2019 EED Annual Report

26 April 2019
Report to the European Commission pursuant to Article 24(1) of the
Energy Efficiency Directive (2012/27/EU

ANNUAL REPORT EED 2019 – TABLE OF CONTENTS

1 INTRODUCTION

The 2019 EED Annual Report is Finland's fifth annual report pursuant to the Energy Efficiency Directive (2012/27/EU). In line with the reporting requirements under the Energy Efficiency Directive, this Annual Report presents statistics (indicators) from 2017 in accordance with Annex XIV to the Directive, important new measures taken in 2018 which contribute towards attainment of overall national energy efficiency targets, the energy savings achieved by the national government pursuant to Article 5 of the Directive in 2018, energy savings which have been achieved through the measures approved under Article 7(9) and implemented in 2017, and an assessment of the cumulative savings under Article 7 that have to be achieved by the end of 2020.

Finland's national cumulative energy savings target for 2014–2020 under Article 7 is 49 TWh_{cum}. The total impact on energy savings of the energy saving measures implemented in 2017 is around 6.5 TWh/year. At the end of 2020, the estimated cumulative impact on energy savings of the measures implemented between 2014 and 2020 will be 91.7 TWh_{cum}.

Finland's central government energy savings target for the period 2014–2020 is 8,225 MWh. The energy savings achieved through measures implemented between 2014 and 2018 and in force in 2019 amount to 14,941 MWh. 14,562 MWh of those will have a long-lasting impact and still be in force up until 2020.

The measures having the most significant impact on energy efficiency in 2018 are the new regulations providing guidance for more energy-effective building, the new energy-efficiency work group set up to establish new measures for the period from 2021 to 2030 and the new allocation of EUR 25 million introduced in 2018 for measures implementing the medium-term climate programme and the national energy and climate strategy.

For indicators, the Energy Efficiency Directive requires the submission of data for 2017. In those sectors in which energy consumption remains stable or increases in comparison to the previous year, an analysis of the changes is required. Indicators have been presented numerically for the years 2016 and 2017 and graphically for the period from 2000 to 2017.

2 FINNISH INDICATIVE NATIONAL ENERGY EFFICIENCY TARGET FOR 2020

Finland's indicative national energy efficiency target for 2020 is a final energy consumption level of 310 TWh (26.6 Mtoe). This corresponds to a level of primary energy consumption of 417 TWh (35.86 Mtoe). The GDP value for 2020 used in the various scenarios is EUR 159 billion (EUR 134.7 billion at 2000 prices in 2010). The national targets, which are based on the Energy and Climate Strategy drawn up in 2008 and updated in 2013, were notified to the Commission in the 2013 EED Annual Report. The targets for 2020 were not changed in the new Energy and Climate Strategy drawn up in 2016.

According to data from Eurostat, Finland's primary energy consumption in 2017 was 369 TWh (31.7 Mtoe) and total final energy consumption was 293 TWh (25.2 Mtoe).

3 INDICATORS AND STATISTICAL INFORMATION ON COMBINED HEAT AND POWER (CHP) SET OUT IN ANNUAL REPORTS

Indicators

Table 1 shows the indicators required to be set out in the EED Annual Report for the years 2016 and 2017. On the basis of a comparison of those two consecutive years, no far-reaching conclusions can be made with regard to changes in energy efficiency. The situation in Finland is strongly influenced by the weather in a particular year (demand for heating) and the production volumes of energy-intensive industries.

Table 1. Energy consumption statistics for 2016 and 2017

	Indicator	2016	2017	Unit
1	Total primary energy consumption	1,343,320	1,327,610	TJ
2	Gross final energy consumption	1,053,223	1,054,286	TJ
3	Final energy consumption – industry	511,781	514,080	TJ
4	Final energy consumption – transport	174,928	175,595	TJ
5	Final energy consumption – households[2]	244,610	241,275	TJ
6	Final energy consumption – services[2]	122,028	124,411	TJ
7	Gross value added – industry[3]	46,159	48,853	M€
8	Gross value added – services[3]	100,060	101,852	M€
9	Disposable income of households	119,003	121,513	M€
10	Gross domestic product (GDP)[4]	192,684	197,795	M€
11	Electricity generation from thermal power generation	49,602	47,513	GWh
12	Electricity generation from combined heat and power	21,618	21,472	GWh
13	Heat generation from thermal power generation	51,721	48,199	GWh
14	Heat generation from combined heat and power plants	34,228	33,197	GWh
15	Fuel input for thermal power generation	583,916	558,979	TJ
16	Passenger kilometres (pkm)[5]	Not available	80,871	million pass. km
17	Tonne kilometres (tkm)[6]	36,386	39,229	million tonne/km
18	Total population	5,487,308	5,503,297	inhabitants
19	*Average disposable income per household*	*44,828*	*45,339*	*€/household*

The indicators shown in the table in italics are mentioned in the guidance on reporting for Commission Annual Reports (2013) http://ec.europa.eu/energy/sites/ener/files/documents/20131106_swd_guidance_neeaps.pdf, but are not required by Part 1(a) of Annex XIV to the Directive on reporting under the Directive.

[2] The data from Eurostat contain free energy from heat pumps from 2017 on. The year 2016 has been made commensurate by adding the free energy from the use of heat pumps to the end use of the year in question from the data provided by Statistics Finland.

[3] At constant 2005 prices

[4] At constant 2010 prices

[5] Inland road, rail and vessel traffic. Owing to changes in calculation methods, the figures for 2016 cannot be compared with those for previous years. The figure for 2016 was reported by Statistics Finland as 71,000 million person-kilometres (source: Finnish Transport Agency).

[6] Inland road, rail and vessel traffic.

	INDICATOR	2016	2017	UNIT
20	*Total number of households*	*2,654,657*	*2,680,077*	*Number*
21	*Fuel input for combined heat and power plants*	*387,967*	*394,646*	*TJ*
22	*Losses in energy transfer and distribution (all fuels)*	*8,054*	*8,638*	*GWh*
23	*Separate production of district heating*	*62,978*	*54,009*	*TJ*
24	*Fuel inputs for separate production of district heating*	*72,148*	*63,068*	*TJ*

The data in the annual report for 2018 come primarily from Eurostat, which the Commission has mentioned in the optional Excel spreadsheet in the EED annual report. These data have been supplemented with data from Statistics Finland in cases where no Eurostat data have been available (indicators Nos 16, 17, 19, 20 and 21). Free energy from heat pumps has been added to the data of households for 2016 (indicator No 5) from data from Statistics Finland to make the data commensurate with the 2017 Eurostat data as free heat from heat pumps has been reported as of this year. Up until 2016, only data from Statistics Finland was used in annual reports.

The indicator data in the previous table, under Part 1 of Annex XIV to the Directive, are to be reported annually and are shown as a time-series in Annex 1 to the annual reports for 2000 to 2017. The data have been presented both year by year, in accordance with the Directive ('EED indicators'), and in the form of three-year rolling averages.

Analysis of changes in energy consumption

For annual reporting purposes, the Energy Efficiency Directive requires an analysis and assessment of changes in final energy consumption in sectors (industry, transport, households, services) in which this consumption has remained stable or has grown (Energy Efficiency Directive, Annex XIV, Part 1).

Primary energy consumption decreased by 1.2% in 2017 while total final energy consumption grew by 0.1%. Energy consumption by households decreased by 1.4%. In 2017, energy consumption grew by 0.4% in industry and in transport and by 2.0% in the service sector

Energy consumption in Finland is strongly influenced by annual fluctuations in heating needs The difference between a cold and a hot year alone can result in a more than 5% change in Finland's final energy consumption. The year 2017 was slightly colder than 2016 while the resident-weighted heating needs figure was 2.7% greater than the previous year.

Industry

Fuel consumption varies from year to year, depending on various factors. Fuel use is influenced by fuel and emission allowance prices, supply, possible tax changes, development of the industrial sector, structural factors, etc.

Industrial production volume indices grew by 3.2% in 2017 in comparison to the previous year and gross value added was 5.8% greater than in 2016.

Transportation

The growth in energy consumption in the transport sector can be explained by the increase in goods delivered. In freight transport, the number of tonne-kilometres increased by 7.8%. In passenger transport, no data commensurate with 2017 on persons carried are available in passenger-kilometres for 2016, but, according to the background data of VTT's LIPASTO model, vehicle kilometres for passenger cars grew by 1.0% since 2016. Vehicle-kilometres for lorries also increased by 1.0%.

Services

In the services sector, gross value added increased in 2017 by 1.8% in comparison with the previous year. Along with the pick-up in economic activity, a key factor leading to the increase in energy consumption was colder weather, resulting in an increased need for heating.

Statistics on combined heat and power (CHP) and district heating and cooling

Article 24 of the EED obliges Member States to submit, by the end of April, statistics on the year (x–2)[5] on national electricity and heat production from high and low efficiency cogeneration in relation to total heat and electricity production capacity. The Directive also requires Member States to provide statistics on district heating and cooling.

The Finnish national statistical authority (Statistics Finland) provided statistics on 2016 to Eurostat via the eDAMIS portal.

[5] x = current year

4 SIGNIFICANT MEASURES TAKEN IN THE PREVIOUS YEAR

The most important measures taken in 2018 were the introduction of decrees on nearly zero-energy building, the start of the work of the energy efficiency working group and the additional funding of EUR 25 million allotted to energy and climate measures.

The revised decree of the Ministry of Environment on the Energy Certificate as well as decrees on energy coefficients and on the energy efficiency of new buildings, with which guidelines are provided for nearly zero-energy building, entered into force at the beginning of 2018.[6]

In autumn of 2018, the Ministry of Economic Affairs and Employment set up an energy efficiency working group[7] to discuss the opportunities of improving energy efficiency and to propose measures that will enable Finland to achieve the energy savings targets defined in Article 7 of the Energy Efficiency Directive over the 2021–2030 period. Five thematic expert groups will be working in connection with the energy efficiency working group that will submit its final report by September 30, 2019.

A total of EUR 25 million was allotted in 2018 to the implementation of the midterm climate policy plan8 and of the national energy and climate strategy9 approved in 2016. Of this, a total of EUR 16 million was allotted to reducing transport greenhouse emissions. The amount was used for a purchase subsidy for all-electric cars, on conversion subsidies for old cars (EUR 6 million), on subsidies for the supply infrastructure of road fuel electricity and road fuel gas (EUR 4.5 million), on developing public transport (EUR 3.5 million) and on rail transport purchases (EUR 2 million). These subsidies are intended to continue in 2019–2021. In addition, money was allotted in 2018 to a scrapping bonus campaign (EUR 8 million) and on promoting walking and cycling (EUR 3.5 million). Thanks to the added funding received, the Energy Authority launched in 2018 ten pilot projects of regional energy counselling with the intention to extend them to cover each of the 18 Finnish regions in 2019. The Energy Authority has reserved a total of EUR 2.8 million for financing regional energy counselling in 2018−2022. The additional funding available to the Ministry of Environment will be mainly aimed at accelerating climate work in municipalities and regions.

In addition, the new energy performance contracts for 2017–202510, which will play a central part in Finland as regards achieving the cumulative energy savings target in 2014–2020 under Article 7 of the Energy Efficiency Directive, need to be mentioned. The aim is to bring the rate of coverage of the new energy performance contracts to at least the same level on which the period of validity of the previous energy performance contracts ended on 31 December 2016. By the end of 2018, this target level of coverage had been achieved.

[6] Legislation on the energy efficiency of buildings
[7] Press Release - TEM Energy Efficiency Working Group
[8] The Medium-term Climate Change Policy Plan for 2030
[9] Energy and Climate Strategy
[10] Energy performance contracts for 2017–2025

5 CENTRAL GOVERNMENT BUILDINGS – ARTICLE 5

In implementing Article 5, Finland chose to perform the alternative actions under Article 6. The notice of implementation[11] provided to the Commission on 18 December 2013 defined the central government building stock for the purposes of the Directive (884,000 m^2) and the energy savings corresponding to a rate of building renovation of 3% of surface area annually during the 2014–2020 period (8 225 MWh), as well as the eight energy efficiency measures which will bring about those energy savings.

