



Danish Energy
Agency

Data, tables, statistics and maps

Energy Statistics 2018

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-series for energy consumption, emissions and assumptions for the period 1972-2018.

Descriptions of methods and revisions are also available here.

Note

Briquettes

Wood briquettes have been included in firewood, households for the years 2013-2018.

LNG

LNG (liquefied natural gas) has been included in domestic sea transport under the fuel gas/diesel in 2015 to 2018.

Firewood

Households' consumption of firewood for the year 2018 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 2018

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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.

Statistics Denmark

DCE – Danish Centre for Environment and Energy

Danish Energy Agency, relevant employees in the scenarios team

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

Observed energy consumption increased in 2018

The observed energy consumption increased to 749 PJ in 2018; an increase of 0.4%. However, the trends in consumption of the individual types of fuel are significantly less pronounced than in previous years. Consumption of coal rose in 2018, but it is still at a low level compared with previous years. Consumption of renewable energy went up, although by somewhat less than in previous years.

Adjusted gross energy consumption rose 1.1%

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 781 PJ in 2018, which is 1.1% above the 2017 level.

Compared with 1990, adjusted gross energy consumption has decreased by 4.6%. Coal and coke account for the largest drop at 70%, while renewable energy, which began from a low start point, accounted for the largest increase. Natural gas increased by 47%.

Share of RE in electricity supply

In 2018, electricity from renewables accounted for 60.5% of Danish domestic electricity supply, compared to 64.1% in 2017. The drop is primarily due to a drop in production of electricity from wind turbines. At the same time, the use of biomass fell, particularly wood fuels. The fall in wind power is primarily attributable to poorer wind conditions than in 2017. Wind power accounted for 40.2%. Biomass accounted for 15.3% and solar energy, hydro and biogas accounted for the remaining 5.0%.

Energy production and degree of self-sufficiency decreased

The Danish production of crude oil, natural gas and renewable energies etc. combined has seen a decrease of 11.0% in 2018 to 587 PJ. Production of crude oil decreased by 15.9% while production of natural gas decreased by 14.9%. Renewable energy etc. increased by 0.4%. The degree of self-sufficiency in energy for Denmark decreased in 2018 to 75%, whereas it was 85% the year before. This means that energy production in 2018 was 25% lower than energy consumption.

The degree of self-sufficiency in oil consumption compared to crude oil production has decreased from 101% in 2017 to 85% in 2018. This is the first time since 1992 that Denmark has not been self-sufficient in oil products.

Increase in consumption of renewable energy

Consumption of renewable energy increased from 245 PJ in 2017 to 246 PJ in 2018, which corresponds to an increase of 0.4%. The development is primarily attributable to a significant drop in the consumption of wind power of 6.0%, and this is offset by an increase in the consumption of woodchips, biogas, heat pumps and solar energy. Calculated according to the EU's method of calculation, renewable energy accounted for about 36.7% of energy consumption in 2018 as opposed to 35.8% in 2017.

Increase in CO₂ emissions

Observed CO₂ emissions from energy consumption were 34.5 million tonnes in 2018 and thus unchanged compared with 2017. Adjusted for fuel consumption linked to foreign trade in electricity and climatic variations, CO₂ emissions increased by 1.0%. Since 1990, Danish adjusted CO₂ emissions have gone down by 38.0%.

Greenhouse gas emissions for 2018

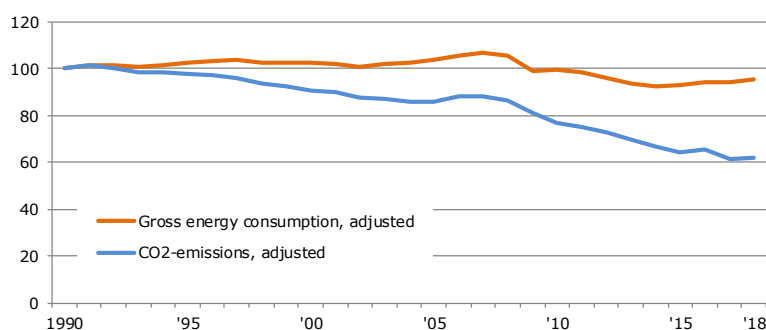
A preliminary statement of total observed emissions of greenhouse gases in Denmark shows a drop of 32.0% from 1990 to 2018. For 2005-2017, observed emissions from greenhouse gases have fallen by 27.7%. The EU ETS accounts for a decrease of 43.0% while consumers outside the EU ETS accounts for a decrease of 17.5%.

Energy consumption by area of consumption

The final adjusted gross energy consumption increased by 1.2%. Gross energy consumption for transport was 2.1% higher in 2018 than the year before, of which energy consumption for road transport increased by 2.4%.

The total climate-adjusted energy consumption of the agriculture and industry sector was 0.2% higher in 2018 than the year before. Energy consumption by manufacturing industries increased by 0.6%.

In commercial and public services and households, climate adjusted energy consumption was respectively 0.2% higher and 1.4% higher in 2018 than in 2017.



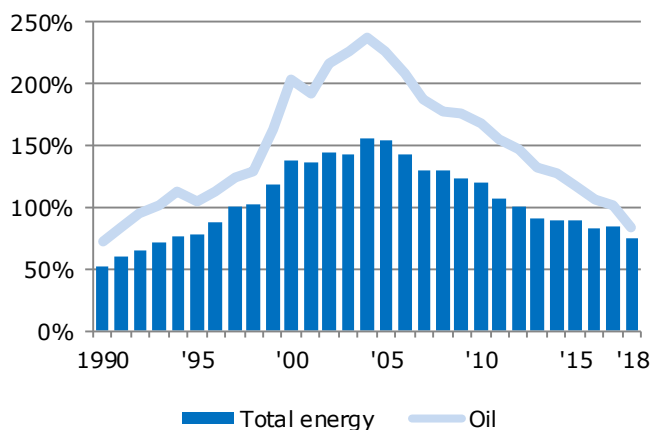
Energy balance 2018

	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	749 301	299 759	-13 231	112 785	67 582	17 297	246 187	18 808	114	-
Primary energy production	586 574	243 629	-	155 071	-	15 103	172 771	-	-	-
Recycling	3	-	3	-	-	-	-	-	-	-
Imports	675 227	205 303	253 806	14 523	67 360	2 194	75 646	56 281	114	-
Exports	-496 705	-149 683	-249 344	-57 669	-421	-	-2 116	-37 473	-	-
Border trade	-9 925	-	-9 925	-	-	-	-	-	-	-
International marine bunkers	-24 876	-	-24 876	-	-	-	-	-	-	-
Stock changes	16 301	-1 622	19 156	7	-1 298	-	58	-	-	-
Statistical differences, input from blending	2 702	2 132	-2 051	853	1 940	-	-173	-	0	-
Energy sector	-38 371	-299 759	286 402	-20 987	-	-	-	-3 415	- 612	-
Extraction and gasification	-20 987	-	-	-20 987	-	-	-	-	-	-
Petroleum products	300 870	-	300 870	-	-	-	-	-	-	-
Used in refineries	-315 932	-299 759	-14 468	-	-	-	-	-1 093	- 612	-
Used in distribution	-2 322	-	-	-	-	-	-	-2 322	-	-
Transformation	-38 418	-	-3 786	-31 318	-61 990	-16 311	-164 221	104 496	134 078	632
Large-scale units	-28 728	-	- 831	-3 995	-61 841	-	-47 814	38 823	46 930	-
Wind turbines and hydropower plants	-	-	-	-	-	-	-50 089	50 089	-	-
Small-scale units	-2 906	-	- 17	-11 107	- 39	-2 421	-17 421	9 277	18 820	-
District heating units	- 497	-	- 790	-12 675	- 110	- 236	-24 569	-1 059	38 943	-
Autoproducers	-1 566	-	-2 148	-2 998	-	-13 653	-24 167	11 161	30 240	-
Gas works	- 70	-	-	- 542	-	-	-160	-	-	632
Own use	-4 650	-	-	-	-	-	-	-3 795	- 855	-
Distribution losses etc.	-34 959	-	-	- 110	-	-	-	-7 985	-26 838	- 25
Final energy consumption	-637 544	-	-269 385	-60 370	-5 592	- 987	-81 958	-111 904	-106 742	- 607
Non-energy use	-10 268	-	-10 268	-	-	-	-	-	-	-
Transport	-222 741	-	-212 005	- 306	-	-	-8 980	-1 451	-	-
Agriculture and industry	-128 915	-	-34 606	-29 112	-5 592	- 672	-16 362	-37 396	-4 969	- 206
Commercial and public services	-83 368	-	-2 575	-7 383	-	- 315	-3 016	-37 874	-32 174	- 32
Households	-192 252	-	-9 931	-23 570	-	-	-53 601	-35 183	-69 599	- 369

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 2018 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 2018, the degree of self-sufficiency in energy was 75% as opposed to 85% the year before.

Denmark has been more than self-sufficient in oil since 1993, resulting in annual net exports. In 2018, the degree of self-sufficiency in oil was 85% as opposed to 101% 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]	1990	2000	2005	2010	2015	2016	2017	2018	Change '90-'18
Total production	424 361	1 164 525	1 311 683	978 612	679 026	641 602	658 912	586 574	38.2%
Crude oil	255 959	764 526	796 224	522 733	330 662	297 748	289 690	243 629	-4.8%
Natural gas	115 967	310 307	392 868	307 425	173 510	169 735	182 142	155 071	33.7%
Renewable energy	45 461	76 016	105 585	131 306	159 189	158 697	171 056	172 771	280%
Waste, non-renewable	6 975	13 676	17 006	17 148	15 665	15 422	16 024	15 103	117%

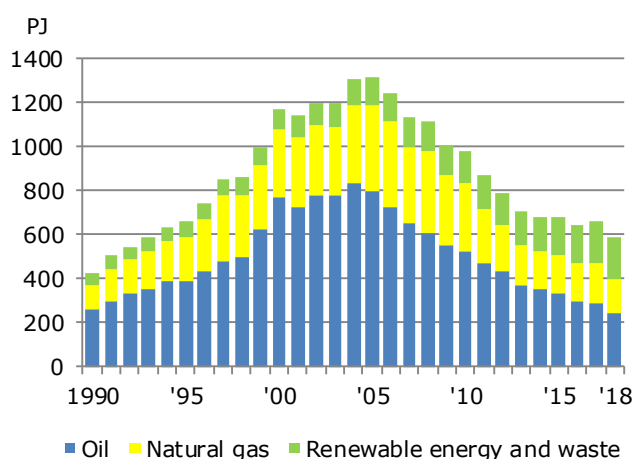
Production and consumption of renewable energy

Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	Change '90-'18
Production of renewable energy	45 461	76 016	105 585	131 306	159 189	158 697	171 056	172 771	280%
Solar	100	335	419	657	3 713	4 658	5 068	6 195	6107%
Wind	2 197	15 268	23 810	28 114	50 879	46 014	53 208	50 036	2177%
Hydro	101	109	81	74	65	69	64	54	-46.9%
Geothermal	48	58	172	212	140	225	152	110	129%
Biomass	39 996	54 039	73 542	92 268	90 106	89 821	92 427	92 728	132%
- Straw	12 481	12 220	18 485	23 323	19 788	19 698	20 212	17 606	41.1%
- Wood chips	1 724	2 744	6 082	11 352	14 744	17 101	19 448	22 375	1198%
- Firewood	8 757	12 432	17 667	23 779	21 943	22 492	22 492	22 210	154%
- Wood pellets	1 575	2 984	3 262	2 407	2 697	2 861	2 836	2 728	73.2%
- Wood waste	6 191	6 895	6 500	8 500	11 151	8 546	7 668	9 115	47.2%
- Waste, renewable	8 524	16 715	20 786	20 959	19 147	18 849	19 585	18 459	117%
- Biodiesel *)	•
- Biooil	744	49	761	1 949	636	274	188	234	-68.5%
Biogas	752	2 912	3 830	4 337	6 285	9 048	11 053	13 414	1684%
Heat pumps	2 267	3 296	3 731	5 643	8 001	8 861	9 083	10 235	351%
Imports of renewable energy	-	2 466	18 918	39 483	52 586	60 572	76 525	75 646	•
Firewood	-	-	1 963	2 939	2 547	2 611	2 611	2 578	•
Wood chips	-	305	1 521	4 865	2 808	3 257	5 485	6 311	•
Wood pellets	-	2 161	12 802	27 675	34 243	41 838	55 032	52 939	•
Waste, renewable	-	-	-	-	2 684	2 878	2 224	2 682	•
Bioethanol	-	-	-	1 118	1 818	1 593	1 934	1 812	•
Biodiesel	-	-	2 632	2 886	8 485	8 395	9 239	9 325	•
Exports of renewable energy	-	-	2 632	2 846	1 084	1 203	1 765	2 116	•
Biodiesel	-	-	2 632	2 846	1 084	1 203	1 765	2 116	•
Stock changes, stat. diffs. etc.	-	23	6	1	- 266	267	- 406	29	•
Consumption of renewable energy	45 461	78 505	121 877	167 944	210 424	218 333	245 410	246 331	442%

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

PRODUCTION OF PRIMARY ENERGY

Primary energy production



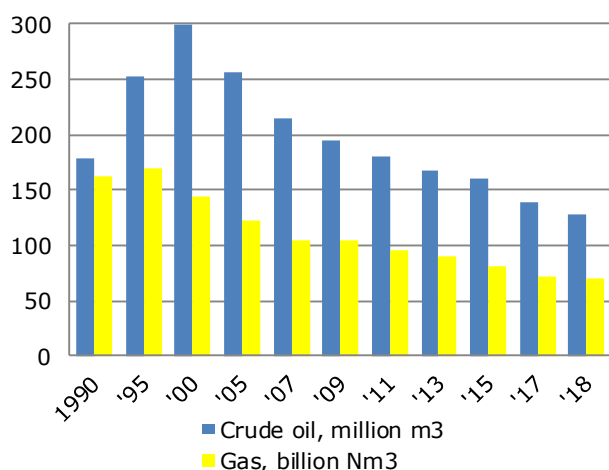
Primary energy refers to crude oil, natural gas, renewable energy (including renewable waste) and non-renewable waste.

In 2018, primary energy production was 587 PJ, as opposed to 659 PJ in 2017. This is a decrease by 11.0% 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 and natural gas fell by 15.9% and 14.9% respectively in 2018, while production of renewable energy etc. increased by 0.4%.

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.

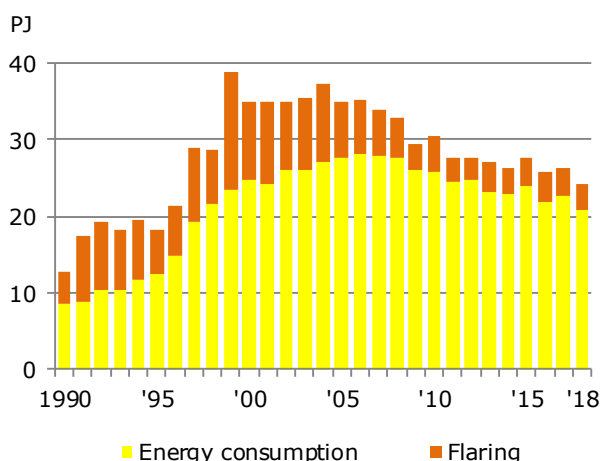
At the end of 2009, the Danish Energy Agency changed the classification system for oil and gas reserves, introducing the category contingent resources. For the period 2009-2018, the statement includes the sum of reserves and contingent resources so that comparison with earlier statements is possible.

At the end of 2018, the sum of reserves and contingent resources totaled 128 million m³ oil and 70 billion Nm³ gas.

Danish oil and gas reserves have in the period 2011-2017 been calculated every two years.

Source: Ressourceopgørelse og prognoser (Published August 27th 2019, by the Danish Energy Agency)

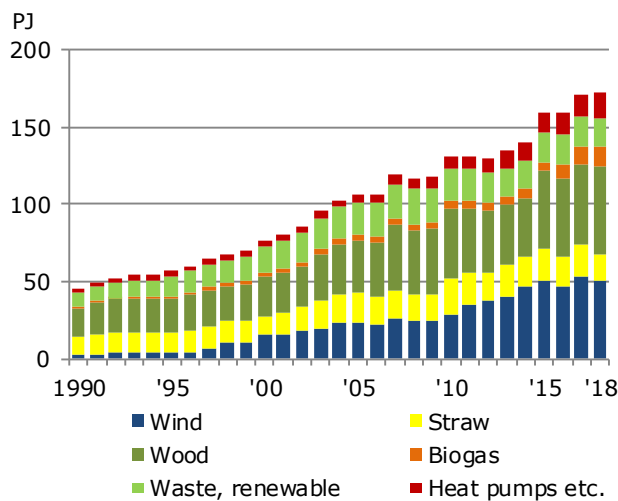
Natural gas consumption and flaring on platforms in the North Sea



Extraction of crude oil and natural gas requires natural gas consumption for production as well as for transport and off-loading ashore. In 2018 consumption was 20.9 PJ, corresponding to 18.5% of total Danish natural gas consumption. In 2017 consumption on platforms was 22.7 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 emission inventories, and is covered by the EU Emission Trading System (EU ETS). In 2018, flaring of natural gas was calculated at 3.4 PJ compared with 3.6 PJ in 2017.

Production of renewable energy by energy product



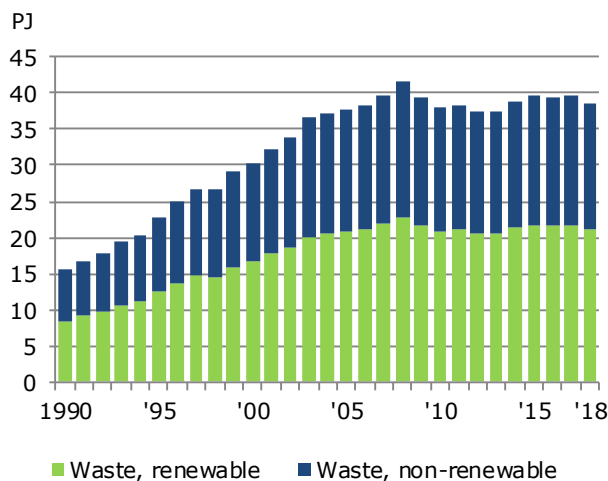
Renewable energy includes wind power, wood, straw, biogas, renewable waste and others (hydropower, geothermal energy, solar energy and heat pumps).

Production of renewable energy was 173 PJ in 2018, which is an increase of 1.0% compared to 2017. Production of renewable energy grew by 280% during the period 1990 to 2018.

In 2018 wind power production was 50.0 PJ, which is a decrease of 6.0% compared with 2017.

Production from straw, wood products and renewable waste in 2018 was 17.6 PJ, 56.4 PJ and 18.5 PJ, respectively. Compared with 2017, the total production from the three fuels increased by 0.3%.

Consumption of waste

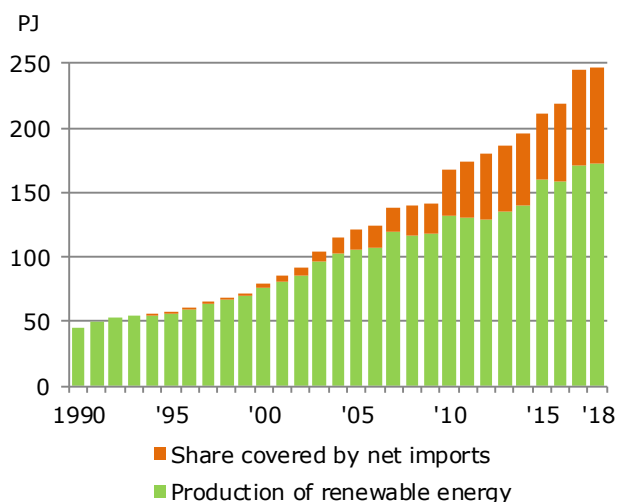


Consumption of waste for the production of electricity and district heating has increased significantly over time. Total consumption of waste decreased by 3.1% in 2018 compared with 2017. Compared with 1990, waste consumption for energy purposes increased by 148% in 2018.

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



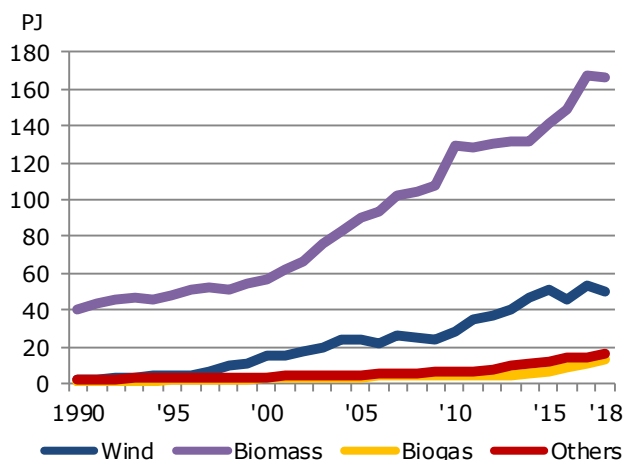
Production of renewable energy has increased dramatically since 1990. In addition, net imports have increased. Net imports of renewable energy (including stock changes etc.) were 73.6 PJ in 2018.

In 2018 consumption of renewable energy was 246.3 PJ, which is 0.4% 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

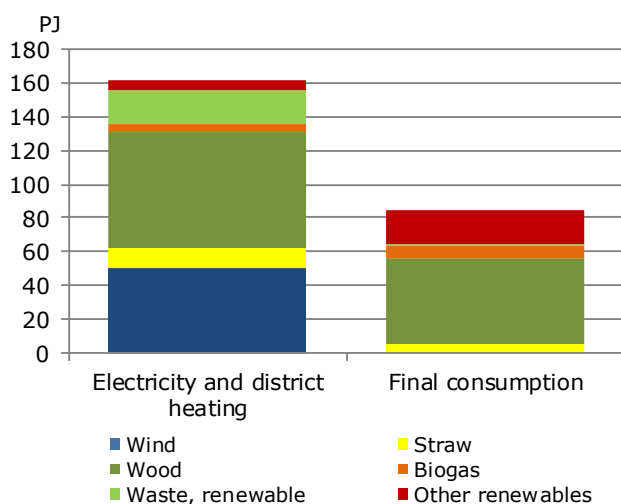


Consumption of renewable energy increased from 245.4 PJ in 2017 to 246.3 PJ in 2018.

