

District Heating in Finland 2021



Energiateollisuus

Kaukolämpö

District heating in Finland 2021

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1. District heating 2021

Finnish Energy compiles district heating statistics based on the information collected from the companies. The objective is to reliably and transparently describe the district heating operations in Finland as well as serve as a foundation towards sustainable advocacy. These annually published statistical tables contain detailed and comprehensive information of the district heating operations in Finland in 2021. Tables are available as Excel files at Finnish Energy website:

www.energia.fi/en/newsroom/publications/district_heating_statistics

1.1 General knowledge

Statistical tables contain information from those member companies of Finnish Energy that answered to the statistical survey. Information was also collected from those wholesale companies that deliver district heat to companies already answering to the survey.

This publication contains statistics from 108 district heating companies and from 77 wholesale companies.

Table 1. General information on district heating year 2021

	Year 2021	Change compared to 2020
Total supply	39 100 GWh	+ 16,2 %
DH production by fuels	33 700 GWh	+ 15,7 %
Net production of electricity in CHP production	9 900 GWh	+ 14,9 %
Fuel energy consumed	52 000 GWh	+ 15,6 %
Heat recovery and heat produced by heat pumps	5 400 GWh	+ 19,4 %
DH consumption	35 300 GWh	+ 17,3 %
of which the share of dwelling houses	53,7 %	- 1,8 p.p.
Customers:		
❖ The contracted heat power	19 200 MW	+ 0,0 %
❖ Building volume	1020 million m ³	+ 0,7 %
❖ of which the share of dwelling houses	46,1 %	- 0,2 p.p.
Average selling price		
❖ Arithmetic value	82,78 €/MWh	- 1,3 %
❖ Weighted by sales	82,83 €/MWh	+ 0,7 %
Total length of DH networks	16 100 km	+ 3,3 %

1.2 Municipalities with district heating

The district heating companies included in this publication distributed district heat in 177 municipalities.

