor has entered several international partnerships to investigate the development of low-carbon hydrogen value chains.[23] A consortium of 14 European companies, including Norway's Eidesvik, Equinor, Prototech AS and NCE Maritime CleanTech, received support in early 2020 from the European Union (EU) research programme Fuel Cells and Hydrogen Joint Undertaking. Within this project they will test the use of ammonia fuel cells on the supply ship Viking Energy. The five-year research has a total budget of NOK 230 million (EUR 23 million), of which a significant part is financed through the EU scheme[24]. As noted in Equinor's 2021 Energy Perspectives report, hydrogen applications have the potential to greatly contribute to decarbonisation, but today the market for hydrogen is "non-existent" and the industry is still in its early stages.[25]

Another potential avenue to reduce carbon emissions consists in using IT technologies. **Tech companies** producing software that can assist organisations and businesses in their decision-making have grown both in terms of revenues and valuations in the last five years. Their software has a wide range of uses, from optimising production output to predicting criminal activity. The idea of using this type of decision-making software to assist companies towards achieving net-zero carbon emissions is gaining traction. For instance, last year BP signed a multi-million-dollar deal with software developer Palantir. While BP initially used Palantir applications to optimise oil and gas production efficiency, it is now seeking to deploy them in its renewable endeavours and "(...) other aspects of the energy giant's net-zero emission targets". [26] The gist of what companies like Palantir are doing is to integrate data across all levels of an organisation, bringing relevant information from siloed business areas to the decision-makers. The software can then assess and model different cost-benefit questions behind decisions regarding the decarbonisation,

[17] Pål Eirtheim, Executive Vice President for Renewables at the Energy Perspectives 2021 presentation, 10 June 2021, available at https://www.equinor.com/en/sustainability/energy-perspectives.html.

[18] – Oljejobbene som forsvinner erstattes allerede – E24

[19] Equinor, 'Sleipner-lisensen frigir CO2-lagringsdata', 6 December 2019, https://www.equinor.com/no/news/2019-06-12-sleipner-co2-storage-data.html.

[20] Miljøverndepartementet, 'Utslippstillatelse for CO2 for Statoils kraftvarmeverk på Mongstad':, Brev, 022001-110097 (regjeringen.no, 12 October 2006), https://www.regjeringen.no/no/dokument/dep/kld/anbud-konsesjoner-og-brev/brev/utvalgte_brev/2006/utslippstillatelse-for-co2-for-statoils-/id270811/.

[21] Ulf Peter Hellstrøm, Andreas Slettholm, and Karen Tjernshaugen, 'Dropper CO2-rensing på Mongstad', Aftenposten, 20 September 2013, https://www.aftenposten.no/norge/politikk/i/VoKJ/dropper-co2-rensing-paa-mongstad.

[22] Olje- og energidepartementet and Klima- og miljødepartementet, 'Regjeringens hydrogenstrategi på vei mot lavutslippssamfunnet', Strategi (Oslo, 6 August 2020), 24.

[23] Equinor, 'ENGIE and Equinor Join Forces in the Development of Low-Carbon Hydrogen - Equinor.Com', 2021, https://www.equinor.com/en/news/20210218-join-forces-engie-hydrogen.html; Olje- og energidepartementet and Klima- og miljødepartementet, 'Regjeringens hydrogenstrategi på vei mot lavutslippssamfunnet', 7.

ranging from operational issues at one part of the business to strategic ones for the organisation as a whole.[27]

Even though Norway is not a major player in software development, similar solutions are being developed in the country. The most notable example is software company **Cognite**, a subsidiary of Aker group. Aker is the largest shareholder of Aker BP, the second-largest oil and gas operator on the Norwegian Continental Shelf. Although Cognite has a shorter track record than its American peers Palantir and Snowflake, it has established a joint venture with oil major Saudi Aramco. Cognite will, among other things, provide solutions for yield optimisation, predictive maintenance and reduced environmental footprint of Saudi Aramco's industrial operations.[28] While data analytics solutions have primarily focused on the optimisation of production, an increasing number of stakeholders believe that such applications might also be helpful for reducing their carbon footprint. It is reasonable to assume that applications developed by Cognite and other software companies will play a role in Norwegian businesses' endeavour to reach net-zero emissions.

A further sector seen as important in Norway's energy transition, in terms of alternative sources of value and employment, is the **bioeconomy,** and forest-based industries in particular.[29] The champion of this branch is Borregaard, a Norwegian multinational company originating from the paper and pulp industry now focusing mainly on the production of biochemicals.[30] Borregaard's biorefinery offers a knowledge and technology base for the expansion of the sector, while there is also significant potential in bioenergy and biogas production across the country.

1.2 The policy landscape: drivers and barriers to the transition

1.2.1 Oil and gas exploration policies

Norway exercises jurisdiction over its continental shelf, which is approximately 2 million square kilometres in size.[31] Under the law pertaining to petroleum activity, the right to subsea deposits is vested in the state and the deposits have to be managed for the benefit of the Norwegian society as a whole. Consequently, the rights to explore, drill and extract oil and gas are granted through the country's licensing rounds.

Given the need for capital and expertise at the time, in the first licensing round, in 1965, the Norwegian government was keen on attracting foreign companies. It was not until August 1969 that the first commercially viable oil discovery was made on the Ekofisk field, and production commenced in June 1971.[32] The discovery changed the balance of power between the state and oil companies. The latter would now go to great lengths to secure licenses on the Norwegian continental shelf. The new balance of power allowed the government to bring the concession system more in alignment with its own preferences. Some of the changes consisted in only allowing individual applications in licensing rounds. This resulted in companies submitting competing analyses of the fields and effectively increasing the information and know-how available to the Norwegian oil bureaucracy.[33]

[24] Equinor, 'The World's First Carbon-Free Ammonia-Fuelled Supply Vessel on the Drawing Board - Equinor.Com', 2020, https://www.equinor.com/en/news/2020-01-23-viking-energy.html; Olje- og energidepartementet and Klima- og miljødepartementet, 'Regjeringens hydrogenstrategi på vei mot lavutslippssamfunnet', 33.

[25] Equinor, 'Energy Perspectives - long-term macro and market outlook - equinor.com', 2021, https://www.equinor.com/no/sustainability/energy-perspectives.html; Olje- og energidepartementet and Klima- og miljødepartementet, 'Regjeringens hydrogenstrategi på vei mot lavutslippssamfunnet', 24.

[26] Laura Hurst and Javier Blast, 'BP Deepens Tech Ties With Palantir in Push for Low-Carbon Future', Bloomberg.Com, 5 February 2021, https://www.bloomberg.com/news/articles/2021-02-05/bp-deepens-tech-ties-with-palantir-in-push-for-low-carbon-future.

[27] Palantir, 'Net Zero Is a Data Integration Problem', Medium (blog), 25 March 2021, https://blog.palantir.com/net-zero-is-a-data-integration-problem-1255a8853d38.

[28] Cognite, 'Aramco and Cognite Establish Joint Venture to Accelerate Industrial Digitalization', 21 December 2020, https://www.cognite.com/newsroom/aramco-and-cognite-establish-joint-venture-to-accelerate-industrial-digitalization.

[29] Antje Klitkou et al., 'New Path Development for Forest-Based Value Creation in Norway', in From Waste to Value: Valorisation Pathways for Organic Waste Streams in Bioeconomies, ed. Antje Klitkou, Arne Fevolden, and Marco Capasso, Routledge Studies in Waste Management and Policy (London ; New York: Routledge, Taylor & Francis Group, earthscan from Routledge, 2019).

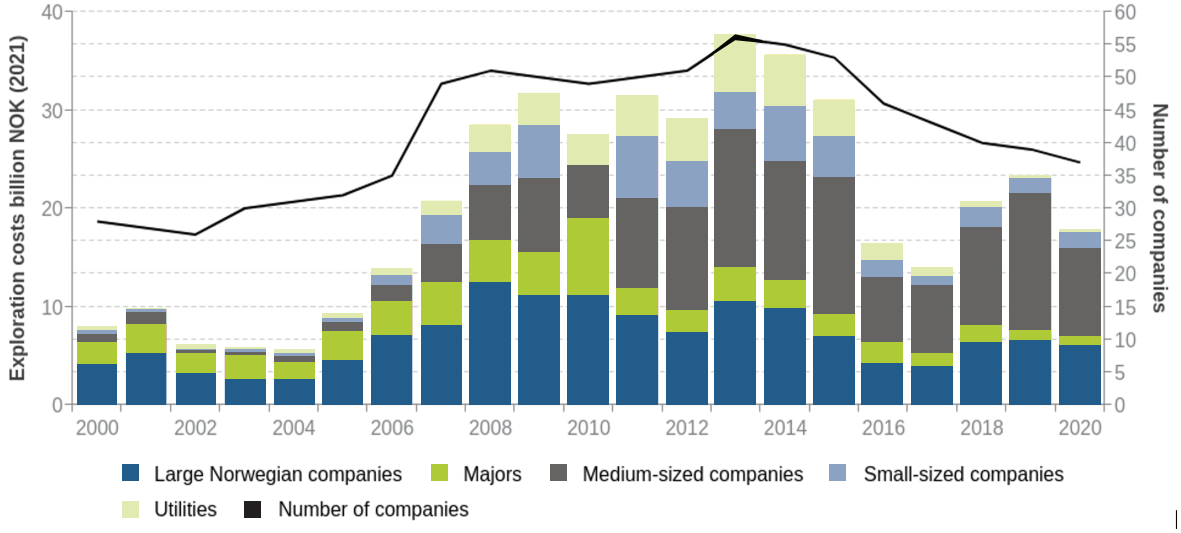
[30] 'Norwegian Wood to Grow the Bioeconomy in Østfold County - Nordregio', accessed 13 June 2021, https://archive.nordregio.se/en/Publications/Publications-2016/GREEN-GROWTH-IN-NORDIC-REGIONS-50-ways-to-make-/Bioeconomy/Norwegian-wood-to-grow-the-b/index.html.

[31] Norsk petroleum, 'Aktivitet per havområde', Norskpetroleum.no, accessed 3 June 2021, https://www.norskpetroleum.no/utbygging-og-drift/aktivitet-per-havomrade/.

Concessions would also come with conditions related to the employment of Norwegians and the placing of orders with the Norwegian industry.[34]

Understandably, reforming the licensing system was unpopular among the companies operating on the shelf. However, Norway has managed to maintain the interest of exploration & production (E&P) companies. A relatively stable political climate has played a role in maintaining the appeal, as well as the introduction of awards in predefined areas (APA - see the following section) and an overhaul of the taxation system in the early 2000s. Since the reform, favourable deduction schemes for exploration activities have also applied to companies without income.

Figure 2: Exploration costs in production licenses, 2000-2020 Source: Norsk Petroleum



Two types of licensing rounds

The Norwegian government facilitates the continuous exploration on the continental shelf through two types of licensing rounds: **awards in predefined areas (APA)**, held annually, and **numbered licensing rounds**, held every other year.[35] APA rounds cover well explored and developed areas where infrastructure is in place, while exploration rights in frontier areas, less explored and developed, can be won through the numbered licensing rounds. As more and more areas are explored, the number of licences awarded in the APA awards increases. In 2020 the APA round resulted in 61 new licences, while the 25 numbered rounds resulted in four licences.

APA-rounds were introduced in 1999 with the objective to find and extract additional petroleum resources in mature areas before the infrastructure is built.[36] While in APA areas the probability of discoveries is relatively high, major findings are unlikely.[37] In addition, APAs have increased the overall frequency of

[32] Dag Harald Claes, The Politics of Oil: Controlling Resources, Governing Markets and Creating Political Conflicts, 1st ed. (Cheltenham,: Edward Elgar Publishing Limited, 2018), 53, DOI 10.4337/9781785360183.

[33] Claes, 53–54.

[34] Claes, 53–54.

[35] Norsk petroleum, 'Letepolitikk', accessed 19 April 2021, https://www.norskpetroleum.no/leting/letepolitikk/.

[36] Oljedirektoratet, 'Ressursrapporten 2018' (Stavanger, 2018), 17, https://www.npd.no/globalassets/1-npd/publikasjoner/ressursrapport-2018/ressursrapporten-2018-n-lav.pdf.

[37] Olje- og energidepartementet, 'Konsesjonsrunder', Regjeringen.no (regjeringen.no, 20 2016), https://www.regjeringen.no/en/topics/energy/oil-and-gas/licensing-rounds/id2001295/.

[38] Industri Energi, 'TFO-ordningen trygger arbeidsplasser og ringvirkninger', 04 2021, https://www.industrienergi.no/nyhet/tfo-ordningen-trygger-arbeidsplasser-og-ringvirkninger/.

