Norway

As Norway, like Switzerland, is not in the EU, it does not have an Integrated National Energy and Climate Plan (NECP). Information on Norway's targets and estimates are thus much harder to find. There is also a clear lack of concrete targets, and an oversupply of vaguely defined ones, which is noticeably different from Switzerland which have well-developed plans for the energy transition.

Targets

Norway's main goal is to reduce emissions by 55% from the 1990-level by 2030.[1] The most concrete build out goals are 30 GW of offshore wind by 2040,[2] and 8 TWh of solar by 2030.[3] Other than this, it seems like there are targets for energy efficiency, being a 30% reduction from 2015-levels by 2030 and 10 TWh reduced electricity demand for buildings.[4] Generally speaking, the Norwegian government have no clear targets for electricity production and reduction, other than these described above. There is also no comprehensive plan for achieving these targets, making them even more nebulous and information is hard to find from credible sources. Norway's Water Resources and Energy Directorate (NVE) have estimates of capacity and energy production for Norway up until 2050, which can be found in Table 1.

Table 1: Power production and capacity[5]

Energy production (GWh)							
	Hydro	Onshore Wind	Offshore wind	Solar	Other thermic	Production curtailment	Total
2022	128.7	14.8	0.0	0.2	2.4		146.1
2030	141.9	17.8	0.0	3.9	1.0	-0.8	163.9
2035	143.7	20.0	11.2	6.6	1.0	-2.2	180.4
2040	145.0	23.1	28.9	8.8	1.0	-3.6	203.3
2050	146.4	30.5	28.9	10.5	1.1	-2.4	215.1
Installed capacity (GW)							
2022	33.7	5.1	0.0	0.3	0.6		39.7
2030	36.9	5.3	0.0	4.4	0.3		46.9
2035	37.8	5.8	2.4	7.4	0.3		53.6
2040	38.5	6.5	6.2	9.8	0.3		61.3
2050	42.2	7.9	6.2	11.7	0.3		68.2

[1] Klima-og miljødepartementet, 'Klimaendringer og norsk klimapolitikk'.
[2] Olje- og energidepartementet, 'Vindkraft til havs - tidslinje'.
[3] Stortinget, 'Representantforslag fra stortingsrepresentantene Lars Haltbrekken og Kari Elisabeth Kaski om fritak for skatt på egenprodusert strøm til eget forbruk'.
[4] Olje- og energidepartementet, 'Handlingsplan for energieffektivisering i alle deler av norsk økonomi'; Hagemoen and Bårdsen, 'Endelig et tallfestet mål om energisparing i bygg!'
[5] Norges vassdrags- og energidirektorat, *Utviklingen i Kraftmarkedet Mot 2050*.

Energy demand projections

The Norwegian NVE estimates that the Norwegian electricity consumption will increase from around 140 TWh today, to 200 TWh by 2050.[6] This will mainly be driven by transport, industry and data centres.[7] Estimates for electricity consumption can be found in Table 2 below.

Transportation

NVE's definition of transport sector seems to include rail, aviation, and maritime transportation. Norway has one of the most developed EV fleets in the world, with several incentives its citizens to buy electric. Norway's targets are as follows:[8]

(1) From 2025 onwards, new light vehicles (private cars and vans) should be zero-emission
(2) In 2025, all new city-buses should be zero-emission or use biogas.
(3) By 2030, all new heavy-duty vans, 75% of new long-distance buses, and 50% of new lorries should be zero-emission.
(4) By 2030, all large city centre goods distribution should be close to zero-emission.

Table 2: Electricity consumption projections (TWh)[9]

	2022	**2022[A]**	**2030**	**2035**	**2040**	**2050**
Households and services	60 TWh	62 TWh	62 TWh	61 TWh	60 TWh	58 TWh
Transportation	3 TWh	3 TWh	8 TWh	13 TWh	16 TWh	22 TWh
Land-based industry and data centres	52 TWh	52 TWh	62 TWh	66 TWh	75 TWh	81 TWh
Hydrogen	0 TWh	0 TWh	4 TWh	7 TWh	12 TWh	20 TWh
Petroleum industry	9 TWh	9 TWh	16 TWh	17 TWh	16 TWh	14 TWh
Losses and other use	10 TWh	10 TWh	11 TWh	12 TWh	12 TWh	13 TWh
Total	133 TWh	135 TWh	163 TWh	176 TWh	191 TWh	208 TWh

A: Thermal-corrected consumption for household and services

[6] Norges vassdrags- og energidirektorat, *Utviklingen i Kraftmarkedet Mot 2050*, 19.
[7] Norges vassdrags- og energidirektorat, *Utviklingen i Kraftmarkedet Mot 2050*, 19.
[8] Samferdselsdepartementet, 'Norge er elektrisk'.
[9] Norges vassdrags- og energidirektorat, *Utviklingen i Kraftmarkedet Mot 2050*.

Heat pumps

The Norwegian government does not have any incentives for air-to-air heat pumps, as it now considers the market to be well enough developed. Other, more rare and expensive options may have it though.[10]

Hydrogen and batteries

Norway has developed a hydrogen strategy based mainly on industry and transportation, however, there are no concrete targets for capacity.[11] While Norway has a lot of battery capacity in the form of EVs, the fact that Norway has a large energy storage capacity in hydropower will likely make energy storage in the form of hydrogen and batteries slow.

[10] Enova, 'Luft-til-luft-varmepumpe'.
[11] Olje- og energidepartementet and Klima-og miljødepartementet, 'Regjeringens hydrogenstrategi - på vei mot lavutslippssamfunnet'.