Table 2. Energy savings target under Article 5 of the Energy Efficiency Directive and the energy savings achieved for the 2014–2020 period

YEAR	SAVINGS TARGET MWh	LONG-TERM SAVING ACHIEVED MWh	SHORT-TERM SAVING ACHIEVED MWh	CURRENT SAVING IN FORCE, TOTAL MWh
2014	**1,285**	**878**	**7,948**	**8,826**
2015	**2,531**	**3,358**	**10,513**	**13,871**
2016	**3,741**	**6,331**	**5,353**	**11,684**
2017	**4,913**	**9,534**	**3,706**	**13,240**
2018	**6,051**	**12,844**	**1,298**	**14,142**
2019	7,154	*14,562*	*(379)*	*14,941*
2020	8,225	*14,562*	–	*14,562*

The long-term impact of the measures implemented in 2018 (2,950 MWh) on energy savings results from Action 3 (1,169 MWh), which is referred to in the notice on the implementation of Article 5, and from Action 6 (1,781 MWh). When considering the savings brought about by the latter Action 6, space efficiency improvements in Senate and defence force properties and the resultant reduction in heat energy needs for those spaces were taken into account. For actions with a lasting impact, the energy saving is calculated in full for the years following the implementation year. For the implementation year, half of the impact of energy savings is taken into account.

The short-term impact of savings generated by measures implemented in 2017 results from actions 1 and 4 referred to in the notice of implementation of Article 5. Actions 2, 5, 7 and 8 were not implemented in 2018. Without any new actions, the short-term impact of energy saving in 2019 is currently 379 MWh. The short-term impact of the savings is calculated in full for the implementation year and for the following years.

The combined impact of the measures implemented in the years 2014–2018 is 14,142 MWh in 2018. Without any new actions, the combined impact would be 14,941 MWh in 2019 and 14,562 MWh in 2020. Of the overall energy savings target pursuant to Article 5 (8 225 MWh), around 177% has been achieved after five years of operation, i.e. savings have reached the target of greater than 6,337 MWh.

[11] http://ec.europa.eu/energy/sites/ener/files/documents/2013_fi_eed_article5_fi.pdf

6 ENERGY SAVINGS– ARTICLE 7

The Finnish authorities chose so-called alternative policy measures in order to implement Article 7 of the Energy Efficiency Directive Finland's national cumulative energy saving target under Article 7 is 49 TWh_{cum}.

When following-up on implementation of the savings target under Article 7 of the Energy Efficiency Directive, energy savings resulting from energy saving measures implemented during the 2014–2020 period can be taken into account. The annual EED report for 2017 was enclosed as Annex 1 to the national energy efficiency plan (NEEAP-4[12]) for 2017. Annex 3 to the Annual Report presented detailed descriptions of eight energy efficiency measures notified for the purpose of implementing Article 7 and the procedure for calculating cumulative energy savings.

Pursuant to the Directive, the new annual savings effect of the previous year and an assessment of the cumulative impact of savings under the Directive in the two periods reported (2014–2016 and 2017–2020) and the total for the entire 2014–2020 period are presented once a year. A new annual energy saving must be reported from the year (x-2), in which x is the current year.

The impact of measures implemented in 2017 on energy savings, an updated assessment of the cumulative impact of savings under Article 7 for the 2014–2020 period and for the 2014–2016 and 2017–2020 periods are presented in Table 3. The new savings in 2014–2017 under Article 7 and the cumulative saving in the periods of implementation have been presented in Annex 2. The reported cumulative savings exceed Finland's cumulative target for the 2014–2020 period under Article 7 of the EED.

Table 3. Energy efficiency actions and their cumulative impacts on energy savings, as set out in the national energy efficiency programme and an assessment of their cumulative energy savings impact (TWh_{kum}) for different periods.

ENERGY EFFICIENCY ACTION	YEAR2017[1] [3] GWh	PERIOD 1[14] 2014-2016 TWh_{kum}	PERIOD 2[15] 2017-2020 TWh_{kum}	TOTAL[16] 2014-2020 TWh_{kum}
KETO-1 ENERGY PERFORMANCE CONTRACTING ACTIVITIES	1,619	22.37	11.52	33.89
KETO-2 TAXATION OF TRANSPORT FUELS/ROAD TRANSPORT	2,710	9.15	10.51	19.66
KETO-3 ENERGY AUDIT ACTIVITIES	53	1.34	0.44	1.78
KETO-4 ENERGY PERFORMANCE CONTRACT ACTIVITIES/ENERGY SERVICES OPERATIONAL PROGRAMME AND HÖYLÄ ENERGY EFFICIENCY AGREEMENT (ON OIL-HEATED BUILDINGS) – CUSTOMERS	1,139	3.43	4.53	7.95
KETO-5 HEAT PUMP HEATERS OF SINGLE-FAMILY AND TERRACED HOUSES	283	8.06	2.75	10.80
KETO-6 INVESTMENTS IN A HEATING PLANT	99	1.25	1.05	2.30
KETO-7 ENERGY EFFICIENCY RULES FOR RENOVATED BUILDINGS AND START-UP GRANTS FOR MAJOR RENOVATIONS	231	3.94	2.11	6.06
KETO-8 ENERGY EFFICIENCY RULES FOR NEW BUILDINGS	387	6.18	3.11	9.28
TOTAL	**6,520**	**55.70**	**36.02**	**91.7217**

[12] https://ec.europa.eu/energy/sites/ener/files/documents/fi_neeap_2017_fi.pdf

New energy saving in 2017

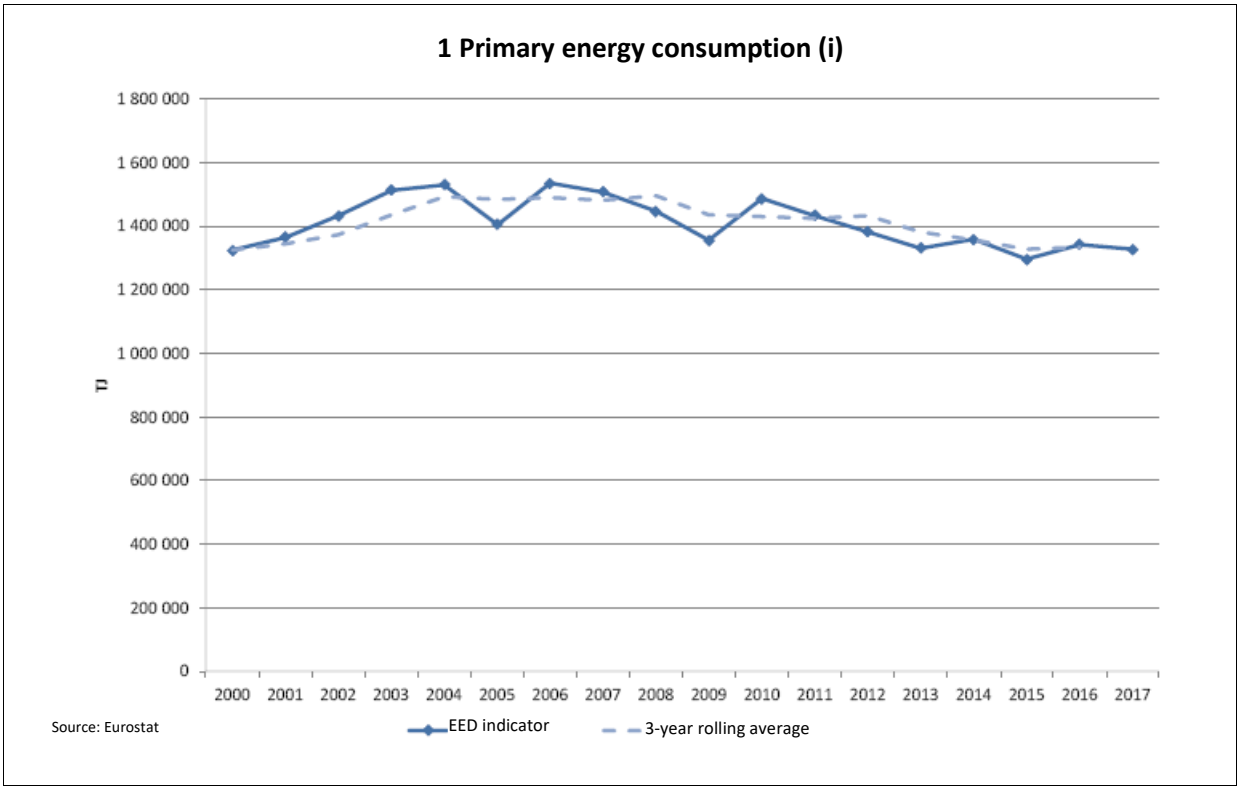
[14] Cumulative impact on savings in 2020 of measures realized during the period 1 (2014–2016)

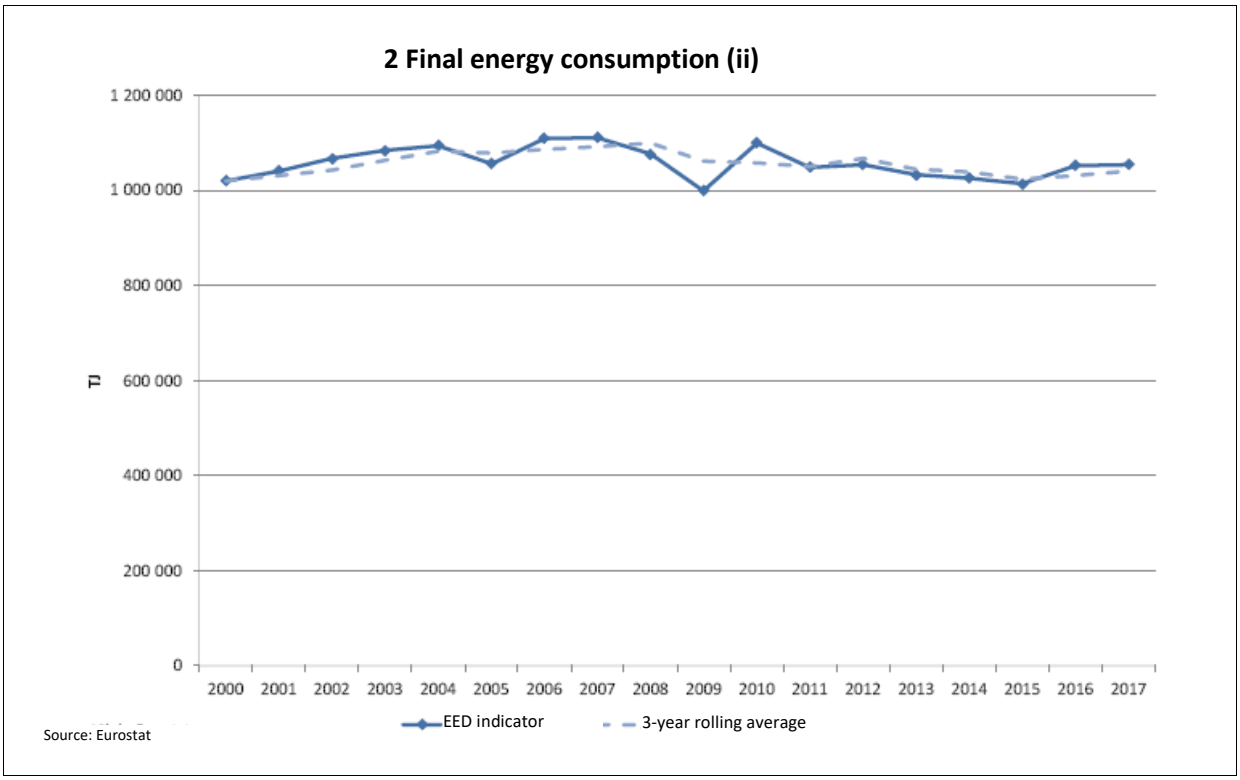
[15] Assessment of the cumulative impact on savings in 2020 of actions implemented in period 2 (2017–2020)

