



Data, tables, statistics and maps

ENERGY STATISTICS 2017



Danish Energy
Agency

CONTENTS

www.ens.dk

Please feel free to visit the Danish Energy Agency's website for statistics and data

www.ens.dk/facts_figures.

This website includes energy statistics that are far more detailed than the statistics published here. Please find the complete energy statistics, including tables and time-lines for energy consumption, emissions and assumptions for the period 1972-2017.

Descriptions of methods and revisions are also available here.

Note

Briquettes

Wood briquettes have been included in firewood, households for the years 2013-2017.

LNG

LNG (liquefied natural gas) has been included in domestic sea transport under the fuel gas/diesel in 2015 to 2017.

Firewood

Households' consumption of firewood for the year 2017 is calculated on the basis of the survey from 2015. This is due to a lack of data delivery.

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Energy Statistics 2017

Published April 2019 by the Danish Energy Agency,
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1577 Copenhagen V, Denmark.

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Design and production: Danish Energy Agency

Cover photo: Heat pump from Rye CHP. Kindly loaned by Dansk Fjernvarme.
Photography by Jesper Voldgaard.

ISBN 978-87-93180-37-6www
ISSN 0906-4699

Queries concerning methods and calculations should be addressed to the
Danish Energy Agency, Statistics Section, tel.: +45 33 92 67 00 or statistik@ens.dk

The Danish Energy Agency is an agency under the Danish Ministry of Energy, Utilities
and Climate.

This publication may be quoted with source reference.

Access to the statistics or parts of the statistics before publication

The organisations below have access to the statistics under a special agreement.

DCE – Danish Centre for Environment and Energy

Increase in energy consumption and continued increase in consumption of renewable energy

Observed energy consumption increased marginally

The observed energy consumption increased to 747 PJ in 2017; an increase of 0.5%. The trend in the composition of consumption still shows a declining usage of coal, while renewable energy, which primarily consists of a rise in biomass by 17.6 PJ and wind power by 7.2 PJ, is still on the rise.

Adjusted gross energy consumption rose 0.3%

Besides *observed energy consumption*, the Danish Energy Agency calculates *adjusted gross energy consumption*, which is adjusted for fuel linked to foreign trade in electricity and climatic variations in relation to a normal temperature year. The purpose of the adjusted calculations is to illustrate the trends underlying the development. *Adjusted gross energy consumption* was 772 PJ in 2017, which is 0.3% above the 2016 level.

Compared with 1990, adjusted gross energy consumption has decreased by 5.7%. Coal and coke account for the largest drop at 72.0%, while renewable energy, which began from a low start point, accounted for the largest increase.

Share of RE in electricity supply

In 2017, electricity from renewables accounted for 63.7% of Danish domestic electricity supply, compared to 53.9% in 2016. The increase is primarily due to an increase in biomass especially wood pellets and wind power. Wind power accounted for 43.2% which is largely due to good weather conditions and partly due to an increase in capacity in 2017. Biomass accounted for 16.6% and solar energy, hydro and biogas accounted for the remaining 3.9%.

Energy production and degree of self-sufficiency increased

The Danish production of crude oil, natural gas and renewable energies etc. combined has seen an increase of 2.6% in 2017 to 658 PJ. Production of crude oil decreased by 2.7% while production of natural gas increased by 7.3%.

The degree of self-sufficiency in energy for Denmark rose in 2017 to 85%, whereas it was 83% the year before. This means that energy production in 2017 was 15% lower than energy consumption. The degree of self-sufficiency in oil consumption compared to crude oil production has decreased from 106% in 2016 to 101% in 2017.

Increase in consumption of renewable energy

Consumption of renewable energy increased from 218 PJ in 2016 to 244 PJ in 2017, which corresponds to an increase of 12.3%. This development is due to increases in the consumption of biomass of 11.9% and wind power by 15.6%. Calculated according to the EU's method of calculation, renewable energy accounted for about 34.2% of energy consumption in 2017 as opposed to 32.2% in 2016.

Decrease in CO₂ emissions

Observed CO₂ emissions from energy consumption decreased by 6.0% in 2017, ending at 34.7 million tonnes. Adjusted for fuel consumption linked to foreign trade in electricity and climatic variations, CO₂ emissions decreased by 6.3%. Since 1990, Danish adjusted CO₂ emissions have gone down by 38.3%.

Greenhouse gas emissions for 2017

A preliminary statement of total observed emissions of greenhouse gases in Denmark shows a drop of 31.4% from 1990 to 2017. For 2005-2016, actual emissions from greenhouse gasses have fallen by 23.9%. The quota sector (excl. aviation) accounts for a decrease of 35.0% while consumers outside the quota sector accounts for a decrease of 16.5%.

Energy consumption by area of consumption

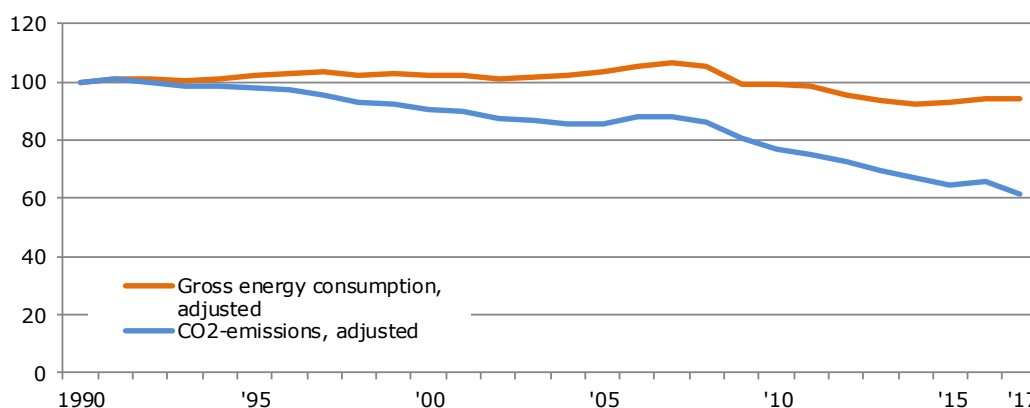
The final adjusted gross energy consumption increased by 1.3%. Gross energy consumption for *transport* was 2.1% higher in 2017 than the year before, of which energy consumption for road transport increased by 1.4%.

The total climate-adjusted energy consumption of the *agriculture and industry sector* was 2.3% higher in 2017 than the year before. Energy consumption by *manufacturing industries* increased by 4.3%.

In *commercial and public services and households*, climate adjusted energy consumption was respectively 3.2% higher and 0.8% higher in 2017 than in 2016.

Exports of energy technology

Exports of energy technology and equipment were DKK 75.1 billion in 2017 as opposed to DKK 75.5 billion in 2016. Exports of energy technology and equipment were thus 11.1% of total Danish goods exports. The corresponding figure for 2016 was 11.8%.

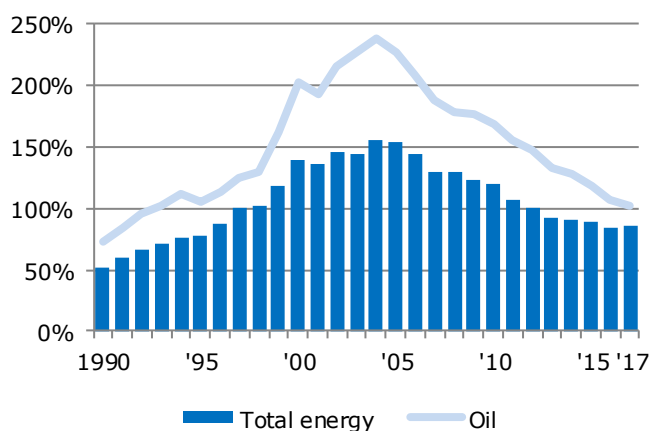


Energy balance 2017

	Total	Crude oil and refinery feedstocks	Oil products	Natural gas	Coal and coke	Waste, non-renewable	Renewable energy	Electricity	District heating	Gas works gas
Direct energy content [TJ]										
Total energy consumption										
Primary energy production	658 419	289 690	-	182 142	-	16 021	170 567	-	-	-
Recycling	19	-	19	-	-	-	-	-	-	-
Imports	672 897	210 988	235 631	19 446	75 135	1 819	74 969	54 785	124	-
Exports	-584 264	-195 652	-265 376	-84 036	- 0	-	- 840	-38 359	-	-
Border trade	-9 925	-	-9 925	-	-	-	-	-	-	-
International marine bunkers	-22 389	-	-22 389	-	-	-	-	-	-	-
Stock changes	29 995	1 282	42 074	-2 528	-10 299	-	- 493	-	-	-
Statistical differences, input from blending	1 777	- 745	- 922	2 635	831	-	- 22	-	0	-
Energy sector	-41 648	-305 562	290 675	-22 769	-	-	-	-3 378	- 614	-
Extraction and gasification	-22 769	-	-	-22 769	-	-	-	-	-	-
Petroleum products	305 841	-	305 841	-	-	-	-	-	-	-
Used in refineries	-322 437	-305 562	-15 166	-	-	-	-	-1 094	- 614	-
Used in distribution	-2 283	-	-	-	-	-	-	-2 283	-	-
Transformation	-38 991	-	-3 818	-31 850	-60 663	-16 857	-167 073	105 725	134 930	614
Large-scale units	-26 638	-	-1 145	-6 612	-60 151	-	-49 873	39 941	51 202	-
Wind turbines and hydropower plants	-	-	-	-	-	-	-53 272	53 272	-	-
Small-scale units	-3 329	-	- 13	-9 213	- 402	-2 593	-17 722	8 302	18 312	-
District heating units	- 539	-	- 592	-12 823	- 110	- 231	-22 667	-1 026	36 910	-
Autoproducers	-2 789	-	-2 005	-2 734	-	-14 032	-23 409	10 226	29 166	-
Gas works	- 46	-	- 63	- 468	-	-	-129	-	-	614
Own use	-5 650	-	-	-	-	-	-	-4 990	- 661	-
Distribution losses etc.	-33 242	-	-	- 113	-	-	-	-6 094	-27 011	- 25
Final energy consumption	-632 644	-	-265 930	-62 928	-5 003	- 984	-77 101	-112 680	-107 429	- 589
Non-energy use	-10 350	-	-10 350	-	-	-	-	-	-	-
Transport	-218 253	-	-207 501	- 253	-	-	-9 034	-1 465	-	-
Agriculture and industry	-129 195	-	-36 029	-30 511	-5 003	- 669	-14 325	-37 465	-4 987	- 206
Commercial and public services	-83 916	-	-2 389	-7 809	-	- 315	-2 748	-38 239	-32 385	- 31
Households	-190 931	-	-9 662	-24 355	-	-	-50 995	-35 510	-70 056	- 353

Note: The energy balance provides an overview of supply, transformation and consumption of energy. A more detailed statement of input (black figures) and output (red figures) of energy products is listed in the table Energy supply and consumption 2017 on pages 18-19.

Degree of self-sufficiency



The degree of self-sufficiency is calculated as primary energy production in relation to climate-adjusted gross energy consumption. Self-sufficiency in oil is calculated as crude oil production in relation to the share of gross energy consumption constituted by oil.

In 1997, Denmark produced more energy than it consumed for the first time ever. The degree of self-sufficiency was 52% in 1990 and peaked in 2004 at 155%. Denmark was a net importer of energy in 2013 for the first time since 1996. In 2017, the degree of self-sufficiency in energy was 85% as opposed to 83% the year before.

Denmark has been more than self-sufficient in oil since 1993, resulting in annual net exports. In 2017, the degree of self-sufficiency in oil was 101% as opposed to 106% the year before. The degree of self-sufficiency in oil peaked in 2004 and has been falling ever since.

Production of primary energy

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	Change '90-'17
Total production	40 228	424 361	1 164 525	1 311 683	978 612	678 998	641 498	658 419	55.2%
Crude oil	12 724	255 959	764 526	796 224	522 733	330 662	297 748	289 690	13.2%
Natural gas	17	115 967	310 307	392 868	307 425	173 510	169 735	182 142	57.1%
Renewable energy	22 699	45 461	76 016	105 585	131 306	159 161	158 593	170 567	275.2%
Waste, non-renewable	4 787	6 975	13 676	17 006	17 148	15 665	15 422	16 021	129.7%

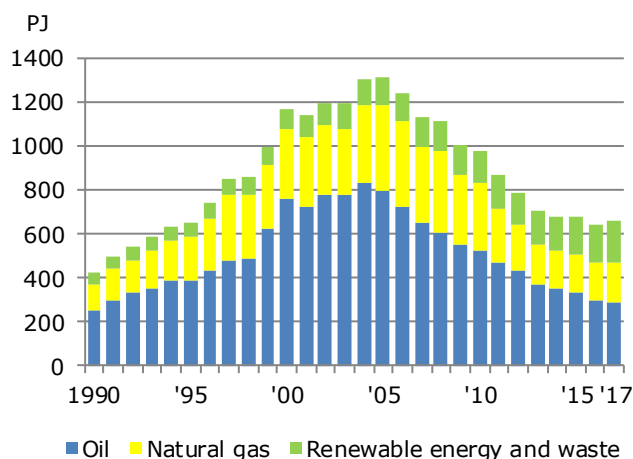
Production and consumption of renewable energy

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	Change '90-'17
Production of renewable energy	22 699	45 461	76 016	105 585	131 306	159 161	158 593	170 567	275%
Solar	50	100	335	419	657	3 713	4 642	5 035	4945%
Wind	38	2 197	15 268	23 810	28 114	50 879	46 014	53 208	2322%
Hydro	123	101	109	81	74	65	69	64	-36.2%
Geothermal	-	48	58	172	212	140	225	152	218%
Biomass	22 023	39 996	54 039	73 542	92 268	90 078	89 733	91 868	130%
- Straw	4 840	12 481	12 220	18 485	23 323	19 788	19 663	20 212	61.9%
- Wood chips	-	1 724	2 744	6 082	11 352	14 744	17 097	19 433	1027%
- Firewood	7 621	8 757	12 432	17 667	23 779	21 943	22 492	22 492	157%
- Wood pellets	-	1 575	2 984	3 262	2 407	2 669	2 812	2 797	77.6%
- Wood waste	3 710	6 191	6 895	6 500	8 500	11 151	8 546	7 166	15.7%
- Waste, renewable	5 851	8 524	16 715	20 786	20 959	19 147	18 849	19 581	130%
- Biodiesel *)	
- Biooil	-	744	49	761	1 949	636	274	188	-74.7%
Biogas	184	752	2 912	3 830	4 337	6 285	9 048	11 158	1384%
Heat pumps	282	2 267	3 296	3 731	5 643	8 001	8 861	9 081	301%
Imports of renewable energy	-	-	2 466	18 918	39 483	52 232	59 862	74 969	•
Firewood	-	-	-	1 963	2 939	2 547	2 611	2 611	•
Wood chips	-	-	305	1 521	4 865	2 808	3 257	5 481	•
Wood pellets	-	-	2 161	12 802	27 675	33 889	41 128	54 284	•
Waste, renewable	-	-	-	-	-	2 684	2 878	2 224	•
Bioethanol	-	-	-	-	1 118	1 818	1 593	1 934	•
Biodiesel	-	-	-	2 632	2 886	8 485	8 395	8 435	•
Exports of renewable energy	-	-	-	2 632	2 846	1 084	1 203	840	•
Biodiesel	-	-	-	2 632	2 846	1 084	1 203	840	•
Stock changes, stat. diffs. etc.	-	- 3	31	9	1	- 268	259	- 536	
Consumption of renewable energy	22 699	45 458	78 513	121 880	167 944	210 040	217 510	244 160	437%

*) Production of biodiesel has been included in imports of biodiesel.

PRODUCTION OF PRIMARY ENERGY

Primary energy production



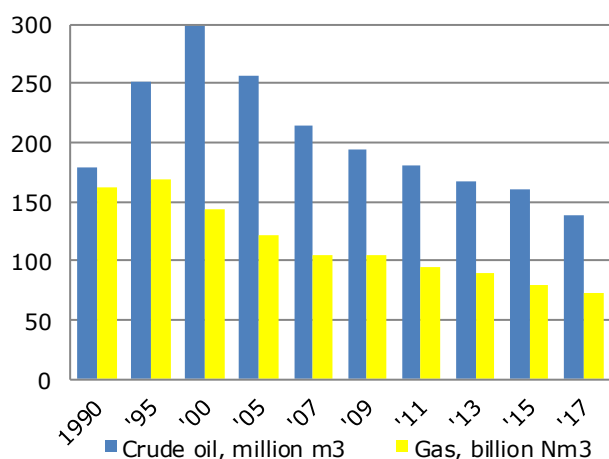
Primary energy refers to crude oil, natural gas, renewable energy (including renewable waste) and non-renewable waste.

In 2017, primary energy production was 658 PJ, as opposed to 641 PJ in 2016. This is an increase by 2.6% compared to last year. Primary energy production peaked at 1312 PJ in 2005.

Production of crude oil and natural gas increased steadily up to 2004 and 2005, respectively, after which it fell.

Production of crude oil fell by 2.7% in 2017, while production of renewable energy etc. and natural gas increased by 7.2% and 7.3% respectively.

Oil and gas reserves / resources



Up to the end of 2009, crude oil and natural gas reserves were calculated as the volumes that were financially feasible to recover from known oil fields and oil discoveries, using known technologies. The reserves are regularly reassessed for new discoveries and changes in assumptions for calculations.

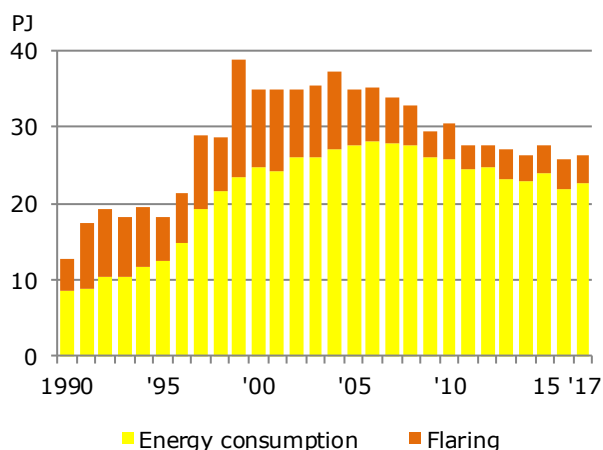
At the end of 2009, the Danish Energy Agency changed the classification system for oil and gas reserves, introducing the category *contingent resources*. For the period 2009-2017, the statement includes the sum of reserves and contingent resources so that comparison with earlier statements is possible.

At the end of 2017, the sum of reserves and contingent resources totaled 139 million m³ oil and 72 billion Nm³ gas.

Danish oil and gas reserves have been calculated every two years since and including 2011.

Source: *Resources and forecasts 2017* (Published August 30th 2018, by the Danish Energy Agency)

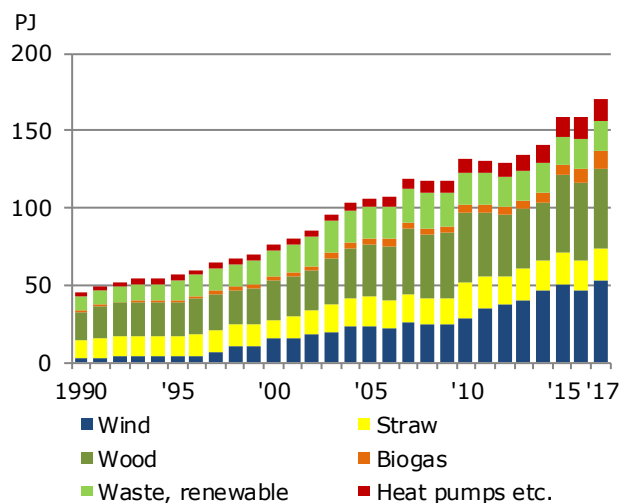
Natural gas consumption and flaring on platforms in the North Sea



Extraction of crude oil and natural gas requires natural gas consumption for production as well as for transport and off-loading ashore. In 2017 consumption was 22.7 PJ, corresponding to 19.3% of total Danish natural gas consumption. In 2016 consumption on platforms was 21.9 PJ.

Furthermore, flaring (burning) is carried out in the production of natural gas in the North Sea fields. Flaring is not included in energy consumption, but is included in Denmark's international statement of greenhouse gases, and is covered by the EU Emission Trading System (EU ETS). In 2017, flaring of natural gas was calculated at 3.6 PJ compared with 3.9 PJ in 2016.

Production of renewable energy by energy product



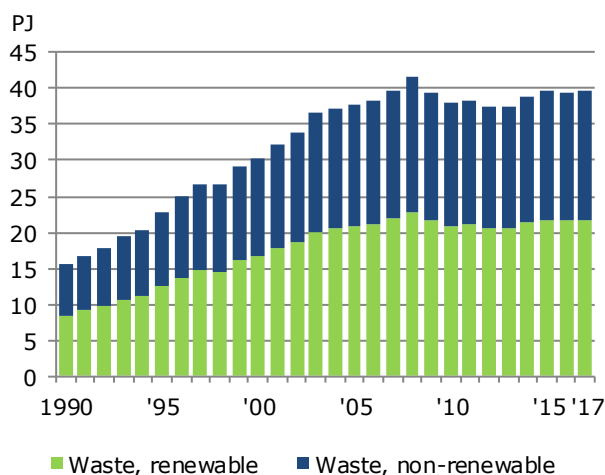
Renewable energy includes wind power, wood, straw, biogas, renewable waste and others (hydropower, geothermal energy, solar energy and heat pumps).

Production of renewable energy was 171 PJ in 2017, which is an increase of 7.6% compared to 2016. Production of renewable energy grew by 275% during the period 1990 to 2017.

In 2017 wind power production was 53.2 PJ, which is an increase of 15.6% compared with 2016.

Production from straw, wood products and renewable waste in 2017 was 20.2 PJ, 51.9 PJ and 19.6 PJ, respectively. Compared with 2016, the total production from the three fuels increased by 1.8%.

Consumption of waste

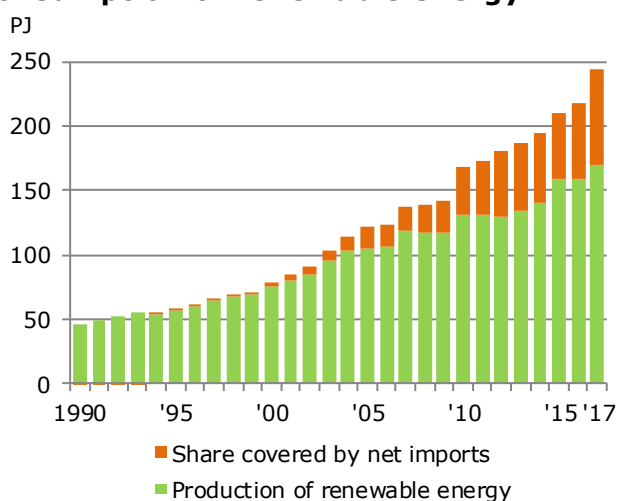


Consumption of waste for the production of electricity and district heating has increased significantly over time. Total consumption of waste increased by 0.4% in 2017 compared with 2016. Compared with 1990, waste consumption for energy purposes increased by 156% in 2017.

In statistics for energy and CO₂ emissions, waste is divided into two components: Renewable waste and non-renewable waste. According to international conventions, renewable waste is included in renewable energy.

These energy statistics assume that 55.0% of the waste consumed is renewable waste. This means that waste accounts for a considerable proportion of the total consumption of renewable energy.

Consumption of renewable energy



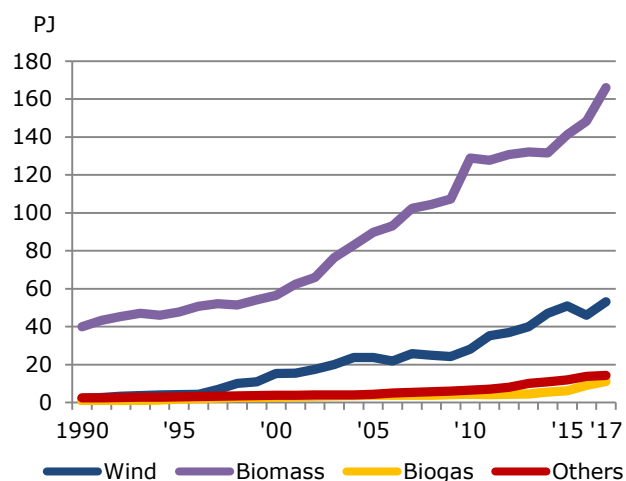
Production of renewable energy has increased dramatically since 1990. In addition, net imports have increased. Net imports of renewable energy (including stock changes etc.) were 73.6 PJ in 2017.

In 2017 consumption of renewable energy was 244.2 PJ, which is 12.3% more than the year before. Observed consumption of renewable energy was 45.5 PJ in 1990.

The increased use of renewable energy makes a significant contribution to reducing Danish CO₂ emissions.

RENEWABLE ENERGY

Renewable energy - consumption by energy product

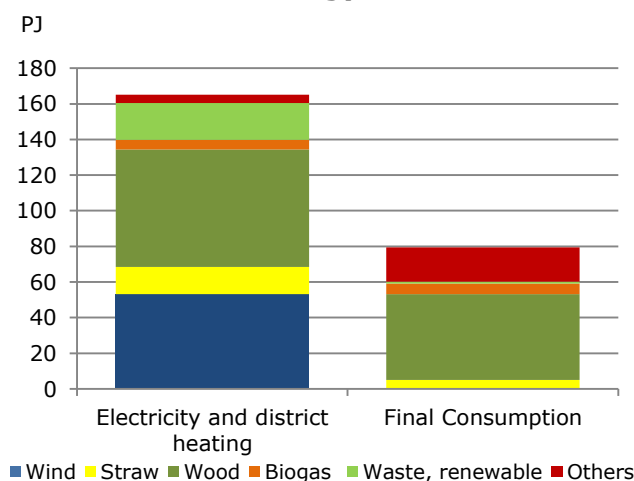


Consumption of renewable energy increased from 217.5 PJ in 2016 to 244.2 PJ in 2017.

Consumption of biomass, including liquid biofuels increased from 148.4 PJ in 2016 to 166.0 PJ in 2017, while wind power rose from 46.0 PJ to 53.2 PJ.

The increasing consumption of biomass since 2000 entails higher consumption of wood chips, wood pellets and firewood. In the period 2000 to 2017 the increase was 717%, 1009%, and 102%, respectively.

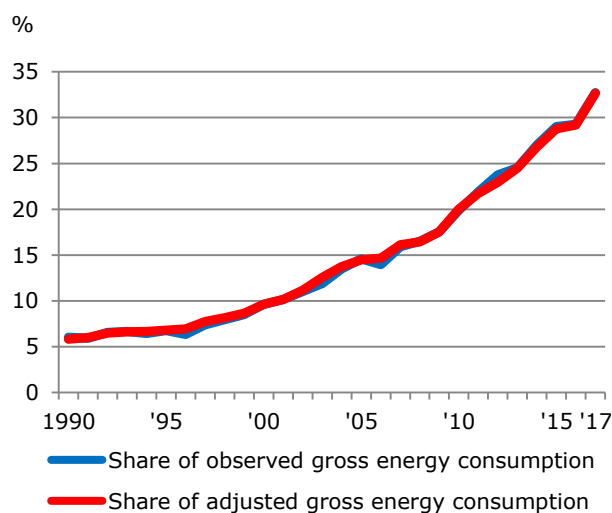
Use of renewable energy in 2017



Total consumption of renewable energy in 2017 (production plus net imports) was 244.7 PJ, of which 165.2 PJ was used in the production of electricity and district heating. Wind power, wood pellets and renewable waste were predominant in the production of electricity and district heating, accounting for 53.2 PJ, 39.8 PJ and 20.6 PJ, respectively. Consumption of wood otherwise, straw and biogas accounted for 66.0 PJ, 15.3 PJ and 5.3 PJ, respectively.

A total of 79.5 PJ of renewable energy was included in final energy consumption, i.e. for process consumption and consumption for heating in the agriculture and industry sector, in the commercial and public services sector, as well as for heating in households and for transport. In final energy consumption, wood, particularly firewood, is most prominent.

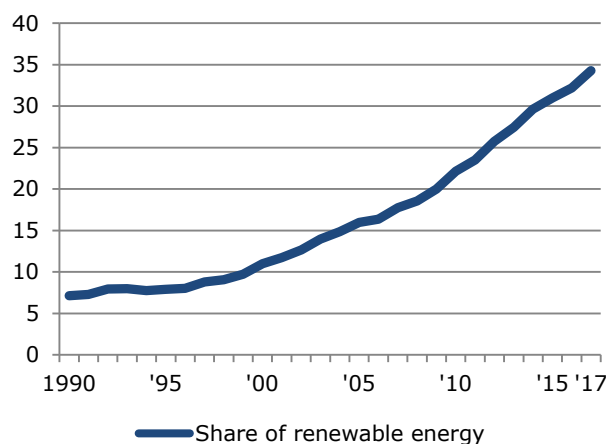
Renewable energy - share of total energy consumption



Observed energy consumption shows the registered amount of energy consumed in a calendar year. In 2017 renewable energy covered 32.7% of total observed energy consumption, as opposed to 29.3% the year before. In 1990 this figure was 6.0%.

Adjusted gross energy consumption is found by adjusting observed energy consumption for the fuel consumption linked to foreign trade in electricity, and by adjusting for fluctuations in climate with respect to a normal weather year. In 2017 renewable energy's share of adjusted gross energy consumption was 32.6%, as opposed to 29.2% the previous year. In 1990 this figure was 5.8%.

Share of renewable energy according to the EU method of calculation



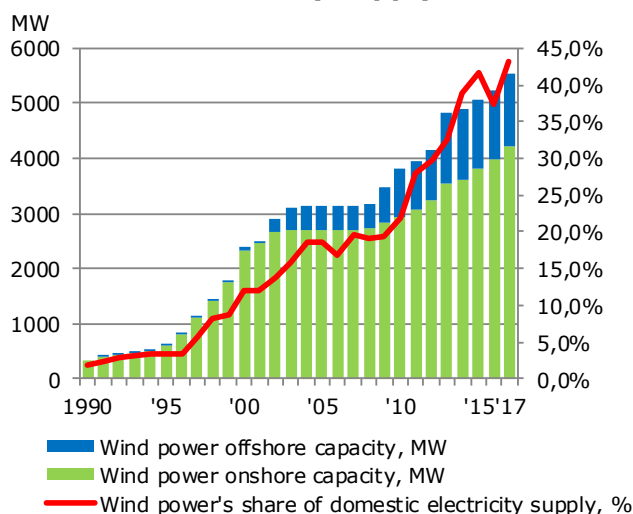
The EU Directive on renewable energy prescribes a different method for calculating the share of renewable energy than those used above.

The EU's calculation is based on final energy consumption expressed as energy consumption by end-users, excl. border trade and consumption for non-energy purposes, incl. distribution losses and own use in the production of electricity and district heating. In the EU method, renewable energy is defined as end-consumption of renewables as well as consumption of renewables for the production of electricity and district heating.

According to the EU method of calculation, the share of renewable energy was 34.2% in 2017 as opposed to 32.2% the year before, i.e. 1.6 percentage points higher than if the share of renewable energy is calculated as the share of the total energy consumption (p. 8).

Sources: 2004-2016 Eurostat. 1990-2003 and 2017 Danish Energy Agency calculations.

