

The heat pump market in Norway

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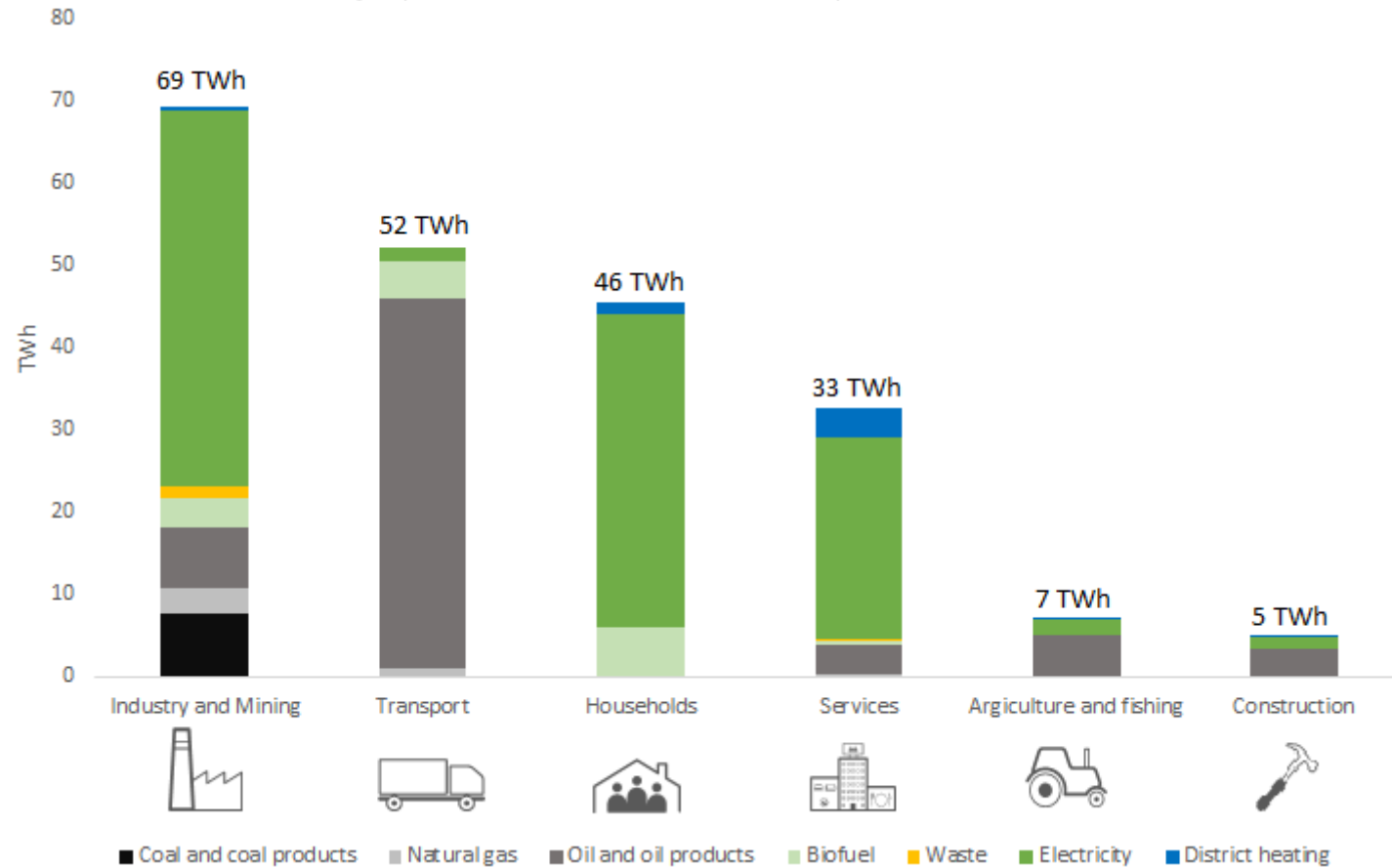
Norwegian Heat Pump Association

