Electrification of oil and gas operations in Norway

By Lars Marius Stømbe..

Electrification means replacing fossil-based power supply with renewable energy by Norway's mostly state owned energy company Equinor, enabling a reduction in greenhouse gas emissions from the production of oil.

But, is it a true environmental effort?

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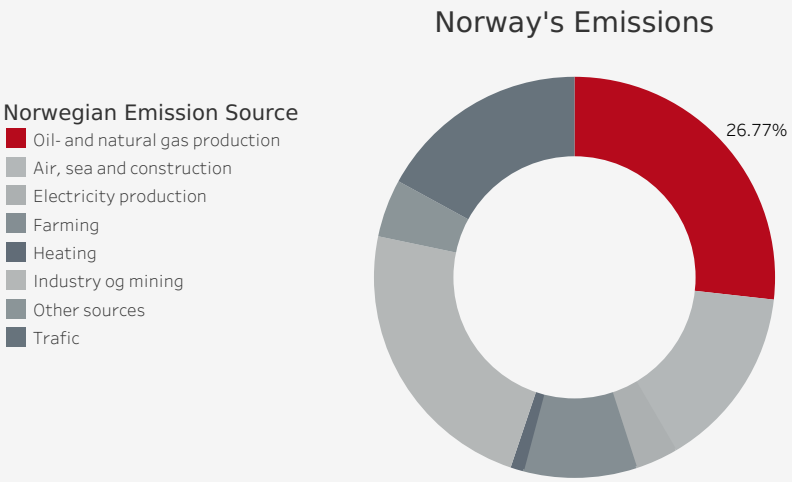
Norway's Emissions

Norway’s Largest source of CO2 emissions is its oil production.
This accounts for almost 27% of total emissions. Norway is generally seen as a leader in environmental efforts with 100% of electricity production coming from renewable energy sources, and more than 70% of new car sales being fully electric cars.



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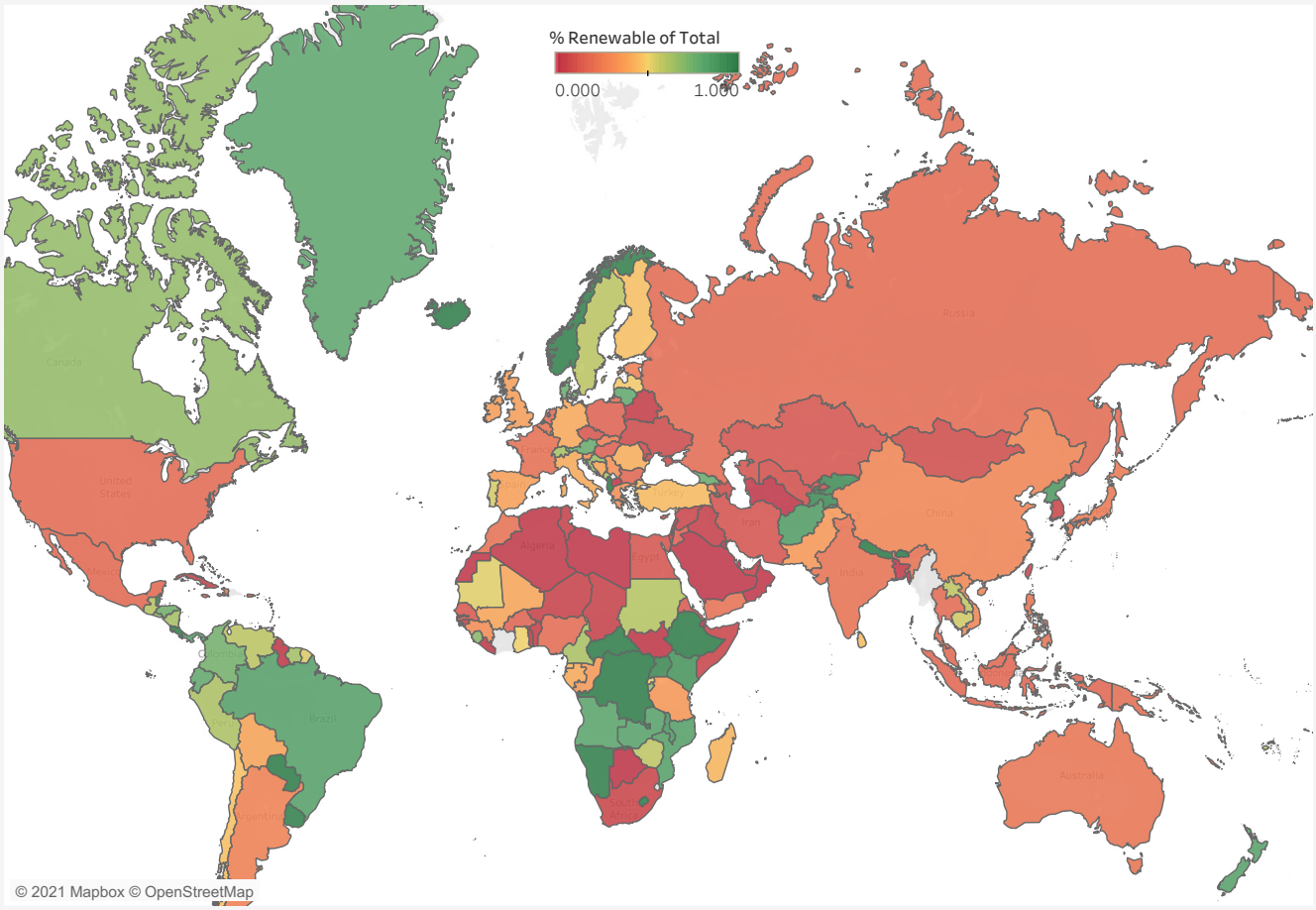
World Energy Consumption by Renewable Share

