How tax support for the petroleum industry could contradict Norway’s climate goals

For the past four decades, Norway has built a large portion of its economy on oil and gas production. The oil and gas sector now accounts for one-fifth of Norway’s GDP, and has enabled the country to build the world’s largest sovereign wealth fund.¹

That fund is possible through petroleum revenues, aided by the government’s shared ownership with industry of oil and gas fields, as well as a tax structure that rewards exploration in exchange for a greater State interest in profits.² Today, Norway is the top oil and gas producer in Europe, producing about 2% of the world’s supply.³

But Norway’s partnership with the petroleum industry is now a subject of debate. The country has positioned itself as a leader on climate change and greenhouse gas emissions, while at the same time issuing a record number of new leases for offshore oil and gas production, leading some to accuse the government of hypocrisy.⁴

Norway has adopted an ambitious commitment to reduce its own emissions to 40% below 1990 levels by 2030, and to become a “low emission society” by 2050.⁵ It has also committed to the Paris Agreement and its long-term targets to stabilize warming at levels “well below” 2 degrees Celsius and to achieve net zero emissions by the second half of the century.⁶

Despite these intentions, many government leaders have seen no contradiction in continued production and new development in oil and gas. They have argued that Norway should maintain its role as a major fossil fuel producer and exporter and maximize revenues from Norway’s limited resource.⁷,⁸ Currently, Norway ships 10 times the carbon dioxide emissions in the fossil fuels it exports than it emits from fossil fuel use within the country.⁹

This discussion brief aims to inform this debate, by looking at how parts of the Norwegian tax code support future oil and gas development. We look at two tax support measures – fast depreciation and uplift – that the government only offers to petroleum producers, in part to overcome the dampening effect of the special petroleum tax of 54%. In 2015, Norway’s Green Tax Commission recommended that fast depreciation and uplift be removed, as they affect activity in the petroleum sector and lead to environmental harm.¹⁰

Our findings support that assertion: we show that these measures will boost future oil and gas production in Norway, thus increasing the country’s fossil fuel exports and the world’s CO₂ emissions.

Development on the horizon

Our investigation focuses on petroleum fields that already have licenses from the Norwegian Petroleum Directorate but are not yet producing oil and gas. Because these fields are not yet developed, they are especially relevant for policies – like the tax measures considered here – that focus on new

By the numbers: Oil and gas tax support in Norway

At USD 50 per barrel, fast depreciation and uplift tax supports would:

- Spur 8 billion more barrels of oil and gas than would otherwise be produced
- Result in 2.9 billion metric tonnes (Gt) CO₂ from the additional oil and gas
- Trigger 95% of future oil investment (which would not occur without these measures)

The Finnmaren ferry in Svolvaer in the Lofoten Islands. Traditionally a fishing region, the Lofoten area is the subject of increasing interest in oil drilling.
investment and development. Furthermore, eventual oil and gas production from these licenses will represent a dominant portion of Norway’s oil production in the future – perhaps as soon as the mid-2020s, if oil prices rebound (Figure 1). (Prospects for new gas production are more muted).

Norway is in the middle of a debate about how to approach new petroleum development. Some in civil society have argued that, due to climate change concerns, government tax support should instead go to different (non-fossil) uses\(^2\) and that the issuance of new licenses should be constrained or perhaps stopped entirely.\(^9,13,14\)

Our prior research has found that many of these new fields would require oil prices much higher than currently forecast to meet common benchmarks of investor return.\(^5\) We found this to be especially true for fields in the Barents Sea, where Statoil’s recent failure to find oil in the highly touted Korpfell field illustrates the risk that new fields may not be economic.\(^16\) Furthermore, the high oil prices needed to make the Barents Sea economic may never materialize, especially if the world continues to pursue an energy system consistent with a 2-degree limit on warming.\(^17\)

Others have argued that Norway’s oil can actually be produced for a much lower cost than common assumptions about risk and reward would indicate.\(^18\) In that view – advanced by Statoil, the majority government-owned oil company – it may be that Norway should “invest quickly” before climate constraints become binding.\(^19\)

Government leaders can better evaluate these claims if they have a greater understanding of how Norway’s tax system affects the economics of the country’s oil and gas development. Such knowledge can also help government leaders consider whether the level of support offered is consistent with other goals, such as climate change mitigation. Our analysis therefore offers a detailed, if partial, analysis of how the Norwegian State shares the risks, costs, and revenues associated with oil and gas development.

