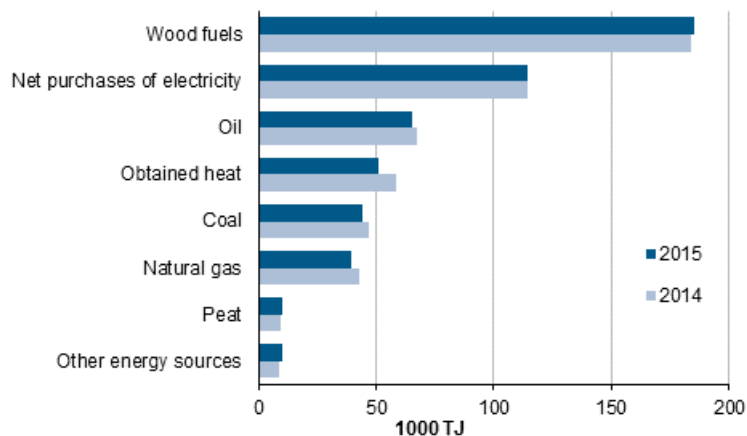


# Energy use in manufacturing 2015

## Energy use in manufacturing diminished by 3 per cent in 2015

According to Statistics Finland, energy use in manufacturing decreased by three per cent from the previous year in 2015. Manufacturing consumed 504 petajoules (PJ) of energy. The total use of electricity in manufacturing decreased by two per cent.

### Use of energy in manufacturing



In 2015, the volume of industrial output decreased further from one year earlier, which was also reflected in the use of energy. Energy consumption decreased for the fifth consecutive year ending up close to 2009 figures seen after the drop following the financial crisis.

The main source of energy was wood fuels, whose share was 37 per cent. The consumption of wood fuels remained almost on level with the previous year. The second most significant group in fuels was oil products, whose consumption increased slightly. Together, wood fuels and oil products cover one-half of fuels used by manufacturing. The consumption of all other energy sources decreased year-on-year.

The consumption of fuels fluctuates annually due to many factors. The use of fuels is affected by the prices of fuels and emission rights, availability, possible changes in taxation, industry-specific development of manufacturing, etc. In this decade, the drop in fuels used by manufacturing has, however, been trend-like

in fossil fuels and peat. The consumption of wood fuels has, in turn, grown, while the total consumption of fuels has declined, which means that the share of wood fuels in all used fuels has increased evenly.

Consumption of electricity amounted to close on 39 terawatt hours (TWh), down by two per cent year-on-year. The consumption of electricity in manufacturing has remained fairly stable throughout this decade fluctuating only by a few percentages from one year to another. By contrast, the drop from the level prevailing prior to the financial crisis is over 20 per cent, which is the case in almost all other fuels apart from wood fuels.

Despite the decrease in its share, the forest industry is still clearly the biggest user of electricity in manufacturing with a share of nearly 50 per cent. When manufacturing consumes nearly one-half of electricity in Finland, the share of the forest industry is close to one-quarter of total electricity consumption. After the forest industry, the main industries are the chemical industry and the manufacture of metals, which combined consume one-third of electricity use in manufacturing. In most industries, electricity consumption has been declining in the current decade, with mining and quarrying and the manufacture of metals as the only considerable exceptions.

The consumption of heat decreased by over seven per cent year-on-year. Heat used by manufacturing includes both industrial heat and district heat. The consumption of district heat declined from the year before due to the warm weather that decreased the need to heat buildings. The consumption of industrial heat has decreased by one-third in this decade. In addition to the ongoing structural change in industry in Finland this is also affected by structural changes in the business sector. Steam produced by manufacturing enterprises for own use is visible in the statistics as consumed fuels but if the steam is produced by another enterprise in the energy sector, the consumption of steam is visible as purchased steam and the consumption of fuels used to produce the steam as fuels used by the energy sector. Thus, a transfer of ownership of a power plant can in part be visible as structural changes.