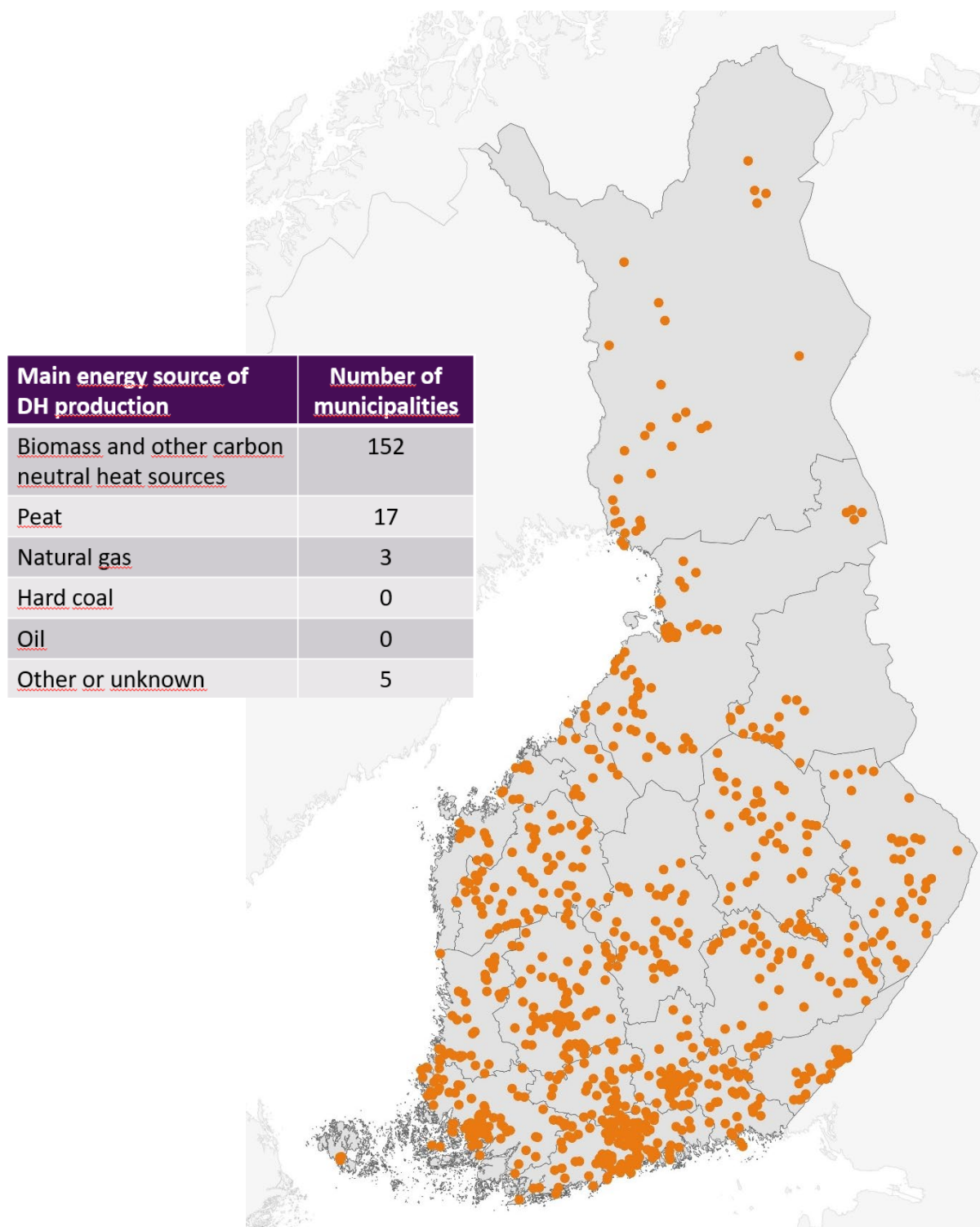


Figure 1 District heating production units at the end of year 2021. The locations are within the right municipalities but do not present the exact locations.

1.3 District heating networks and production units

The length of the district heating network at the end of year 2021 was 16 090 km which increased 520 km from the previous year. The development of the network length since 1970 is presented in Figure 2.

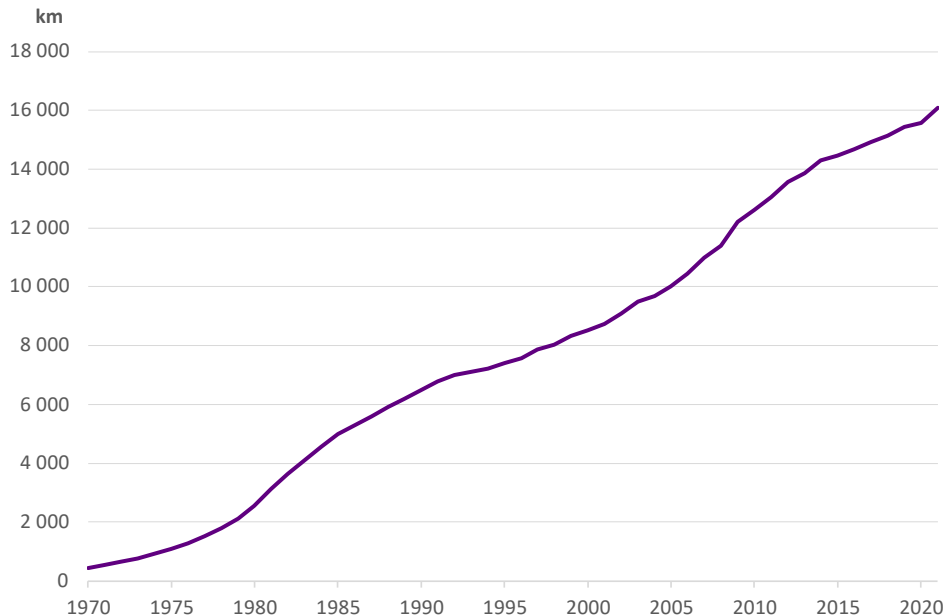


Figure 2. Total length of the DH networks

There were 106 power plants with a district heating capacity of 9 100 MW. Power output of these CHP plants totaled 5 600 MW. Moreover, there were 835 stationary heating plants as well as 25 separate heat recovery or heat pump units. The aggregated heat capacity of the above-mentioned was 14 100 MW. The companies also had 275 transportable heating plants with an overall capacity of 1 000 MW.