[39] Klima- og miljødepartementet, 'Meld. St. 20 (2019-2020). Helhetlige forvaltningsplaner for de norske havområdene', Stortingsmelding (Oslo: Klima- og miljødepartementet, 2020), 131–34, https://www.regjeringen.no/contentassets/5570db2543234b8a9834606c33caa900/no/pdfs/stm201920200020000dddpdfs.pdf.

licensing rounds, giving actors regular access to new exploration zones, which in turn increases predictability for all parties along the value chain.[38] Figure 4 shows the area status of the NCS. Yellow areas are open, but subject to special arrangements.[39]

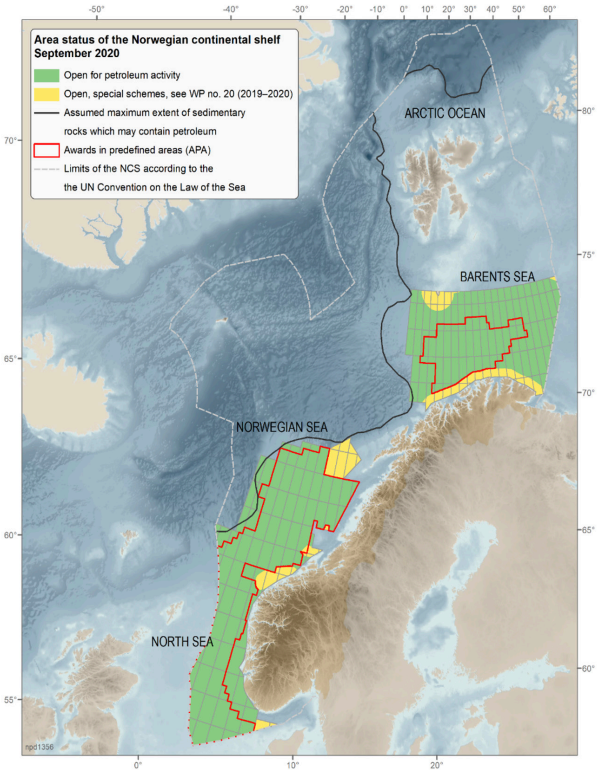
The introduction of APA-rounds has increased overall activity on the Norwegian continental shelf and has subsequently amassed criticisms due to its environmental impact. In response to a 2011 **government white paper**, a statement signed by the Bellona Foundation, the Norwegian Society for the Conservation of Nature, Nature and Youth, WWF and Greenpeace, called for the APA scheme to be abolished altogether.[40] Among other issues, the signatories were concerned that awards were being allocated in environmentally sensitive areas, contrary to recommendations, and licensing rounds lacked transparency.[41] The groups argued that 40% of the concessions awarded through the APA system were in areas for which environmental institutions had expressed objections. Furthermore, the signatories considered the scheme in conflict with the parliament's request that Norwegian sea areas be managed according to an integrated ecosystem-based model.[42]

In 2020, the government has decided that terms and restrictions, such as when a company can conduct seismic surveys or drill exploration wells, may accompany concessions.[43] Still, there has been widespread frustration among environmental institutions because once a zone is defined as APA, there are no mechanisms to change its status based on new available knowledge, nor real opportunities to withdrawal the licence.[44]

Financial incentives

Considering the large capital needs when exploring frontier areas, the introduction of APA rounds lowered the entry barriers for new actors wanting to embark on exploration. Despite the new licensing policy, exploration on the continental shelf was still dwindling at the turn of the century. To stimulate more activity, in 2005 the second conservative-liberal government of Kjell Magne Bondevik (Christian Democratic Party) introduced the **reimbursement scheme** for exploration costs.

Figure 4: Area status of the Norwegian continental shelf, September 2020. Source: Norsk Petroleum



The scheme allows companies exploring for oil and gas to choose between getting an immediate refund of the tax value of exploration costs or carrying forward the losses, and related interests, to a year when the company has taxable income.[45] The scheme thus greatly increases the liquidity of companies that have yet to turn a net profit, benefiting new entrants.[46] The new policy, together with the increase of oil prices, resulted in a surge in exploration activity, especially among small and medium-sized enterprises (SMEs).[47]

Considering there are no guarantees for operating companies to turn a net profit, the system has

[40] Bellona et al., 'Høringsuttalelse - TFO-området og forslag til utvidelse' (2011), https://bellona.no/assets/sites/2/2015/06/fil_111207-TFO_hoering1.pdf.

[41] Bellona et al., 1.

[42] Bellona et al., 1; Miljøverndepartementet, 'St.meld. nr. 37 (2008-2009). Helhetlig forvaltning av det marine miljø i Norskehavet (forvaltningsplan)', Stortingsmelding (Oslo: Miljøverndepartementet, 08 2009), regjeringen.no/contentassets/1b48042315f24b0182c3467f6f324d73/no/pdfs/stm200820090037000dddpdfs.pdf.

[43] Klima- og miljødepartementet, 'Meld. St. 20 (2019-2020). Helhetlige forvaltningsplaner for de norske havområdene', 85.

[44] Bellona et al., Høringsuttalelse - TFO-området og forslag til utvidelse, 1.

come under criticism for essentially **"gambling with taxpayer money"**.[48] However, between 2005 and 2019, reimbursement payouts have amounted to approximately NOK 106 billion (EUR 11 billion), a mere 3.75%[49] of the tax revenue generated from the industry.[50] Therefore the scheme seems to have served its purpose of enhancing the exploration to ensure that all commercial resources are extracted before the existing installations and infrastructure are eventually dismantled.

Still, given the **growing uncertainty regarding the future of oil prices** and that it can take 10 to 15 years from when a discovery is made until the field is developed and put in production, NGOs such as Bellona have called for a reform of the petroleum tax system to transfer more of the financial risk to exploration companies.[51] Among Bellona's requests there are the lowering of assets' depreciation rate and the removal or the uplift of the cessation refund scheme.[52]

Due to the importance of the oil and gas industry for the Norwegian economy, **the government has generally been accommodating to companies wanting to explore the continental shelf**. On average, just under 50 exploration wells have been spudded each year since 2010. Exploration activity, however, took a hit due to the COVID-19 pandemic and only 31 exploration wells were spudded in 2020.[53]

To sustain activities in the oil and gas sector during the **COVID-19 crisis**, the parliament agreed that companies could write off all investments decided in 2020 and 2021 immediately, instead of over six years as the normal tax regulation stipulates. Estimates suggest that this can release NOK 100 billion in investments over the two years, as companies push development projects forward instead of shelving them.[54] To combat a potential reversal of investment on the continental shelf, the government has also introduced temporary amendments to the Petroleum Tax Act.[55] Between 2020 and 2021 this will deliver oil and gas companies an estimated additional liquidity of NOK 115 billion and a tax relief of about NOK 8 billion.[56] As a consequence, concessionaires are expected to resume their activities in 2021 with a more optimistic market outlook.[57]

In a surprise announcement made in August 2021, during an electoral campaign focusing on climate change and the oil industry, the Solberg government declared that the **tax deduction would be cut**, reducing the incentive for the riskiest explorations, although an immediate increase in investment is also possible.[58]

Exploration frontiers and restricted areas: LoVeSe and the Arctic

Oil exploration in the sea areas of the **Lofoten islands, Vesterålen and Senja (LoVeSe)** has been a controversial issue since the 1970s. Today no petroleum activity is conducted in these areas.

[45] Norsk petroleum, 'Petroleumsskatt', Norskpetroleum.no, accessed 1 May 2021, https://www.norskpetroleum.no/okonomi/petroleumsskatt/.

[46] Norsk petroleum.

[47] Norsk petroleum, 'Leteaktivitet', accessed 20 April 2021, https://www.norskpetroleum.no/leting/leteaktivitet/.

[48] Bellona, 'Bellona Tries to Pull the Plug on Vast Norwegian Oil and Gas Exploration Subsidies', Bellona, 22 August 2017, https://bellona.org/news/fossil-fuels/2017-08-23814.

[49] Figure only includes ordinary and special taxes

[50] Anders Lie Brenna, 'Så mye har Norge brukt på leterefusjon og opphørsrefusjon', enerWe, 3 January 2019, https://enerwe.no/sa-mye-har-norge-brukt-pa-leterefusjon-og-opphorsrefusjon/166683; Statistisk sentralbyrå, 'Skatt for selskaper', ssb.no, accessed 1 May 2021, https://www.ssb.no/virksomheter-foretak-og-regnskap/statistikker/skattepl/aar/2021-02-18.

[51] Bellona, 'Derfor er leterefusjonsordningen farlig gambling med skattepenger', Bellona.no, accessed 1 May 2021, https://bellona.no/oljespons.

[52] Bellona.

[53] Norsk petroleum.

[54] E24, 30. April 2020. https://e24.no/olje-og-energi/i/GGRxrJ/regjeringen-gaar-med-paa-skattepakke-for-oljenaeringen-kan-frigi-100-milliarder-kroner

[55] Stortinget, 'Vedtak til lov om endring i lov om skattlegging av undersjøiske petroleumsforekomster mv. (petroleumsskatteloven)', lovvedtak, Stortinget (Stortingets administrasjon, 12 June 2020), https://www.stortinget.no/no/Saker-og-publikasjoner/Vedtak/Beslutninger/Lovvedtak/2019-2020/vedtak-201920-135/.

[56] Finansdepartementet, 'Temporary Amendments to the Petroleum Tax Act', n.d., https://www.regjeringen.no/contentassets/b9e1bc24fdf84a4fb04909f1df20db1c/2021-02-23-letter-esa-temporary-amendments-petroleum-tax-act.pdf.

[57] Norsk petroleum, 'Leteaktivitet'.

[58] Nerijus Adomaitis and Nora Buli, 'Norwegian government proposes overhaul of petroleum tax system', Reuters, accessed 14 September, https://www.reuters.com/business/energy/norwegian-government-proposes-overhaul-petroleum-tax-system-2021-08-31/

Over the years, however, the prospect of starting activities has sporadically emerged in Norwegian politics. Opponents are mainly concerned about the risk of accidents and oil spills, and the threat this poses to sensitive areas, their wildlife and coral reefs. Norway's **fishing industry** has a long tradition here and it sustains livelihoods helping to maintain settlements in barren coastal areas.[59] In recent years, the debate has primarily focused on whether an environmental impact assessment (EIA) of potential oil exploration activities should be carried out in these sea regions. The grassroots group People's Action Oil-free Lofoten, Vesterålen and Senja, has voiced scepticism, as they believe it would be an "initial step in a process towards awarding production licences".[60]

Another issue that has sparked controversy is the opening of oil and gas extraction activities in the Barents Sea region and the **Arctic**. Governmental representatives emphasised the development potential of the industry in the sparsely populated territory, noting already in 2015 that they "will pursue an offensive petroleum policy in the north by facilitating the allocation of new exploration areas".[61]

1.2.2 Decarbonisation policies

As a member of the European Economic Area, Norway is strongly influenced by the EU energy policy and participates in the EU Emissions Trading System (EU ETS). In early 2020, Norway updated its Nationally Determined Contribution (NDC) to the Paris Agreement, aiming to reduce emissions by at least 50% and towards 55% by 2030 compared to 1990 levels.[62] At the time of submission, the 55% goal was conditioned upon the EU increasing its climate target to the same level, which it did later in the year.[63] In 2021, the government published a comprehensive climate action plan. Among the highlighted measures, there are the substantial increase of greenhouse gas emissions taxation, climate-related requirements in public procurements, as well as initiatives and financial support for the development of new technologies.[64]

Economy-wide and sectoral emission reduction targets

The oil and gas industry is responsible for 28% of the country's **greenhouse gas emissions** (see Table 1, life cycle emissions from oil are not included), the second largest source after transport.[65] Emissions from petroleum activities are regulated through several laws, including the Petroleum Act, the CO_2 Tax on Petroleum Activities Act, the Sales Tax Act, the Greenhouse Gas Emissions Trading Act and the Pollution Control Act.[66] Most of the GHG emissions are CO_2 from energy production, i.e. from gas-producing energy for oil extraction, gas transport in pipelines and onshore gas processing. The second largest source of emissions from the petroleum sector is natural gas flaring in oil extraction facilities. In Norway flaring can only occur for operational or safety reasons, including when production is stopped or maintenance is performed.[67] As a result, CO^2 emissions from flaring on the NCS are 8% of the global average for the sector, and 10% of those from the British continental shelf.[68]

Norway's CO_2 emissions per toe (tonne of oil equivalent) increased between 1997 and 2012. A possible reason is that many fields on the NCS are in a declining phase and when the extraction rate declines, emission intensity increases. It may also be the result of lower CO_2 prices in the EU ETS, which reduced the incentive to cut emissions in that period. The CO_2 price for Norwegian oil and gas producers declined by more than 50% from the late

[59] Erik Olsen, 'Lofoten-Vesterålen – noe helt for seg selv', Framsenteret, 2013, https://framsenteret.no/arkiv/lofotenvesteraalen-noe-helt-for-seg-selv-5167301-146437/.

[60] Oljefrittfakta, 'Konsekvensutredning', Fakta for et oljefritt Lofoten, Vesterålen og Senja, accessed 4 June 2021, http://www.oljefrittfakta.net/konsekvensutredning.html.

[61] Nærings- og fiskeridepartementet, 'Maritime Muligheter - Blå Vekst for Grønn Fremtid', Plan/strategi (Oslo, 29 May 2015), 51, https://www.regjeringen.no/contentassets/05c0e04689cf4fc895398bf8814ab04c/maritim-strategi_web290515.pdf.

[62] United Nations Framework Convention on Climate Change, 'Update of Norway's Nationally Determined Contribution' (United Nations Framework Convention on Climate Change, 2 July 2020), 1, https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Norway%20First/Norway_updatedNDC_2020%20(Updated%20submission).pdf.

[63] Klima- og miljødepartementet, 'Norge forsterker klimamålet for 2030 til minst 50 prosent og opp mot 55 prosent', Nyhet, Regjeringen.no (regjeringen.no, 7 February 2020), https://www.regjeringen.no/no/aktuelt/norge-forsterker-klimamalet-for-2030-til-minst-50-prosent-og-opp-mot-55-prosent/id2689679/.

[64] Klima- og miljødepartementet, 'Heilskapeleg plan for å nå klimamålet', Nyhet, Regjeringa.no (regjeringen.no, 8 January 2021), https://www.regjeringen.no/nn/aktuelt/heilskapeleg-plan-for-a-na-klimamalet/id2827600/.