The energy consumption of manufacturing differs considerably when examined by region. When examined by region, more than one-half of the energy consumed by manufacturing is used within four regions. Uusimaa, South Karelia, North Ostrobothnia and Lapland are responsible for a majority of the energy consumed by manufacturing in Finland. The regional profile is determined by the placement of energy-intensive industries. The location of the big units in the manufacture of metals, forest industry and chemical industry determines where most energy is consumed.

# Contents

## Tables

### Appendix tables

Appendix table 1. Energy use in manufacturing by energy source 2015.....	4
Appendix table 2. Energy use in manufacturing by industry 2015.....	4
Appendix table 3. Total electricity consumption in manufacturing 2015.....	6

## Figures

### Appendix figures

Appendix figure 1. Use of energy in manufacturing.....	7
Appendix figure 2. Energy use in manufacturing by energy source 2015.....	7
Appendix figure 3. Energy use in manufacturing by industry.....	7
Appendix figure 4. Energy use in manufacturing by region.....	8
Appendix figure 5. Total electricity consumption in manufacturing 2015.....	8
Appendix figure 6. Total electricity consumption by manufacturing branch.....	8
Appendix figure 7. Total electricity consumption in manufacturing by region.....	9

# Appendix tables

**Appendix table 1. Energy use in manufacturing by energy source 2015**

Source of energy	TJ	GWh
Refinery gas	25 805	7 168
LPG (Liquefied petroleum gas)	9 237	2 566
Light fuel oil and Gasoil	5 447	1 513
Heavy fuel oils	16 103	4 473
Petroleum coke	5 504	1 529
Recycled and waste oils	349	97
Other petroleum products	4 635	1 287
Hard coal, bituminous	3 878	1 077
Other coal	1	
Coke <sup>1)</sup>	19 809	5 502
Blast furnace gas and Coke oven gas and CO gas	13 837	3 844
Natural gas	37 423	10 395
Milled peat	9 507	2 641
Sod peat and Peat pellets and briquettes	106	30
Forest chippings and other firewood	6 057	1 682
Bark	22 780	6 328
Sawdust, cutter shavings etc.	4 313	1 198
Other industrial wood residue	3 589	997
Black liquor and other concentrated liquors	142 056	39 460
Other by-products from wood processing industry	5 226	1 452
Wood pellets and briquettes	151	42
Biogas	219	61
Other biofuels	1 713	476
Recovered fuels	3 115	865
Waste and other non-specified energy sources	1 613	448
Exothermic heat from industry	2 615	726
Hydrogen	291	81
Electricity	112 110	31 142
District heat	9 767	2 713
Heat used in production processes	37 045	10 290
<b>Total</b>	<b>504 302</b>	<b>140 084</b>

Includes industries (TOL 2008) B Mining and quarrying and C Manufacturing (including autoproducer plants). Does not include the energy use of industry D Electricity, gas and steam supply. Includes the fuel consumption of industrial establishments (including autoproducer establishments) as well as the external net purchases of electricity and heat. Summing these together gives the total energy use in the industry.

1) Includes coke intake into blast furnace and other coke consumption in industry. Energy content of coke has been subtracted by the energy content of the produced blast furnace gas.

**Appendix table 2. Energy use in manufacturing by industry 2015**

Industries	Fuels, TJ	Electricity (nett), TJ <sup>1)</sup>	Heat (nett) TJ <sup>1)</sup>	Total, TJ
05 Mining of coal and lignite	.	.	.	.
06 Extraction of crude petroleum and natural gas	.	.	.	.
07 Mining of metal ores	411	4 243	76	4 730