1.4 District heat production and fuel energy

The total supply of the district heat was 39 100 GWh whereof 33 700 GWh was produced with fuels. The remaining 5 400 GWh was produced with heat recovery and heat pumps. Heat recovery and the production of the heat pumps increased by 82 % during the past five years. 56,2 % of the total supply was produced in CHP plants or comparable cogeneration heat from gas turbines, gas engines or diesel engines. The electricity produced in the CHP plants was 9 900 GWh.

In total, 52 000 GWh of fuels were used to produce district heat and CHP electricity. The share of fuels used for separate DH production was 13 400 GWh. The percentage distribution of the fuels in 2021 is presented below in Figure 3. The energy sources of the district heat supply in 2020 and in 2021 are presented in Figure 4.

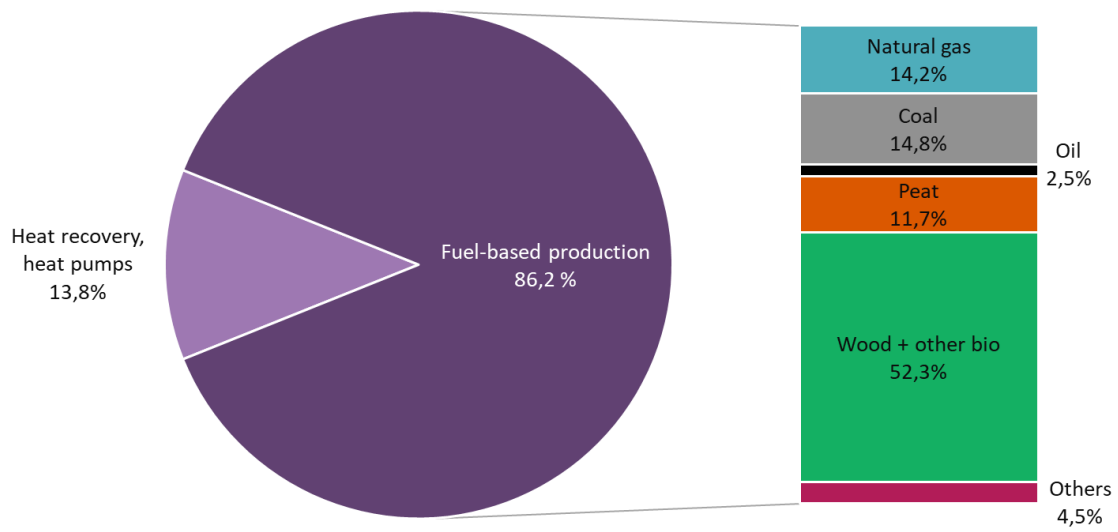


Figure 3. Fuels used to produce district heat and CHP electricity in year 2021.

