

Finland / Comprehensive assessment of the potential for efficient heating and cooling under Article 14(1) of Directive 2012/27/EU (EED)

Provisions and the Commission's recommendations for drawing up a comprehensive assessment: Amended ANNEX VIII Potential for efficient heating and cooling (C(2019) 1616 (final) of the Energy Efficiency Directive and Commission Recommendation (C(2019) 6625 final

Part I Overview of heating and cooling

Part I(1)

An assessment of the amount of useful energy (UE) and quantification of final energy consumption (FEC) by sector (GWh per year); and

Part I(4)

A forecast of trends in the demand for heating and cooling to maintain a perspective of the next 30 years in GWh and taking into account in particular projections for the next 10 years, the change in demand in buildings and different sectors of the industry, and the impact of policies and strategies related to the demand management, such as long-term building renovation strategies under EPBD

Part I: Overview of heating and cooling (1. Reporting current heating and cooling demand + 4. Reporting forecasted heating and cooling demand)									
		Unit	2018	2020	2025	2030	2035	2040	X+30
Heating demand, final energy	Residential sector	GWh/a	57383						
	Service sector	GWh/a	19341						
	Industrial sector	GWh/a	NA						
	Other sectors	GWh/a	NA						
Cooling demand, final energy	Residential sector	GWh/a							
	Service sector	GWh/a							
	Industrial sector	GWh/a							
	Other sectors	GWh/a							
Heating demand, useful energy	Residential sector	GWh/a	50068	53052	52484	52250	51894	51411	NE
	Service sector	GWh/a	18283	19067	17857	16824	15743	14629	NE
	Industrial sector	GWh/a	NA	NE	NE	NE	NE	NE	NE
	Other sectors	GWh/a	NA	NE	NE	NE	NE	NE	NE
Cooling demand, useful energy	Residential sector	GWh/a							
	Service sector	GWh/a							
	Industrial sector	GWh/a							
	Other sectors	GWh/a							

The figures also include heat pump energy

Note: demand for heating in 2018 was 9% lower than in a normal year
2020 is assumed to be as warm as normal, although it will actually be considerably (15%) warmer than a normal year

Notes: X represents the starting year of the analysis;
The column for year X should contain actual numbers of current heating and cooling demand;
Columns for years X+5,...,X+30 should contain forecasted values of useful energy demand;

Part I(2a)

The estimated and identified current heating and cooling supplied to sectors of final consumption (GWh per year), with breakdowns by technologies and as to whether the energy was derived from fossil and renewable sources

Energy provided on-site			Unit	Value
Residential sector	Fossil fuel sources	Heat only boilers	GWh/a	2841
		Other technologies	GWh/a	0
		HECHP	GWh/a	0
	Renewable energy sources	Heat only boilers	GWh/a	IE
		HECHP	GWh/a	0
		Heat pumps	GWh/a	5970
		Other technologies	GWh/a	8004
Service sector	Fossil fuel sources	Heat only boilers	GWh/a	2563
		Other technologies	GWh/a	0
		HECHP	GWh/a	0
	Renewable energy sources	Heat only boilers	GWh/a	490
		HECHP	GWh/a	0
		Heat pumps	GWh/a	502
		Other technologies	GWh/a	NA
Industrial sector	Fossil fuel sources	Heat only boilers	GWh/a	NA
		Other technologies	GWh/a	NA
		HECHP	GWh/a	NA
	Renewable energy sources	Heat only boilers	GWh/a	NA
		HECHP	GWh/a	NA
		Heat pumps	GWh/a	NA
		Other technologies	GWh/a	NA
Other sectors	Fossil fuel sources	Heat only boilers	GWh/a	NA
		Other technologies	GWh/a	NA
		HECHP	GWh/a	NA
	Renewable energy sources	Heat only boilers	GWh/a	NA
		HECHP	GWh/a	NA
		Heat pumps	GWh/a	NA
		Other technologies	GWh/a	NA

Useful heat (not fuel quantities)

pellets are included under Other technologies

only so-called heat pump energy (excluding heat pump electricity)
including all small-scale use of wood, excluding solar energy

including all small-scale use of wood

only so-called heat pump energy (excluding heat pump electricity)
solar energy unknown

Energy provided off-site				
Residential sector	Fossil fuel sources	Waste heat	GWh/a	1160
		HECHP	GWh/a	9432
		Other technologies	GWh/a	2098
	Renewable energy sources	Waste heat	GWh/a	IE
		HECHP	GWh/a	6112
		Other technologies	GWh/a	7063
Service sector	Fossil fuel sources	Waste heat	GWh/a	780
		HECHP	GWh/a	5405
		Other technologies	GWh/a	1149
	Renewable energy sources	Waste heat	GWh/a	IE
		HECHP	GWh/a	3160
		Other technologies	GWh/a	2940
Industrial sector	Fossil fuel sources	Waste heat	GWh/a	NA
		HECHP	GWh/a	NA
		Other technologies	GWh/a	NA
	Renewable energy sources	Waste heat	GWh/a	NA
		HECHP	GWh/a	NA
		Other technologies	GWh/a	NA
Other sectors	Fossil fuel sources	Waste heat	GWh/a	NA
		HECHP	GWh/a	NA
		Other technologies	GWh/a	NA
	Renewable energy sources	Waste heat	GWh/a	NA
		HECHP	GWh/a	NA
		Other technologies	GWh/a	NA

district heating and electricity divided in proportion to purchasing in the entire country into technologies and foss/RES surplus heat and industrial waste heat recovered with condensers

surplus heat recovered with condensers all on the fossil row

surplus heat and industrial waste heat recovered with condensers

surplus heat recovered with condensers all on the fossil row

Part I(2b)