Wind power capacity and wind power's share of domestic electricity supply

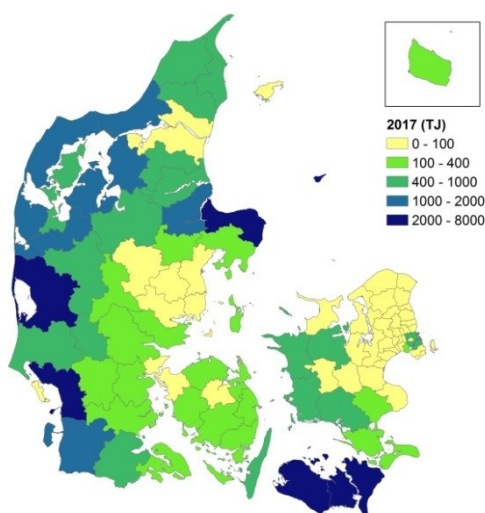


In 2017, wind power production accounted for 43.2% of domestic electricity supply, compared with 37.4% in 2016 and 1.9% in 1990.

Wind power capacity was 5522 MW in 2017, as opposed to 5246 MW the year before. In 2017 onshore and offshore wind turbine capacities were 4226 MW and 1297 MW, respectively. In 1990 there were only onshore wind turbines and they accounted for a wind power capacity of 326 MW.

Trends in wind power capacity and production do not always correspond, as annual wind power generation is highly dependent on wind conditions, which can be quite variable in Denmark. Furthermore, when capacity goes up, this is not reflected fully in the production until in the following year, as production from new capacity is limited to the part of the year in which the installations are in operation.

Wind power onshore by municipality



Total wind power production was 53.2 PJ in 2017. Of this, onshore installations accounted for 64.9% and offshore installations accounted for 35.1%.

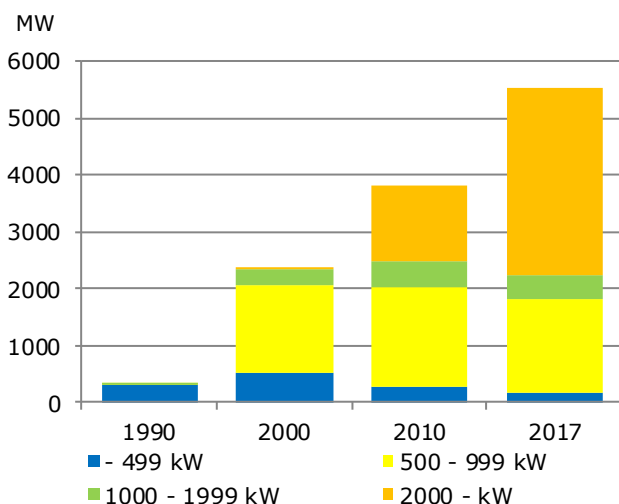
Wind power generation from onshore installations varies across Denmark. Municipalities with west-facing coastlines have many wind turbines, and the favourable wind conditions in these areas contribute to high production from these installations.

In 2017 the turbines in the ten municipalities with the highest wind power production thus together accounted for a production of 32.9 PJ, or 62.0% of total wind power production from onshore installations.

Wind power - number of turbines and capacity by size

	1980	1990	2000			2016			2017		
	Onshore	Onshore	Onshore	Offshore	Total	Onshore	Offshore	Total	Onshore	Offshore	Total
Total no. of turbines	68	2 665	6 194	41	6 235	5 592	516	6 108	5 642	519	6 161
0 – 25 kW	34	160	252	-	252	1 358	-	1 358	1 472	-	1 472
26 – 499 kW	34	2 495	3 400	11	3 411	849	11	860	751	11	762
500 – 999 kW	-	8	2 283	10	2 293	2 432	10	2 442	2 397	10	2 407
1 000 – 1 999 kW	-	2	251	-	251	362	-	362	340	-	340
2 000 – kW	-	-	8	20	28	591	495	1 086	682	498	1 180
Total wind power capacity [MW]	3	326	2 340	50	2 390	3 975	1 271	5 246	4 226	1 297	5 522
0 – 25 kW	1	3	4	-	4	17	-	17	18	-	18
26 – 499 kW	2	314	529	5	534	180	5	185	161	5	166
500 – 999 kW	-	6	1 512	5	1 517	1 656	5	1 661	1 634	5	1 639
1 000 – 1 999 kW	-	3	279	-	279	444	-	444	422	-	422
2 000 – kW	-	-	16	40	56	1 679	1 261	2 940	1 991	1 287	3 278

Wind power capacity by size of turbine

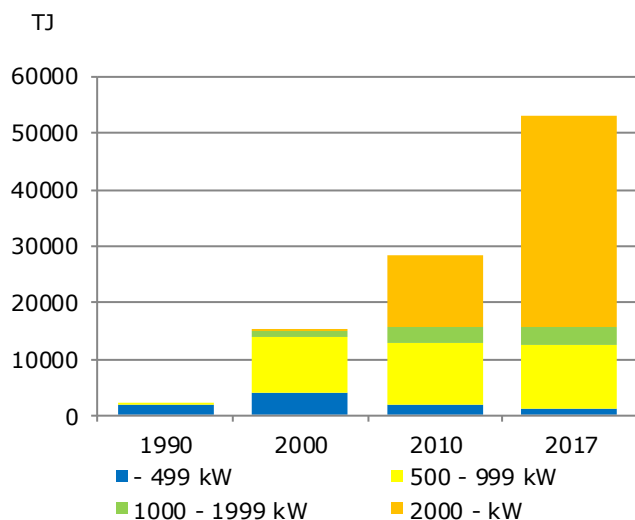


The total number of wind turbines increased by roughly 50 from 2016 to 2017, and the total wind power capacity grew by 277 MW.

For some years now, the trend has been toward fewer but larger turbines. When omitting the small turbines (up to and including 25 kW), the number of wind turbines have been reduced by almost 1300 turbines since 2000. This reflects a reduction of 2649 in the number of turbines with capacities between 25kW and 499kW, as well as an increase of 1355 in the number of larger turbines.

Similarly, turbines with a capacity below 500kW accounted for only 3.3% of the total capacity in 2017, whereas this figure was 22.5% in 2000.

Wind power production by size of turbine



The development toward larger turbines is even more evident in terms of wind power production.

Where turbines larger than 2 MW accounted for 59.4% of wind power capacity, in 2017 these turbines produced 70.4% of the total energy from wind turbines.

Similarly, in 2017 wind turbines with a capacity below 500kW accounted for only 2.3% of the total production.

The most important reason for this is that by far the majority of the turbines established offshore have capacities above 2 MW, and that offshore wind turbines have a higher production in terms of their capacity than onshore wind turbines.

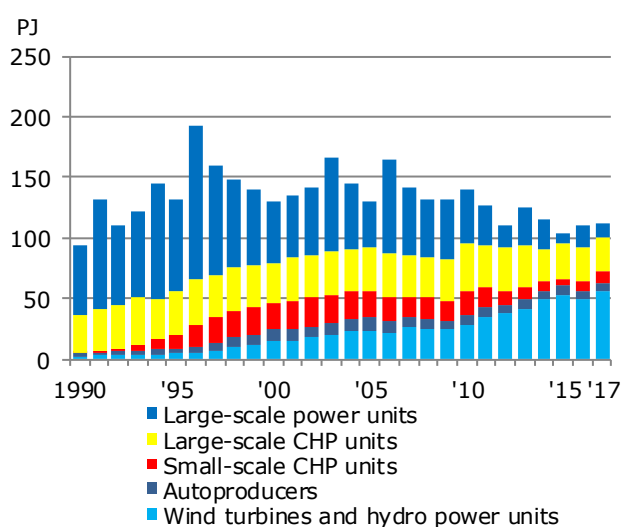
Electricity production by type of producer

Change

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	'90 -'17
Total electricity production(gross)	97 508	93 518	129 776	130 469	139 906	104 164	109 928	111 741	19.5%
Large-scale power units	44 155	7 494	8 871	49	336	46	44	82	-98.9%
Large-scale CHP units	52 056	80 639	73 809	74 932	83 940	37 375	46 063	39 859	-50.6%
- of which electricity production	36 026	50 157	41 584	38 402	43 221	8 936	16 978	11 835	-76.4%
Small-scale CHP units	18	988	21 547	21 254	19 216	5 765	7 748	8 302	740%
Autoproducers	1 118	2 099	10 168	10 336	8 203	7 858	7 312	7 520	258%
- Electricity production ¹⁾	-	-	9	7	6	3	3	3	•
- CHP ¹⁾	1 118	2 099	10 158	10 328	8 197	7 855	7 309	7 517	258%
Wind turbines ¹⁾	38	2 197	15 268	23 810	28 114	50 879	46 014	53 208	2322%
Hydropower units ¹⁾	123	101	109	81	74	65	69	64	-36.2%
Photovoltaics ¹⁾	-	-	4	8	22	2 175	2 678	2 705	•
Own use in production	-5 731	-6 118	-5 776	-6 599	-7 159	-3 670	-5 246	-4 990	-18.4%
Large-scale power units	- 2 787	- 590	- 312	- 2	- 17	- 0	- 3	- 5	-99.1%
Large-scale CHP units	- 2 944	- 5 509	- 4 993	- 6 033	- 6 602	- 3 303	- 4 831	- 4 543	-17.5%
Small-scale CHP units	-	- 19	- 472	- 564	- 541	- 368	- 412	- 442	2227%
Total electricity production (net)	91 777	87 400	123 999	123 870	132 747	100 493	104 682	106 752	22.1%
Net imports of electricity	- 4 453	25 373	2 394	4 932	- 4 086	21 282	18 206	16 426	-35.3%
Domestic electricity supply	87 323	112 773	126 393	128 802	128 661	121 775	122 888	123 177	9.2%
Transformation consumption	-	-	- 1	-	- 110	- 1 073	- 735	- 1 026	•
Distribution losses etc. ²⁾	- 7 497	- 8 886	- 7 650	- 5 573	- 9 482	- 6 404	- 6 795	- 6 094	31.4%
Domestic electricity consumption	79 827	103 887	118 742	123 228	119 068	114 298	115 358	116 057	-11.7%
Consumption in the energy sector	- 1 214	- 1 748	- 1 893	- 2 761	- 3 445	- 3 244	- 3 378	- 3 378	93.2%
Final electricity consumption	78 613	102 139	116 849	120 467	115 623	111 055	111 980	112 680	10.3%

¹⁾ Gross and net production are by definition identical. ²⁾ Determined as the difference between supply and consumption.

Electricity production by type of producer



In 2017 electricity production was 111.7 PJ, which is an increase of 1.6% compared with 2016. The reason is due to a slight increase in domestic electricity supply as well as lower net import of electricity in 2017 as opposed to 2016.

Electricity is generated at large-scale power units, at small-scale CHP units, by wind turbines and by autoproducers (i.e. small producers, whose main product is not energy).

Large-scale power units generate electricity, partly as separate electricity production, and partly as combined electricity and heat production. Of the total electricity production of 111.7 PJ, 39.9 PJ (36%) were generated from large-scale power units – 11.8 PJ as separate production. Separate electricity production varies greatly from year to year due to fluctuations in foreign trade in electricity. Electricity production from small-scale units and autoproducers was 8.3 PJ and 7.5 PJ, respectively. Wind turbines generated 53.2 PJ of electricity, an increase of 15.6% relative to 2016.

ELECTRICITY AND DISTRICT HEATING

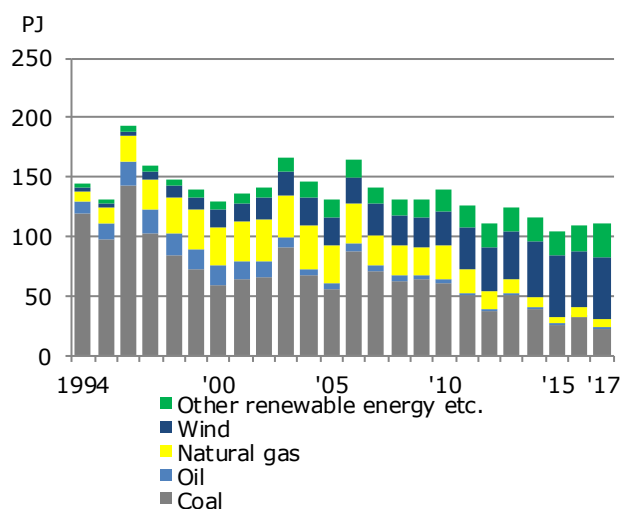
Electricity production by fuel

								Change
Direct energy content [TJ]	1994	2000	2005	2010	2015	2016	2017	'94 -'17
Total electricity production (gross)	144 707	129 776	130 469	139 906	104 164	109 928	111 741	-22.8%
Oil	9 547	15 964	4 933	2 783	1 122	1 157	1 003	-89.5%
- of which orimulsion	-	13 467	-	-	-	-	-	•
Natural gas	8 206	31 589	31 606	28 464	6 499	7 872	6 879	-16.2%
Coal	119 844	60 022	55 666	61 222	25 596	31 915	22 351	-81.4%
Surplus heat	-	139	-	-	-	-	-	•
Waste, non-renewable	836	2 002	2 938	2 689	2 706	2 536	2 603	211%
Renewable energy	6 275	20 060	35 326	44 749	68 241	66 448	78 906	1157%
Solar	-	4	8	22	2 175	2 678	2 705	•
Wind	4 093	15 268	23 810	28 114	50 879	46 014	53 208	211%
Hydro	117	109	81	74	65	69	64	-45.2%
Biomass	1 743	3 928	10 410	15 253	13 396	15 649	20 454	1073%
- Straw	293	654	3 088	3 968	2 080	2 288	2 140	631%
- Wood	429	828	3 730	7 998	7 987	10 252	15 129	3422%
- Biooil	-	0	1	1	22	10	4	•
- Waste, renewable	1 021	2 447	3 591	3 286	3 307	3 099	3 181	211%
Biogas	321	751	1 017	1 285	1 726	2 038	2 474	671%

Electricity from renewable energy: Share of domestic electricity supply

								Change
[%]	1994	2000	2005	2010	2015	2016	2017	'94 -'17
Renewable energy	5.3	15.9	27.4	34.8	56.0	53.9	63.7	1109%
Solar	0.0	0.0	0.0	0.0	1.8	2.2	2.2	•
Wind	3.4	12.1	18.5	21.9	41.8	37.4	43.2	1155%
Hydro	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-47.1%
Biomass	1.5	3.1	8.1	11.9	11.0	12.7	16.6	1033%
- Straw	0.2	0.5	2.4	3.1	1.7	1.9	1.7	606%
- Wood	0.4	0.7	2.9	6.2	6.6	8.3	12.3	3302%
- Biooil	-	0	0	0	0	0	0	•
- Waste, renewable	0.9	1.9	2.8	2.6	2.7	2.5	2.6	201%
Biogas	0.3	0.6	0.8	1.0	1.4	1.5	1.7	529%

Electricity production by fuel



In 2017, 22.4 PJ (20.0%) of total electricity production was generated by coal. Natural gas accounted for 6.9 PJ (6.2%) of electricity production. Oil and non-renewable waste accounted for 1.0 PJ (0.9%) and 2.6 PJ (2.3%) of the electricity production, respectively.

Electricity production based on renewables was 78.9 PJ in 2017. This is 18.7% more than production in 2016. The increase is due to a significant increase in wind power and biomass production.

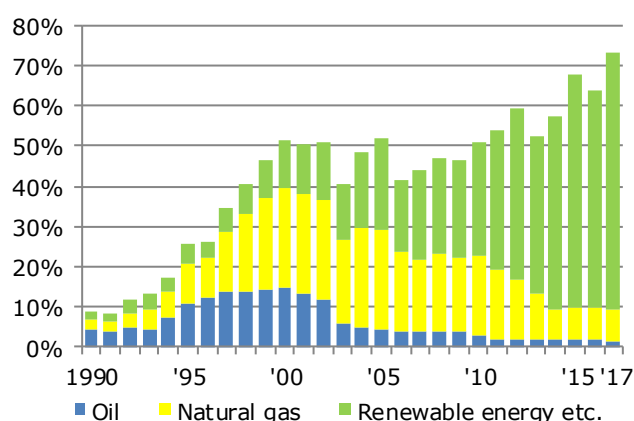
Electricity production based on biomass contributed 20.5 PJ, which is 30.7% more than in 2016. With 53.2 PJ, which is 15.6% more than in 2016, wind turbines still accounted for the greatest contribution to electricity production based on renewable energy.

Fuel consumption for electricity production

Change

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	'94-'17
Total fuel consumption	261 835	227 001	276 974	265 330	286 006	180 654	195 722	190 552	-16.1%
Oil	47 533	9 215	40 356	11 867	8 087	3 110	3 026	2 677	-71.0%
- of which orimulsion	-	-	33 503	-	-	-	-	-	•
Natural gas	-	6 181	68 868	65 912	57 229	14 303	16 295	14 466	134%
Coal	214 012	207 173	134 205	127 119	139 714	58 410	70 876	50 976	-75.4%
Waste, non-renewable	-	262	5 294	7 650	9 085	9 412	9 298	8 487	3141%
Renewable energy	290	4 170	28 252	52 784	71 891	95 419	96 226	113 947	2633%
Solar	-	-	4	8	22	2 175	2 678	2 705	•
Wind	38	2 197	15 268	23 810	28 114	50 879	46 014	53 208	2322%
Hydro	123	101	109	81	74	65	69	64	-36.2%
Biomass	90	1 428	11 009	26 470	40 808	38 665	43 248	52 965	3609%
- Straw	-	363	2 021	7 715	10 213	5 807	5 854	5 981	1548%
- Wood	90	745	2 518	9 405	19 492	21 248	26 004	36 599	4813%
- Biooil	-	-	0	0	-	107	25	13	•
- Waste, renewable	-	320	6 470	9 350	11 104	11 503	11 365	10 373	3141%
Biogas	39	444	1 861	2 415	2 872	3 634	4 217	5 004	1027%

Other fuels than coal for electricity production

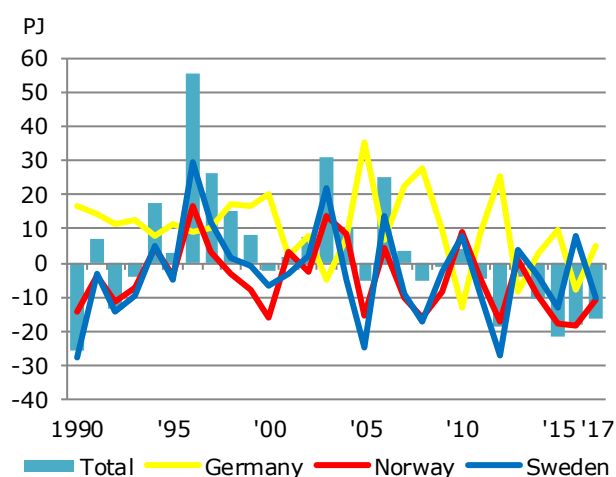


In the early 1990s, coal was the dominant fuel used in the production of electricity. In 1990, other types of fuel than coal only accounted for just 8.7% of total fuel consumption.

The share of fuels other than coal increased throughout the 1990s and in the period from 2000 to 2010 amounted to 40-52%. In recent years this share has been higher than 50%, and in 2017, oil, natural gas and renewable energy etc. together accounted for 73.2% of fuel consumption for electricity production.

The share of other fuels than coal has increased compared to 2016. This is mainly due to the fact, that less coal was used in 2017 compared to 2016.

Net exports of electricity by country



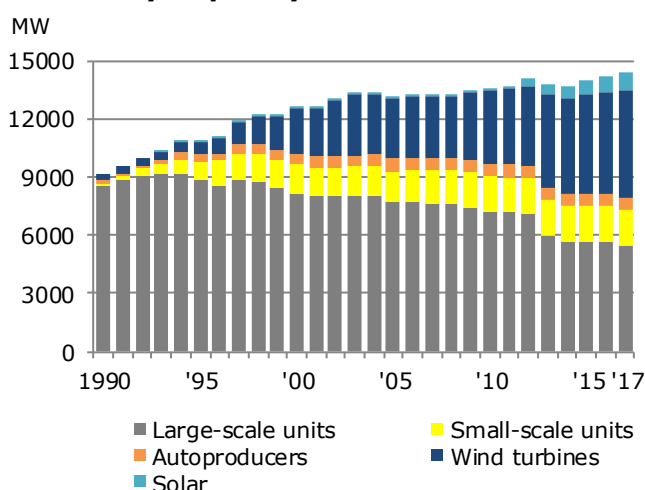
Danish foreign trade in electricity varies considerably from year to year. Foreign trade is strongly affected by price trends on the Nordic electricity exchange, Nordpool, which, in turn, is significantly influenced by varying precipitation patterns in Norway and Sweden, where electricity production is dominated by hydropower.

In 2017, Denmark had overall net imports of electricity of 16.4 PJ. This was the result of net imports from Norway and Sweden of 11.0 PJ and 10.4 PJ, respectively and net exports to Germany of 5.0 PJ.

Electricity capacity, end of year

MW	1994	2000	2005	2010	2015	2016	2017	Change
								'94 - '17
Total	10 767	12 598	13 088	13 450	13 995	14 229	14 368	33.4%
Large-scale units	9 126	8 160	7 710	7 175	5 690	5 666	5 402	-40.8%
- Electricity	2 186	1 429	834	840	839	815	815	-62.7%
- CHP	6 940	6 731	6 877	6 335	4 850	4 850	4 586	-33.9%
Small-scale units	773	1 462	1 579	1 819	1 836	1 838	1 882	144%
Autoproducers	339	574	657	638	604	619	646	90.6%
Solar	0	1	3	7	782	851	906	•
Wind	521	2 390	3 128	3 802	5 077	5 246	5 522	959%
Hydro	8	10	11	9	7	9	9	10.8%

Electricity capacity

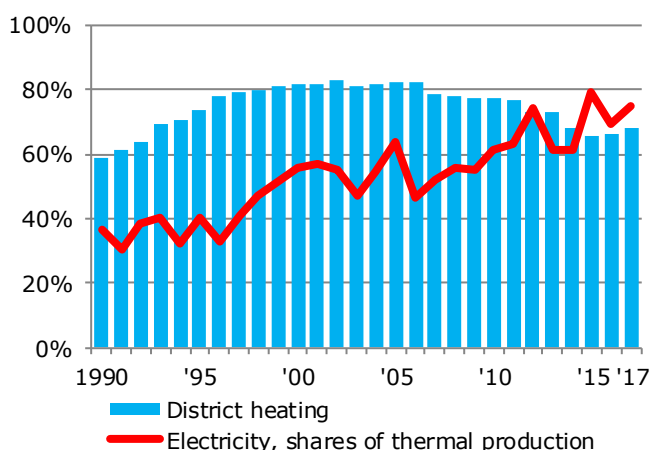


Up until the early 1990s electricity production capacity was dominated by the large-scale power units. Up through the 1990s, electricity capacity in small-scale units and secondary installations (autoproducers) increased. By the turn of the millennium, this capacity corresponded to a quarter of the capacity of the large-scale units.

A number of units at the large-scale plants which have in fact been out of operation for a number of years have now been scrapped and capacity at the large-scale plants therefore fell significantly. Capacity at small-scale units has increased slightly and has remained quite constant over recent years. Capacity at small-scale and autoproducers' installations now corresponds to one-third of the capacity of thermal plants.

Wind power capacity has also been increasing and in 2017 accounted for 5522 MW which is an increase of 277 MW or 5.3% compared with 2016.

CHP share of thermal power and district heating production



By generating electricity and district heating together, it is possible to exploit the large amounts of heat generated through thermal production of electricity.

In 2017, 75.0% of thermal electricity production (i.e. total production excl. wind, solar and hydropower) was produced simultaneously with heating. This is an increase of 5.9 percentage points compared to 2016. It is primarily because electricity production without simultaneous production of heat (condensing power) at thermal plants has decreased because of increasing wind power generation.

In 2017, 68.0% of district heating was produced with electricity. This is an increase of 1.8 percent point in comparison to 2016.

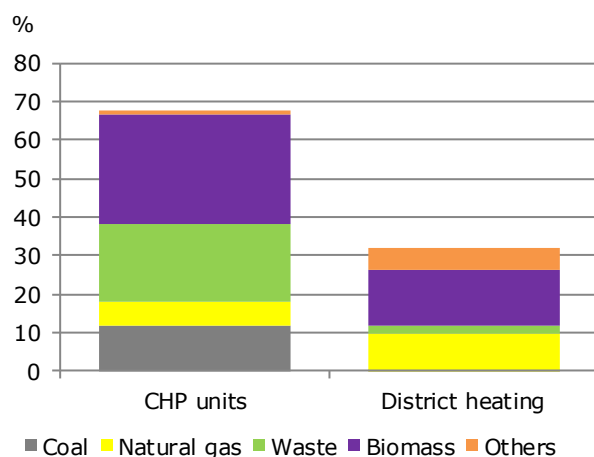
Heat production units by type of production plant, 2017

	Number of units	Electricity capacity [MW]	Heat capacity [MJ/s]	Share of total heat supply [%]
Total	2 809	7 149	24 692	100
Large-scale CHP units	22	4 586	5 648	37.9
Small-scale CHP units	637	1 893	2 305	13.2
District heating units	1 759		13 882	27.3
Autoproducers				
- CHP units	267	670	1 874	16.8
- Heating units	124		984	4.7

Heat production by units' primary fuel, 2017

	CHP units				Heat-only units		
Primary fuel of unit	Number of units	Electricity capacity [MW]	Heat capacity [MJ/s]	Share of total heat supply [%]	Number of units	Heat capacity [MJ/s]	Share of total heat supply [%]
Total	926	7 149	9 827	67.9	1 883	14 866	32.1
Coal	7	2 521	2 383	12.0	1	10	0.1
Natural gas	494	1 876	2 395	5.9	557	4 600	9.8
Oil	86	204	284	0.2	298	3 289	0.3
Waste	33	425	1 277	20.2	13	121	2.1
Biogas	158	114	152	1.1	24	46	0.1
Biomass	28	1 680	2 744	28.6	349	1 669	14.5
Biooil	-	-	-	-	46	622	0.1
Surplus heat	-	-	-	-	49	359	3.0
Solar heating	-	-	-	-	115	859	1.3
Heat pumps and electric boilers	-	-	-	-	65	603	0.8
No production in 2017	120	329	591	-	366	2 687	0.0

Heat supply by primary fuel, 2017



District heating supply takes place partly at CHP units and partly at units exclusively producing district heating. In 2017 CHP units produced 67.9%, of which: large-scale CHP units contributed 37.9%, small-scale CHP units contributed 13.2%, and CHP units at autoproducers contributed 16.8%.

Some CHP and district heating units use several types of fuel. A break down by types of primary fuel used by units in 2017 reveals that CHP units using coal as the primary fuel accounted for 12.0% of heat supply, while units using natural gas, waste or biomass as primary fuel accounted for 5.9%, 20.2% and 28.6%, respectively, of total district heating supply.

For units that produce district heating alone, units primarily firing with biomass contributed 14.5% and natural gas units contributed 9.8% of total district heating supply.

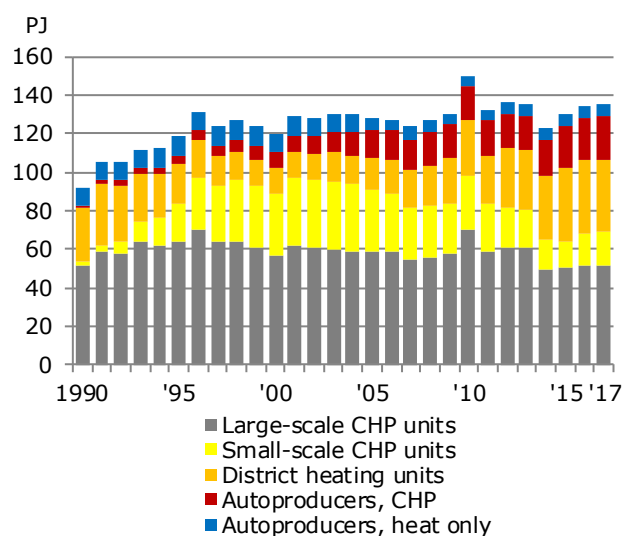
ELECTRICITY AND DISTRICT HEATING

District heating production by type of production plant

									Change
Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	'90 -'17
Total production (gross)	79 016	92 411	119 702	128 382	150 393	130 036	134 886	135 590	46.7%
Large-scale CHP units	30 757	51 511	56 271	58 248	69 955	50 098	51 509	51 202	-0.6%
Small-scale CHP units	30	2 145	33 027	32 727	28 462	13 777	16 337	18 312	754%
District heating by type of producer	43 655	27 755	12 516	16 621	28 816	38 218	39 065	36 910	33.0%
Autoproducers									
- CHP units ¹⁾	130	694	8 375	14 884	17 625	21 589	21 464	22 750	3178%
- Heating units ¹⁾	4 444	10 306	9 513	5 901	5 537	6 354	6 511	6 415	-37.8%
Consumption in production	-	-	-1 539	-1 303	-1 207	- 623	- 723	- 661	•
Large-scale CHP units	-	-	- 866	- 384	- 331	-	-	-	•
Small-scale CHP units	-	-	- 637	- 656	- 643	- 321	- 390	- 424	•
District heating units	-	-	- 36	- 262	- 233	- 302	- 333	- 236	•
Total production (net)	79 016	92 411	118 163	127 079	149 187	129 413	134 163	134 930	46.0%
Net imports	-	122	144	153	174	151	128	124	1.4%
Domestic supply	79 016	92 533	118 307	127 232	149 360	129 564	134 291	135 054	46.0%
Consumption in refineries	-	- 428	- 275	- 355	- 584	- 480	- 614	- 614	43.5%
Distribution losses	-19 754	-18 507	-23 661	-25 446	-29 872	-25 913	-26 858	-27 011	46.0%
Final consumption	59 262	73 599	94 370	101 430	118 904	103 171	106 819	107 429	46.0%

¹⁾ Gross and net productions are by definition identical.

District heating production by type of production plant



District heating production is generated at large-scale CHP units, small-scale CHP units, district heating units and by auto producers such as industrial companies, horticulture and waste treatment facilities.

The greatest contribution to district heating production comes from large-scale CHP units. Throughout the 1990s, the share produced at small-scale CHP units and by auto producers such as CHP units, at CHP units at waste treatment facilities, in industry and in horticulture etc. increased.

During the last ten years the production from small-scale CHP units has decreased substantially. However from 2016 to 2017 the production once again increased slightly.

In 2017 total district heating production was 135.6 PJ, which is a rise of 0.5% compared with 2016. Compared with 2000, district heating production increased by 13.3%; compared with 1990 it increased by 46.7%.