Norway stands out amongst industrialized nations due to its hydroelectric power supply



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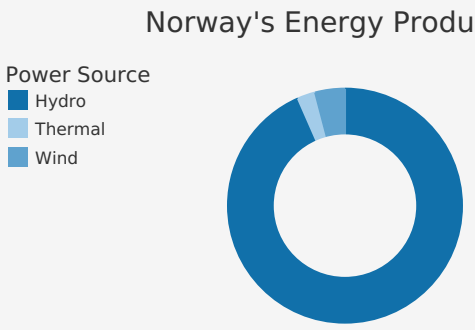
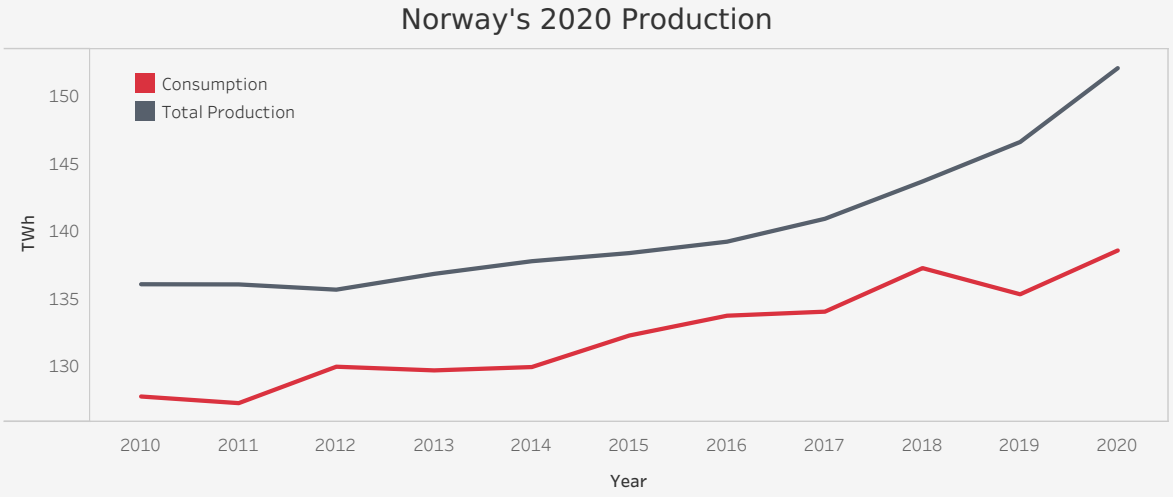
Norway's Energy Production



Norway

Norway has historically only produced electricity from renewable sources.
As a mountainous large country with a low population density hydroelectric power has been the main source of electricity in the country.
Norway has on average had stable higher production than consumption, allowing for either export or storage of excess energy. This renewable energy is what Equinor is looking to take advantage of.