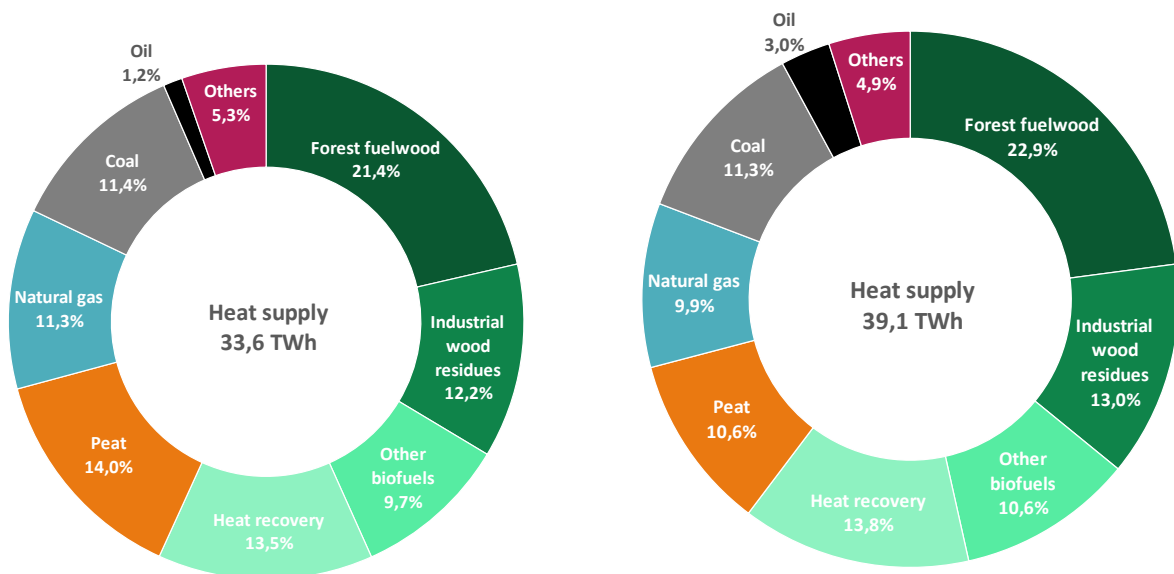


Figure 4. Energy sources of district heating supply in 2020 (left) and in 2021 (right)

1.5 Emissions

The specific emissions of district heating were 102,5 gCO₂/kWh which is 16,6 % less than in 2020. The fuels used in combined heat and power production have been allocated to district heat according to the benefit allocation method.