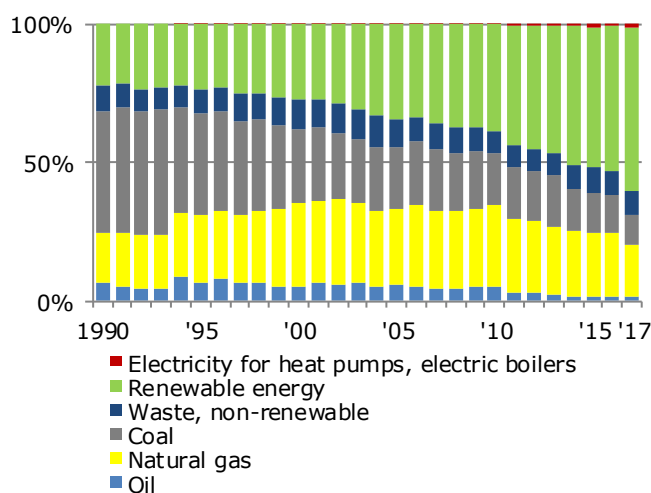
District heating production by fuel

								Change
Direct energy content [TJ]	1994	2000	2005	2010	2015	2016	2017	'94 -'17
Total production (gross)	113 103	119 702	128 382	150 393	130 036	134 886	135 590	19.9%
Oil	6 335	4 433	6 103	4 627	1 281	1 378	1 227	-80.6%
- of which orimulsion	-	1 291	-	-	-	-	-	•
Natural gas	25 370	41 620	39 377	44 844	23 656	25 379	20 640	-18.6%
Coal	55 748	38 873	34 189	36 337	26 050	24 917	19 238	-65.5%
Surplus heat	2 838	3 676	3 174	2 518	3 130	3 458	3 744	31.9%
Electricity excl. heat pumps	-	-	-	110	1 036	697	961	
Electricity, heat pumps	12	1	-	0	29	30	46	299%
Waste, non-renewable	6 084	8 651	10 713	10 627	12 245	12 202	12 541	106%
Renewable energy	16 715	22 448	34 826	51 331	62 608	66 826	77 193	362%
Solar	6	24	53	139	956	1 375	1 733	30051%
Geothermal	21	29	86	106	70	112	76	260%
Biomass	16 304	21 462	33 509	49 912	59 329	62 609	72 094	342%
- Straw	4 318	5 696	7 681	11 507	11 359	11 046	12 136	181%
- Wood	4 327	5 153	12 086	23 731	32 495	36 411	44 475	928%
- Biooil	223	39	650	1 685	508	239	155	-30%
- Waste, renewable	7 436	10 574	13 093	12 989	14 966	14 913	15 327	106%
Biogas	348	903	1 169	1 173	2 172	2 627	3 156	808%
Heat pumps	36	29	9	0	82	102	134	269%

Fuel consumption for district heating production

								Change
Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	'90 -'17
Total fuel consumption	75 443	69 830	73 257	78 766	95 889	87 357	90 273	29.3%
Oil	51 304	4 766	3 726	4 322	4 554	1 039	1 153	-77.4%
- of which orimulsion	-	-	646	-	-	-	-	•
Natural gas	-	12 131	22 203	22 044	28 454	20 136	20 996	39.4%
Coal	13 527	30 898	19 459	17 121	18 245	13 117	12 500	-68.6%
Electricity	-	-	75	76	149	1 121	787	•
Waste, non-renewable	4 492	6 289	7 675	8 138	7 122	7 649	7 608	33.1%
Renewable energy	6 120	15 746	20 120	27 065	37 364	44 295	47 229	237%
Solar	-	6	24	53	143	956	1 375	28775%
Geothermal	-	48	58	172	212	140	225	218%
Biomass	6 105	15 611	19 425	26 125	36 288	41 738	43 886	215%
- Straw	290	3 640	5 013	5 934	8 269	9 066	8 851	155%
- Wood	324	3 541	4 983	9 484	17 365	22 793	25 488	731%
- Biooil	-	744	49	761	1 949	529	249	-76.4%
- Waste, renewable	5 491	7 686	9 380	9 946	8 705	9 349	9 298	33.1%
Biogas	15	81	582	707	721	1 379	1 644	2375%
Heat pumps	-	-	29	9	0	82	98	•

Fuel consumption for district heating production, percentage distribution



The upper table shows output, the amount of district heating produced, and the type of fuel used. For example, in 2017 a total of 135.6 PJ district heating was produced. The lower table shows input and the amount of fuel used to produce district heating. For example, in 2017 a total of 90.3 PJ fuel was used. Input can well be less than output. This is because of variations in the heat efficiency by which the different fuels are converted into district heating, and because it is assumed that combined heat and power plants produce heat with an efficiency of 200%. An example would be consumption of 9.7 PJ coal (lower table) results in district heating production of 19.2 PJ (upper table).

There has been a significant change in the fuel used in the production of district heating since 1990.

Production of district heating based on coal has decreased from about 50% to the current 10.7%. The corresponding percentage based on renewable energy - primarily biomass - has increased from around 20% to 58.9% of district heating production in 2017.

ENERGY SUPPLY AND CONSUMPTION 2017

Energy supply and consumption 2017

Direct energy content [TJ]	Total	Crude oil	Refinery feed-stocks	Refinery gas	LPG	Aviation gasoline	Motor gasoline	Other kerosene	JP1	Gas-/diesel-oil	Fuel oil	Waste oil	Petroleum coke	Lubrication oil and bitumen
Energy supply														
- Primary production	658 419	289 690	-	-	-	-	-	-	-	-	-	-	-	-
- Recycling	19	-	-	-	-	-	-	-	-	-	-	19	-	-
- Imports	672 897	207 408	3 580	-	1 622	17	17 099	-	40 316	119 009	39 857	-	7 187	10 523
- Exports	-584 264	-176 198	-19 454	-	-3 906	- 3	-53 542	- 19	-7 797	-100 530	-99 386	-	- 58	- 134
- Border trade	-9 925	-	-	-	-	-	1 643	-	-	-12 195	-	-	628	-
- International marine bunkers	-22 389	-	-	-	-	-	-	-	-	-16 638	-5 650	-	-	- 101
- Supply from blending	1	-	-1 260	-	- 0	-	- 50	21	0	307	906	-	-	3
- Stock changes	29 995	1 379	- 97	-	- 140	15	1 262	-	5 814	14 555	19 645	-	836	46
Statistical differences	1 776	633	- 118	0	100	3	- 93	- 0	- 53	-2 887	855	-	- 47	12
Extraction and gasification	-22 769	-	-	-	-	-	-	-	-	-	-	-	-	-
Refineries														
- Input and net production	279	-322 912	17 349	15 928	4 854	-	91 231	-	5 288	140 708	47 832	-	-	-
- Own use in production	-16 875	-	-	-14 503	-	-	-	-	-	-	- 663	-	-	-
Used in distribution	-2 283	-	-	-	-	-	-	-	-	-	-	-	-	-
Large-scale power units	-													
- Fuel used and production	- 219	-	-	-	-	-	-	-	-	- 166	- 135	-	-	-
- Own use in production	- 5	-	-	-	-	-	-	-	-	-	-	-	-	-
Large-scale CHP units														
- Fuel used and production	-26 419	-	-	-	- 0	-	-	-	-	- 12	- 832	-	-	-
- Own use in production	-4 543	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable energy, selected														
- Wind	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Small-scale CHP units														
- Fuels used and production	-3 329	-	-	-	-	-	-	-	-	- 12	- 1	-	-	-
- Own use in production	- 867	-	-	-	-	-	-	-	-	-	-	-	-	-
District heating units														
- Fuels used and production	- 539	-	-	-	-	-	-	-	-	- 447	- 144	- 1	-	-
- Own use in production	- 236	-	-	-	-	-	-	-	-	-	-	-	-	-
Autoproducers														
- Electricity units	- 11	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHP units	-6 185	-	-	-1 425	- 19	-	-	-	-	- 269	- 287	- 1	-	-
- Heat units	3 349	-	-	-	-	-	-	-	-	- 2	- 2	- 0	-	-
Gas works	- 46	-	-	-	-	-	-	-	-	- 63	-	-	-	-
Biogas upgrading plants														
Distribution losses etc.	-33 190	-	-	-	-	-	-	-	-	-	-	-	-	-
Final consumption														
- Non-energy use	-10 350	-	-	-	-	-	-	-	-	-	-	-	-	-10 350
- Road	-162 214	-	-	-	-	-	-56 581	-	-	-96 347	-	-	-	-
- Rail	-4 762	-	-	-	-	-	- 0	-	-	-3 297	-	-	-	-
- Domestic sea transport	-6 214	-	-	-	-	-	-	-	-	-6 214	-	-	-	-
- International aviation	-41 001	-	-	-	-	-	-	-	-41 001	-	-	-	-	-
- Domestic aviation	-1 262	-	-	-	-	- 31	- 0	-	-1 231	-	-	-	-	-
- Military transport	-2 800	-	-	-	-	-	- 2	-	-1 336	-1 462	-	-	-	-
- Agriculture, forestry and horticulture	-25 945	-	-	-	- 250	-	- 78	-	-	-12 451	- 18	-	-	-
- Fishing	-4 890	-	-	-	- 12	-	- 0	-	-	-4 879	-	-	-	-
- Manufacturing	-91 141	-	-	-	-1 027	-	- 17	- 2	-	-2 000	-1 946	- 17	-7 906	-
- Construction	-7 218	-	-	-	- 82	-	- 10	- 0	-	-5 334	-	-	-	-
- Wholesale	-11 060	-	-	-	- 41	-	-	-	-	- 263	- 0	-	- 1	-
- Retail trade	-10 233	-	-	-	- 33	-	-	-	-	- 113	- 0	-	- 0	-
- Private service	-37 610	-	-	-	- 154	-	-	-	-	- 467	- 13	-	- 2	-
- Public service	-25 013	-	-	-	- 161	-	-	-	-	-1 129	- 8	-	- 4	-
- Single-family houses	-140 773	-	-	-	- 492	-	- 862	-	-	-6 192	-	-	- 628	-
- Multi-family houses	-50 158	-	-	-	- 260	-	-	-	-	-1 211	- 10	-	- 6	-

ENERGY SUPPLY AND CONSUMPTION 2017

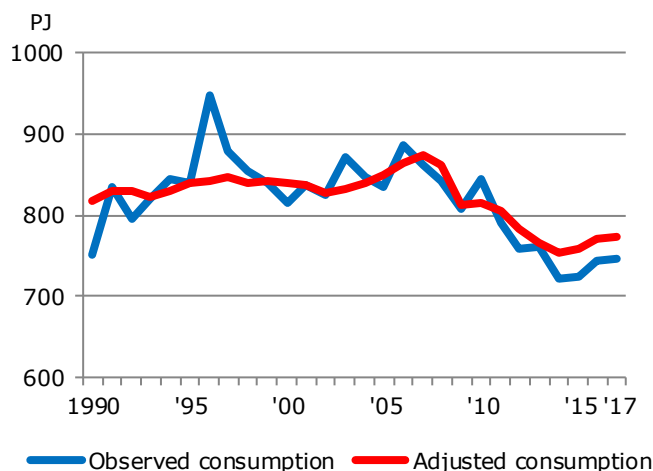
Natural gas	Coal	Coke etc.	Solar energy	Wind power	Hydro power	Geo-thermal	Straw	Wood chips	Fire-wood	Wood pellets	Wood waste	Biogas	Bio-met-hane	Waste	Biooil, biodiesel etc.	Heat pumps	Electricity	District heating	Gas-works gas
182 142	-	-	5 035	53 208	64	152	20 212	19 433	22 492	2 797	7 166	11 158	-	35 602	188	9 081	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 446	74 789	345	-	-	-	-	-	5 481	2 611	54 284	-	-	-	4 043	10 369	-	54 785	124	-
-84 036	-	- 0	-	-	-	-	-	-	-	-	-	-	-	-	- 840	-	-38 359	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	-	-	-	-
-2 528	-10 300	1	-	-	-	-	-	-	-	-	-	-	-	-	- 493	-	-	-	-
2 635	861	- 31	0	-	-	-	-	- 6	-	-	0	-	0	-	- 91	0	-	0	- 0
-22 769	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1 094	- 614	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-2 283	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 5	-	-
-6 612	-60 151	-	-	-	-	-	-4 702	-7 236	-	-37 051	- 511	- 10	- 364	-	-	-	39 859	51 202	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-4 543	-	-
-	-	-	-	-53 208	-	-	-	-	-	-	-	-	-	-	-	-	53 208	-	-
-	-	-	-	-	- 64	-	-	-	-	-	-	-	-	-	-	-	64	-	-
-9 213	- 402	-	-	-	-	-	-4 478	-4 950	-	- 524	- 753	-3 341	- 507	-5 763	-	-	8 302	18 312	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 442	- 424	-
-12 823	- 110	-	-1 733	-	-	- 152	-6 046	-10 588	-	-2 277	- 637	- 72	- 705	- 513	- 176	-	-1 026	36 910	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 236	-
-	-	-	-2 705	-	-	-	-	-	-	-	-	- 15	-	-	-	-	2 709	-	-
-2 671	-	-	-	-	-	-	- 3	- 381	-	-	- 561	-1 790	- 147	-28 885	- 13	-	7 517	22 750	-
- 62	-	-	-	-	-	-	- 26	- 140	-	-	- 418	- 57	- 3	-2 298	-	-	- 58	6 415	-
- 468	-	-	-	-	-	-	-	-	-	-	-	- 104	- 26	-	-	-	-	-	614
-	-	-	-	-	-	-	-	-	-	-	-	-5 130	5 130	-	-	-	-	-	-
- 113	-	-	-	-	-	-	-	-	-	-	-	-	- 6	-	-	-	-6 036	-27 011	- 25
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- 253	-	-	-	-	-	-	-	-	-	-	-	-	- 14	-	-9 020	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1 465	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-1 708	- 403	-	-	-	-	-	-1 983	- 27	-	-	- 177	- 110	- 94	-	-	- 731	-6 331	-1 585	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-28 478	-4 285	- 315	-	-	-	-	-	-1 333	-	-1 403	-4 020	- 151	-1 478	-1 486	-	-1 983	-29 685	-3 402	- 206
- 325	-	-	-	-	-	-	-	-	-	-	-	-	- 18	-	-	-	-1 450	-	-
-1 041	-	-	-	-	-	-	-	-	-	-	-	-	- 57	-	-	-	-5 415	-4 241	-
- 804	-	-	-	-	-	-	-	-	-	-	-	-	- 44	-	-	-	-5 964	-3 274	-
-3 394	-	-	-	-	-	-	-	- 19	-	-	- 89	- 380	- 187	- 700	-	-	-17 932	-14 262	- 12
-2 570	-	-	- 90	-	-	-	-	- 151	-	-1 204	-	-	- 141	-	-	-	-8 928	-10 609	- 19
-20 466	-	-	- 418	-	-	-	-2 974	- 83	-25 102	-14 622	-	-	-1 125	-	-	-6 366	-27 058	-34 192	- 192
-3 889	-	-	- 90	-	-	-	-	-	-	-	-	-	- 214	-	-	-	-8 452	-35 865	- 161

GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Gross energy consumption

	1980	1990	2000	2005	2010	2015	2016	2017	Change '90-'17
Adjusted total gross energy consumption. Fuel equivalent [PJ]	814	819	839	850	814	760	770	772	-5.7%
By fuel	814	819	839	850	814	760	770	772	-5.7%
Oil	546	355	376	352	312	279	280	286	-19.5%
Natural gas	0	82	192	192	176	133	131	125	52.5%
Coal and coke	241	327	175	166	147	111	116	92	-72.0%
Waste, non-renewable	5	8	14	17	16	18	18	18	135%
Renewable energy	22	48	81	123	163	219	225	252	428%
By energy product	814	819	839	850	814	760	770	772	-5.7%
Oil	446	338	329	333	300	274	275	281	-16.7%
Natural gas	0	59	98	100	94	87	85	86	45.5%
Coal and coke	22	17	12	11	6	5	5	5	-70.9%
Waste, non-renewable	0	0	1	1	1	1	1	1	111%
Renewable energy	16	28	32	43	54	72	75	78	181%
Electricity	249	297	286	279	274	229	237	228	-23.2%
District heating	73	77	79	81	86	91	92	92	18.7%
Gas works gas	7	2	1	1	1	1	1	1	-71.4%
By use	814	819	839	850	814	760	770	772	-5.7%
Energy sector	17	28	44	52	46	42	36	40	44.4%
Non-energy use	16	13	13	12	11	11	10	10	-20.4%
Transport	144	172	203	218	212	211	215	220	28.1%
Agriculture and industry	228	226	226	213	187	163	166	166	-26.6%
Commercial and public services	130	132	125	127	130	114	117	118	-10.6%
Households	277	248	228	229	228	220	225	218	-12.3%
Observed total energy consumption [PJ]	830	752	816	835	846	724	743	747	-0.8%
Oil	555	343	370	348	316	277	279	285	-17.1%
Natural gas	0	76	186	188	185	120	122	117	54.3%
Coal and coke	252	255	166	155	164	76	88	66	-74.2%
Waste, non-renewable	5	7	14	17	17	18	18	18	156%
Renewable energy	23	45	79	122	168	210	218	244	437%
Foreign trade in electricity, net imports	- 4	25	2	5	- 4	21	18	16	
Foreign trade in district heating, net imports	-	0	0	0	0	0	0	0	

Observed energy consumption and adjusted gross energy consumption



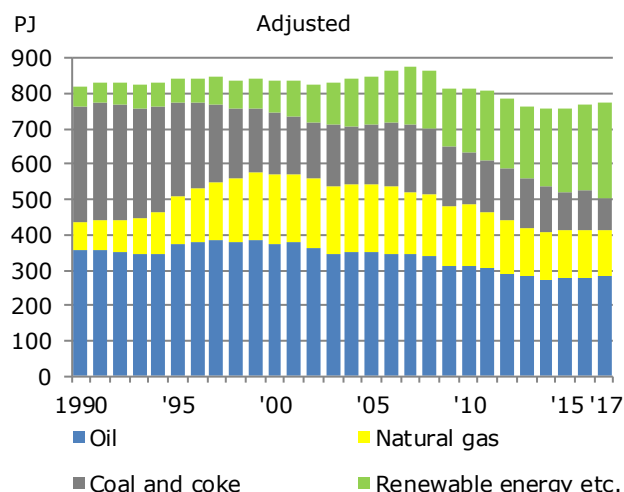
Observed energy consumption shows the registered amount of energy consumed in a calendar year. Gross energy consumption is derived by adjusting observed energy consumption for the fuel consumption linked to foreign trade in electricity. The adjusted gross energy consumption is moreover adjusted for climate variations with respect to a normal weather year. The purpose of this consumption figure is to provide a clearer picture of trends in domestic energy consumption.

Adjusted gross energy consumption was 772 PJ in 2017, which is 0.3% higher than the 2016 level. Compared with 1990, consumption has fallen by 5.7%.

Observed energy consumption was 747 PJ in 2017, which is 0.5% higher than the 2016 level. Compared with 1990, observed energy consumption was 0.8% lower.

GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Gross energy consumption by fuel

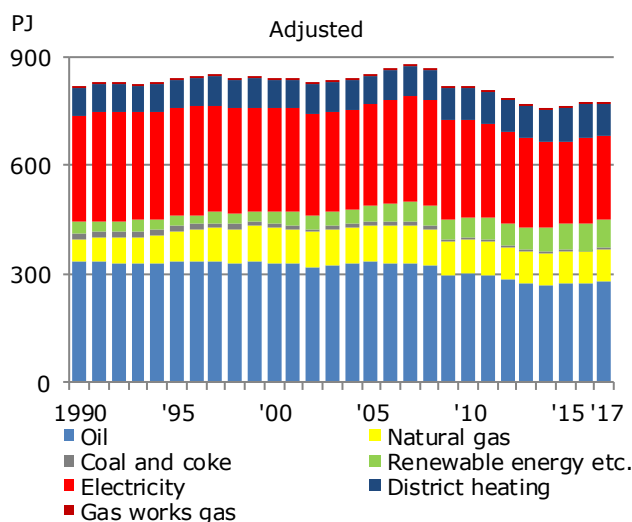


Adjusted gross energy consumption was 5.7% lower in 2017 than in 1990. However, consumption of individual fuels has followed rather varied trends.

Consumption of oil fell up until 1993, after which it rose again and stabilised, first at around 380 PJ and then at around 350 PJ. After this, there was another drop. From 1990 to 2017, oil consumption fell by 19.5%. Consumption of coal, which primarily takes place at CHP units, has decreased by 72.0% since 1990. In the period consumption of natural gas and renewable energy etc. (i.e. renewable energy and non-renewable waste) went up by 52.5% and 387%, respectively.

In 2017 consumption of oil and renewable energy etc. increased by 2.1% and 11.3%, respectively, compared with the year before. In 2017, consumption of coal and natural gas decreased by 21.3% and 4.9% respectively compared with 2016.

Gross energy consumption by energy product after transformation

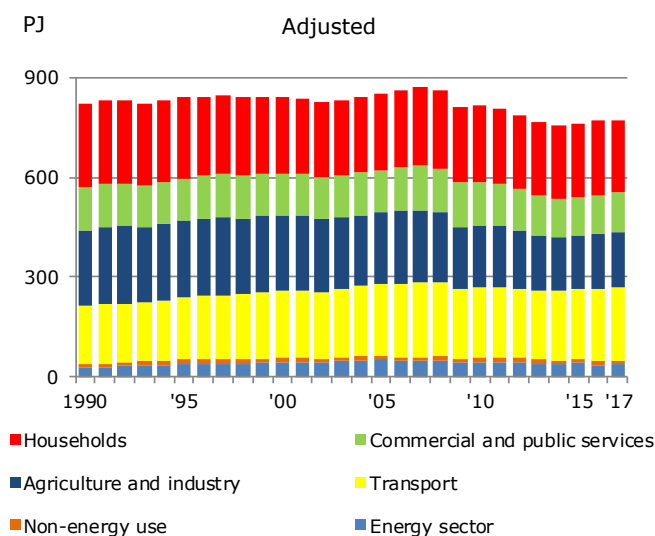


Gross energy consumption by energy product shows gross energy consumption after a number of fuels have been transformed to electricity, district heating, and gas works gas. In other words, the consumption of oil, natural gas, coal and renewable energy etc. is a statement of the volumes of these fuels used outside the transformation sector.

Fuel consumption for electricity production was 228 PJ in 2017, which is 3.8% more than in 2016. Compared with 1990, fuel consumption fell by 23.2% due to more efficient electricity production and a growing share of wind power.

Fuel consumption for district heating was 92 PJ in 2017, which is 0.3% higher than in 2016. Compared with 1990, fuel consumption increased by 18.7%. Also in this regard, production has become more efficient, as district heating production has increased by 46.7% since 1990.

Gross energy consumption by use



For gross energy consumption broken down by use, note that electricity, district heating and gas works gas are included with their associated fuel consumptions.

Gross energy consumption for transport and commercial and public services was 2.0% and 0.6% higher respectively in 2017 than the year before, whereas in the agriculture and industry sector consumption was unchanged. In the households, gross energy consumption fell by 3.1%. In the energy sector (platforms in the North Sea and oil refineries) gross energy consumption rose by 12.4%.

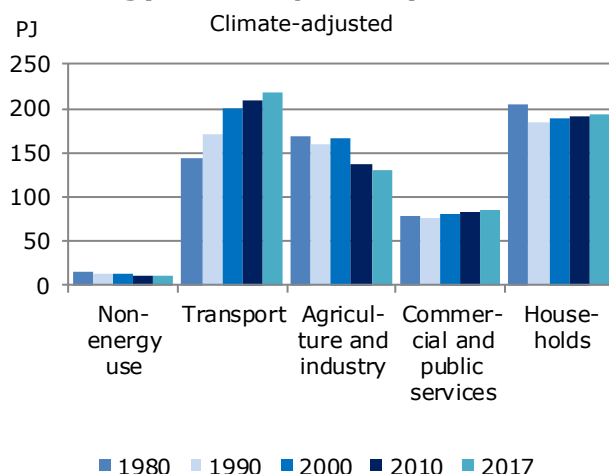
Compared with 1990, gross energy consumption for transport increased by 28.1%. In the agriculture and industry sector, gross energy consumption fell by 26.6%, while it fell by 10.6% and 12.3%, respectively, for the commercial and public services sector and for households. From 1990 to 2017, developments were affected by the fact that electricity and district heating can be generated with ever smaller fuel consumption.

GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Final energy consumption

									Change
Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	'90-'17
Total final energy consumption Climate adjusted	609 602	604 097	650 815	665 869	633 250	619 212	628 618	636 833	5.4%
By energy product									
Oil	430 738	321 946	312 354	312 290	283 644	258 929	263 665	266 467	-17.2%
Natural gas	-	50 060	72 674	72 415	67 638	62 622	63 128	63 388	26.6%
Coal and coke	21 623	17 243	12 389	10 826	5 559	4 972	4 782	5 014	-70.9%
Waste, non-renewable	288	470	763	1 239	922	806	874	990	111%
Renewable energy	15 928	27 833	32 228	43 216	53 578	72 451	74 909	78 154	181%
Electricity	78 378	103 212	117 590	120 731	114 700	111 358	112 098	112 819	9.3%
District heating	57 715	81 679	102 127	104 604	106 725	107 398	108 451	109 407	33.9%
Gas works gas	4 930	1 654	691	547	485	675	712	595	-64.0%
By use									
Non-energy use	16 253	13 004	12 619	12 064	11 026	10 529	10 491	10 350	-20.4%
Total transport	143 337	170 216	201 209	215 789	209 731	209 265	213 828	218 253	28.2%
Road transport	100 945	129 943	153 666	161 923	161 215	159 245	159 958	162 214	24.8%
Rail transport	5 016	4 765	4 339	4 488	4 728	4 785	4 927	4 762	-0.1%
Sea transport, domestic	5 588	6 344	6 857	8 026	6 533	5 640	6 399	6 214	-2.1%
Aviation	23 642	27 515	34 822	37 627	35 785	38 246	41 066	42 263	53.6%
Military transport	8 145	1 649	1 525	3 726	1 470	1 350	1 479	2 800	69.8%
Total agriculture and industry	167 679	158 790	167 113	158 242	137 014	125 109	126 682	129 554	-18.4%
Agriculture, forestry and horticulture	29 818	33 087	32 428	29 322	29 146	27 542	27 200	26 126	-21.0%
Fishing	7 312	10 785	9 451	7 488	6 049	5 205	5 192	4 890	-54.7%
Manufacturing	124 557	108 624	117 583	113 280	94 679	85 808	87 550	91 307	-15.9%
Construction	5 992	6 295	7 651	8 152	7 140	6 554	6 741	7 231	14.9%
Total commercial and public services	78 314	77 047	80 599	85 045	83 893	81 272	82 138	84 764	10.0%
Wholesale	19 045	13 795	13 893	12 906	11 493	10 888	10 935	11 151	-19.2%
Retail trade	9 702	8 883	9 323	9 991	10 939	10 338	10 235	10 314	16.1%
Private service	25 955	28 812	32 901	36 238	36 653	35 519	36 111	37 981	31.8%
Public service	23 612	25 557	24 481	25 909	24 807	24 528	24 857	25 317	-0.9%
Total households	204 018	185 039	189 275	194 729	191 585	193 036	195 478	193 912	4.8%
Single-family houses	155 706	137 383	139 568	144 258	140 888	141 799	144 053	142 968	4.1%
Multi-family houses	48 312	47 656	49 706	50 471	50 696	51 237	51 425	50 945	6.9%
Observed consumption Total final energy consumption	616 998	580 458	632 528	658 455	659 750	610 291	625 147	632 644	9.0%

Final energy consumption by use

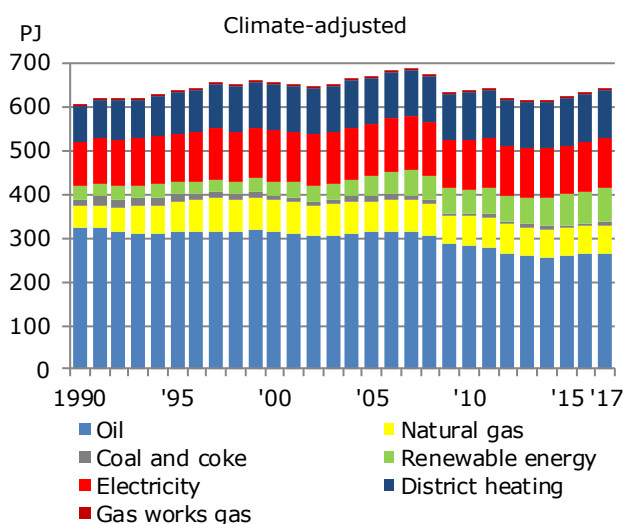


Final energy consumption includes consumption for transport and non-energy purposes (such as lubricants and asphalt), and energy consumption for production and heating by the agriculture and industry sector, the commercial and public services sector, and energy consumption by households.

Final energy consumption in 2017 was 637 PJ, which is 1.3% higher than in 2016. Final consumption was 5.4% higher compared with 1990.

Energy consumption for the transport sector increased steadily throughout most of the period. From 1990 to 2017 consumption went up by 28.2%. Energy consumption in the agriculture and industry sector fell by 18.4% from 1990 to 2017, while consumption in the commercial and public services sector and households increased by 10.0% and 4.8%, respectively.

Final energy consumption by energy product

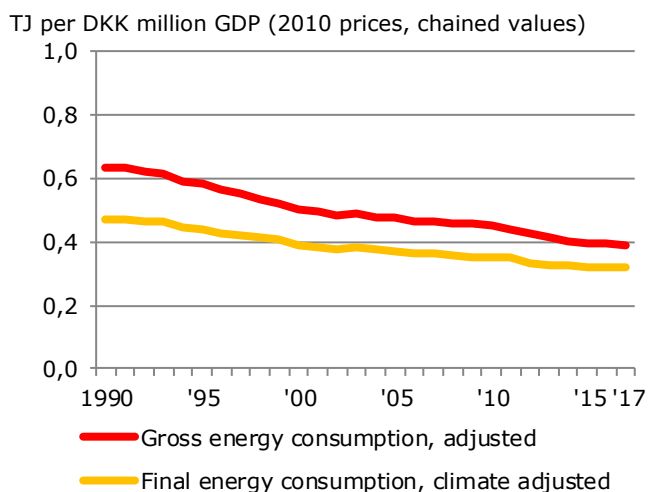


Consumption of oil rose by 1.1% and consumption of natural gas (for other uses than electricity and district heating production) increased by 0.4% from 2016 to 2017. Consumption of electricity increased by 0.6% and consumption of district heating was 0.9% higher than the year before.

Since 1990, final consumption of natural gas has increased by 26.6%, while consumption of electricity and district heating has increased by 9.3% and 33.9%, respectively. In the same period, consumption of oil and coal fell by 17.2% and 70.9%, respectively.

In 2017, final consumption of renewable energy etc. was 4.4% higher than in 2016. Consumption of renewable energy etc. has increased by 180% since 1990.

Gross energy consumption and final energy consumption per DKK million GDP (intensity)



Economic activity in Denmark, measured in terms of gross domestic product (GDP) in 2010 prices (chained values), has increased much faster than energy consumption.

In 2017 gross energy consumption was 0.386 TJ per DKK million GDP (calculated in 2010 prices, chained values), as opposed to 0.636 TJ in 1990; i.e. fuel intensity was reduced by 39.2% during this period. Intensity in 2017 decreased by 1.9% compared with the year before.

If developments in GDP are instead compared to developments in final energy consumption, energy intensity fell by 32.0% from 1990 to 2017. This reduction is less than the figure above, because the increased efficiency of the transformation sector is not included. Intensity decreased by 0.9% in 2017 compared with the year before.