**The Norwegian petroleum tax system**

Observers from across the political spectrum have articulated how the tax system in Norway provides more support to the petroleum industry than is necessary.\(^20–22\) Several tax provisions are specific to the petroleum industry, and combine to create a system that transfers risk from petroleum investors to the government, while increasing the confidence in (and magnitude of) economic returns to those investors. This system also helps maximize returns to the State, since it increases overall production levels. In exchange for the risk reduction and up-front support to exploration and capital investment in field development, the Government retains a substantial portion of the revenues through a special petroleum tax (SPT) of 54%, in addition to the normal corporate income tax rate of 24%.\(^2\)

From that perspective, the system of support for petroleum investment in Norway benefits both industry and the government tax base. However, by using the tax system to steer investment to the petroleum sector, the government could be under-investing in other sectors. The investment in the petroleum sector also could present a conflict with Norway’s goal of a “low emissions society”, if doing so increases fossil fuel production and global carbon dioxide (CO\(_2\)) emissions. (There is also the possibility, noted by Norway’s Expert Committee for Green Competitiveness, that investments in some fields could become “stranded” in the coming decades under a global low-carbon transition, as lower than expected fossil fuel prices cause the fields to earn less than the expected economic returns.\(^23,24\))

To explore the connection between Norway’s petroleum tax system and CO\(_2\) emissions, we analyse two tax provisions that are unique and differ from tax treatment for industries on the mainland.\(^25\) These are: (1) fast depreciation, or raske avskrivninger, where firms may deduct their capital investment expenses over six years instead of over a longer period;\(^4\) and (2) “uplift”, or friinntekten (literally, “free income”), in which firms may further deduct 5.4% of capital investment costs from taxable income in four successive years.

For all scenarios, we conduct the analysis from the perspective of an investor considering whether to deploy capital in an oil or gas field in Norway. We look specifically at how tax support would affect expected investor returns and,

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\(^{a}\) For non-petroleum sectors, Norway’s tax code allows assets to be depreciated at different rates, depending on function. Here, we assume a standard depreciation rate for the asset classes for ships, rigs, buildings and facilities. Based on prior work by Aarnes and Lindgren,\(^26\) we assume the rate averages 10% annually on a “declining balance” basis, i.e. the 10% is applied to the depreciated value after the prior years’ deductions, not to the original value (which would instead be a “straight line” method).
therefore, the decision to move forward with a new field. We assess these investor returns using a typical investment metric: the internal rate of return (IRR), using the same approach as in our recent work in the United States, and relying in part on field-level data from Oslo-based oil industry consultant Rystad Energy. For all investments, we calculate the IRR from the decision point – the year of first investment in production infrastructure.\( \text{b} \)

**Areas of future petroleum development**

The Norwegian government licenses fields in three areas: the North Sea, the Norwegian Sea, and the Barents Sea (Figure 2). Historically, most oil and gas production – or more than 85% – has come from the North Sea. Though it remains the dominant area, production there peaked in the mid-1990s, just as production in the Norwegian Sea was beginning. Since that time, new exploration activity has moved steadily northward, with production just recently beginning in the Goliat field of the Barents Sea.