Consumption of biomass, including liquid biofuels decreased from 167.2 PJ in 2017 to 166.3 PJ in 2018, and wind power decreased from 53.2 PJ to 50.0 PJ.

The increasing consumption of biomass since 2000 entails higher consumption of wood chips, wood pellets and firewood. In the period 2000 to 2018 the increase was 841%, 982%, and 99.4%, respectively.

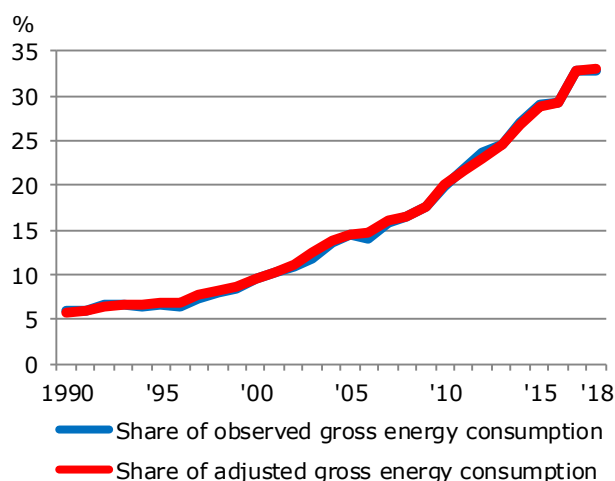
Use of renewable energy in 2018



Total consumption of renewable energy in 2018 (production plus net imports) was 246.3 PJ, of which 161.7 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 50.0 PJ, 36.6 PJ and 19.9 PJ, respectively. Consumption of wood otherwise, straw and biogas accounted for 30.9 PJ, 12.7 PJ and 5.5 PJ, respectively.

In 2018, final energy consumption consisted of 84.6 PJ renewable energy. This was used for process consumption and 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.

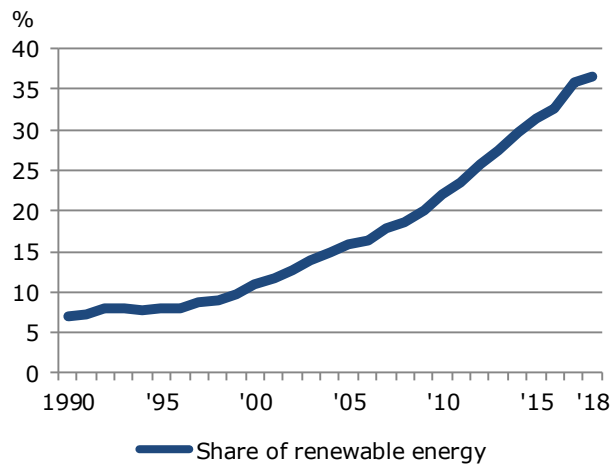
Renewable energy - share of total energy consumption



Observed energy consumption shows the registered amount of energy consumed in a calendar year. In 2018 renewable energy covered 32.9% of total observed energy consumption, which is the same as 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 2018 renewable energy's share of adjusted gross energy consumption was 33.0%, as opposed to 32.8% the previous year. In 1990 this figure was 5.8%.

Share of renewable energy according to the EU method of calculation



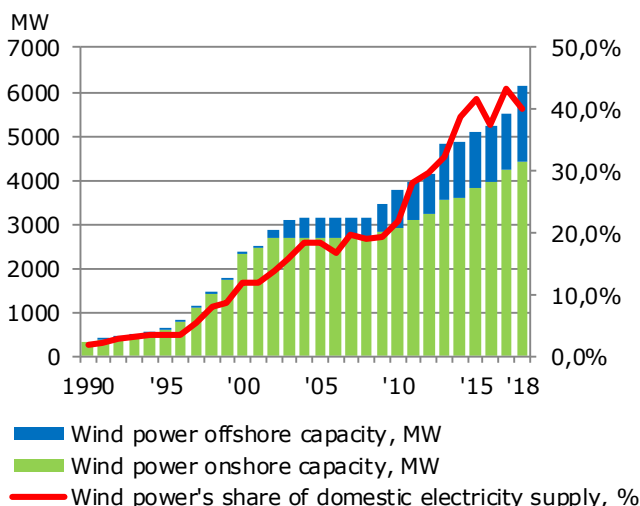
The EU Directive on renewable energy prescribes a different method for calculating the share of renewable energy than those used above.

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 36.7% in 2018 as opposed to 35.8% the year before, i.e. 3.8 percentage points higher than if the share of renewable energy is calculated as the share of the total gross energy consumption (p. 8).

Sources: 2004-2017 Eurostat. 1990-2003 and 2018 Danish Energy Agency calculations.

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

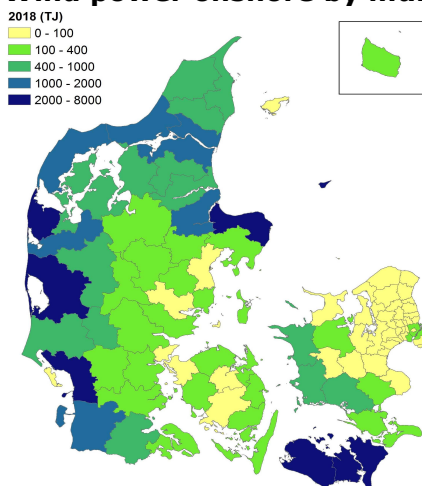


In 2018, wind power production accounted for 40.2% of domestic electricity supply, compared with 43.2% in 2017 and 1.9% in 1990.

Wind power capacity was 6121 MW in 2018, as opposed to 5490 MW the year before. In 2018 onshore and offshore wind turbine capacities were 4420 MW and 1701 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 50.0 PJ in 2018. Of this, onshore installations accounted for 66.7% and offshore installations accounted for 33.3%.

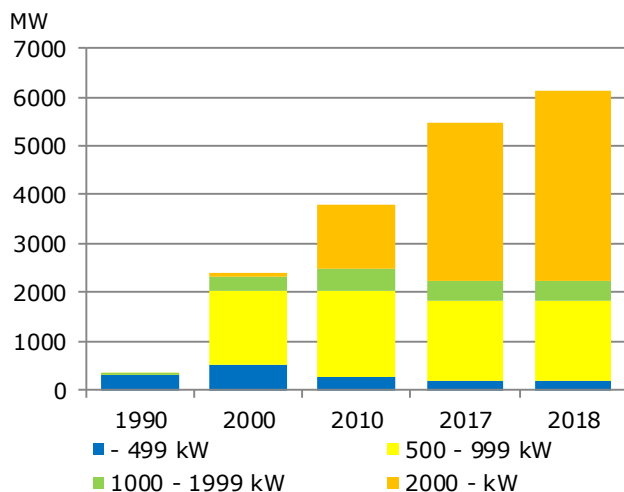
Wind power generation from onshore installations varies across Denmark. Municipalities with west-facing coastlines have many wind turbines, and the favourable wind conditions in these areas contribute to high production from these installations.

In 2018 the turbines in the ten municipalities with the highest wind power production thus together accounted for a production of 17.3 PJ, or 51.9% of total wind power production from onshore installations.

Wind power - number of turbines and capacity by size

	1990	2000			2017			2018		
	Onshore	Onshore	Offshore	Total	Onshore	Offshore	Total	Onshore	Offshore	Total
Total no. of turbines	2 665	6 194	41	6 235	5 638	504	6 142	5 702	558	6 260
- 499 kW	2 655	3 652	11	3 663	2 219	-	2 219	2 233	-	2 233
500 - 999 kW	8	2 283	10	2 293	2 397	10	2 407	2 396	10	2 406
1 000 - 1 999 kW	2	251	-	251	340	-	340	333	-	333
2 000 - kW	-	8	20	28	682	494	1 176	740	548	1 288
Total wind power capacity [MW]	326	2 340	50	2 390	4 226	1 264	5 490	4 420	1 701	6 121
- 499 kW	317	533	5	538	178	-	178	177	-	177
500 - 999 kW	6	1 512	5	1 517	1 634	5	1 639	1 634	5	1 639
1 000 - 1 999 kW	3	279	-	279	422	-	422	413	-	413
2 000 - kW	-	16	40	56	1 992	1 259	3 251	2 196	1 696	3 892

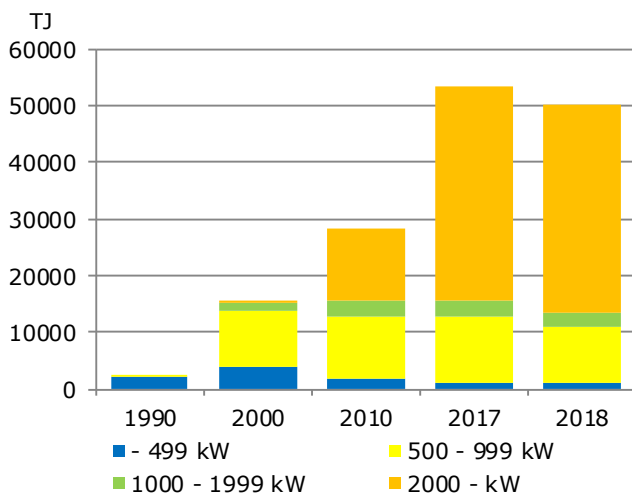
Wind power capacity by size of turbine



The total number of wind turbines increased by roughly 118 from 2017 to 2018, and the total wind power capacity grew by 631 MW.

For some years now, the trend has been toward fewer but larger turbines. The number of small wind turbines with capacities up to 499 kW has been reduced by 1430 turbines since 2000. The number of large wind turbines with capacities above 2 MW has increased by 1260 turbines.

Wind power production by size of turbine



The development toward larger turbines is even more evident in terms of wind power production. However, 2018 was characterised by unfavourable winds, and wind power generation fell by 6.0%.

Where turbines larger than 2 MW accounted for 63.6% of wind power capacity, in 2018 these turbines produced 73.0% of the total energy from wind turbines.

Similarly, in 2018 wind turbines with a capacity below 500 kW accounted for only 2.0% of the total production.

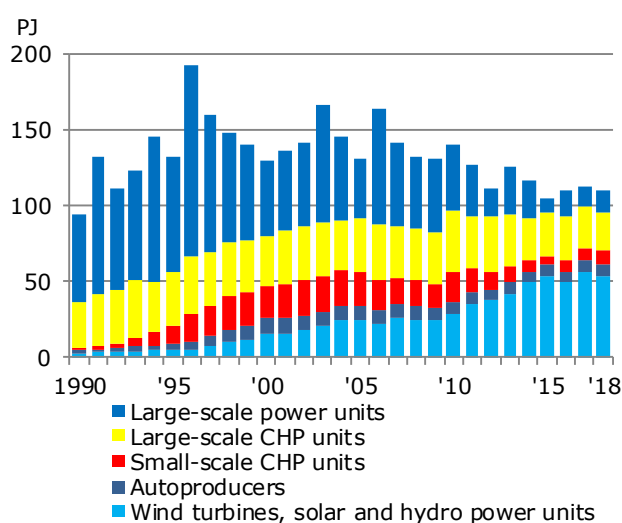
Electricity production by type of producer

Change

Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	'90 - '18
Total electricity production(gross)	93 518	129 776	130 469	139 906	104 164	109 928	111 746	109 350	16.9%
Large-scale power units	7 494	8 871	49	336	46	44	82	46	-99.4%
Large-scale CHP units	80 639	73 809	74 932	83 940	37 375	46 063	39 859	38 777	-51.9%
- of which electricity production	50 157	41 584	38 402	43 221	8 936	16 978	11 835	13 943	-72.2%
Small-scale CHP units	988	21 547	21 254	19 216	5 765	7 748	8 313	9 277	839%
Autoproducers	2 099	10 168	10 336	8 203	7 858	7 312	7 514	7 730	268%
- Electricity production ¹⁾	-	9	7	6	3	3	3	3	•
- CHP ¹⁾	2 099	10 158	10 328	8 197	7 855	7 309	7 511	7 727	268%
Wind turbines ¹⁾	2 197	15 268	23 810	28 114	50 879	46 014	53 208	50 036	2177%
Hydropower units ¹⁾	101	109	81	74	65	69	64	54	-46.9%
Photovoltaics ¹⁾	-	4	8	22	2 175	2 678	2 705	3 431	•
Own use in production	-6 118	-5 776	-6 599	-7 159	-3 670	-5 246	-4 990	-3 795	-38.0%
Large-scale power units	- 590	- 312	- 2	- 17	- 0	- 3	- 5	- 7	-98.8%
Large-scale CHP units	- 5 509	- 4 993	- 6 033	- 6 602	- 3 303	- 4 831	- 4 543	- 3 351	-39.2%
Small-scale CHP units	- 19	- 472	- 564	- 541	- 368	- 412	- 442	- 437	2199%
Total electricity production (net)	87 400	123 999	123 870	132 747	100 493	104 682	106 756	105 555	20.8%
Net imports of electricity	25 373	2 394	4 932	- 4 086	21 282	18 206	16 426	18 808	-25.9%
Domestic electricity supply	112 773	126 393	128 802	128 661	121 775	122 888	123 182	124 363	10.3%
Transformation consumption	-	- 1	-	- 110	- 1 073	- 735	- 1 026	- 1 059	•
Distribution losses etc. ²⁾	- 8 886	- 7 650	- 5 573	- 9 482	- 6 404	- 6 795	- 6 098	- 7 985	-10.1%
Domestic electricity consumption	103 887	118 742	123 228	119 068	114 298	115 358	116 057	115 319	11.0%
Consumption in the energy sector	- 1 748	- 1 893	- 2 761	- 3 445	- 3 386	- 3 418	- 3 415	- 3 415	95.4%
Final electricity consumption	102 139	116 849	120 467	115 623	110 912	111 939	112 642	111 904	9.6%

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 2018 electricity production was 109.4 PJ, which is a decrease of 2.1% compared with 2017. The reason is mainly due to higher net import of electricity in 2018 as opposed to 2017.

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 109.4 PJ, 38.8 PJ (35.5%) were generated from large-scale power units – 14.0 PJ (12.8%) 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 9.3 PJ (8.5%) and 7.7 PJ (7.1%), respectively. Wind turbines generated 50.0 PJ (45.8%) and photovoltaics generated 3.4 PJ (3.1%).

ELECTRICITY AND DISTRICT HEATING

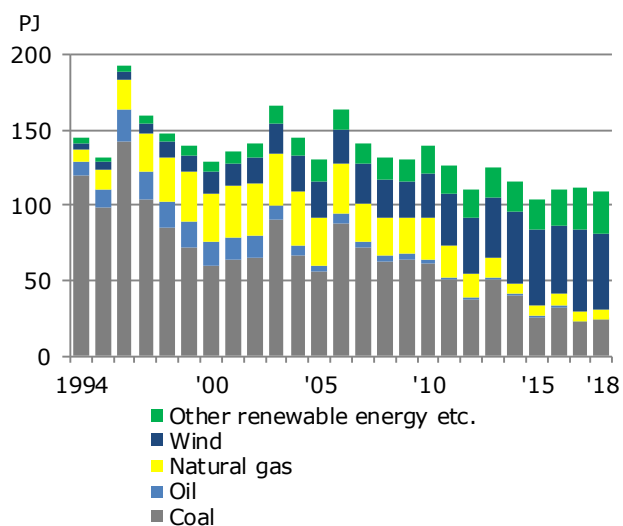
Electricity production by fuel

Direct energy content [TJ]	1994	2000	2005	2010	2015	2016	2017	2018	Change '94 - '18
Total electricity production (gross)	144 707	129 776	130 469	139 906	104 164	109 928	111 746	109 350	-24.4%
Oil	9 547	15 964	4 933	2 783	1 122	1 157	1 004	949	-90.1%
- of which orimulsion	-	13 467	-	-	-	-	-	-	•
Natural gas	8 206	31 589	31 606	28 464	6 499	7 872	6 884	6 926	-15.6%
Coal	119 844	60 022	55 666	61 222	25 596	31 915	22 351	23 654	-80.3%
Surplus heat	-	139	-	-	-	-	-	-	•
Waste, non-renewable	836	2 002	2 938	2 689	2 706	2 536	2 603	2 533	203%
Renewable energy	6 275	20 060	35 326	44 749	68 241	66 448	78 905	75 288	1100%
Solar	-	4	8	22	2 175	2 678	2 705	3 431	•
Wind	4 093	15 268	23 810	28 114	50 879	46 014	53 208	50 036	1122%
Hydro	117	109	81	74	65	69	64	54	-54.4%
Biomass	1 743	3 928	10 410	15 253	13 396	15 649	20 454	19 005	990%
- Straw	293	654	3 088	3 968	2 080	2 288	2 140	1 708	484%
- Wood	429	828	3 730	7 998	7 987	10 252	15 129	14 196	3205%
- Biooil	-	0	1	1	22	10	4	5	•
- Waste, renewable	1 021	2 447	3 591	3 286	3 307	3 099	3 181	3 096	203%
Biogas	321	751	1 017	1 285	1 726	2 038	2 473	2 762	761%

Electricity from renewable energy: Share of domestic electricity supply

[%]	1994	2000	2005	2010	2015	2016	2017	2018	Change '94 - '18
Renewable energy	5.3	15.9	27.4	34.8	56.0	54.1	64.1	60.5	1048
Solar	0.0	0.0	0.0	0.0	1.8	2.2	2.2	2.8	•
Wind	3.4	12.1	18.5	21.9	41.8	37.4	43.2	40.2	1069
Hydro	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-56
Biomass	1.5	3.1	8.1	11.9	11.0	12.7	16.6	15.3	943
- Straw	0.2	0.5	2.4	3.1	1.7	1.9	1.7	1.4	458
- Wood	0.4	0.7	2.9	6.2	6.6	8.3	12.3	11.4	3062
- Biooil	-	0	0	0	0	0	0	0	•
- Waste, renewable	0.9	1.9	2.8	2.6	2.7	2.5	2.6	2.5	190
Biogas	0.3	0.6	0.8	1.0	1.4	1.7	2.0	2.2	724

Electricity production by fuel



In 2018, 23.7 PJ (21.6%) of total electricity production was generated by coal. Natural gas accounted for 6.9 PJ (6.3%) of electricity production. Oil and non-renewable waste accounted for 0.9 PJ (0.9%) and 2.5 PJ (2.3%) of the electricity production, respectively.

Electricity production based on renewables was 75.3 PJ in 2018. This is 4.6% less than production in 2017. The decrease is due to a decrease in wind power and biomass production.

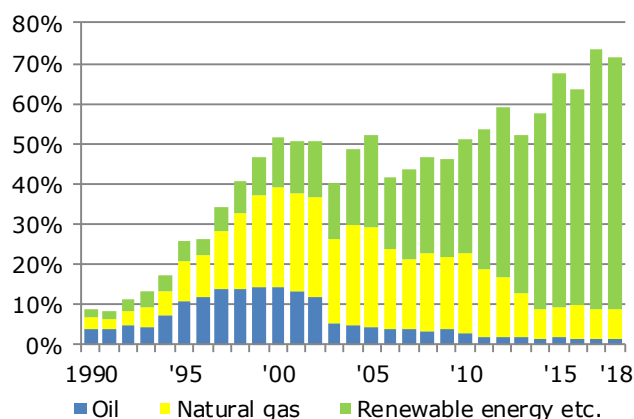
Electricity production based on biomass contributed 19.0 PJ, which is 7.1% less than in 2017. Wind turbines contributed with 50.0 PJ, which is 6.0% less than in 2017.

Fuel consumption for electricity production

Change

Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	'90 - '18
Total fuel consumption	227 001	276 974	265 330	286 006	180 654	195 722	190 671	187 681	-17.3%
Oil	9 215	40 356	11 867	8 087	3 110	3 026	2 677	2 644	-71.3%
- of which orimulsion	-	33 503	-	-	-	-	-	-	•
Natural gas	6 181	68 868	65 912	57 229	14 303	16 295	14 510	13 944	126%
Coal	207 173	134 205	127 119	139 714	58 410	70 876	50 976	53 652	-74.1%
Waste, non-renewable	262	5 294	7 650	9 085	9 412	9 298	8 511	7 951	2936%
Renewable energy	4 170	28 252	52 784	71 891	95 419	96 226	113 996	109 489	2526%
Solar	-	4	8	22	2 175	2 678	2 705	3 431	•
Wind	2 197	15 268	23 810	28 114	50 879	46 014	53 208	50 036	2177%
Hydro	101	109	81	74	65	69	64	54	-46.9%
Biomass	1 428	11 009	26 470	40 808	38 665	43 248	53 004	50 397	3429%
- Straw	363	2 021	7 715	10 213	5 807	5 854	5 981	4 502	1140%
- Wood	745	2 518	9 405	19 492	21 248	26 004	36 608	36 164	4754%
- Biooil	-	0	0	-	107	25	13	13	•
- Waste, renewable	320	6 470	9 350	11 104	11 503	11 365	10 403	9 718	2936%
Biogas	444	1 861	2 415	2 872	3 634	4 217	5 015	5 572	1155%

Other fuels than coal for electricity production

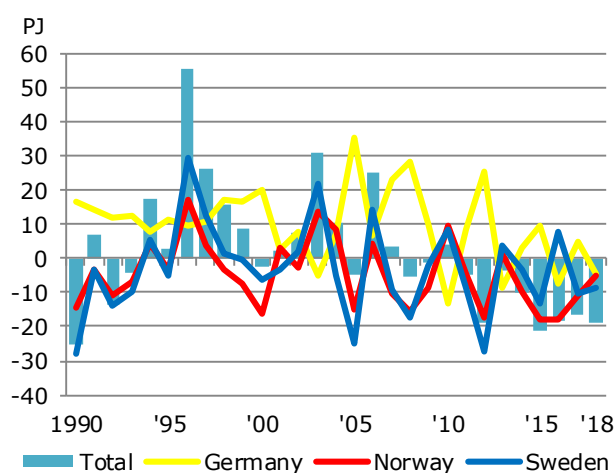


In the early 1990s, coal was the dominant fuel used in the production of electricity. In 1990, other types of fuel than coal only accounted for just 8.7% of total fuel consumption.

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 increased even more, and in 2018, oil, natural gas and renewable energy etc. together accounted for 71.4% of fuel consumption for electricity production.