Industries	Fuels, TJ	Electricity (nett), TJ <sup>1)</sup>	Heat (nett) TJ <sup>1)</sup>	Total, TJ
08–09 Other mining and quarrying and mining support service activities	1 853	942	20	2 814
10 Manufacture of food products	3 464	5 859	5 098	14 421
11 Manufacture of beverages	171	487	696	1 354
12 Manufacture of tobacco products	.	.	.	.
13 Manufacture of textiles	293	389	155	838
14 Manufacture of wearing apparel	126	147	49	321
15 Manufacture of leather and related products	46	48	42	136
16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	9 574	4 552	5 911	20 037
17 Manufacture of paper and paper products	214 499	40 319	12 675	267 493
18 Printing and reproduction of recorded media	119	765	256	1 140
19 Manufacture of coke and refined petroleum products	40 646	2 243	445	43 335
20 Manufacture of chemicals and chemical products	17 137	15 725	9 277	42 138
21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	22	281	310	613
22 Manufacture of rubber and plastic products	928	2 931	785	4 644
23 Manufacture of other non-metallic mineral products	8 090	2 354	451	10 894
24 Manufacture of basic metals	45 284	20 302	5 752	71 337
25 Manufacture of fabricated metal products, except machinery and equipment	1 253	4 288	1 197	6 738
26 Manufacture of computer, electronic and optical products	26	1 054	423	1 504
27 Manufacture of electrical equipment	70	939	455	1 464
28 Manufacture of machinery and equipment n.e.c.	434	1 874	1 048	3 356
29 Manufacture of motor vehicles, trailers and semi-trailers	318	565	406	1 289
30 Manufacture of other transport equipment	184	610	452	1 246
31 Manufacture of furniture	179	552	409	1 139
32 Other manufacturing	59	201	75	336
33 Repair and installation of machinery and equipment	193	441	349	984
Total	345 379	112 110	46 812	504 302
. No data available (the sample contained no establishments) Includes industries (TOL 2008) B Mining and quarrying and C Manufacturing (including autoproducer plants). Does not include the energy use of industry D Electricity, gas and steam supply. Includes the fuel consumption of industrial establishments (including autoproducer establishments) as well as the external net purchases of electricity and heat. Summing these together gives the total energy use in the industry.				

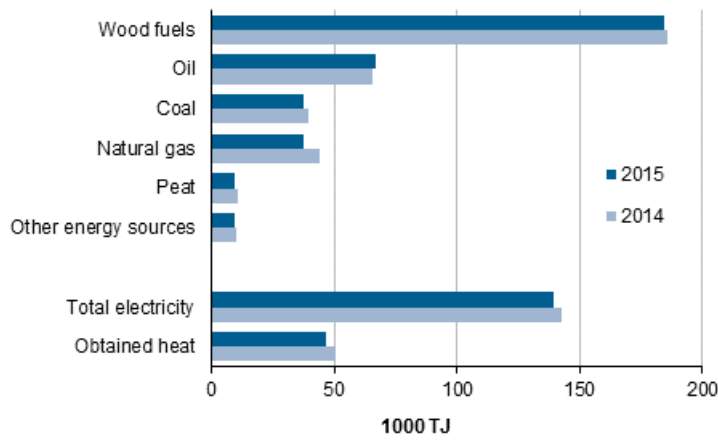
1) Net purchases

**Appendix table 3. Total electricity consumption in manufacturing 2015**

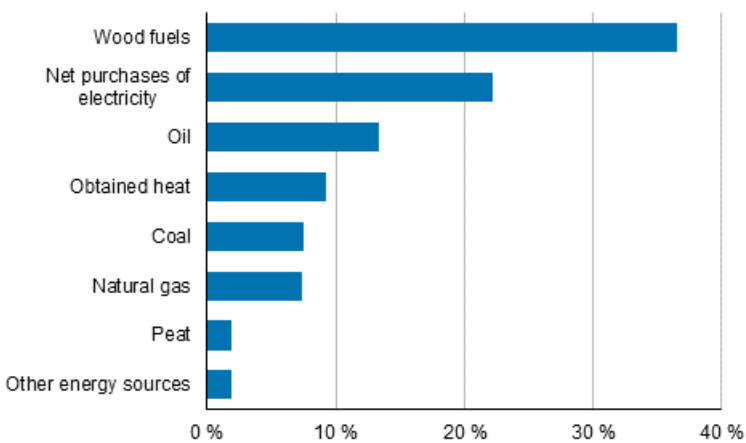
Industries	GWh
07 Mining of metal ores	1 179
08□09 Other mining and quarrying and mining support service activities	262
10 Manufacture of food products	1 657
11 Manufacture of beverages	135
12 Manufacture of tobacco products	.
13 Manufacture of textiles	108
14 Manufacture of wearing apparel	41
15 Manufacture of leather and related products	13
16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	1 330
17 Manufacture of paper and paper products	17 516
18 Printing and reproduction of recorded media	218
19 Manufacture of coke and refined petroleum products	1 089
20 Manufacture of chemicals and chemical products	4 581
21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	90
22 Manufacture of rubber and plastic products	834
23 Manufacture of other non-metallic mineral products	654
24 Manufacture of basic metals	6 197
25 Manufacture of fabricated metal products, except machinery and equipment	1 091
26 Manufacture of computer, electronic and optical products	293
27 Manufacture of electrical equipment	259
28 Manufacture of machinery and equipment n.e.c.	545
29 Manufacture of motor vehicles, trailers and semi-trailers	157
30 Manufacture of other transport equipment	170
31 Manufacture of furniture	153
32 Other manufacturing	56
33 Repair and installation of machinery and equipment	123
Total	38 750
. No data available (the sample contained no establishments)	
Includes industries (TOL 2008) B Mining and quarrying and C Manufacturing (including autoproducer plants). Does not include the energy use of industry D Electricity, gas and steam supply. Includes the fuel consumption of industrial establishments (including autoproducer establishments) as well as the external net purchases of electricity and heat. Summing these together gives the total energy use in the industry.	