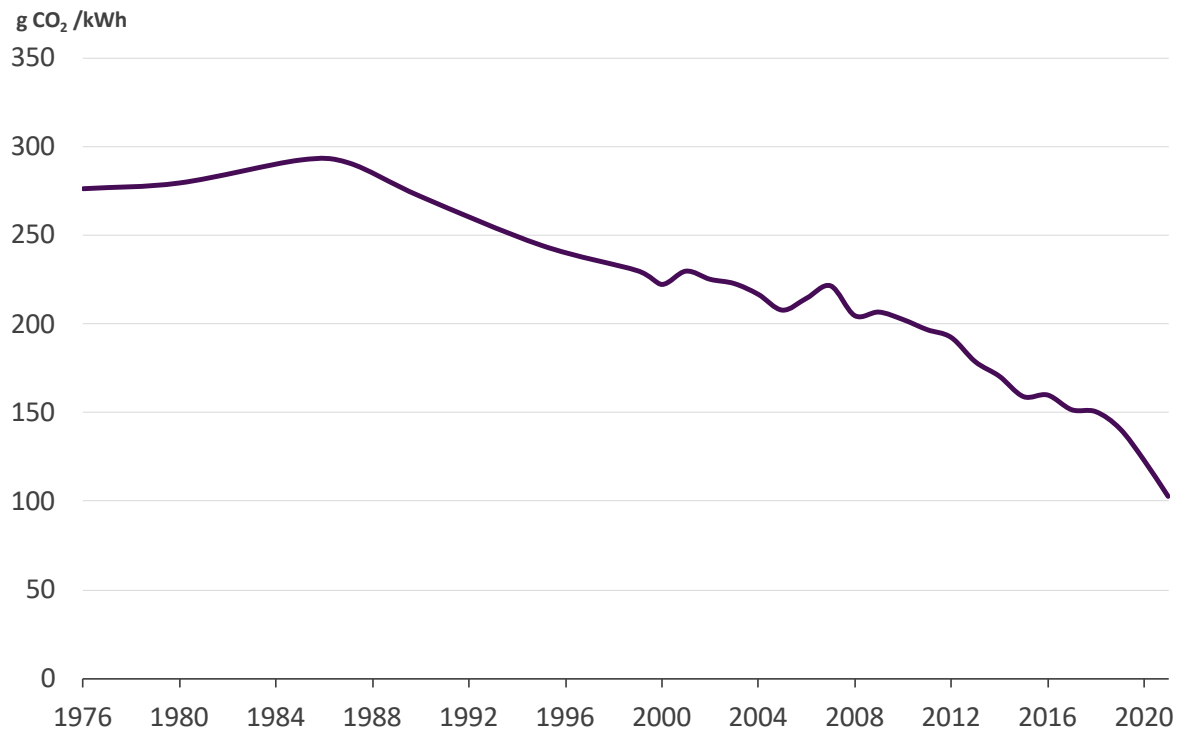


Figure 5. Specific emissions of district heating production (Sources: Statistics Finland, Finnish Energy)

1.6 Customers

The connected heat load of customers was 19 200 MW (+ 0,0 %). The number of customers was divided among sectors as follows: dwelling houses 80 %, industry 4 % and other customers 16 %.

The heat delivery to the customers was 35 300 GWh in 2021 which was 17,3 % more than in 2020. Temperature corrected heat consumption decreased by 0,2 %. The measured heat consumption as well as the temperature corrected heat consumption is presented below in Figure 6. The heat consumption was divided among sectors as follows: dwelling houses 54 %, industry 9 % and other customers 37 %.

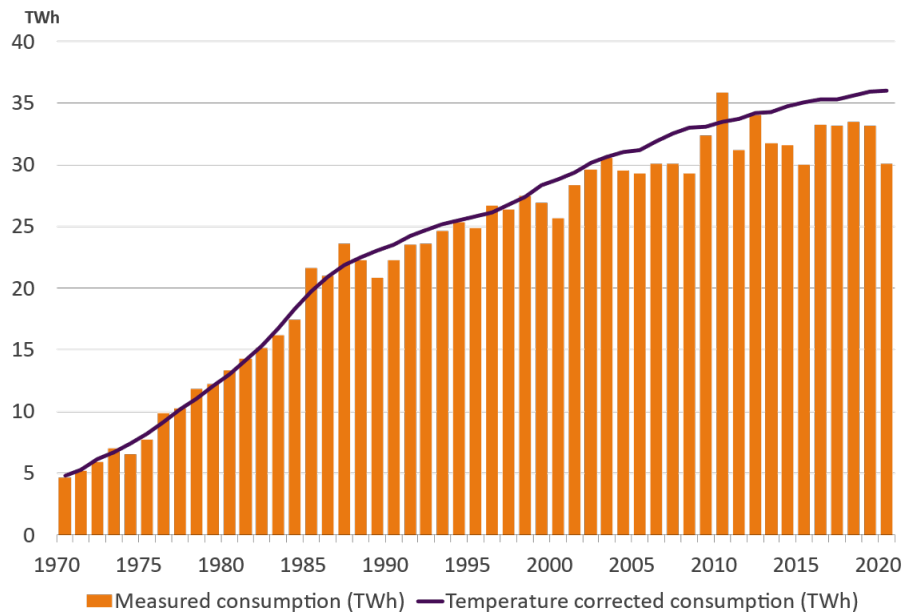


Figure 6. Measured DH consumption and temperature corrected consumption

The building volume of the customers was 1020 million m³ of which the share of dwelling houses was 46 %, industry 13 % and other customers 41 %. The number of inhabitants living in the buildings heated by district heating was 3,0 million. The share of inhabitants living in buildings heated by district heat in each municipality is presented in statistical table 8 in Excel files

1.7 Heat sales and sales proceeds

The heat sales to customers during 2021 was 35 300 GWh. The arithmetical average price for heat sales was 82,78 €/MWh. The average price weighted by the heat sales of each district heating company was 82,83 €/MWh. The arithmetical average price was decreased by 1,3 % and the weighted price increased by 0,7 % compared to the previous year. The share of district heating companies according to the average heat sales price (incl. VAT 24 %) is presented in Figure 7.