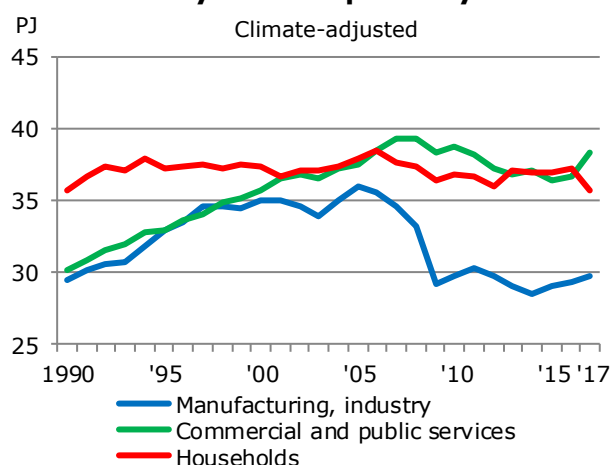
GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Final electricity consumption

Change

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	'90-'17
Total final electricity consumption	78 378	103 212	117 590	120 731	114 700	111 358	112 098	112 819	9.3%
Climate adjusted									
Rail transport	479	736	1 253	1 351	1 455	1 429	1 501	1 465	99.1%
Agriculture and industry	27 724	36 633	43 283	44 092	37 851	36 735	36 872	37 481	2.3%
Agriculture, forestry and horticulture	5 553	6 143	7 047	6 874	6 841	6 441	6 281	6 339	3.2%
Manufacturing	21 404	29 436	35 022	35 943	29 638	28 994	29 248	29 693	0.9%
Construction	767	1 054	1 214	1 274	1 372	1 300	1 343	1 450	37.5%
Commercial and public services	21 788	30 147	35 715	37 479	38 656	36 338	36 573	38 263	26.9%
Wholesale	3 599	5 451	5 936	5 973	5 740	5 274	5 291	5 417	-0.6%
Retail trade	3 784	5 202	5 742	6 260	6 543	6 081	5 959	5 966	14.7%
Private services	8 347	11 715	14 903	15 866	17 108	16 395	16 594	17 945	53.2%
Public services	6 058	7 778	9 134	9 380	9 266	8 589	8 729	8 935	14.9%
Households	28 388	35 696	37 339	37 810	36 738	36 855	37 151	35 609	-0.2%
Single-family houses	21 431	27 011	28 210	28 279	27 335	27 772	28 053	27 148	0.5%
Multi-family houses	6 957	8 686	9 129	9 530	9 403	9 084	9 098	8 461	-2.6%
Observed electricity consumption	78 613	102 139	116 849	120 467	115 623	111 055	111 980	112 680	10.3%

Final electricity consumption by use

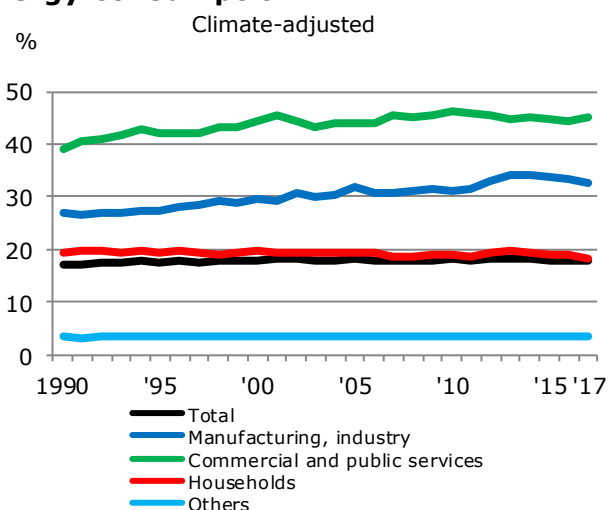


Electricity consumption by manufacturing industries was 1.5% higher in 2017 than in 2016. Compared with 1990, electricity consumption has increased by 0.9%.

In the commercial and public services sector, electricity consumption increased until 2008, after which it fell. In 2017, electricity consumption was 4.6% higher than the year before. From 1990 to 2017 electricity consumption went up by 26.9%.

The electricity consumption of households increased slightly from 1990 to 2006. Consumption has remained almost stable from 2009 to 2011. Electricity consumption decreased by 4.2% in 2017. Consumption decreased by 0.2% relative to 1990.

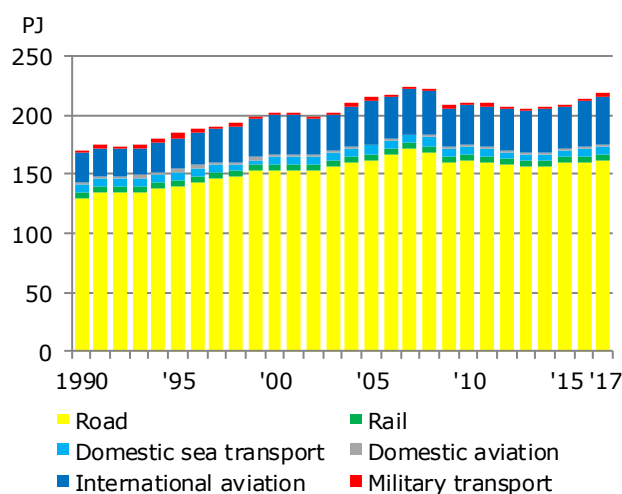
Electricity consumption's share of total energy consumption



During the period from 1990 to 2017 the electricity consumption's share of total energy consumption has been almost unchanged. In 1990, the share was 17.1%, in 2000 it was 18.1% and in 2017 it was 17.7%.

In the commercial and public services sector, electricity consumption's share of total energy consumption grew steadily from 1990 when the share was 39.1% and up to 2001 when it was 45.7%. Since 2002 the share has fluctuated between 43.4% and 46.1%. In 2017, electricity consumption accounted for 45.1% of the sector's total energy consumption. Manufacturing industries has seen a steady increase across the period 1990-2017; with the share of electricity at 32.5% in 2017 compared with 27.1% in 1990. Electricity consumption's share for households remains more or less unchanged with 19.3% in 1990 and 18.4% in 2017.

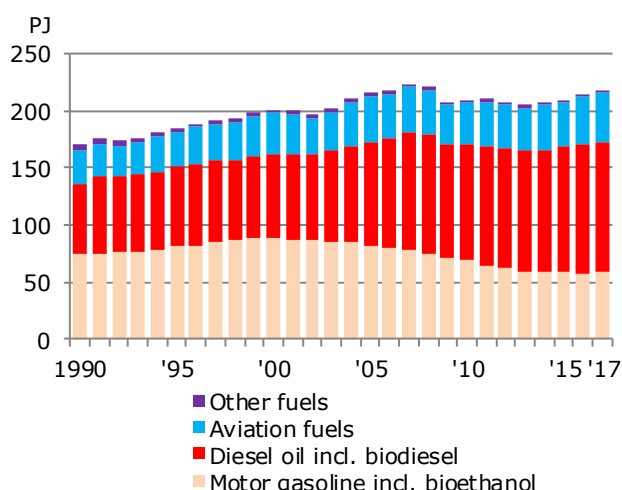
Energy consumption for transport by type



Energy consumption for transport followed an upward trend until 2007, when energy consumption was at 224.0 PJ. In 2009 energy consumption fell to 208.4 PJ. In 2017, energy consumption was calculated at 218.3 PJ, which is 2.1% higher than in 2016. Compared with 1990, energy consumption for transport has increased by 28.2% in 2017.

Energy consumption for road transport was 162.2 PJ in 2017, which is 1.4% higher compared with 2016. Energy consumption for road transport is calculated as sales in Denmark, adjusted for border trade. Energy consumption for international aviation grew steadily throughout almost the whole period 1990-2017. In 2017, consumption increased by 3.2% in comparison to last year.

Energy consumption for transport by fuel type

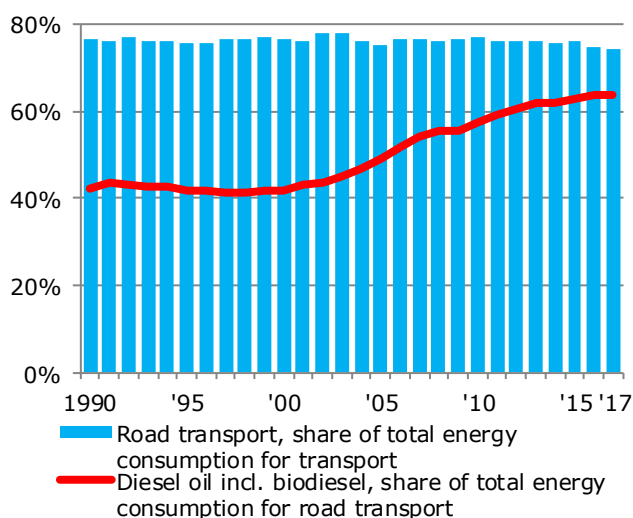


Consumption of motor gasoline (including bioethanol) rose by 0.5% from 2016 to 2017, while consumption of diesel oil (including biodiesel) increased by 2.0%. Consumption of bioethanol and biodiesel together is almost unchanged from 2016 to 2017.

Considering developments from 1990 to 2017, consumption of motor gasoline (including bioethanol) fell by 21.4%, while consumption of diesel oil (including biodiesel) grew by 85.6%. Consumption of aviation fuels increased by 50.4%.

Consumption of other types of fuel fell by 66.8% in the same period. Other types of fuel include electricity consumption by railways. Work is underway for developing a method to calculate electricity consumption for road transport.

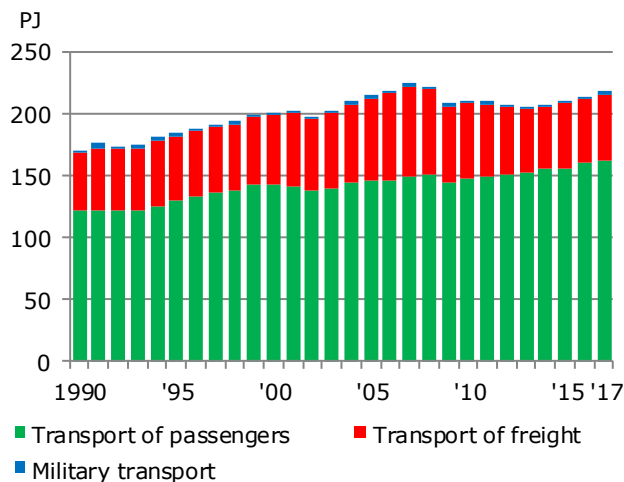
Energy consumption for road transport



Energy consumption for road transport is by far the largest contributor to total energy consumption for transport. This contribution was almost unchanged from 1990 to 2017. In 2017, road transport accounted for 74.3% of total energy consumption for transport.

Consumption of diesel oil has increased significantly and diesel oil has been the most common fuel for road transport since 2006. In 2017, diesel oil (including biodiesel) accounted for 63.8% of total energy consumption for transport, as opposed to 42.1% in 1990.

Final energy consumption by passenger and freight transport

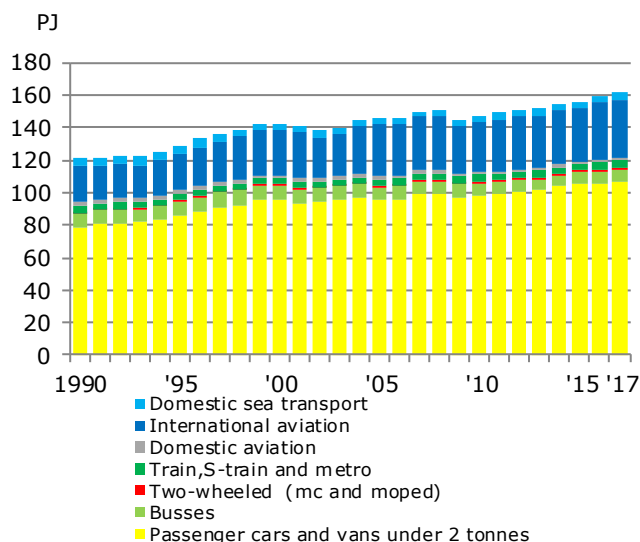


In the distribution of energy consumption for transport of passengers and freight, vans less than two tonnes are included under passenger transport, whereas vans of 2-6 tonnes are included under freight transport.

Out of the total energy consumption for transport in 2017, which amounted to 218.3 PJ, passenger transport accounted for 161.4 PJ, corresponding to 73.9%. Energy consumption for freight transport was 54.1 PJ, corresponding to 24.8%, while energy consumption for transport by Danish military was 2.8 PJ.

Energy consumption for passenger transport increased by 1.0% from 2016 to 2017, while energy consumption for freight transport grew by 2.7%. Considering the trend from 1990 to 2017, energy consumption for passenger transport increased by 33.0%, while energy consumption for freight transport increased by 14.6%.

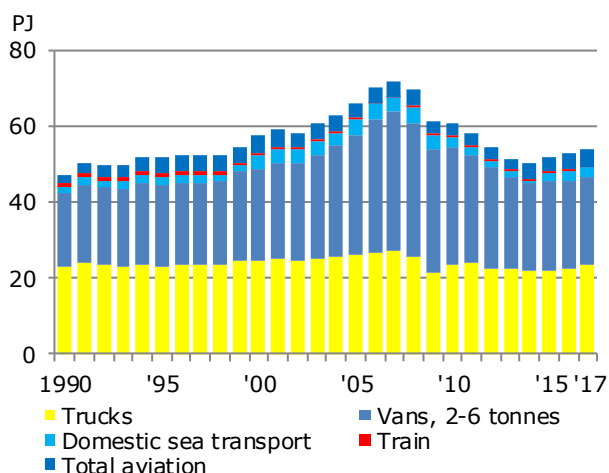
Energy consumption for passenger transport by means of transport



Energy consumption for passenger transport is mainly used for transport by car and for international aviation. In 2017, energy consumption for these categories made up 66.0% and 22.5%, respectively, of total energy consumption for passenger transport.

Energy consumption for cars and vans (less than 2 tonnes) increased by 0.9% from 2016 to 2017, while energy consumption for international aviation grew by 1.9%. From 1990 to 2017, energy consumption for cars and vans increased by 35.2%, while energy consumption for international aviation grew by 63.1%.

Energy consumption for freight transport by means of transport



Energy consumption for freight transport is mostly by trucks and vans (2-6 tonnes). In 2017, energy consumption by these types of vehicle made up 43.0% and 43.5%, respectively, of total energy consumption for freight transport.

Energy consumption for trucks grew by 3.0% from 2016 to 2017, while energy consumption for vans increased by 1.5%. Energy consumption for trucks increased by 0.2% from 1990 to 2017, while energy consumption for vans increased by 23.0%.

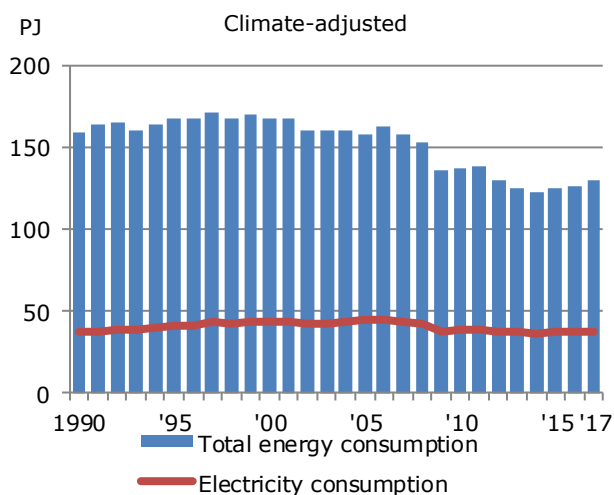
Final energy consumption for transport

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	Change '90-'17
Total transport	143 337	170 216	201 209	215 789	209 731	209 265	213 828	218 253	28.2%
Observed consumption									
LPG	880	464	425	323	3	-	-	-	-100%
Aviation gasoline	201	155	119	107	76	57	49	31	-80.0%
Motor gasoline	67 830	74 327	88 976	82 126	67 726	57 443	56 305	56 582	-23.9%
JP4	7 500	-	-	-	-	-	-	-	•
Petroleum	129	462	39	14	0	-	-	-	-100%
JP1	23 473	28 828	35 810	39 959	36 577	38 927	41 695	43 568	51.1%
Gas/diesel oil	41 053	61 685	73 077	90 529	101 893	102 325	105 041	107 319	74.0%
Fuel oil	1 791	3 560	1 509	1 379	868	39	2	-	-100%
Natural gas						76	132	253	•
Bio methane						1	4	14	•
Bioethanol	-	-	-	-	1 118	1 840	1 838	1 825	•
Biodiesel	-	-	-	-	16	7 129	7 263	7 194	•
Electricity	479	736	1 253	1 351	1 455	1 429	1 501	1 465	99.1%
Road	100 945	129 943	153 666	161 923	161 215	159 245	159 958	162 214	24.8%
Rail	5 016	4 765	4 339	4 488	4 728	4 785	4 927	4 762	-0.1%
Domestic sea transport	5 588	6 344	6 857	8 026	6 533	5 640	6 399	6 214	-2.1%
Domestic aviation	1 607	2 587	1 803	1 304	1 813	1 285	1 325	1 262	-51.2%
International aviation	22 036	24 928	33 019	36 323	33 972	36 961	39 740	41 001	64.5%
Military transport	8 145	1 649	1 525	3 726	1 470	1 350	1 479	2 800	69.8%
Passenger transport	100 889	121 356	142 254	145 934	147 687	155 982	159 701	161 368	33.0%
Freight transport	34 303	47 212	57 430	66 129	60 574	51 934	52 648	54 085	14.6%
Military transport	8 145	1 649	1 525	3 726	1 470	1 350	1 479	2 800	69.8%

Final energy consumption in agriculture and industry

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	Change '90-'17
Total for agriculture and industry	167 679	158 790	167 113	158 242	137 014	125 109	126 682	129 554	-18.4%
Climate adjusted									
By energy product									
Oil	112 269	65 613	58 460	53 743	44 071	35 757	36 829	36 102	-45.0%
Natural gas	-	25 281	35 606	32 433	30 901	29 452	29 444	30 634	21.2%
Coal and coke	19 126	16 315	12 339	10 817	5 531	4 972	4 781	5 014	-69.3%
Waste, non-renewable	25	13	72	591	759	669	669	669	5200%
Renewable energy	5 174	9 377	8 098	7 759	11 509	13 202	12 840	14 395	53.5%
Electricity	27 724	36 633	43 283	44 092	37 851	36 735	36 872	37 481	2.3%
District heating	2 949	5 409	9 210	8 788	6 353	4 115	5 042	5 053	-6.6%
Gas works gas	413	149	45	19	41	208	206	207	38.3%
By use									
Agriculture, forestry and horticulture	29 818	33 087	32 428	29 322	29 146	27 542	27 200	26 126	-21.0%
Fishing	7 312	10 785	9 451	7 488	6 049	5 205	5 192	4 890	-54.7%
Manufacturing industries	124 557	108 624	117 583	113 280	94 679	85 808	87 550	91 307	-15.9%
Construction	5 992	6 295	7 651	8 152	7 140	6 554	6 741	7 231	14.9%

Energy and electricity consumption in agriculture and industry

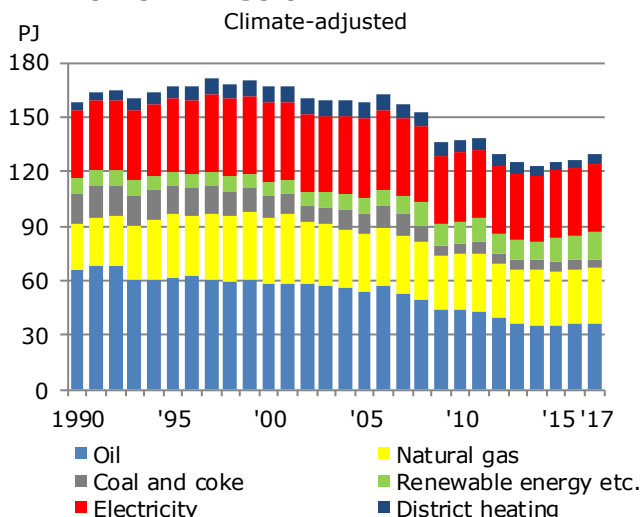


Agriculture and industry covers agriculture, forestry and horticulture, fishing, manufacturing industries (excl. refineries), as well as construction.

In 2017 climate-adjusted energy consumption in agriculture and industry was 129.6 PJ, which is 2.3% higher than the year before. Compared with 1990, energy consumption decreased by 18.4%.

Electricity consumption in 2017 was 37.5 PJ after adjusting for climate variation. This is an increase by 1.7% compared with the year before. Compared with 1990, electricity consumption increased by 2.3%.

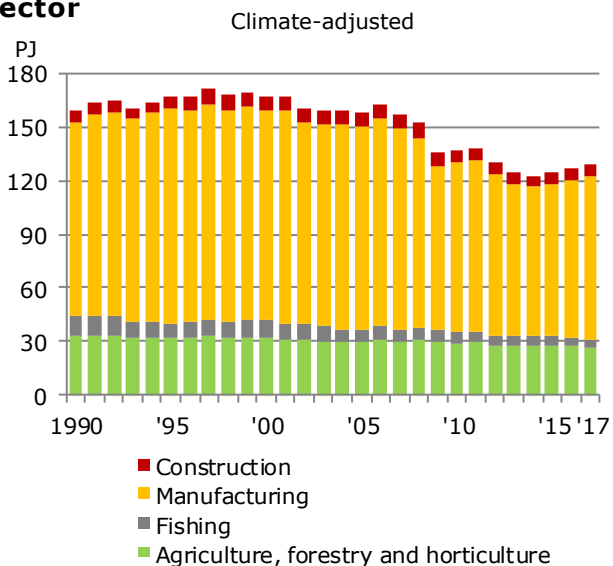
Energy consumption in agriculture and industry by energy products



In 2017 consumption of natural gas, coal and renewable energy etc. for agriculture and industry grew by 4.0%, 4.9% and 11.5%, respectively, compared with 2016, while oil decreased by 2.0%. Consumption of electricity increased by 1.7%, while consumption of district heating was 0.2% higher in 2017 than the year before.

Consumption of natural gas in the period 1990-2017 increased by 21.2%, while consumption of oil and coal fell by 45.0% and 69.3%, respectively. Consumption of renewable energy etc. increased by 60.4%. Consumption of electricity has increased by 2.3% and district heating has decreased by 6.6% since 1990.

Energy consumption by individual industry in the agriculture and industry sector

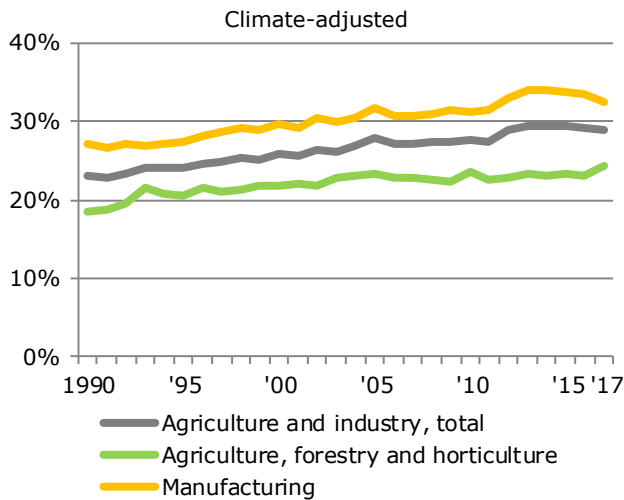


Compared with 2016 energy consumption grew by 4.3% and 7.3%, respectively, in manufacturing industries and in construction. Energy consumption in agriculture, forestry and horticulture fell by 3.9% in 2017.

From 1990 to 2017, energy consumption in manufacturing industries fell by 15.9%. Energy consumption in agriculture, forestry and horticulture fell by 21.0%, while in construction consumption increased by 14.9%. In fishing, energy consumption fell by 54.7%.

In 2017, agriculture, forestry and horticulture's share of total energy consumption by the agriculture and industry sector was 20.2%, while the share of manufacturing industries was 70.5%. In 2017, fishing and construction accounted for 3.8% and 5.6%, respectively, of energy consumption in the agriculture and industry sector.

Electricity consumption's share of total energy consumption

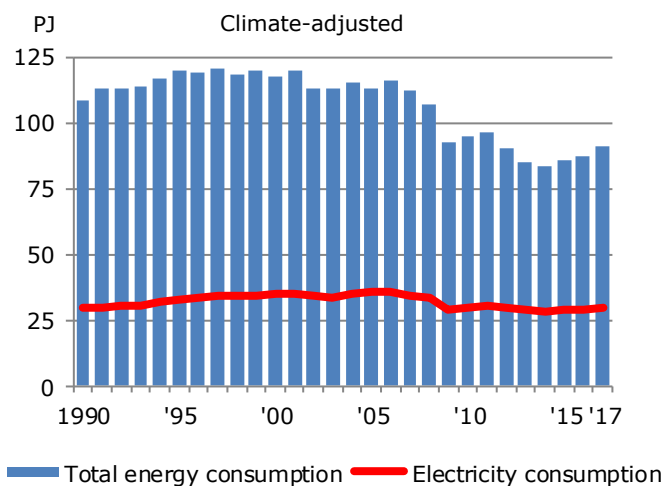


Electricity consumption's share of total energy consumption in the agriculture and industry sector increased from 23.1% in 1990 to 28.9% in 2017.

In manufacturing industries the share of electricity increased from 27.1% in 1990 to 32.5% in 2017.

In agriculture, forestry and horticulture the share of electricity was 18.6% in 1990. In 2017 this share was 24.3% of total energy consumption in agriculture, forestry and horticulture.

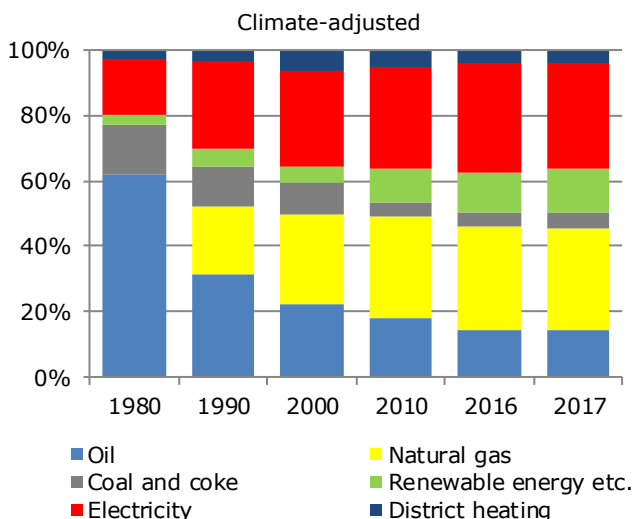
Energy and electricity consumption in manufacturing industries



Climate-adjusted energy consumption in manufacturing industries increased from 87.5 PJ in 2016 to 91.3 PJ in 2017, corresponding to a rise of 4.3%. Compared with 1990, energy consumption decreased by 15.9%.

In 2017, electricity consumption was 29.7 PJ, which is 1.5% higher than the year before. Electricity consumption has risen by 0.9% since 1990.

Composition of energy consumption in manufacturing industries



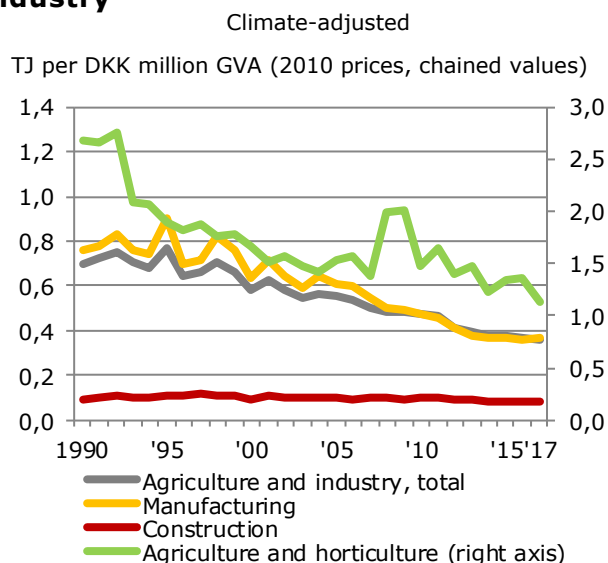
The composition of energy consumption in manufacturing industries has changed significantly since 1980, when oil consumption was dominant by 62.2% of the total energy consumption. In 1990, oil consumption accounted for almost one-third of total energy consumption. In 2017 this figure was 14.2%.

Consumption of natural gas accounted for 31.3% of energy consumption in manufacturing industries in 2017, as opposed to 20.8% in 1990.

Coal's share of energy consumption has gone down from 12.3% in 1990 to 5.0% in 2017. The contribution from renewable energy etc. and district heating has increased from 1990 to 2017. In 2017, their shares were 13.0% and 3.8%, respectively.

The share of electricity consumption grew from 27.1% in 1990 to 32.5% in 2017.

Energy intensities in agriculture and industry



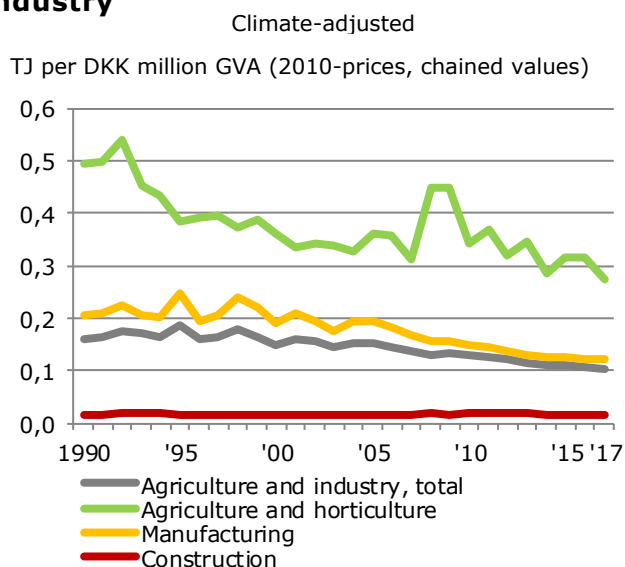
Energy intensity has been calculated as climate-adjusted energy consumption in relation to the gross value added (GVA), measured at 2010 prices, chained values.

Energy intensity in agriculture and industry dropped by 48.4% from 1990 to 2017. The annual average fall in energy intensity from 1990 to 2017 was 2.4% per year.

In manufacturing industries, energy intensity fell by 51.6% from 1990 to 2017. In 2017, energy intensity increased by 2.5% compared with 2016.

In agriculture, forestry and horticulture, energy intensity decreased by 17.1% in 2017. The energy intensity has fallen by 57.6% since 1990. Since 2005, the trend has been influenced by significant fluctuations in agricultural, forestry and horticultural GVA.

Electricity intensities in agriculture and industry

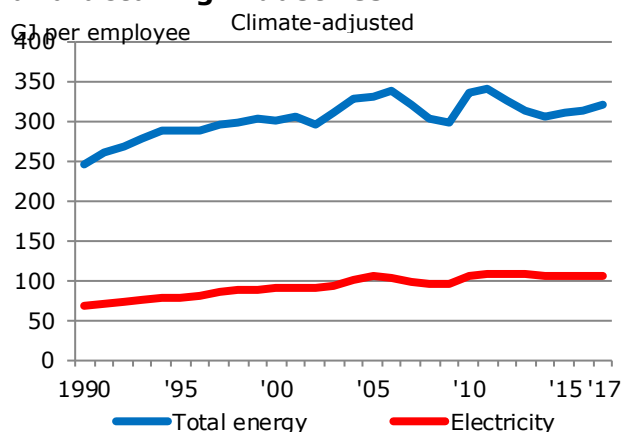


Electricity intensity has been calculated as climate-adjusted electricity consumption in relation to GVA, measured at 2010 prices, chained values.

After a period of fluctuating electricity intensity in agriculture and industry in the 1990s, it fell steadily up to 2017. In the period 1990 to 2017, electricity intensity fell by 35.2%. In 2017, electricity intensity was 0.104, i.e. 0.104 TJ of electricity (corresponding to 28.944 kWh) were used for every DKK 1 million GVA in the agriculture and industry sector. In 2017, electricity intensity fell by 2.1% compared with 2016.

Electricity intensity in manufacturing industries fell by 0.3% in 2017. In agriculture, forestry and horticulture intensity fell by 12.9%. Both compared with 2016. Electricity intensity in construction rose by 0.7%.

Energy consumption per employee in manufacturing industries

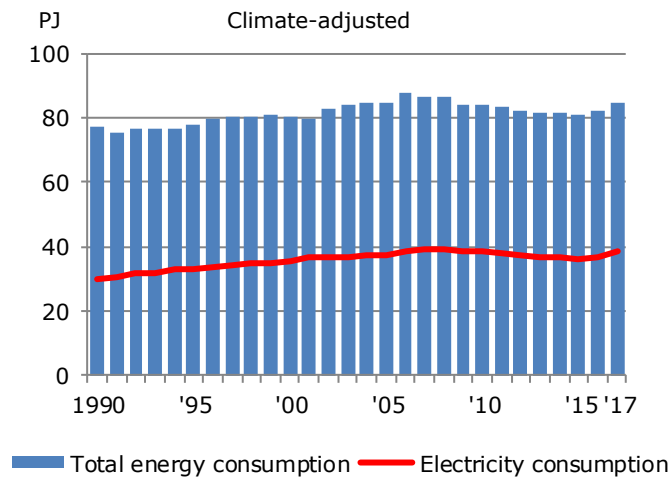


Energy and electricity consumption per employee in manufacturing industries have developed differently than the intensities shown above. This is due to a considerable increase in productivity, i.e. measured as GVA per employee in this sector.