# Appendix figures

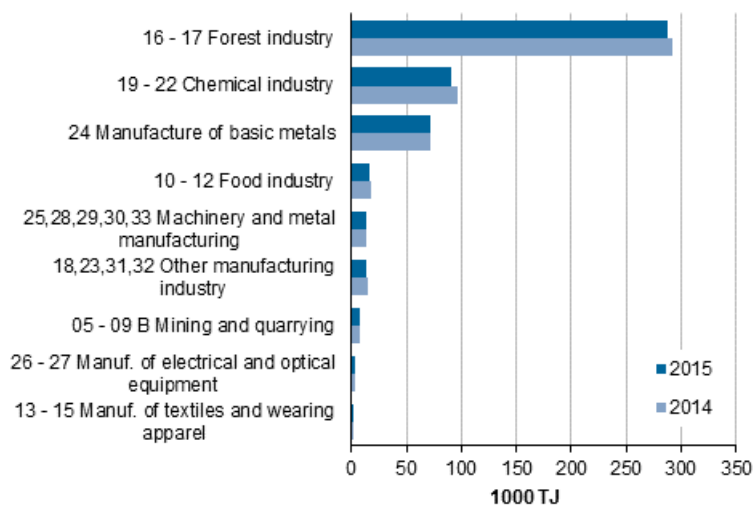
**Appendix figure 1. Use of energy in manufacturing**



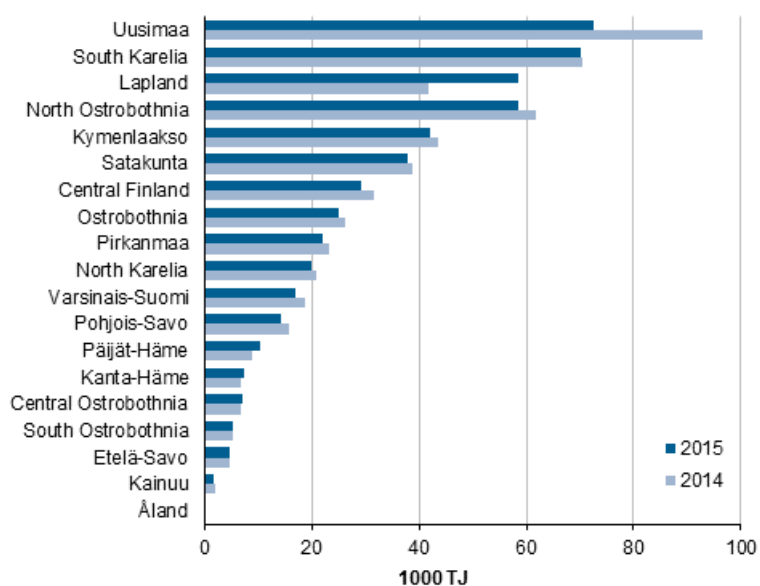
**Appendix figure 2. Energy use in manufacturing by energy source 2015**