[65] Miljødirektoratet, 'Klimagassutslipp fra olje- og gassutvinning', Miljøstatus, accessed 7 June 2021, https://miljostatus.miljodirektoratet.no/tema/klima/norske-utslipp-av-klimagasser/klimagassutslipp-fra-olje—og-gassutvinning/.

1990s to 2012 (in real terms). This is partly because the nominal CO_2 tax was reduced by more than 20% in 1999 and 2000, and partly due to lower-than-expected CO_2 prices in the EU ETS between 2009 and 2012. A final contributing factor could be the tripling (in real terms) of oil prices in that period, incentivising companies to develop more expensive and often more energy demanding fields, and to delay the termination of producing fields, which often implies higher emissions per unit extracted.[69]

In a 2021 white paper, the Ministry of Climate and Environment presented the government **policy for the reduction of greenhouse gas emissions up until 2030**. The white paper presents measures for a 45% cut in non-ETS emissions mainly focusing on the transport and agriculture sectors. For the oil and gas industry, which is covered by the EU ETS, the government suggests a CO_2 tax increase in line with that of non-ETS sector emissions. The plan is expected to deliver a total carbon price (CO_2 tax + quota price) of about NOK 2000 per tonne of CO_2 in 2030, compared to the current NOK 1030 (the CO_2 tax is NOK 591).[70]

The rationale is that a substantial increase in carbon prices can make a number of other climate measures, such as the deployment of offshore wind and carbon capture, cost-effective for the decarbonisation of the petroleum sector.[71] The policy should also make the development of oil fields that seem to have weak profitability even less attractive.

It is important to note that in the oil and gas sector, the rationale for emissions reductions has focused primarily on energy efficiency and **"cleaner" activities, not decommissioning**. The Norwegian Oil and Gas Association has expressed concerns over the government's **CO_2 pricing policy**. Director General Anniken Hauglie was especially worried about the competitiveness of companies operating on the Norwegian continental shelf.[72] The organisation has emphasised that the funds raised from higher CO_2 taxes should be earmarked for measures that accelerate GHG emissions reductions in the affected sectors.[73]

Electrification of oil platforms

The **electrification of oil platforms** with power from the land is also seen as a solution to the sector's emissions. Several fields such as Johan Sverdrup, Ormen Lange and Snøhvit are already supplied with power generated onshore, and the government is pushing for the further electrification of producing platforms. Equinor plans to invest NOK 50 billion on the electrification and the energy optimisation of its operations. The company estimates that electrification would require around 10-12 TWh of energy, equivalent to about 7% of present electricity national production. Equinor considers "stable framework conditions", i.e., a reimbursement of 78% of the investment, a requirement to go ahead with the plan.[74]

The **effectiveness of the electrification** has been heavily debated. The Progress Party (Frp) has criticised the high costs relative to the benefits, while the Green Party (MdG) believes this policy is a form of greenwashing of the oil and gas industry.[75] Some stakeholders have also been concerned that the electrification of the continental shelf will result in a growth in electricity prices with ramifications on Norway's onshore industry. In addition, the large amount of power required for this operation results in the debate intersecting with the much disputed issue of wind power development, which is currently at the heart of the discussion on the national energy transition.

[66] Norsk petroleum, 'Utslipp til luft', Norskpetroleum.no, accessed 7 June 2021, https://www.norskpetroleum.no/miljo-og-teknologi/utslipp-til-luft/.

[67] Miljødirektoratet, 'Klimagassutslipp fra olje- og gassutvinning'.

[68] Halfdan Carstens and Snorre Olaussen, 'Fakling – den aller største elefanten i rommet', Tu.no, 1 June 2021, https://www.tu.no/artikler/fakling-den-aller-storste-elefanten-i-rommet/510521.

[69] Ekaterina Gavenas, Knut Einar Rosendahl, and Terje Skjerpen, 'CO2-Emissions from Norwegian Oil and Gas Extraction', Discussion Papers (Statistisk sentralbyrå, April 2015), 4–9.

[70] Finansdepartementet, 'Avgiftssatser 2021', Innhold, Regjeringen.no (regjeringen.no, 7 October 2020), https://www.regjeringen.no/no/tema/okonomi-og-budsjett/skatter-og-avgifter/avgiftssatser-2021/id2767486/; Ember, 'Carbon Price Viewer', Ember, accessed 3 May 2021, https://ember-climate.org/data/carbon-price-viewer/.

[71] Klima- og miljødepartementet, 'Meld. St. 13 (2020-2021). Klimaplan for 2021-2030' (Klima- og miljødepartementet, 8 January 2021), 164, https://www.regjeringen.no/contentassets/a78ecf5ad2344fa5ae4a394412ef8975/nn-no/pdfs/stm202020210013000dddpdfs.pdf.

[72] Maryam Iqbal Tahir, 'Vi skal både nå klimamålene og sikre lønnsom produksjon', Norsk olje og gass, 21 January 2021, https://www.norskoljeoggass.no/om-oss/nyheter/2021/01/vi-skal-bade-na-klimamalene-og-sikre-lonnsom-produksjon-fra-norsk-sokkel/.

[73] Iqbal Tahir.

[74] Equinor, 'Equinor med ambisjon om å kutte utslippene i Norge til nær null i 2050 - equinor.com', Equinor, 1 June 2020, https://www.equinor.com/no/news/2020-01-06-climate-ambitions-norway.html.

1.2.3 Norway's most important just transition instrument, the Sovereign Wealth Fund

While Norway has a set of climate policies and targets, which are driven to a large extent by the global (UNFCCC) and European climate governance, the lack of a national commitment to decarbonisation and to the phase-out of oil and gas means that there are no conventional decarbonisation policies in place economy-wide. The rollout of renewables, in particular offshore wind, where Norway has the potential to become a technology leader globally and an important player in the regional power market, offers significant opportunities.

The **most important policy and financial instrument** available nationally for the purpose of the economic recovery and a just transition from the decline of the oil and gas sector is the **Sovereign Wealth Fund** (officially called the Government Pension Fund Global but most often referred to as the Oil Fund - *Oljefondet*).

This is the largest sovereign wealth fund in the world, with over EUR 1.1 trillion in assets. The fund aims to ensure the "responsible and long-term management of revenue from Norway's oil and gas resources, so that this wealth benefits both current and future generations".[78] The fund is a financial instrument on which the government can draw only to a limited extent, e.g. it cannot be used for direct domestic investments, overseen by parliament.

However, it plays three important functions in the context of the energy transition: it can be, to a limited extent, a "rainy day fund" used in the event of a sudden economic shock; it can support a smooth transition to a post-oil era; and it involves a strong inter-generational component distributing oil wealth to citizens who might be born even after production stops. In this sense, the Fund represents the backbone of a just transition and plays an important role in the transformation of the Norwegian economy.

1.3 Stakeholder mapping

1.3.1 Value chain actors and business landscape

Equinor is by far the largest operator on the NCS. In 2020, based on current ownership in fields, the company produced 76.55 million Sm3 oil equivalents, most of which from gas. This made up 33.8% of total production on the NCS.[79] The same year, the company was present in 31 countries, producing in 12 of these.[80] Foreign oil and gas production accounted for about 36% of total equity activities with an average output of 2.07 million barrels of oil equivalents per day.[81] Equinor has some 21,000 employees and is the largest publicly traded Nordic company, with a market capitalisation of about NOK 620 billion. Storting's Standing Committee on Scrutiny and Constitutional Affairs recommended the government to move the ownership of Equinor from the Ministry of Petroleum and Energy to the Ministry of Trade, Industry and Fisheries, noting that it was problematic for the same Ministry to own Equinor and be responsible for regulating the oil and gas industry.[82] However, no steps in that direction have been taken by the time this report was published, in October 2021.

Aker BP and **Lundin Energy Norway AS** are the second and third largest operators, producing 11.81 and 9.66 Sm^3 oil equivalents in 2020, respectively.

[75] remskrittspartiet, 'Vil ikke elektrifisere norsk sokkel | Fremskrittspartiet - FrP', Fremskrittspartiet, 11 March 2021, https://www.frp.no/nyheter/vil-ikke-elektrifisere-norsk-sokkel; Kjetil Magne Sørenes, 'MDG og Frp med samstemt klimakritikk', Aftenposten, 19 November 2020, https://www.aftenposten.no/norge/politikk/i/nAwyjL/mdg-slutter-seg-til-frps-slakt-av-oljenaeringens-viktigste-klimagrep.

[76] Oljedirektoratet, '6 - Kraftsituasjonen og kraftnettet på land', Oljedirektoratet, 2020, /fakta/publikasjoner/rapporter/rapportarkiv/kraft-fra-land-til-norsk-sokkel/6—-kraftsituasjonen-og-kraftnettet-pa-land/.

[77] Kacper Szulecki et al., 'Shaping the 'Energy Union': Between National Positions and Governance Innovation in EU Energy and Climate Policy', Climate Policy 16, no. 5 (3 July 2016): 548–67, https://doi.org/10.1080/14693062.2015.1135100.

[78] https://www.nbim.no/

[79] Norsk petroleum, 'Produksjonsprognoser'; Norsk petroleum, 'Selskap: Equinor Energy AS', Norskpetroleum.no, accessed 3 June 2021, https://www.norskpetroleum.no/fakta/selskap-utvinningstillatelse/equinor-energy-as/.

[80] Equinor, '2020 Annual Report and Form 20-F' (Equinor, 19 March 2021), 39.

[81] Equinor, 5.

[82] Stortinget, 'Olje- og energidepartementets håndtering av åpningen av Barentshavet sørøst' (Kontroll- og konstitusjonskomiteen, 11 May 2021), https://www.stortinget.no/no/Saker-og-publikasjoner/Saker/Sak/?p=82359.

[83] Norsk petroleum, 'Selskap med utvinningstillatelse i Norge', Norskpetroleum.no, accessed 3 June 2021, https://www.norskpetroleum.no/fakta/selskap-utvinningstillatelse/.

At the turn of 2020, 37 companies were active on the NCS, 24 as operators and 13 as partners in production licences.[83] While large Norwegian companies such as Aker BP and Equinor make up a sizeable part of the total exploration costs, medium-sized companies are the most active.

From the outset, the **supply industry** has experienced strong growth reaching a turnover of NOK 397 billion in 2019. Norwegian suppliers have also significant international operations which represented 43% of their turnover in 2020.[84] The 20 largest Norwegian suppliers account for 78% of international sales.[85] The most prominent are **Aker Solutions, Odfjell Drilling, BW Offshore, DNV GL, Kongsberg Gruppen, PGS** and **Interwell**. In terms of turnover, the largest international segments are subsea equipment and installation, seismic and geological and geophysical (G&G), operational and professional services, and topside and process equipment.[86] The UK is the largest single market internationally. Combined with the USA and Brazil, the three countries make up 42% of Norwegian companies' international turnover.[87] The Norwegian **service and supply industry** consists of more than 1,100 companies along the entire value chain.[88] The majority of this industry is located in the Rogaland region.

In contrast to field operations, there is far greater state control over pipeline networks. **Gassco**, a Norwegian state-owned company, develops and operates most of the 7,800-kilometre gas pipeline network. In contrast, the longest **oil pipeline**, and the only one connected to Europe, is operated by US giant **ConocoPhilips Skandinavia AS** and spans from Ekofisk to Teeside (UK).

Established in 2001, Gassco is only one example of a special category of business actors, i.e., wholly or partially state-owned companies. Founded in the same year, **Petoro** is wholly owned by the government and manages its portfolio (known as the State's Direct Financial Interest) of oil and natural gas exploration and production licences on the NCS. A third government-owned company is **Enova** SF, which is responsible for the promotion of sustainable energy production and use. Enova SF was set up to explore clean energy sources, reduce overall energy consumption and provide related know-how. The company is financed by a state tariff on electricity. Another wholly state-owned actor is **Statkraft**, Norway's national power company, which controls most of Norway's vast hydropower assets, as well as wind, gas and other sources, and is the Nordic region's third largest energy producer.

Among the **associations representing the oil and gas industry**, there are several groups under the umbrella of the national employers' associations, the **Confederation of Norwegian Enterprise (NHO). Norwegian Oil and Gas**, Norwegian Industry, Energy Norway and Nelfo are members of the confederation. Norwegian Industry is NHO's largest association making up 25% of total man-years in the NHO member companies.[89] The breadth of sectors in these groups is wide, but many of the companies, including oil majors, are represented by Norwegian Oil and Gas (116 members) and have a dual-membership in these associations.[90] The mission of Norwegian Oil and Gas is to look after member companies' common interests vis-à-vis public authorities, employee organisations, other national and international institutions, organisations and society in general.[91] All companies that operate and have production licences on the NCS are members of Norwegian Oil and Gas.[92] The Confederation of Norwegian Enterprise (NHO), Norwegian Oil and Gas, Norwegian Industry, as well as the Norwegian Shipowners' Association and the largest national trade union (LO) have created a platform on energy-related issues called **KonKraft** (from Competitiveness on the Norwegian shelf).

[84] Rystad Energy, 'Internasjonal Omsetning Fra Norske Oljeserviceselskaper - Rapport Til Olje Og Energidepartementet', 2020, 10.

[85] Rystad Energy, 20.

[86] Rystad Energy, 21.

[87] Rystad Energy, 5.

[88] Norsk petroleum, 'Leverandørindustrien', Norskpetroleum.no, accessed 6 June 2021, https://www.norskpetroleum.no/utbygging-og-drift/leverandorindustrien/.

[89] Norsk Industri, 'Bransjer i Norsk Industri', accessed 13 June 2021, https://www.norskindustri.no/bransjer/.