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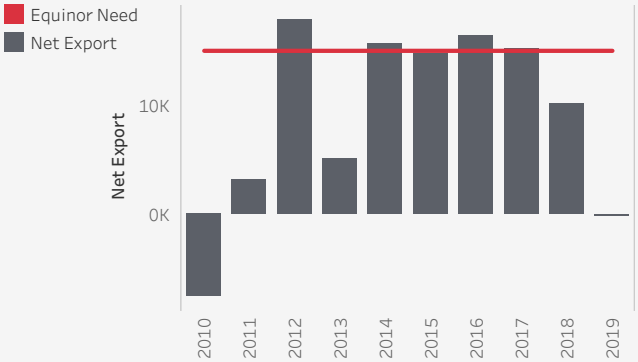
Equinor's Net Need & Norway's Production

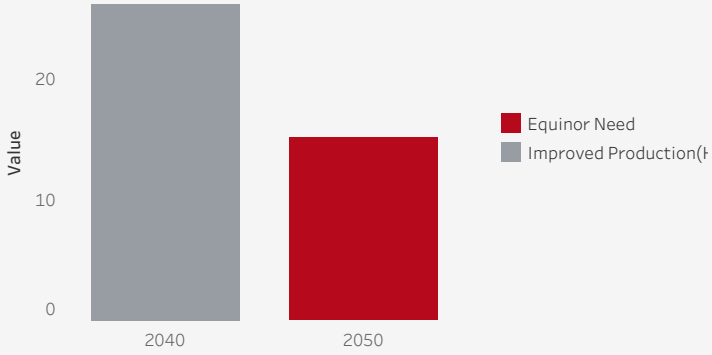


Electricity Export and Equinor's Need

Equinor and Norway will have to increase electricity production to cover the enormous needs of the oil industry. While Equinor does not provide data for the exact amount of electricity required. Estimates and requests to the power grid sets the requirement to **15 TWh a year**. This does not include electricity produced by Equinor's own planned offshore windmills. In essence this extra electricity need would have basically eliminated Norwegian electricity export the last ten years.

Equinor's Electricity Need and Norway's Future Production Increase

Equinor's need is more than **10% of Norway's current energy production**. But luckily Norway is estimating an increase in its production by **26 TWh by 2040.**



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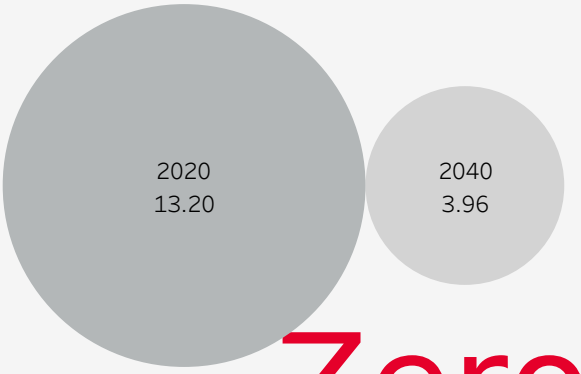
Equinor's Emissions



Zero

Emission by 2050

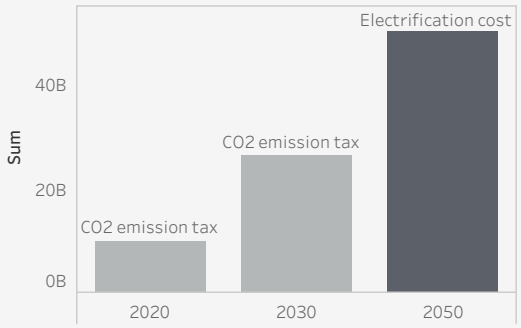
Equinor Emissions From Norway

Equinor aims to reduce its emissions in Norway to **zero by 2050**. This can only be done by electrification of the offshore platforms, as all other operations in Norway already use renewable energy.

Equinor Financials

While the estimated cost until completion in 2050 for Equinor is equal to **50 billion NOK**. This is a relatively low cost compared to the potential savings, as they already pay **9.9 billion NOK** a year in CO2 quotas for the emissions this project is removing. Norway is also planning an increase in CO2 quota prices of 150 % by 2030.

