The heat pump market in Norway

Rolf Iver Mytting Hagemoen

Norwegian Heat Pump Association

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Facts about Norway

- Norway is a country of mountain ranges, huge forests, vast empty expanses and only about 3% arable land.
- The population is approximately 5.3 million, around 1.2 million of whom live in and around the capital city, Oslo.
- Form of government: Constitutional monarchy
- Parliament
- EU membership: No
The Norwegian economy

- The biggest source of national income is the extraction and export of offshore oil and gas. Other significant industries include fishing, raw aluminum, shipping and tourism.

- Per capita GDP:
  - 73 170,43 Euro
  - 76 148,61 US$
Final energy consumption in Norway

Total in 2020: 211 TWh. Source: Statistics Norway
Electricity production and consumption

Electricity production in 2021: 157.1 TWh
Electricity consumption 2021: 139.7 TWh
Net export of electricity: 17.3 TWh

1739 hydropower plants - 88 % of Norwegian production capacity
64 wind farms - 10 % of Norwegian production capacity

The total renewable share in Norway is 50.4 per cent, compared with 46.7 per cent in 2010
Electric heating is common in Norway
Electric heating is common in Norway
Air-to-air-heat pumps is popular
Air-to-water heat pumps in both old and new buildings
Drilling for boreholes
Heating and tap water with brine to water heat pumps
Fossil oil for heating

Banned in all buildings from 2020
Powerhouse in Trondheim
Plus energy building
Two buildings share electricity from solar power and heat from a sea water heat pump.
The building is designed for energy production.
Ammonia heat pump
Norwegian EV market

In 2021: 64.5 percent of all new cars sold were fully electric.
Electric ferries

In 2022 there are 58 car ferries in electric operation in Norway.

Another 14 ferries will be put into electric operation during the year.
Explaining market for heat pumps 2022

- Highest electricity prices ever
- Fossil oil heating is prohibited for most buildings since 2020
- Fossil energy is prohibited in new buildings since 2015
- Gas heating is only available in a few places
- Fossil energy is still used in industry, but this will be phased out
- Electric heating is most common in Norway
- Many houses have wood stoves
- High electricity prices increase the demand for heat pumps
- There is district heating in the cities and some smaller towns, yet less than in the other Nordic countries
- CO₂ price on fossil fuel and refrigerants – more natural refrigerants than most other countries
Electricity price, grid rent and taxes for households (100 øre = 1 NOK = 0.1 Euro Cent)

Source: Statistics Norway
Number of sold air-to-air heat pumps vs price electricity for households

- **Air-to-air pumps**
- **Price electricity incl net and VAT øre/kWh**

*Kilder: SSB/Norsk Varmepumpeforening*
Pros and cons for heat pumps

**Pros:**
- Electricity prices low compared to fossil energy
- CO₂-taxes on fossil energy
- Fossil energy banned in new buildings
- Fossil oil banned in most buildings
- Energy labelling of buildings, BREEAM, FutureBuild etc promotes heat pumps
- Ambitious building owners choose heat pumps
- Many competent companies, installers and planners
- Subsidies for some heat pumps

**Cons:**
- Direct electric heating is common
- Building regulations does not give initiatives for heat pumps
- NZEB not implemented in building regulations
- Many incompetent companies, installers and planners
- No national strategy for energy efficiency in buildings
Heat pump sales Sweden 2019 - 2021

- Air-water
- Exhaust air
- Brine-water
Annual Heat Pump installations in Finland (pcs)
Norway 2021 vs 2020

• Lowest electricity prices for 20 years in 2020, highest ever in 2021

• Total sales of heat pumps:
  • 2019 105 124
  • 2020 91 894
  • 2021 125 049

  • An increase of 36% compared to 2020

• Fourth quarter 2021 compared to fourth quarter 2020
  • Air-to-air  + 60,70%
  • Air-to-water  + 33,70%
  • Brine-to-water + 29,90%
  • Exhaust air 156,2%

• 2021 compared to 2020
  • Air-to-air  + 38,00%
  • Air-to-water  + 2,5%
  • Brine-to-water + 8,0%
  • Exhaust air 29,9%
Distribution of heat pumps in Norway

- In the period 1987 - 2021, almost 1.5 million heat pumps were sold in Norway
- Air-to-air: approx. 1,36 millioner
- Air-to-water: over 50 000
- Brine-to-water: over 60 000
- Ventilation heat pumps: over 20,000

- More than 1.1 million heat pumps are in operation - more than 10,6 TWh of ambient heat.
Contribution from heat pumps in Norway

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Calculations from NVE based on statistics from the Norwegian Heat Pump Association

In 2021, 11.8 TWh of wind power was produced, which accounted for 7.5 % of total Norwegian power production.
Potential for more heat pumps in Norway

Sintef Community analyses 2022

Existing building:
2030 - Potential heat pump 8.1 TWh
2050 - Potential heat pump 9.4 TWh

New buildings 2030
2030 - 3 TWh
2050 - 6.3 TWh

Heat pumps in new and existing buildings
2030 - 11, 1 TWh
2050 - 15.7 TWh

Today's contribution 10, 6 TWh
Trend projection for heat pump sales

Number of heat pumps sold by type, trend projection

Number of heat pumps sold per year
How many heat pumps are in operation?

Heat pumps in operation in homes vs. the housing stock (detached houses, terraced houses and holiday homes), 2020

Number of heat pumps in operation, 2020 - estimate

Heat pumps in operation in total

Building mass

Air-to-air
1,055,746

Air-to-water
45,731

Brine-to-water
53,860

Exhaust air
15,042

Heat pumps in operation in total