[90] Norsk olje og gass, 'Våre medlemsbedrifter/Member companies', accessed 13 June 2021, https://www.norskoljeoggass.no/om-oss/vare-medlemsbedrifter/.

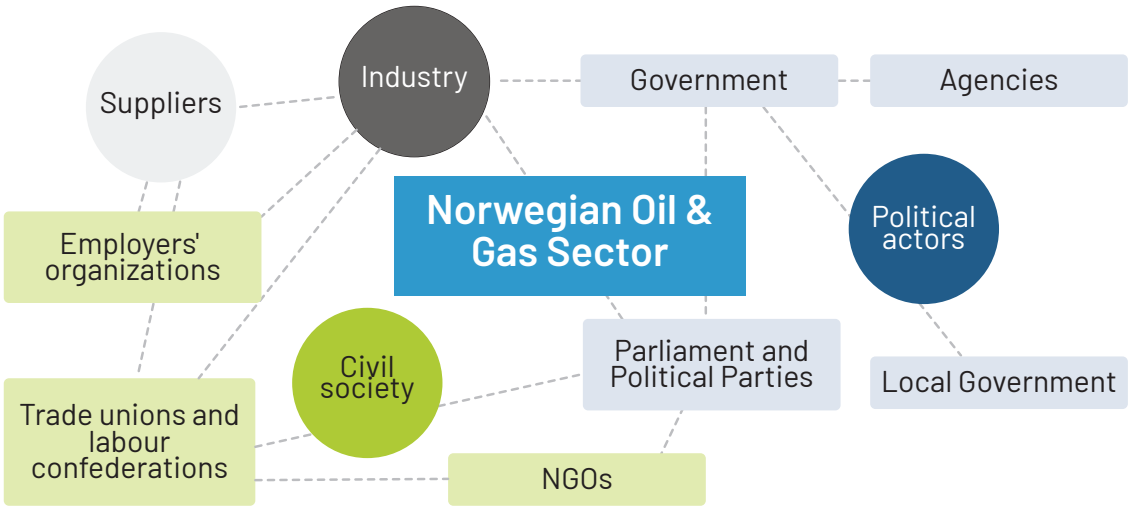
[91] Norsk olje og gass, 'Vedtekter, visjon og verdier', accessed 13 June 2021, https://www.norskoljeoggass.no/om-oss/vedtekter-og-verdier/.

[92] Norsk petroleum, 'Selskap med utvinningstillatelse i Norge'; Norsk olje og gass, 'Våre medlemsbedrifter/Member companies'.

Financial institutions form another category of key stakeholders. The first Norwegian bank to issue a loan to a company operating on the NCS was Den norske Creditbank, now known as DNB following a merger in 1990. A report based on research by Dutch consultancy Profundo has found that, among Scandinavian banks, DNB is the largest investor in fossil fuels, having provided EUR 16.5 billion to oil and gas companies between 2016 and June 2020.[93] DNB is Norway's largest financial services group, with a market capitalisation of NOK 290 billion (EUR 30 billion). The largest recipient of DNB's loans is Aker BP, which has borrowed EUR 1.1 billion over the period. Among recipients of funds listed in the Profundo report, Aker BP operates solely on the NCS, while several others do not have any Norwegian operations.

The second-largest Norwegian lender is **SpareBank 1 SR-Bank**, a Rogaland-based financial company with a market capitalisation of NOK 28.8 billion SpareBank 1 SR-Bank is Norway's fifth largest bank and provides just under NOK 1 billion in loans and underwriting services to the oil and gas industry.[94] As of the filings on June 30th 2020, DNB and SpareBank 1 SR-Bank held oil and gas shares worth NOK 7.9 billion million and NOK 41.7 million respectively.

Figure 5: Stakeholder categories in the O&G sector and main links between stakeholder groups. Own elaboration.



1.3.2 Policy actors

The three most important policy actors are the Ministries governing the industry. **The Ministry of Petroleum and Energy** oversees the entire energy sector, including the power system in the mainland and the exploration and production on the Norwegian Continental Shelf. Its significance is reinforced by oversight competences over subsidiaries, such as subordinate government agencies (Norwegian Petroleum Directorate, Norwegian Water Resources and Energy Directorate, Enova, Gassnova, Statnett), wholly-owned companies (Gassco and Petoro), and partially-owned public limited companies (Equinor, with 67% of stakes). This situation has led to a potential conflict of interests because the ministry is a stakeholder of the entities it regulates and parliament has called for the transfer of competences to other Ministries.

The **Ministry of Climate and Environment** is responsible for national climate policy and international climate negotiations, but does not have direct influence on the energy sector. For a long

[93] Ward Warmerdam, Daisy Termorshuizen, and Beenes Maaike, 'Banking on Thin Ice: Exposing Scandinavian Bank Finance for Fossil Fuels', n.d., 30, https://www.banktrack.org/download/banking_on_thin_ice/210202_banking_on_thin_ice.pdf.

[94] Warmerdam, Termorshuizen, and Maaike, 55–56.

time, petroleum and climate policies have been dealt with separately,[95] leading to a visible fragmentation of measures and to the exclusion from the debate of the domestic petroleum industry because it lays outside the ministry's competences[96]. However, this separation is increasingly challenged both by civil society advocacy coalitions and political parties in parliament.

Other actors with relevant competences are the Ministry of Trade, Industry and Fisheries, Ministry of Transport, the Ministry of Local Government and Modernisation and the Ministry of Labour and Social Inclusion.

Governmental agencies, in particular the **Norwegian Petroleum Directorate** (NPD), which oversees the oil and gas sector, and the **Norwegian Water Resources and Energy Directorate** (NVE), responsible for electric power production (including offshore renewables), have also an important role as they combine direct oversight and technical expertise. The national transmission system operator, **Statnett**, is also an increasingly significant player due to electrification plans.

The most important forum for political debate is clearly the **parliament** (Stortinget), since ministries report to lawmakers and MPs set the policy directions that will affect the oil and gas sector. Since the September 2021 elections, ten **political parties** are represented in the Storting.

The government led by Erna Solberg, supported by a coalition including the **Conservative Party** (Høyre), the Liberal Party (Venstre) and the **Christian Democratic Party** (Kristelig Folkeparti - KrF), stepped down in 2021 after having been in office since 2017. The right-wing populist **Progress Party** (Fremskrittspartiet - Frp) had left the government in 2020. Following their electoral victory, a new minority government including the social democratic **Labour Party** (Arbeiderpartiet) and the agrarian **Center Party** (Senterpartiet - Sp) took office in October 2021. The **Socialist Left** (Sosialistisk Venstreparti - SV) pulled out of coalition talks due to a lack of agreement with Sp particularly on climate policy, but might still support the government in some areas. Two smaller parties with significant influence on the climate policy debate are **the Greens** (Miljøpartiet De Grønne - MdG) and the far-left **Red Party** (Rødt). The positions of these parties are described in Section 3.1.

1.3.3 Civil society actors

Norway has a strongly unionised work force, with a membership rate of approximately 50%. Trade unions are therefore key stakeholders in the petroleum and supply sectors. Several policy issues have become contested within the labour movement and in particular among affiliates of the **Norwegian Confederation of Trade Unions (LO)**[97]. This is the largest union in the country, with more than 900,000 members over a national population of just over five million. LO's close ties to the Labour Party, as well as to other centre-left parties, means they will have a strong influence on climate and petroleum policies with a government led by Labour. The dominant unions within LO on issues related to oil and gas are the **United Federation of Trade Unions** (*Fellesforbundet)* and Industri Energi, with the large public sector union, the **Norwegian Union of Municipal and General Employees** (*Fagforbundet*), representing a political counterpoint (see table below).

Outside the LO, several other unions have a stake in oil and gas policies. These include the independent **Norwegian Engineers and Technologists Organization (NITO)**, the **Norwegian Society of Graduate Technical and Scientific Professionals (Tekna)**, and the **Association of Unionized Workers in the Energy Sector (SAFE)**. The latter two are affiliated to other confederations.

The position of unions within and beyond the oil and gas industry, as well as those of the main trade union confederations, are mapped below.[98] On policy issues with a direct effect on the oil

[95] Guri Bang and Bård Lahn, 'From Oil as Welfare to Oil as Risk? Norwegian Petroleum Resource Governance and Climate Policy', Climate Policy 20, no. 8 (13 September 2020): 997–1009, https://doi.org/10.1080/14693062.2019.1692774.

[96] Zita Asdal, 'Petrolocked - Exploring Climate Change Mainstreaming in Norwegian Petroleum Policy, 2005-2016' (MA Thesis, Oslo, University of Oslo, 2017).

[97] OGT Team members have analysed these dynamics in the following research article: Houeland, C., Jordhus-Lier, D. C., & Angell, F. H. (2021). Solidarity tested: The case of the Norwegian Confederation of Trade Unions (LO-Norway) and its contradictory climate change policies. Area, 53(3), 413-421.

and gas industry along the West Coast, there are clear division lines between industrial unions on the one hand, and public sector and service economy unions on the other. In between, there are professional unions like the **Electrician and IT Workers' Union (EL og IT**), with members from both the oil and gas and the renewable energy industry, and **NITO**. Economic interests also intersect with union's political allegiances or apolitical positions. Many unions have so far refrained from taking active positions on some of the most contested policy issues.

Table 2: Most important trade unions and their characteristics (own elaboration).

Oil industry unions	
El og IT	LO affiliate with 39,000 members in energy, electrical engineering, telecommunications and IT
Fellesforbundet	LO affiliate and largest trade union organising 140,000 members in the private sector with a strong presence in the supply industry
FLT	LO affiliate with 21,000 members among engineers, production managers, middle managers, team leaders and technical staff
Industri Energi	LO affiliate with 56,000 members in the petroleum and process industry
NITO	Non-affiliated union for engineers and technologists with BA/MA, 93,000 members across the economy, including in the oil industry
SAFE	YS affiliate with 10,000 members in the onshore and offshore oil industry
Tekna	Akademikerne affiliate for graduate technical and scientific professionals, 90,000 members across the economy, including in the oil industry
Non-oil industry unions	
Fagforbundet	LO affiliate and Norway's largest trade union with 395,000 members in the public sector, in local and county government and in hospitals
HK	LO affiliate with 74,000 members in retail and office work
NTL	LO affiliate with 50,000 members in state-related organisations, agencies and businesses
Utdannings-forbundet	Unio affiliate with 180,000 members in the education sector
Union federations	
LO	Largest trade union confederation in the country, maintains collaborative links with the Labour Party; 25 affiliates representing 970,000 members
Unio	Trade union centre for workers with higher education; politically neutral; 13 affiliates representing 380,000 members
YS	General trade union umbrella organisation; politically neutral; 12 affiliates representing 220,000 members
Akademikerne	Trade union and professional organisation confederation for workers with higher education; politically neutral; 13

In conclusion, trade unions should not be treated as one actor, nor as a coherent force in policy processes. They rather represent a **diverse set of stakeholder groups**, with interests and perspectives that do not align perfectly or may at times be contradictory. Differences stem from divisions between employees in the private vs public sector, skilled and specialised vs non-skilled workers, professional vs manual labourers, as well as geographical location. During the parliamentary negotiations on a support package for the oil and gas industry in May and June 2020, four LO affiliates and the Unio confederation called for a green stimulus designed to create "climate jobs" in renewable energy, clean transport and energy efficiency. However, none of the signatories took position against the stimulus package that was passed, even if it did not meet their demands.

Figure 6: Trade unions and their policy positions in O&G sector

Oil-/industry unions	Green bargaining/tariff	LoVeSe conservation	Barents sea conservation	Continued exploration	Reimbursement system	End date for OG industry	CO2 tax	Offshore electrification	Carbon capture and storage	ACER	Cables to Europe	Covid-19 stimulus package
El og IT	o	*	*	o	o	o	*	*	*	x	x	o
Fellesforbundet	o	x	x	*	x	x	o	*	*	*	x	*
FLT	o	x	o	o	o	x	o	o	o	x	x	o
Industri Energi	o	x	x	*	x	x	*	*	*	*	x	*
NITO	*	x	x	*	o	x	o	o	*	x	x	*
SAFE	o	x	x	*	o	x	o	o	*	x	o	*
Tekna	o	o	o	o	o	x	o	*	*	o	*	*
Non-oil/-industry unions												
Fagforbundet	o	*	o	x	x	o	o	o	o	o	o	o
HK	*	*	o	o	o	o	o	o	o	o	o	o
NTL	*	*	o	x	o	o	o	o	o	o	o	o
Utdanningsforbundet	*	o	o	o	o	o	o	o	o	o	o	o
Union federations												
LO	o	x	x	*	*	x	*	*	*	o	x	*
Unio	*	o	o	o	o	o	*	o	*	o	o	o
YS	*	o	o	o	o	o	*	o	*	o	o	*
Akademikerne	*	o	o	o	o	o	o	o	*	o	o	o

Legend	
support measure	*
oppose measure	x
no position	o

The policy debate over the future of the oil and gas sector is increasingly influenced by environmental organisations. **Norges Naturvernforbund** (Friends of the Earth Norway), **Natur og Ungdom** (Young Friends of the Earth Norway), the **Bellona Foundation, Framtiden i våre hender** (Future in Our Hands), Greenpeace, WWF, as well as the ZERO foundation and the Norwegian Climate Foundation are the most prominent actors in the advocacy network aiming at more ambitious climate and decarbonisation policies. **The Norwegian Forum for Development and Environment (ForUM)** is a network of 50 organisations working on development, environment, peace and human rights, acting as an umbrella and a link to other NGO communities, e.g., the Danish one. The Greens and the Socialist Left are the closest parties to the environmental movement, but important connections exist also with the Liberals, Reds and Christian Democrats, which all have a broad environmental agenda. Trade unions too maintain close relations with environmental NGOs and even the oil sector's unions collaborate with the more "technology optimistic" organisations, like Zero and Bellona.