Emission Fees and Project Cost



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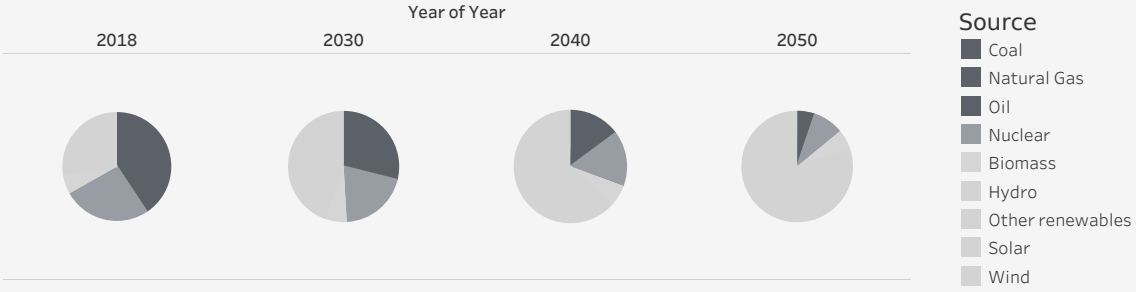
EU Impact

It is important to note that the power grid in Europe is connected. And Norway is directly exporting electricity to these nations. While they in turn export or import from the rest of the EU. As renewable production of electricity is less expensive than fossil fuels. EU countries will rather import than use their own fossil fuel production. As a result, any export of electricity reduces emissions in other countries

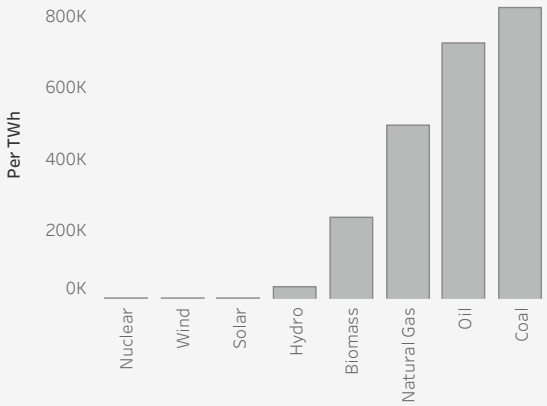
Norway and its Directly Connected Countries

EU Source of Electricity



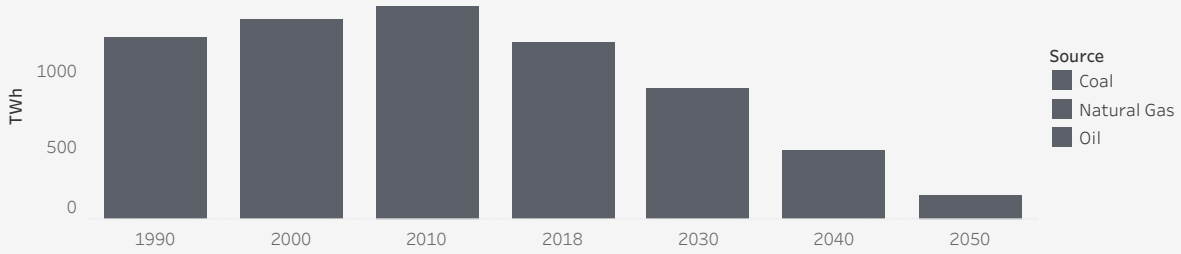
EU Energy Production

Emission per TWh by Energy Source



The current EU Production is heavily reliant on fossil fuel for electricity production, and Equinor's own estimates for EU's electricity production includes using natural gas and coal until 2050. EU prefers using natural gas for energy production over coal and oil. But is currently limited by the availability of natural gas in the world. Norway supplies 22 % of EU's total natural gas demand, and is EU's preferred supplier due to the instability of other sources.

EU Fossil Fuel Use In Electricity Production



EU CO2 Emissions Impact

1. Norway will see a reduction in CO2 emissions and Equinor will see improved financial performance.

2. But the electricity going to the oil platforms could have gone to the EU reducing the EU's use of fossil fuels. The EU will receive a large part of the natural gas not used on the oil platforms this will be used for electricity production in essence simply moving the emission out of Norway into the EU.

3. This is best case, as all the natural gas will not be utilized, not all oil platforms can export the natural gas. As this is the case the EU might have to use coal or oil to produce the electricity that could have been imported from Norway, effectively increasing worldwide CO2 emissions.

While something might make economical and, on the surface, environmental sense. We live in a connected world. And any actions that is made with the environment in mind should include a worldwide view. Equinor and Norway is acting in a negative way to improve its own figures, disregarding global impact. We are all connected and in Europe, even our electrical grid is.

Recommendation:
Norway and Equinor should stop the electrification of oil and gas operations, while still increasing the electricity production from renewable sources.

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