



# WHAT NOW?

## Balancing Act Norway's approach to oil and gas production and decarbonization goals

**Marla Orenstein** | Director, Natural Resources Centre

Marla Orenstein champions the responsible development of the West's natural resources for the benefit of all. Most of her work focuses on Canada's energy future and how Canadian business can prosper as the world transitions to cleaner forms of energy.

**Tyler Robinson** | Johnson Shoyama Policy Analyst

Tyler Robinson is enrolled in the Master of Public Administration program at Johnson Shoyama Graduate School. His studies have focused on applying innovation policy to natural resources and energy.

Like Canada, Norway is a major oil and gas exporter with almost half of the government's revenues coming from the sector. At the same time, Norway has very ambitious goals around industrial decarbonization and managing climate change. How is the country reconciling oil and gas production, economic prosperity and its low-carbon objectives? And where will the energy transition take the country in the future?

To answer these questions, CWF hosted a webinar with Norway's Ambassador to Canada, **Jon Elvedal Fredriksen** and **Asgeir Tomasgard**, Director of the Energy Transition Initiative at the Norwegian University of Science and Technology. They discussed Norway's challenges and successes, and the pathway that the country has laid out to succeed in the energy transition. This *What Now?* brief summarizes their key messages. We have supplemented some of their answers with additional information to provide context for Canadian readers.

# Some Key Takeaways

- 1** In Norway, oil and gas production and decarbonization are not seen as an either/or proposition. The government plans to continue responsible extraction of the resource while also facilitating the removal of emissions from the production process.
- 2** Decarbonization of industrial production is seen as a competitive strength for Norway – not just for oil and gas but for sectors such as green marine shipping.
- 3** Norway has targets to reduce emissions across the economy by about 50% by the year 2050 compared with the base year of 2005. This applies equally to all sectors.
- 4** Emissions reductions are incentivized by both carbon taxes and direct subsidies, including two-thirds of the cost of carbon capture projects such as Northern Lights – the first open-source carbon capture project in Europe, which will come online in 2024.
- 5** Domestically, almost 100% of Norway’s electricity is provided by hydropower, which means that electrification can run off a decarbonized grid. Offshore wind may in future help the petroleum sector to further reduce its own emissions.
- 6** Norway is experiencing rising electricity costs like the rest of Europe because Norwegian and European electricity transmission and markets are integrated. But because the sector is publicly owned, higher revenues support subsidies to users.
- 7** Norway’s immediate oil and gas production capacity is pretty much maxed out, so the country is unable to substantially increase exports to Europe during this difficult time. However, there is some consideration of additional exploration and development for natural gas.



**Jon Elvedal Fredriksen** is Norway’s Ambassador to Canada. He has previously held the roles of diplomatic advisor to the Prime Minister of Norway, Norway’s Ambassador to Ukraine and Consul General of Norway in Murmansk, Russia; and he has also worked with the Norwegian Ministry of Trade.



**Asgeir Tomasgard** is a Professor in Managerial Economics and Optimisation at the Norwegian University of Science and Technology (NTNU) and the Director of the NTNU Energy Transition Initiative. His research focuses on energy transition strategies and on energy policy.

# Balancing Act

## Key Messages

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### What is the historical importance of Norway's oil and gas sector to the country?

**(3:30)**

Over the last 50 years, oil and gas production has transformed Norway. The industry has been the economic backbone of the country, with oil and gas representing almost two-thirds of all exports from the country and responsible for a third of the GDP and almost 50% of government revenues. It has generated employment opportunities and provides Norway with the wealth that supports strong social services, benefitting the entire population. In addition, investment income from the country's \$1.5 trillion sovereign wealth fund – built from petroleum revenues – supplies 20% of the government budget each year.

### Have targets been set by government for reducing emissions from energy production?

**(8:08)**

Norway has set goals to lower emissions throughout the entire economy by 50-60% by 2030 and to become a net-zero society by 2050. The power sector is essentially emissions free, as almost all electricity produced in Norway comes from hydropower. Much of the responsibility to decarbonize therefore rests on the petroleum sector, which emits a quarter of total emissions in the country.

*Authors' note: The targets for the oil and gas sector are the same as the rest of society: a decrease in emissions of around 50% by 2030 compared with 2005. So far, modest progress has been made. Total emissions from the sector were 12.0 MT CO<sub>2</sub>e in 2021, compared with 13.5 in 2005 – a decrease of about 11%, but down 22% from the industry's peak of 15.3 MT in 2008.*

### What approach is being taken to meet emissions reduction targets for the sector? Sticks or carrots?

**(9:12)**

There are no policies that will attempt to abruptly end oil and gas extraction. Efforts instead focus on removing emissions from the extraction process.