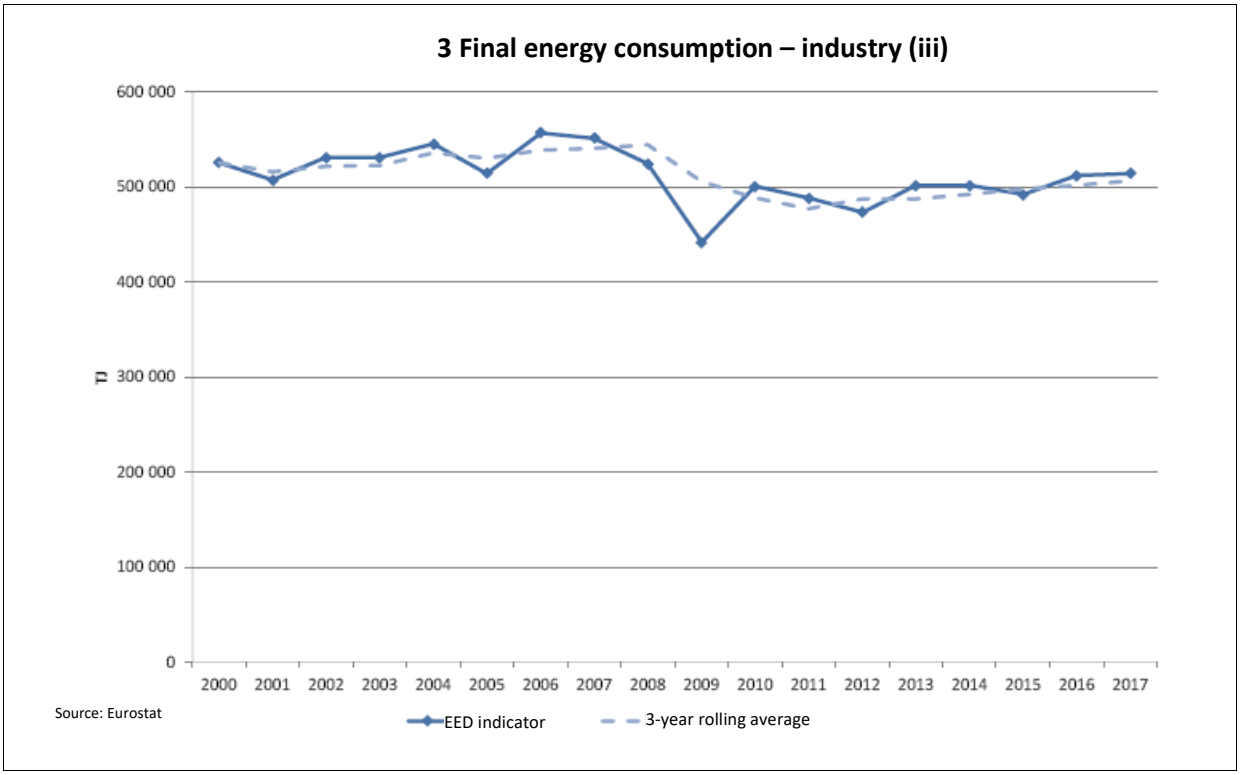
[16] Assessment of the cumulative impact on savings in 2020 under Article 7 in the period 2014–2020

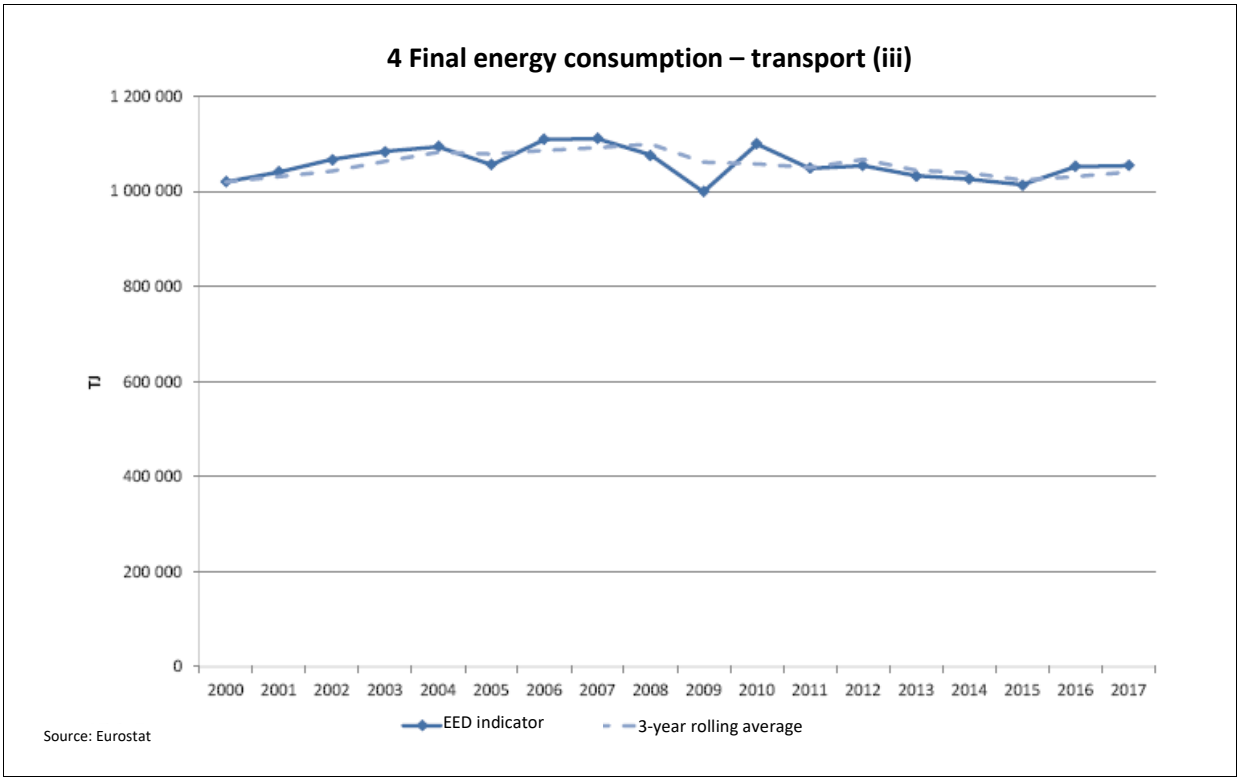
Finland's national target under Article 7 is 49 TWh_{cum}.

ANNEX 1 EED ANNUAL REPORT– INDICATOR ILLUSTRATIONS

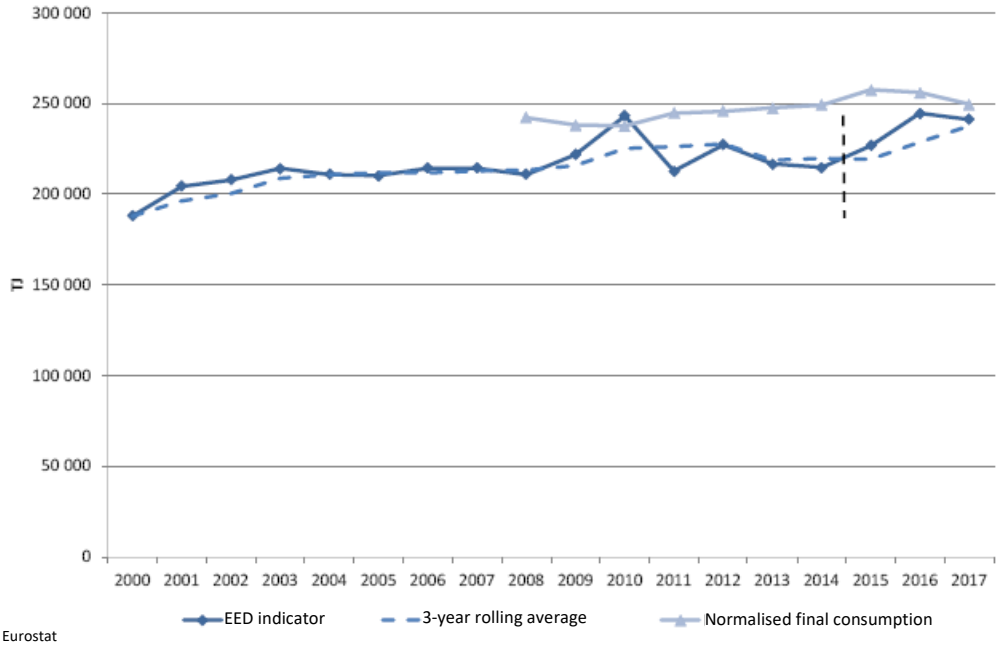





3 Final energy consumption – industry (iii)
600 000
500 000
400 000
300 000
200 000
100 000
0
TJ
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
3-year rolling average
Source: Eurostat


4 Final energy consumption – transport (iii)
1 200 000
1 000 000
800 000
600 000
400 000
200 000
0
TJ
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
3-year rolling average
Source: Eurostat

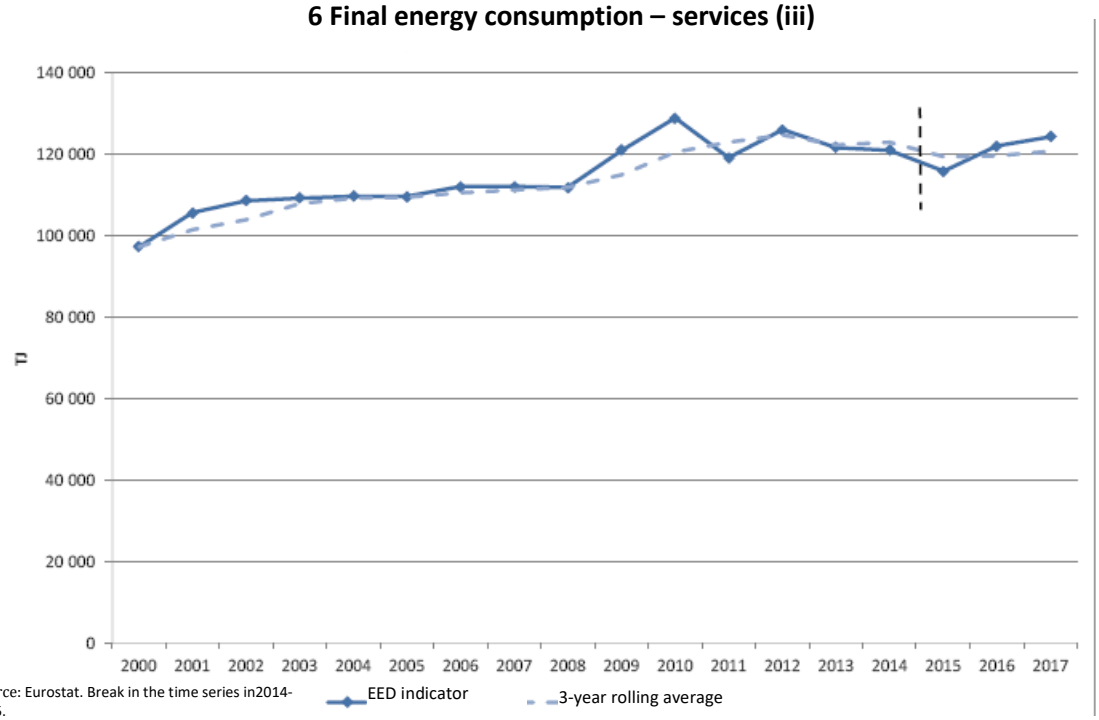
5 Final energy consumption – households (iii)