Energy consumption per employee was 322.1 GJ in 2017, as opposed to 314.0 GJ the year before. This corresponds to an increase of 2.6%. Compared with 1990, energy consumption per employee grew by 30.6%.

Electricity consumption per employee was 104.8 GJ in 2016, which is 0.1% lower than the year before. Compared with 1990, electricity consumption per employee increased by 56.8%.

Energy and electricity consumption in the commercial and public services

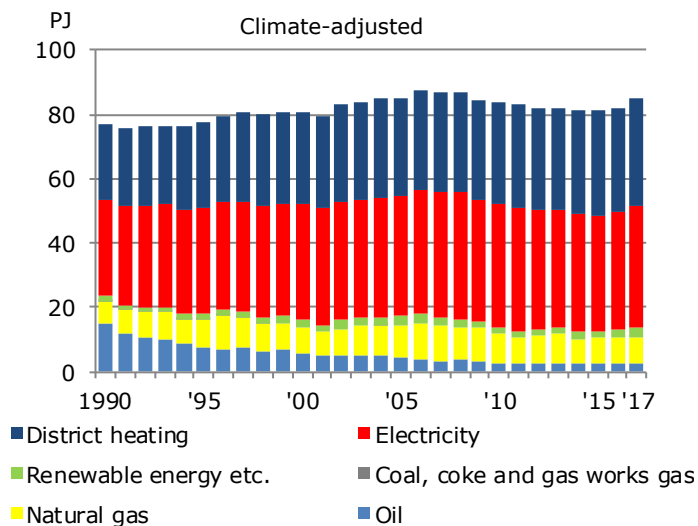


The commercial and public services sector includes wholesale, retail, private and public services.

Climate-adjusted energy consumption was 84.8 PJ in 2017, which is 3.2% higher than the year before. Compared with 1990, consumption increased by 10.0%.

In 2017, climate-adjusted electricity consumption was 38.3 PJ, which is 4.6% higher than the year before. Compared with 1990, electricity consumption increased by 26.9%.

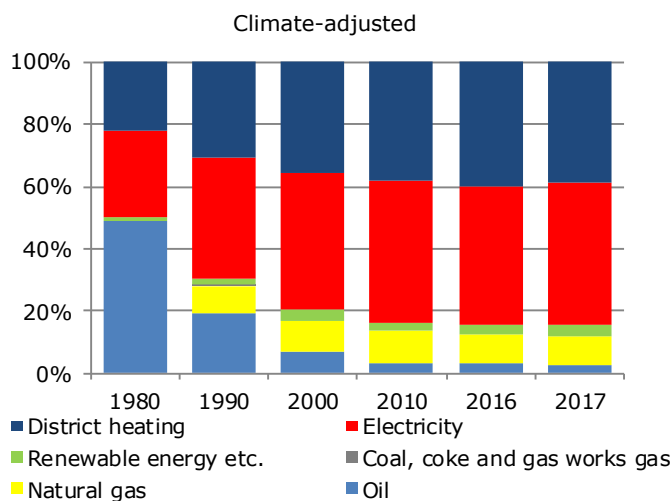
Energy consumption by energy product



Electricity and district heating are predominant energy sources in the commercial and public services sector. In 2017, consumption of electricity grew by 4.6%, while consumption of district heating was 0.9% higher than the year before.

Compared with 1990, oil consumption fell by 83.7%, while natural gas consumption increased by 15.1%. In 2017, consumption of electricity and district heating was 26.9% and 40.7% higher, respectively, compared with 1990.

Composition of energy consumption in the commercial and public services

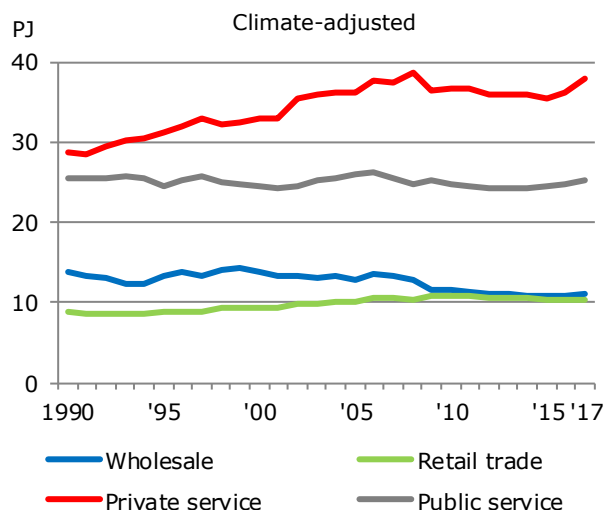


In 1990, electricity and district heating together accounted for 69.6% of total energy consumption in the commercial and public services sector (electricity 39.1% and district heating 30.4%). The share of oil and natural gas was 19.3% and 9.0%, respectively, while consumption of renewable energy etc. accounted for 1.9%.

In 2017, electricity and district heating consumption together accounted for 84.1% of total energy consumption (electricity 45.1% and district heating 38.9%). The share of oil was 2.9%, while the share of natural gas was 9.4%. Renewable energy etc. was 3.7%.

COMMERCIAL AND PUBLIC SERVICES

Energy consumption by sector



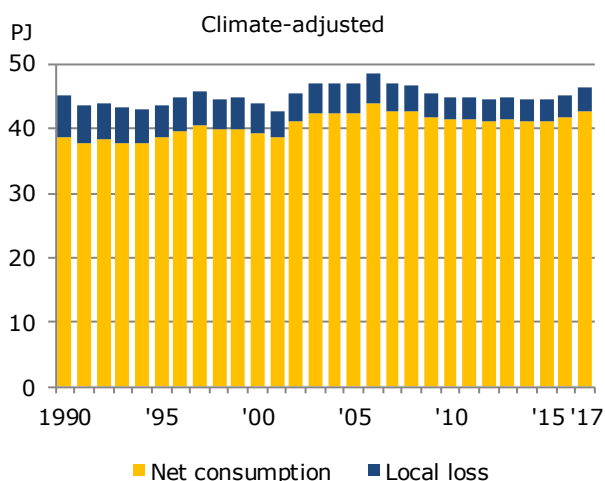
In 2017, 74.7% of energy consumption in the commercial and public services sector was in private and public services, while wholesale and retail accounted for the remaining 25.3%.

From 2016 to 2017, energy consumption in private services grew by 5.2%. Energy consumption in public services increased by 1.8%. Energy consumption in wholesale and retail trade grew by 2.0% and 0.8% respectively.

Compared with 1990, energy consumption in wholesale fell by 19.2%, while energy consumption in retail grew by 16.1%.

Energy consumption in the private service sector is higher today than in 1990. Since 1990, growth has been 31.8%. In the public service sector, energy consumption is 0.9% lower compared with 1990.

Energy consumption for heating in the commercial and public services

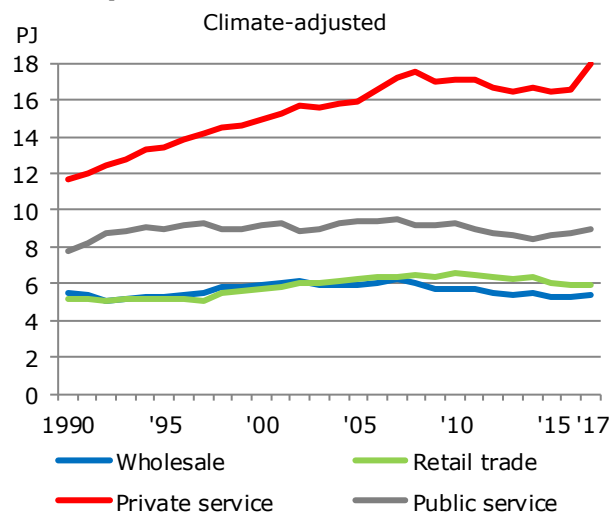


Energy consumption for heating (space heating and hot water) can be calculated in different ways. While final energy consumption is the volume of energy paid for, net energy consumption is the volume of energy utilised. The difference is local losses by the individual consumers, e.g. from oil and natural gas boilers.

Final energy consumption for heating in the commercial and public services sector was 46.2 PJ in 2017, which is 2.2% higher than the year before. Compared with 1990, consumption grew by 2.7%.

Net energy consumption was 42.6 PJ in 2017, which is 2.1% higher than the year before. Compared with 1990, net energy consumption increased by 10.5%.

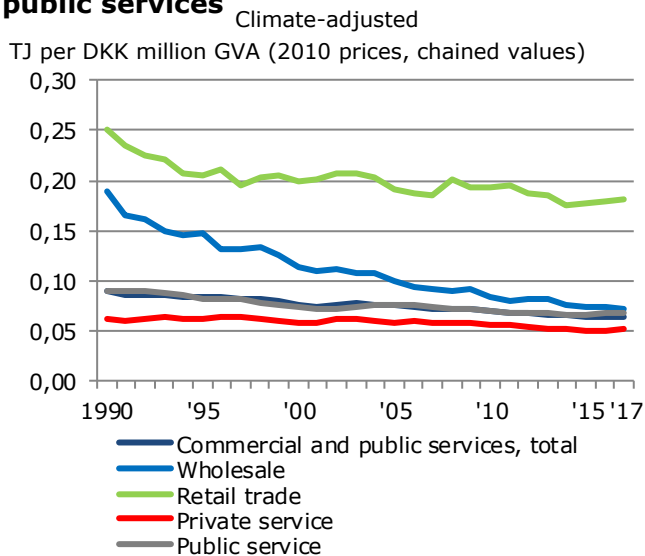
Electricity consumption by sector



Electricity consumption generally increased in the commercial and public services sector up to 2008, after which it decreased. In 2017, electricity consumption was 2.4% higher in wholesale and 0.1% higher in retail, compared with 2016. In private service, electricity consumption increased by 8.1% and electricity consumption in public services increased by 2.4%.

From 1990 to 2017, electricity consumption in wholesale fell by 0.6% and retail increased by 14.7%. Electricity consumption in the public service sector increased by 14.9%. In the private service sector the increase was significantly higher, reaching 53.2%.

Energy intensities in the commercial and public services

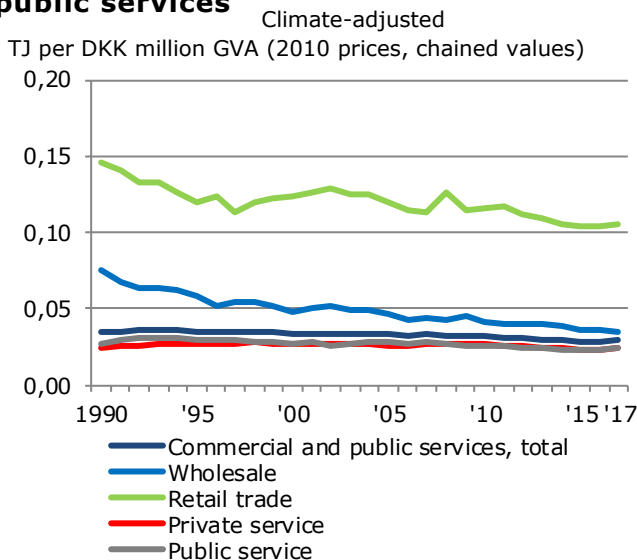


Energy intensities have been calculated as climate-adjusted energy consumption in relation to gross value added (GVA), measured at 2010 prices, chained values.

Energy intensity was 0.064 in 2017, i.e. for every DKK 1 million GVA in the commercial and public services sector, 0.064 TJ of energy were used. This is 1.4% more than the year before.

Energy intensity in the commercial and public services sector fell by 28.0% from 1990 to 2017. For wholesale and retail, energy intensities fell by 61.7% and 27.6%, respectively. For the private service sector and the public service sector, intensities fell by 15.8% and 24.3%, respectively.

Electricity intensities in commercial and public services

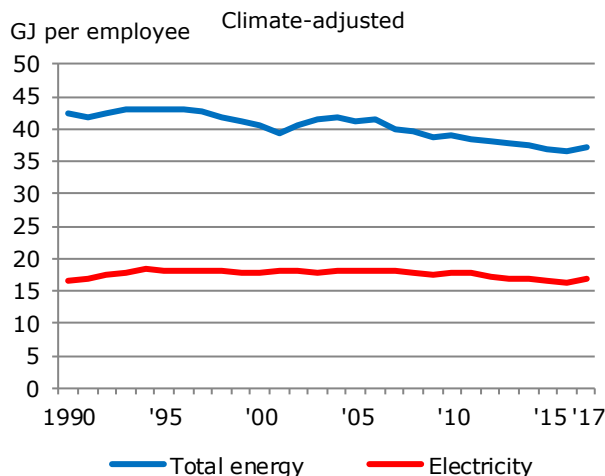


Electricity intensities have been calculated as climate-adjusted electricity consumption in relation to GVA, measured at 2010 prices, chained values.

In 2017 electricity intensity was 0.029, i.e. for every DKK 1 million GVA in the commercial and public services sector, 0.029 TJ of electricity (corresponding to 8.059 kWh) were used. Electricity intensity is unchanged relative to the year before.

Electricity intensity in the commercial and public services sector fell by 16.9% from 1990 to 2017. For wholesale, retail and public services, electricity intensities fell by 52.9%, 28.5% and 12.3%, respectively. In private services, electricity intensity fell by 2.1%.

Energy consumption per employee in the commercial and public services



Energy and electricity consumption per employee in the commercial and public services sector have developed differently than the intensities shown above. This is due to a considerable increase in productivity, measured as GVA per employee.

Energy consumption per employee was 37.2 GJ in 2017, as opposed to 36.6 GJ the year before. This corresponds to an increase of 1.7%. Compared with 1990, energy consumption per employee fell by 12.5%.

In 2017, electricity consumption per employee was 16.8 GJ as opposed to 16.3 GJ the year before, which is a rise of 3.1%. Compared with 1990, electricity consumption per employee decreased by 1.0%.

COMMERCIAL AND PUBLIC SERVICES/HOUSEHOLDS

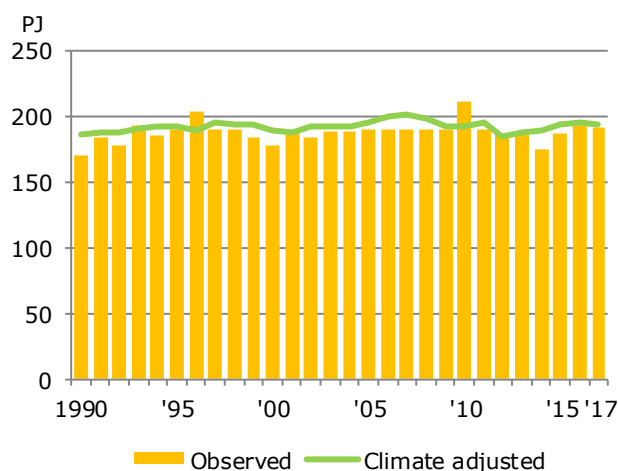
Final energy consumption in the commercial and public services

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	Change '90-'17
Total commercial and public services. Climate adjusted	78 314	77 047	80 599	85 045	83 893	81 272	82 138	84 764	10.0%
Oil	38 337	14 850	5 874	4 428	2 810	2 671	2 645	2 424	-83.7%
Natural gas	-	6 902	7 739	9 989	8 977	7 674	7 645	7 943	15.1%
Coal and coke	-	98	-	-	-	-	-	-	-100%
Waste, non-renewable	263	457	691	648	163	137	205	321	-29.8%
Renewable energy	448	1 022	2 078	2 178	1 491	1 775	2 343	2 797	174
Electricity	21 788	30 147	35 715	37 479	38 656	36 338	36 573	38 263	26.9%
District heating	17 117	23 449	28 451	30 281	31 761	32 639	32 687	32 985	40.7%
Gas works gas	361	121	52	42	35	37	40	31	-74.2%
By use									
Wholesale	19 045	13 795	13 893	12 906	11 493	10 888	10 935	11 151	-19.2%
Retail	9 702	8 883	9 323	9 991	10 939	10 338	10 235	10 314	16.1%
Private service	25 955	28 812	32 901	36 238	36 653	35 519	36 111	37 981	31.8%
Public service	23 612	25 557	24 481	25 909	24 807	24 528	24 857	25 317	-0.9%

Final energy consumption in households

Direct energy content [TJ]	1980	1990	2000	2005	2010	2015	2016	2017	Change '90-'17
Total households. Climate adjusted	204 018	185 039	189 275	194 729	191 585	193 036	195 478	193 912	4.8%
Oil	121 022	58 998	35 444	27 617	18 595	11 105	10 474	9 823	-83.4%
Natural gas	-	17 877	29 329	29 993	27 761	25 497	26 039	24 812	38.8%
Coal and coke	2 498	830	49	8	28	-	1	-	-100%
Renewable energy	10 305	17 434	22 052	33 279	39 444	48 505	50 625	51 942	198%
Electricity	28 388	35 696	37 339	37 810	36 738	36 855	37 151	35 609	-0.2%
District heating	37 649	52 820	64 466	65 536	68 612	70 644	70 723	71 370	35.1%
Gas works gas	4 157	1 384	594	486	408	429	465	358	-74.2%
Single-family houses	155 706	137 383	139 568	144 258	140 888	141 799	144 053	142 968	4.1%
Oil	102 281	52 233	32 741	25 032	16 910	9 408	8 911	8 309	-84.1%
Natural gas	-	15 143	24 907	25 472	23 554	21 530	21 910	20 850	37.7%
Coal and coke	1 249	136	17	0	13	-	0	-	-100%
Renewable energy	10 298	17 420	22 006	33 226	39 370	48 376	50 408	51 634	196%
Electricity	21 431	27 011	28 210	28 279	27 335	27 772	28 053	27 148	0.5%
District heating	18 190	24 685	31 364	31 985	33 486	34 479	34 517	34 833	41.1%
Gas works gas	2 258	754	323	264	221	234	253	194	-74.2%
Multi-family houses	48 312	47 656	49 706	50 471	50 696	51 237	51 425	50 945	6.9%
Oil	18 740	6 766	2 703	2 585	1 685	1 696	1 562	1 514	-77.6%
Natural gas	-	2 733	4 422	4 522	4 207	3 966	4 129	3 962	44.9%
Coal and coke	1 249	693	32	8	15	-	0	-	-100%
Renewable energy	8	14	46	54	74	129	217	307	2085%
Electricity	6 957	8 686	9 129	9 530	9 403	9 084	9 098	8 461	-2.6%
District heating	19 459	28 135	33 103	33 550	35 125	36 166	36 206	36 537	29.9%
Gas works gas	1 899	630	271	222	187	196	212	163	-74.1%

Energy consumption in households



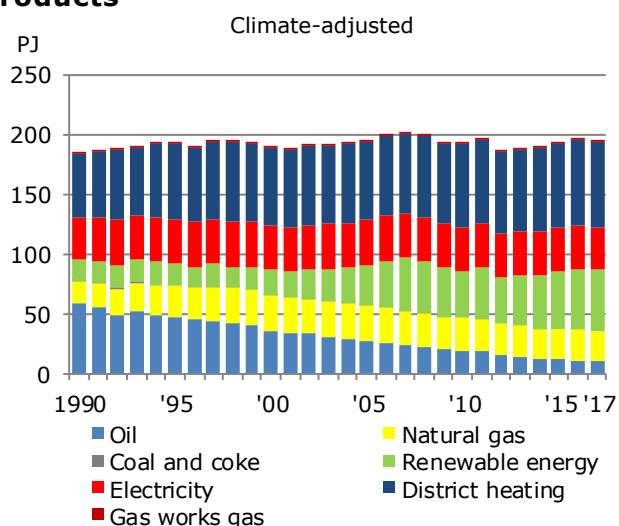
Household energy consumption is greatly influenced by the weather. The years 1990, 2000 and 2014 were very hot years with low energy consumption, whereas 1996 and 2010 were exceptionally cold.

In 2017 climate-adjusted energy consumption by households was 193.9 PJ, accounting for 30.4% of total final energy consumption in Denmark. 162.5 PJ of the 193.9 PJ was used for heating and 31.4 PJ were used for electrical appliances etc.

The climate-adjusted energy consumption of households was 0.8% lower in 2017 than the year before. Compared with 1990, energy consumption grew by 4.8%.

A contributing explanation of the increase in energy consumption may be that forms of heating with a relatively low efficiency, such as biomass, have gained an increasing footing.

Household consumption by energy products

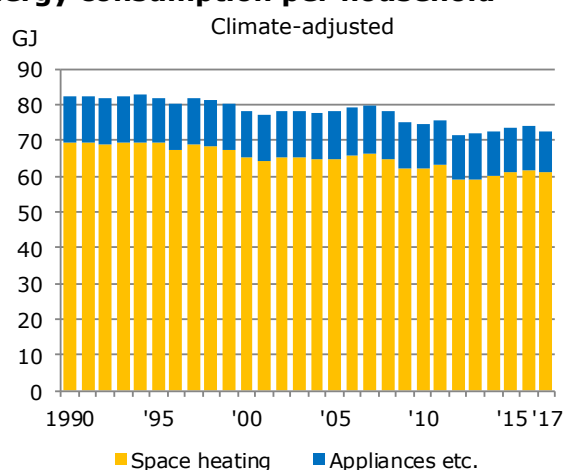


There have been significant changes in the composition of household energy consumption since 1990. Oil consumption decreased throughout the period shown due to a shift to district heating and natural gas. Firewood and wood pellets consumption has increased significantly since 2000.

In 2017 district heating amounted to 36.8% of household energy consumption, and renewable energy and electricity amounted to 26.8% and 18.4%, respectively. Consumption of natural gas, oil and gas works gas amounted to 12.8%, 5.1% and 0.2%, respectively.

The electricity consumption remained more or less constant from the 1990s until 2000. Electricity consumption showed an increasing trend from 2002 to 2006, whereas consumption in the period from 2009 to 2017 has fluctuated around 36 and 37 PJ. Electricity consumption decreased by 4.2% in 2017 compared with 2016.

Energy consumption per household

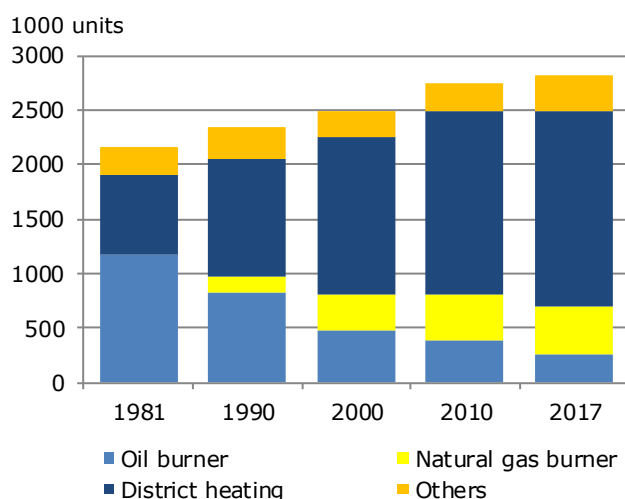


In 2017, average energy consumption per household was 72.8 GJ, which is 1.4% lower than the year before. Of this, 61.0 GJ – corresponding to 83.8% – were used for space heating and hot water. Energy consumption by households went down by 11.6% compared with 1990.

In 2017, average electricity consumption per household for electrical appliances and lighting was 11.8 GJ, corresponding to approximately 3275 kWh. This is a decrease of 4.8% compared to the year before and 7.3% less than in 1990.

Households also consume a small amount of motor gasoline for garden tools etc., LPG (bottled gas) and gas works gas for other purposes. Consumption of motor gasoline and diesel oil for household vehicles has been included under road transport.

Heating installations in dwellings

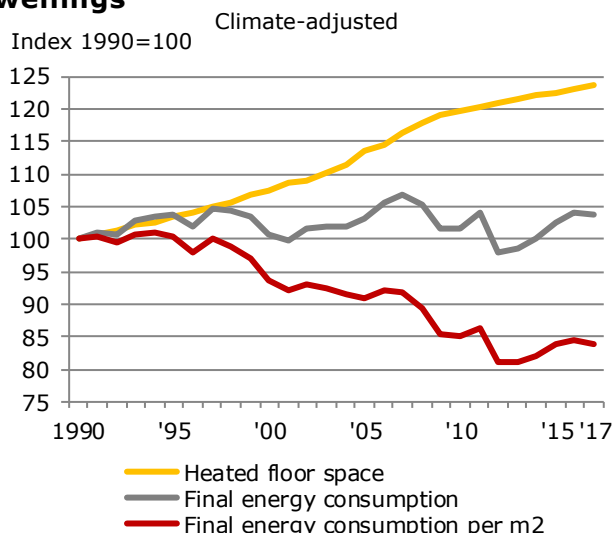


The significant changes in the composition of energy consumption by energy type reflect changes in the composition of heating installations in dwellings over time. Until the mid-1980s, oil-fired boilers clearly dominated the market, after which district heating became the most common source of heating. Thus since the late 1980s and during the 1990s, the number of district heating installations and natural gas boilers continued to increase at the cost of oil-fired boilers.

As of 1 January 2017, the total of 2.8 million heating installations could be analysed as follows: District heating installations 63.9%, natural gas boilers 15.3%, oil-fired boilers 9.5% and other installations, including heat pumps, electric heating and wood-fired boilers 11.3%.

Source: Statistics Denmark

Energy consumption for heating in dwellings

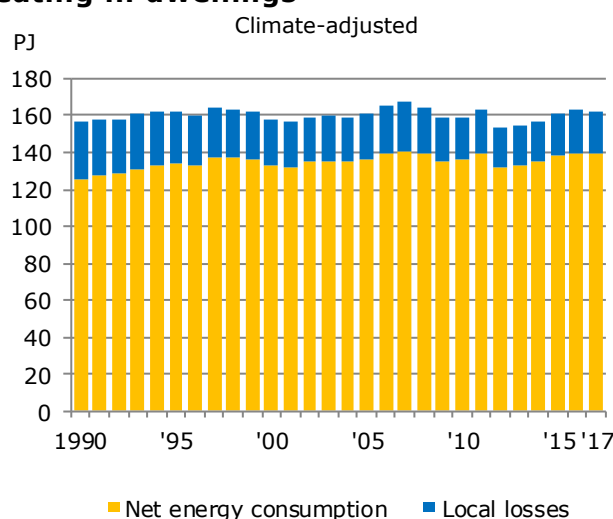


Except from 2001, 2012 and 2013, climate-adjusted energy consumption for heating (space heating and hot water) has been between 0.2% and 6.7% above the 1990 level. In 2017, energy consumption was 3.9% higher compared with 1990.

The background for this is a 23.7% increase in total heated area in the period from 1990 to 2017.

In the period 1990 to 2017, energy consumption for heating per m² fell by 16.1%. This fall can be explained by improvements in the insulation of older dwellings as well as a shift away from old oil-fired boilers to more efficient natural gas boilers and district heating installations. In addition, according to the building regulations, new homes must have lower energy consumption per m² than existing homes. An increase in less efficient use of biomass draws in the opposite direction.

Net energy consumption and heat loss for heating in dwellings

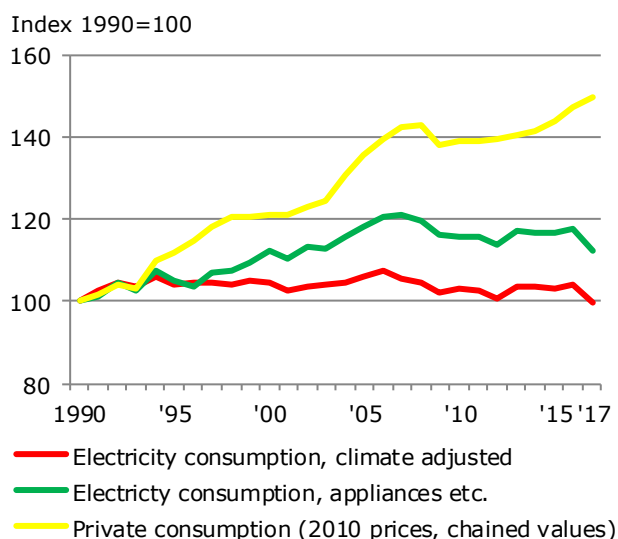


Net energy consumption means the energy utilised. The difference between final energy consumption and net energy consumption is local heat loss in individual dwellings, e.g. from oil and natural gas boilers.

While final consumption for heating as mentioned increased by 3.9% from 1990 to 2017, net energy consumption for space heating and hot water in households increased by 11.4% in the same period.

The different trend is due to the shift from oil heating to district heating and later also to natural gas heating, where the local losses are considerably smaller. The increase in net energy consumption is due to the fact that the growth in the total heated area has been greater than the reduction in consumption per m².

Private consumption and electricity consumption in households

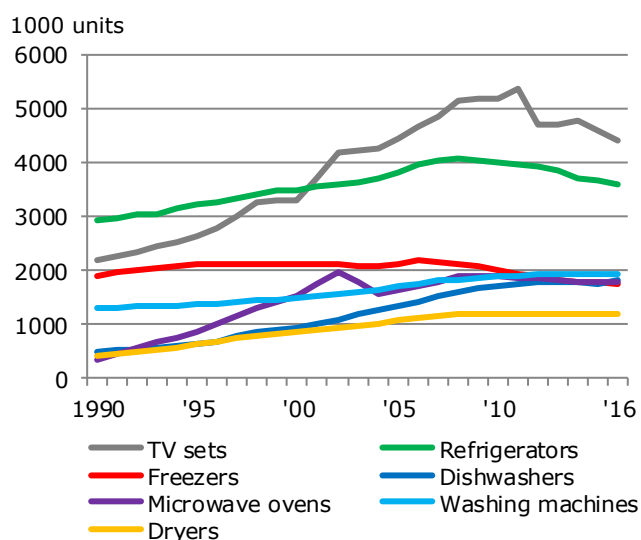


In the period 1990-2017, total household electricity consumption decreased by 0.2%, whereas electricity consumption for appliances and lighting etc. increased by 12.5%. This big difference is due to a significant fall in electricity consumption for heating.

Taking into account the large increase in the number of electrical appliances per household, see below, and a general increase of 49.7% in total private consumption, i.e. considerably larger growth in private consumption than in electricity consumption for appliances and lighting etc., this may seem as a surprise.

This development is due to significant decreases in the specific electricity consumption of electrical appliances, see below.

Household stock of electrical appliances



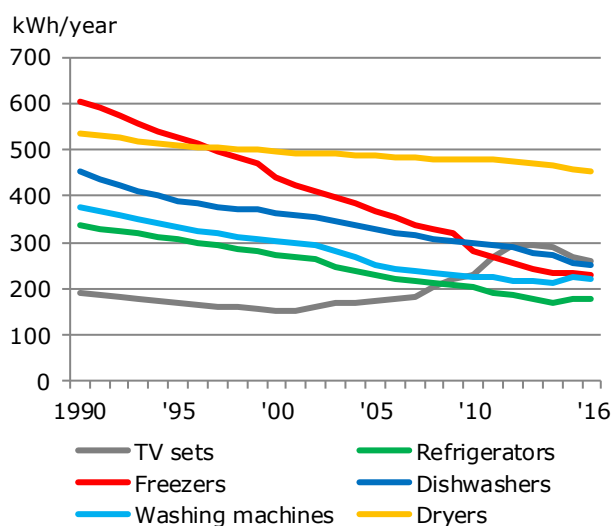
In the period from 1990 to 2010 there has been a sharp increase in the stock of almost all electricity-consuming household appliances. The stock of most appliances have however stagnated or decreased during roughly the past 10 years.