Both regulations and incentives are being used. Carbon pricing is well established in Norway, having been implemented in 1991, and as a result is not as contested as it has been in Canada. Taxation on the petroleum industry is high – around 78%. There are also multiple government programs to incentivize and assist in the research and creation of projects in carbon capture, hydrogen production and renewable energy.

*Authors' note: Among other incentives, the government has introduced temporary amendments (like allowing accelerated depreciation) that will give petroleum companies greater liquidity, which the government expects the companies to plow back into projects designed to reduce emissions.*

### How has the oil and gas sector responded?

**(12:41)**

The industry has begun to change from using gas to generate power at its offshore installations to using electrical power provided by the onshore power grid. Future efforts could use electricity produced by offshore wind, which would leverage energy located on the Norwegian shelf itself. Carbon capture and storage is also a focus. The petroleum sector has also begun diversifying its energy offerings, supplementing petroleum production with renewables, for example.

*Authors' note: The Northern Lights CCS project is an "open source" carbon capture and storage network being developed in partnership among Equinor, Shell, Total and the Norwegian government. It will come online in 2024.*



The **time stamp** after each question refers to when in the webinar the topic is discussed.



If you'd like to watch the full webinar, you can find it [here](#).

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## **Equinor (Norway’s largest energy producer) is state owned. How much of a difference has that made in terms of getting the energy sector on board with meeting targets?**

**(14:33)**

Equinor is partially state owned with 67% belonging to the Norwegian government. Since Equinor is also a very large actor on the Norwegian shelf it helps set the standard for how the entire industry proceeds. Equinor’s mandate is to generate profit (which produces income for the government through taxes, royalties and dividends), but they also understand the political signals and work with the government and other parts of the Norwegian economy.

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## **Some people argue that the costs of decarbonization will make Canadian oil and gas uncompetitive. Are these arguments also being made in Norway?**

**(16:17)**

In Norway, the general impression is that decarbonization is a positive for the industry. Carbon prices will continue to rise, and creating a lower-emissions product will establish Norwegian petroleum products as a leader and provide competitive advantages.

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## **What is the future of oil and gas in Norway?**

As mentioned above, the government’s plan is not to abruptly end oil and gas extraction, but to continue responsible extraction of oil and gas while also facilitating the removal of emissions from the production process. It’s the job of oil and gas companies to demonstrate that the production process itself is as clean as it can be.

*Authors’ note: Norway’s Climate Action Plan sends clear signals of this intention: “The overall objective of Norway’s petroleum policy is to provide a framework for profitable long-term production of oil and gas. The Government’s climate policy is designed to ensure that it pays to develop and deploy technologies and solutions that reduce greenhouse gas emissions.”*

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## **Turning to the energy transition more broadly – what strengths is Norway building on?**

**(18:19)**

The success of the energy transition in Norway rests on several foundations. One is that our electricity production is already close to 100% renewable. While our climate can be frigid, our electrical heating system is almost completely powered by low emissions hydropower.

A second is the attitude of government: that we should use policy not only to encourage but to actively make it as easy as possible for society to become carbon neutral. The government has created a range of agencies – such as ENOVA and Innovation Norway – to support small and medium businesses and communities to become more energy efficient or to develop new projects that reduce emissions.

And going back 10 years, the Norwegian government, industry and universities collaborated to develop 11 centres focused on environmentally friendly energy initiatives such as solar, wind, CCUS, and bioenergy. This was an important step to take at that time, because it started to address the question of how you get people, technologies and systems (like the energy system and the transport system) to interact in a way that makes it possible to decarbonize while also maintaining quality of life and services. These questions are about more than just energy, and also focus on new industrial processes, how urban environments are designed, how transport is used, and how the energy system can help with these transitions.

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## **What are some of the challenge areas?**

**(26:09)**

The main challenge is that carbon reduction now must come from sectors where decarbonization is more difficult, like the shipping and transport industries. There is a potential upside in that if solutions are found, it leaves Norway poised to become a global leader in carbon abatement strategies in these sectors.