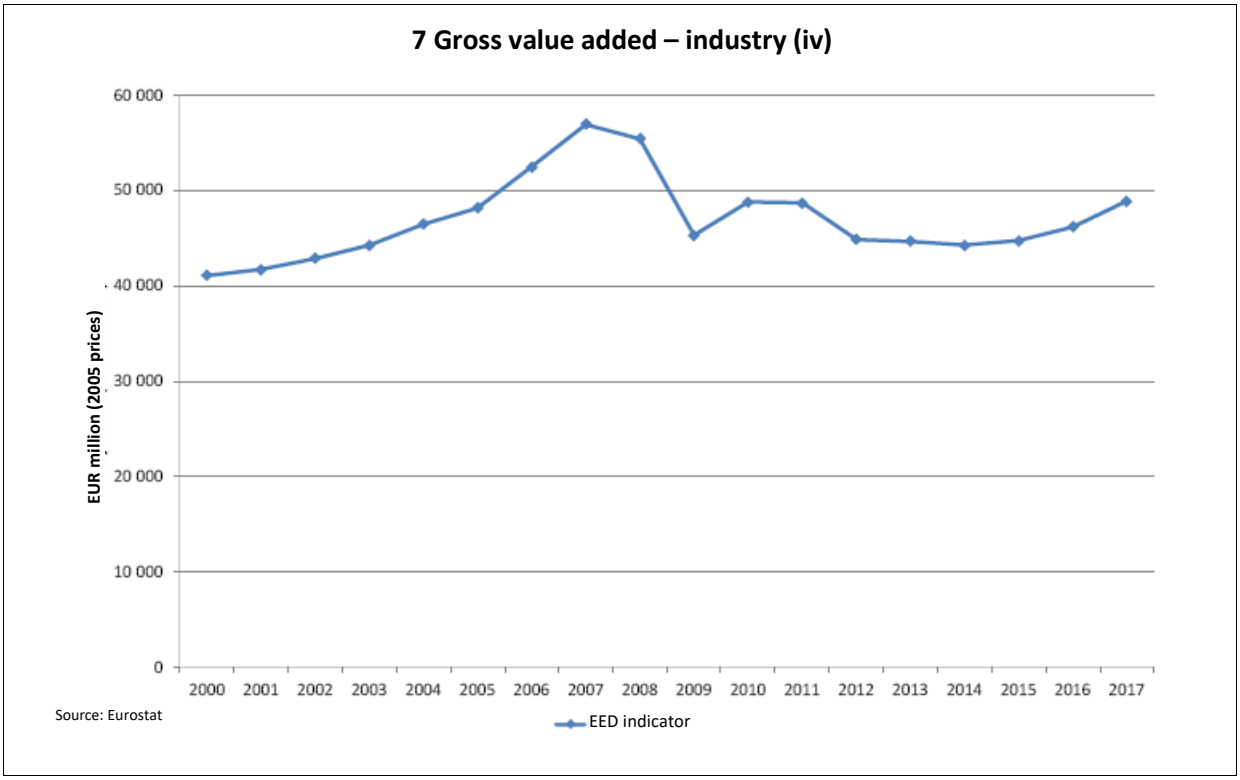
Source: Eurostat

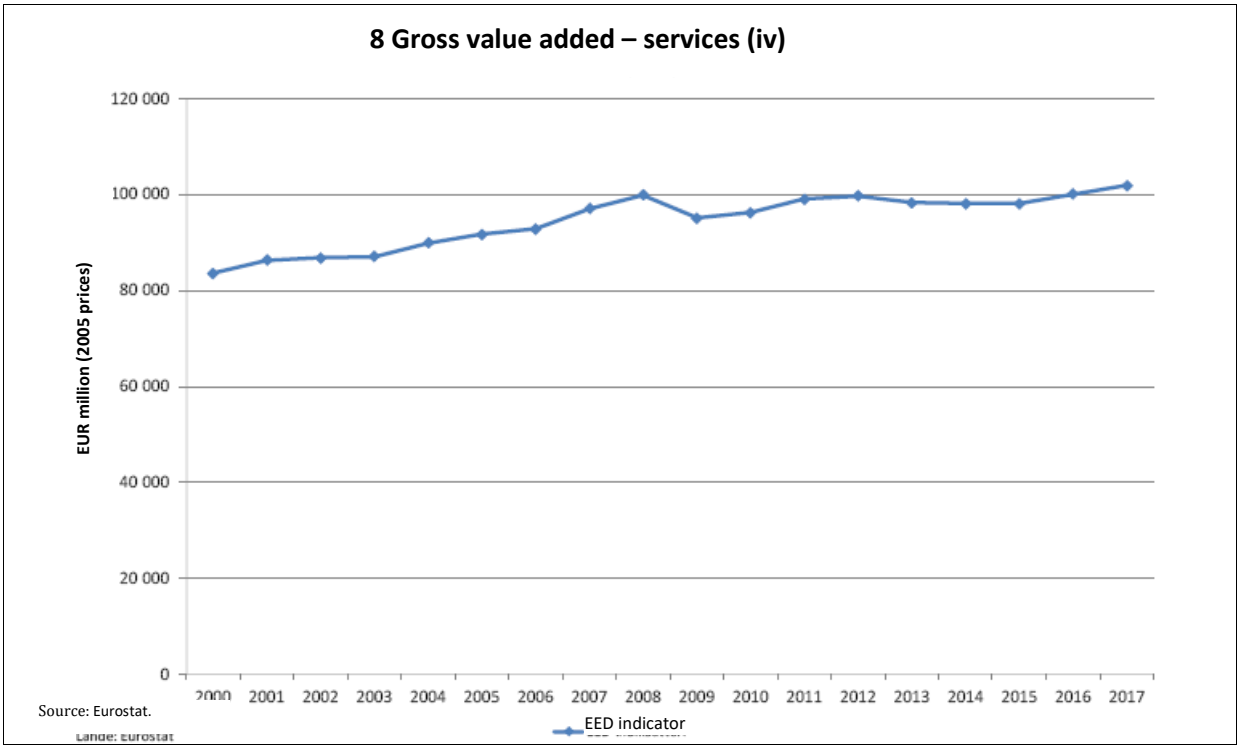
Source: Eurostat. Normalised data obtained using data from Statistics Finland, as the time series in question is not commensurate with other data. Break in the time series in 2014-2015.

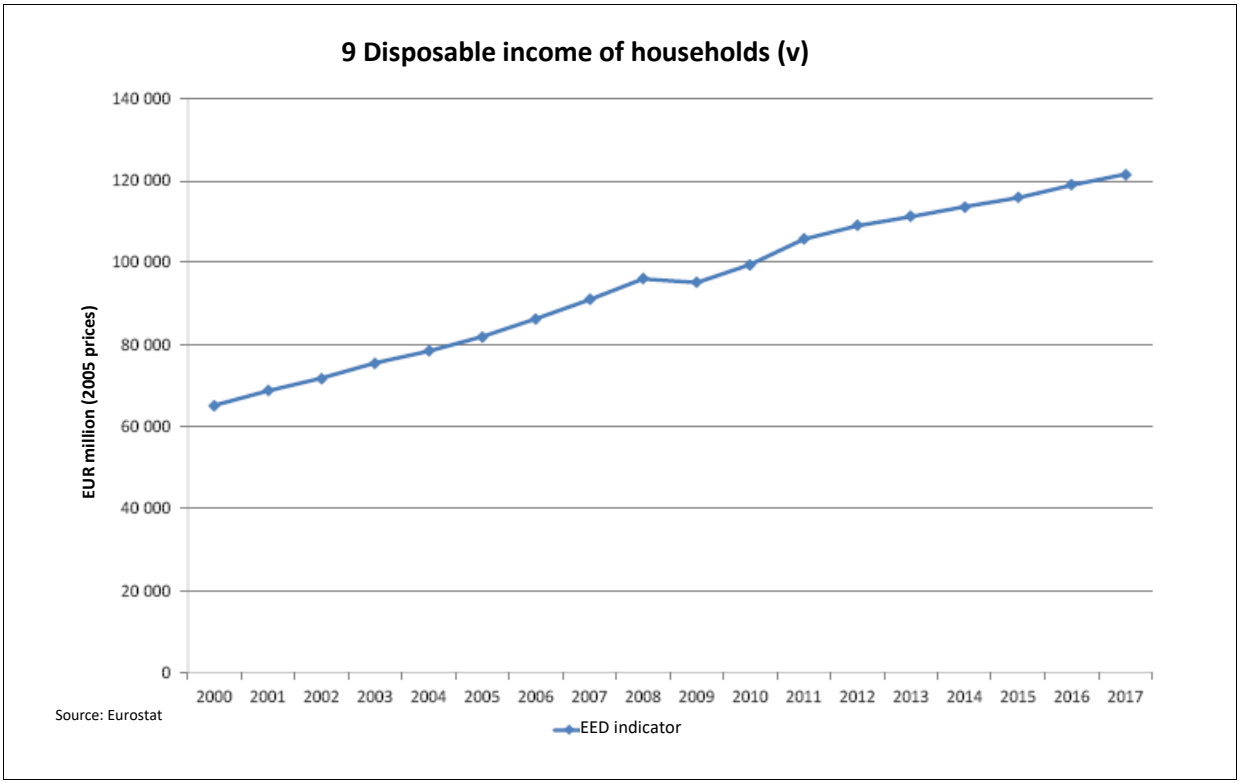
6 Final energy consumption – services (iii)