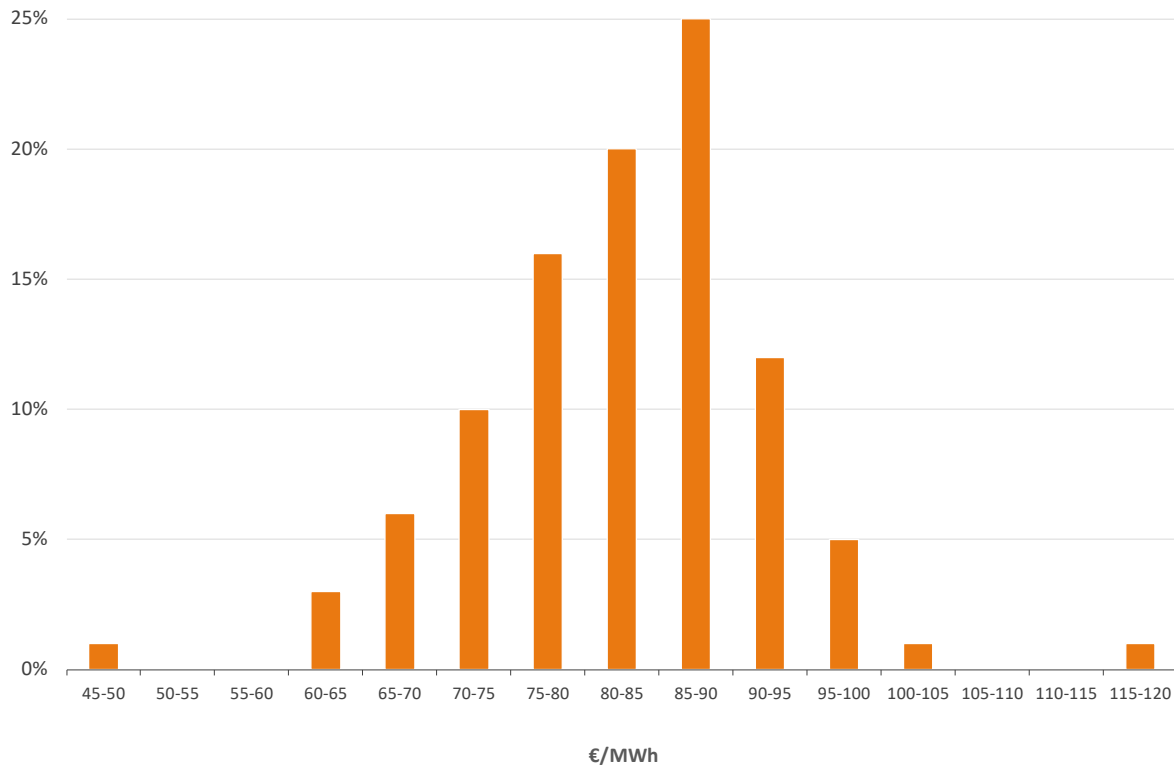


Figure 7. The share of district heating companies according to the average heat sales price (incl. VAT 24 %)

1.8 Specific heat consumption and heating degree day

The specific heat consumption in district heated buildings in 2021 was 35,7 kWh/m³ or 116,1 kWh/m². This value also includes heating of the hot tap water. Temperature corrected specific heat consumption decreased by 1,0 % compared to the previous year and it has decreased by 20,5 % during this decade. (Figure 8).