Information on the identification of potential supply from installations that generate waste heat or cold (GWh per year):

- i) thermal power generation installations that can supply or can be retrofitted to supply waste heat with a total thermal input exceeding 50 MW;
- ii) heat and power cogeneration installations using technologies referred to in Part II of Annex I with a total thermal input exceeding 20 MW;
- ii) waste incineration plants;
- iv) renewable energy installations with a total thermal input exceeding 20 MW other than the installations specified under point 2(b)(i) and (ii) generating heating or cooling using the energy from renewable sources;
- v) industrial installations with a total thermal input exceeding 20 MW which can provide waste heat;

is provided on pages 9–30 of Annex **Overview EED Article 14**

Part I(2c)

Reported share of energy from renewable sources and from waste heat or cold in the final energy consumption of the district heating and cooling sector over the past five years, in line with Directive (EU) 2018/2001.

2014	34%
2015	39%
2016	41%
2017	44%
2018	43%

Part I(3abc)

Maps covering the entire national territory identifying

- a) heating and cooling demand areas following from the analysis of point 1, while using consistent criteria for focusing on energy dense areas in municipalities and conurbations
- b) existing heating and cooling supply points and district heating transmission installations
- c) planned heating and cooling supply points and planned district heating transmission installations

can be found in the annexes

ANNEX Map Demand areas

ANNEX Map Heating and cooling supply points

ANNEX Map District heating installations in 2018

Part II Objectives, strategies and policy measures

Long-term renovation strategy

Finland's long-term renovation strategy was published on 10 March 2020. The strategy provides an overview of Finland's building stock and identifies cost-effective renovation measures and their financing, as well as policies and measures to promote deep renovations. The strategy also estimates the expected energy savings, reductions in emissions and other impact. Submitted to the Commission.

The measures included in the Finnish roadmap will decrease heating energy consumption (gross) by approximately 50% between 2020 and 2050. During the same period, the consumption of delivered energy is estimated to decrease more, by approximately 60%. Of Finland's total current carbon dioxide emissions (46 MtCO₂), residential and non-residential buildings amount to 7.8 MtCO₂ (17%). CO₂ emissions from the heating energy consumption of the building stock will decrease by some 92% in the period 2020–2050.

Phasing out oil heating

Buildings and construction generate one third of Finland's climate emissions. Switching from fossil oil to more sustainable heating methods is a concrete way to reduce emissions and realise the objective of a carbon-neutral Finland by 2035. In accordance with the Government Programme, the use of fossil oil for heating will be phased out by the beginning of the 2030s. The public sector will set an example by switching to more sustainable heating by 2024. Oil heating renovations are also part of the Government's short-term measures for sustainable recovery, promoting economic recovery while responding to the climate crisis and decline in biodiversity.

- Owners of detached houses will be offered grants to transition from oil heating to another method of heating.
- As of 5 October 2020, municipalities and municipally owned enterprises will be offered grants to remove oil heating systems and transition to more sustainable heating methods in the properties they own. The maximum grant would be 20–25% of the costs, depending on whether the municipality has entered into the voluntary energy efficiency agreement.
- The transition to more sustainable heating methods will be boosted in the current decade by an action programme to phase out oil heating. The programme sets forth actions to encourage private and public entities that use oil heating to switch from oil to other heating methods. Possible actions include various subsidies and grants, tax solutions, advice, communications and regulations.

Further information: <https://ym.fi/oljylammityksesta-luopuminen>

Government Decree on energy subsidies for residential buildings in the period 2020–2022 (1342/2019)

The Housing Finance and Development Centre of Finland (ARA) is granting energy subsidies to housing companies for planning and renovation projects aimed at improving energy efficiency in the period 2020–2022. The size of the subsidy is EUR 4 000–6 000 for projects that improve energy efficiency. The total amount for grants for the years 2020–2022 is EUR 100 million.

A subsidy can be granted for the costs of repairs in a renovation project that involve improving the energy efficiency of a residential property to a level exceeding the minimum level provided in section 7 of Decree No 4/13 of the Finnish Ministry of the Environment on improving the energy performance of buildings in connection with renovations and alterations compared to the construction year of the building or, if the purpose of the building has been altered, to the level appropriate for the altered purpose.