The most important think tanks and research institutions working on climate policy in Norway are **CICERO** (Center for International Climate Research), based in Oslo, and Sintef, based in Trondheim. But many other policy think tanks and research institutes, e.g. **Civita** and **Manifest,** contribute to the debate. There are also many research institutions and university departments focused on relevant topics and partly financed by the oil industry. The disappearance of oil and gas activities will likely have consequences for their mission and finances. Some will be able to redirect their work towards renewables, but not all.

A recent addition to the civil society landscape are networks and bridging initiatives that gather actors from across the industry, unions, NGO and research divides. The most prominent industry-led initiative is KonKraft, while an NGO-led initiative is the **Climate Transitions Committee** (*Klimaomstilingsutvalget*) set up by WWF, the Norwegian Climate Foundation and Civita. Its core task is to "describe a policy that will prepare, implement and handle the consequences of such a transition, including a structuring of the petroleum policy that is compatible with reaching the climate goals".[99] Green Industry 21, an alliance that seeks to "find a common ground on which industrial actors and the climate movement can agree",[100] brings together trade unions representatives in and beyond the oil industry, with members from NITO, NTL, Future in Our Hands, Aker ASA, Fellesforbundet and the think tank Manifest. Also, the **Bridge to the Future** (*Broen til framtiden*) initiative gathers unions such as Fagforbundet, EL og IT, LO, NTL, alongside environmental NGOs Naturvernforbundet, Greenpeace, Future in Our Hands and others, the Church of Norway and Concerned Scientists Norway. Many of the same organisations are also members of the non-partisan **Climate Election Alliance** (*Klimavalgalliansen*).

[98] 'Summary in English – Klimaomstillingsutvalget', accessed 13 June 2021, https://www.klimaomstillingsutvalget.no/summary-in-english/.

[99] 'Med Grønn industri 21 får vi fart på omstillingen', NITO, accessed 15 September 2021, https://www.nito.no/aktuelt/2021/2/nito-deltar-i-prosjektet-gronn-industri-21/

[100] Regjeringen. 2021. Revidert nasjonalbudsjett 2021, 11 May 2021, available at: https://www.regjeringen.no/no/dokumenter/meld.-st.-2-20202021/id2849037/

2. Role of oil and gas in Norway's economy and society

2.1 National and regional significance

For Norway, the discovery of oil resources and the emergence of the lucrative oil and gas industry constituted not only an economic, but also a socio-cultural shift. The revolutionary event, also called **"the oil fairy tale"** (*oljeeventyret*), has catapulted Norway from being a minor economy based on fisheries and limited industrial production to an important European player. It also contributed to building the robust Norwegian welfare state. The oil and gas sector remains an important employer, attracting domestic and international staff, and a source of national pride. This is most visible in the "land of fortune" of Stavanger, as the title of a 2018 popular TV series suggested. The economy of the **region** (Southwestern Norway, Rogaland County) is to a large extent dominated by the industry.

The Norwegian oil and gas sector has a fundamental importance for the national economy, but it is highly **concentrated regionally** and has therefore uneven impact across the country. The long coastline hosts numerous terminals, helicopter bases, supply facilities and harbours. Other than in Stavanger, there are such facilities outside **Bergen** (Western Norway, Vestland County) at the **Mongstad** refinery and the Sture and Kolsnes terminals. Outside **Trondheim** (North-Central Norway, Trøndelag County) similar activities are found at **Tjelbergodden**. In the Northern part of Norway, both **Harstad** and **Hammerfest** (Troms og Finnmark County) will be strongly impacted as in this part of the country alternative industries are less likely to appear.

2.2 State revenue and regional budgets

The government **net cash flow from petroleum activities** is expected to amount to NOK 154 billion in 2021, around 9% of the total budget income.[101] The national instruments to secure income from petroleum operations have been taxes and fees, as well as state participation in such activities. The extraordinary returns on oil and gas production make the entities that extract such resources subject to a special levy in addition to ordinary taxation. The marginal tax on the net profit of these companies is 78% (22% ordinary tax plus 56% special tax). The total cash flow from the industry in 2020 amounted to NOK 106.8 billion, relatively poor compared to previous years.[102] Taxes (including environmental taxes and area fees) added up to NOK 35.4 billion, dividends from Equinor amounted to NOK 15 billion and the net cash flow from State's Direct Financial Interest (SDFI) was NOK 56.4 billion. In 2021 it is estimated that the total net cash flow will amount to NOK 154 billion.[103]

Net cash flow from petroleum activities does not have a direct effect on the financing of the government budget the same year. Regardless of the annual cash flow, the budget receives money from the **Sovereign Wealth Fund** within the so-called 'budgetary rule', which limits contributions to 3% of the fund's value.[104] In 2020, the government budget received NOK 417.4 billion from the Sovereign Wealth Fund.[105]

[101] Norsk petroleum, 'Statens inntekter fra petroleumsvirksomhet', Norskpetroleum.no, accessed 14 June 2021, https://www.norskpetroleum.no/okonomi/statens-inntekter/.

[102] Norsk petroleum.

[103] Hernes, Erraia, and Fjose, 16–18.

[104] Finansdepartementet, 'Et budsjett for å skape mer og inkludere flere', Pressemelding, Regjeringen.no (regjeringen.no, 11 May 2021), https://www.regjeringen.no/no/aktuelt/et-budsjett-for-a-skape-mer-og-inkludere-flere/id2848501/.

[105] Hernes, Erraia, and Fjose, 'Ringvirkninger av olje- og gassnæringens aktivitet i 2019', 16–18.

Table 3: Petroleum related tax revenue and transfers (Billions NOK), 2019 Source: Menon Economics

County	Rogaland	Viken	Vestland	Oslo	Trøndelag	Vestfold og Telemark	Innlandet	Agder	More and Romsdal	Troms og Finnmark	Nordland
Revenue	9.2	8.4	6	3.8	3.4	2.8	2.6	2.4	2.2	2	1.8

While most of the petroleum industry is concentrated in specific regions, the revenues it generates are redistributed to all counties (see Table 3). Concessionaries pay petroleum tax and corporation tax that go to the Sovereign Wealth Fund, which finances the budget. The supply industry further down the value chain pays corporate tax that goes directly into the government budget. In addition, direct and indirect employees pay income tax, which contributes to both the national and the municipal budgets. Large parts of municipalities' budgets are financed by the government budget, and parts of their welfare production can thus be traced back to the activity of the oil and gas industry.[106]

Several **industrial sectors** in Norway have developed and prospered on the back of oil and gas discoveries. First and foremost, the pre-existing ship building industry along most of the coast has benefited, but engineering companies have also emerged in addition to a number of other service suppliers. Most of these have achieved international competitiveness, so they are not dependent on the location of the oil and gas activity, although proximity to demand helps.

2.3 Employment and vulnerable populations

While calculations vary due to different definitions and methodical approaches, Statistics Norway estimates that 1**40,000 people were either directly or indirectly employed in the oil and gas sector in 2019**,[107] but a report by consultancy Menon Economics puts the total at **205,000**.[108] This constitutes 5-6% of national employment, but there are significant differences across regions (see Table 4). A 2016 report by Statistics Norway estimated that 60% of workers in the petroleum sector lived in the Rogaland or Hordaland Counties.

Employment peaked in 2014[109] and has declined sharply following the oil price shock the same year.[110] Rogaland County, where 30% of private employment can be directly or indirectly attributed to the petroleum industry, saw a 7% drop after 2014, according to Menon Economics. Other counties with similar experiences include Agder, Vestland and Møre and Romsdal. A sizeable part of these figures consists of employees in supply services, while some 23,700 were engaged with oil and gas extraction.[111]

Table 4: PEmployment effects of the O&G industry as a share of private employment per county. 2019. Source: Fjose et al. p. 10

County	Rogaland	Vestland	More og Romsdal	Agder	Vestfold og Telemark	Oslo	Trøndelag	Viken	Nordland	Troms of Finnmark	Innlandet
Share	30%	11%	8%	6%	5%	5%	5%	4%	4%	3%	2%

[106] Hernes, Erraia, and Fjose, 'Ringvirkninger av olje- og gassnæringens aktivitet i 2019', 16–18.

[107] Norsk Petroleum, 'Arbeidsplasser', Norsk petroleum, accessed 12 May 2021, https://www.norskpetroleum.no/okonomi/arbeidsplasser/.

[108] Sigrid Hernes, Jonas Erraia, and Sveining Fjose, 'Ringvirkninger av olje- og gassnæringens aktivitet i 2019' (Menon Economics, March 2021), 6.

[109] Joakim Blix Prestmo, Birger Strøm, and Hilde karoline Midsem, 'Ringvirkninger av petroleumsnæringen i norsk økonomi', Rapporter (Oslo: Statistisk sentralbyrå, 16 February 2015), 16, https://www.ssb.no/nasjonalregnskap-og-konjunkturer/artikler-og-publikasjoner/_attachment/218398?_ts=14b82bba2f0.

[110] Norsk Petroleum, 'Arbeidsplasser'.

[111] Norsk Petroleum.

According to Statistics Norway, employees who leave the oil and gas industry typically enter other industrial jobs or move to sectors such as mining, construction and professional business services.

Oil workers are considered the most vulnerable to a green transition. Workers in the industry are generally considered to benefit from relatively good conditions, although these vary greatly between white collar, permanent offshore and contract workers in supply and service. Different skills offer different prospects for (or interest in) green economy jobs.

Even before the transition, industry staff felt vulnerable due to market fluctuations (2014 and 2020 crises) and general pressure on working conditions. The number of oil and gas workers is declining and the trend is expected to continue and accelerate. Some stakeholders say that as the media debate is framed around climate change, the employment aspect is not acknowledged.[112]

There are also important differences in the sector with regard to **gender** and **age**. Although the Norwegian oil and gas industry has the highest share of female staff in the world, peaking at 20% in 2016 and currently around 19%, most oil workers are men. Women are generally more exposed to the transition via indirect jobs or as spouses. Older workers may also have less flexibility for a career change. Many planned to stay for a lifetime when they entered the industry in their youth. Younger workers, instead, are divided. Some are wary about their future, while representatives of the union's student sections interviewed for this report said their members studying petroleum-related subjects are "impatient" for the green transition. They assume they will not work in the industry for their entire life.[113] Despite this realisation, young workers often feel directly threatened by the direction the policy debate has taken. They are the least aware about their rights, more vulnerable to exploitation, and the first likely to lose their job in a downsizing.

Many oil workers do not feel "transferable" and are concerned about not having alternatives and not knowing what terms might be available. Employment conditions are worsening, especially for newly hired employees, and some workers who were dismissed during the 2014 crisis were re-hired with worse contractual arrangements. Among catering and cleaning staff, categories on which unions have focused to ensure good conditions, there is an understanding that workers could get jobs onshore and outside the petroleum sector, but do not want them because these are vulnerable positions with relatively low salaries and inconvenient working hours.

Norway's transition policies seen through a "just transition" lens

The government strategy laid out in the recent "Energy for work" white paper does not address the question of justice brought by the transition, as it is built on the expectation that slowly decreasing petroleum activities will be substituted by the rapidly expanding low-carbon sector without socio-economic difficulties. The seven principles of a just transition laid out by Atteridge and Strambo (2020) help assess the current policy plan and guide the ongoing debate over plausible actions.

1. Actively encourage decarbonisation: The current target of 50% greenhouse gas emissions reduction by 2030 is only related to on-site emissions from oil and gas extraction. In principle, this corresponds to the European target of net-zero emissions by 2050, but it does not address the deeper problem of the "production gap". However, the debate over new licences and the possibility of limiting exploration of new fields in the near future is a step in that direction.

2. Avoid carbon lock-in and more "losers" in these sectors. Due to reluctance, there is a major risk of carbon lock-in associated with continuous investment in fossil fuels. Since no vision of the transformation is in place, there is also no clear pathway to avoid an unmanaged shock linked to the decline of entire branches of the oil economy in the future.

[112] David Jordhus-Lier and Camilla Houeland (2020). Polarisering i klimadebatten. Samtaler med tillitsvalgte i oljeindustrien. Oslo, Manifest Tankesmie. 7.

[113] Head of NITO Student and Industri Energi Student interviewed in" Jordhus-Lier and Houeland. Polarisering i klimadebaten.

3. Support affected regions. This issue is not yet addressed in relation to any possible sectoral decline, but regions are being brought into the agenda as far as geographically concentrated value creation is concerned. For instance, the Labour Party and the Center Party have talked about regional and local value creation: "Petroleum policy must be designed so that it stimulates and creates local value creation to the greatest possible extent with positive ripple effects in the area where the activity takes place" (Senterparti, 'Forslag til prinsipp- og handlingsprogram 2021-2025').

4. Support workers, their families and the wider community. Similarly, the lack of a realistic vision for the transition out of oil in the long term leads to a lack of any regional vision of social and economic development in the future. It is not surprising that there is little or no buy in among the population of the regions potentially most affected for the more radical decarbonisation plans.

5. Clean up environmental damage and ensure that related costs are not transferred from the private to the public sector. The question of costs and benefits from the petroleum sector transition and the externalisation of business risks, which are transferred to the state and local communities, was previously unaddressed but has recently become part of the political debate.