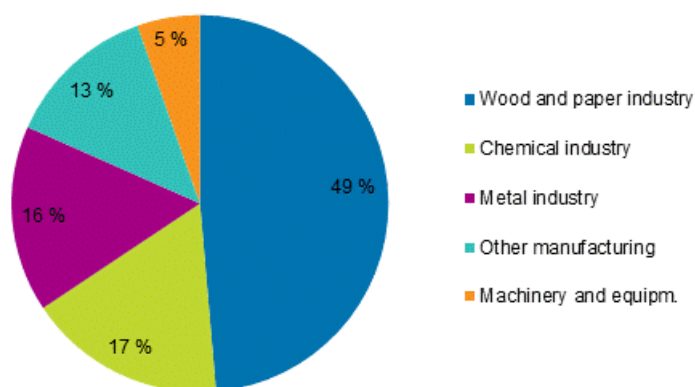
**Appendix figure 3. Energy use in manufacturing by industry**



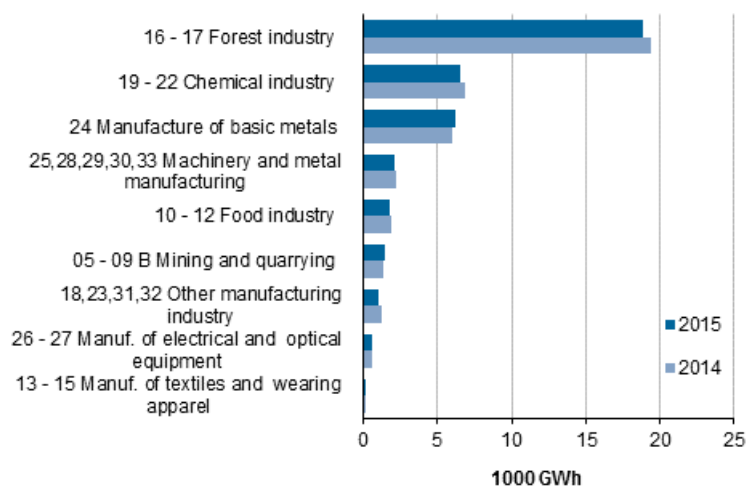
**Appendix figure 4. Energy use in manufacturing by region**



**Appendix figure 5. Total electricity consumption in manufacturing 2015**

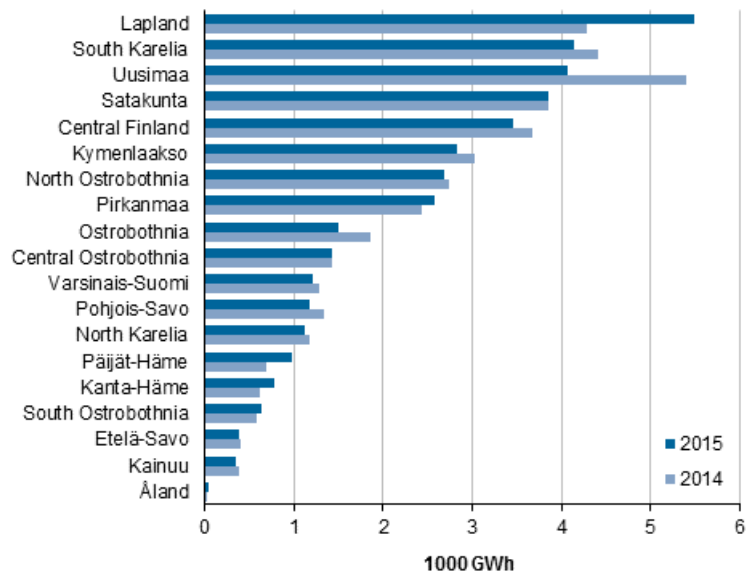


**Appendix figure 6. Total electricity consumption by manufacturing branch**





**Appendix figure 7. Total electricity consumption in manufacturing by region**



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Source: Energy use in manufacturing, Statistics Finland