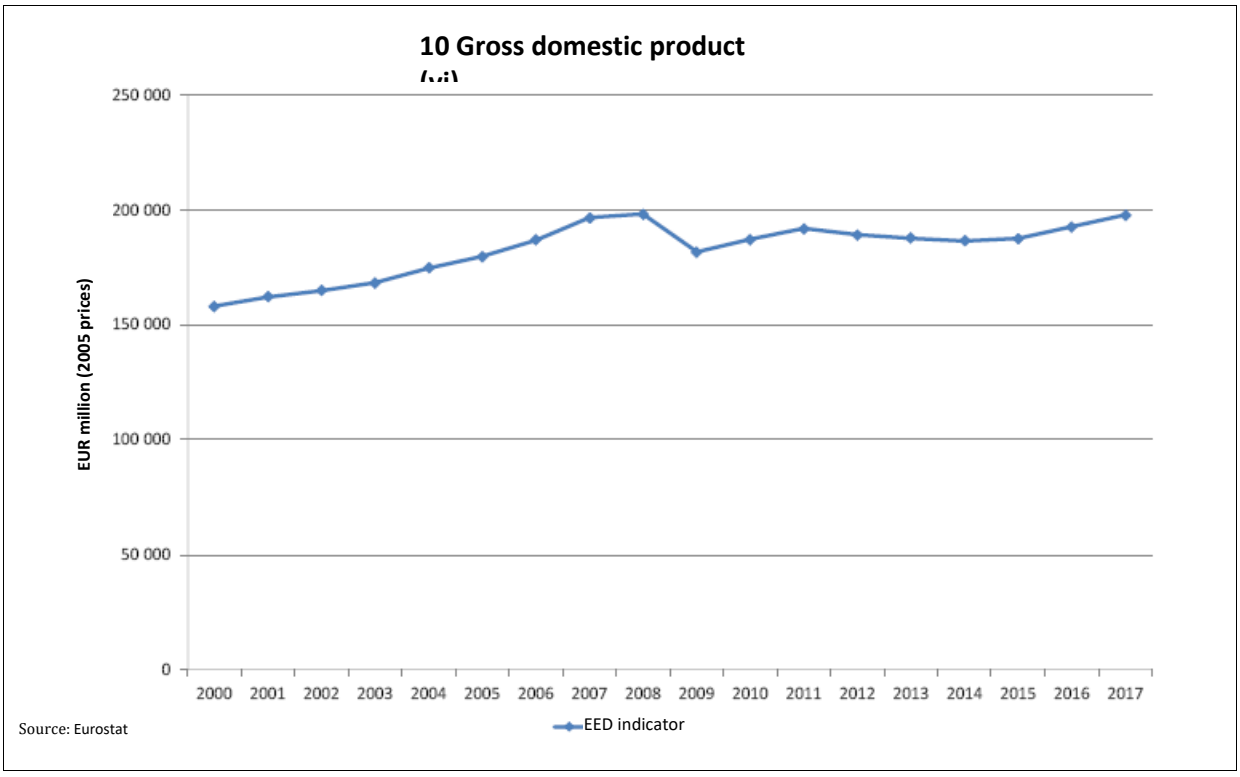


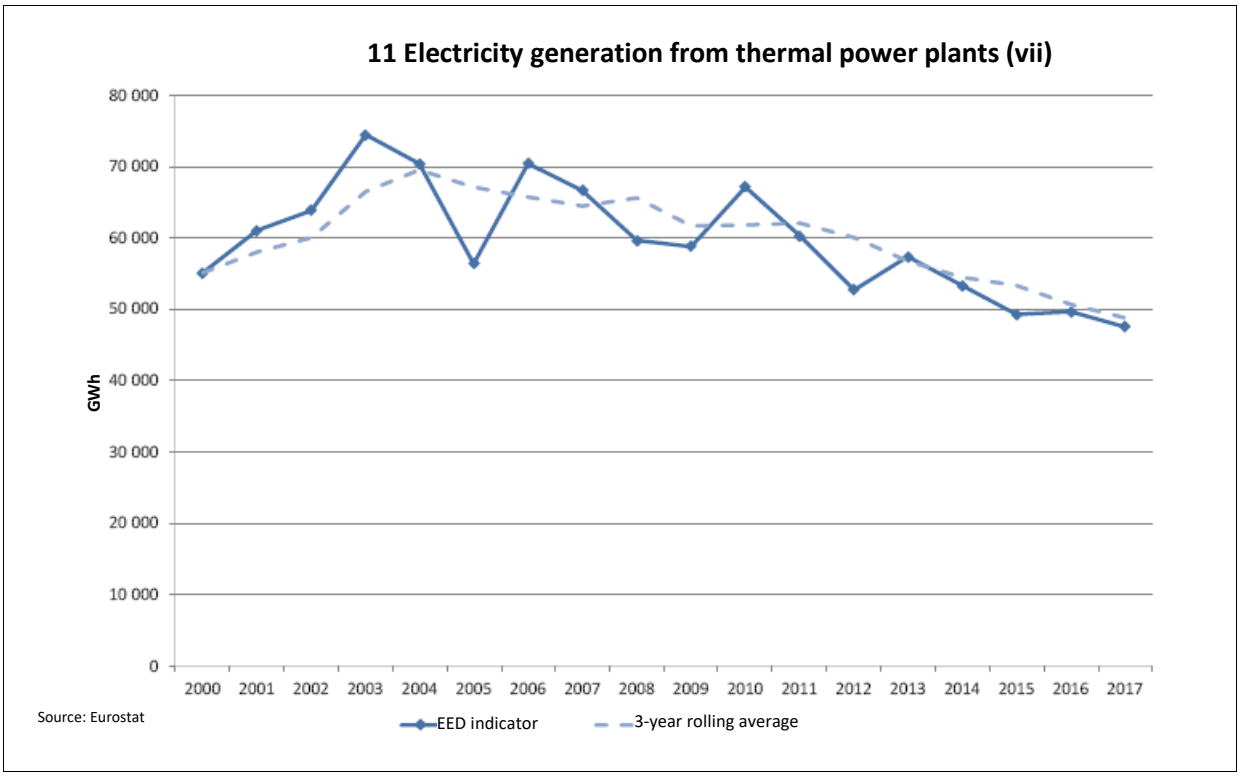
Source: Eurostat. Break in the time series in2014-2015.

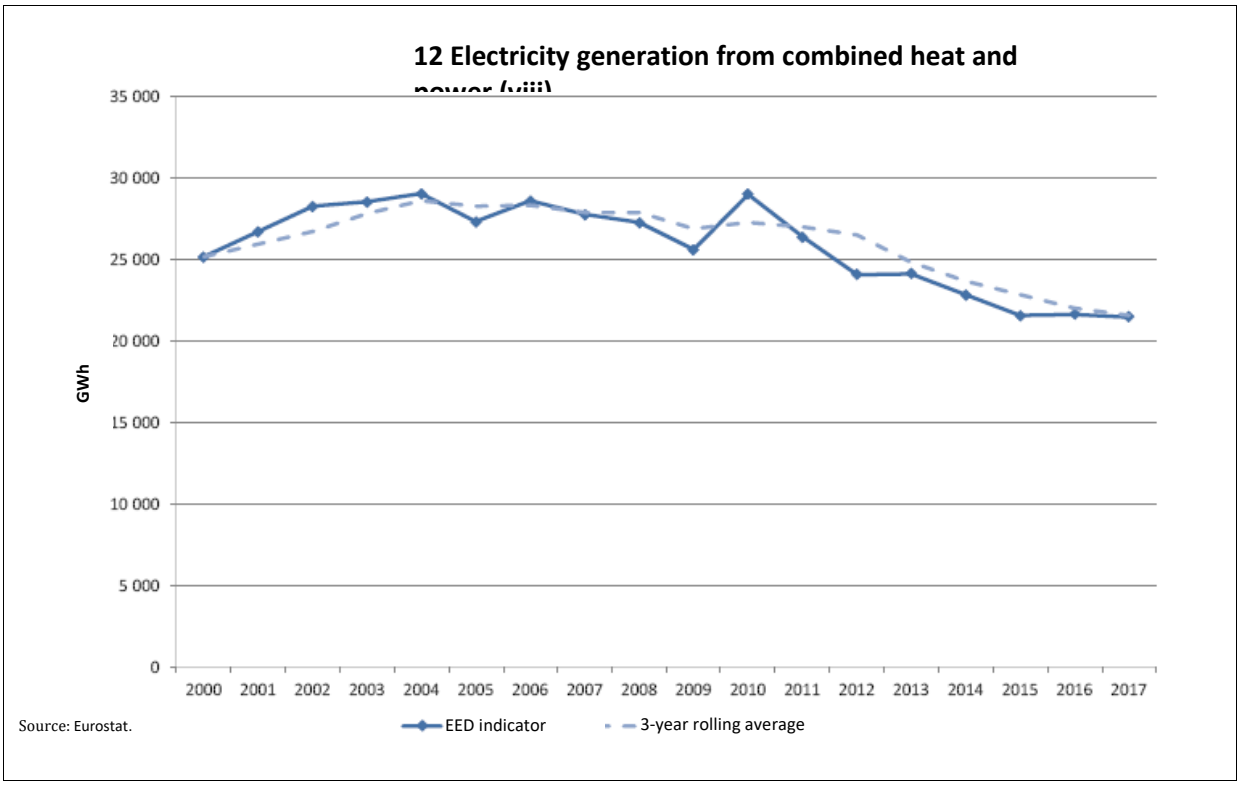

7 Gross value added – industry (iv)
60 000
50 000
40 000
30 000
20 000
10 000
0
EUR million (2005 prices)
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
Source: Eurostat

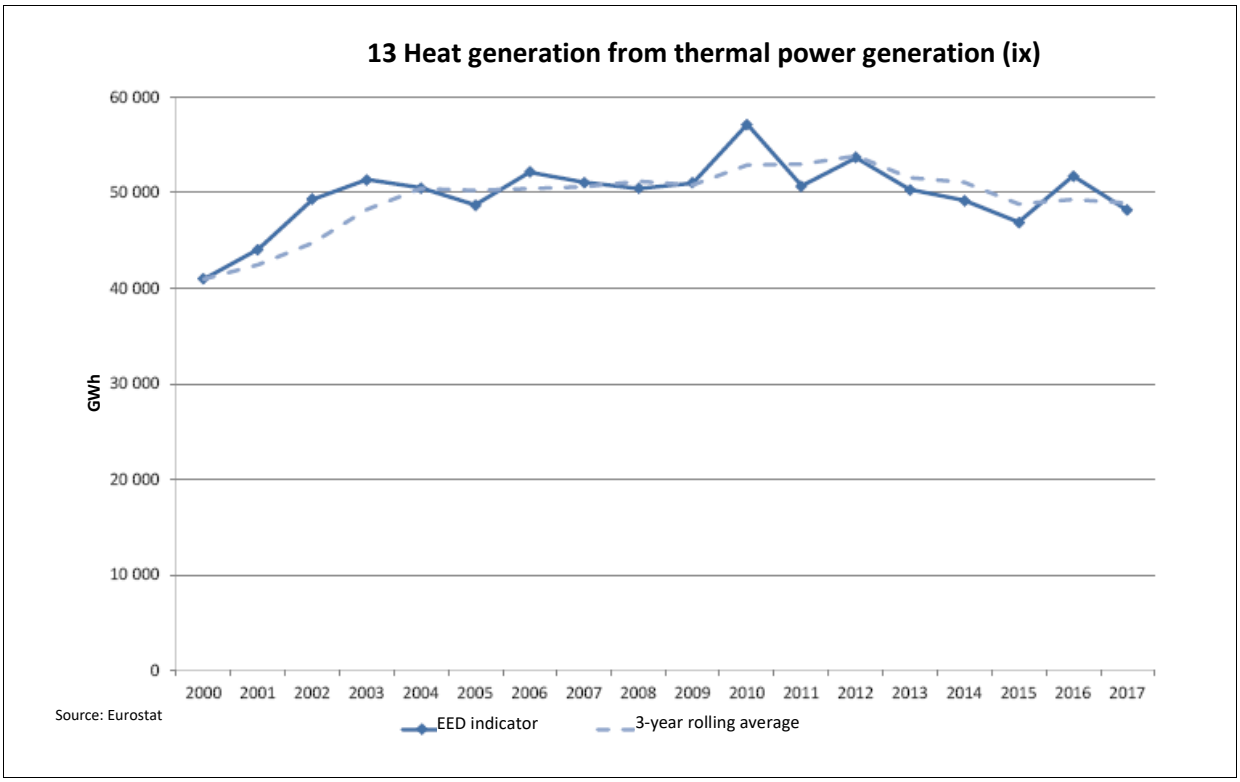

8 Gross value added – services (iv)
120 000
100 000
80 000
60 000
40 000
20 000
0
EUR million (2005 prices)
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
Source: Eurostat.

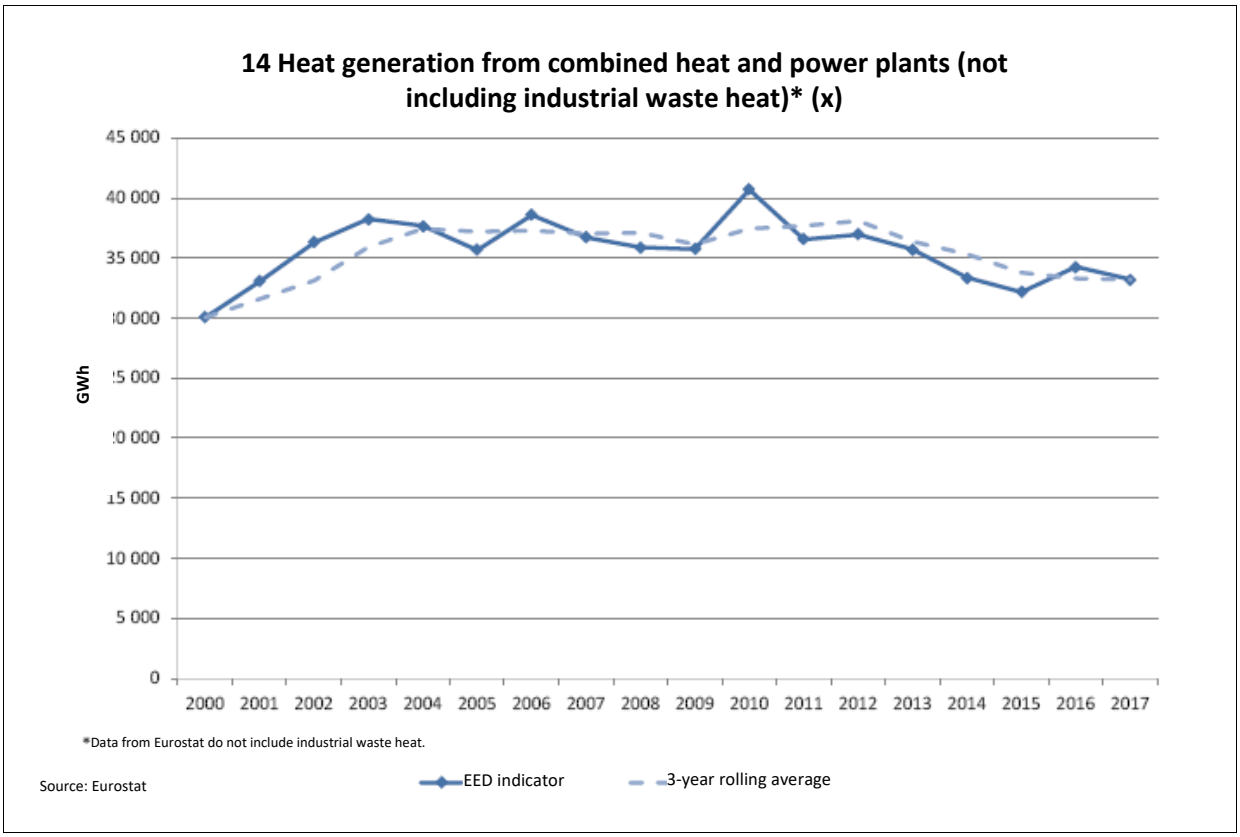

9 Disposable income of households (v)
140 000
120 000
100 000
80 000
60 000
40 000
20 000
0
EUR million (2005 prices)
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
Source: Eurostat