From 1990 to 2016 the number of microwaves has increased by 392%, while the number of tumble dryers and dishwashers has increased by 173% and 262%, respectively. Television sets, washing machines and refrigerators have also increased considerably in numbers. The number of separate freezers has decreased by 7.2% since 1990.

Latest data on households' electricity consumption for appliances is from 2016.

Source: ElmodelBOLIG

Specific electricity consumption of household appliances



Ceteris paribus, the trend in the stock of appliances should lead to a considerable increase in electricity consumption. The reason that this has not happened is particularly due to a significant improvement in the average specific electricity consumption (kWh/year) of appliances in the same period.

For example, the average annual electricity consumption of a refrigerator fell from 336 kWh in 1990 to 177 kWh in 2016, i.e. by 47.4%. Electricity consumption for a separate freezer fell by 62.0%, while the fall for a washing machine was 40.7% in the same period. Other electrical appliances, apart from television sets, have also experienced considerable reductions in average specific annual consumption.

Source: ElmodelBOLIG

EMISSIONS OF CO₂ AND OTHER GREENHOUSE GASES

CO₂ accounts and statements for other greenhouse gases

CO₂ accounts are used along with statements for the other greenhouse gas emissions in order to e.g. monitor developments with regard to international greenhouse gas emission reduction targets. Denmark's international climate commitment means that, in accordance with the EU Effort Sharing Decision (ESD), by 2020 Denmark must have reduced emissions of greenhouse gases from the sectors not covered by the EU Emissions Trading System (ETS) by 20% in relation to the base year, 2005. In 2010 the base year was determined in relation to emissions outside the ETS in 2005 for CO₂, CH₄ and N₂O and the fluorinated greenhouse gases (the F-gases). Furthermore, annual permitted non-ETS emissions have been set under the ESD for the period 2013-2020. In 2016, the maximum allowed emissions for Denmark was 34.1 million tonnes CO₂ equivalents.

In 2016, observed total emissions of greenhouse gases were 50.5 million tonnes CO₂ equivalents, which is 28.3% lower than in 1990. Including adjustments in the Energy Statistics for fluctuations in temperature and net exports of electricity, the level in 2016 was 53.7 million tonnes CO₂ equivalents, corresponding to a drop of 31.5% relative to the adjusted emissions in

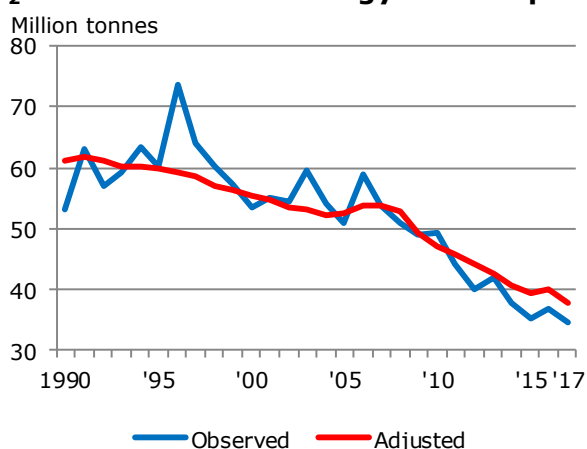
1990. In 2016, total observed emissions of greenhouse gases outside the ETS (ESD) were 33.1 million tonnes CO₂ equivalents, which is 16.5% lower than the 2005 base-year emissions and 1 million tonnes CO₂ equivalents lower than the emissions permitted under the ESD for 2016.

The greenhouse gas inventory for 2017 will be ready in 2019. The overall greenhouse gas accounts include both CO₂ emissions from energy use (excluding emissions from international aviation and the effect of border trade in motor gasoline and diesel oil - unlike the separate CO₂ accounts in the Energy Statistics) and CO₂ emissions from other sources (flaring of gas in the North Sea and certain industrial processes). Emissions of six other greenhouse gases are also included in the commitment: methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃), which are converted to CO₂ equivalents.

Reductions achieved in connection with certain carbon removals by forests and soils, as well as from potential projects in other countries (JI and CDM projects) must also be stated in the climate accounts under the Kyoto Protocol.

Source: Danish Energy Agency and DCE, Danish Centre for Environment and Energy

CO₂ emissions from energy consumption

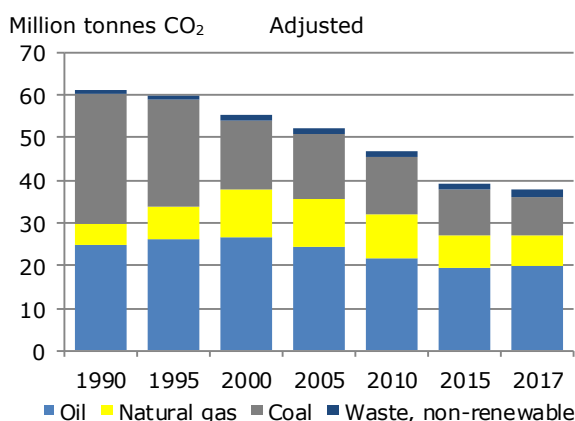


The Danish Energy Agency calculates observed CO₂ emissions as well as adjusted CO₂ emissions, which take annual temperature variations and foreign trade in electricity into account, see the statement of energy consumption on pages 18 and 19. The purpose of the adjusted calculations is to illustrate the trends underlying the development.

In 2017, observed CO₂ emissions from energy consumption were 34.7 million tonnes, which is 6.0% lower than in 2016. Observed CO₂ emissions dropped by 34.6% compared with 1990.

Adjusted CO₂ emissions from energy consumption declined to 37.6 million tonnes in 2017; a decrease of 6.3% compared with the previous year. Compared with 1990, the drop is 38.3%.

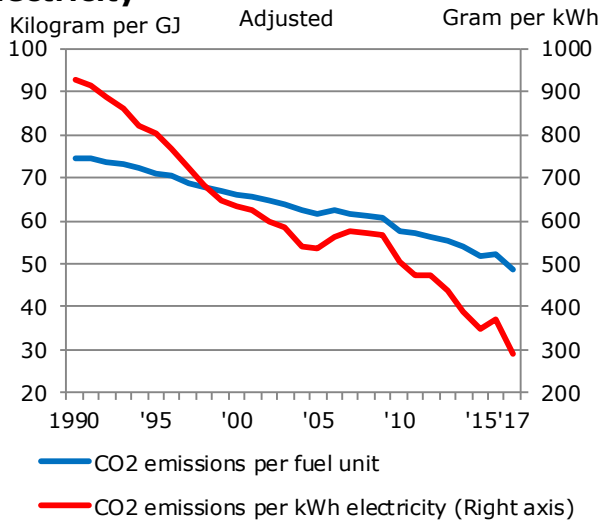
CO₂ emissions by fuel



Since 1990, there has been a significant shift in energy consumption analysed by fuel. Consumption of natural gas and renewable energy has increased at the expense of consumption of oil and coal.

This shift in fuels has led to a reduction in CO₂ emissions, as consumption of oil and coal entails greater CO₂ emissions than consumption of natural gas and renewable energy. While gross energy consumption has fallen by 5.7% since 1990, adjusted CO₂ emissions have fallen by 38.3%.

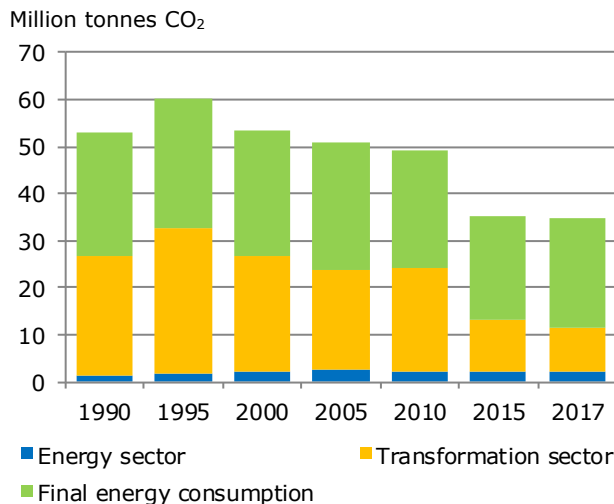
CO₂ emissions per fuel unit and per kWh electricity



From 1990-2017 gross energy consumption has fallen by 5.7%, whereas the breakdown by fuel has changed significantly. As a result of the shift from oil and coal to natural gas and renewable energy, still less CO₂ is emitted for each unit of fuel consumed. In 2017, each GJ of adjusted gross energy consumption was linked to 48.7 kg CO₂, compared with 74.5 kg in 1990. This corresponds to a reduction of 34.6%.

One kWh of electricity sold in Denmark in 2017 led to 291 grams of CO₂ emissions. In 1990, CO₂ emissions were 928 grams per kWh of electricity sold. The reasons for this large reduction are shifts to other fuels in electricity production as well as the ever increasing significance of wind power.

Observed CO₂ emissions by sector

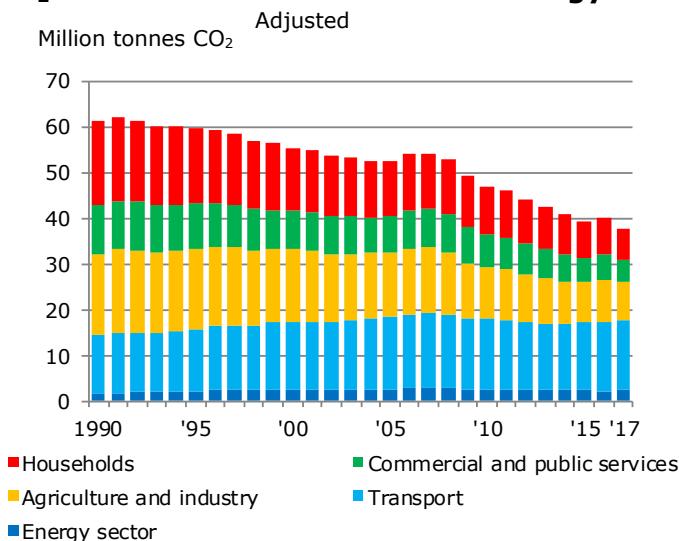


The energy system is divided into three sectors: The *energy sector* (extraction and refining), the *transformation sector* (production of electricity, district heating, and gas works gas), and *final consumption* (transport and consumption by households and industries).

In 1990, total observed CO₂ emissions were 53.1 million tonnes. Of these, 25.1 million tonnes came from the transformation sector and 26.5 million tonnes came from final energy consumption, while the energy sector emitted 1.4 million tonnes.

In 2017, total observed CO₂ emissions were 34.7 million tonnes, of which 9.4 million tonnes were from the transformation sector, 23.1 million tonnes were from final energy consumption, and 2.2 million tonnes were from the energy sector. The transformation sector saw a fall of 15.7 million tonnes of CO₂ from 1990 to 2017, although electricity and district heating production grew significantly in this period.

CO₂ emissions from end-use of energy



Breaking down CO₂ emissions from energy consumption to production of electricity, district heating, and gas works gas by end consumer provides a picture of how total emissions of CO₂ can be allocated to the energy sector, transport, industry and households.

In 2017, the transport and the agriculture and industry sectors were responsible for the largest shares of total CO₂ emissions, with 40.8% and 22.2%, respectively. Households and the commercial and public services sector accounted for 18.5% and 12.4%, respectively, while the energy sector accounted for 6.1% of CO₂ emissions.

Compared with 1990, CO₂ emissions from transport increased by 21.7%. Industries and households have seen significant decreases. In the agriculture and industry sector, and the commercial and public service sectors, CO₂ emissions fell by 53.2% and 56.8% respectively, while for households they fell by 61.5%.

EMISSIONS OF CO₂ AND OTHER GREENHOUSE GASES

Observed CO₂ emissions from energy consumption

1000 tonnes

Change

Observed emissions	1980	1990	2000	2005	2010	2015	2016	2017	'90-'17
Total CO₂ emissions	64 293	53 069	53 590	50 868	49 383	35 349	36 915	34 705	-34.6%
By fuel	64 293	53 069	53 590	50 868	49 383	35 349	36 915	34 705	-34.6%
Oil	40 164	24 201	26 225	24 212	22 070	19 394	19 686	19 753	-18.4%
Natural gas	1	4 323	10 629	10 676	10 572	7 040	7 177	7 028	62.6%
Coal	23 734	23 972	15 612	14 582	15 331	7 229	8 373	6 239	-74.0%
Waste, non-renewable	394	573	1 124	1 398	1 410	1 687	1 679	1 685	194%
By sector	64 293	53 069	53 590	50 868	49 383	35 349	36 915	34 705	-34.6%
Energy sector	890	1 401	2 323	2 440	2 323	2 346	2 131	2 201	57.0%
Transformation sector	30 110	25 135	24 214	21 132	21 948	10 655	11 968	9 433	-62.5%
Electricity production	23 852	20 561	20 163	17 233	17 666	7 433	8 742	6 647	-67.7%
District heating production	5 668	4 473	4 010	3 866	4 247	3 187	3 188	2 754	-38.4%
Gas works gas production	589	101	42	33	35	35	38	31	-68.9%
Final energy consumption	33 294	26 533	27 053	27 297	25 112	22 347	22 816	23 072	-13.0%
Transport	10 440	12 420	14 638	15 709	15 191	14 580	14 896	15 226	22.6%
Agriculture and industry	10 441	7 785	7 579	7 024	5 827	4 954	5 053	5 092	-34.6%
Commercial and public services	2 972	1 406	869	922	803	622	638	648	-53.9%
Households	9 440	4 922	3 967	3 641	3 292	2 192	2 229	2 106	-57.2%

Observed CO₂ emissions have been calculated on the basis of observed energy consumption as shown in the energy balance on page 4. By using emission factors specific to fuel, energy consumption is

converted to CO₂ emissions. The emission factors applied are shown on page 59. Renewable energy, including renewable waste, is not linked to CO₂ emissions in the calculations.

CO₂ emissions from energy consumption, adjusted*)

1000 tonnes

Change

Adjusted emissions	1980	1990	2000	2005	2010	2015	2016	2017	'90-'17
Total CO₂ emissions	62 580	61 046	55 340	52 415	47 019	39 413	40 159	37 645	-38.3%
By fuel	62 580	61 046	55 340	52 415	47 019	39 413	40 159	37 645	-38.3%
Oil	39 498	25 058	26 744	24 487	21 770	19 523	19 761	19 822	-20.9%
Natural gas	1	4 646	10 961	10 955	10 054	7 751	7 670	7 438	60.1%
Coal	22 690	30 758	16 500	15 570	13 798	10 448	11 047	8 697	-71.7%
Waste, non-renewable	392	583	1 136	1 403	1 398	1 692	1 681	1 687	190%
By sector	62 580	61 046	55 340	52 415	47 019	39 413	40 159	37 645	-38.3%
Energy sector	890	1 401	2 323	2 440	2 323	2 346	2 131	2 201	57.0%
Transformation sector	28 784	32 256	25 456	22 496	20 114	14 578	15 158	12 310	-61.8%
Electricity production	22 691	27 070	20 965	18 416	16 570	11 081	11 825	9 395	-65.3%
District heating production	5 514	5 078	4 446	4 047	3 511	3 461	3 294	2 884	-43.2%
Gas works gas production	578	108	45	33	32	36	39	32	-70.7%
Final energy consumption	32 907	27 388	27 562	27 479	24 583	22 489	22 870	23 134	-15.5%
Transport	10 440	12 420	14 638	15 709	15 191	14 580	14 896	15 226	22.6%
Agriculture and industry	10 376	7 963	7 692	7 065	5 708	4 985	5 064	5 105	-35.9%
Commercial and public services	2 902	1 543	934	949	727	644	647	658	-57.3%
Households	9 189	5 462	4 298	3 756	2 956	2 280	2 263	2 144	-60.7%

*) Adjusted for fuel consumption linked to net import of electricity, as well as for temperature fluctuations.

Adjusted CO₂ emissions have been calculated on the basis of adjusted gross energy consumption as shown in the table on page 20. In this statement, energy consumption has been adjusted for temperature fluctuations relative to a normal weather year and fuel

consumption linked to foreign trade in electricity. In cold years or years with net electricity exports, the adjustment is therefore negative, while in warmer years or years with net imports of electricity, the adjustment is positive.

EMISSIONS OF CO₂ AND OTHER GREENHOUSE GASES

Total emissions of greenhouse gases

1000 tonnes CO ₂ equivalents	1990	1995	2000	2005	2010	2014	2015	2016	Change '90-'16
Observed emissions in total²⁾	70 408	78 345	70 783	66 321	63 342	51 009	48 502	50 478	-28.3%
Of which ETS excl. aviation (ETS) ³⁾	-	-	-	26 476	25 266	18 389	15 796	17 219	-35.0%
- CO ₂ from domestic aviation (ETS) ³⁾	-	-	-	174	176	136	128	133	-23.5%
- Non-ETS (ESD) ³⁾	-	-	-	39 671	37 900	32 483	32 578	33 126	-16.5%
Emissions ceiling for non-ETS (ESD)	-	-	-	-	-	35 925	35 021	34 117	•
Over fulfillment for non-ETS (ESD)	-	-	-	-	-	3 442	2 443	991	•
Observed net emissions in total⁴⁾	75 196	81 833	74 309	70 917	62 542	51 283	52 724	55 892	-25.7%
Emissions from energy consumption	51 894	59 899	52 455	49 902	48 653	36 521	34 256	35 843	-30.9%
Energy and transformation sector	26 251	32 560	26 051	23 170	24 080	15 554	12 899	14 048	-46.5%
Final energy consumption	25 643	27 338	26 404	26 732	24 573	20 966	21 357	21 795	-15.0%
- Transport (incl. military)	10 946	12 426	12 692	13 997	13 617	12 649	12 895	13 196	20.6%
- Industry	5 436	5 924	5 934	5 453	4 442	3 900	3 862	3 938	-27.6%
- Commercial and public services and households, agriculture etc.	9 261	8 989	7 779	7 282	6 514	4 418	4 600	4 661	-49.7%
Industrial process, flaring etc.	2 860	3 582	4 726	3 670	2 604	2 472	2 389	2 543	-11.1%
Transient emissions and flaring	517	699	1 090	877	568	398	391	419	-18.9%
Industrial process	2 344	2 883	3 636	2 794	2 036	2 075	1 998	2 124	-9.4%
Emissions from agriculture	12 673	12 135	11 262	10 818	10 408	10 520	10 392	10 534	-16.9%
Animals digestion	4 039	3 967	3 631	3 483	3 631	3 695	3 667	3 712	-8.1%
Animal manure	2 523	2 797	3 034	3 167	2 800	2 638	2 608	2 572	2.0%
Agricultural land	5 490	4 830	4 324	3 941	3 818	3 944	3 936	4 030	-26.6%
Others (liming of soils etc.)	621	540	273	226	159	244	181	220	-64.6%
Other emissions	1 816	1 653	1 543	1 304	1 218	1 180	1 162	1 271	-30.0%
Waste deposit	1 536	1 331	1 073	909	772	688	652	618	-59.7%
Sewage treatment	205	213	183	177	170	176	178	176	-14.0%
Other waste (biomass gasification etc.)	75	109	288	217	277	317	332	477	533%
Forestry and land use⁵⁾	4 789	3 487	3 526	4 596	- 801	275	4 222	5 413	•
Forestry ⁵⁾	- 553	- 557	- 563	560	-3 739	-3 970	229	913	•
Land use ⁵⁾	5 342	4 044	4 089	4 036	2 938	4 245	3 993	4 500	•
Indirect CO₂-emissions	1 163	1 077	797	627	459	315	302	287	-75.3%

Note 1: This table only includes Denmark's emissions and removal of greenhouse gases. In the total climate accounts in relation to Denmark's climate commitments under the Kyoto Protocol, credits that are part of the CO₂ removal under "Forestry and land use", and credits from reductions achieved through projects in other countries and purchases of emission allowance, must also be included. The base year stated is the non-ETS emissions set in 2010 for 2005.

1) The changes have been stated in relation to 1990, except for ETS, ESD and domestic aviation (including aviation to/from Greenland and the Faroe Islands), where the reductions have been stated in relation to 2005 (for ESD and domestic aviation in relation to the baseline year for ESD set in 2010).

2) Total emissions without the contribution from "Forestry and land use", as only a part of this is to be included in the climate accounts in the Kyoto Protocol.

3) CO₂ emissions from domestic aviation are shown separately here and as part of ETS, even though these emissions were in practice included under ESD in the period 2005-2011. ESD emissions have been calculated by deducting ETS emissions from the total observed emissions without the contribution from forest "Forestry and land use".

4) Total emissions with the contribution from "Forestry and land use", in which CO₂ removals has been included as negative emissions.

5) The figures are not directly comparable with contributions from forestry and soil, which are included in Denmark's reduction commitment in the Kyoto Protocol.

Observed and adjusted emissions of greenhouse gases

1000 tonnes CO ₂ equivalents	1990	2000	2005	2010	2015	2016	2017*	Change '90 - '17
Observed emissions, total¹⁾	70 408	70 783	66 321	63 342	48 502	50 478	48 268	-31.4%
Adjusted emissions, total¹⁾	78 384	72 532	67 869	60 979	52 566	53 723	51 208	-34.7%

Note 1: See note 1 above.

Note 2: Denmark's greenhouse gas inventory must be reported internationally without adjustments for fluctuations in climate or fuel consumption linked to foreign trade in electricity. The adjusted greenhouse gas inventory can only be used to illustrate the effect of initiatives and other national impacts influencing CO₂ emissions connected to Denmark's own energy consumption.

1) See 2) above.

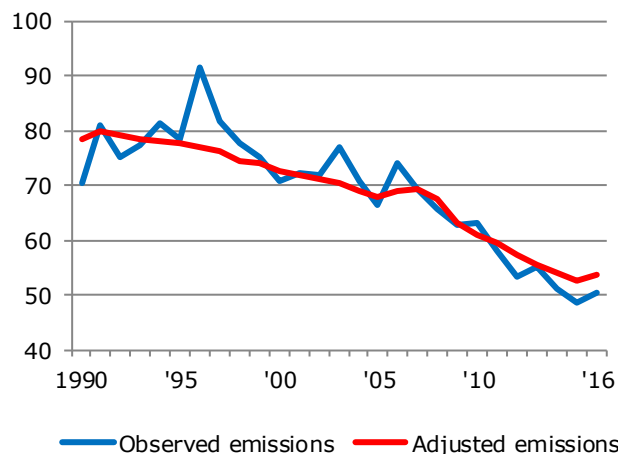
* The preliminary emissions statement for 2017 is solely based on CO₂ emissions from energy consumption and flaring as calculated in the Energy Statistics 2017. Total greenhouse gas emissions are calculated by assuming that all emissions other than CO₂ from energy consumption and flaring are constant at the values for 2016, calculated by DCE - Danish Centre for Environment and Energy.

Source: DCE - Danish Centre for Environment and Energy

EMISSIONS OF CO₂ AND OTHER GREENHOUSE GASES

Emissions of greenhouse gases

Million tonnes CO₂ equivalents



The figure shows emissions of greenhouse gases, excluding the effects of CO₂ removal by forests and land use.

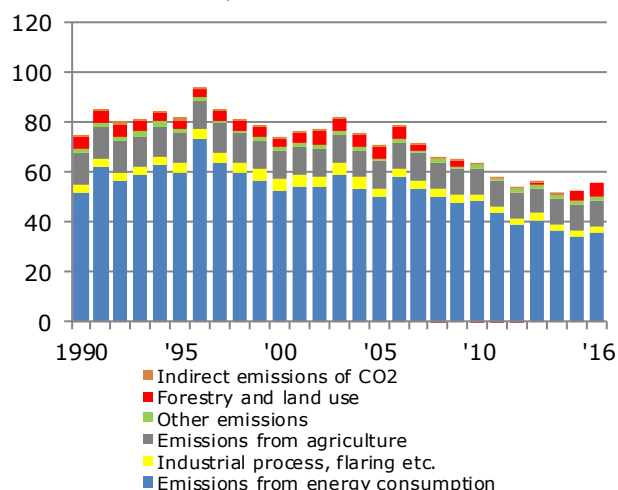
Observed emissions of greenhouse gases were 50.5 million tonnes of CO₂ equivalents in 2016, which is 4.1% more than in 2015.

Adjusted for climatic variations and fuel consumption linked to foreign trade in electricity, emissions of greenhouse gases were 53.7 million tonnes of CO₂ equivalents in 2016, which is 2.2% more than in 2015.

Source: DCE - Danish Centre for Environment and Energy
www.dce.au.dk

Observed net emissions of greenhouse gases by origin

Million tonnes CO₂ equivalents

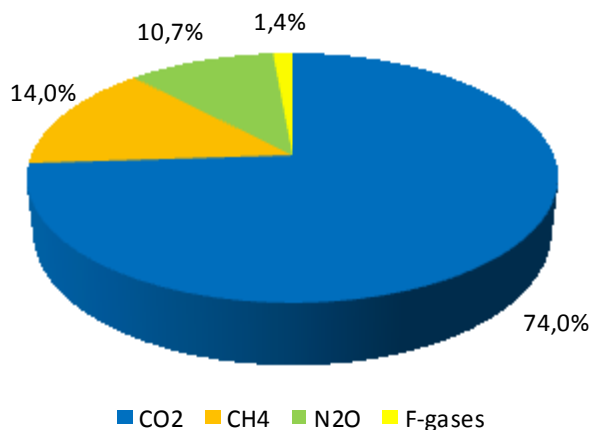


Emissions from energy consumption make the largest contribution to total net emissions of greenhouse gases. Such emissions derive from the energy and transformation sector as well as from final energy consumption. The second-largest contribution derives from agriculture (excl. energy consumption).

In 2016 observed emissions including CO₂ removals from forestry and land use were: Emissions from energy consumption 64.1%, emissions from agriculture 18.8%, industrial processes, flaring etc. 4.6% and other emissions 2.3% and indirect CO₂ emissions of 0.5%. CO₂ removals from forestry and land use corresponded to a deduction of 9.7% from observed emissions.

Source: DCE - Danish Centre for Environment and Energy
www.dce.au.dk

Observed emissions by type of greenhouse gases in 2016



The greenhouse gases included in the statement of total emissions contribute with different percentages. With 74.0%, CO₂ accounted for the largest part of total greenhouse gas emissions in 2016. With 14.0%, methane (CH₄) was the second-largest contributor to total emissions, followed by nitrous oxide (N₂O) with 10.7% and F-gases with 1.4%.

The primary source of CO₂ emissions is fuel consumption for energy purposes. The primary source of both methane and nitrous oxide emissions is agriculture, but waste also significantly contributes to methane emissions.

Note: Exclusive of LULUCF and indirect CO₂-emissions.
 Source: DCE - Danish Centre for Environment and Energy.
www.dce.au.dk

ETS and non-ETS CO₂ emissions from energy consumption 2015-2017

1000 tonnes	Observed CO ₂ emissions from energy consumption								
	Total			EU ETS			Non-EU ETS		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Total	35 349	36 915	34 705	14 632	15 852	13 607	20 717	21 063	21 098
Energy sector	2 346	2 131	2 201	2 346	2 131	2 201	0	0	0
Transformation sector	10 655	11 968	9 433	10 105	11 440	8 947	551	528	485
Final energy consumption	22 347	22 816	23 072	2 181	2 281	2 459	20 166	20 535	20 612
Transport*	14 580	14 896	15 226	93	95	91	14 487	14 801	15 135
Agriculture and industry	4 954	5 053	5 092	2 089	2 186	2 369	2 865	2 867	2 723
- agriculture, forestry and horticulture	1 187	1 174	1 108	18	21	23	1 169	1 153	1 056
- manufacturing	3 004	3 104	3 231	2 071	2 165	2 345	933	939	886
- other industry	764	775	781	-	-	-	764	775	781
Commercial and public services	622	638	648	-	-	-	622	638	648
Households	2 192	2 229	2 106	-	-	-	2 192	2 229	2 106

Note 1: The first three columns of figures include CO₂ emissions from oil, natural gas and non-renewable waste.

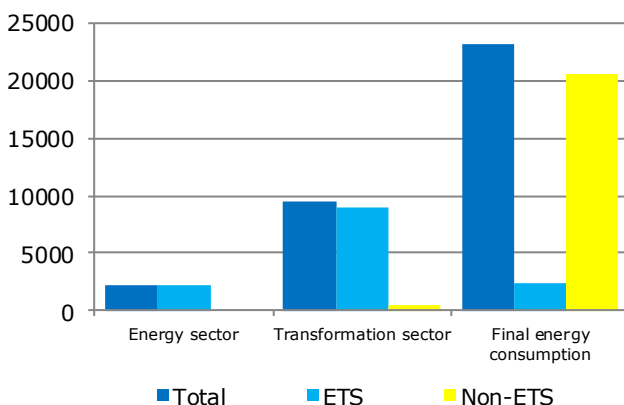
Note 2: The table does not include emissions from industrial processes and flaring.

Note 3: From 2013 non-renewable waste is covered by the EU ETS (EU Emission Trading System). CO₂ emissions from own consumption by waste incineration plants (industry code 383921) have been included under the transformation sector.

* Of the stated Danish CO₂ emissions in the transport sector the stated EU ETS CO₂ emissions are from domestic flights (excluding aviation to/from Greenland and the Faroe Islands). However, the statement is inclusive of CO₂ emissions from non-scheduled flights which are not covered by the EU ETS.

Observed CO₂ emissions from energy consumption in 2017, EU ETS and non-EU ETS sectors

Thousand tonnes



The EU Emission Trading System (EU ETS) comprises almost half the CO₂ emissions from energy consumption. However, the share varies considerably from sector to sector.

In the energy sector, which includes refineries and oil and gas production plants in the North Sea, all emissions are covered by the EU ETS. In the transformation sector, which includes power plants and district heating plants, if non-renewable waste is excluded, the picture is almost the same.

In relation to emissions linked to final energy consumption, i.e. emissions from burning oil, natural gas and coal by enterprises, households and means of transport, less than 10% is covered by the EU ETS. In this context, almost all emissions can be attributed to manufacturing industries.

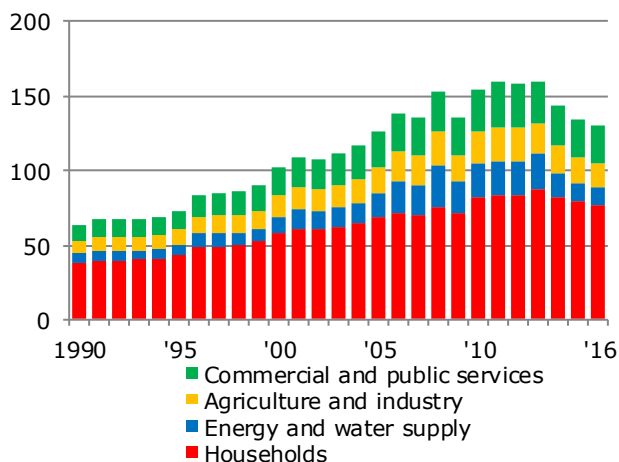
Total observed emissions of greenhouse gases, EU ETS and non-EU ETS sectors

1000 tonnes CO ₂ equivalents	Total	EU ETS, from energy consumption	EU ETS, from industries and flaring	Non-EU ETS
2016	50 478	15 889	1 463	33 126
2017	48 268	13 650	1 530	33 089

Note: The preliminary emission statement for 2017 is solely based on the CO₂ emissions from energy consumption and flaring as stated in the Energy statistics 2017. DCE's emission statement for 2016 has been used for domestic transport and includes flights to/from Greenland and the Faroe Islands. The total of greenhouse gas emissions is calculated by assuming that all emissions except CO₂ from energy consumption and flaring equals the values in 2016 as stated by DCE - Danish Centre for Environment and Energy.