The share of other fuels than coal has decreased compared to 2017. This is mainly due to a decrease in production of electricity from wind power and biomass and a small increase in the usage of coal in 2018 compared to 2017.

Net exports of electricity by country



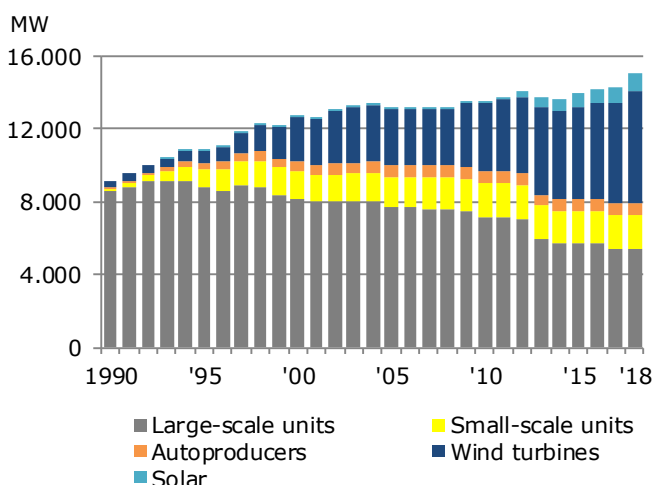
Danish foreign trade in electricity varies considerably from year to year. Foreign trade is strongly affected by price trends on the Nordic electricity exchange, Nordpool, which, in turn, is significantly influenced by varying precipitation patterns in Norway and Sweden, where electricity production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

In 2018, Denmark had overall net imports of electricity of 18.8 PJ. This was the result of net imports from Sweden, Norway and Germany of 8.7 PJ, 5.3 PJ and 4.8 PJ, respectively.

Electricity capacity, end of year

									Change
[MW]	1994	2000	2005	2010	2015	2016	2017	2018	'94 - '18
Total	10 768	12 598	13 088	13 450	13 995	14 228	14 321	15 073	40.0%
Large-scale units	9 126	8 160	7 710	7 175	5 690	5 666	5 402	5 402	-40.8%
- Electricity	2 186	1 429	834	840	839	815	815	815	-62.7%
- CHP	6 940	6 731	6 877	6 335	4 850	4 850	4 586	4 586	-33.9%
Small-scale units	773	1 462	1 579	1 819	1 836	1 838	1 884	1 904	146%
Autoproducers	339	574	657	638	604	619	630	639	88.4%
Solar	0	1	3	7	782	851	906	998	•
Wind	521	2 390	3 128	3 802	5 077	5 246	5 490	6 121	1 074%
Hydro	8	10	11	9	7	9	9	9	11.2%

Electricity capacity

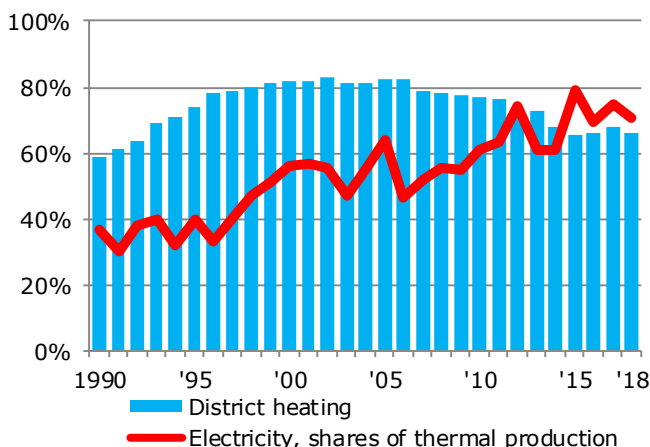


Up until the early 1990s electricity production capacity was dominated by the large-scale power units. Up through the 1990s, electricity capacity in small-scale units and secondary installations (autoproducers) increased. By the turn of the millennium, this capacity corresponded to a quarter of the capacity 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 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 2018 accounted for 6121 MW which is an increase of 631 MW or 11.5% compared with 2017.

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 2018, 70.6% of thermal electricity production (i.e. total production excl. wind, solar and hydropower) was produced simultaneously with heating. This is a decrease of 4.4 percentage points compared to 2017. It is primarily because electricity production without simultaneous production of heat (condensing power) at thermal plants has increased because of decreasing wind power generation.

In 2018, 66.2% of district heating was produced with electricity. This is a decrease of 1.8 percent point in comparison to 2017.

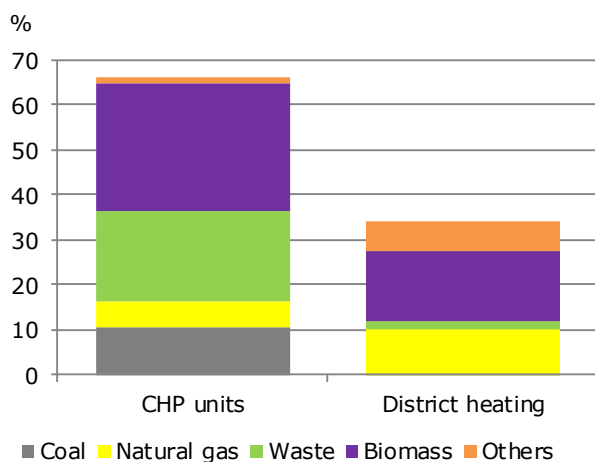
Heat production by type of production plant, 2018

	Number of units	Electricity capacity [MW]	Heat capacity [MJ/s]	Share of total heat supply [%]
Total	2 832	7 136	25 104	100
Large-scale CHP units	22	4 586	5 648	34.9
Small-scale CHP units	637	1 914	2 442	13.6
District heating units	1 785		14 313	29.0
Autoproducers				
- CHP units	263	635	1 746	17.6
- Heating units	125		955	5.0

Heat production by primary fuel, 2018

	CHP by plant				Heat producers by plant		
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	921	7 136	9 836	66.0	1 910	15 268	34.0
Coal	7	2 521	2 383	10.5	1	10	0.1
Natural gas	489	1 849	2 382	5.8	574	5 066	10.0
Oil	76	139	237	0.2	279	3 096	0.5
Waste	31	386	1 150	20.2	12	115	2.0
Biogas	164	120	160	1.1	24	49	0.1
Biomass	30	1 697	2 831	28.2	351	1 751	15.3
Biooil	-	-	-	-	45	619	0.2
Surplus heat	-	-	-	-	57	362	3.2
Solar heating	-	-	-	-	121	919	1.6
Heat pumps and electric boilers	-	-	-	-	73	671	1.1
No production in 2018	124	423	694	-	373	2 611	0.0

Heat supply by primary fuel, 2018



District heating supply takes place partly at CHP units and partly at units exclusively producing district heating. In 2018 CHP units produced 66.0%, of which: large-scale CHP units contributed 34.9%, small-scale CHP units contributed 13.6%, and CHP units at autoproducers contributed 17.6%.

Some CHP and district heating units use several types of fuel. A break down by types of primary fuel used by units in 2018 reveals that CHP units using coal as the primary fuel accounted for 10.5% of heat supply, while units using natural gas, waste or biomass as primary fuel accounted for 5.8%, 20.2% and 28.2%, respectively, of total district heating supply.

For units that produce district heating alone, units primarily firing with biomass contributed 15.3% and natural gas units contributed 10.0% of total district heating supply.

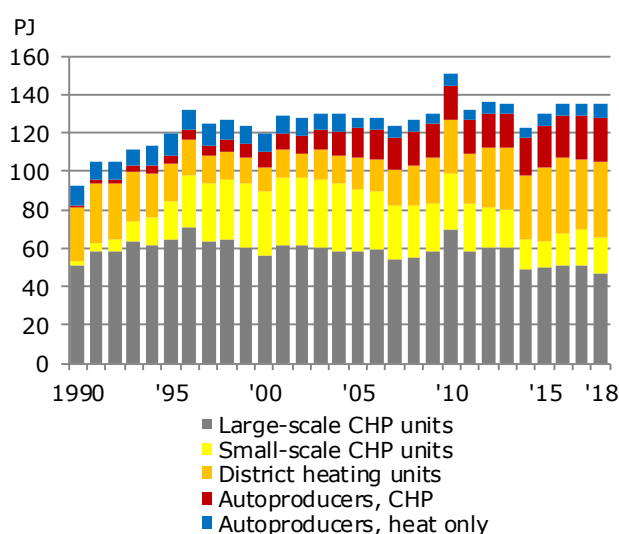
ELECTRICITY AND DISTRICT HEATING

District heating production by type of production plant

									Change
Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	'90 - '18
Total production (gross)	92 411	119 702	128 382	150 393	130 036	134 941	135 649	134 933	46.0%
Large-scale CHP units	51 511	56 271	58 248	69 955	50 098	51 509	51 202	46 930	-8.9%
Small-scale CHP units	2 145	33 027	32 727	28 462	13 777	16 337	18 328	18 820	777%
District heating by type of producer	27 755	12 516	16 621	28 816	38 218	39 119	36 936	38 943	40.3%
Autoproducers									
- CHP units ¹⁾	694	8 375	14 884	17 625	21 589	21 464	22 751	23 610	3302%
- Heating units ¹⁾	10 306	9 513	5 901	5 537	6 354	6 512	6 431	6 630	-35.7%
Consumption in production	-	-1 539	-1 303	-1 207	- 623	- 723	- 676	- 855	•
Large-scale CHP units	-	- 866	- 384	- 331	-	-	-	-	•
Small-scale CHP units	-	- 637	- 656	- 643	- 321	- 390	- 440	- 598	•
District heating units	-	- 36	- 262	- 233	- 302	- 333	- 236	- 257	•
Total production (net)	92 411	118 163	127 079	149 187	129 413	134 218	134 973	134 078	45.1%
Net imports	122	144	153	174	151	128	124	114	-7.0%
Domestic supply	92 533	118 307	127 232	149 360	129 564	134 346	135 096	134 192	45.0%
Consumption in refineries	- 428	- 275	- 355	- 584	- 480	- 614	- 612	- 612	43.0%
Distribution losses	-18 507	-23 661	-25 446	-29 872	-25 913	-26 869	-27 019	-26 838	45.0%
Final consumption	73 599	94 370	101 430	118 904	103 171	106 863	107 465	106 742	45.0%

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 2017 to 2018 the production once again increased slightly.

In 2018 total district heating production was 134.9 PJ, which is a small decrease of 0.5% compared with 2017. Compared with 2000, district heating production increased by 12.7%; compared with 1990 it increased by 46.0%.

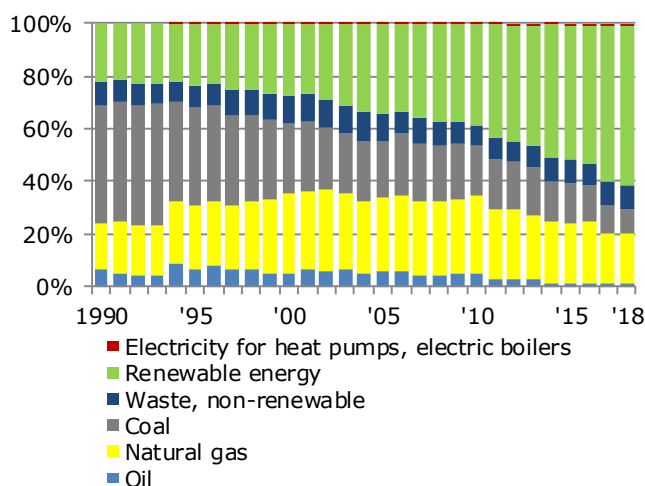
District heating production by fuel

Direct energy content [TJ]	1994	2000	2005	2010	2015	2016	2017	2018	Change '94 - '18
Total production (gross)	113 103	119 702	128 382	150 393	130 036	134 941	135 649	134 933	19.3%
Oil	6 335	4 433	6 103	4 627	1 281	1 378	1 227	1 290	-79.6%
- of which orimulsion	-	1 291	-	-	-	-	-	-	•
Natural gas	25 370	41 620	39 377	44 844	23 656	25 379	20 641	20 446	-19.4%
Coal	55 748	38 873	34 189	36 337	26 050	24 917	19 239	16 509	-70.4%
Surplus heat	2 838	3 676	3 174	2 518	3 130	3 458	3 759	4 055	42.9%
Electricity excl. heat pumps	-	-	-	110	1 036	697	961	949	•
Electricity, heat pumps	23	9	2	0	29	30	46	109	367%
Waste, non-renewable	6 084	8 651	10 713	10 627	12 245	12 202	12 541	12 697	109%
Renewable energy	16 704	22 440	34 823	51 331	62 608	66 880	77 236	78 878	372%
Solar	6	24	53	139	956	1 391	1 740	2 134	37033%
Geothermal	21	29	86	106	70	112	76	55	160%
Biomass	16 304	21 462	33 509	49 912	59 329	62 647	72 113	72 811	347%
- Straw	4 318	5 696	7 681	11 507	11 359	11 080	12 136	10 189	136%
- Wood	4 327	5 153	12 086	23 731	32 495	36 415	44 494	46 908	984%
- Biooil	223	39	650	1 685	508	239	155	195	-12.4%
- Waste, renewable	7 436	10 574	13 093	12 989	14 966	14 913	15 327	15 519	109%
Biogas	348	903	1 169	1 173	2 172	2 627	3 172	3 570	926%
Heat pumps	25	22	6	0	82	102	134	309	1156%

Fuel consumption for district heating production

Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	Change '90 - '18
Total fuel consumption	69 833	73 249	78 764	95 889	87 357	90 331	90 322	90 659	29.8%
Oil	4 766	3 726	4 322	4 554	1 039	1 153	1 052	1 142	-76.0%
- of which orimulsion	-	646	-	-	-	-	-	-	•
Natural gas	12 131	22 203	22 044	28 454	20 136	20 997	16 917	16 831	38.7%
Coal	30 898	19 459	17 121	18 245	13 117	12 500	9 687	8 338	-73.0%
Electricity	-	75	76	149	1 121	789	1 084	1 113	•
Waste, non-renewable	6 289	7 675	8 138	7 122	7 649	7 608	8 379	8 359	32.9%
Renewable energy	15 749	20 112	27 063	37 364	44 295	47 285	53 203	54 875	248%
Solar	6	24	53	143	956	1 392	1 766	2 161	35912%
Geothermal	48	58	172	212	140	225	152	110	129%
Biomass	15 611	19 425	26 125	36 288	41 738	43 926	49 144	49 962	220%
- Straw	3 640	5 013	5 934	8 269	9 066	8 886	9 274	8 191	125%
- Wood	3 541	4 983	9 484	17 365	22 793	25 493	29 454	31 334	785%
- Biooil	744	49	761	1 949	529	249	176	221	-70.3%
- Waste, renewable	7 686	9 380	9 946	8 705	9 349	9 298	10 241	10 217	32.9%
Biogas	84	582	707	721	1 379	1 644	2 013	2 338	2684%
Heat pumps	-	22	6	0	82	98	129	304	•

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 2018 a total of 134.9 PJ district heating was produced. The lower table shows input and the amount of fuel used to produce district heating. For example, in 2018 a total of 90.7 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 8.3 PJ coal in 2018 (lower table) results in district heating production of 16.5 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 9.2%. On the other hand, the percentage of renewables increased from around 20% to covering 60.5% of district heating production in 2018.

ENERGY SUPPLY AND CONSUMPTION 2018

Energy supply and consumption 2018

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	586 574	243 629	-	-	-	-	-	-	-	-	-	-	-	-
- Recycling	3	-	-	-	-	-	-	-	-	-	-	3	-	-
- Imports	675 227	202 719	2 584	-	947	88	18 738	-	40 968	103 812	73 011	-	5 899	10 343
- Exports	-496 705	-120 770	-28 913	-	-4 020	-	-51 885	-	-2 473	-75 284	-115 553	-	- 16	- 114
- Border trade	-9 925	-	-	-	-	-	1 643	-	-	-12 195	-	-	628	-
- International marine bunkers	-24 876	-	-	-	-	-	-	-	-	-15 810	-8 966	-	-	- 101
- Supply from blending	206	-	1 285	-	-	-	- 103	184	-	- 48	-1 152	-	-	2
- Stock changes	16 301	-1 090	- 532	-	- 2	- 38	1 369	-	1 499	8 253	6 911	-	1 033	131
Statistical differences	2 496	1 213	- 367	- 0	181	- 1	- 163	0	- 184	-1 241	466	-	- 0	7
Extraction and gasification	-20 987	-	-	-	-	-	-	-	-	-	-	-	-	-
Refineries														
- Input and net production	1 111	-325 700	25 942	15 662	5 555	-	88 089	-	4 915	138 729	47 919	-	-	-
- Own use in production	-16 173	-	-	-14 096	-	-	-	-	-	-	- 372	-	-	-
Used in distribution	-2 322	-	-	-	-	-	-	-	-	-	-	-	-	-
Large-scale power units														
- Fuel used and production	- 127	-	-	-	-	-	-	-	-	- 125	- 47	-	-	-
- Own use in production	- 7	-	-	-	-	-	-	-	-	-	-	-	-	-
Large-scale CHP units														
- Fuel used and production	-28 601	-	-	-	- 0	-	-	-	-	- 83	- 575	-	-	-
- Own use in production	-3 351	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable energy, selected														
- Wind	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Small-scale CHP units	-													
- Fuels used and production	-2 906	-	-	-	-	-	-	-	-	- 16	- 1	-	-	-
- Own use in production	-1 034	-	-	-	-	-	-	-	-	-	-	-	-	-
District heating units	-													
- Fuels used and production	- 497	-	-	-	-	-	-	-	-	- 626	- 163	- 1	-	-
- Own use in production	- 257	-	-	-	-	-	-	-	-	-	-	-	-	-
Autoproducers														
- Electricity units	- 8	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHP units	-5 424	-	-	-1 566	- 1	-	-	-	-	- 129	- 446	- 1	-	-
- Heat units	3 812	-	-	-	-	-	-	-	-	- 2	- 2	- 0	-	-
Gas works	- 70	-	-	-	-	-	-	-	-	-	-	-	-	-
Biogas upgrading plants														
Distribution losses etc.	-34 913	-	-	-	-	-	-	-	-	-	-	-	-	-
Final consumption														
- Non-energy use	-10 268	-	-	-	-	-	-	-	-	-	-	-	-	-10 268
- Road	-166 120	-	-	-	-	-	-56 756	-	-	-100 079	-	-	-	-
- Rail	-4 479	-	-	-	-	-	- 0	-	-	-3 028	-	-	-	-
- Domestic sea transport	-6 391	-	-	-	-	-	-	-	-	-6 386	- 5	-	-	-
- International aviation	-42 944	-	-	-	-	-	-	-	-42 944	-	-	-	-	-
- Domestic aviation	-1 202	-	-	-	-	- 49	-	-	-1 153	-	-	-	-	-
- Military transport	-1 606	-	-	-	-	-	- 2	-	- 630	- 974	-	-	-	-
- Agriculture, forestry and horticulture	-25 736	-	-	-	- 192	-	- 65	- 1	-	-12 587	- 38	-	-	-
- Fishing	-4 650	-	-	-	- 11	-	- 0	-	-	-4 640	-	-	-	-
- Manufacturing	-91 178	-	-	-	-1 044	-	- 31	- 16	-	-2 544	- 975	-	-6 886	-
- Construction	-7 350	-	-	-	- 122	-	- 28	- 0	-	-5 426	-	-	-	-
- Wholesale	-11 046	-	-	-	- 43	-	-	- 6	-	- 261	-	-	- 2	-
- Retail trade	-9 886	-	-	-	- 35	-	-	- 3	-	- 112	-	-	- 1	-
- Private service	-37 663	-	-	-	- 162	-	-	- 17	-	- 594	- 12	- 0	- 5	-
- Public service	-24 773	-	-	-	- 169	-	-	- 26	-	-1 118	-	-	- 8	-
- Single-family houses	-142 219	-	-	-	- 600	-	- 806	- 69	-	-6 270	-	-	- 628	-
- Multi-family houses	-50 033	-	-	-	- 281	-	-	- 46	-	-1 217	-	-	- 14	-