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Final energy consumption in Norway



Total in 2020: 211 TWh. Source: Statistics Norway

Use of fossil energy in Norway

- 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
- CO₂-tax: 83 Euro per ton of CO₂ (NOK 952)

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

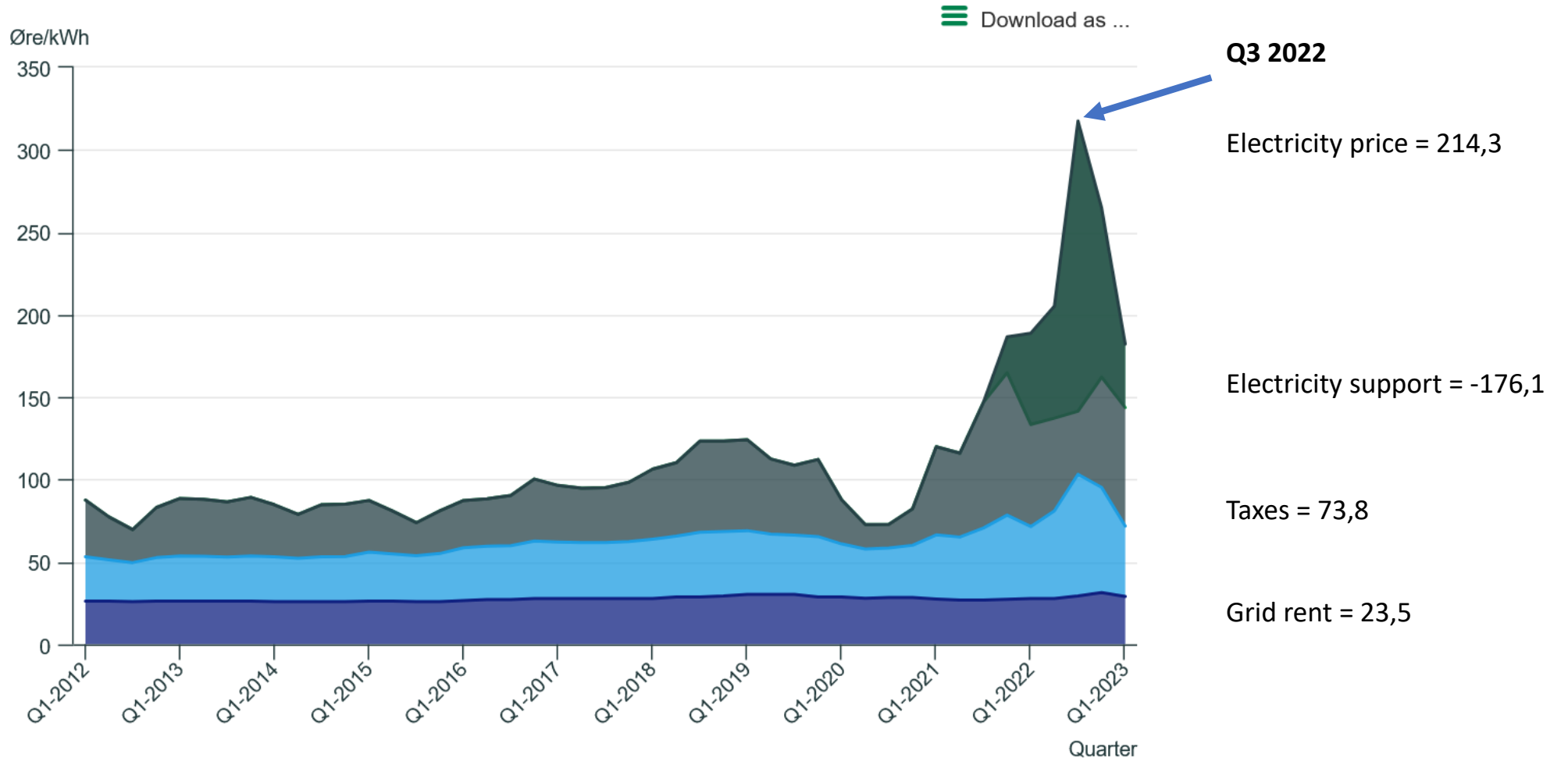
64 wind farms

10 % of Norwegian production capacity

The total renewable share in Norway is 50.4 per cent, compared with 46.7 per cent in 2010



Electricity price, grid rent and taxes for households



Electric heating is common in Norway



Norwegian EV market



April 2023 : 83,2 percent of all new cars sold were fully electric.

