Oslo energy storage market analysis

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Norway has set ambitious targets for reducing greenhouse gas (GHG) emissions and establishing a low emissions society by 2050. As an energy-rich country, Norway is in a unique starting position with respect to the energy transition. An abundance of affordable hydropower has enabled the development of energy-intensive industries and a high level of electrification of homes and businesses with limited GHG emissions. At the same time, as a major oil and gas producer and exporter, Norway will need to support an evolution of its energy sector amid a global energy transition.

Thanks to its ample reserves of oil and natural gas, Norway is a net energy exporter: in2020, 87% of its energy production was exported. From a global perspective, Norway is the seventh-largest natural gas producer in the world, supplying 3% of global gas consumption. Norway is also a significant oil producer, accounting for 2.3% of global oil production in 2020. As a reputable and reliable producer, Norway has played a stabilising role in the world"s oil and gas supply, particularly in meeting European demand.

In addition, its extensive hydropower resources covered 92% of electricity generation, supporting an almost completely renewables-based power sector. Moreover, Norway"s energy demand is highly electrified: in 2020, electricity covered almost half of the country"s total final consumption (TFC), the highest share among IEA member countries. Norway has tremendous potential to further leverage its clean electricity system to decarbonise other sectors of the economy through additional electrification.

Nonetheless, to meet its ambitious target of being a low emissions society by 2050, Norway has considerable work ahead, especially since electricity generation is already zero emissions and the country already has substantial electrification of the buildings sector and almost half of industry, thereby also achieving low emissions in these sectors. As a result, many of the easy wins for reducing emissions have already been achieved and the remaining emissions reductions will be more complex, challenging and costly, notably in transport and industry.

Norway has, through its enhanced nationally determined contribution (NDC) under the Paris Agreement, committed to reduce emissions by at least 50% and towards 55% by2030 compared to 1990 levels. In June 2017, the Norwegian parliament adopted the Climate Change Act, which establishes by law Norway"s NDC target as well as the target of becoming a low emissions society by 2050. The target is equivalent to reducing emissions by around 90-95% from 1990 levels.

The polluter-pays principle is a cornerstone of the Norwegian policy framework on climate change. Norway was one of the first countries in the world to put in place a carbon tax, in1991, covering the combustion of fossil fuels and the petroleum sector. Today, approximately 85% of domestic GHG emissions are either covered by the EU ETS or subject to a CO2 tax (or other GHG taxes), or both. The national CO2 tax is currently around 766Norwegian krone per tonne of CO2 equivalent (NOK/tCO2-eq) (76EUR/t CO2-eq) for

emissions outside the EU ETS.

The main policy instruments in the Climate Action Plan are GHG taxation, regulatory measures, climate-related requirements in public procurement processes, information for the public on climate-friendly options, financial support for the development of new technologies, and initiatives to promote research and innovation. The white paper announced a gradual increase in the national carbon tax rate to 2000NOK/tCO2-eq (196EUR/tCO2-eq) in 2030, which would be one of the highest levels in the OECD.

CO2 pricing levels are robust from an international perspective and can drive meaningful emissions reductions in relevant sectors. However, even such a high carbon price is unlikely to achieve the level of emissions reductions needed to meet Norway"s climate targets. The government would benefit from more detailed projections of the levels of carbon prices needed to motivate technological shifts to cut emissions, and consider supplementary incentives and support for sectors that may need them.

As in all countries, energy efficiency has an important role to play in Norway. In the past decade, economic growth has been decoupled from energy consumption. The government has set a target to lower the overall energy intensity of the economy by 30% in 2030 compared to 2015. However, from 2015 to 2019, energy intensity fell by only 4%.

In the industry sector, which has the highest share in TFC, from 2003 to 2018, Enova provided support to projects for energy efficiency and for the replacement of fossil fuels with renewable energy. In 2018, Enova"s focus changed to innovative measures more specifically targeting emissions reductions and the shift to a low emissions society. Since2019, therefore, Enova"s mandate no longer directly targets energy efficiency in industry.

In the buildings sector, which accounts for 34% of TFC, Norway has a target to reduce energy use in existing buildings by 10terawatt hours (TWh) by 2030 relative to 2015 levels. The main energy efficiency measure in the buildings sector is the adoption of building codes. Since 2010, energy performance certificates are required when buildings are built, leased or sold. The government also banned the installation of fossil fuel-based heating systems since 2016 and the use of heating oil since 2020. Most buildings nowadays have electric heating systems.

In the transport sector, which accounts for 21% of total demand, Norway is pursuing an ambitious policy on EVs. Fossil fuel cars are subject to a high registration tax on purchase as well as to a CO2 tax and road use tax on gasoline and diesel. Meanwhile, zero emissions vehicles are heavily subsidised. Support includes no value-added tax (VAT), exemption from a one-off registration tax as well as reduced toll roads, ferry and parking fees. As such, Norway had the highest share of zero-emission vehicles in both car stock (16%) and car sales (64.5%) in 2021.

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