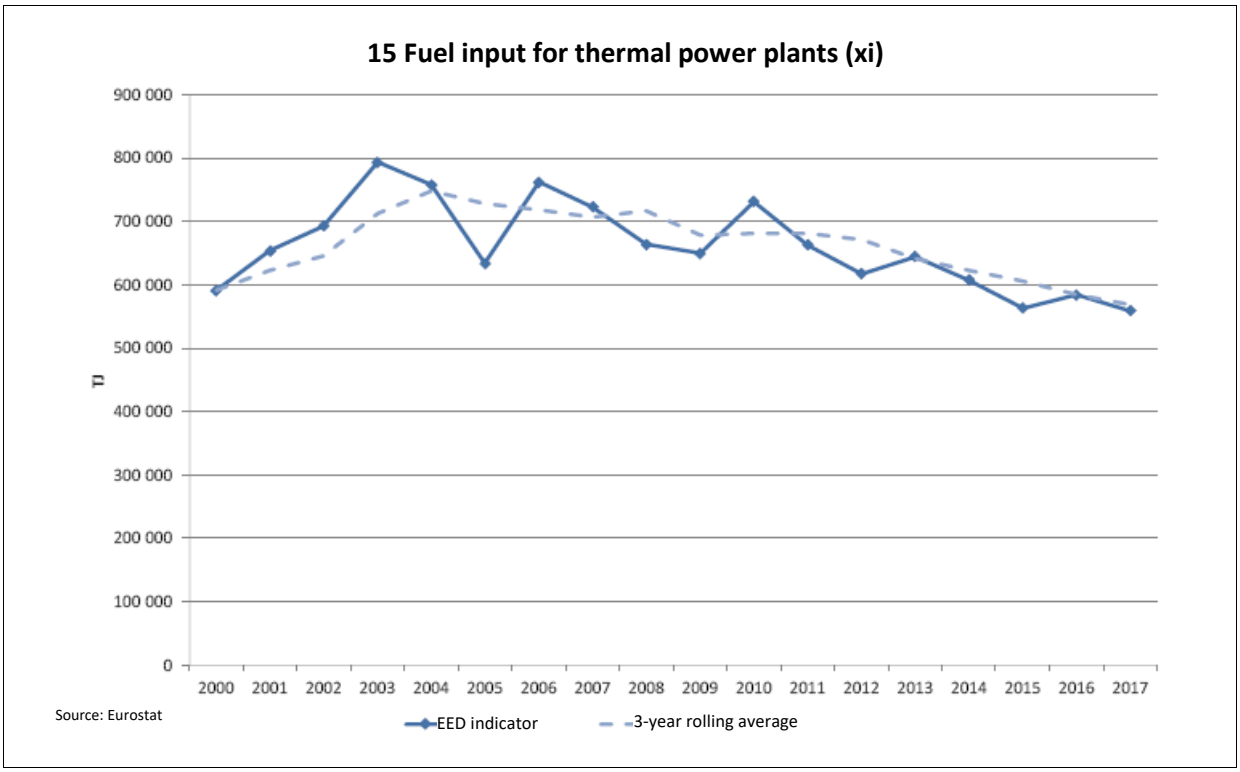

10 Gross domestic product
250 000
200 000
150 000
100 000
50 000
0
EUR million (2005 prices)
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
Source: Eurostat

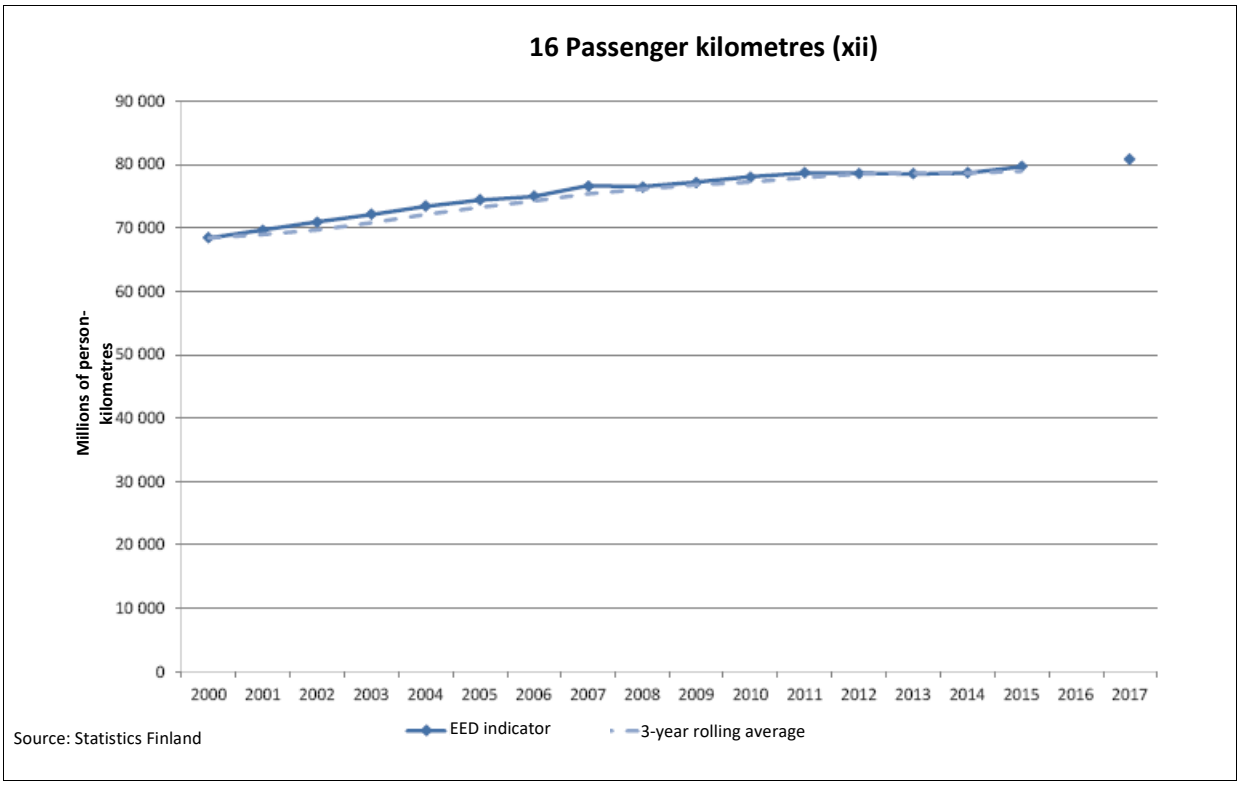

11 Electricity generation from thermal power plants (vii)
80 000
70 000
60 000
50 000
40 000
30 000
20 000
10 000
0
GWh
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
3-year rolling average
Source: Eurostat


12 Electricity generation from combined heat and
35 000
30 000
25 000
20 000
15 000
10 000
5 000
0
GWh
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
3-year rolling average
Source: Eurostat.

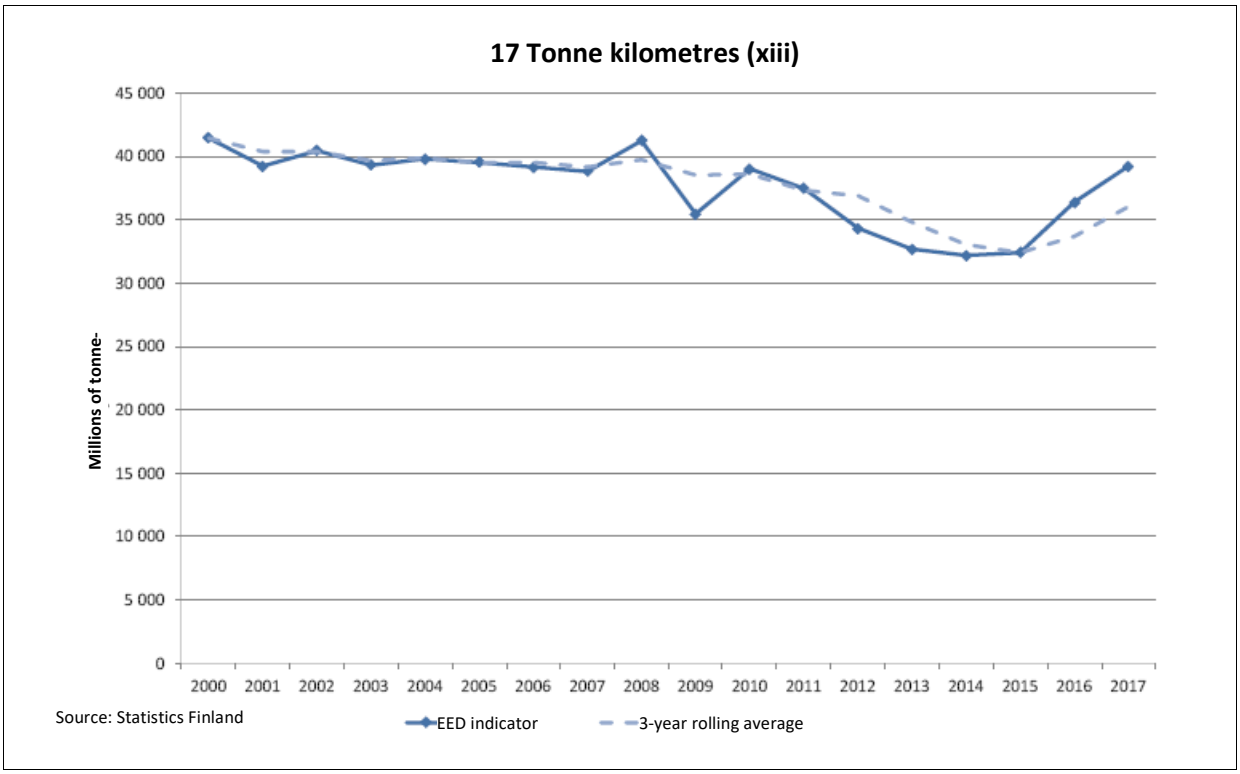

13 Heat generation from thermal power generation (ix)
60 000
50 000
40 000
30 000
20 000
10 000
0
GWh
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
EED indicator
3-year rolling average
Source: Eurostat


14 Heat generation from combined heat and power plants (not including industrial waste heat)* (x)
45 000
40 000
35 000
10 000
5 000
0
GWh
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
*Data from Eurostat do not include industrial waste heat.
EED indicator
3-year rolling average
Source: Eurostat