Some success factors for heat pumps in Norway

- Electrification of society - strong electricity grid
- Price of electricity vs gas - heat pumps are the most profitable heating solution
- Taxes on electricity vs CO₂ - bans of fossil fuels for heating in Norway
- High quality heat pumps for cold climate
- Large network of skilled installers throughout the countries
- Training and specialisation of installers, planners, plumbers and entrepreneurs

Some challenges

- Building regulations do not encourage the choice of heat pumps in new buildings
- Relatively few buildings with hydronic heating
- Electricity has historically been cheap

Heat pumps for cold climate

- High quality models adapted to cold and Nordic climates dominate the market
- Many models tested for -25 or -30° Celsius
- Air source heat pumps deliver lower COP and heat at low temperatures
- Buildings with air source heat pumps normally need additional heat from other sources as electric heating or bio energy

- Geothermal heat pumps are most efficient but cost more
- Air-to-air heat pumps have the shortest pay back time

- Longer heating seasons than many other European countries

Heat pumps in new and old buildings

- Hospitals
- Nursing homes
- Schools
- Hotels
- Offices
- Single family houses
- Apartment blocks
- Cultural buildings
- Churches
- Kindergartens
- Industry
- District heating



Guide for heat pumps in listed and heritage-listed buildings

Directorate of cultural heritage



Heat pump in a listed building