ENERGY SUPPLY AND CONSUMPTION 2018

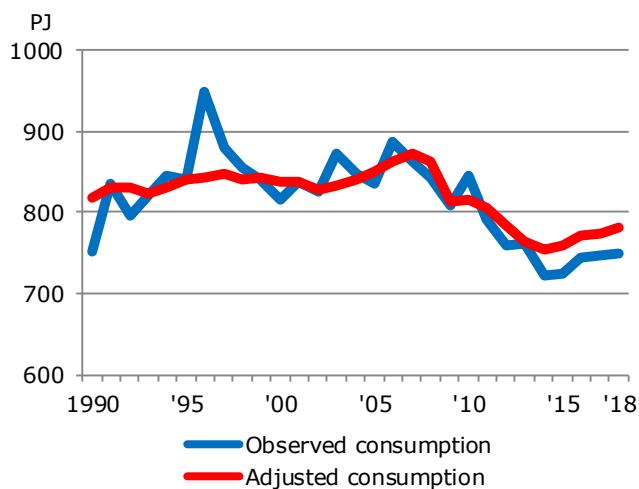
Natural gas	Coal	Coke etc.	Solar energy	Wind power	Hydro power	Geo-thermal	Straw	Wood chips	Fire-wood	Wood pellets	Wood waste	Biogas	Bio-met-hane	Waste	Biooil, biodiesel etc.	Heat pumps	Electricity	District heating	Gas-works gas
155 071	-	-	6 195	50 036	54	110	17 606	22 375	22 210	2 728	9 115	13 414	-	33 562	234	10 235	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 523	66 936	425	-	-	-	-	-	6 311	2 578	52 939	-	-	-	4 876	11 137	-	56 281	114	-
-57 669	- 420	- 0	-	-	-	-	-	-	-	-	-	-	-	-	-2 116	-	-37 473	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	-	-	-	-
7	-1 243	- 54	-	-	-	-	-	-	-	-	-	-	-	-	58	-	-	-	-
853	1 946	- 6	-	-	-	-	-	- 49	-	0	-	-	- 0	-	- 161	0	-	0	- 0
-20 987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1 093	- 612	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-2 322	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 7	-	-
-3 995	-61 841	-	-	-	-	-	-3 386	-8 690	-	-33 819	-1 604	- 8	- 307	-	-	-	38 777	46 930	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-3 351	-	-
-	-	-	-	-50 036	-	-	-	-	-	-	-	-	-	-	-	-	50 036	-	-
-	-	-	-	-	- 54	-	-	-	-	-	-	-	-	-	-	-	54	-	-
-11 107	- 39	-	-	-	-	-	-3 456	-5 685	-	- 451	- 672	-3 344	- 854	-5 381	-	-	9 277	18 820	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 437	- 598	-
-12 675	- 110	-	-2 161	-	-	- 110	-5 809	-11 846	-	-2 342	- 756	- 62	- 975	- 525	- 221	-	-1 059	38 943	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 257	-
-	-	-	-3 431	-	-	-	-	-	-	-	-	- 12	-	-	-	-	3 434	-	-
-2 818	-	-	-	-	-	-	- 21	- 396	-	-	- 923	-2 087	- 217	-28 143	- 13	-	7 727	23 610	-
- 181	-	-	-	-	-	-	- 21	- 150	-	-	- 166	- 31	- 14	-2 197	-	-	- 54	6 630	-
- 542	-	-	-	-	-	-	-	-	-	-	-	- 119	- 42	-	-	-	-	-	632
-	-	-	-	-	-	-	-	-	-	-	-	-7 060	7 060	-	-	-	-	-	-
- 110	-	-	-	-	-	-	-	-	-	-	-	-	- 8	-	-	-	-7 931	-26 838	- 25
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- 306	-	-	-	-	-	-	-	-	-	-	-	-	- 23	-	-8 956	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1 451	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-1 420	- 361	-	-	-	-	-	-1 965	- 27	-	-	- 184	- 105	- 109	-	-	- 837	-6 266	-1 579	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-27 413	-4 868	- 364	-	-	-	-	-	-1 595	-	-1 524	-4 562	- 365	-2 108	-1 492	-	-2 138	-29 657	-3 389	- 206
- 279	-	-	-	-	-	-	-	-	-	-	-	-	- 21	-	-	-	-1 474	-	-
- 997	-	-	-	-	-	-	-	-	-	-	-	-	- 77	-	-	-	-5 448	-4 213	-
- 769	-	-	-	-	-	-	-	-	-	-	-	-	- 59	-	-	-	-5 655	-3 252	-
-3 140	-	-	-	-	-	-	-	- 18	-	-	- 249	- 222	- 241	- 700	-	-	-18 121	-14 169	- 13
-2 477	-	-	- 91	-	-	-	-	- 149	-	-1 334	-	-	- 191	-	-	-	-8 650	-10 539	- 19
-19 815	-	-	- 422	-	-	-	-2 948	- 82	-24 788	-16 197	-	-	-1 524	-	-	-7 260	-26 641	-33 968	- 201
-3 755	-	-	- 91	-	-	-	-	-	-	-	-	-	- 289	-	-	-	-8 542	-35 631	- 168

GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Gross energy consumption

	1990	2000	2005	2010	2015	2016	2017	2018	Change '90-'18
Adjusted total gross energy consumption. Fuel equivalent [PJ]	819	839	850	814	760	770	773	781	-4.6%
By fuel									
Oil	819	839	850	814	760	770	773	781	-4.6%
Natural gas	355	376	352	312	279	280	286	288	-18.8%
Coal and coke	82	192	192	176	133	130	123	121	47.4%
Waste, non-renewable	327	175	166	147	111	117	92	98	-70.2%
Renewable energy	8	14	17	16	18	18	18	18	129%
By energy product	819	839	850	814	760	770	773	781	-4.6%
Oil	48	81	123	163	219	226	253	257	-16.1%
Natural gas	338	329	333	300	274	275	282	284	38.7%
Coal and coke	59	98	100	94	87	84	85	82	-67.5%
Waste, non-renewable	17	12	11	6	5	5	6	6	112%
Renewable energy	0	1	1	1	1	1	1	1	201%
Electricity	28	32	43	54	73	76	79	84	-22.2%
District heating	297	286	279	274	229	237	228	231	20.6%
Gas works gas	77	79	81	86	91	92	92	93	-70.6%
By use	819	839	850	814	760	770	773	781	-4.6%
Energy sector	2	1	1	1	1	1	1	1	32.8%
Non-energy use	28	44	52	46	42	36	40	37	-21.0%
Transport	13	13	12	11	11	10	10	10	30.7%
Agriculture and industry	172	203	218	212	211	215	220	224	-26.0%
Commercial and public services	226	226	213	187	162	166	166	168	-9.5%
Households	132	125	127	130	114	117	118	119	-10.3%
Households	248	228	229	228	220	225	219	223	
Observed total energy consumption [PJ]	752	816	835	846	724	743	747	749	-0.4%
Oil	343	370	348	316	277	279	285	287	-16.6%
Natural gas	76	186	188	185	120	122	116	113	48.2%
Coal and coke	255	166	155	164	76	88	66	68	-73.5%
Waste, non-renewable	7	14	17	17	18	18	18	17	148%
Renewable energy	45	79	122	168	210	218	245	246	442%
Foreign trade in electricity, net imports	25	2	5	- 4	21	18	16	19	-25.9%
Foreign trade in district heating, net imports	0	0	0	0	0	0	0	0	-7.0%

Observed energy consumption and adjusted gross energy consumption

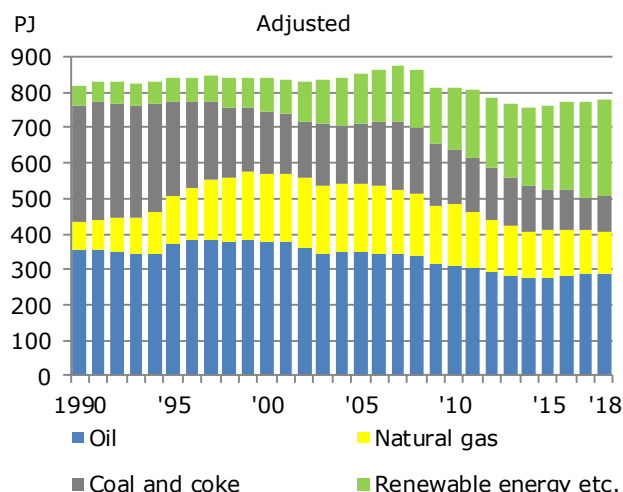


Observed energy consumption shows the registered amount of energy consumed in a calendar year. Gross energy consumption is derived by adjusting observed energy consumption for the fuel consumption linked to foreign trade in electricity. The adjusted gross energy consumption is moreover adjusted for climate 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 781 PJ in 2018, which is 1.1% higher than the 2017 level. Compared with 1990, consumption has fallen by 4.6%.

Observed energy consumption was 749 PJ in 2018, which is 0.4% higher than the 2017 level. Compared with 1990, observed energy consumption was 0.4% lower.

Gross energy consumption by fuel

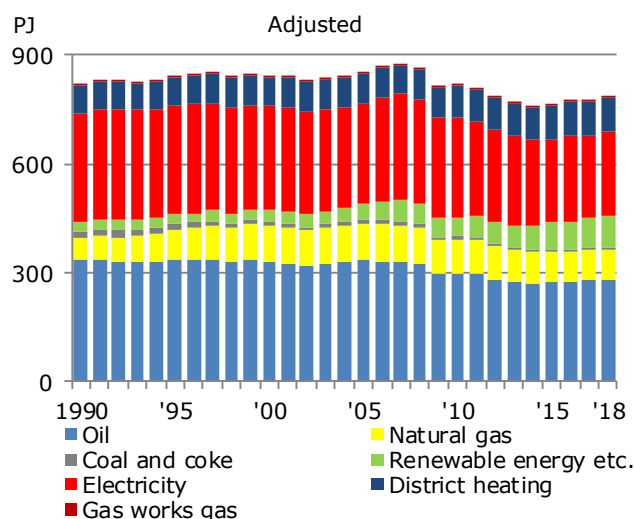


Adjusted gross energy consumption was 4.6% lower in 2018 than in 1990. However, consumption of individual fuels has followed rather varied trends.

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 2018, oil consumption fell by 18.8%. Consumption of coal, which primarily takes place at CHP units, has decreased by 70.2% since 1990. In the period consumption of natural gas and renewable energy etc. (i.e. renewable energy and non-renewable waste) went up by 47.4% and 396%, respectively.

In 2018 consumption of oil and renewable energy etc. increased by 0.7% and 1.4%, respectively, compared with the year before. In 2018, consumption of coal increased by 5.8% and consumption of natural gas decreased by 2.1% compared with 2017.

Gross energy consumption by energy product after transformation

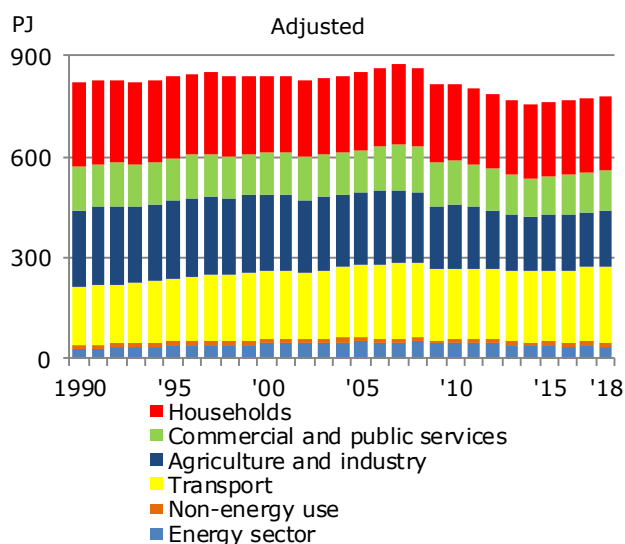


Gross energy consumption by energy product shows gross energy consumption after a number of fuels have been transformed to electricity, district heating, and gas works gas. In other words, the consumption of oil, natural gas, coal and renewable energy etc. is a statement of the volumes of these fuels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

Fuel consumption for electricity production was 231 PJ in 2018, which is 1.2% more than in 2017. Compared with 1990, fuel consumption fell by 22.2% due to more efficient electricity production and a growing share of wind power.

Fuel consumption for district heating was 93 PJ in 2018, which is 1.6% higher than in 2017. Compared with 1990, fuel consumption increased by 20.6%. Also in this regard, production has become more efficient, as district heating production has increased by 46.0% 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 2.1% and 1.3% higher respectively in 2018 than the year before, whereas in the agriculture and industry sector consumption was 1% higher. In the households, gross energy consumption rose by 2.0%. In the energy sector (platforms in the North Sea and oil refineries) gross energy consumption fell by 8.1%.

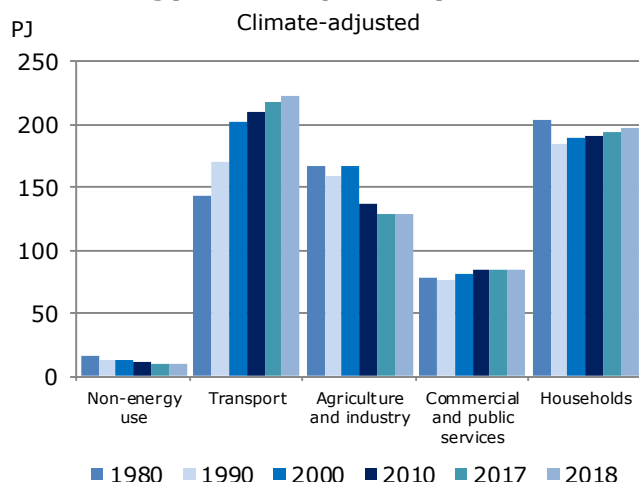
Compared with 1990, gross energy consumption for transport increased by 30.7%. In the agriculture and industry sector, gross energy consumption fell by 26.0%, while it fell by 9.5% and 10.3%, respectively, for the commercial and public services sector and for households. From 1990 to 2018, developments were affected by the fact that electricity and district heating can be generated with even smaller fuel consumption.

GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Final energy consumption

									Change
Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	'90-'18'
Total final energy consumption Climate adjusted	604 097	650 815	665 869	633 250	619 147	628 916	636 941	644 505	6.7%
By energy product									
Oil	321 946	312 354	312 290	283 644	258 929	263 761	266 656	270 177	-16.1%
Natural gas	50 060	72 674	72 415	67 638	62 307	62 225	61 735	61 190	22.2%
Coal and coke	17 243	12 389	10 826	5 559	4 972	5 116	5 506	5 607	-67.5%
Waste, non-renewable	470	763	1 239	922	806	874	958	996	112%
Renewable energy	27 833	32 228	43 216	53 578	72 844	75 676	79 265	83 795	201%
Electricity	103 212	117 590	120 731	114 700	111 216	112 057	112 781	112 129	8.6%
District heating	81 679	102 127	104 604	106 725	107 398	108 496	109 445	109 993	34.7%
Gas works gas	1 654	691	547	485	675	712	595	617	-62.7%
By use									
Non-energy use	13 004	12 619	12 064	11 026	10 529	10 481	10 347	10 268	-21.0%
Total transport	170 216	201 209	215 789	209 731	209 265	213 828	218 253	222 741	30.9%
Road transport	129 943	153 666	161 923	161 215	159 245	159 958	162 214	166 120	27.8%
Rail transport	4 765	4 339	4 488	4 728	4 785	4 927	4 762	4 479	-6.0%
Sea transport, domestic	6 344	6 857	8 026	6 533	5 640	6 399	6 214	6 391	0.7%
Aviation	27 515	34 822	37 627	35 785	38 246	41 066	42 263	44 146	60.4%
Military transport	1 649	1 525	3 726	1 470	1 350	1 479	2 800	1 606	-2.6%
Total agriculture and industry	158 790	167 113	158 242	137 014	124 933	126 418	129 222	129 501	-18.4%
Agriculture, forestry and horticulture	33 087	32 428	29 322	29 146	27 542	27 244	26 165	26 023	-21.3%
Fishing	10 785	9 451	7 488	6 049	5 205	5 192	4 890	4 650	-56.9%
Manufacturing	108 624	117 583	113 280	94 679	85 632	87 215	90 888	91 457	-15.8%
Construction	6 295	7 651	8 152	7 140	6 554	6 767	7 278	7 370	17.1%
Total commercial and public services	77 047	80 599	85 045	83 893	81 167	82 188	84 603	84 763	10.0%
Wholesale	13 795	13 893	12 906	11 493	10 866	10 932	11 149	11 196	-18.8%
Retail trade	8 883	9 323	9 991	10 939	10 313	10 230	10 311	10 019	12.8%
Private service	28 812	32 901	36 238	36 653	35 457	36 101	37 752	38 272	32.8%
Public service	25 557	24 481	25 909	24 807	24 531	24 925	25 391	25 276	-1.1%
Total households	185 039	189 275	194 729	191 585	193 252	196 000	194 516	197 231	6.6%
Single-family houses	137 383	139 568	144 258	140 888	142 015	144 554	143 542	145 903	6.2%
Multi-family houses	47 656	49 706	50 471	50 696	51 237	51 446	50 973	51 328	7.7%
Observed consumption Total final energy consumption	580 458	632 528	658 455	659 750	610 217	625 436	632 744	637 544	9.8%

Final energy consumption by use

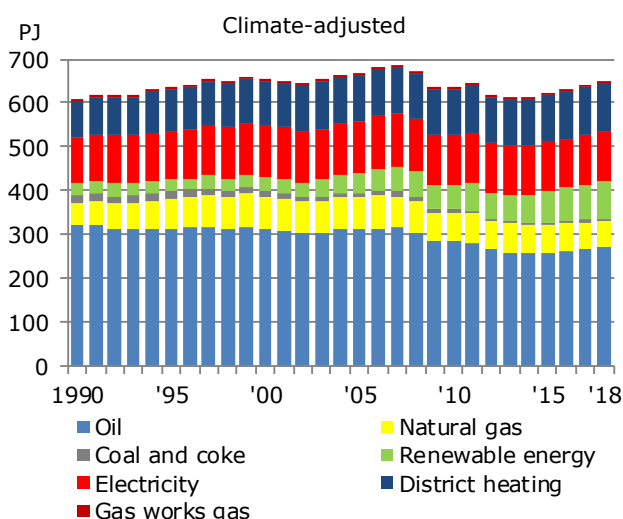


Final energy consumption includes consumption for transport and non-energy purposes (such as lubricants and asphalt), and energy consumption for production and heating by the agriculture and industry sector, the commercial and public services sector, and energy consumption by households.

Final energy consumption in 2018 was 645 PJ, which is 1.2% higher than in 2017. Final consumption was 6.7% higher compared with 1990.

Energy consumption for the transport sector increased steadily throughout most of the period. From 1990 to 2018 consumption went up by 30.9%. Energy consumption in the agriculture and industry sector fell by 18.4% from 1990 to 2018, while consumption in the commercial and public services sector and households increased by 10.0% and 6.6%, respectively.

Final energy consumption by energy product

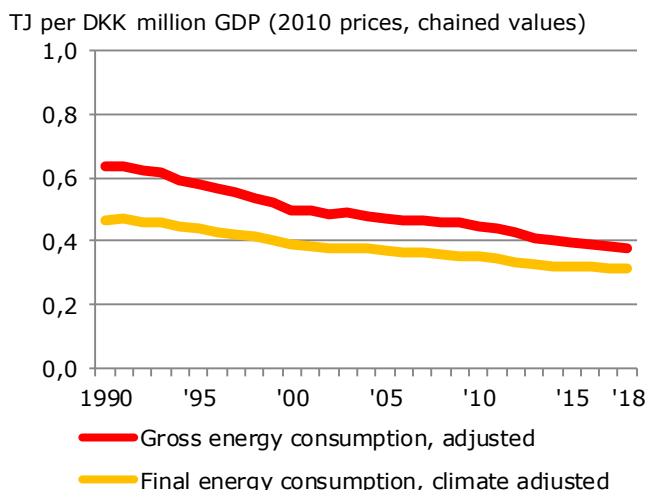


Consumption of oil rose by 1.3% and consumption of natural gas (for other uses than electricity and district heating production) decreased by 0.9% from 2017 to 2018. Consumption of electricity decreased by 0.6% and consumption of district heating was 0.5% higher than the year before.

Since 1990, final consumption of natural gas has increased by 22.2%, while consumption of electricity and district heating has increased by 8.6% and 34.7%, respectively. In the same period, consumption of oil and coal fell by 16.1% and 67.5%, respectively.

In 2018, final consumption of renewable energy etc. was 5.7% higher than in 2017. Consumption of renewable energy etc. has increased by 200% 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 2018 gross energy consumption was 0.381 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 40.1% during this period. Intensity in 2018 decreased by 0.4% compared with the year before.

If developments in GDP are instead compared to developments in final energy consumption, energy intensity fell by 33.0% from 1990 to 2018. This reduction is less than the figure above, because the increased efficiency of the transformation sector is not included. Intensity decreased by 0.3% in 2018 compared with the year before.

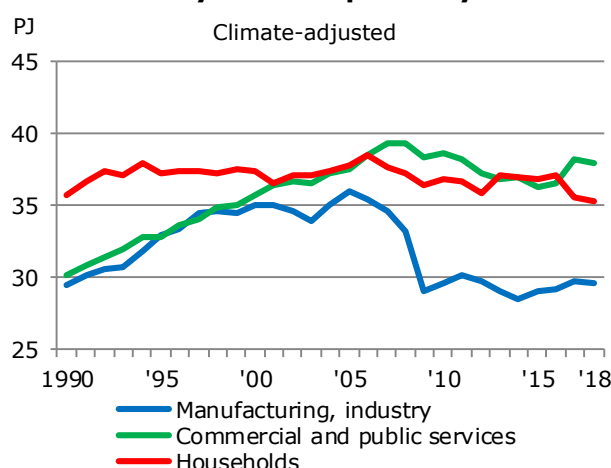
GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Final electricity consumption

Change

Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	'90-'18
Total final electricity consumption	103 212	117 590	120 731	114 700	111 216	112 057	112 781	112 129	8.6%
Climate adjusted									
Rail transport	736	1 253	1 351	1 455	1 429	1 501	1 465	1 451	97.2%
Agriculture and industry	36 633	43 283	44 092	37 851	36 735	36 872	37 482	37 423	2.2%
Agriculture, forestry and horticulture	6 143	7 047	6 874	6 841	6 441	6 281	6 339	6 279	2.2%
Manufacturing	29 436	35 022	35 943	29 638	28 994	29 248	29 694	29 671	0.8%
Construction	1 054	1 214	1 274	1 372	1 300	1 343	1 450	1 474	39.8%
Commercial and public services	30 147	35 715	37 479	38 656	36 196	36 532	38 225	37 912	25.8%
Wholesale	5 451	5 936	5 973	5 740	5 253	5 285	5 411	5 451	0.0%
Retail trade	5 202	5 742	6 260	6 543	6 056	5 953	5 960	5 658	8.8%
Private services	11 715	14 903	15 866	17 108	16 332	16 576	17 927	18 142	54.9%
Public services	7 778	9 134	9 380	9 266	8 555	8 719	8 926	8 661	11.3%
Households	35 696	37 339	37 810	36 738	36 855	37 151	35 609	35 342	-1.0%
Single-family houses	27 011	28 210	28 279	27 335	27 772	28 053	27 148	26 786	-0.8%
Multi-family houses	8 686	9 129	9 530	9 403	9 084	9 098	8 461	8 556	-1.5%
Observed electricity consumption	102 139	116 849	120 467	115 623	110 912	111 939	112 642	111 904	9.6%

Final electricity consumption by use

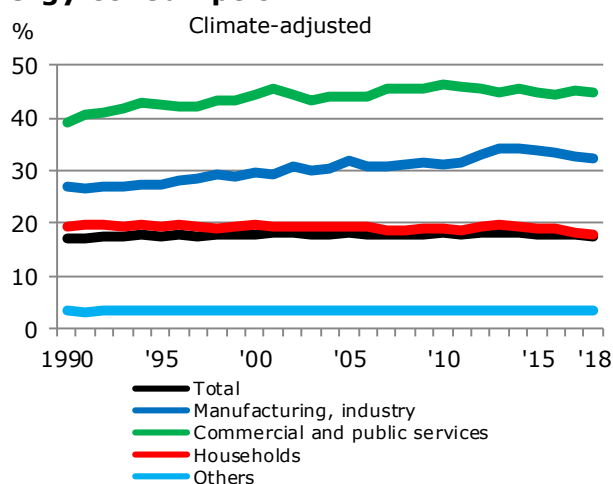


Electricity consumption by manufacturing industries was 0.1% lower in 2018 than in 2017. Compared with 1990, electricity consumption has increased by 0.8%.