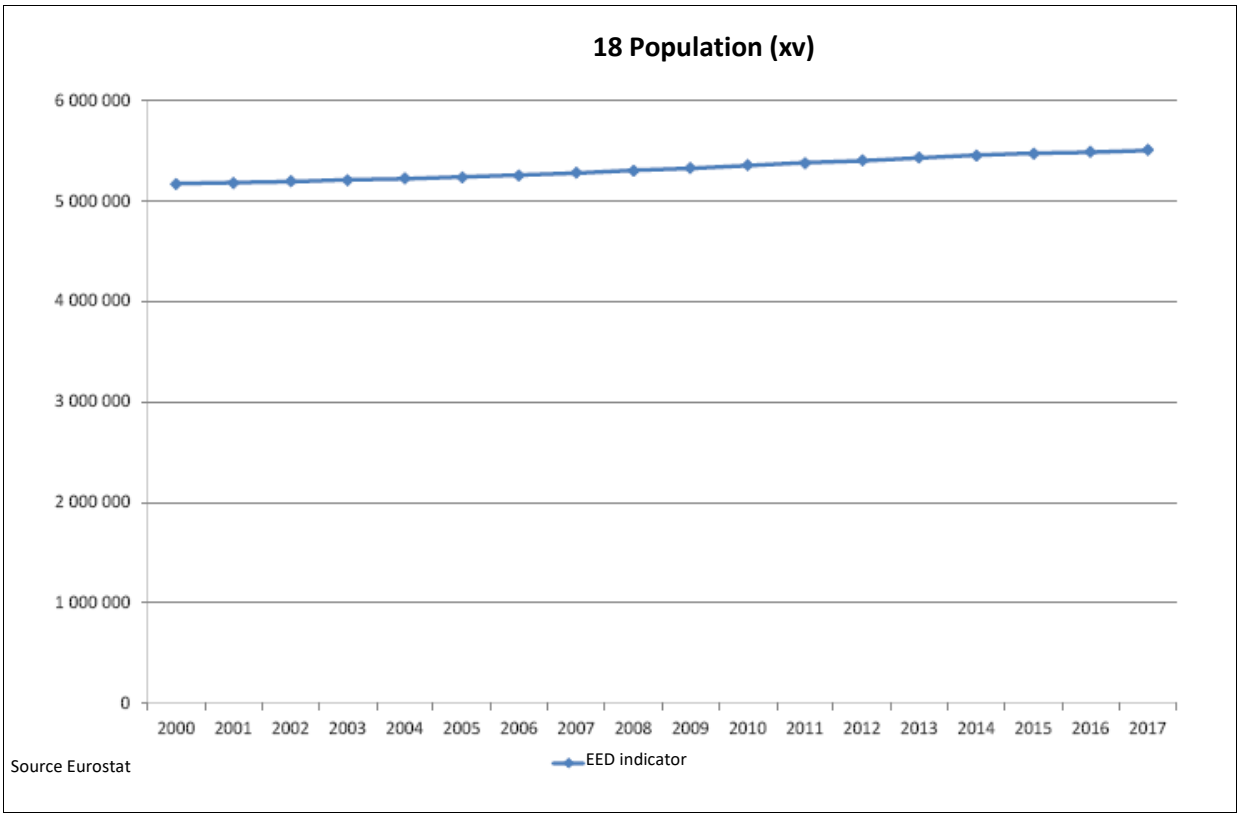




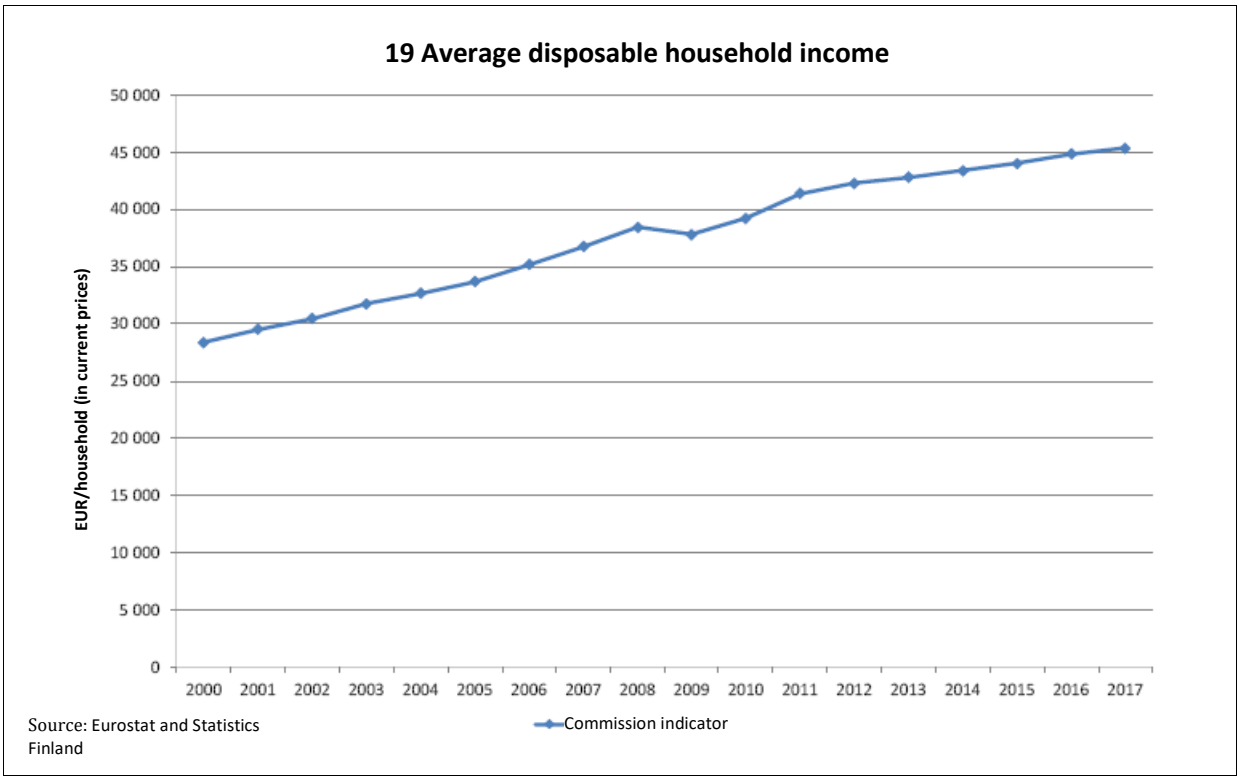
NB: In the data for 2016, there is such a significant break in the time series that the reporting is not meaningful.