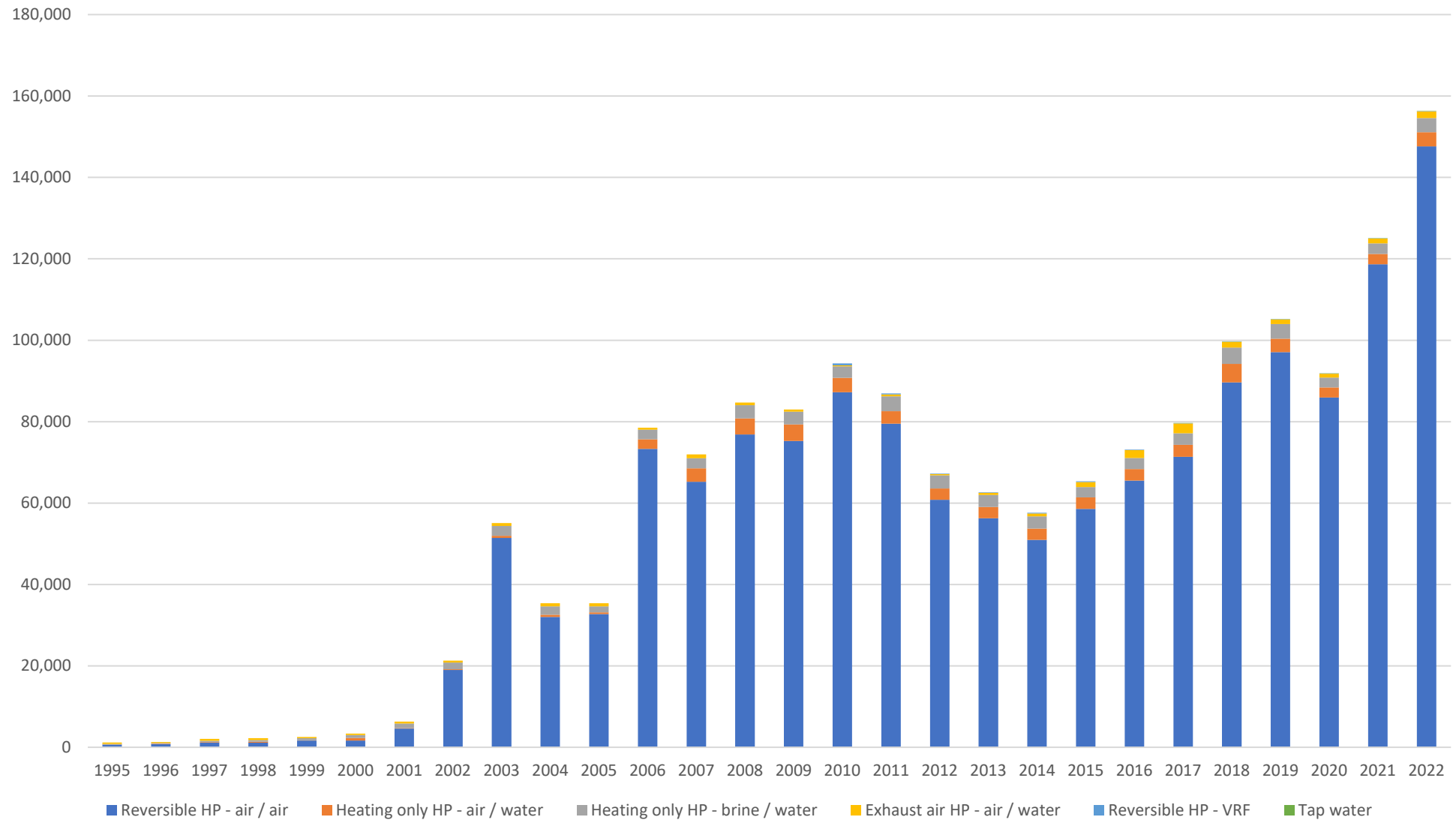
Heat pump in mountain cabin



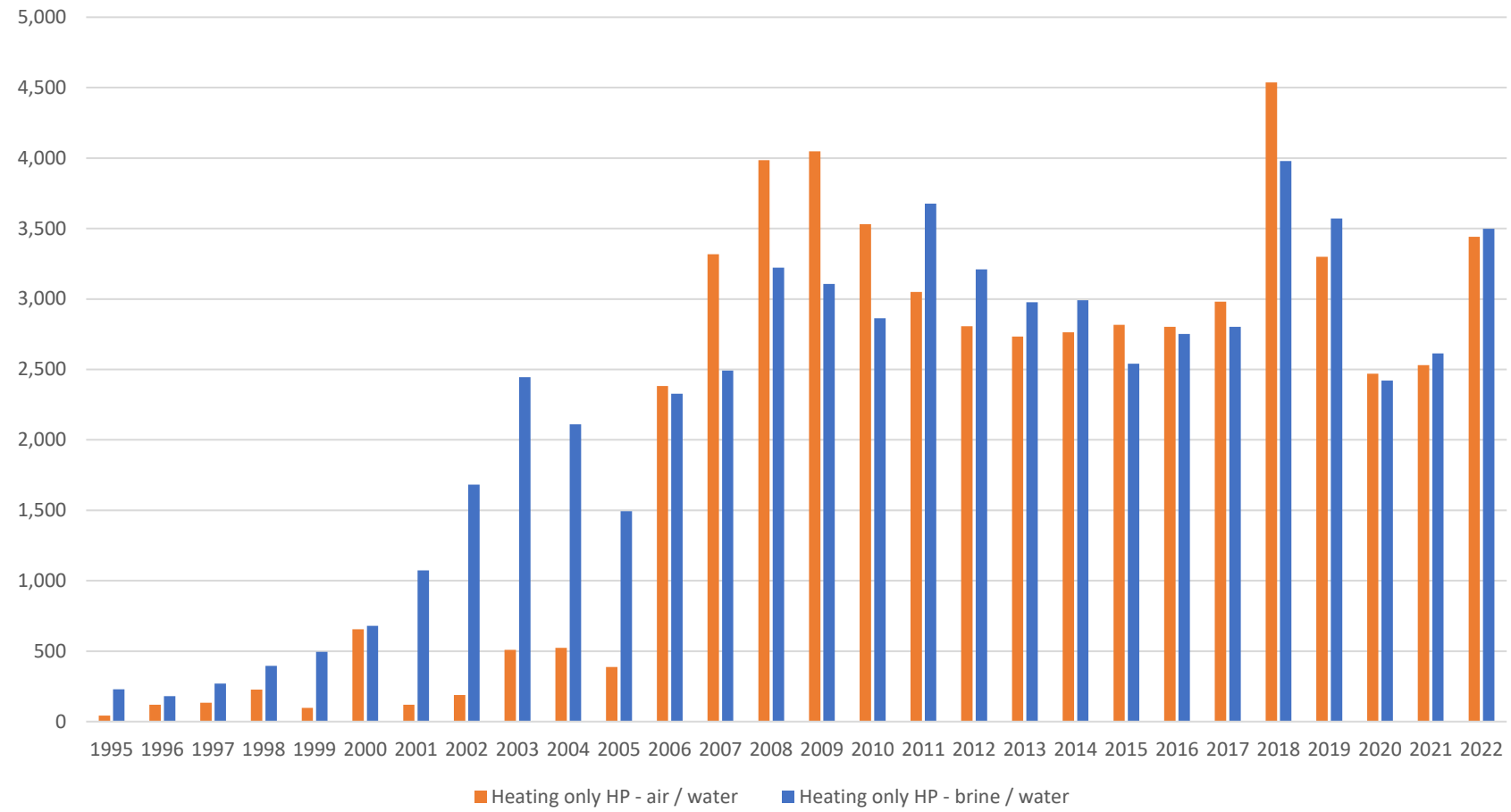
Propane heat pumps



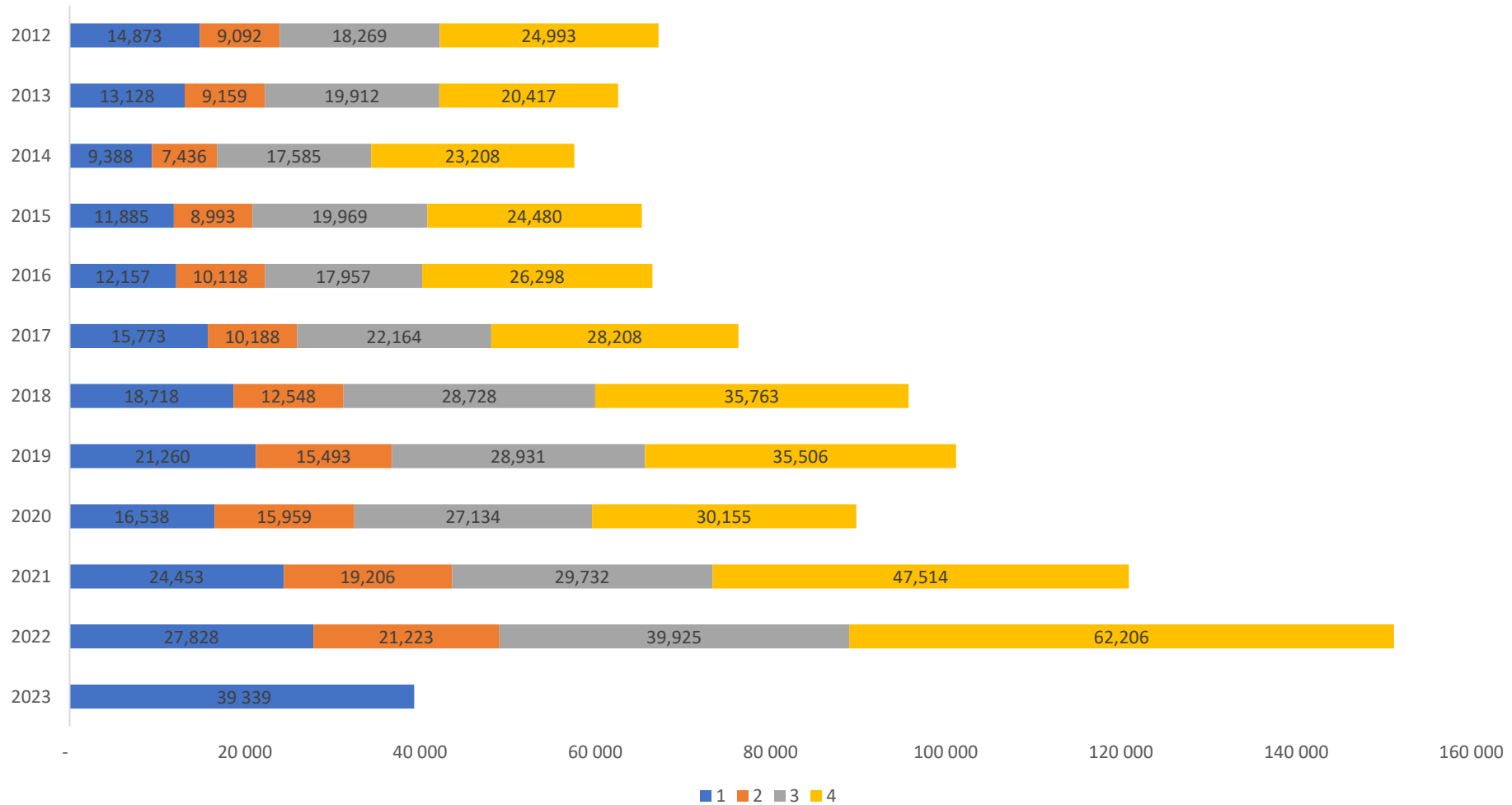
Total market heat pumps 1995 - 2022



Heat pumps for hydronic systems 1995 - 2022



Total market per quarter



Explaining market for heat pumps in 2022

- Highest electricity prices ever
- High electricity prices increase the demand for heat pumps
- Fossil heating is no competitor for heating in buildings

Distribution of heat pumps in Norway

- In the period 1987 - 2022, almost 1,64 million heat pumps were sold in Norway
 - Air-to-air: approx. 1,49 million
 - Air-to-water: over 57 000
 - Brine-to-water: almost 64 000
 - Ventilation heat pumps: approx 26,000
- More than 1.3 million heat pumps are in operation – approx. 11 TWh of ambient heat.

Contribution from heat pumps in Norway

	TWh
Heat production 2021	18,8
Input electricity	8,1
Ambient heat	10,6



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.

Norway vs Nordic countries

Norway

- Population 5,3 million
- Low electricity prices, years with moderate taxes for electricity, high CO₂-taxes
- Air-to-air-heat pumps-dominant, little gas grid

Finland

- Population 5,5 million
- Higher electricity prices than Norway
- More air-to-water and brine-to-water heat pumps than Norway, little gas grid

Sweden

- Population 10,42 million
- Higher electricity prices and higher taxes for electricity than Norway, high CO₂-taxes
- More air-to-water and brine to water than Norway, little gas grid