The prerequisite for receiving the grant is that energy efficiency is improved by:

- 1) in residential blocks of flats and terraced houses, at least 20%;
- 2) in detached and linked houses, at least 30%; or
- 3) in residential blocks of flats, terraced houses, detached houses and linked houses, at least the virtual zero-energy level required for new buildings under the Decree of the Ministry of the Environment on the Energy Performance of New Buildings (1010/2017).

Taxation

The tax on fuels intended for heating will rise by EUR 2.7 per MWh from the beginning of 2021. The tax reform will increase the competitiveness of low-carbon forms of energy.

The industrial electricity tax will be lowered to the minimum level allowed by the EU (0.05 cents per kWh) in 2021. This also applies to data centres. At the same time, approximately two thirds of the tax refund for energy-intensive enterprises will automatically go, as use of electricity will not qualify for a tax refund.

Act on Prohibiting the Use of Coal

The Act on Prohibiting the Use of Coal as an Energy Source (Laki hiilen energiakäytön kieltämisestä, 416/2019) entered into force in March 2019. The prohibition of coal has prompted energy companies to develop increasingly efficient solutions and business models around energy efficiency.

Investment aid for new energy technology and large-scale demonstration projects

The investment aid is intended for future energy solutions that contribute to meeting the national and EU objectives for 2030. The aid was first paid out in 2019. According to the Government Programme, the use of renewable energy will be sustainably increased so that its share will exceed 50% in the 2020s and self-sufficiency will exceed 55%. The Government Programme also sets the target of raising the share of renewable fuels in transport to 30% by 2030 and to phase out the use of coal in energy production and halve the use of imported oil for domestic needs during the 2020s. The aid is governed by the Government Decree on General Terms of Granting Energy Aid for the years 2018–2022 (Valtioneuvoston asetus energiätuen myöntämisen yleisistä ehdoista vuosina 2018–2022, <https://www.finlex.fi/fi/laki/alkup/2017/20171098>), hereinafter the Energy Aid Decree. In addition, individual aid decisions may require the notification procedure required under the Commission's State aid rules. The aid would be granted from the budget item for energy aid (item 32.20.41)

Large-scale demonstration projects refer to energy aid projects where the investment costs are at least EUR 5 million. The supported projects are divided into the following categories: 1. Renewable biofuels for transport 2. Other than combustion-based heat production 3. Other large-scale demonstration projects involving new energy technology

Energy aid

Energy aid can be granted for investment and investigation projects that promote the production or use of renewable energy, energy savings or improving the efficiency of energy production or use or otherwise replacing the energy system with a low carbon system.

The aid particularly seeks to promote the adoption and placing on the market of new energy technology. Energy aid plays an important role in the commercialisation and adoption of new energy technologies. Energy aid also promotes employment, and the projects can help increase self-sufficiency and improve the balance of trade by reducing the purchase of energy products from abroad. Energy aid is granted through a continuous application procedure.

Aid for projects to replace the use of coal in energy production

The Government has allocated EUR 90 million for investment subsidies for the replacement of coal in energy production. The use of coal for as fuel for electricity or heating production will be prohibited from May 2029. The investment aid aims to promote the voluntary, accelerated phasing out of coal in energy production by the end of 2025. Investment aid can be granted to energy producers who completely abandon coal as an energy source in specified energy use areas by the end of 2025 for investment projects that promote:

- the production or use of renewable energy, or
- energy saving or more efficient generation and use of energy.

Investment aid can be granted if the project or part of the project or the new technology used in the project would not be implemented without aid before the end of 2025. The aid is based on an overall evaluation and comparison between projects, involving in particular an assessment of the impact of the project on replacing coal in energy production and the volume of energy produced, the novelty and demonstrative value of the technology used in the project, its feasibility and cost-efficiency, and its other impacts.

Priority will be given to projects that are based on technologies other than combustion. If the Budget authority allows aid to be granted for other projects, priority will be given to combined, as opposed to separate, heat and power production projects.

Aid can be granted to businesses and other organisations, such as municipalities. The investment aid is granted on the basis of project evaluation and may account for up to 30% of eligible project costs. For projects involving new technology, investment aid may cover up to 40% of costs. Projects may not be started before the submission of the aid application.

Part III Analysis of the economic potential for efficiency in heating and cooling

The cost-benefit analysis and other information is provided in Annex **Overview EED Article 14**.

Part IV Potential new strategies and policy measures

The assessment and overview of new legislative and non-legislative policy measures to realise the economic potential possibly identified on the basis of the cost-benefit analysis will be made part of the national climate and energy strategy work, and decisions will be made and implemented once the strategy is completed. The national climate and energy strategy is under preparation and will be completed during 2021.

EU Renewable Energy Directive 2018/2001/EU, Article 15(7)

The assessment of potential of energy from renewable sources and of the use of waste heat and cold in the heating and cooling sector is presented in Annex **Overview RED II Article 15(7)**.

ANNEXES

Annex Overview EED

Article 14

Annex Map Demand areas

Annex Map Heating and cooling supply points

Annex Map District heating installations in 2018

Annex Overview RED II Article 15(7)