In the commercial and public services sector, electricity consumption increased until 2008, after which it fell. In 2018, electricity consumption was 0.8% lower than the year before. From 1990 to 2018 electricity consumption went up by 25.8%.

The electricity consumption of households fluctuated in the period 1990 to 2018 between 35.3 PJ and 38.4 PJ. Electricity consumption decreased by 0.7% in 2018. Consumption decreased by 1.0% relative to 1990.

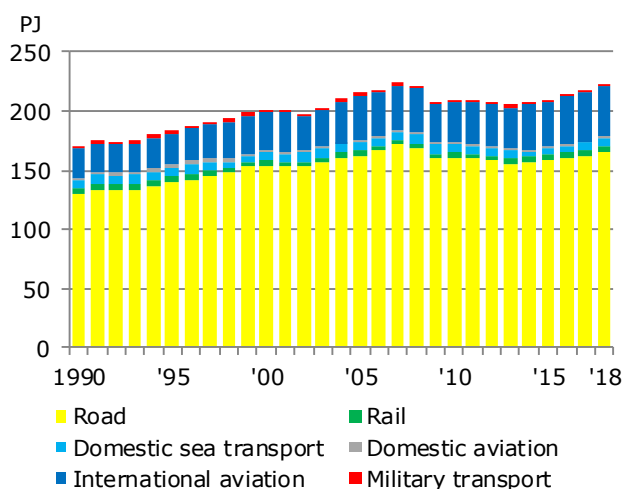
Electricity consumption's share of total energy consumption



During the period from 1990 to 2018 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 2018 it was 17.4%.

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 2018, electricity consumption accounted for 44.7% of the sector's total energy consumption. Manufacturing industries has seen a steady increase across the period 1990-2013. After this, the percentage of electricity fell. In 2018, the share was 32.4% compared to 27.1% in 1990. Electricity consumption's share for households remains more or less unchanged with 19.3% in 1990 and 17.9% in 2018.

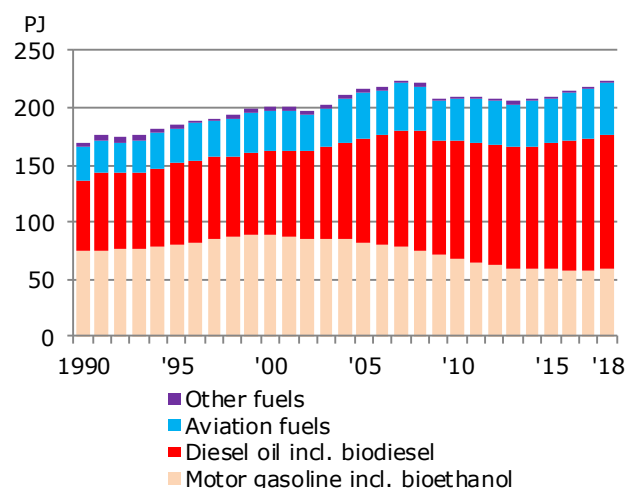
Energy consumption for transport by type



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 2018, energy consumption was calculated at 222.7 PJ, which is 2.1% higher than in 2017. Compared with 1990, energy consumption for transport has increased by 30.9% in 2018.

Energy consumption for road transport was 166.1 PJ in 2018, which is 2.4% higher compared with 2017. 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 1990-2018. In 2018, consumption increased by 4.7% in comparison to last year.

Energy consumption for transport by fuel type

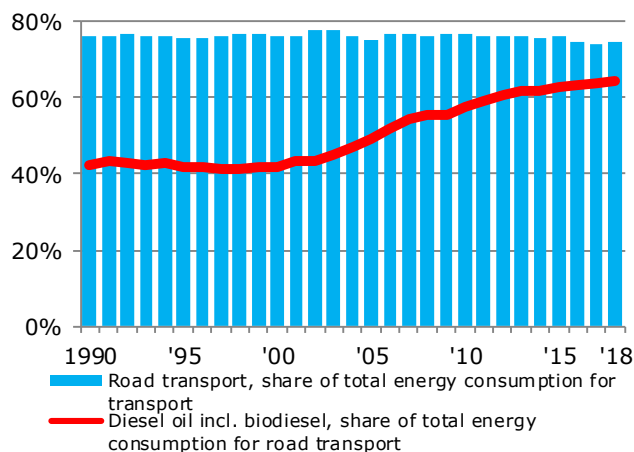


Consumption of motor gasoline (including bioethanol) rose by 0.3% from 2017 to 2018, while consumption of diesel oil (including biodiesel) increased by 2.7%. Consumption of bioethanol and biodiesel together is almost unchanged from 2017 to 2018.

Considering developments from 1990 to 2018, consumption of motor gasoline (including bioethanol) fell by 21.2%, while consumption of diesel oil (including biodiesel) grew by 90.7%. Consumption of aviation fuels increased by 54.5%.

Consumption of other types of fuel fell by 65.8% 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.

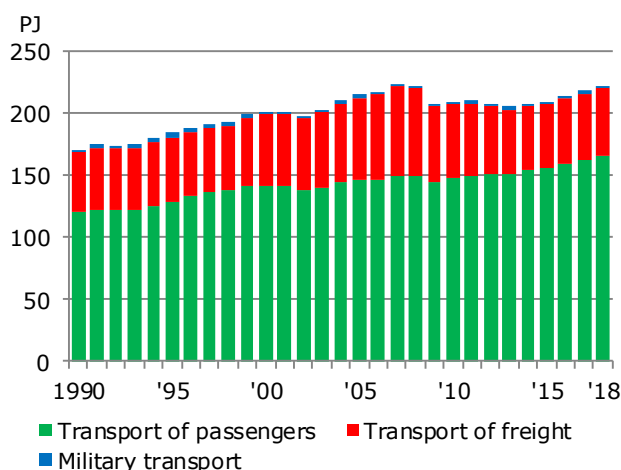
Energy consumption for road transport



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 2018. In 2018, road transport accounted for 74.6% 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 2018, diesel oil (including biodiesel) accounted for 64.6% of total energy consumption for transport, as opposed to 42.1% in 1990.

Final energy consumption by passenger and freight transport



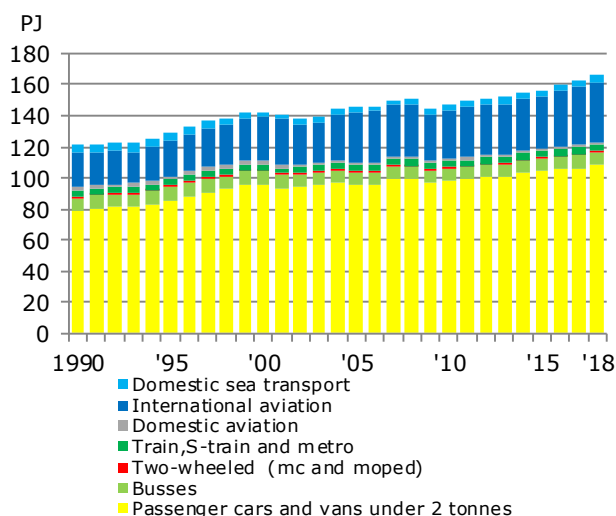
In the distribution of energy consumption for transport of passengers and freight, vans less than two tonnes are included under passenger transport, whereas vans of 2-6 tonnes are included under freight transport.

Out of the total energy consumption for transport in 2018, which amounted to 222.7 PJ, passenger transport accounted for 166.0 PJ, corresponding to 74.5%. Energy consumption for freight transport was 55.1 PJ, corresponding to 24.7%, while energy consumption for transport by Danish military was 1.6 PJ.

Energy consumption for passenger transport increased by 2.3% from 2017 to 2018, while energy consumption for freight transport grew by 3.5%. Considering the trend from 1990 to 2018, energy consumption for passenger transport increased by 36.8%, while energy consumption for freight transport increased by 16.6%.

The distribution between the individual transport categories in 2018 is associated with some uncertainty.

Energy consumption for passenger transport by means of transport

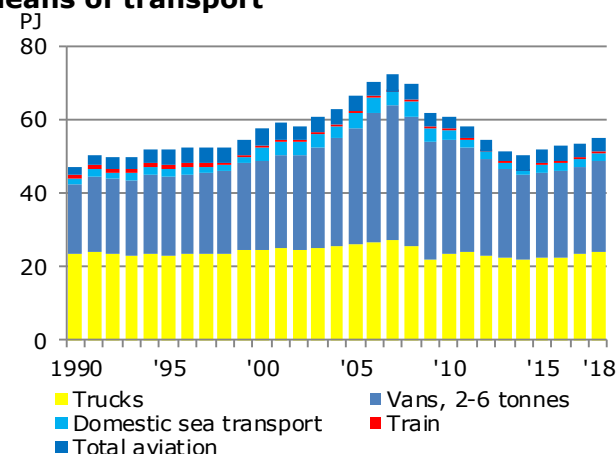


Energy consumption for passenger transport is mainly used for transport by car and for international aviation. In 2018, energy consumption for these categories made up 65.1% and 23.6%, respectively, of total energy consumption for passenger transport.

Energy consumption for cars and vans (less than 2 tonnes) increased by 1.5% from 2017 to 2018, while energy consumption for international aviation grew by 5.0%. From 1990 to 2018, energy consumption for cars and vans increased by 37.3%, while energy consumption for international aviation grew by 71.6%.

The distribution between the individual transport categories in 2018 is associated with some uncertainty.

Energy consumption for freight transport by means of transport



Energy consumption for freight transport is mostly by trucks and vans (2-6 tonnes). In 2018, energy consumption by these types of vehicle made up 43.9% and 44.3%, respectively, of total energy consumption for freight transport.

Energy consumption for trucks grew by 3.9% from 2017 to 2018, and energy consumption for vans increased also by 3.9%. Energy consumption for trucks increased by 4.1% from 1990 to 2018, while energy consumption for vans increased by 27.8%.

The distribution between the individual transport categories in 2018 is associated with some uncertainty.

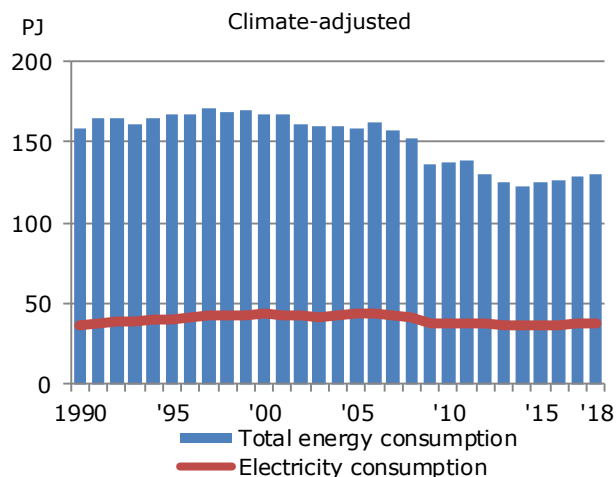
Final energy consumption for transport

Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	Change '90-'18
Total transport	170 216	201 209	215 789	209 731	209 265	213 828	218 253	222 741	30.9%
Observed consumption									
LPG	464	425	323	3	-	-	-	-	-100%
Aviation gasoline	155	119	107	76	57	49	31	49	-68.2%
Motor gasoline	74 327	88 976	82 126	67 726	57 443	56 305	56 582	56 758	-23.6%
JP4	-	-	-	-	-	-	-	-	•
Petroleum	462	39	14	0	-	-	-	-	-100%
JP1	28 828	35 810	39 959	36 577	38 927	41 695	43 568	44 726	55.1%
Gas/diesel oil	61 685	73 077	90 529	101 893	102 325	105 041	107 319	110 467	79.1%
Fuel oil	3 560	1 509	1 379	868	39	2	-	5	-99.9%
Natural gas					76	132	253	306	•
Bio methane					1	4	14	23	•
Bioethanol	-	-	-	1 118	1 840	1 838	1 825	1 797	•
Biodiesel	-	-	-	16	7 129	7 263	7 194	7 159	•
Electricity	736	1 253	1 351	1 455	1 429	1 501	1 465	1 451	97.2%
Road	129 943	153 666	161 923	161 215	159 245	159 958	162 214	166 120	27.8%
Rail	4 765	4 339	4 488	4 728	4 785	4 927	4 762	4 479	-6.0%
Domestic sea transport	6 344	6 857	8 026	6 533	5 640	6 399	6 214	6 391	0.7%
Domestic aviation	2 587	1 803	1 304	1 813	1 285	1 325	1 262	1 202	-53.5%
International aviation	24 928	33 019	36 323	33 972	36 961	39 740	41 001	42 944	72.3%
Military transport	1 649	1 525	3 726	1 470	1 350	1 479	2 800	1 606	-2.6%
Passenger transport	121 329	142 204	145 883	147 683	155 982	159 702	162 249	165 986	36.8%
Freight transport	47 238	57 481	66 180	60 578	51 933	52 647	53 204	55 083	16.6%
Military transport	1 649	1 525	3 726	1 470	1 350	1 479	2 800	1 606	-2.6%

Final energy consumption in agriculture and industry

Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	Change '90-'18
Total for agriculture and industry	158 790	167 113	158 242	137 014	124 933	126 418	129 222	129 501	-18.4%
Climate adjusted									
By energy product									
Oil	65 613	58 460	53 743	44 071	35 757	36 855	36 149	34 730	-47.1%
Natural gas	25 281	35 606	32 433	30 901	29 136	28 541	28 982	29 298	15.9%
Coal and coke	16 315	12 339	10 817	5 531	4 972	5 115	5 506	5 607	-65.6%
Waste, non-renewable	13	72	591	759	669	669	672	672	5224%
Renewable energy	9 377	8 098	7 759	11 509	13 342	13 118	15 190	16 487	75.8%
Electricity	36 633	43 283	44 092	37 851	36 735	36 872	37 482	37 423	2.2%
District heating	5 409	9 210	8 788	6 353	4 115	5 042	5 034	5 077	-6.1%
Gas works gas	149	45	19	41	208	207	207	207	38.6%
By use									
Agriculture, forestry and horticulture	33 087	32 428	29 322	29 146	27 542	27 244	26 165	26 023	-21.3%
Fishing	10 785	9 451	7 488	6 049	5 205	5 192	4 890	4 650	-56.9%
Manufacturing industries	108 624	117 583	113 280	94 679	85 632	87 215	90 888	91 457	-15.8%
Construction	6 295	7 651	8 152	7 140	6 554	6 767	7 278	7 370	17.1%

Energy and electricity consumption in agriculture and industry

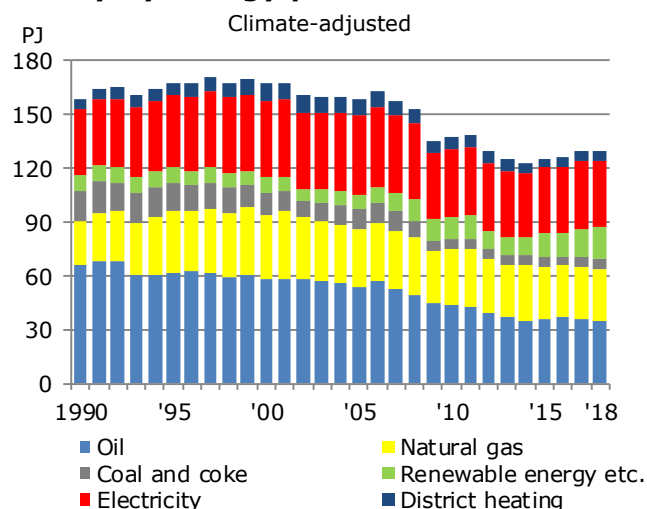


Agriculture and industry covers agriculture, forestry and horticulture, fishing, manufacturing industries (excl. refineries), as well as construction.

In 2018 climate-adjusted energy consumption in agriculture and industry was 129.5 PJ, which is 0.2% higher than the year before. Compared with 1990, energy consumption decreased by 18.4%.

Electricity consumption in 2018 was 37.4 PJ after adjusting for climate variation. This is a decrease by 0.2% compared with the year before. Compared with 1990, electricity consumption increased by 2.2%.

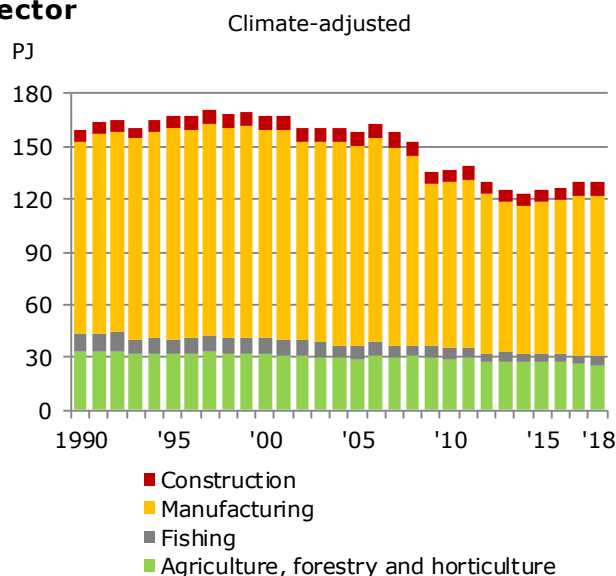
Energy consumption in agriculture and industry by energy products



In 2018 consumption of natural gas, coal and renewable energy etc. for agriculture and industry grew by 1.1%, 1.8% and 8.2%, respectively, compared with 2017, while consumption of oil decreased by 3.9%. Consumption of electricity decreased by 0.2%, while consumption of district heating was 0.9% higher in 2018 than the year before.

Consumption of natural gas in the period 1990-2018 increased by 15.9%, while consumption of oil and coal fell by 47.1% and 65.6%, respectively. Consumption of renewable energy etc. increased by 82.7%. Consumption of electricity has increased by 2.2% and district heating has decreased by 6.1% since 1990.

Energy consumption by individual industry in the agriculture and industry sector

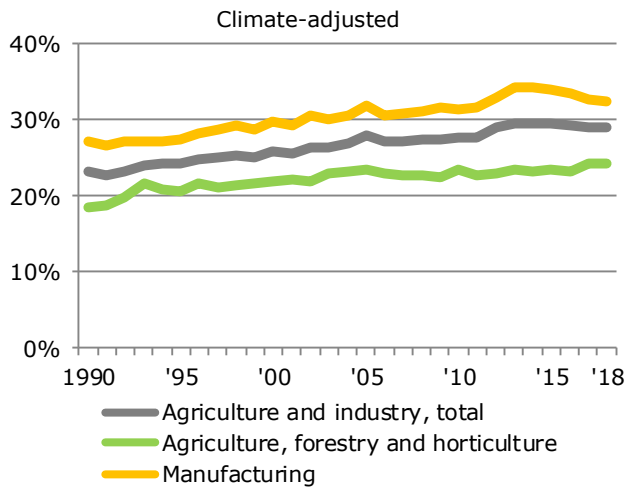


Compared with 2017 energy consumption grew by 0.6% and 1.3%, respectively, in manufacturing industries and in construction. Energy consumption in agriculture, forestry and horticulture fell by 0.5% in 2018.

From 1990 to 2018, energy consumption in manufacturing industries fell by 15.8%. Energy consumption in agriculture, forestry and horticulture fell by 21.3%, while in construction consumption increased by 17.1%. In fishing, energy consumption fell by 56.9%.

In 2018, agriculture, forestry and horticulture's share of total energy consumption by the agriculture and industry sector was 20.1%, while the share of manufacturing industries was 70.6%. In 2018, fishing and construction accounted for 3.6% and 5.7%, respectively, of energy consumption in the agriculture and industry sector.

Electricity consumption's share of total energy consumption

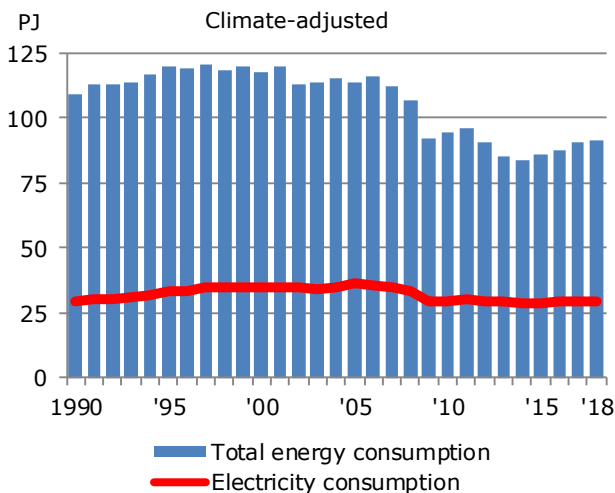


Electricity consumption's share of total energy consumption in the agriculture and industry sector increased from 23.1% in 1990 to 28.9% in 2018.

In manufacturing industries the share of electricity increased from 27.1% in 1990 to 32.4% in 2018.

In agriculture, forestry and horticulture the share of electricity was 18.6% in 1990. In 2018 this share was 24.1% of total energy consumption in agriculture, forestry and horticulture.

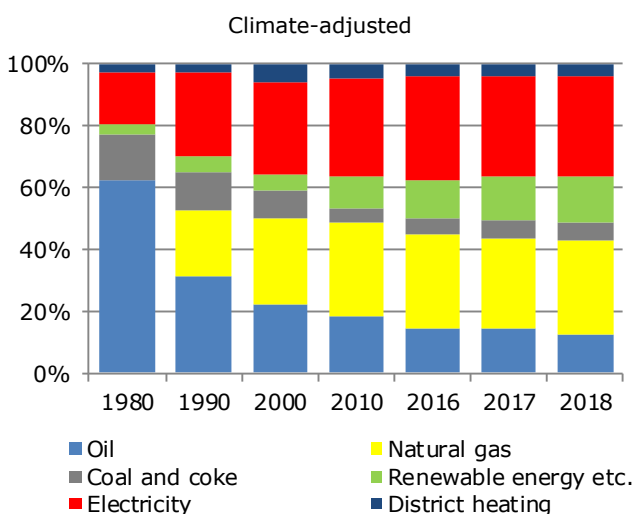
Energy and electricity consumption in manufacturing industries



Climate-adjusted energy consumption in manufacturing industries increased from 90.9 PJ in 2017 to 91.5 PJ in 2018, corresponding to a rise of 0.6%. Compared with 1990, energy consumption decreased by 15.8%.