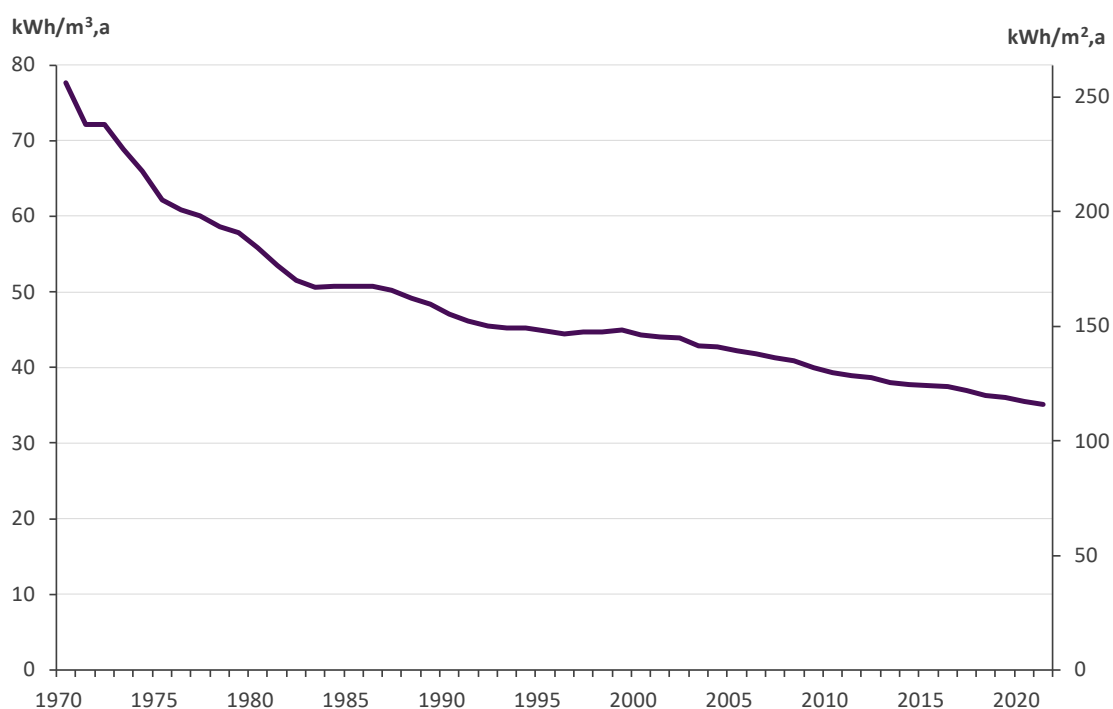


Figure 8. Specific heat consumption in district heated buildings

Year 2021 as warm as the normal period of 1981...2010. The heating degree day (describing the heating requirement) in 2021 was 1 % lower than the average during the years 1981...2010.

2 Definitions and commentaries

2.1 Symbols

Notations used in the tables mean the following:

Symbol	Explanation
-	No action exists
..	Quantity was missing or was too uncertain to be reported
0	Quantity equals to zero

2.2 Tables in the statistics

These statistics include only those member undertakings that have answered to the survey. The following member undertakings have not answered:

Lapuan Energia Oy
Ähtärin Energia ja Vesi Oy

These statistics include only those wholesale companies that have answered to the survey. The following wholesale companies selling district heat to district heating companies have not answered:

Akonkosken Saha Oy, Alavus
Biotermo Oy, Kuusamo
Boliden Kokkola Oy
ER-Saha, Viitasaari
Fine Pine Oy, Lapinlahti

Jätevesilaitos, Hämeenlinna
Keitele Energy Oy
Kierrätys Kangas Oy
Lapuan Saha Oy, Lapua
Pohjanmaan Biolämpö Oy, Alavus

Rovaniemen kaupunki
UPM-Kymmene Oyj, Jämsänkoski
UPM-Kymmene Oyj, Kaipola
Jeld-Wen Suomi Oy, Asikkala
Lahti Aqua Oy
Varmalämmitys Oy

The heat sales of the above mentioned in 2021 was 151,7 GWh and the corresponding amount of fuels and production capacity is missing from the statistics.