These three provinces have a combined economic oil resource (including not-yet-discovered quantities) of over 25 billion barrels of oil and 23 billion barrels (on an oil-equivalent basis) of gas. The North Sea is still expected to be the dominant resource (Figure 1), in part due to the new, very large Johan Sverdrup field. In our analysis, we examine all oil and gas fields and prospects in these provinces that are licensed and not yet producing. That totals more than 700 fields: about 400 in the North Sea (including Johan Sverdrup), 200 in the Norwegian Sea, and 100 in the Barents Sea.

We do not consider fields that are already producing (as of mid-2017) in any of the seas, because the decision to explore and develop these fields has already occurred, and is no longer subject to the influence of tax policy. Tax policy may continue to affect oil or gas production from these areas, to the extent that further investment is needed to extract the remaining, diminished resources. Still, we assume this effect is small compared to the effect of bringing new investments online. (We also do not consider potential petroleum plays in areas that are not yet licensed, as few data on potential production and economics are available for those areas.)

**Fast depreciation and uplift strongly increase investor returns**

We conduct our field-by-field analysis using Rystad’s detailed economic and production data. Rystad estimates capital investment, operating costs, taxes, and production profiles for each oil field in Norway (and globally) based on a combination of public (e.g. licensing documents) and private (industry-provided) sources. Using these cash flow estimates as a starting point, we modify the appropriate portion of cash flow to isolate the effect of both fast depreciation and uplift, evaluating each against a case where these measures are not in place. We then analyse whether these two tax measures tip a project from being uneconomic to economic, assuming that this threshold is crossed at a 10% nominal internal rate of return (IRR), a “hurdle rate” commonly used in industry. (There is an active debate in Norway between government and industry about the appropriate hurdle rate to use; as a result, we also display results using a 6% nominal hurdle rate, following a recent analysis by two Norwegian economists.)

How the Norwegian tax code affects petroleum sector investment also depends on what oil and gas prices investors are expecting. At the time of this analysis (summer 2017), oil prices were about USD 50 per barrel (Brent blend) and natural gas prices were about NOK 1.5 /Sm³ (equivalent to between USD 6 and USD 7 per thousand cubic feet). However, oil prices could rise again in the future. Other analysts have determined that the Norwegian Petroleum Directorate, for example, recently used an oil price outlook of USD 70 per barrel in its own planning. Accordingly, we present detailed results at both USD 50 and USD 70 per barrel of oil.

We find that most of the new, licensed fields in Norway would not be developed without the fast depreciation and uplift measures. At USD 50 per barrel – and without these tax supports – very few of these fields (small grey dots in Figure 3a) would exceed a 10% hurdle rate and therefore proceed with investment. By contrast, with the tax support measures in place, the same fields get a bump of 9 percentage points or more to their internal rate of return (IRR). Collectively, that is enough to boost production by 8 billion barrels of oil and gas; without the tax supports, those barrels would not be economic. Across all fields, the bump in IRR averages 9 percentage points on a production-weighted basis: 5 points from fast depreciation and 4 points from uplift.

At USD 70 per barrel, many more fields are economic, even without fast depreciation and uplift. As shown in Figure 3b, fields containing nearly 6 billion barrels of oil and gas would proceed even without these measures. With fast depreciation and uplift in place, more than 12 billion barrels of oil would be economic assuming a 10% hurdle rate.
Table 1 shows the cumulative effect of this bump in project IRR across the more than 700 fields assessed at both the USD 50/bbl and USD 70/bbl levels.

As indicated, at USD 50 per barrel, we estimate that 95% of new oil investment would not occur if not for the fast depreciation and uplift tax measures. At USD 70 per barrel, 54% of investment depends on these measures. (At higher prices, not displayed here, we find that the economics of fields improve and dependence on these measures declines gradually, such that at USD 100 per barrel, 40% of fields are dependent on fast depreciation and uplift.)

These findings show the strong connection between State tax policy and investor behaviour. By providing fast depreciation and uplift, the State is effectively bringing at least 6 billion barrels of oil and gas into profitability (at USD 70 per barrel; higher amounts at lower prices). This is partly by design, since the government implemented these measures to help counteract the effect of the special petroleum tax. At the same time, this oil and gas, once burned, will amount to at least 2.3 billion metric tonnes (Gt) CO₂.