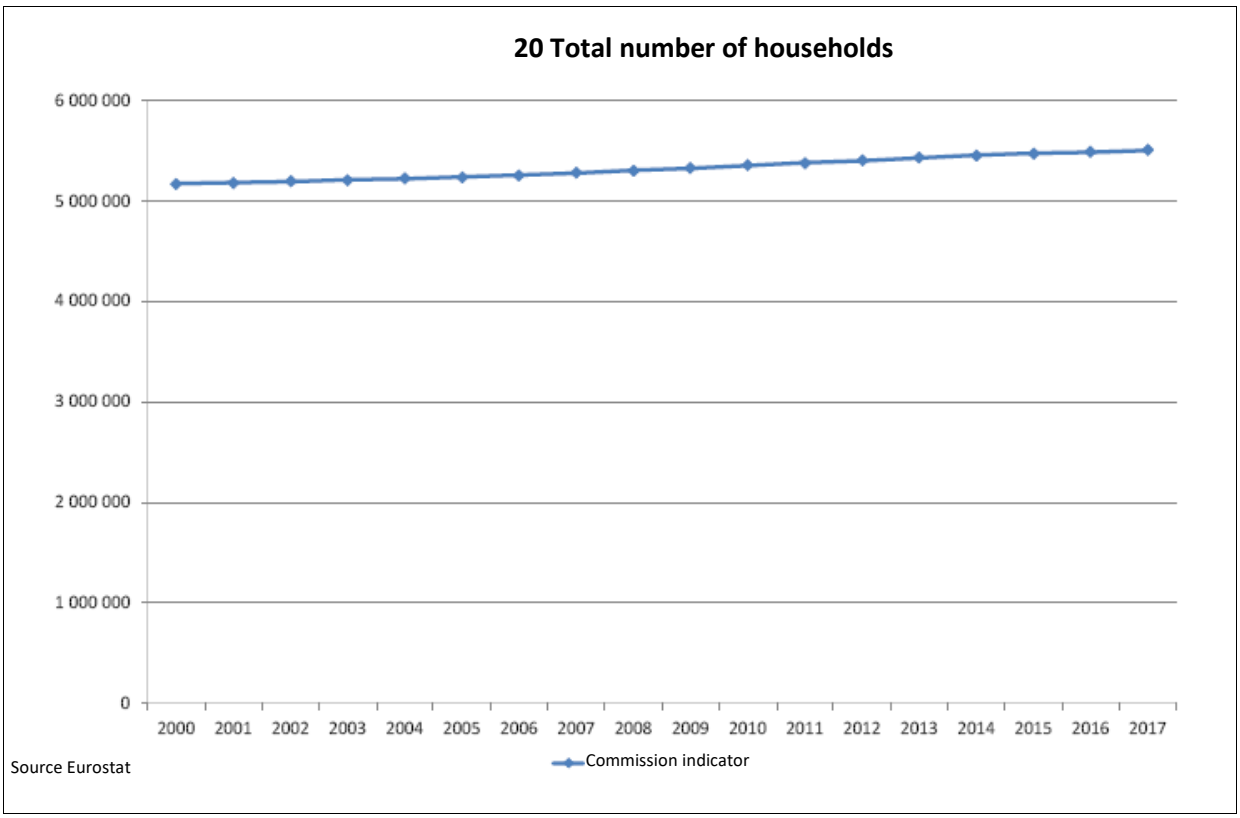
Source: Statistics Finland



Source Eurostat

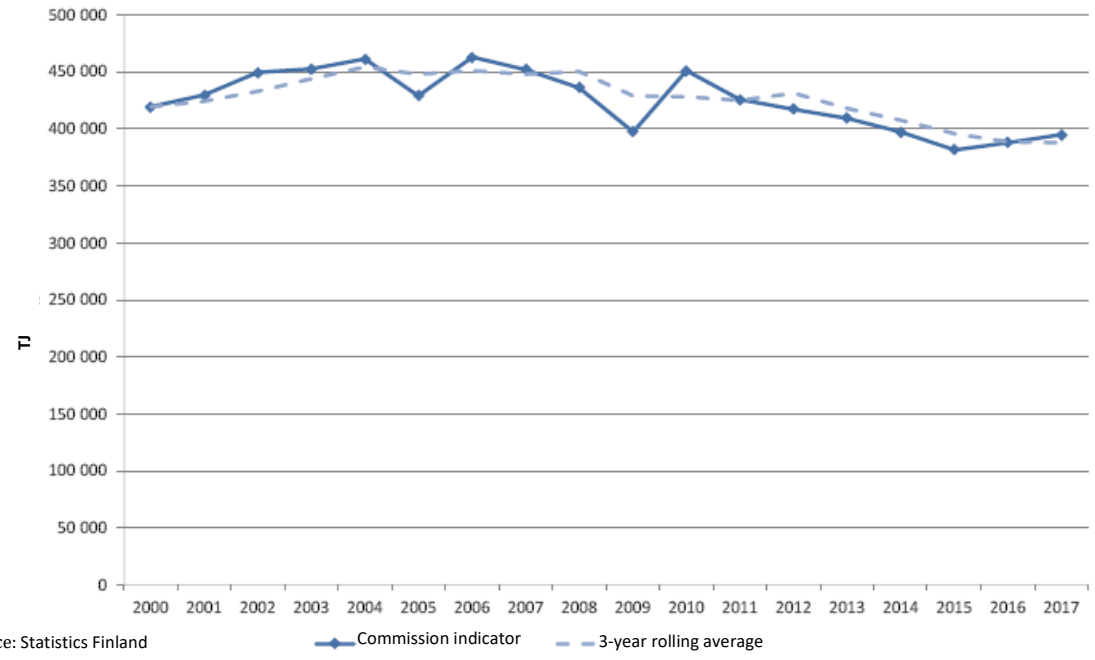


Source: Eurostat and Statistics Finland



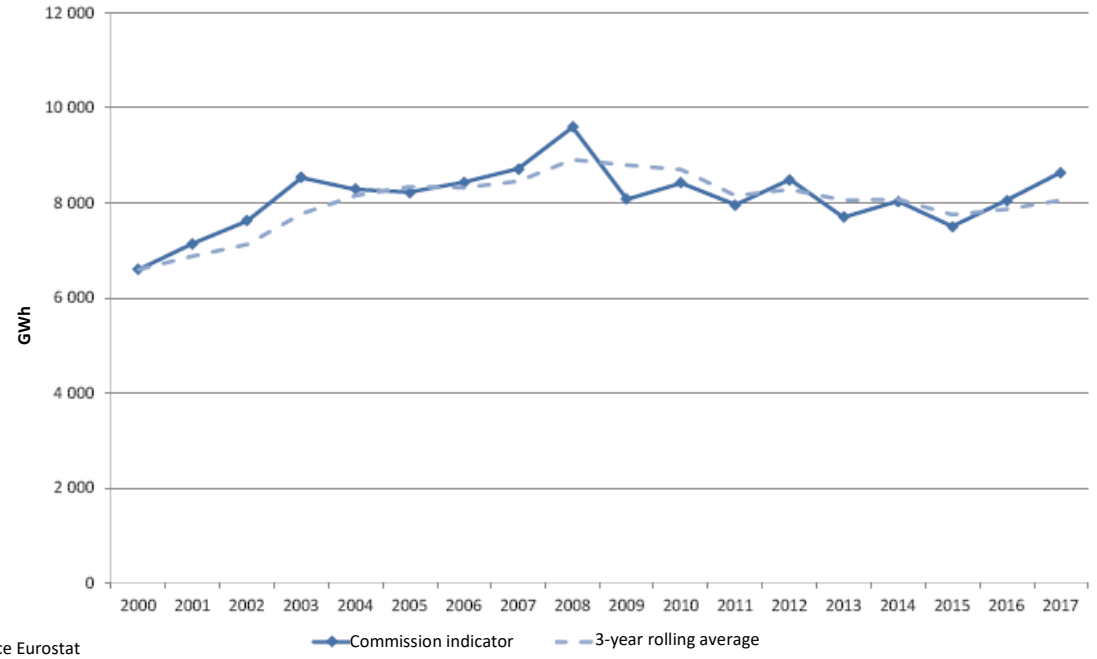
Source Eurostat

21 Fuel inputs for combined heat and power plants

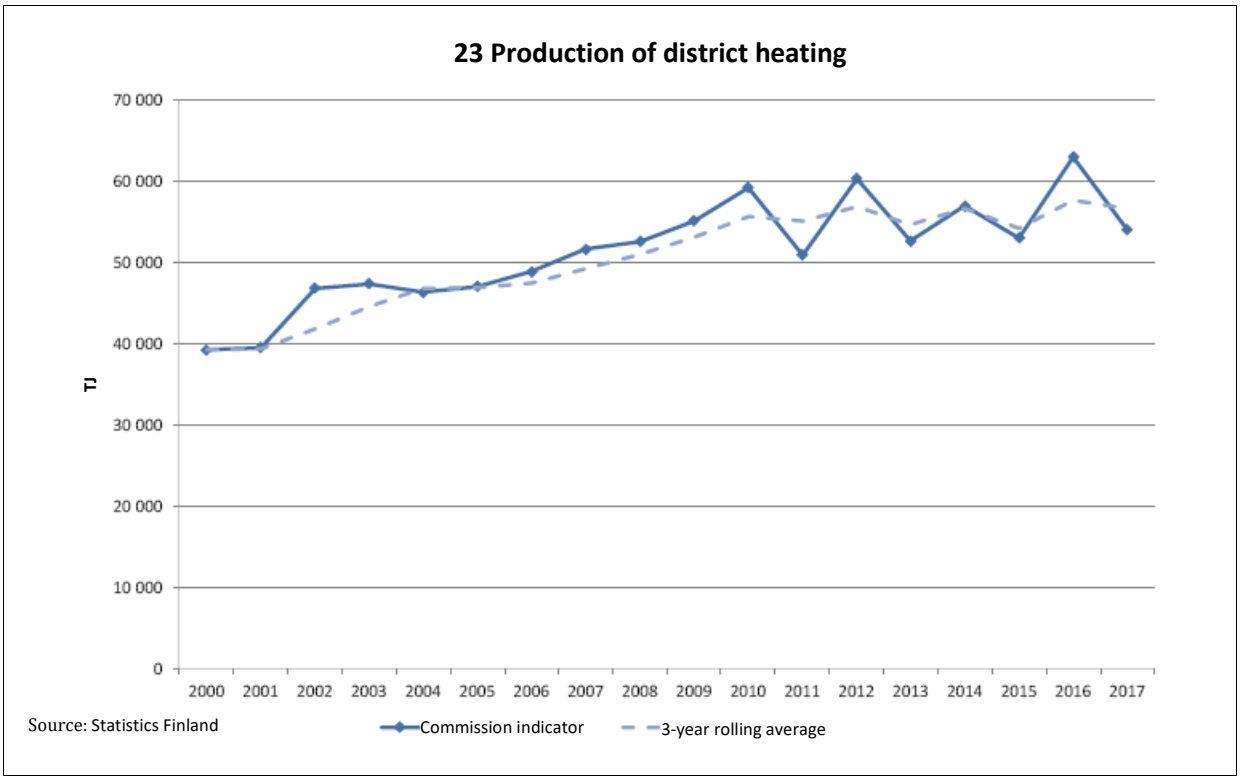


Source: Statistics Finland

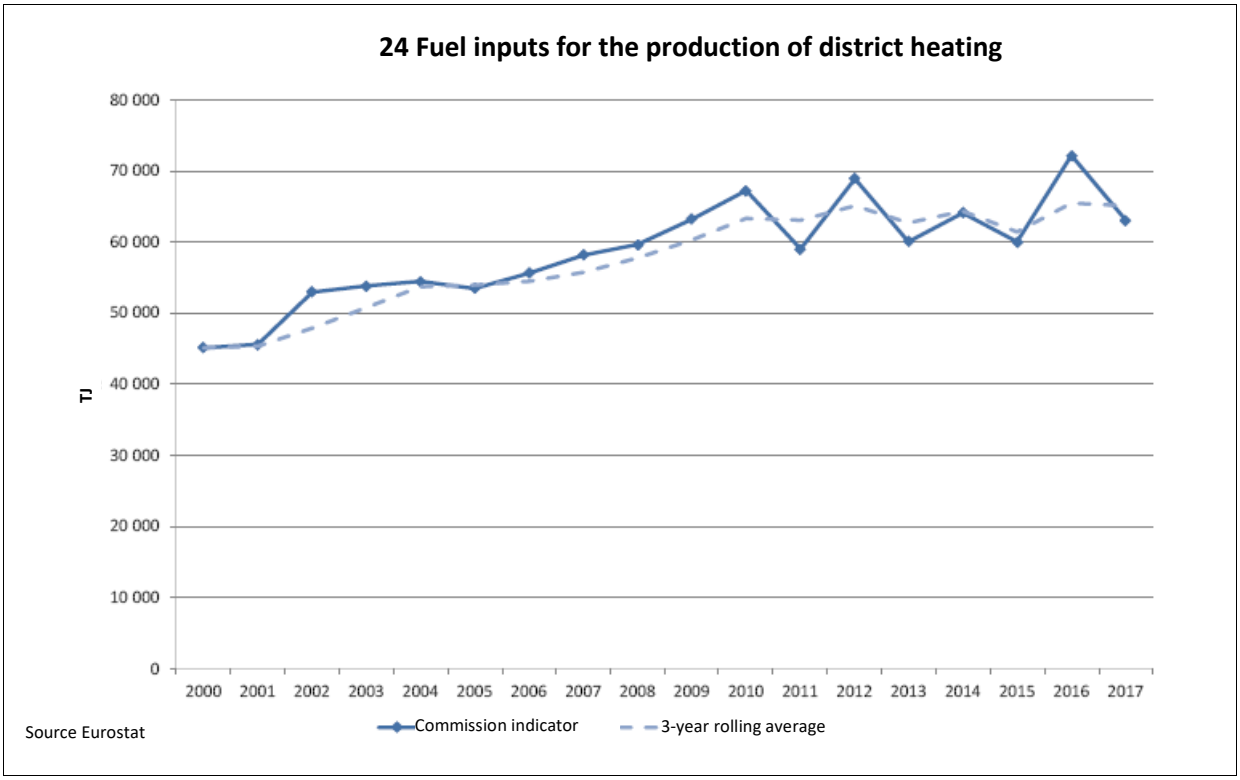
22 Losses in energy transfer and distribution



Source Eurostat



Source: Statistics Finland



Source Eurostat

Annex 2 Article 7 – Annual and cumulative savings [18]

GWh/a and GWh$_{kum}$

Year of follow-up	2014	2015		2016		2017	
	New annual saving	New annual saving	Total annual saving 2014-2015	New annual saving	Total annual saving 2014-2016	New annual saving	Total annual saving 2014-2017
	QWh/a	**GWh/a**	**GWh/a**	**GWh/a**	**GWh/a**	**GWh/a**	**GWh/a**
	6,749	**6,901**	**13,651**	**7,056**	**20,707**	**6,520**	**27,227**

Year of follow-up	2014	2014-2015	Period 1 2014-2016	2014-2017	Period 2 2017-2020	2014-2020	Objective 2014-2020
	Cumulative saving in the year 2020 **GWh$_{kum}$**	Cumulative saving in the year 2020 **GWh$_{kum}$**	Cumulative saving in the year 2020 **GWh$_{kum}$**	Cumulative saving in the year 2020 **GWh$_{kum}$**	Assessment of cumulative saving in the year 2020 **GWh$_{kum}$**	Assessment of cumulative saving in the year 2020 **GWh$_{kum}$**	Cumulative saving in the year 2020 **GWh$_{kum}$**
	21,999	**41,683**	**55,705**	**68,903**	**36,017**	**91,722**	**48,992**
In comparison with the target	45%	85%	114%	141%	74%	187%	

ktoe/a and ktoe$_{kum}$

Year of follow-up	2014	2015		2016		2017	
	New annual saving	New annual saving	Total annual saving 2014-2015	New annual saving	Total annual saving 2014-2016	New annual saving	Total annual saving 2014-2017
	ktoe/a	**ktoe/a**	**ktoe/a**	**ktoe/a**	**ktoe/a**	**ktoe/a**	**ktoe/a**
	580	**593**	**1,174**	**607**	**1,780**	**561**	**2,341**

Year of follow-up	2014	2014-2015	Period 1 2014-2016	2014-2017	Period 2 2017–2020	2014-2020	Objective 2014-2020
	Cumulative saving in the year 2020 **ktoe$_{kum}$**	Cumulative saving in 2020 **ktoe$_{kum}$**	Cumulative saving in the year 2020 **ktoe$_{kum}$**	Cumulative saving in the year 2020 **ktoe$_{kum}$**	Assessment of cumulative saving in the year 2020 **ktoe$_{kum}$**	Assessment of cumulative saving in the year 2020 **ktoe$_{kum}$**	Cumulative saving in the year 2020 **ktoe$_{kum}$**
	1,892	**3,584**	**4,790**	**5,925**	**3,097**	**7,887**	**4,213**
In comparison with the target	45%	85%	114%	141%	74%	187%	

[18] The saving impacts may also be updated retroactively for the years of follow-up because parties who have joined an energy efficiency contract, for example, may add previously unreported measures on earlier years of reporting too, and data reviews may reveal adjustment needs also for earlier years.