An example of where industrial decarbonization has shown promise as an economic advantage has been in marine shipping (Norway is the fourth largest shipping nation). Norway is pioneering green shipping, utilizing

ammonia and hydrogen powered vessels to reduce the sector's reliance on fossil fuels. It is generating new research into how to decarbonize the marine shipping sector, while also creating new infrastructure – an example of turning decarbonization into an opportunity for growth.

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## **Can you tell me about hydrogen? How will Norway increase production, use and infrastructure?**

**(28:31)**

Norway's goal is to create a full value chain for blue and green hydrogen to help feed Europe's growing demand – the EU wants to import 10 million tonnes. Norway has a long history of hydrogen production through electrolysis in the fertilizer industry. Natural gas and CO<sub>2</sub> infrastructure is also in place to enable the creation of blue hydrogen with carbon capture.

There are challenges involved with establishing a complete value chain, with both supply and demand needing to ramp up. Concerns are also present over the resources required to make hydrogen, as both clean electricity and natural gas are required to produce it, and both are scarce. In the long term it is likely that additional sources of natural gas and renewable energy will be required to create hydrogen in a way that allows Norway to meet the import demands of the EU.

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## **Does Norway have plans for nuclear energy in the future?**

**(32:10)**

Building nuclear energy facilities is not on the agenda for Norway. Traditional nuclear reactors take too long to build, are too expensive and the public perception of nuclear energy in the country is not positive. Some companies have expressed interest in building small modular reactors, but the Minister of Oil and Energy has stated that they are not currently relevant for Norway.



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## **Is Norway becoming a larger producer and refiner of critical materials? Is that part of the country's energy transition?**

**(35:34)**

Research and development of the mining industry absolutely needs to be a priority focus, as more mining projects will be required in the future. Norway is also considering deep seabed mining. We also understand that circular economy and the recirculation of critical resources is a key element to make production more sustainable in the future. It would be a positive to see cooperation between Canada and Norway on mining issues, as both have access to critical minerals and would prefer to source these materials from friends and allies.

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## **We've heard a lot about the energy plight of Germany; are Norwegian households also facing an energy availability crisis? Or are Norwegians shielded since the country is an energy producer?**

**(42:29)**

Many people in Norway were taken aback by how the energy crisis has affected us. The population knows that we have an abundance of hydropower and many people assumed we would not be affected; that we will use what we need for ourselves and then give the leftovers to others who require help. But this is not how it works in practice. We are part of the European energy market, and our energy is therefore exported to that market. And this means energy prices have also increased for households and other users in Norway.

However, because hydropower is state-owned and the increase in prices has meant additional revenue, we have been able to assist by directly subsidizing energy costs in households, up to 90% of bills over a given "normal" in some regions. There has been some discussion around whether there would need to be energy rationing or prioritizing, but regulators and system operators say that this is unlikely to be required.

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## Has the war in Ukraine and the corresponding energy crisis changed Norway's approach to oil and gas?

[\(47:45\)](#)

On the policy side nothing significant has changed in terms of decarbonization. If anything, it tells us that we need to work more intensely on the green transition and building more renewable energy sources. From the EU side, there is a strong need for long-term contracts on natural gas and they are looking to Norway as a preferred provider of that natural gas.

This has generated interest around possible additional exploration for natural gas, as oil and gas production is already at a practical maximum capacity, and while some minor adjustments can be made, production can not yet be significantly increased.

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## Does Norway face internal polarization around the energy transition?

[\(50:57\)](#)

Norway has not faced polarization to the same extent as Canada. How to build future energy production is viewed more as a problem for government rather than a point of conflict between different regions in the country. There are differences of opinion between the political parties as to how quickly renewable energy sources should be pursued and how much should be done to stop or adapt to climate change; but there is less debate over the production of oil and gas, as all parties understand that it would be difficult for Europe to continue without Norway's production of natural gas.

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## How can Canada and Norway work together to promote smart, low-cost energy transition that has global impact?

[\(57:08\)](#)

We need combined global effort on the technologies that support the energy transition, such as carbon capture, building hydrogen value chains, or turning offshore wind into a scalable industrial solution. This kind of cooperation can happen either through business-to-business partnerships or via governments supporting opportunities like industrial missions. The only way to succeed is global cooperation in resource and industrial scale-up, and Norway and Canada should be in a very good position to cooperate – and it will leave both countries with a highly valuable knowledge export product.

Canada was also included in [Norway's Panorama Strategy](#) to facilitate cooperation with non-EU countries in education and research. Specifically, areas like the maritime clusters with green transition marine technology provide ample opportunity for collaboration.

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