**Is Norway’s tax system suited to addressing climate risk?**

Our findings show how two specific tax support measures increase oil and gas production in Norway. Because of this added production, these measures are increasing Norway’s future oil and gas exports and, by extension, the world’s CO₂ emissions.

Throughout the summer of 2017, Norway’s election campaigns helped start a new debate about tax policy, one that is likely to intensify now that the September elections are com-

**Table 1: Effect of tax support on new petroleum resources and CO₂ emissions at USD 50/bbl and USD 70/bbl.**

<table>
<thead>
<tr>
<th>Province</th>
<th>Economic petroleum resources, licensed but not yet producing (billion barrels oil-equivalent)</th>
<th>Percent dependent on fast depreciation and uplift</th>
<th>Increase in petroleum resources due to fast depreciation and uplift (billion barrels)</th>
<th>Increase in petroleum resources due to fast depreciation and uplift (Gt CO₂)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Sea</td>
<td>5.3 / 6.9</td>
<td>97% / 43%</td>
<td>5.1 / 2.9</td>
<td>1.9 / 1.1</td>
</tr>
<tr>
<td>Norwegian Sea</td>
<td>1.1 / 1.6</td>
<td>76% / 46%</td>
<td>0.9 / 0.7</td>
<td>0.3 / 0.2</td>
</tr>
<tr>
<td>Barents Sea</td>
<td>1.8 / 3.4</td>
<td>100% / 81%</td>
<td>1.8 / 2.7</td>
<td>0.6 / 1</td>
</tr>
<tr>
<td>Total Norway</td>
<td>8.3 / 11.9</td>
<td>95% / 54%</td>
<td>7.8 / 6.4</td>
<td>2.9 / 2.3</td>
</tr>
</tbody>
</table>

Source: SEI Analysis
complete. Our research here shows the investment and climate consequences of two important measures in Norway’s tax code. Policy-makers will need to carefully consider whether to adjust these measures.

In the past, the fast depreciation and uplift measures provided a boost to investment that the industry and Ministry of Finance believe moved the tax system towards something approaching “neutrality”—the stated aim of the Ministry—in which the petroleum tax system neither encourages nor discourages investment in any particular project.2,33

In practice, however, neutrality is difficult to ensure or know with confidence, as there is an inherent information asymmetry34 between actors in the oil industry and in the Norwegian government. Investors always have more and better information about their costs and potential revenues than does the Norwegian State.

To that end, our analysis offers an important new piece of evidence in how Norway could re-evaluate its tax code. Two measures—fast depreciation and uplift—are increasing investment in the petroleum sector. Exactly how far these measures go beyond “neutral” is partly a matter of perspective, and one we cannot fully evaluate here. For example, some have argued that some amount of uplift—though smaller than the current amount—is justified.26,29

Nonetheless, our analytical approach offers one path forward for conducting a deeper, transparent analysis. For example, the Ministry of Finance could use a similar approach, relying on a third-party source of data to evaluate how different tax systems would affect each new investment. A detailed and thorough look at neutrality would also require other considerations, such as possible variations in the level of the special petroleum tax and the hurdle rate against which to assess investment decisions. Furthermore, changes in the tax system also have other, indirect effects, such as affecting investor confidence if the tax regime appears less stable.35

However, Norway’s commitment to a “low emissions society” and to the Paris Agreement suggest that a regulatory system that is neutral and stable for the petroleum industry may no longer be the most appropriate goal. Norway could instead use its partnership with the petroleum industry to begin serious considerations of a fossil fuel phase-out by mid-century, consistent with Paris goals. In that light, Norway could wind down these two tax support measures as part of a revised tax system that is even stronger in the long term: one that is determined and predictable in its aim to avoid climate risks and stranded assets by clearly and carefully articulating a path to a deeply low-carbon economy.

Endnotes