In 2018, electricity consumption was 29.7 PJ, which is 0.1% less than the year before. Electricity consumption has risen by 0.8% since 1990.

Composition of energy consumption in manufacturing industries



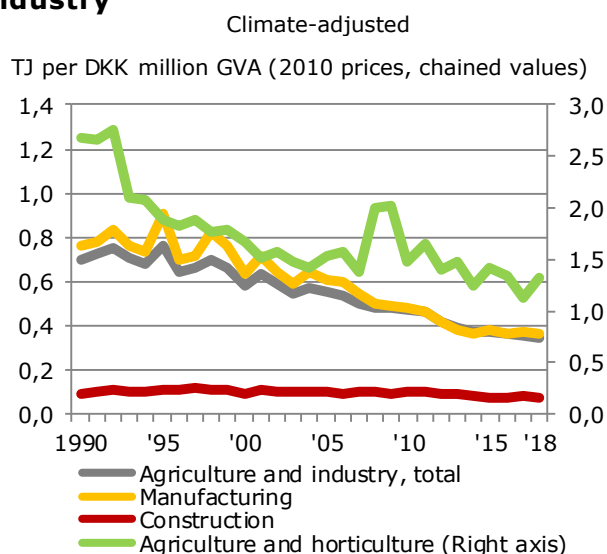
The composition of energy consumption in manufacturing industries has changed significantly since 1980, when oil consumption was dominant by 62.2% of the total energy consumption. In 1990, oil consumption accounted for almost one-third of total energy consumption. In 2018 this figure was 12.6%.

Consumption of natural gas accounted for 30.1% of energy consumption in manufacturing industries in 2018, as opposed to 20.8% in 1990.

Coal's share of energy consumption has gone down from 12.3% in 1990 to 5.7% in 2018. The contribution from renewable energy etc. and district heating has increased from 1990 to 2018. In 2018, their shares were 15.1% and 3.7%, respectively.

The share of electricity consumption grew from 27.1% in 1990 to 32.4% in 2018.

Energy intensities in agriculture and industry



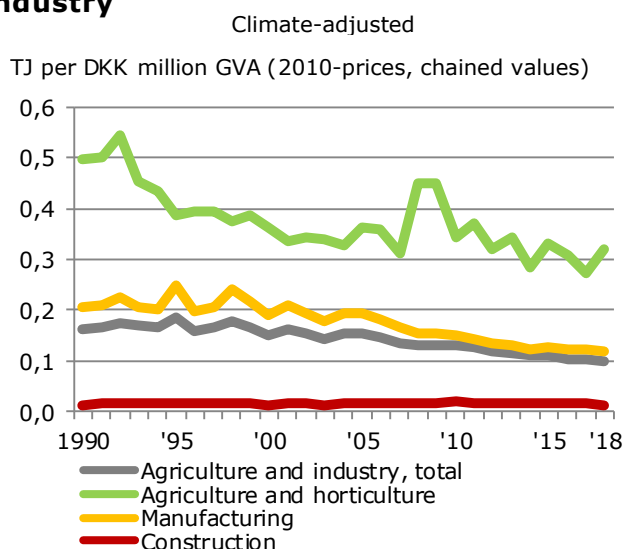
Energy intensity has been calculated as climate-adjusted energy consumption in relation to the gross value added (GVA), measured at 2010 prices, chained values.

Energy intensity in agriculture and industry dropped by 50.5% from 1990 to 2018. The annual average fall in energy intensity from 1990 to 2018 was 2.5% per year.

In manufacturing industries, energy intensity fell by 52.2% from 1990 to 2018. In 2018, energy intensity decreased by 2.2% compared with 2017.

In agriculture, forestry and horticulture, energy intensity increased by 17.7% in 2018. The energy intensity has fallen by 50.4% since 1990. Since 2005, the trend has been influenced by significant fluctuations in agricultural, forestry and horticultural GVA.

Electricity intensities in agriculture and industry

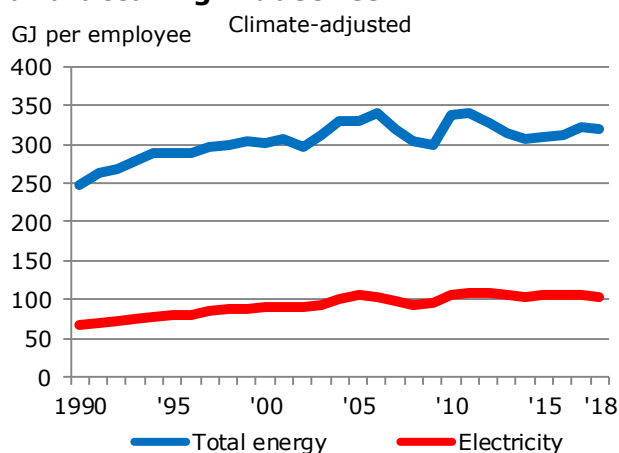


Electricity intensity has been calculated as climate-adjusted electricity consumption in relation to GVA, measured at 2010 prices, chained values.

After a period of fluctuating electricity intensity in agriculture and industry in the 1990s, it fell steadily up to 2018. In the period 1990 to 2018, electricity intensity fell by 37.9%. In 2018, electricity intensity was 0.100, i.e. 0.100 TJ of electricity (corresponding to 27,738 kWh) were used for every DKK 1 million GVA in the agriculture and industry sector. In 2018, electricity intensity fell by 3.7% compared with 2017.

Electricity intensity in manufacturing industries fell by 2.9% in 2018. In agriculture, forestry and horticulture intensity rose by 17.2%. Both compared with 2017. Electricity intensity in construction fell by 8.1%.

Energy consumption per employee in manufacturing industries

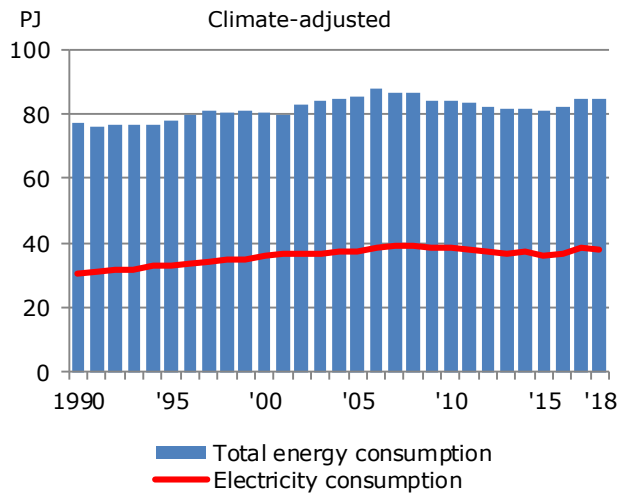


Energy and electricity consumption per employee in manufacturing industries have developed differently than the intensities shown above. This is due to a considerable increase in productivity, i.e. measured as GVA per employee in this sector.

Energy consumption per employee was 318.0 GJ in 2018, as opposed to 321.1 GJ the year before. This corresponds to a decrease of 0.9%. Compared with 1990, energy consumption per employee grew by 29.0%.

Electricity consumption per employee was 103.2 GJ in 2018, which is 1.6% lower than the year before. Compared with 1990, electricity consumption per employee increased by 54.4%.

Energy and electricity consumption in the commercial and public services

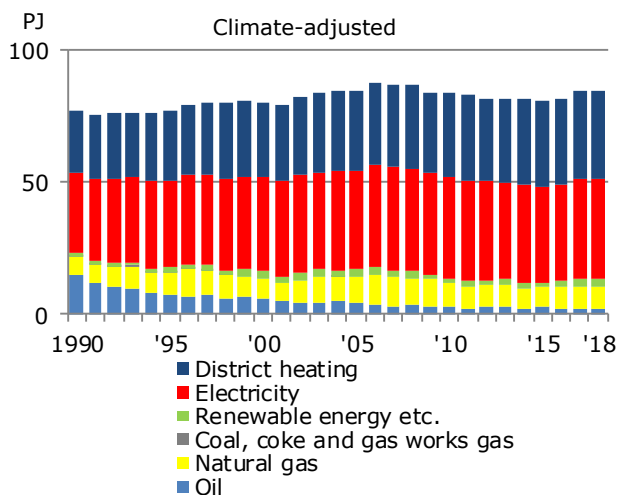


The commercial and public services sector includes wholesale, retail, private and public services.

Climate-adjusted energy consumption was 84.8 PJ in 2018, which is 0.2% higher than the year before. Compared with 1990, consumption increased by 10.0%.

In 2018, climate-adjusted electricity consumption was 37.9 PJ, which is 0.8% less than the year before. Compared with 1990, electricity consumption increased by 25.8%.

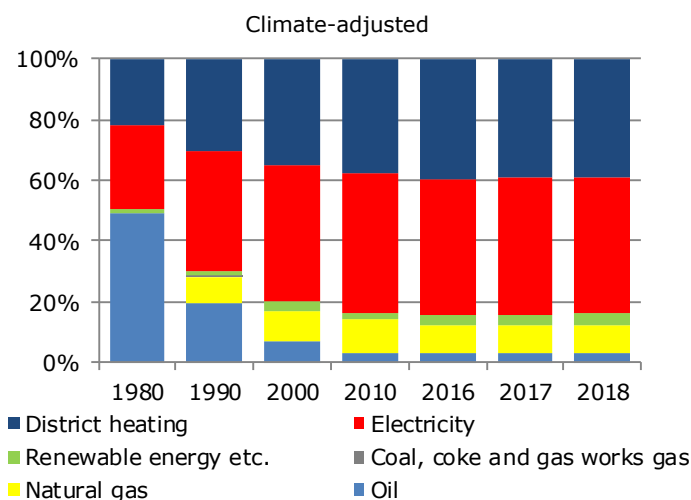
Energy consumption by energy product



Electricity and district heating are predominant energy sources in the commercial and public services sector. In 2018, consumption of electricity decreased by 0.8%, while consumption of district heating was 0.5% higher than the year before.

Compared with 1990, oil consumption fell by 82.2%, while natural gas consumption increased by 10.0%. In 2018, consumption of electricity and district heating was 25.8% and 41.4% higher, respectively, compared with 1990.

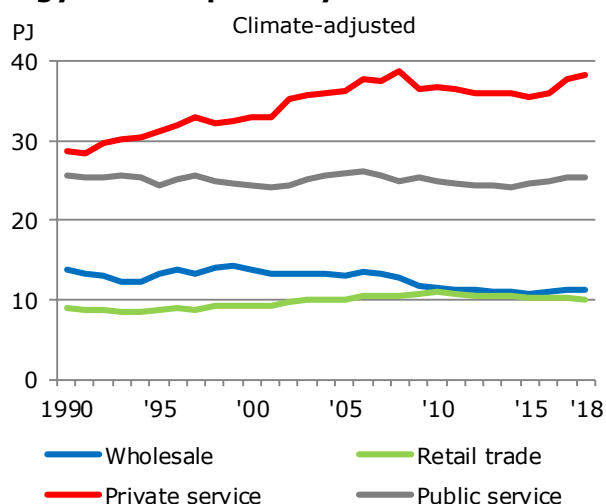
Composition of energy consumption in the commercial and public services



The composition of energy consumption in the commercial and public services sector has changed significantly since 1980, when oil consumption was dominant. 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 2018, electricity and district heating consumption together accounted for 83.8% of total energy consumption (electricity 44.7% and district heating 39.1%). The share of oil was 3.1%, while the share of natural gas was 9.0%. The share of renewable energy etc. was 4.0%.

Energy consumption by sector



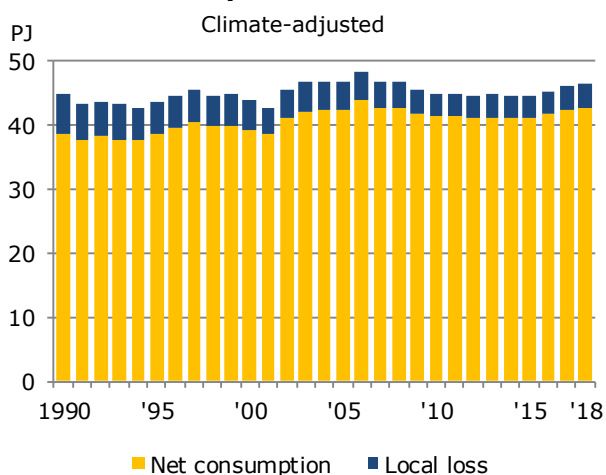
In 2018, 75.0% of energy consumption in the commercial and public services sector was in private and public services, while wholesale and retail accounted for the remaining 25.0%.

From 2017 to 2018, energy consumption in private services grew by 1.4%. Energy consumption in wholesale increased by 0.4%. Energy consumption in public services and retail trade decreased by 0.5% and 2.8% respectively.

Compared with 1990, energy consumption in wholesale fell by 18.8%, while energy consumption in retail grew by 12.8%.

Energy consumption in the private service sector is higher today than in 1990. Since 1990, growth has been 32.8%. In the public service sector, energy consumption is 1.1% lower compared with 1990.

Energy consumption for heating in the commercial and public services

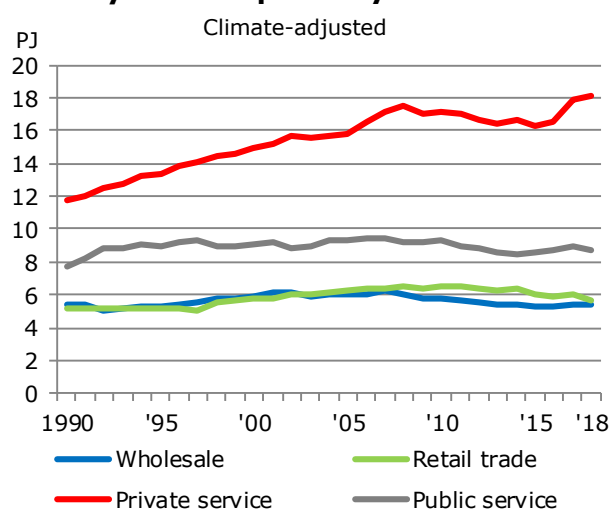


Energy consumption for heating (space heating and hot water) can be calculated in different ways. While final energy consumption is the volume of energy paid for, net energy consumption is the volume of energy utilised. The difference is local losses by the individual consumers, e.g. from oil and natural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

Final energy consumption for heating in the commercial and public services sector was 46.5 PJ in 2018, which is 1.0% higher than the year before. Compared with 1990, consumption grew by 3.4%.

Net energy consumption was 42.8 PJ in 2018, which is 0.8% higher than the year before. Compared with 1990, net energy consumption increased by 11.2%.

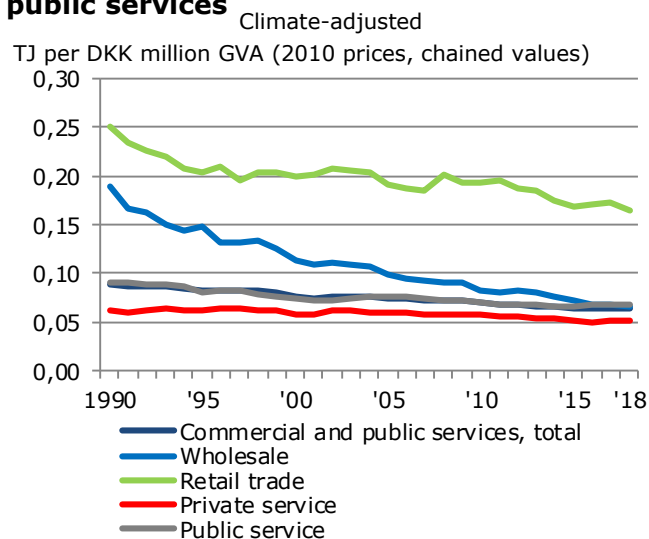
Electricity consumption by sector



Electricity consumption generally increased in the commercial and public services sector up to 2008, after which it fell until 2015 when it again started to rise. In 2018, electricity consumption was 0.7% higher in wholesale and 5.1% lower in retail, compared with 2017. In private service, electricity consumption increased by 1.2% and electricity consumption in public services decreased by 3.0%.

From 1990 to 2018, electricity consumption in wholesale is unchanged and retail increased by 8.8%. Electricity consumption in the public service sector increased by 11.3%. In the private service sector the increase was significantly higher, reaching 54.9%.

Energy intensities in the commercial and public services

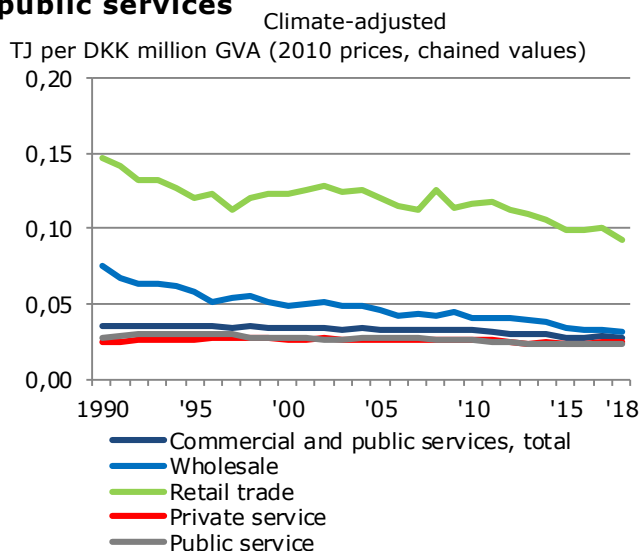


Energy intensities have been calculated as climate-adjusted energy consumption in relation to gross value added (GVA), measured at 2010 prices, chained values.

Energy intensity was 0.063 in 2018, i.e. for every DKK 1 million GVA in the commercial and public services sector, 0.063 TJ of energy were used. This is 0.9% less than the year before.

Energy intensity in the commercial and public services sector fell by 29.4% from 1990 to 2018. For wholesale and retail, energy intensities fell by 65.6% and 34.4%, respectively. For the private service sector and the public service sector, intensities fell by 15.1% and 25.3%, respectively.

Electricity intensities in commercial and public services

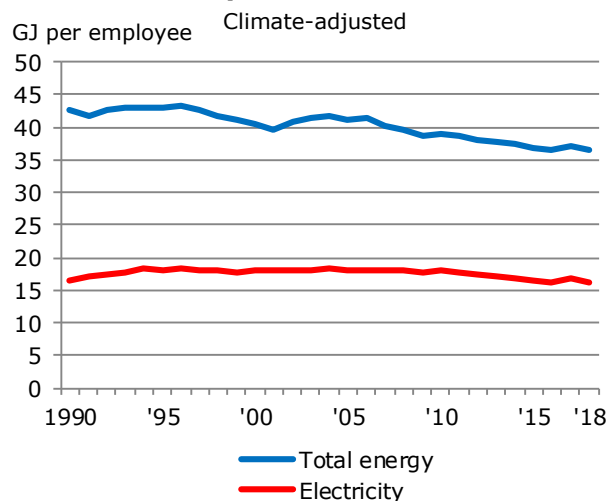


Electricity intensities have been calculated as climate-adjusted electricity consumption in relation to GVA, measured at 2010 prices, chained values.

In 2018 electricity intensity was 0.028, i.e. for every DKK 1 million GVA in the commercial and public services sector, 0.028 TJ of electricity (corresponding to 7,830 kWh) were used. Electricity intensity fell by 1.9% relative to the year before.

Electricity intensity in the commercial and public services sector fell by 19.3% from 1990 to 2018. For wholesale, retail and public services, electricity intensities fell by 57.6%, 36.7% and 15.9%, respectively. In private services, electricity intensity fell by 1.0%.

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 36.5 GJ in 2018, as opposed to 37.1 GJ the year before. This corresponds to a decrease of 1.5%. Compared with 1990, energy consumption per employee fell by 14.1%.

In 2018, electricity consumption per employee was 16.3 GJ as opposed to 16.8 GJ the year before, which is a decrease of 2.5%. Compared with 1990, electricity consumption per employee decreased by 1.8%.