6. Address existing economic and social inequalities. The parties supporting more radical climate policies, particularly the Socialist Left and the Red Party, but also to some extent the Center, the Greens and the Christian Democrats, have adopted the language of the just transition and thus expanded the scope of the discussion to include socio-economic marginalisation and the risks of an unmanaged transition. Although no specific policies are in place, the Norwegian welfare state remains a well-functioning and robust instrument actively aimed at managing social inequalities. While it will come under stronger pressure during the transition, it places Norway in a much better position than many other European countries facing similar challenges.

An important vulnerable group are migrants[114] working in the oil and gas sector. One in ten oil workers in Norway is a migrant. Some of them live in Norway, while many maintain their residence abroad and regularly travel to the workplace. In 2016, 6,927 immigrants working in the petroleum sector were living in Norway compared to 2,638 residing abroad. The unions do not register members on the basis of nationality, but according to the home address. In 2019, Industri Energi said they had 55,769 members, of which 1,338 living abroad. Safe reported that 617 of their 9,500 members had an address in another country. Most of these workers are from the EU/EEA (European Union and European Economic Area) and have the same rights as Norwegians. Their vulnerability to an oil and gas phase-out depends on who hires them and in which jurisdiction. However, especially in shipping and multipurpose vessels registered under a foreign flag, the jurisdiction is contested and many workers in Norway do not fall under Norwegian but under international labour law. For instance, "an oil worker can be resident of England, employed by an agency in Singapore, working on the Norwegian shelf on a ship registered and taxed in Panama, remaining outside Norwegian law". [115]

2.4 Macroeconomic impacts of an unmitigated transition

A 2020 report by **Statistics Norway attempted to estimate the macroeconomic impacts of two different oil and gas phase-out strategies.** The first is to end awards of licences for new exploration areas (both numbered and APA awards), which effectively reduces activities to already active fields. Under this scenario companies may still explore and develop areas for which licences have been awarded by the end of 2021. The second strategy is also about ending the numbered licensing rounds, but only tightening the APA scheme. This scenario severely reduces the financial incentives for oil companies as it removes several pillars of the current financing framework. More specifically, this option explores the effects of the removal of the reimbursement

[114] Regjeringen, 2019, 'Ny rapport om flerbruksfartøy på norsk sokkel', p. 120, available at https://www.regjeringen.no/no/aktuelt/ny-rapport-om-flerbruksfartoy-pa-norsk-sokkel/id2662604/

[115] Finn Roar Aune, Ådne Cappelen, and Ståle Mæland, 'Konsekvenser av redusert petroleumsvirksomhet', Rapporter (Statistisk sentralbyrå, 28 October 2020), https://www.ssb.no/nasjonalregnskap-og-konjunkturer/artikler-og-publikasjoner/_attachment/435324?_ts=17563963dc0.

scheme and the ability to write investments off using straight-line depreciation over six years. In addition to the changing licensing conditions, the sum of the CO_2 tax is gradually increased to NOK 1500 by 2030, which is NOK 500 lower than the government proposal.[116]

The report finds that the first phase-out strategy would start having a significant impact from 2030, as it is likely that exploration & production (E&P) companies would reallocate some of their activity from the fields they would have acquired to fields that have already been assigned. Compared to the Statistics Norway benchmark scenario, which envisages a gradual decline and extraction more than halving in 2050 over 2020 levels, the first scenario would reduce Norway's GDP by 1% in 2050. The 2050 output in this case would be around 10% lower than the benchmark trajectory. The reason for the GDP reduction compared to the benchmark is that monetary policy will improve the international competitiveness of Norwegian goods and services (supply industry included). Real wages and consumption are expected to decline modestly in relation to the expected increase according to the benchmark scenario.[117]

More dramatic effects are forecast with the second strategy. In this scenario, the 2050 production is expected to be half the business-as-usual benchmark. In the long term, GDP in the mainland would fall by almost 1.5% compared to the benchmark scenario and accumulated oil taxes would decrease by a little less than NOK 1 billion compared to the reference path. The report estimates that the unemployment rate, at its peak in 2031, would be less than 1% higher than the benchmark. Between 2030 and 2050, the effect of the second strategy would correspond to a reduction of about one year of GDP growth compared to the benchmark scenario.[118]

The geographical concentration of the oil and gas industry means that a prospective phase-out would have a bigger impact in some regions. As shown during the 2014 oil price shock, a phase-out of the petroleum sector will reduce the demand for goods and services along coastal areas, causing unemployment and requiring a national redistribution of public support or workers mobility. The latter is likely to increase the pressure on infrastructure in and around the Oslo area, where most employment opportunities are found.

There are also indirect economic and employment effects that might be difficult to anticipate. For example, a member of the municipal workers union Fagforbundet said that during the 2014-2015 crisis, some 60 union members in a municipality of 20,000 lost their job in public kindergartens and the public sector as some young families left. This also caused a decline in local fertility rates.[119]

Beyond coastal areas, the employment effects of a phase-out will be felt throughout the country, where services and supply companies are clustered. Southern Norway hosts some of the world-leading companies in drilling technology. In and around Oslo there are well-established engineering expertise, financial and advisory services, as well as several seismic survey businesses. Kongsberg is a centre of leading subsea, automation and dynamic positioning equipment. A shipbuilding and outfitting cluster is located in the Aalesund region and the north-western part of the country.[120]

An unmitigated reduction or cessation of oil income is likely to result in unemployment and, in fact, a lower level of consumption than before the oil income appeared (Claes, 2018: 63). The public sector would have to shrink and public support and activity would be reduced. In addition, taxes would most likely increase. With oil and gas-related activity and employment in 415 of Norway's 428 municipalities, the entire country would experience reduced economic performance, with multiplier effects in all regions and most sectors of the economy.

[116] Aune, Cappelen, and Mæland, 64–65.

[117] Aune, Cappelen, and Mæland, 50–65.

[118] Camila Houeland, David Jordhus-Lier, and Frida Hambro Angell (2021). Solidarity tested: The case of the Norwegian Confederation of Trade Unions (LO-Norway) and its contradictory climate change policies. Area, 53(3), 413-421.

[119] Norsk petroleum, 'Leverandørindustrien'.

[120] https://www.npd.no/fakta/nyheter/generelle-nyheter/2020/lonnsom-leting-pa-norsk-sokkel/

3. Stakeholder perceptions

As Norway's oil and gas reserves remain vast and accessible, with significant resources already invested and high potential future yields, there is not a purely economic reason to limit or stop oil extraction. A business-as-usual scenario would therefore see current levels of activity on the Norwegian Continental Shelf continue over many years. However, the non-internalised climate costs of these operations are huge and the urgent need for a global decarbonisation exerts pressure on the industry. In such a context, **any radical change will have to come from political decisions.** This section focuses on the political parties discourse, as in the Norwegian democracy they are the key actors to steer energy governance representing all interest groups. The 2021 election campaign, hailed as the first "climate vote" in Europe, galvanised public opinion, putting centre stage the future of oil and Norway's climate pledges, and forcing all parties and interest groups to take a stance. This occurred at the time two international reports – the International Energy Agency scenarios and the latest IPCC climate science assessment – indicated that the climate crisis is impending and the oil and gas phase-out has to be seriously considered in the long run.

3.1 What would a phase-out mean in practice?

Norwegian oil and gas resources differ from those in e.g. onshore US or the Middle East, as the required investment in the North Sea is high, but the running costs are comparatively low. Once the production platforms are in place, the operating costs are only a few dollars per barrel of oil, which means that it will almost always be profitable to continue extraction from existing sources, regardless of what the price is and what fiscal burden is added. Political interventions **limiting or banning extraction** from operational platforms are legally possible (the Petroleum Law allows it) but are **very unlikely** and would cause national controversy.

For the same reason, **fields 'in the pipeline' to be developed are unlikely to be halted.** Companies might have invested significantly on a project, which could be stopped by commercial considerations if the expected oil price in the long term is very low. For instance, $40 per barrel will restrict, but not exclude, new field developments.

For **areas where licences have been awarded but activity has not started yet**, a political intervention is not unthinkable. This might trigger legal disputes with the companies that have been granted exploration rights, but such situations can be resolved with compensation.

The most likely and most debated way forward is a government decision to **stop awarding new licences** or, even more likely, a government decision to specify a date when this will happen. However, in a 2020 report, the **Norwegian Petroleum Directorate (NPD)** suggested new licensing procedures should be granted as there are still a lot of profitable resources on the continental shelf.[121] Neither the **Conservative Party** nor the Labour Party have indicated support for an end date decision, although a growing wing of the **Labour Party** is in favour. That said, a Labour-Centre government has not given any signal that a change in licensing policy is on the table.

3.2 Imagining the future of (and without) oil in the 2021 electoral debate

The different positions of actors and stakeholders on the future of the Norwegian oil and gas sector are founded on **different understandings of the country's situation and global role**, as well as on the benefits and barriers that petroleum extraction brings. Most mainstream political forces underline the importance of the industry for the national economy and its historical contribution to the Norwegian welfare state. These parties treat an oil and gas phase-out as a taboo or envisage it in a very distant future. On the other hand, political forces

[121] MdG, 'Partiprogram Og Dybdeinformasjon', Miljøpartiet De Grønne, 2020, https://www.mdg.no/partiprogram_og_dybdeinformasjon.

critical of the petroleum sector, primarily the Green Party, the Socialist Left Party and the far-left Reds, speak of the country's **"oil dependence"** and portray the sector not as a driver of national economic development, but as a factor slowing down the green transition "economically, structurally and mentally" and as "Norway's largest contribution to global warming".[122] The logical conclusion from this perspective is that "the only thing that is justifiable if we are to avoid a global climate collapse and protect the Norwegian economy against declining oil demand" is "to free Norway from oil dependence".[123]

The Socialist Left emphasises Norway's uniquely privileged position, and so its responsibility: "Norway is a country with large renewable energy resources, high competence and great wealth. Compared to many other countries, we are very lucky, and we have managed many of these resources well. Therefore, we have a **special responsibility** to be a pioneer in environmental policy: we have both the resources and the knowledge needed, we have benefited from our resources, and we can further develop our industry and business for the future".[124]

Among the three parties that present the oil and gas phase-out as their policy goal, only the Greens set a target date, "within 14 years from the start of the parliamentary term". The Greens say: "In line with our climate responsibility, we will implement a planned, controlled restructuring away from petroleum activities by 2035, while at the same time we will safeguard employment, contribute to the retraining and the creation of new jobs, in consultation with authorities, organisations, workers and the industry"[125].The Red Party proposes to reduce production by 90% already by 2030 and maintain only what is necessary to cover energy needs that cannot be substituted with renewables for the time being.[126] The moderate pro-environmental forces in the political scene – the Center Party and the Liberals – hint at a possible phase-out but only after 2050. Norway's largest parties in the centre-right (Conservatives) and the centre-left (Labour) do not raise the issue at all in their party programmes (see Table 2). The Conservatives believe that "an end date for the Norwegian petroleum industry" should not be set, but the industry should rather be supported "in the further work of exploring for new resources and the green shift".[127]

At the opposite end of the spectrum, the Progress Party defends the business-as-usual scenario, dismissing the idea of a national phase-out as **"symbolic politics dangerous for the Norwegian economy and welfare"** which will lead to a "green paradox" (see box) and carbon leakage. "More and more politicians are speaking out in favour of shutting down the oil and gas industry, by far the most profitable industry for Norway. This is an expensive symbolic policy that will lead to more greenhouse gas emissions in the world, devastating job losses in Norway and less welfare for the Norwegian people".[128] The extreme right political groupings, e.g., the Capitalist Party (*Liberalistene*) and the Climate Realists (*Klimarealistene*), a climate-sceptic group, are also against decarbonisation goals.

The debate about the future of the oil and gas sector creates tensions within political coalitions, and according to the youth committee of the Industri Energi trade union, "pushes the industry's workers to the right" because left-of-center politicians "want to phase out the industry for what they believe is a contribution to a green shift". The response of young workers is: "Stop the eradication of Norwegian oil and gas. Today's oil and gas industry faces a major threat, and that threat consists of politicians. ... Industri Energi will continue to work for the opening of new fields in the North Sea so that Norwegian gas and oil can contribute to a greener future".[129]

Apart from the electoral campaign, which was defined the "climate election", two international reports published in 2021 put the future of Norwegian oil in the spotlight.

In June, the **International Energy Agency (IEA)** scenarios for net-zero emissions by 2050 suggested that no new oil resources should be explored after 2021. This was complemented in August by the **IPCC report** with the latest climate science stressing the urgency of climate action.

[122] MdG, 'Partiprogram Og Dybdeinformasjon', Miljøpartiet De Grønne, 2020, https://www.mdg.no/partiprogram_og_dybdeinformasjon.

[123] MdG.

[124] SV, 'SV - Prinsipprogram', SV, 2021, https://www.sv.no/politikken/prinsipprogram/.

[125] MdG, 'Partiprogram Og Dybdeinformasjon', Miljøpartiet De Grønne, 2020, https://www.mdg.no/partiprogram_og_dybdeinformasjon.

[126] Rødt, 'Olje', 2021, https://roedt.no/olje?v=wEpddxk2ekuVnxiFqYWVJf.

[127] Høyre, 'Partiprogram 2021-2025', Høyre, 2021, https://hoyre.no/politikk/partiprogram/.

[128] Frp, 'Olje og gass', 2021, https://www.frp.no/var-politikk/energi-og-miljo/petroleumsvirksomhet.