Energy expenses by industry and households

Billion DKK, current prices



Energy expenses have been calculated based on purchase prices for the year, including taxes and VAT. For industries, as a general rule, a full refund of energy taxes (but not CO₂ taxes) and VAT applies.

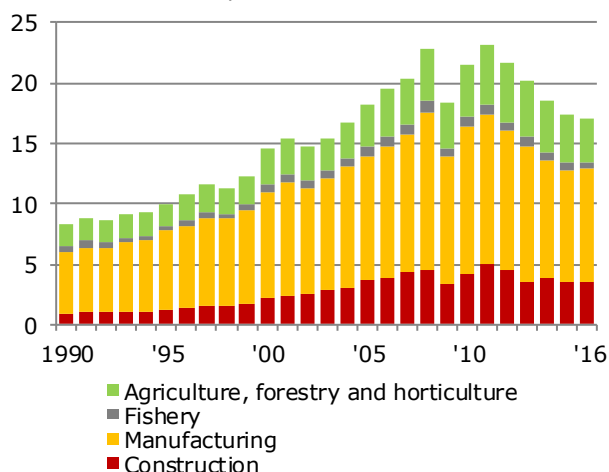
Total energy expenses by industry and households amounted to DKK 130.8 billion in 2016, which is 2.5% less than the year before. For households energy expenses were DKK 76.9 billion; for agriculture and industry (excluding oil refineries) expenses were DKK 17.1 billion; while for commercial and public services expenses were DKK 25.3 billion.

Energy expenses in current prices increased during the period from 1990-2016. The fall from 2008 to 2009 is due to a reduction in energy consumption. The reason for the large drop in expenses from 2013 to 2016 is a drop in consumer prices.

Source: Statistics Denmark

Energy expenses in agriculture and industry

Billion DKK, current prices



Energy expenses for agriculture and industry can be further analysed between four sub-sectors.

Energy expenses for manufacturing industries (DKK 9.4 billion) accounted for the major part of agriculture and industry's energy expenses in 2016 (54.8%).

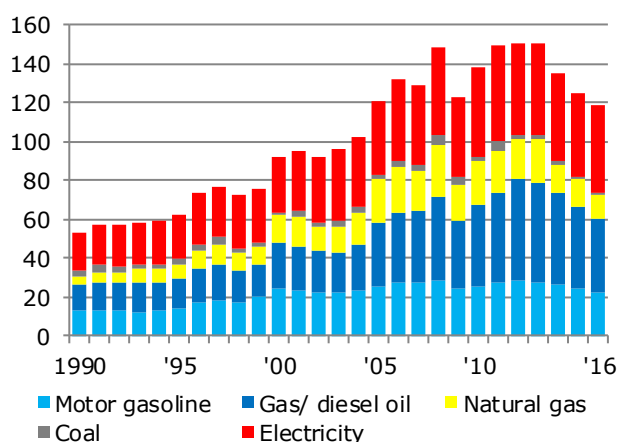
With DKK 3.6 billion (21.3%), agriculture, forestry and horticulture contributed the second-largest share. The third-largest share was contributed by construction with DKK 3.5 billion (20.7%). Finally, with DKK 0.5 billion (3.3%), fishing accounted for the smallest share of energy expenses.

In the period 1990-2016, manufacturing industries' share of the agriculture and industry sector's energy expenses followed a downward trend, while the energy expenses of construction have followed an upward trend.

Source: Statistics Denmark

Energy expenses by fuel

Billion DKK, current prices



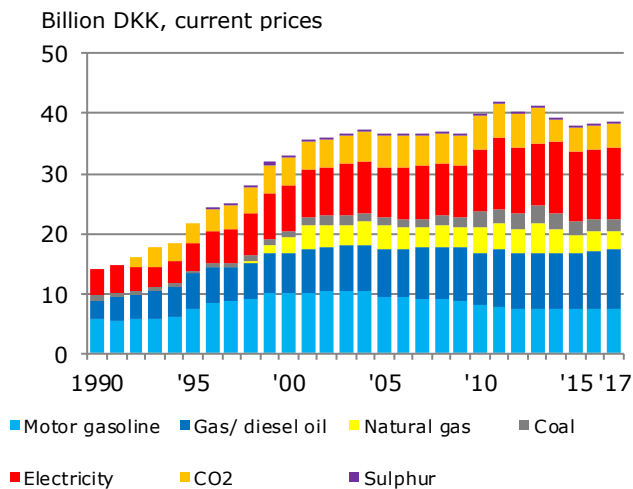
Energy expenses include i.a. motor gasoline, gas/diesel oil, natural gas, coal and electricity. These five fuels account for almost 58% of total energy expenses of DKK 205 billion, when including expenses for foreign bunkering of Danish vessels and oil refineries.

Of these fuels, the greatest share of energy expenses in 2016 was attributable to electricity (DKK 45.4 billion). Gas/diesel oil accounted for the second-largest share (DKK 37.6 billion). Seen over the period 1990-2016, electricity usually accounts for the largest share.

This is followed by motor gasoline (DKK 22.4 billion), natural gas (DKK 12.6 billion), and coal (DKK 1.3 billion).

Source: Statistics Denmark

Revenue from energy, CO₂ and sulphur taxes



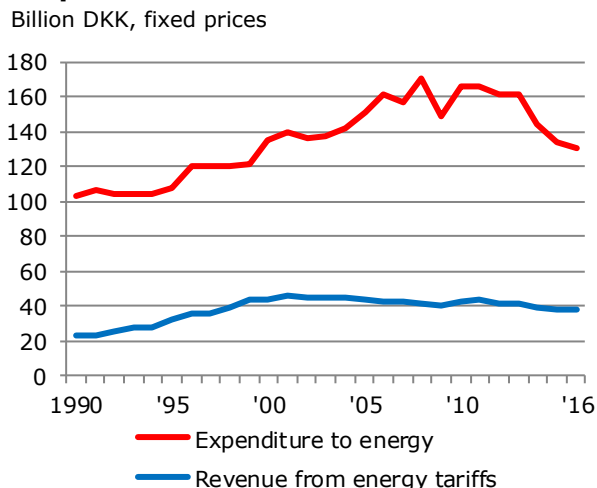
In 2017, revenues from energy taxes calculated in current prices were DKK 38.5 billion, which is an increase of 0.8% compared with 2016. In addition to energy taxes, revenues include CO₂ and sulphur taxes. The largest contributions to revenues in 2017 is from electricity (DKK 12.2 billion), gas/diesel oil (DKK 9.8 billion), motor gasoline (DKK 7.5 billion) and CO₂ taxes (DKK 4.0 billion).

The 2017 revenues in current prices increased by 176% compared with 1990, when there were no CO₂ and sulphur taxes. Gas/diesel oil, electricity and motor gasoline have seen growths of 213%, 182% and 33.0%, respectively, since 1990.

In 2016 and 2017, energy, CO₂ and sulphur taxes amounted to 3.9% and 3.8%, respectively, of total tax and VAT revenues in Denmark.

Source: Statistics Denmark

Energy expenditures and tax revenues, fixed prices



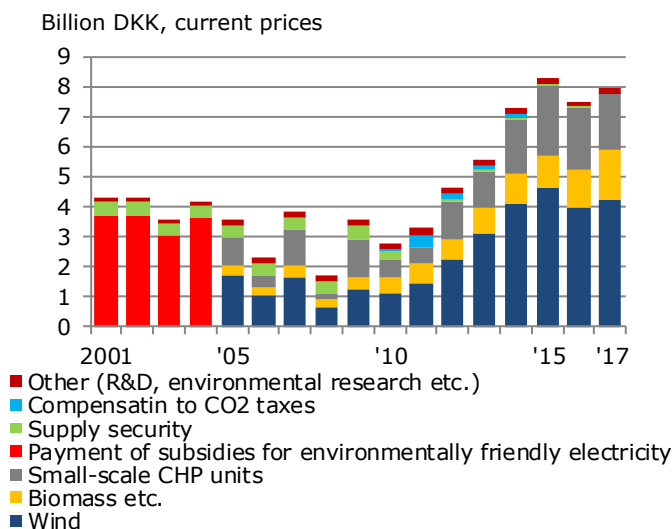
In order to assess changes in energy expenses and tax revenues in relation to general price fluctuations, the figures have been converted to 2016 prices.

Measured as 2016 prices, energy expenses in 2016 were 2.8% lower than in the previous year. Compared with 1990, energy expenses have increased by 27.4%.

Revenues from energy taxes measured in 2016 prices rose by 68.5% from 1990 to 2016.

Source: Statistics Denmark

Expenses for Public Service Obligations (PSO) in the electricity area



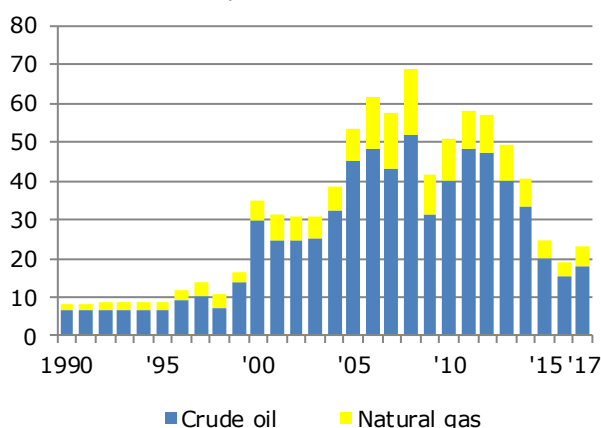
Total expenses for Public Service Obligations (PSO) were DKK 7.9 billion in 2017, compared with DKK 7.5 billion the year before. The increase in PSO expenses from 2016 to 2017 is attributable in particular to an increase in wind power production and electricity from biomass

For 2017, total funding support for environmentally friendly electricity production was DKK 7.7 billion, divided between DKK 4.3 billion for wind power, DKK 1.9 billion for small-scale CHP and DKK 1.6 billion for biomass.

In 2010, compensation for CO₂ taxes was introduced, but this compensation was cancelled at the end of 2014.

Value of crude oil and natural gas production

DKK billion, current prices



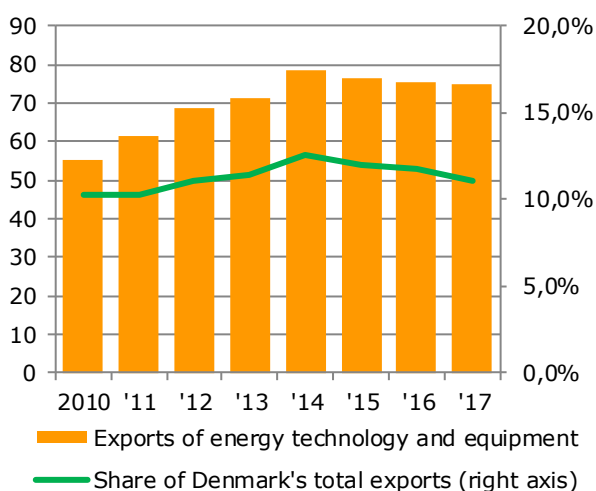
The value of the crude oil and natural gas produced from the North Sea in 2017 was DKK 23.0 billion, compared with DKK 19.2 billion the previous year. The value of crude oil rose from DKK 15.4 billion to DKK 17.9 billion, and the value of natural gas rose from DKK 3.8 billion to DKK 5.1 billion.

The value of the North Sea production depends on the scale of production as well as on world market prices. In 2017, the production of crude oil and natural gas rose by more than the production value. Production of crude oil fell by 2.7% while the production of natural gas was rose by 7.3% in 2017

Source: Danish Energy Agency.

Exports of energy technology and equipment

DKK billion, current prices



Exports of energy technology and equipment such as wind turbines, district heating pipes, thermostat valves, pumps etc. increased rapidly up to the year 2014.

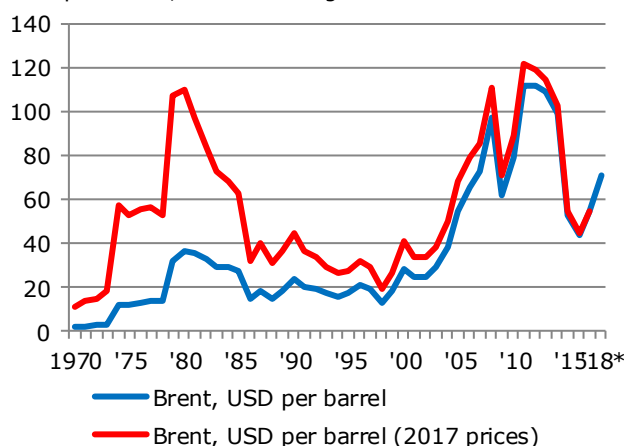
The exports fell from 2016 to 2017 and were 0.5% lower in 2017 than the year before. In 2017, Denmark exported energy technologies and equipment at a value of DKK 75.1 billion, corresponding to 11.1% of total Danish goods exports.

For more information see the publication on Danish energy technology and service exports 2017, "Eksport af energiteknologi og -service 2017", which is published as collaboration between the Danish Energy Agency, DI Energy and Danish Energy Association. The publication is available in Danish at the website of the Danish Energy Agency.

Source: Eksport af energiteknologi og -service 2017

Spot market prices for crude oil

USD per barrel, annual average



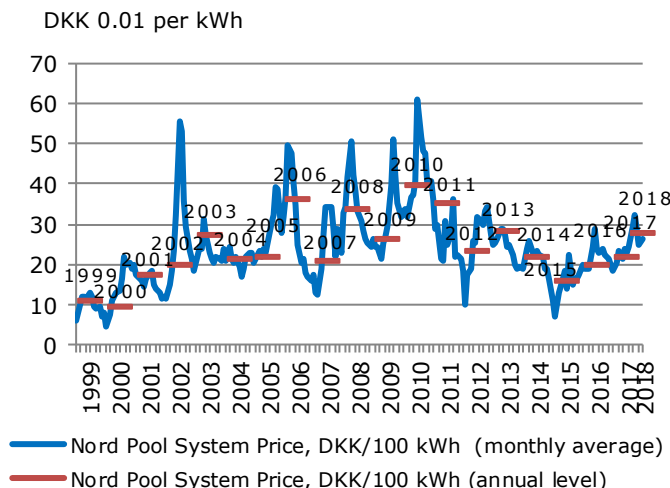
The average crude oil price was USD 54 per barrel in 2017. This is a relatively high price compared with the level in the mid-1980s and 20 years onwards, but it is a relatively low price compared with the level just before and during the economic crisis in 2008 and the period from 2011 to mid-2014.

The current price level established itself in late 2014, when the price per barrel fell from around 100 USD to 50 USD. The reason for the current relatively low price compared with 2011-2014 is the relatively large amount of oil available on global markets compared to demand.

Source: BP and the World Bank (prices for 2018)

*Prices for 2018 cover only the first six months.

Spot market prices for electricity



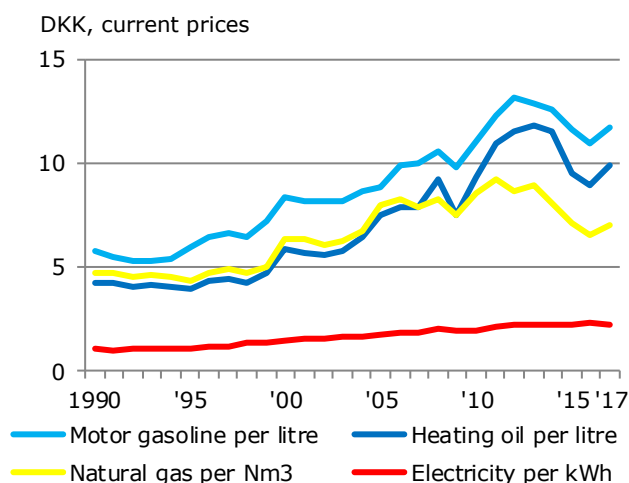
The system price of electricity on Nord Pool is set hour by hour on the basis of supply and demand. The price is affected by a number of factors, including precipitation and temperature. For example, the winter 2010/2011 was affected by concerns over water shortages and increasing electricity consumption in Norway because of low temperatures, and this resulted in high prices. The market price of electricity in Denmark may deviate from the system price because of restrictions in transfer capacity between areas.

The average system price of electricity per kWh was DKK 0.22 in 2017 compared with DKK 0.20 in 2016.

In the first half of 2018, the average system price was DKK 0.28 per kWh. This increase is especially due to the lower water levels in Nordic reservoirs.

Source: Nord Pool

Energy prices for households



The energy prices shown are annual averages of current consumer prices, i.e. including energy and CO₂ taxes and VAT.

The price of heating oil was DKK 9.88 per litre in 2017, as opposed to DKK 8.93 per litre the year before, corresponding to a rise of 10.6%. In the period 1990-2017 the price increased by 133%.

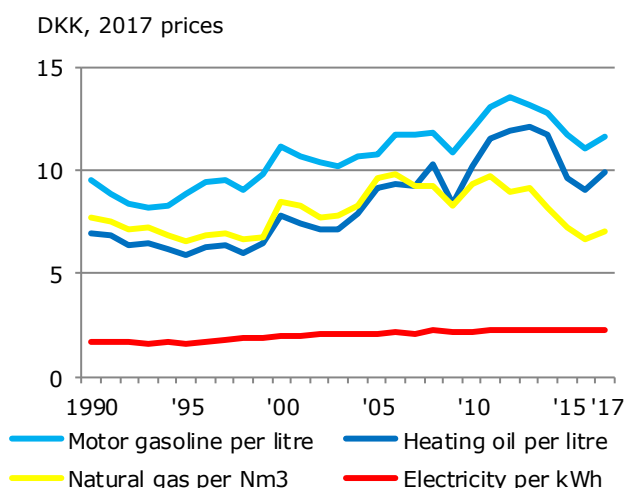
The price of natural gas for households was DKK 7.07 per Nm³ in 2017, compared with DKK 6.59 per Nm³ the year before, corresponding to a rise of 7.3%.

The price of a litre of motor gasoline was DKK 11.69 in 2017, compared with DKK 10.97 in 2016, corresponding to a rise of 6.5%. The increase in price is attributable to a higher price of crude oil in 2017 than in the year before. The tax on motor gasoline has varied considerably over time and this has affected the price.

The price of electricity was DKK 2.25 per kWh in 2017, compare with DKK 2.30 in 2016, corresponding to a drop of 1.9%.

Source: Eurostat (electricity and natural gas) and Drivkraft Danmark (oil products)

Energy prices for households



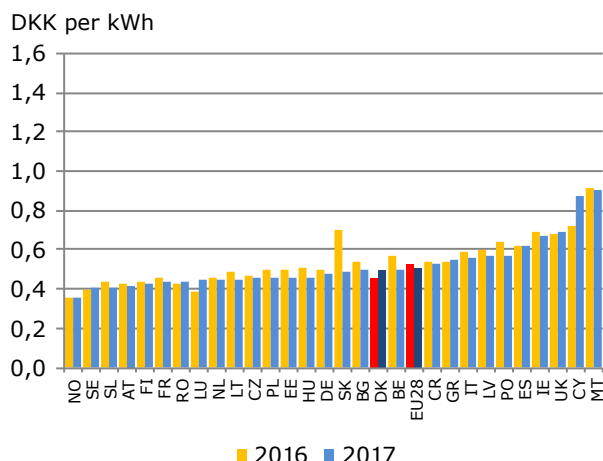
Household energy prices have been calculated at 2017 prices by adjusting current prices for changes in the general price level as stated in the consumer price index. Measured in 2017 prices, the price per litre of motor gasoline has risen 5.4% in 2017 compared with 2016.

Over a period in the 1990's the price of heating oil fluctuated around DKK 6 per litre. Since 2000, however, the price has been above this level and in 2017 it was DKK 9.88 per litre, which is 9.4% higher than in 2016. The price of natural gas was DKK 7.07 per Nm³ in 2017, which is 6.2% higher than the year before. The price of electricity in 2017 prices was 3.0% lower in 2017 than the year before.

Source: Eurostat (electricity and natural gas) and Drivkraft Danmark (oil products), DEA

ENERGY PRICES

Electricity prices for industrial customers



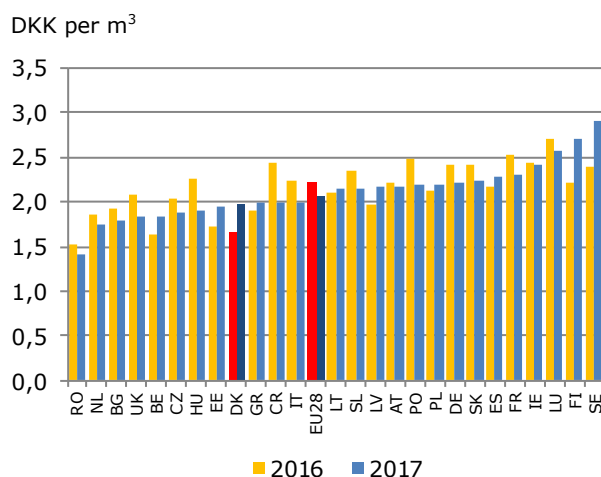
Electricity prices are shown in current prices (DKK per kWh) exclusive of taxes for industry customers with an annual consumption between 2 - 20 GWh.

In 2017, the price of electricity per kWh varied in the EU Member States (EU28) from DKK 0.41 in Sweden to DKK 0.90 in Malta. Norway had an electricity price of DKK 0.36 per kWh.

In 2017 the Danish electricity price was DKK 0.50 per kWh. This was 2.4% lower than the average price in EU28, which was DKK 0.51 per kWh. The Danish electricity price increased by 8.7% in 2017 compared with the year before. In EU28, the average electricity price fell by 3.7% between 2016 and 2017.

Source: Eurostat

Natural gas prices for industrial customers



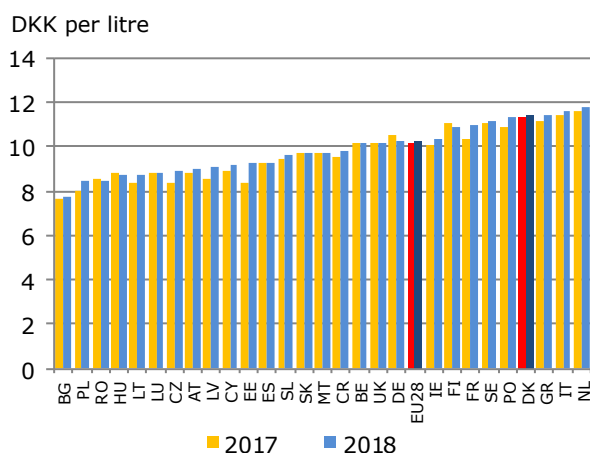
Natural gas prices are shown in current prices (DKK per m³) exclusive of taxes for industry customers with an annual consumption of 10 TJ to 100 TJ.

In 2017, the price of natural gas per m³ varied in the EU28 Member States from DKK 1.40 in Romania to DKK 2.90 in Sweden. The Danish price in 2017 was DKK 1.96, while the average EU28 price was DKK 2.07.

In 2017, the Danish price of natural gas was 18.4% higher than in 2016, while the average EU28 price was 6.8% lower compared to the year before.

Source: Eurostat

Motor gasoline prices

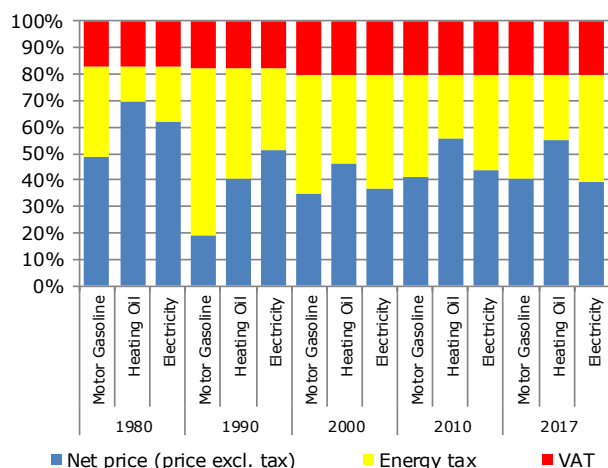


The price of motor gasoline in week 1 in 2017 and 2018, respectively, are shown in current prices (DKK per litre). Prices are for motor gasoline 95 unleaded, including taxes. The average for the EU28 Member States is a weighted average.

In 2018, the lowest price, DKK 7.77 per litre, was in Bulgaria, while the highest price, DKK 11.77, was in Netherlands. In Denmark, the price per litre was DKK 11.42, while the average price in EU28 was DKK 10.29 per litre.

Source: Oil Bulletin, European Commission

Composition of energy prices for households



Expenses on taxes increased considerably from 1980 to 1990. Since then, the share of the consumer price which comprises taxes has been falling for motor gasoline and heating oil. For electricity, the tax share continued to increase up to 2000, after which it went down again.

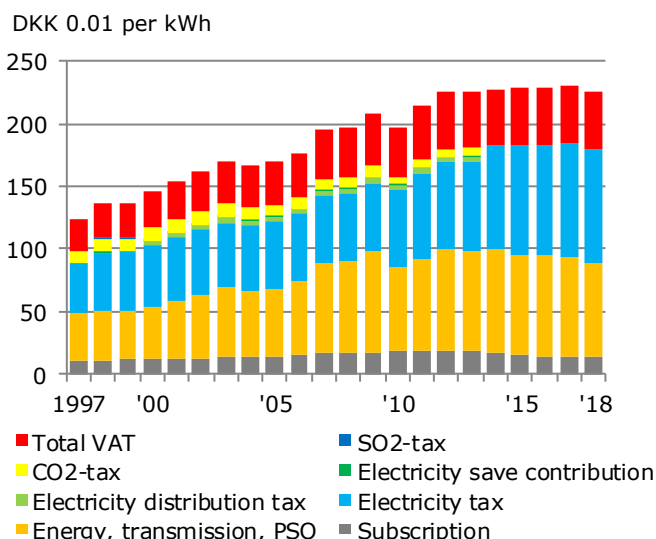
The price of motor gasoline in 2017 of DKK 11.69 per litre was made up as follows: Price exclusive of taxes and VAT 40.7%, taxes 39.3% and VAT 20.0%.

The price of heating oil in 2017 of DKK 9.88 per litre was made up as follows: Price exclusive of taxes and VAT 55.2%, taxes 24.8% and VAT 20.0%.

The price of electricity in 2017 of DKK 2.25 per kWh was made up as follows: Price inclusive of PSO and exclusive of taxes and VAT 39.6%, taxes 40.4% and VAT 20.0%.

Source: Eurostat (electricity) and Drivkraft Danmark (oil products)

Electricity prices for households 1997-2018 (as of 1 January), consumption of 4000 kWh



At the beginning of 2018, the average price of electricity for household customers with an annual consumption of 4,000 kWh was DKK 2.25 per kWh, which constitutes a slight decrease of 2.3% from the year before. The price of electricity has increased by 46.1% since 2001.

Total tax revenues for the state per kWh in 2018 were DKK 1.36 compared with DKK 0.96 in 2001. Until 2014 these taxes included: Electricity tax, electricity distribution tax, electricity savings contribution, CO₂ tax (electricity savings tax) and VAT. From 2014 these taxes were changed to include only electricity tax and VAT.

The payment for the actual energy per kWh (inclusive of PSO and electricity transmission) was DKK 0.75 in 2018, as opposed to DKK 0.46 in 2001, while subscription costs per kWh were DKK 0.14 as opposed to DKK 0.13 in 2001.

Source: Danish Energy Association and Danish Energy Regulatory Authority

CO₂ prices (EUR/tonne)



The price of allowances in the EU ETS has varied greatly since the beginning in 2008. Prices for allowances in the period 2008-12 dropped significantly as of the summer of 2008 in parallel with expectations for lower energy consumption and emissions in the coming years due to the economic slowdown. The allowance price was relatively stable from April 2009 to June 2011. After this time it fell additionally in step with an increasing surplus of allowances due to the continuing economic slowdown and a steeply falling price of international climate credits. In 2017, an EU agreement was reached on the revision of the Emissions Trading Directive for the period 2021-2030, which included a series of structural reforms aimed at addressing the large quota surplus. Since the conclusion of the agreement, the price of CO₂ quotas has increased significantly and reached over 20 euros in August 2018.

Source: Point Carbon and European Energy Exchange

Energy consumption in EU28 and other countries 2016 - by share of renewable energy

	Energy consumption ¹⁾ , PJ	Share in percentage						Net import of electricity
		Oil	Natural gas	Coal	Nuclear power	Renewable energy and waste ²⁾	Waste, non-renewable	
Sweden	2061	24	2	4	33	37 (54)	2	-2
Latvia	184	34	25	1	0	37 (37)	1	2
Finland	1449	28	6	13	17	31 (39)	1	5
Austria	1418	36	21	9	0	30 (34)	2	2
Denmark	729	39	17	11	0	29 (32)	2	2
Portugal	974	46	18	12	0	24 (29)	1	-2
Croatia	359	38	25	8	0	23 (28)	0	6
Lithuania	295	39	26	3	0	21 (26)	1	10
Romania	1357	29	28	16	9	19 (25)	0	-1
Italy	6479	36	38	7	0	17 (17)	1	2
Slovenia	285	35	10	17	22	17 (21)	1	-1
Estonia	260	18	7	61	0	16 (29)	1	-3
Spain	5115	44	20	8	12	14 (17)	0	1
EU28	68689	35	23	15	13	13 (17)	1	0
Germany	13283	34	22	24	7	12 (15)	1	-1
Hungary	1076	27	31	9	16	12 (14)	1	4
Greece	1011	53	14	18	0	11 (15)	0	3
Bulgaria	759	23	15	31	23	11 (19)	0	-3
Czech Republic	1750	20	17	40	15	10 (15)	1	-2
France	10414	30	15	3	42	10 (16)	1	-1
Slovakia	691	21	24	20	23	10 (12)	1	1
Poland	4184	27	15	49	0	9 (11)	1	0
UK	7931	38	37	6	10	8 (9)	1	1
Ireland	622	50	29	14	0	7 (10)	0	0
Belgium	2405	41	25	5	20	7 (9)	1	1
Cyprus	102	93	0	0	0	6 (9)	1	0
Luxembourg	176	63	17	1	0	5 (5)	1	13
Netherlands	3288	41	38	13	1	5 (6)	1	1
Malta	30	79	0	0	0	3 (6)	0	18
Norway	1164	31	20	3	0	50 (69)	1	-5
USA	90712	43	30	16	10	7	0	0
Japan	17833	39	24	27	1	5	1	0

¹⁾ Source: Eurostat (Gross inland consumption). Corresponds to "gross energy consumption", however without e.g. adjustments for conversion loss in connection with foreign trade in electricity.

²⁾ The statement figures in brackets are according to the EU Directive on renewable energy. The percentage share for other fuels is the Danish Energy Agency's calculation based on figures from Eurostat. For a more detailed explanation, see pages 8 and 9. Source: Eurostat and IEA (figures for USA and Japan).