COMMERCIAL AND PUBLIC SERVICES/HOUSEHOLDS

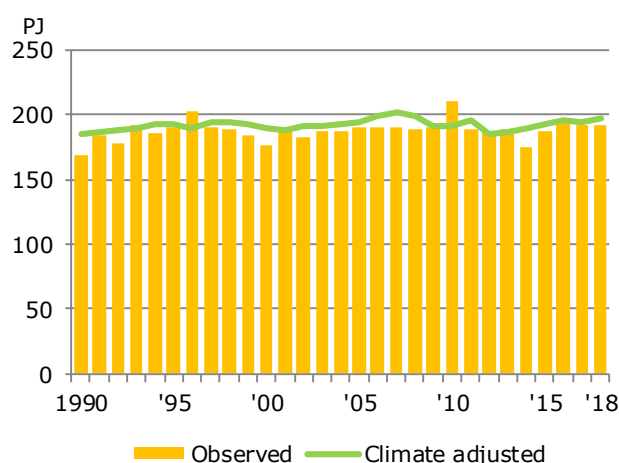
Final energy consumption in the commercial and public services

									Change
Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	'90-'18
Total commercial and public services. Climate adjusted	77 047	80 599	85 045	83 893	81 167	82 188	84 603	84 763	10.0%
Oil	14 850	5 874	4 428	2 810	2 671	2 651	2 435	2 637	-82.2%
Natural gas	6 902	7 739	9 989	8 977	7 674	7 645	7 941	7 592	10.0%
Coal and coke	98	-	-	-	-	-	-	-	-100.0%
Waste, non-renewable	457	691	648	163	137	205	287	325	-28.9%
Renewable energy	1 022	2 078	2 178	1 491	1 812	2 414	2 682	3 105	203.7%
Electricity	30 147	35 715	37 479	38 656	36 196	36 532	38 225	37 912	25.8%
District heating	23 449	28 451	30 281	31 761	32 639	32 701	33 002	33 158	41.4%
Gas works gas	121	52	42	35	37	40	31	33	-72.8%
By use									
Wholesale	13 795	13 893	12 906	11 493	10 866	10 932	11 149	11 196	-18.8%
Retail	8 883	9 323	9 991	10 939	10 313	10 230	10 311	10 019	12.8%
Private service	28 812	32 901	36 238	36 653	35 457	36 101	37 752	38 272	32.8%
Public service	25 557	24 481	25 909	24 807	24 531	24 925	25 391	25 276	-1.1%

Final energy consumption in households

									Change
Direct energy content [TJ]	1990	2000	2005	2010	2015	2016	2017	2018	'90-'18
Total households. Climate adjusted	185 039	189 275	194 729	191 585	193 252	196 000	194 516	197 231	6.6%
Oil	58 998	35 444	27 617	18 595	11 105	10 548	9 956	10 207	-82.7%
Natural gas	17 877	29 329	29 993	27 761	25 497	26 039	24 812	24 300	35.9%
Coal and coke	830	49	8	28	-	1	-	-	-100.0%
Renewable energy	17 434	22 052	33 279	39 444	48 722	51 043	52 373	55 247	216.9%
Electricity	35 696	37 339	37 810	36 738	36 855	37 151	35 609	35 342	-1.0%
District heating	52 820	64 466	65 536	68 612	70 644	70 753	71 408	71 757	35.9%
Gas works gas	1 384	594	486	408	429	465	357	377	-72.7%
Single-family houses	137 383	139 568	144 258	140 888	142 015	144 554	143 542	145 903	6.2%
Oil	52 233	32 741	25 032	16 910	9 408	8 980	8 433	8 603	-83.5%
Natural gas	15 143	24 907	25 472	23 554	21 530	21 910	20 850	20 429	34.9%
Coal and coke	136	17	0	13	-	0	-	-	-100.0%
Renewable energy	17 420	22 006	33 226	39 370	48 593	50 826	52 066	54 859	214.9%
Electricity	27 011	28 210	28 279	27 335	27 772	28 053	27 148	26 786	-0.8%
District heating	24 685	31 364	31 985	33 486	34 479	34 532	34 851	35 022	41.9%
Gas works gas	754	323	264	221	234	253	194	205	-72.8%
Multi-family houses	47 656	49 706	50 471	50 696	51 237	51 446	50 973	51 328	7.7%
Oil	6 766	2 703	2 585	1 685	1 696	1 567	1 523	1 604	-76.3%
Natural gas	2 733	4 422	4 522	4 207	3 966	4 129	3 962	3 871	41.6%
Coal and coke	693	32	8	15	-	0	-	-	-100.0%
Renewable energy	14	46	54	74	129	217	307	388	2659%
Electricity	8 686	9 129	9 530	9 403	9 084	9 098	8 461	8 556	-1.5%
District heating	28 135	33 103	33 550	35 125	36 166	36 221	36 557	36 736	30.6%
Gas works gas	630	271	222	187	196	212	163	172	-72.7%

Energy consumption in households

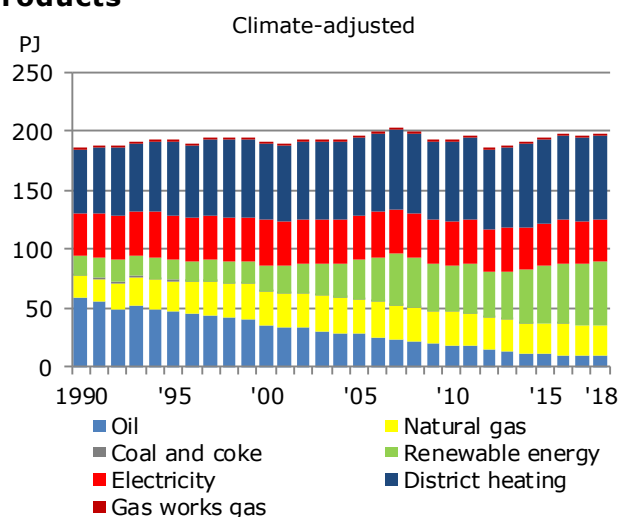


Household energy consumption is greatly influenced by the weather. The years 1990, 2000 and 2014 were very hot years with low energy consumption, whereas 1996 and 2010 were exceptionally cold.

In 2018 climate-adjusted energy consumption by households was 197.2 PJ, accounting for 30.6% of total final energy consumption in Denmark. 166.0 PJ of the 197.2 PJ was used for heating and 31.2 PJ were used for electrical appliances etc.

The climate-adjusted energy consumption of households was 1.4% higher in 2018 than the year before. Compared with 1990, energy consumption grew by 6.6%.

Household consumption by energy products

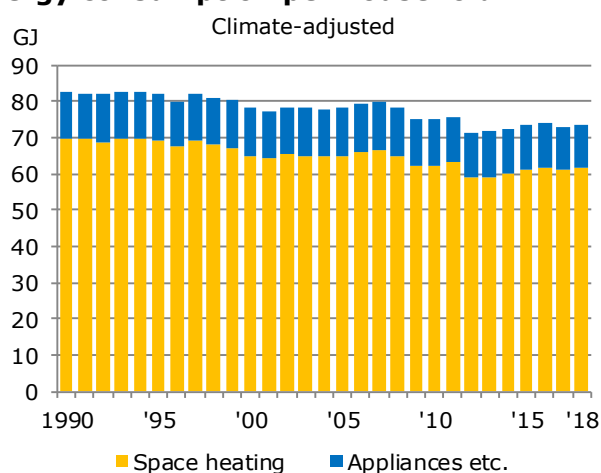


There have been significant changes in the composition of household energy consumption since 1990. Oil consumption decreased throughout the period shown due to a shift to district heating and natural gas. Firewood and wood pellets consumption has increased significantly since 2000.

In 2018 district heating amounted to 36.4% of household energy consumption, and renewable energy and electricity amounted to 28.0% and 17.9%, respectively. Consumption of natural gas, oil and gas works gas amounted to 12.3%, 5.2% 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 2018 has fluctuated around 35 and 37 PJ. Electricity consumption decreased by 0.7% in 2018 compared with 2017.

Energy consumption per household

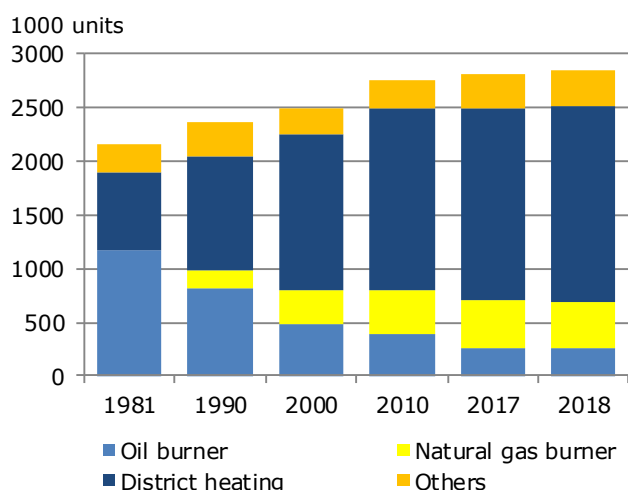


In 2018, average energy consumption per household was 73.6 GJ, which is 0.8% higher than the year before. Of this, 62.0 GJ – corresponding to 84.2% – were used for space heating and hot water. Energy consumption by households went down by 10.7% compared with 1990.

In 2018, average electricity consumption per household for electrical appliances and lighting was 11.6 GJ, corresponding to approximately 3232 kWh. This is a decrease of 1.4% compared to the year before and 8.5% 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

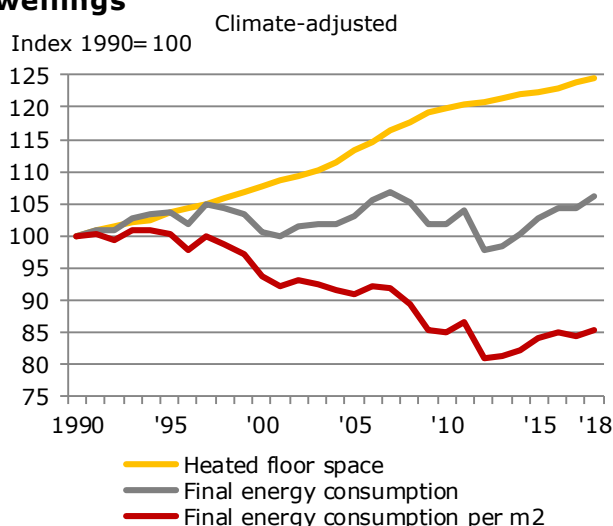


The significant changes in the composition of energy consumption by energy type reflect changes in the composition of heating installations in dwellings over time. Until the mid-1980s, oil-fired boilers clearly dominated the market, after which district heating became the most common source of heating. 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 2018, the total of 2.8 million heating installations could be analysed as follows: District heating installations 64.4%, natural gas boilers 15.2%, oil-fired boilers 9.0% and other installations, including heat pumps, electric heating and wood-fired boilers 11.4%.

Source: Statistics Denmark

Energy consumption for heating in dwellings

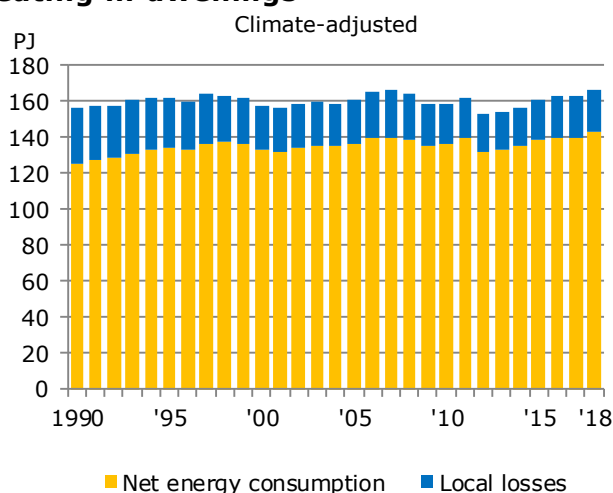


Except from 2001, 2012 and 2013, climate-adjusted energy consumption for heating (space heating and hot water) has been between 0.2% and 6.7% above the 1990 level. In 2018, energy consumption was 6.1% higher compared with 1990.

The background for this is a 24.6% increase in total heated area in the period from 1990 to 2018.

In the period 1990 to 2018, energy consumption for heating per m² fell by 14.8%. 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

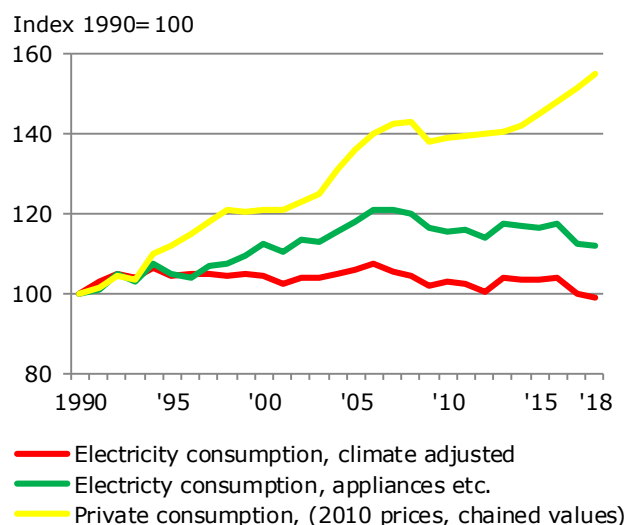


Net energy consumption means the energy utilised. The difference between final energy consumption and net energy consumption is local heat loss in individual dwellings, e.g. from oil and natural gas boilers.

While final consumption for heating as mentioned increased by 6.1% from 1990 to 2018, net energy consumption for space heating and hot water in households increased by 13.8% 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

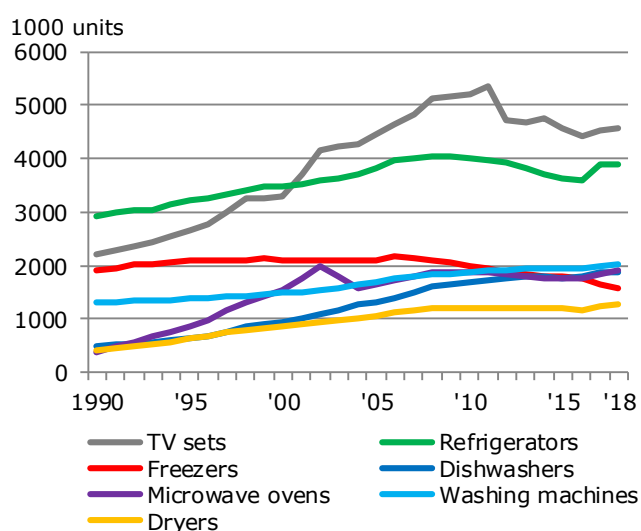


In the period 1990-2018, total household electricity consumption decreased by 1.0%, whereas electricity consumption for appliances and lighting etc. increased by 11.7%. This big difference is due to a significant fall in electricity consumption for heating.

Taking into account the large increase in the number of electrical appliances per household, see below, and a general increase of 54.7% 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

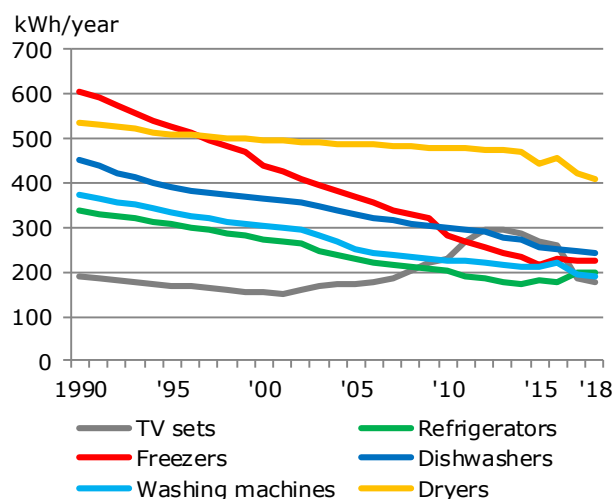


In the period from 1990 to 2010 there has been a sharp increase in the stock of almost all electricity-consuming household appliances. The stock of most appliances have however stagnated or decreased during roughly the past 10 years.

From 1990 to 2018 the number of microwaves has increased by 429%, while the number of tumble dryers and dishwashers has increased by 194% and 278%, respectively. Television sets, washing machines and refrigerators have also increased considerably in numbers. The number of separate freezers has decreased by 17.7% since 1990.

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 198 kWh in 2018, i.e. by 41.1%. Electricity consumption for a separate freezer fell by 63.1%, while the fall for a washing machine was 49.6% 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 inventories 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 2017, the maximum allowed emissions for Denmark was 34.8 million tonnes CO₂ equivalents.

In 2017, observed total emissions of greenhouse gases were 47.9 million tonnes CO₂ equivalents, which is 31.9% lower than in 1990. Including adjustments in the Energy Statistics for fluctuations in temperature and net exports of electricity, the level in 2017 was 50.8 million tonnes CO₂ equivalents, corresponding to a drop of 35.1% relative to the adjusted emissions in

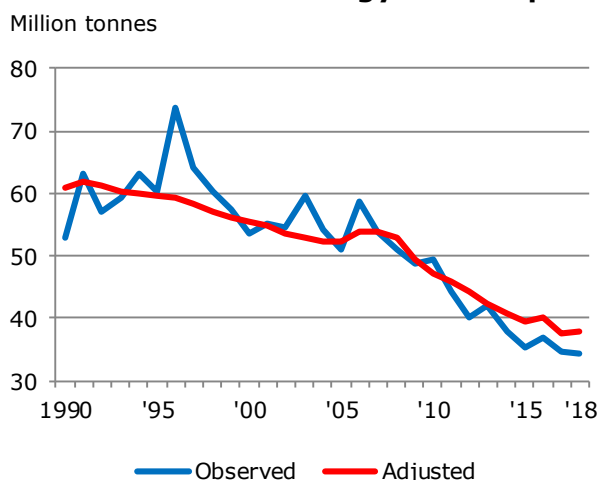
1990. In 2017, total observed emissions of greenhouse gases outside the ETS (ESD) were 32.7 million tonnes CO₂ equivalents, which is 17.5% lower than the 2005 base-year emissions and 2.2 million tonnes CO₂ equivalents lower than the emissions permitted under the ESD for 2017.

The greenhouse gas inventory for 2018 will be ready in 2020. 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

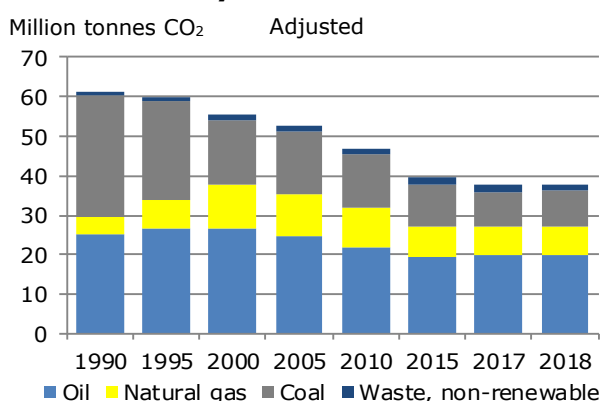


The Danish Energy Agency calculates observed CO₂ emissions as well as adjusted CO₂ emissions, which take annual temperature variations and foreign trade in electricity into account, see the statement of energy consumption on pages 18 and 19. The purpose of the adjusted calculations is to illustrate the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

In 2018, observed CO₂ emissions from energy consumption were 34.5 million tonnes, which is 0.2% lower than in 2017. Observed CO₂ emissions dropped by 35.0% compared with 1990.

Adjusted CO₂ emissions from energy consumption rose to 37.9 million tonnes in 2018; an increase of 1.0% compared with the previous year. Compared with 1990, the drop is 38.0%.

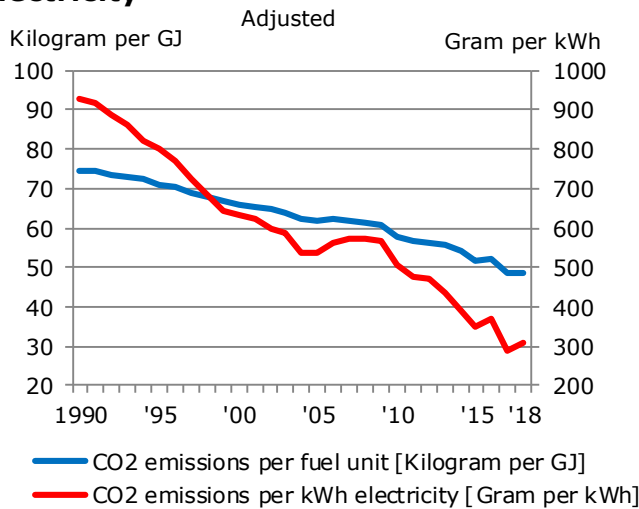
CO₂ emissions by fuel



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 4.6% since 1990, adjusted CO₂ emissions have fallen by 38.0%.

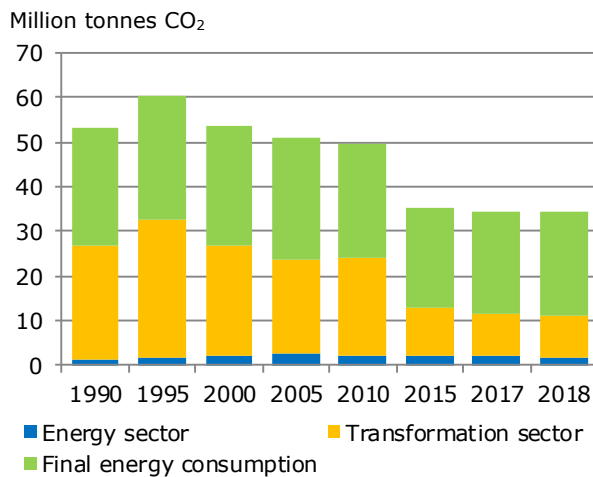
CO₂ emissions per fuel unit and per kWh electricity



From 1990-2018 gross energy consumption has fallen by 4.6%, 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 2018, each GJ of adjusted gross energy consumption was linked to 48.5 kg CO₂, compared with 74.5 kg in 1990. This corresponds to a reduction of 35.0%.

One kWh of electricity sold in Denmark in 2018 led to 306 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

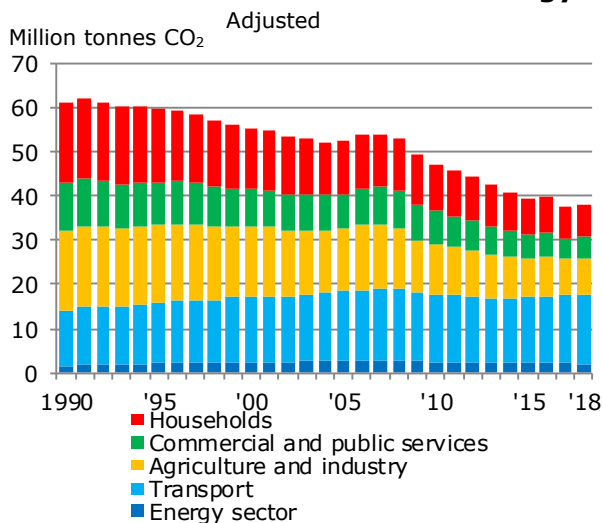


The energy system is divided into three sectors: The *energy sector* (extraction and refining), the *transformation sector* (production of electricity, district heating, and gas works gas), and *final consumption* (transport and consumption by households and industries).

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 2018, total observed CO₂ emissions were 34.5 million tonnes, of which 9.4 million tonnes were from the transformation sector, 23.2 million tonnes were from final energy consumption, and 1.9 million tonnes were from the energy sector. The transformation sector saw a fall of 15.7 million tonnes of CO₂ from 1990 to 2018, 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 2018, the transport and the agriculture and industry sectors were responsible for the largest shares of total CO₂ emissions, with 41.4% and 22.0%, respectively. Households and the commercial and public services sector accounted for 18.7% and 12.7%, respectively, while the energy sector accounted for 5.2% of CO₂ emissions.

Compared with 1990, CO₂ emissions from transport increased by 24.4%. 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 55.8% respectively, while for households they fell by 61.0%.