Norway's "clean oil" and the "green paradox"

The idea of a "green paradox" is based on three theses: 1) Norwegian oil is "green" and the cleanest in the world in terms of emissions per barrel; 2) unlike most petrostates, Norway is a liberal democracy; 3) a reduction or phase-out of Norwegian oil production will be immediately filled by other producers with no positive impact on the climate.

Undeniably, emissions from oil production on the NCS are relatively low due to tight flaring bans. However, environmental NGOs provide data showing that some Gulf oil has lower emissions per barrel, and the main problem for climate change mitigation are not emissions from oil production but from oil use. The political argument is not challenged, but the impact of a Norwegian oil phase-out became a contentious issue during the electoral campaign. Industrial actors commissioned a report from business intelligence company Rystad Energy, which suggested that Norway's oil phase-out would lead to an increase in global emissions. In response, twelve economists said the analysis was flawed and argued that the phase-out would lead to cost-effective emissions reductions, but some additional conditions, e.g. international cooperation, would be needed.

To reduce the risks of the "green paradox" and the substitution of Norwegian oil with more carbon intensive energy sources, the Socialist Left, the Greens and the Christian Democrats propose to establish an international forum of oil producing states where to negotiate a joint reduction of supply.

The IEA report was a political bomb in the country and the biggest newspaper, Dagbladet, suggested that it "can change everything in Norway's oil policy".[130] The publication of the report coincided with a series of other blows to the oil industry: the Dutch ruling against Shell and two decisions in American oil giants, Exxon and Chevron, undermining the position of their executives and their business-as-usual approach. The Guardian called the day "the Black Wednesday of the oil industry".[131] The top economic analyst at Nordea Bank suggested this was "a turning point" and that, following the events, in Norway "the climate crisis will now have to be treated as a crisis".[132]

All stakeholders commented on the report either dismissing its conclusions, downplaying the implications for Norway or using the IEA data as political ammunitions for domestic discussions. Progress Party representatives emphasised that the IEA provided a "hypothetical scenario" and that the important question it raised was "where the remainder of oil and gas is to be produced".[133] The argument is that since Norway's oil is "the greenest", the **Norwegian oil and gas production sector should be the last to end operations** and an early closure would lead to the geopolitical mistake of strengthening authoritarian petrostates elsewhere in the world (see box). The Labour Party experts, while agreeing with the report, said it contained "nothing new" but was a signal of the need to accelerate efforts for a coordinated green transformation of the sector.[134] Equinor's international presentation of the company's Energy Perspectives 2021 took a polemical tone, with the IEA report frequently cited as a reference, but the company's chief economist arguing that even the most ambitious climate scenarios do not have to mean an halt to the opening of new oil fields.[135] While political actors generally recognise that Norwegian oil and gas is in a good position to stay on the market for as long as possible under

[129] Industri Energi Ung, Se ungdomsutvalgets gjeldende politikk, 2018. https://industrienergi.no/content/uploads/2018/12/Gjeldende-politikk-Industri-Energi-Ung.pdf

[130] Dagbladet, 'Kan endre alt i norsk oljepolitikk', dagbladet.no, 2021, https://www.dagbladet.no/meninger/kan-endre-alt-i-norsk-oljepolitikk/73777595.

[131] Jilian Ambrose, '"Black Wednesday" for Big Oil as Courtrooms and Boardrooms Turn on Industry', The Guardian, 29 May 2021, http://www.theguardian.com/environment/2021/may/29/black-wednesday-for-big-oil-as-courtrooms-and-boardrooms-turn-on-industry.

[132] Kristian Elster, 'Tina Saltvedt kaller fire sjokk på ti dager for «Et vendepunkt for oljeindustrien»', NRK, 3 June 2021, https://www.nrk.no/urix/tina-saltvedt-kaller-fire-sjokk-pa-ti-dager-for-_et-vendepunkt-for-oljeindustrien_-1.15516444.

[133] Ketil Solvik-Olsen and Terje Halleland, 'Norge må styrke sin energimakt, ikke fase den ut', NRK, 27 May 2021, https://www.nrk.no/ytring/norge-ma-styrke-sin-energimakt_-ikke-fase-den-ut-1.15504543.

[134] Espen Barth Eide and Skjæran, 'Comeback for industrien?', NRK, 26 May 2021, https://www.nrk.no/ytring/comeback-for-industrien_-1.15504597.

[135] Erik Wæarness at the Energy Perspectives 2021 presentation, 10 June 2021, available at https://www.equinor.com/en/sustainability/energy-perspectives.html.

decarbonisation pressures, pro-environmental parties see this as the last moment to change the course of the industry and avoid locking-in resources. The Centre Party, now in government, argued in its manifesto that "Norwegian oil production will be reduced until 2050. Norwegian oil is produced with significantly lower CO_2 emissions than other places in the world, but emissions from the production itself must be sharply cut, also in a period of declining production. This means, among other things, that power for production on the Norwegian shelf must be renewable".[136]

In June 2021 the government published a white paper entitled "Energy for work", laying out a vision for the country's energy future in which oil and gas exploration plays an important role. The paper says that "the government will contribute to the development on the Norwegian shelf by continuing a petroleum policy that facilitates profitable production of oil and gas in a long-term perspective" and maintain licensing "to make new exploration areas available to the companies".[137]

In June 2021 the 25th licensing round was held, including concessions on the Barents Sea.[138] The apparent shift in the political debate, combined with the recent parliamentary elections in September 2021, **turned the question of petroleum licensing into an important political issue**. Less contentious than talk of a phase-out, a decision on new licences will nevertheless impact on the future of the industry and can start steering it strongly into either direction - either a locked-in business-as-usual scenario or a transition.

Table 5: Political party positions on most important petroleum related issues and their strength in parliament following the September 2021 general election. Highlighted parties likely to form a coalition government, SV pulled out of coalition negotiations on 29 September 2021, leaving only Ap and Sp to form a minority government. Own elaboration based on party programs (Sp positions have become more pro-industry during the electoral campaign).

Party	Seats 2021-	Phase out	Net-zero	Emissions reductions	Electrify the NCS	New Licenses	Develop LoVeSe and Arctic	Position	Combined seats
Progress (Frp)	21	✗	✗	✗	✗	✓	✓	Radical pro-industry	21
Conservative (H)	36	✗	✗	✓	✓	✓	✓	Moderate pro-industy	115
Labour (Ap)	48	✗	✗	✓	✓	✓	✗	Moderate pro-industy	
Christian Democrats (KrF)	3	✗	✓	✓	✓	✓	✗	Moderate pro-industy	
Center (Sp)	28	✓ 2050+	✓	✓	✓	✓	✗	Moderate pro-industy	
Liberal (V)	8	✓ 2050+	✓	✓	✓	✗	✗	Moderate pro-climate	8
Socialist Left (SV)	13	✓	✓	✓	With offshore	✗	✗	Radical pro-climate	24
Reds (R)	8	✓ 90% by 2030	✓	✓	N/A	✗	✗	Radical pro-climate	
Greens (MdG)	3	✓ 2035	✓	✓	With offshore	✗	✗	Radical pro-climate	

[136] Senterparti, 'Forslag til prinsipp- og handlingsprogram 2021-2025', Senterpartiet, 2021, https://www.senterpartiet.no/stortingsvalg-2021/program.

[137] Olje- og energidepartementet, 'Meld. St. 28 (2010–2011). En næring for framtida – om petroleumsvirksomheten', Stortingsmelding (Oslo: Olje- og energidepartementet, 24 June 2011), https://www.regjeringen.no/contentassets/19da7cee551741b28edae71cc9aae287/no/pdfs/stm201020110028000dddpdfs.pdf.

[138] Ina Andersen, 'Lyser ut nye leteområder på norsk sokkel: 70 nye blokker i Barentshavet', Tu.no, 9 June 2021, https://www.tu.no/artikler/lyser-ut-nye-leteomrader-pa-norsk-sokkel-70-nye-blokker-i-barentshavet/510920.

3.3 New areas, licensing and extension of existing concessions

The licensing issue has opened three political frontlines where party positions differ significantly. The first question is about the regulation of **exploration and production in the Barents Sea**, including the High North, with the definition and the protection of the "ice edge" (*iskanten*). Since the ice edge is moving northwards because of climate change, the Conservative oil and energy minister Tina Bru decided to grant new concessions that would have previously been considered out of bounds.[139] The Conservatives were supported by the Progress Party which stated that "it is important to ensure access to new attractive exploration areas, also in the High North... areas that have not yet been opened, but which borders with areas where oil extraction is permitted."[140] Other parties pushed back. Labour agreed at the April 2021 general meeting that it will not support moving the ice edge line northwards[141] and the Centre Party said "no exploration close to the ice edge".[142]

Similar political divisions concern **oil and gas activity near the Lofoten islands, Vesterålen and Senja**. This is the most visible line of controversy between Labour and the Conservatives. Labour stated firmly in their political programme that they oppose petroleum activities in the LoVeSe area.[143] All moderate and radical pro-environmental parties are also against, which makes the opening of this region highly unlikely after the 2021 elections.

The problem of **new and existing licences is likely to become the most contentious policy area in the Norwegian parliament.** While energy companies can change their business models and prepare for a future after oil in the long term, the short- to mid-term direction of the industry will be decided by lawmakers. There are three major positions on this issue: continuing with new licences, stopping the issuance of new licences, and stopping new licences and revising those already acquired (see Table 5).

The Progress Party's logic for maintaining exploration considers economic factors. "If Norwegian petroleum production is to be maintained, four factors are crucial: increased recovery from existing fields, development of commercial discoveries, more discoveries in open areas and the opening of new exploration areas. Since it takes so long from exploration to production, it is urgent to open new areas."[144] The Conservatives and Labour want new licences to maintain the full capabilities of the Norwegian petroleum industry, including the economically important sub-sectors. Labour states that in order to achieve a green energy transition, the sector "must develop, not phase out, and ensure that new industry is built on the shoulders of the old one".[145] The Centre Party, while envisaging a phase-out around 2050, does not reject new concessions and suggests the need to "control the allocation of new [areas] so that consideration for the environment, climate and renewable industries weighs heavily".[146] This is motivated by the need for a managed, gradual evolution of the service industry attached to the oil and gas sector, and its transition towards renewables. The Christian Democrats suggest that "future licence awards must be limited to extensions of existing ones or those mature areas with existing infrastructure".[147] The Liberals, the Socialist Left, Reds and the Greens oppose new licences and further future exploration. The Socialist Left specifies that "production licences should not be extended automatically but assessed according to strict requirements about profitability and impact on the climate and the environment. All applications to extend production licences that are against the 1.5-degree target must be stopped."[148]

[139] Johan Falnes, 'Tina Bru vil utlyse 136 nye oljeblokker', e24.no, 2020, https://e24.no/i/kJ20Gv.

[140] Frp, 'Olje og gass'.

[141] NRK, 'Ap sier nei til å flytte iskanten', NRK, 17 April 2021, https://www.nrk.no/nyheter/ap-sier-nei-til-a-flytte-iskanten-1.15460083.

[142] Senterparti, 'Forslag til prinsipp- og handlingsprogram 2021-2025'.

[143] Arbeiderpartiet, 'Lofoten, Vesterålen, Senja', Arbeiderpartiet, 2021, https://www.arbeiderpartiet.no/politikken/lofoten-vesteralen-senja/.

[144] Frp, 'Olje og gass'.

[145] Arbeiderpartiet, 'De store oppgavene løser vi best sammen', Arbeiderpartiet, 2021, https://www.arbeiderpartiet.no/om/program/.

[146] Senterparti, 'Forslag til prinsipp- og handlingsprogram 2021-2025'.

[147] KrF, 'Politisk program', Kristelig Folkeparti, 2021, https://krf.no/politikk/politisk-program/.

[148] SV, 'SV - Arbeidsprogram', SV, 2021, https://www.sv.no/politikken/arbeidsprogram/.

The independent Climate Transition Committee, convened by civil society organisations and involving different opposition politicians, made two recommendations: to "reduce the state's climate risk by limiting new exploration licences, tightening the oil tax regime and introducing a climate stress test for the plan for development and operation (PDO)," and to "facilitate far greater value creation and increased export revenues from renewable energy, the bioeconomy, CCS and hydrogen".[149]

3.4 Moving the sector towards net-zero

The **decarbonisation of petroleum activities** has been a flagship policy for recent Norwegian governments. This is to be achieved with the electrification of oil platforms using power from the mainland, power from offshore wind farms or with the installation of carbon capture and storage systems. The Progress Party objects to electrification as "inefficient and unsound", while most moderate parties support it. The Socialist Left and the Greens oppose electrification with power from the mainland, but support the deployment of offshore wind power, as well as CCS.

Halving the sector emissions by 2030 is the goal of both the Conservatives and the Labour Party. The most ambitious sectoral decarbonisation goal is set by the Centre Party, which states that "from 2040 there must be zero emissions from all installations on the Norwegian shelf. This means that all installations must be electrified or have a system for capturing and storing CO_2".[150] The largest parties do not mention net-zero ambitions specifically, while the more radical pro-environment forces support an economy-wide net-zero emissions target by 2050, in line with the Paris Agreement, European goals and Norway's current NDC.

3.5 Managing the transition: new technologies, jobs and value creation

Apart from the Progress Party, **all political forces in Norway imagine trajectories for the energy transition** towards a non-carbon future. These visions emphasize the need to develop several new technologies, especially offshore wind, CCS and hydrogen, as well as ideas to stimulate the transition.