Denmark

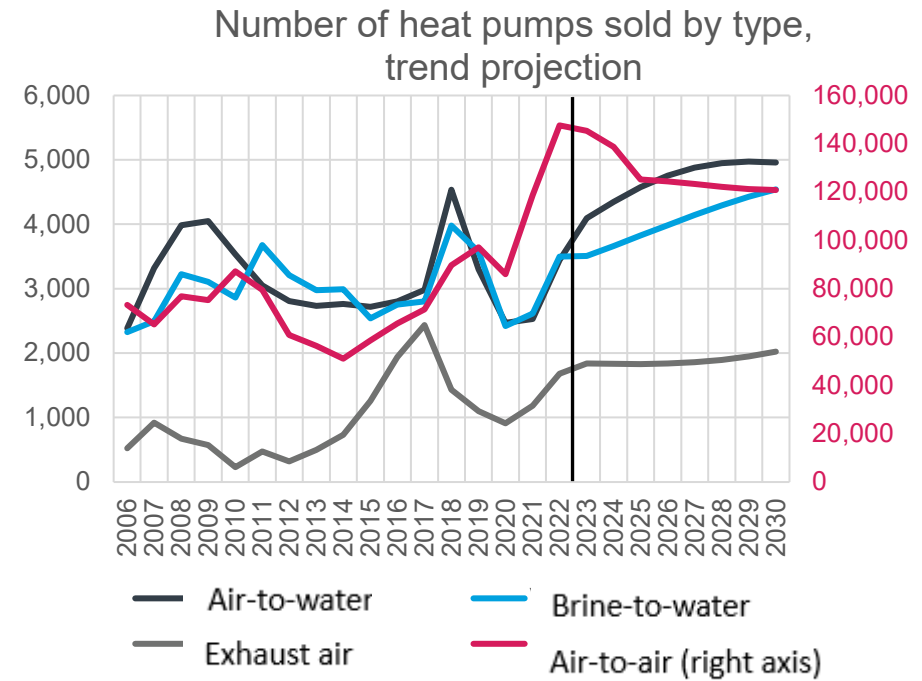
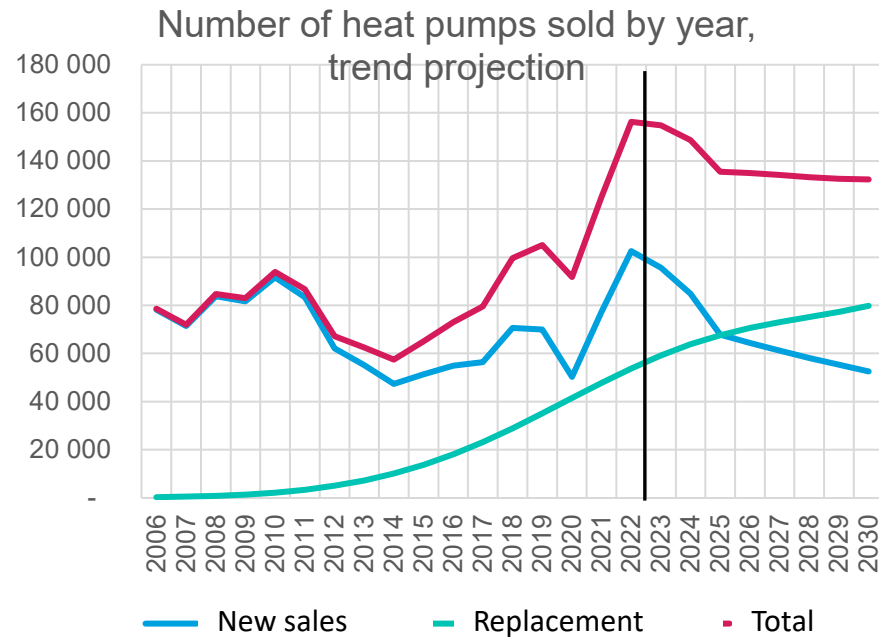
- Population 5,86
- Earlier very high prices and taxes for electricity, large gas infrastructure, thus low heat pump sales
- Now lower taxes for electricity, increased CO₂-taxes, heat pump market is growing

Number of heat pumps sold Norway, Sweden, Finland

2022	Population	Air-to-air	Air-to-water	Brine-to-water
Norway	5,4 mill	142 495	3 430	3 514
Sweden	10,42 milli	150 000*	19 162	28 160
Finland	5,5 mill	160 000	19 000	12 000

*Estimat

Trends



Important topics concerning heating pumps

Policy

- The government's action plan for energy efficiency
- Enova's subsidy schemes
- F-gas and PFAS
- The building code
- The energy label scheme for buildings