Consumption of renewable energy in EU28 and other countries in 2016

		Share in percentage					
		Hydro	Wind	Solar	Geo-thermal	Biomass, incl. waste	Biofuels
	Consumption of renewable energy and waste, PJ						
Sweden	765	29.2	7.3	0.1	0.0	57.0	6.4
Latvia	68	13.4	0.7	0.0	0.0	85.2	0.7
Finland	444	12.8	2.5	0.0	0.0	82.5	2.2
Austria	421	34.1	4.5	2.8	0.3	52.6	5.7
Denmark	210	0.0	21.9	2.3	0.1	70.8	4.9
Portugal	235	24.0	19.1	2.8	2.8	46.3	5.0
Croatia	84	29.4	4.4	0.9	0.5	64.9	0.0
Lithuania	61	2.7	6.7	0.4	0.1	86.2	3.9
Romania	259	25.0	9.2	2.5	0.6	58.5	4.2
Italy	1089	14.0	5.8	8.1	21.4	43.2	7.5
Slovenia	47	34.4	0.0	3.0	4.0	56.8	1.7
Estonia	40	0.3	5.3	0.0	0.0	94.1	0.3
Spain	730	18.0	24.1	18.2	0.1	33.2	6.4
EU28	9069	13.9	12.0	6.2	3.1	57.9	7.0
Germany	1629	4.5	17.4	10.1	0.7	60.0	7.2
Hungary	126	0.7	2.0	0.9	4.0	86.1	6.3
Greece	110	18.1	16.8	20.4	0.4	37.9	6.4
Bulgaria	82	17.4	6.3	7.3	1.8	58.9	8.4
Czech Republic	180	4.0	1.0	4.7	0.0	83.3	7.0
France	1030	21.0	7.5	3.3	1.0	54.5	12.6
Slovakia	66	23.8	0.0	3.3	0.5	63.2	9.2
Poland	367	2.1	12.3	0.7	0.3	79.4	5.2
UK	643	3.0	20.9	6.2	0.0	63.7	6.2
Ireland	46	5.3	47.7	1.3	0.0	35.3	10.4
Belgium	164	0.8	11.9	7.4	0.1	68.3	11.5
Cyprus	6	0.0	12.7	53.3	1.0	27.2	5.8
Luxembourg	9	4.5	3.9	4.8	0.0	46.0	40.8
Netherlands	155	0.2	19.0	4.4	1.8	68.9	5.7
Malta	1	0.0	0.0	61.6	0.0	12.3	26.1
Norway	584	88.2	1.3	0.0	0.0	8.0	2.5
USA	6541	14.8	12.6	4.3	5.9	36.7	25.7
Japan	946	30.0	3.7	20.5	10.3	33.8	1.7

Source: Eurostat and IEA (figures for USA and Japan).

Key figures 2016 – ranked by degree of self-sufficiency

	Self-sufficiency, %			Energy consumption per capita, GJ		Energy intensity, gross energy consumption in toe per 1 million EUR (2010 prices)	
	Total	Oil	Natural gas	Gross energy consumption	Final energy consumption	2000	2016
Denmark	86	104	141	128	106	88	66
Romania	77	41	86	69	47	441	215
Estonia	75	0	0	198	90	466	346
Sweden	70	0	0	209	139	163	116
Poland	66	4	24	110	73	360	231
Czech Republic	65	1	3	166	99	361	239
UK	63	64	51	121	86	146	91
Bulgaria	62	1	3	106	57	759	423
Netherlands	59	3	126	194	122	140	117
Latvia	56	0	0	93	81	314	203
Slovenia	53	0	1	138	99	231	178
France	52	1	0	156	92	145	117
Croatia	51	21	63	86	66	239	186
Finland	51	0	0	264	193	205	182
EU28	46	12	28	135	91	155	119
Hungary	44	10	18	109	76	313	231
Slovakia	38	0	2	127	80	437	209
Austria	36	6	14	163	135	114	107
Germany	36	2	9	162	110	145	111
Ireland	28	0	59	132	103	117	59
Greece	28	1	0	94	65	149	131
Spain	28	0	0	110	74	143	111
Belgium	26	0	0	213	134	191	148
Portugal	26	0	0	94	65	151	133
Lithuania	23	2	0	102	74	386	204
Italy	22	7	8	107	80	112	98
Cyprus	5	0	0	121	87	169	134
Luxembourg	4	0	0	305	293	119	88
Malta	2	0	0	67	54	149	83
Norway	748	928	1849	223	152	95	80
USA	88	59	96	281	195		
Japan	8	0	2	140	97		

Source: Eurostat and IEA (figures for Norway, USA and Japan)

Reserves, production, stocks and consumption of oil by regions

	1980	1990	2000	2005	2010	2015	2016	2017	Change '90 - '17
Oil reserves¹⁾, 1000 million barrels									
The world	684	1 028	1 301	1 377	1 643	1 690	1 697	1 697	65.1%
North America	123	125	232	224	222	227	228	226	80.3%
South and Central America	27	72	98	104	325	329	329	330	361%
Europe and Eurasia	84	76	141	139	158	155	158	158	108%
Middle East	362	660	697	756	766	803	808	808	22.5%
Africa	53	59	93	111	125	126	127	126	115%
Asia and the Pacific	34	36	40	43	48	49	48	48	32.3%
Oil production, million tonnes									
The world	3091	3157	3616	3936	3981	4355	4377	4387	39.0%
North America	671	655	642	638	639	908	883	917	40.1%
South and Central America	195	234	345	375	379	398	382	368	57.4%
Europe and Eurasia	747	788	729	849	860	848	861	862	9.4%
Middle East	934	837	1147	1227	1220	1412	1500	1481	76.9%
Africa	301	317	372	465	481	387	366	383	20.9%
Asia and the Pacific	245	326	381	382	403	402	385	375	15.2%
Oil stocks*), million tonnes									
The OECD	271	217	211	208	215	224	275	215	-0.7%
North America	116	90	75	78	84	87	87	83	-7.5%
Europe	131	106	109	107	108	113	114	108	2.4%
Pacific	23	22	27	22	22	24	24	24	12.6%
Oil consumption, million tonnes									
The world	2979	3154	3583	3927	4076	4332	4409	4470	41.7%
North America	928	923	1061	1128	1041	1042	1053	1056	14.4%
South and Central America	171	176	235	250	299	330	319	317	79.9%
Europe and Eurasia	1201	1128	932	964	913	872	893	905	-19.8%
Middle East	94	166	239	296	357	399	401	404	143%
Africa	70	96	118	138	164	182	186	189	98.0%
Asia and the Pacific	515	664	998	1150	1302	1506	1556	1598	141%
Total energy consumption, Mtoe									
The world	6627	8112	9356	10894	12119	13060	13259	13511	66.6%
North America	2068	2281	2699	2776	2721	2740	2762	2773	21.6%
South and Central America	263	331	476	534	633	701	697	701	112%
Europe and Eurasia	2856	3204	2821	2980	2969	2869	2907	2947	-8.0%
Middle East	127	260	415	554	714	848	870	897	245%
Africa	145	223	273	327	387	429	438	449	101%
Asia and the Pacific	1168	1813	2672	3724	4696	5472	5585	5744	217%
Oil consumption - total share of energy consumption, %									
The world	45	39	38	36	34	33	33	33	
North America	45	40	39	41	38	38	38	38	
South and Central America	65	53	49	47	47	47	46	45	
Europe and Eurasia	42	35	33	32	31	30	31	31	
Middle East	74	64	58	53	50	47	46	45	
Africa	48	43	43	42	42	42	42	42	
Asia and the Pacific	44	37	37	31	28	28	28	28	

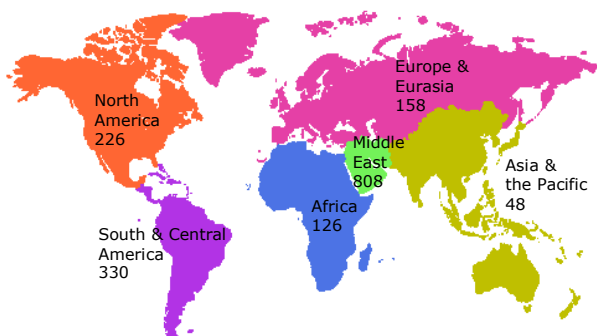
¹⁾ Crude oil, at the end of the year

*) At the end of the year

Sources: BP Statistical Review of World Energy
IEA, International Energy Agency, Paris

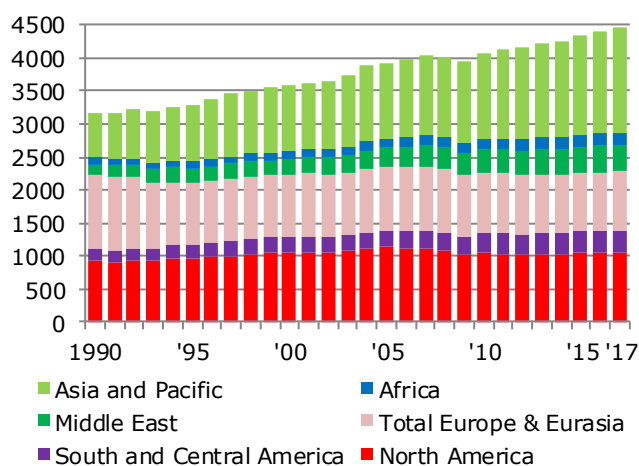
Proved oil reserves at end 2017

Billion barrels



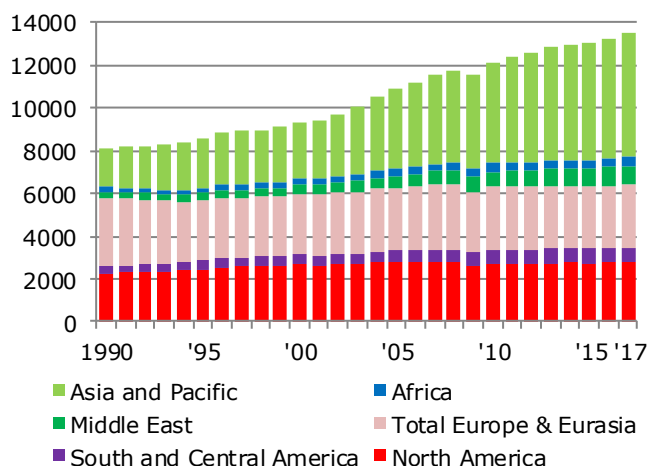
Oil consumption by region by the end of 2017

Million tonnes



Energy consumption by region

Million tonnes oil equivalents



At the end of 2017, the world's total proved oil reserves totalled 1697 billion barrels.

Of which, 47.6% of crude oil reserves are in the Persian Gulf region, where the fields are relatively large and geologically easily accessible, which means production costs are low.

Comparing proved regional oil reserves with actual regional oil production (reserves-to-production ratio, R/P), shows that Europe and Eurasia have reserves for 24.3 years' unchanged production, while North America has reserves for 30.8 years. The R/P ratio for total world oil reserves is 50.2 years' unchanged production. However, new oil reserves are being discovered continually, and for 2017 oil reserves are almost unchanged compared with 2016.

Source: BP Statistical Review of World Energy

In 2017, total world oil consumption was 4.470 billion tonnes, which is 1.4% more than the year before. A total of 23.6% of this oil was consumed in North America, which accounted for 20.9% of the world's crude oil production. Europe & Eurasia accounted for 20.2% of oil consumption and 19.7% crude oil production. Neither North America nor Europe & Eurasia are self-sufficient in oil, as their consumption is greater than their production.

Asia and the Pacific's share of consumption was 35.8% in 2017, the Middle East's share was 9.0%, South and Central America's share was 7.1%, while Africa's share was 4.2%.

Total world oil consumption in 2016 was 33.1% of total world energy consumption compared with 33.3% in 2016. For Europe & Eurasia, this figure was 30.7% compared with 30.9% in 2016.

Source: BP Statistical Review of World Energy

World energy consumption was 13.511 billion tonnes oil equivalents in 2017, which is 1.9% higher than in 2016. Except for in 2009, world consumption increased steadily over the period 1990-2017. The fall from 2008 to 2009 was due to economic recession, especially in North America and in Europe & Eurasia.

Energy consumption went up in all regions in 2017. In North America and South and Central America, the increase was 0.5%.

The largest percentage increase in energy consumption from 2016 to 2017 was in the Middle East region, where energy consumption went up 3.2%. The Asia and Pacific region went up by 2.8% and accounts for 42.5% of total world energy consumption.

In 2017, energy consumption increased by 1.4% in Europe and Eurasia, which accounts for 21.8% of total world energy consumption.

Source: BP Statistical Review of World Energy

Adjustments for trade in electricity	In the case of net imports of electricity, fuel consumption is added corresponding to the average consumption of a Danish condensation plant if the electricity had been produced in Denmark. For net exports, consumption will be deducted correspondingly.
Agriculture and industry	Includes agriculture, forestry, horticulture, fishing, manufacturing and construction.
Autoproducers	Producers of electricity and/or district heating, whose primary activity is not transformation, e.g. manufacturing companies, horticulture or waste treatment facilities.
Bitumen	A tar-like oil product, the heaviest part of the distillation residue in refining. Bitumen is used as a binding material for the stone material in road asphalt and as a sealing material in construction.
Border trade with oil products	Motor gasoline, gas/diesel oil and petroleum coke purchased by private persons and haulage contractors on one side of the border and consumed on the other side due to differences in consumer prices. Reporting to the IEA and Eurostat does not include border trade.
CO₂ emissions	Emissions of carbon dioxide, mainly from use of energy. There are also a number of other sources, including flaring of gas in the North Sea, incineration of plastic waste and certain industrial processes. Energy statistics only include emissions from the consumption of oil, natural gas and coal.
Calorific value	The amount of energy released when combustible matter is burned. Distinction is made between "net" and "gross" calorific values. Gross calorific value is the amount of heat released if the combusted products are cooled enough for their water vapour content to condense completely. The water vapour comes from the actual content of the fuel itself and the combustion of the hydrogen compounds in the fuel. The "net" calorific value is the amount of energy attained when the water remains as vapour. Net calorific value is used in the national Danish energy statistics.
Climate adjustment	Energy consumption for heating in Denmark is somewhat dependent on outdoor temperature, which varies from year to year. A measurement of climatic variations is "degree days", registered by the Danish Meteorological Institute (DMI). The number of "degree days" is calculated as the sum of the days when the mean outdoor temperature is below 17 degrees Celsius multiplied by the difference between 17 degrees Celsius and the mean temperature of the 24-hour period. The climate-adjusted energy consumption for heating purposes is therefore the consumption that would have taken place, had the year been a normal weather year. From the 2005 statistics, the "degree days" of a normal weather year have been fixed as the moving average of degree days in the last twenty years. This causes the amount of degree days to show a declining tendency when looking over a longer period of years. However, some of the fuel consumption for heating purposes is independent of outdoor climate, for example heating of water, heat loss from installations and grids etc. This varies according to types of industry and fuel. As a general rule, it is assumed that 65 % of fuel consumption in households as well as the service sector and 50 % in manufacturing are dependent on "degree days". For each sector, the individual fuels have specific values for heating purposes.
Combined heat and power production (CHP)	Simultaneous production of electricity and heat.
Commercial and public services	Includes wholesale, retail, private services and public services. Public services are limited to administration and services available to society on non-market terms.
Condensing production of electricity	Condensing production of electricity at large-scale power plants is defined as a method of production, where the surplus heat from electricity generation is eliminated. In Denmark, this typically takes place when the heat is released into the sea.
Consumption in distribution	Consumption of electricity in connection with electricity, district heating and gas works gas supply.
Consumption in production/own use	Difference between gross and net production of an energy product. Consumption in production comprises the extraction of natural gas (on platforms), the refining of oil products and the conversion of electricity.
Degree of self-sufficiency	In Danish energy statistics, degree of self-sufficiency is calculated as production of primary energy in relation to climate-adjusted energy consumption. In international statistics, production is in relation to observed energy consumption.
Direct energy content	Amount of energy contained in a product. This is calculated on the basis of calorific value per unit of weight or volume for the different energy products and as the energy delivered in the form of electricity, district heating and gas works gas.
Distribution loss	Difference between supply and final consumption of an energy product. For electricity production, it is calculated as the difference between the supply and sale of electricity. In the case of district heating, distribution loss is estimated to comprise 20% of the district heating supplied to the grid. For gas works gas, the loss is estimated to be 4%. In the case of natural gas, the loss is calculated from year to year.

TERMINOLOGY AND DEFINITIONS

Electricity capacity	The maximum instantaneous electricity production from a power plant, combined heat and power plant, wind turbine etc. Electricity capacity is measured in MW (megawatt) or kW (kilowatt). Electricity capacity does not indicate a plant's actual production; rather, the maximum a plant can produce at a given moment.
Electricity intensity	Electricity consumption in relation to gross domestic product (GDP) or gross value added (GVA) at 2010 prices, chained values.
Electricity plant coal	Hard coal used in Danish power plants.
Energy consumption, observed	Registered energy consumption for a given calendar year.
Energy intensity	Energy consumption in relation to gross domestic product (GDP) or gross value added (GVA) at 2010 prices, chained values.
Extraction and refining	Production of natural gas and crude oil and the processing of crude oil and refinery feedstocks.
Final energy consumption	Sum of the consumption by the final users, i.e. private and public enterprises and households. The energy is used in the production of goods and services, heating, lighting, other usage of appliances and transport. There is also consumption for non-energy purposes, e.g. lubrication, cleaning, and bitumen for roads. Energy consumption in connection with extraction of energy, refining and transformation is not included in final energy consumption. Identification and division of final energy consumption is in accordance with the guidelines from the IEA and Eurostat. Energy consumption for road, rail, sea, air and pipeline transport, irrespective of consumer, is classified in a special main category. Hence, energy used in industry and households is calculated excluding consumption for transportation purposes.
Fuel equivalent	Energy content of a quantity of fuel used for producing a given amount of electricity, district heating or gas works gas. In the case of oil, coal, natural gas and renewable energy etc., there is no difference between the amount of energy measured in direct energy content and in fuel equivalent.
Gas/diesel oil	Gas and diesel oils have the same boiling point interval in the refining process. They can be used for the same purposes to a great extent. No distinction is therefore made between the two products in the Danish energy statistics. There are usually more stringent environmental and safety specifications for automotive diesel oil than for heating gas oil. The requirements for marine diesel are less stringent.
Gas works gas	Gas produced in urban gas stations. Gas works gas was formerly produced from coal and oil, but production since 1990 has almost exclusively been by transforming natural gas.
Geothermal energy	Heat energy from the core of the earth. The energy is used to heat water which then is used to either produce district heating or power. In Denmark, geothermal energy is used only for production of district heating.
Gross domestic product (GDP)	The total market value of all final goods and services produced within the borders of a nation during a specified period.
Gross energy consumption	Observed energy consumption adjusted for fuel consumption related to foreign trade in electricity. See "Adjustments for trade in electricity" above.
Gross energy consumption, adjusted	Observed gross energy consumption adjusted for climatic variations in relation to a normal weather year.
Gross value added (GVA)	Equal to GDP at base prices and calculated for the individual enterprise as production at base prices minus production-related consumption at purchasing prices.
Heat pumps	The volume of energy produced by heat pumps is calculated as the difference between the amount of energy supplied and the electricity consumed by heat pumps. An energy-producing appliance regarded as a form of renewable energy.
Imports and exports	Imports and exports refer to goods that have crossed national borders. Greenland and the Faroe Islands are regarded as abroad.
International marine bunkers	Includes deliveries of energy products (oil) in Denmark to sea-going ships of all flags, including warships and foreign fishing vessels. Deliveries to domestic shipping and Danish fishing vessels are not included. International marine bunkers are not included in national energy consumption.
Joule	Unit of measurement of energy. In Danish energy statistics, the following units are used: 1 PJ (Peta Joule) = 10^3 TJ (Tera) = 10^6 GJ (Giga).
JP1 (Kerosene type jet fuel)	Jet Petroleum 1. Designates a petroleum quality different from other types of petroleum in terms of stringent requirements for low water content and unsaturated compounds. Used in aviation.
Large-scale power plants	Plants at 16 specific power stations. East of the Great Belt are Amager, Asnæs, Avedøre, H.C. Ørsted, Kyndby, Svanemølle, Stigsnæs and Rønne power stations. West of the Great Belt are Ensted, Esbjerg, Fyn, Herning, Randers, Skærbæk, Studstrup and Nordjylland power stations. Earlier Aalborg, Århus and Måsnedø have also been defined as large scale power plants.
LPG	Liquefied Petroleum Gas (liquid gas, bottled gas). The term for propane, butane and combinations of the two. Used in industry and heating, food preparation and as a propellant. Previously, LPG was also used as a raw material for producing gas works gas.

LVN	Light Virgin Naphtha (light petrol). Used as a component for petrol production and as a raw material for the petrochemical industry. Previously, LVN was also used to produce gas works gas.
Manufacturing	The Danish Energy Agency defines manufacturing differently than Statistics Denmark. In the Danish Energy Agency's statistics, manufacturing industries do not include refineries which have been separated into a separate consumption category, whereas the sector extraction of gravel and stone has been included under manufacturing industries.
Non-energy use	Energy products included in Total energy consumption, which are not used for energy purposes. This category includes products such as white spirit, lubricants and bitumen.
Orimulsion	Type of heavy oil emulsified in water. It comes from the area around the Orinoco River in Venezuela.
Petroleum coke	A solid oil by-product appearing when refining fuel oil in a so-called coker. Approximately 10 % of the material is deposited in the coker as petroleum coke. Primarily used in industry.
Primary production	Production of crude oil, coal, natural gas, renewable energy etc.
PSO	PSO include costs for public service obligations in connection with electricity supply. Such costs are paid by all electricity consumers. PSO includes support to the production of environment-friendly electricity, grid connection of small-scale combined heat and power plants and wind turbines, security of supply, environmental studies about offshore wind turbines, and research and development related to environment-friendly electricity generation as well as compensation for CO ₂ taxes.
Recycling	Understood as energy products included in the energy balance for a second time. Currently includes lubricants that have previously been included in final energy consumption for non-energy purposes and which are subsequently included as waste oil.
Refinery feedstocks	Processed oil destined for further processing, products in a stage between raw materials and finished products.
Refinery gas	The lightest fractions obtained in the distillation of crude oil. Refinery gas is non-condensable at normal atmospheric pressure. Primarily used as refinery fuel.
Renewable energy	Renewable energy is defined as solar energy, wind power, hydropower, geothermal power, biomass (straw, wood chips, firewood, wood pellets, waste wood, liquid biofuels, and renewable wastes unless otherwise stated), biogas and heat pumps.
Renewable energy etc.	Renewable energy etc. is defined as "renewable energy" including non-renewable wastes.
Revision of energy statistics	The energy statistics are based on information from multiple sources and a range of assumptions. Insofar as new data about energy supply or consumption become available for a given year, the energy statistics will be revised accordingly. Every year, energy consumption in manufacturing is revised as the statement is partly based on an estimate, which can be replaced by factual data from Statistics Denmark the following year. Also new information concerning production and consumption of renewable energy, including biomass may be provided. Finally, revision of the statistics may be based on a change in delimitations and calculation assumptions.
Small-scale combined heat power (CHP) plants	Plants not included in the list of large-scale power plants, where the production of power and heat is the main activity.
Statistical difference	The difference between calculations of energy consumption based on different sources, which theoretically ought to produce identical results.
Structure effect	Changes in energy consumption owing to shifts in the structure of industry.
Surplus heat	Residual heat from industrial production. Autoproducers sell a great deal of surplus heat from processing to district heating network. District heating resulting from surplus heat is not added to fuels in the energy statistics. Transformation gains are therefore to be made in the case of district heating from autoproducers.
Thermal electricity generation	Thermal electricity generation is defined as electricity generated by the combustion of fuels. Thus, it is electricity not generated using wind power, hydropower, wave power or photovoltaics.
Total energy supply	Denmark's total energy supply is domestic production of energy adjusted for imports and exports (including cross-border trade) in oil products, international marine bunkers, and stock changes. The difference between <i>total energy supply</i> and <i>energy consumption, observed</i> is the <i>statistical difference</i> .
Transformation	Production of electricity, district heating and gas works gas.
Transformation loss	Difference between total input and output in the transformation process.
Transport	All transport activity with the exception of transport within the company's premises. In the Danish statistics energy consumption for road transport is adjusted for border trade, as opposed to international statistics. International statistics is based solely on data from sales.
Volume weight	The relationship between the weight of a specific volume of liquid and the weight of an equal volume of water at 4 degrees Celsius, measured in tonne/m ³ .
Waste oil	Oil used as fuel in industry and transformation, previously included in the energy statistics as lubricants.

KEY FIGURES AND ASSUMPTIONS BEHIND THE ENERGY STATISTICS

Danish key figures for energy and emissions

Change

Denmark	1980	1990	2000	2005	2010	2015	2016	2017	'90-'17
Energy intensity, gross energy consumption [TJ per million GDP]	0.776	0.636	0.500	0.474	0.450	0.396	0.394	0.386	-39.2%
Energy intensity, final energy consumption [TJ per million GDP]	0.582	0.469	0.388	0.372	0.350	0.323	0.322	0.319	-32.0%
Gross energy consumption per capita [GJ]	159	160	157	157	147	134	135	134	-15.8%
Final energy consumption per capita [GJ]	119	118	122	123	114	109	110	111	-5.8%
Degree of self-sufficiency [%]	5	52	139	154	120	89	83	85	64.5%
Oil consumption - share of gross energy consumption [%]	67	43	45	41	38	37	36	37	-14.6%
Renewable energy - share of gross energy consumption [%]	2.7	5.8	9.6	14.5	20.0	28.8	29.2	32.6	460%
Refinery capacity [million tonnes per year]	9.0	9.0	9.2	9.0	9.0	9.0	9.0	9.0	•
Electricity capacity [MW]	6 618	9 124	12 598	13 088	13 450	13 995	14 229	14 368	57.5%
Wind turbine capacity - share of total electricity capacity [%]	-	3.6	19.0	23.9	28.3	36.3	36.9	38.4	976%
Net electricity import - share of domestic supply [%]	-5.1	22.5	1.9	3.8	-3.2	17.5	14.8	13.3	•
CHP production - share of total thermal electricity production [%]	18	37	56	64	61	79	69	75	104%
CHP production - share of total district heating production [%]	39	59	82	82	77	66	66	68	15.7%
Renewable electricity - share of total domestic electricity supply [%]	0.1	2.6	15.9	27.4	34.8	56.0	53.9	63.7	2352%
CO ₂ emission per capita [tonnes]	12.2	11.9	10.4	9.7	8.5	7.0	7.0	6.5	-44.9%
CO ₂ emissions per GDP [tonnes per million GDP]	60	47	33	29	26	21	21	19	-60.2%
CO ₂ emissions per fuel unit [kilogram per GJ]	77	75	66	62	58	52	52	49	-34.6%
CO ₂ emissions per kWh electricity sold [gram per kWh]	1 026	928	632	537	505	348	369	291	-68.7%
CO ₂ emissions per consumed unit of district heating [kilogram per GJ]	96	62	43	39	33	32	30	26	-57.6%

Note: 1: Data on energy consumption and emissions have been adjusted for the fuel consumption linked to foreign trade in electricity and climate variations relative to a normal weather year.

Note: 2: The gross domestic product (GDP) is in 2010 prices, chained values.

The Danish Energy Agency's climate variation adjustment method

The purpose of adjusting for climate variations is to show figures for energy consumption which are independent of climate fluctuations in individual years. Climate adjustment takes place by adjusting - for each of the areas of consumption included in the statistics - the share of the energy consumption that consists of space heating and depends on the climate.

The adjustment takes place by comparing annual degree-day figures to the degree-day figure in a normal weather year. A high number of degree days relative to a normal year indicates a relatively cold year and the annual observed energy consumption is therefore adjusted downward to indicate what the energy consumption would have been had it been a normal weather year. In contrast a low number of degree days lead to an upward adjustment of the observed energy consumption.

Ideally, the degree-days for the various years should distribute fairly evenly around the normal year. Previously, a fixed normal year was used. However, due to an increasingly milder climate, for a considerable number of years with only few exceptions, the degree-day figure was lower than "normal". In order to arrive at an adjustment that takes into account an ever warmer climate, the Danish Energy Agency has decided to use a normal year derived by taking a moving average of the degree-day figures for the last 20 years.

The degree-day figure is calculated by the Danish Meteorological Institute.

The calorific value and CO₂ content in 2017 Tax rates in 2017

	Calorific values	CO ₂ emissions factors
	GJ/ton	Kg/GJ
Crude oil/ North Sea	43.00	
Refinery feedstocks	42.70	
Refinery gas	52.00	57.34
LPG	46.00	63.10
LVN	44.50	65.00
Motor gasoline	43.80	73.00
Aviation gasoline	43.80	73.00
JP4	43.80	72.00
Other kerosene	43.50	71.90
JP1	43.50	72.00
Gas/diesel oil	42.70	74.00
Fuel oil	40.65	78.84
Orimulsion	27.65	80.00
Petroleum coke	31.40	93.00
Waste oil	41.90	73.30
White spirit	43.50	-
Bitumen	39.80	-
Lubricants	41.90	-
Natural gas, GJ/1000 Nm ³	39.66	57.00
Gas works gas/1000 m ³	20.80	-
Coal in electricity plants	24.33	94.95
Other hard coal	24.33	94.95
Coke	29.30	107.00
Brown coal briquettes	18.30	97.50
Straw	14.50	-
Wood chips	9.30	-
Firewood, hard wood GJ/m ³	10.40	-
Firewood, soft wood GJ/m ³	7.60	-
Wood pellets	17.50	-
Wood waste	14.70	-
Wood waste, GJ/m ³ loose volume	3.20	-
Biogas, GJ/1000 m ³	23.00	-
Bio methane (GJ/1000 m ³)	39.63	-
Waste	10.60	42.50
Biodiesel	37.50	-
Bioethanol	26.70	-
Bio oil	37.20	-

Climate adjustments

	Degree days	
Year	Specific year	Normal year
2010	3742	3171
2011	2970	3156
2012	3234	3166
2013	3207	3155
2014	2664	3131
2015	2921	3112
2016	2998	3070
2017	2970	3057

	Energy taxes	CO ₂ taxes
Transport		
Motor gasoline (DKK 0.01 per l)	502.8	41.0
Light diesel oil (DKK 0.01 per l)	303.9	45.7
Low-sulphur diesel oil (DKK 0.01 per l)	419.5	39.3
Other uses		
LPG (DKK 0.01 per l)	183.9	27.8
Other kerosene (DKK 0.01 per l)	198.2	45.7
Heating diesel oil (DKK 0.01 per l)	198.2	45.7
Fuel oil (DKK 0.01 per kg)	224.6	54.7
Petroleum coke (DKK 0.01 per l)	198.2	45.7
Natural gas (DKK 0.01 per Nm ³)	218.8	38.9
Electricity plant coal (DKK per tonne)	1547	458.4
Coke (DKK per tonne)	1824	523.2
Brown coal (DKK per tonne)	1051	311.1
Electricity (DKK 0.01 per kWh)	91.0	
Electricity for space heating ¹⁾ (DKK 0.01 per kWh)	40.5	

¹⁾ For consumption of more than 4000 kWh per year in households.

Source: Ministry of Taxation

Volume weights in 2017

	tonne/m ³
Motor gasoline	0.75
Aviation gasoline	0.71
JP4	0.76
Other kerosene	0.80
JP1	0.80
Gas-/diesel-oil	0.84
Bioethanol	0.79
Biodiesel	0.88

Conversion factors

In order to make comparison easier, all the figures for energy consumption are stated in Tera Joules (TJ) or Peta Joules (PJ).

1 kilo Joule	=	1000 J
1 Mega Joule	=	1000 kJ
1 Giga Joule	=	1000 MJ
1 Tera Joule	=	1000 GJ
1 Peta Joule	=	1000 TJ
1 kWh	=	3.6 MJ
1 MWh	=	3.6 GJ
1 GWh	=	3.6 TJ
1 Btu (British thermal unit)	=	1055.66 J
1 Barrel (barrel, bbl)	=	158.987 litres
1 mtoe (mill. tonne oil equivalent)	=	41.868 PJ

Symbols

- Not applicable
- Nil
- 0 Less than half

Do you need more data?

www.ens.dk/facts_figures

Energy Statistics 2017

- Publication as .pdf
- Figures in Powerpoint
- Time series and tables
- Danish energy flows

Data

- Oil and gas production in Denmark
- Monthly energy statistics
- Wind turbine data

Maps

- Key maps showing aspects of the Danish energy sector

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