Both the IPCC and the IEA scenarios estimate that **carbon capture and storage will be necessary** to reach the objectives of the Paris Agreement. The Norwegian Petroleum Directorate (NPD) has mapped areas suitable for long-term safe storage, and one of these will be used in connection with the government's proposed Longship project. The growing need for CO2 storage in Europe could represent new opportunities for value creation on the shelf. Recent CCS R&D initiatives focus on cost reduction, as improving project's economics is considered essential for wider take up. The Longship project aims to implement carbon capture technology at a cement factory and waste-to-energy plant in the Oslo-fjord region. After being captured, liquefied CO2 will be transported by ship to the **Northern Lights terminal**, a joint project between Equinor, Shell and Total, situated on the west coast. The CO_2 will be sent offshore via pipeline and permanently stored in a reservoir 3,000 meter below sea level. The total costs of the Longship project are estimated at NOK 25.1 billion, of which NOK 8 billion covers ten years of operation. The state contribution to these costs is estimated at NOK 16.8 billion. The first phase of the Longship project is due to be completed by mid-2024 providing a storage capacity of up to 1.5 million tonnes of CO_2 per year. Stakeholders have an ambition to expand capacity to up to 5 million tonnes, which will enable the terminal to receive CO_2 from European sources, effectively making it a **European CCS hub**.[151]

There is near-universal agreement across the political spectrum that **offshore wind** development is desirable from all points of view. It is considered a better solution than controversial onshore wind, which has sparked numerous local conflicts and is opposed by many parties including the Red Party and the Center. Building on the oil and gas sector, Labour sees Norway as a potential global champion of maritime renewables: "Norway is at the forefront

[149] Klimaomstillingsutvalget, 'Klimaomstillingsutvalget – Et uavhengig utvalg oppnevnt av Civita, WWF og Norsk klimastiftelse', 2021, https://www.klimaomstillingsutvalget.no/.

[150] Senterparti, 'Forslag til prinsipp- og handlingsprogram 2021-2025'.

[151] Northern Lights, 'What We Do', Northern Lights, accessed 12 June 2021, https://northernlightsccs.com/what-we-do/.

when it comes to the development of offshore oil and gas activity. The petroleum industry is also a hub for the development of related industries, such as shipbuilding and shipping, and for other business activities with great potential, such as aquaculture and offshore renewable energy."

Many **oil workers** interviewed for the report say their competence is relevant in a green industry (e.g. windmills on and offshore), but stress that these jobs are currently either non-existent and exposed to volatile conditions. To many, "green jobs" are at best a potential future.[152]

Another technology that can be developed on the basis of the petroleum industry is **hydrogen**. In 2020, the government presented the hydrogen strategy noting that "Norway has many years of industrial experience across the entire hydrogen value chain, and conditions for the production and use of clean hydrogen are ideal. Many Norwegian companies and technology communities are already developing and supplying equipment and services for the production, distribution, storage and use of hydrogen for various sectors".[153] While Equinor envisages a large role for **'blue' hydrogen** from natural gas with CCS, there is political will to focus on expanding surplus renewable generation to produce **'green' hydrogen**. However, it is clear that the emphasis on 'blue hydrogen' is an attempt to extend gas production in the long term even in the event of a decrease in European demand.

The development of renewable energy sources and battery technology requires access to considerable amounts of **rare earth minerals.** These are found in massive sulphide deposits and in manganese crusts on the seabed in the deep parts of the Norwegian Sea. The government decided this year to initiate a process to open mineral activities on the Norwegian continental shelf. The NPD has been working for several years to map mineral deposits and is now working on data analyses, geological evaluation while planning new mapping expeditions. Accessing those deposits, however, is also controversial and the Liberal party among others has voiced concerns about the environmental risks.

A recent report by KonKraft proposed eight concrete ambitions towards 2030: (1) develop the value chain for offshore wind; (2) further develop and build a battery value chain; (3) establish a large-scale production of hydrogen and ammonia; (4) further develop job and value creation from the petroleum industry; (5) scale up CO2 capture and storage; (6) reduce carbon intensity in the process industry and new positions in the value chain (7) focus heavily on the development of the renewable energy industry, where upgrading and renewing hydropower is central; (8) establish a clear goal for energy efficiency, e.g. min. 10 TWh reduction by 2030.[154]

3.6 State, industry and the governance of a just transition

A final set of issues concern the governing of the transition, in particular the role of the state in controlling the process and using its various resources to boost certain areas, most importantly the renewables sector. The Socialist Left emphasises that since "Norwegian oil and gas extraction must be gradually replaced by an industry based on renewable resources and climate-friendly production", and that requires the rollout of new renewables as well as the rapid deployment of CCS, "such a reorganisation requires a **large degree of state management and cooperation with the trade union movement**, so that the resources can be managed in a planned and democratic way for the benefit of the community".[155]

The state has various instruments at its disposal, from licensing and taxation to aid for both nascent and phasing out sectors. **Three elements** emerge from the vision of pro-environment political parties: ownership and governance reforms in Equinor, boost for Enova, and use of the State Pension Fund as a source of green finance.

As the largest company on the NCS, **Equinor** will in any case be a leader of change. The Greens suggest for Equinor to be transformed into an international green energy company as "soon as possible" and that its foreign investments in fossil energy are sold or wound down",[156] a

[152] Jordhus-Lier and Houeland. Polarisering i klimadebaten.

[153] Olje- og energidepartementet and Klima- og miljødepartementet, 'Regjeringens hydrogenstrategi på vei mot lavutslippssamfunnet', 7.

[154] Industri Energi, 'Lanserte plattform for en framtidsretta energi- og industripolitikk', Industri Energi, 2021, https://www.industrienergi.no/nyhet/lanserte-plattform-for-en-framtidsretta-energi-og-industripolitikk/.

[155] SV, 'SV - Arbeidsprogram'.

[156] MdG, 'Partiprogram Og Dybdeinformasjon'.

recommendation seconded by the Socialist Left.[157] The Liberals suggest to "increase the CO_2 tax on petroleum activities in parallel with incentives for energy efficiency measures and electrification, and consider reducing the state's holdings in the NCS and in Statoil [Equinor] in order to relocate parts of its assets in renewable and emission-free sectors".[158] The Centre, the Greens, the Socialist Left and the Liberals want to see the strengthening of the state-led renewable energy entity **Enova,** making it a key actor in the development of new renewable technologies, in particular offshore wind, in a manner similar to the historical role of Statoil. Finally, the Red Party is most clear about its plan for a "just environmental policy" and to use the **Sovereign Wealth Fund** for financing the transition: "New jobs are needed for those who currently work in the petroleum industry. That is why we want to focus on: establishing a **national industrial fund**, where a share of the Oil Fund is set aside to make strategic investments in domestic industrial production; establishing a **green infrastructure fund, where a share of the oil fund** is set aside to make necessary investments in the development of climate-friendly infrastructure such as railways, public transport, charging networks, ports and broadband throughout Norway".[159]

[157] SV, 'SV - Arbeidsprogram'.

[158] Venstre, 'Venstres politiske program 2021-2025, "Frihet og muligheter for alle"', Venstre, 2021, https://www.venstre.no/politikk/programarbeid/programkomite/.

[159] Rødt, 'Rettferdig miljøpolitikk', 2021, https://roedt.no/miljo?v=4AGjp7D9sDQgvQSQriezA7.

4. Conclusions and recommendations

A statement from the Christian Democratic party programme captures the major challenge for the Norwegian oil and gas transition and its socioeconomic complications: "The climate crisis demands that Norway be transformed into a zero-emission society by 2050. The restructuring will be demanding, but **Norway has good conditions to succeed in the green shift**. We have financial muscles, strong knowledge and technology environments, and good access to renewable energy. To achieve the goal of becoming a zero-emission society by 2050, we must create a low-emission economy with new, green jobs, we must transform the oil and gas nation into a renewable one, we must develop the world's most environment-friendly transport system and we must cut greenhouse gas emissions in all sectors".[160]

The 2021 general election created new opportunities for Norway's gradual transition in the oil and gas sector. However, change is **unlikely to be quick**. The new prime minister and leader of the Labour Party, Jonas Gahr Støre, said that while his government will oppose opening new areas for oil and gas exploration, "it is wise for Norway to continue exploring" in developed areas where infrastructure is already in place.[161]

It is important to note that a rapid **phase-out of Norwegian oil and gas production** over the coming decade or two is not a matter of transferring investments and workforce from one sector of the economy into others. **It is about transforming the entire Norwegian economy.** There are no previous comparable transformation processes and hardly any example of any country performing anything similar. At the same time, if Norway is not ready to face this challenge, which country would?

Norway has a key asset in the Sovereign Wealth Fund, which can be both a 'rainy-day' relief and a trans-generational public saving resource. The transfer of funds from the petroleum sector currently depends on the production level and the oil price. But the return on the investments will represent an increasing share of the fund's total value, and thus also on the basis for the annual transfer to the state budget. This will reduce the importance of the oil and gas sector for the government's fiscal policy, a significant consideration given that the Norwegian public sector represents about 50% of GNP.

A long-term strategy for the phasing out of oil and gas requires upfront investments in alternative activities. This means moving financial resources out of a well-known and highly profitable sector and into an unknown and most likely less profitable one. A gradual decline in investments in the oil and gas sector and a gradual increase in public support for new green(er) activities is more likely. Equinor's investment in offshore wind power is an attempt to utilise the existing know-how in a new and cleaner industry. The Norwegian government's financing of the first industrial CCS project, in the 2021 budget, is a step in the same direction. But **much attention and resources have to be directed into making these alternatives realistic, tangible and eventually available**.

As of 2021, the oil and gas sector represents 14% of GDP and 41% of Norwegian exports. A rapid removal of these resources would create a trade imbalance with significant macroeconomic effects on the exchange rate and thus on both monetary and fiscal policies. As the state income from the sector represents 10% of total revenues, every citizen in Norway would be affected, not only vulnerable groups.

Considering the information gathered in this report, **four possible transition pathways can be imagined for the Norwegian oil and gas sector.** Two are driven primarily by market forces and two by the state.

[160] KrF, 'Politisk program'.

[161] 'Ap sier nei til store leteoperasjoner på norsk sokkel', Nettavisen, 8 September, accessed 14 September, https://www.nettavisen.no/nyheter/ap-sier-nei-til-store-leteoperasjoner-pa-norsk-sokkel/s/12-95-3424176687

Four possible pathways for the transition

1. **Business as usual: let the market decide.** Norwegian oil and gas production will continue as long as there is demand for it. The government will continue to announce new exploration licences and approve companies' plans for the development and operation of new fields. The transition will be determined by the commercial decision of national and international oil companies to apply for new licences. If demand falls sharply, the oil price will collapse and the sector will face an unmitigated rapid decline.

2. **Market dynamics and government nudges.** The commercial decisions of oil and gas companies to apply for licences and develop new fields have always been affected by the tax regimes of petrostates. By increasing taxes, the government can reduce the number of fields that the companies consider commercially viable. For instance, Statoil decided to pull out of the Stockman field development due to Russia's tax levels.

3. **Politically planned phase-out: changes in licensing practices.** The key instrument in the governance of the activities on the Norwegian Continental Shelf is the award of oil and gas exploration licences. The government can, at any point in time, decide to stop announcing new licences. A softer approach would be stopping new licences in undeveloped areas (where costs are higher as development would require new infrastructure), while continuing in developed ones, or to stop licensing altogether

4. **Political expropriation: government intervention in existing production.** Any government has the legal ability to close factories if they are regarded as a hazard to human life. Theoretically this also applies to oil and gas fields. However, shutting down existing facilities on the Norwegian Continental Shelf will be an extremely complicated strategy to pursue politically, economically and legally.

These pathways cover the politically conceivable options available to Norwegian policy makers, although their likelihood, feasibility and implications differ greatly. None of the stakeholders, not even the new minority government, have enough leverage to singlehandedly steer Norway onto either of these paths. Many factors, including oil prices, international demand, global climate policy and reactions of other oil and gas producers, are also beyond the government control.

On this basis, **we encourage Norwegian stakeholders to consider the most resilient just transition scenarios with the ultimate goal of achieving climate neutrality by 2050, in line with the Paris Agreement.** Any serious discussion of an oil and gas phase-out in the Norwegian context must have a **long-term perspective** giving the country the possibility to prepare for the transformation and understanding that each pathway creates different challenges. Inaction and "business as usual" approaches only delay the problem and while they can be the easiest political solution in the short term, they are likely to backfire due to growing economic and social risks in the medium term, not to mention the negative climate impacts. On the other hand, the most radical pathway with an accelerated phase-out of oil and gas can lead to economic decline and a social crisis, unless mitigating steps are taken to safeguard social inclusion and economic activity.

It is recommended that Norwegian stakeholders strengthen cross-sectoral dialogue, developing visions for the long-term future of the oil and gas sector that are resilient and politically feasible. Some cross-sectoral stakeholder platforms have already been established. Example are **KonKraft**, which gathers the largest trade unions and the largest industry associations, and the **Climate Transition Committee**, which was set up by civil society organisations WWF, Civita and the Norwegian Climate Foundation and gathers politicians supportive of climate policies, local government representatives, finance experts and academics. The recommendations from these two groups are visibly divergent. But it is only through **a dialogue that involves both sides, rather than monologues,** that the future of the Norwegian oil and gas sector and a just transition towards net-zero emissions can be effectively planned and implemented. This dialogue requires to acknowledge that carbon neutrality by 2050 and the possibility of a partial or near-complete phase-out of fossil fuel production on the NCS, are needed, as well as the commitment to social justice and the sustainability of the welfare system. The Oil and Gas Transitions project "backcasting" and transnational learning exercise among North Sea partner countries aims to initiate this dialogue.

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