EMISSIONS OF CO₂ AND OTHER GREENHOUSE GASES

Observed CO₂ emissions from energy consumption

1000 tonnes

Change

Observed emissions	1990	2000	2005	2010	2015	2016	2017	2018	'90-'18
Total CO₂ emissions	53 069	53 590	50 868	49 383	35 331	36 843	34 582	34 511	-35.0%
By fuel	53 069	53 590	50 868	49 383	35 331	36 843	34 582	34 511	-35.0%
Oil	24 201	26 225	24 212	22 070	19 394	19 634	19 712	19 696	-18.6%
Natural gas	4 323	10 629	10 676	10 572	7 022	7 126	6 937	6 799	57.3%
Coal	23 972	15 612	14 582	15 331	7 229	8 405	6 247	6 382	-73.4%
Waste, non-renewable	573	1 124	1 398	1 410	1 687	1 679	1 685	1 634	185%
By sector	53 069	53 590	50 868	49 383	35 331	36 843	34 582	34 511	-35.0%
Energy sector	1 401	2 323	2 440	2 323	2 346	2 072	2 150	1 872	33.6%
Transformation sector	25 135	24 214	21 132	21 948	10 655	11 968	9 401	9 432	-62.5%
Electricity production	20 561	20 163	17 233	17 666	7 433	8 742	6 622	6 783	-67.0%
District heating production	4 473	4 010	3 866	4 247	3 187	3 188	2 747	2 618	-41.5%
Gas works gas production	101	42	33	35	35	38	31	31	-69.3%
Final energy consumption	26 533	27 053	27 297	25 112	22 329	22 803	23 030	23 206	-12.5%
Transport	12 420	14 638	15 709	15 191	14 580	14 896	15 226	15 560	25.3%
Agriculture and industry	7 785	7 579	7 024	5 827	4 936	5 035	5 045	4 933	-36.6%
Commercial and public services	1 406	869	922	803	622	638	645	636	-54.8%
Households	4 922	3 967	3 641	3 292	2 192	2 234	2 115	2 077	-57.8%

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	1990	2000	2005	2010	2015	2016	2017	2018	'90-'18
Total CO₂ emissions	61 046	55 340	52 415	47 019	39 395	40 088	37 506	37 873	-38.0%
By fuel	61 046	55 340	52 415	47 019	39 395	40 088	37 506	37 873	-38.0%
Oil	25 058	26 744	24 487	21 770	19 523	19 709	19 782	19 785	-21.0%
Natural gas	4 646	10 961	10 955	10 054	7 733	7 618	7 347	7 252	56.1%
Coal	30 758	16 500	15 570	13 798	10 448	11 079	8 690	9 198	-70.1%
Waste, non-renewable	583	1 136	1 403	1 398	1 692	1 681	1 688	1 638	181%
By sector	61 046	55 340	52 415	47 019	39 395	40 088	37 506	37 873	-38.0%
Energy sector	1 401	2 323	2 440	2 323	2 346	2 072	2 150	1 872	33.6%
Transformation sector	32 256	25 456	22 496	20 114	14 578	15 158	12 263	12 693	-60.6%
Electricity production	27 070	20 965	18 416	16 570	11 081	11 825	9 355	9 830	-63.7%
District heating production	5 078	4 446	4 047	3 511	3 461	3 295	2 877	2 832	-44.2%
Gas works gas production	108	45	33	32	36	39	32	31	-71.0%
Final energy consumption	27 388	27 562	27 479	24 583	22 471	22 857	23 092	23 307	-14.9%
Transport	12 420	14 638	15 709	15 191	14 580	14 896	15 226	15 560	25.3%
Agriculture and industry	7 963	7 692	7 065	5 708	4 967	5 046	5 058	4 955	-37.8%
Commercial and public services	1 543	934	949	727	644	647	656	654	-57.6%
Households	5 462	4 298	3 756	2 956	2 280	2 267	2 153	2 139	-60.8%

*) 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	2015	2016	2017	Change '90-'17
Observed emissions in total²⁾	70 291	78 259	70 790	66 231	63 038	48 133	50 154	47 892	-31.9%
Of which ETS excl. aviation (ETS) ³⁾	-	-	-	26 476	25 266	15 796	17 219	15 078	-43.0%
- CO ₂ from domestic aviation (ETS) ³⁾	-	-	-	140	173	130	135	137	-2.2%
- Non-ETS (ESD) ³⁾	-	-	-	39 615	37 599	32 207	32 800	32 677	-17.5%
Emissions ceiling for non-ETS (ESD)	-	-	-	-	-	35 021	34 117	34 776	•
Over fulfillment for non-ETS (ESD)	-	-	-	-	-	2 814	1 317	2 099	•
Observed net emissions in total⁴⁾	75 229	81 877	74 390	70 681	62 020	51 766	54 657	50 863	-32.4%
Emissions from energy consumption	51 871	59 871	52 434	49 870	48 526	34 149	35 742	33 446	-35.5%
Energy and transformation sector	26 251	32 559	26 051	23 169	24 104	12 881	14 054	11 574	-55.9%
Final energy consumption	25 620	27 312	26 383	26 701	24 423	21 268	21 688	21 872	-14.6%
- Transport (incl. military)	10 922	12 398	12 670	13 965	13 614	12 920	13 220	13 514	23.7%
- Industry	5 431	5 918	5 927	5 446	4 419	3 833	3 909	4 025	-25.9%
- Commercial and public services and households, agriculture etc.	9 266	8 996	7 786	7 290	6 390	4 515	4 559	4 333	-53.2%
Industrial process, flaring etc.	2 860	3 600	4 788	3 641	2 479	2 220	2 444	2 393	-16.3%
Transient emissions and flaring	517	699	1 090	877	568	391	419	383	-25.8%
Industrial process	2 344	2 901	3 699	2 764	1 911	1 829	2 025	2 010	-14.3%
Emissions from agriculture	12 668	12 129	11 256	10 813	10 405	10 397	10 574	10 642	-16.0%
Animals digestion	4 039	3 967	3 631	3 483	3 631	3 667	3 717	3 731	-7.6%
Animal manure	2 523	2 796	3 034	3 167	2 800	2 609	2 571	2 528	0.2%
Agricultural land	5 485	4 825	4 319	3 937	3 814	3 939	4 067	4 160	-24.1%
Others (liming of soils etc.)	621	540	273	226	159	181	220	223	-64.1%
Other emissions	1 762	1 598	1 487	1 246	1 159	1 070	1 109	1 131	-35.8%
Waste deposit	1 536	1 331	1 073	909	772	653	619	593	-61.4%
Sewage treatment	150	158	126	120	111	118	115	118	-21.8%
Other waste (biomass gasification etc.)	75	109	288	217	276	299	374	421	458.9%
Forestry and land use⁵⁾	4 938	3 618	3 600	4 450	-1 018	3 632	4 502	2 971	-39.8%
Forestry ⁵⁾	- 543	- 552	- 563	560	-3 751	215	899	- 84	-84.6%
Land use ⁵⁾	5 480	4 170	4 163	3 890	2 733	3 417	3 603	3 054	-44.3%
Indirect CO₂-emissions	1 129	1 062	824	660	470	298	285	281	-75.1%

Note 1: This table only includes Denmark's emissions and removal of greenhouse gases. In the reported climate accounts in relation to Denmark's climate commitments under the Kyoto Protocol, if the second commitment period enters into force, information on credits that are part of the CO₂ removal under "Forestry and land use", and information on 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.

Note 2: After finalising calculations of emissions for 2017, DCE - Danish Centre for Environment and Energy adjusted upwards the area of organic lowlands. This affects emissions from LULUCF and agriculture. The updated area will be included in the 2018 emissions calculations by DCE - Danish Centre for Environment and Energy.

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 net 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	2018*	Change '90-'18
Observed emissions, total¹⁾	70 291	70 790	66 231	63 038	48 133	50 154	47 892	47 821	-32.0%
Adjusted emissions, total¹⁾	78 267	72 539	67 779	60 674	52 197	53 399	50 817	51 184	-34.6%

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.

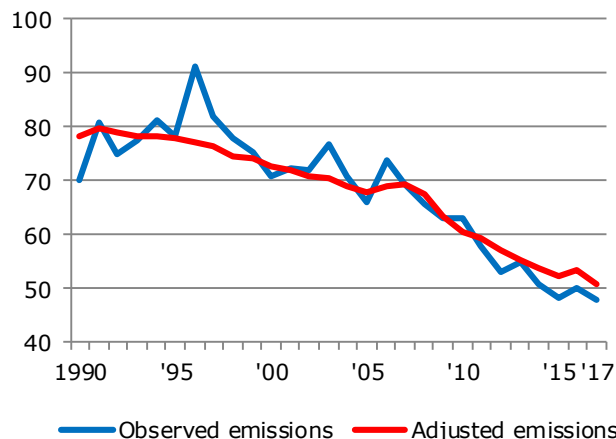
* The preliminary emissions statement for 2018 is solely based on CO₂ emissions from energy consumption and flaring as calculated in the Energy Statistics 2018. Total greenhouse gas emissions are calculated by assuming that all emissions other than CO₂ from energy consumption and flaring are constant at the values for 2017, 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.

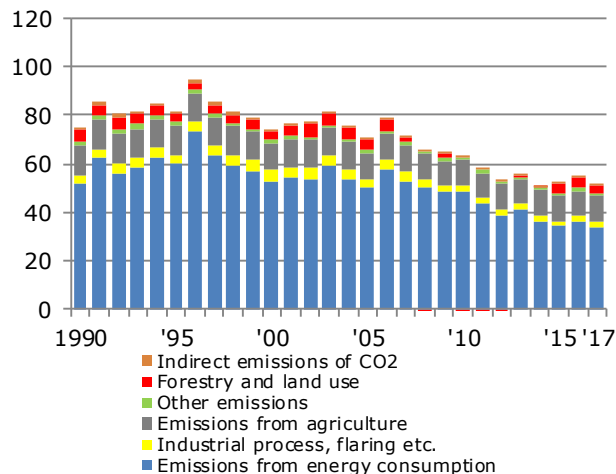
Observed emissions of greenhouse gases were 47.9 million tonnes of CO₂ equivalents in 2017, which is 4.5% less than in 2016.

Adjusted for climatic variations and fuel consumption linked to foreign trade in electricity, emissions of greenhouse gases were 50.8 million tonnes of CO₂ equivalents in 2017, which is 4.8% less than in 2016.

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

Observed net emissions of greenhouse gases by origin

Million tonnes CO₂ equivalents

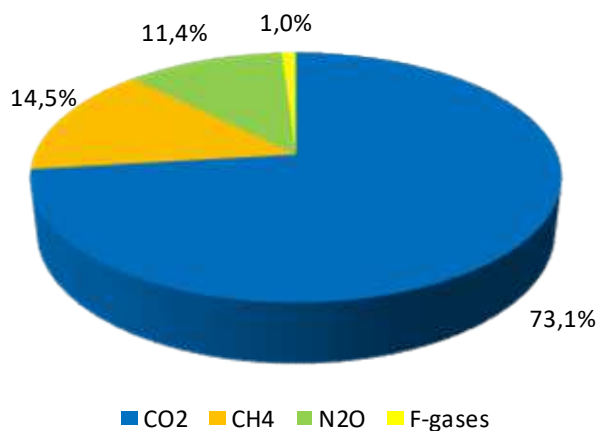


Emissions from energy consumption make the largest contribution to total net emissions of greenhouse gases. Such emissions derive from the energy and transformation sector as well as from final energy consumption. The second-largest contribution derives from agriculture (excl. energy consumption).

In 2017 observed emissions including CO₂ removals from forestry and land use were: Emissions from energy consumption 65.8%, emissions from agriculture 20.9%, industrial processes, flaring etc. 4.7% and other emissions 2.2% and indirect CO₂ emissions of 0.6%. CO₂ removals from forestry and land use corresponded to a deduction of 5.8% from observed emissions.

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

Observed emissions by type of greenhouse gases in 2017



The greenhouse gases included in the statement of total emissions contribute with different percentages. With 73.1%, CO₂ accounted for the largest part of total greenhouse gas emissions in 2017. With 14.5%, methane (CH₄) was the second-largest contributor to total emissions, followed by nitrous oxide (N₂O) with 11.4% and F-gases with 1.0%.

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 2016-2018

1000 tonnes	Observed CO ₂ emissions from energy consumption								
	Total			EU ETS			Non-EU ETS		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
Total	36 843	34 582	34 511	15 852	13 640	13 306	20 991	20 942	21 205
Energy sector	2 072	2 150	1 872	2 072	2 150	1 872	-	-	-
Transformation sector	11 968	9 401	9 432	11 471	9 054	9 051	496	347	380
Final energy consumption	22 803	23 030	23 206	2 308	2 436	2 382	20 495	20 595	20 824
Transport*	14 896	15 226	15 560	95	91	87	14 801	15 135	15 473
Agriculture and industry	5 035	5 045	4 933	2 213	2 345	2 296	2 822	2 700	2 638
- agriculture, forestry and horticulture	1 178	1 084	1 066	6	18	15	1 172	1 066	1 052
- manufacturing	3 080	3 177	3 096	2 207	2 327	2 281	873	851	815
- other industry	777	784	771	-	-	-	777	784	771
Commercial and public services	638	645	636	-	-	-	638	645	636
Households	2 234	2 115	2 077	-	-	-	2 234	2 115	2 077

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

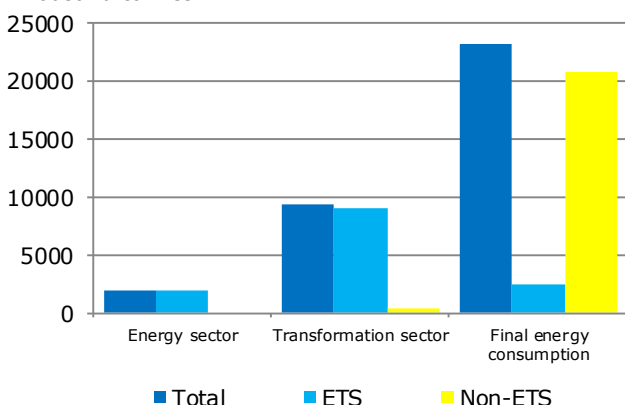
Note 2: The table does not include emissions from industrial processes and flaring.

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 2018, 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, 7% is covered by the EU ETS. In this context, almost all emissions can be attributed to manufacturing industries.

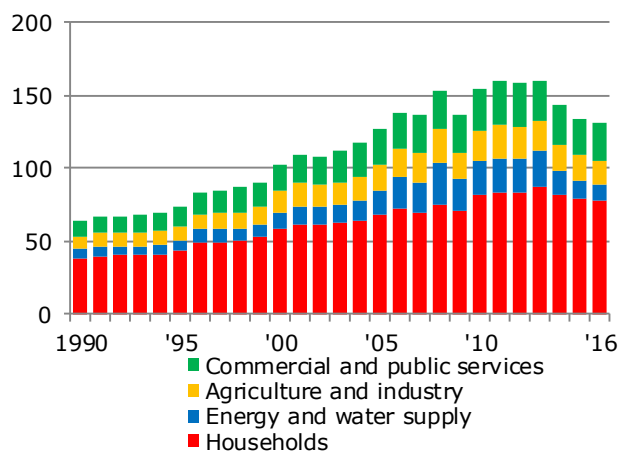
Total observed emissions of greenhouse gases, EU ETS and non-EU ETS sectors

1000 tonnes CO ₂ equivalents	Total	EU ETS, from energy consumption	EU ETS, from industries and flaring	Non-EU ETS
2017	47 892	13 653	1 530	32 709
2018	47 821	13 356	1 497	32 968

Note: The preliminary emission statement for 2018 is solely based on the CO₂ emissions from energy consumption and flaring as stated in the Energy statistics 2018. DCE's emission statement for 2017 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 2017 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.

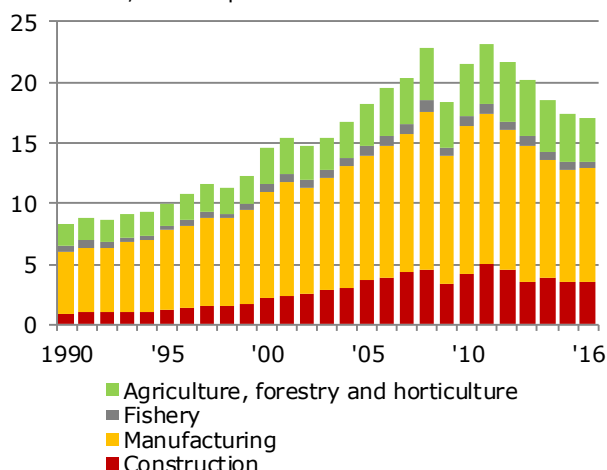
Total energy expenses by industry and households amounted to DKK 130.8 billion in 2016, which is 2.5% less than the year before. For households energy expenses were DKK 76.9 billion; for agriculture and industry (excluding oil refineries) expenses were DKK 17.1 billion; while for commercial and public 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. Due to restructuring and quality assurance of the system for calculating the economic energy accounts, Statistics Denmark's most recently published figures for energy expenses in the corporate sector and households are from 2016.

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 0.6 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 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.

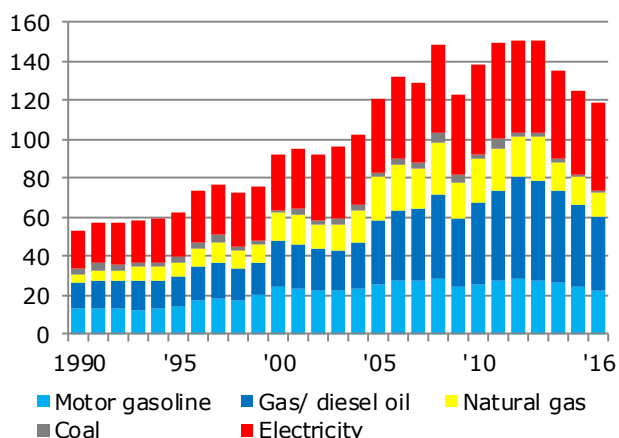
Of these fuels, the greatest share of energy expenses in 2016 was attributable to electricity (DKK 45.4 billion). Gas/diesel oil accounted for the second-largest share (DKK 37.6 billion). Seen over the period 1990-2016, electricity expenses usually accounts for the largest share.

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

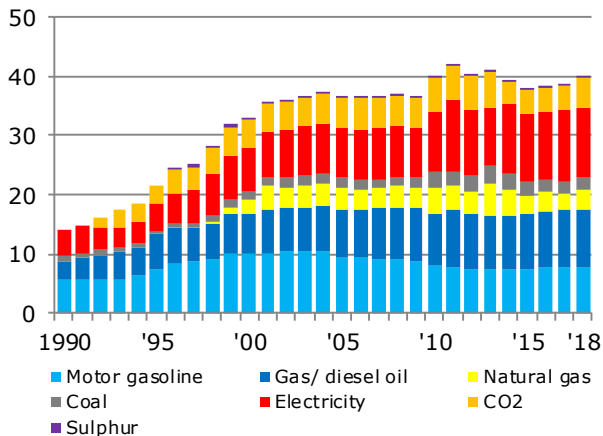
Energy expenses by fuel

Billion DKK, current prices



Revenue from energy, CO₂ and sulphur taxes

Billion DKK, current prices



In 2018, revenues from energy taxes calculated in current prices were DKK 39.9 billion, which is an increase of 3.8% compared with 2017. In addition to energy taxes, revenues include CO₂ and sulphur taxes. The largest contributions to revenues in 2018 are from electricity (DKK 12.1 billion), gas/diesel oil (DKK 10.0 billion), motor gasoline (DKK 7.5 billion) and CO₂ taxes (DKK 5.0 billion).

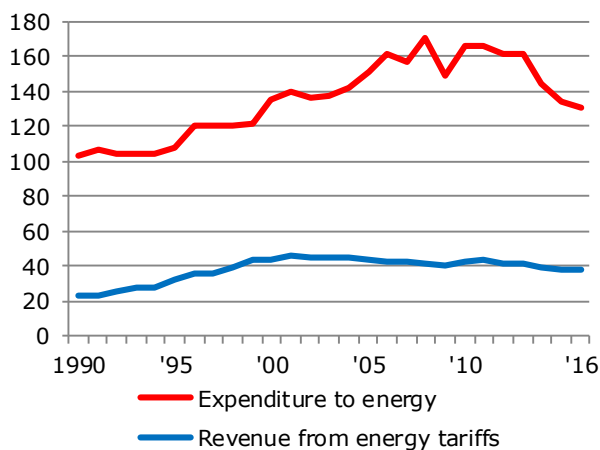
The 2018 revenues in current prices increased by 186% compared with 1990, when there were no CO₂ and sulphur taxes. Gas/diesel oil, electricity and motor gasoline have seen growths of 219%, 181% and 33.4%, respectively, since 1990.

In 2017 and 2018, energy, CO₂ and sulphur taxes amounted to 3.8% and 3.9%, respectively, of total tax and VAT revenues in Denmark.

Source: Statistics Denmark

Energy expenditures and tax revenues, fixed prices

Billion DKK, 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.

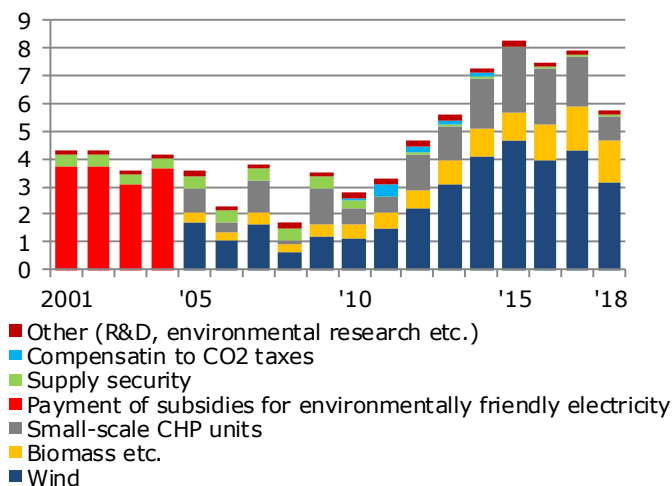
Measured as 2016 prices, energy expenses in 2016 were 2.8% lower than in the previous year. Compared with 1990, energy expenses have increased by 27.4%.

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

Billion DKK, current prices

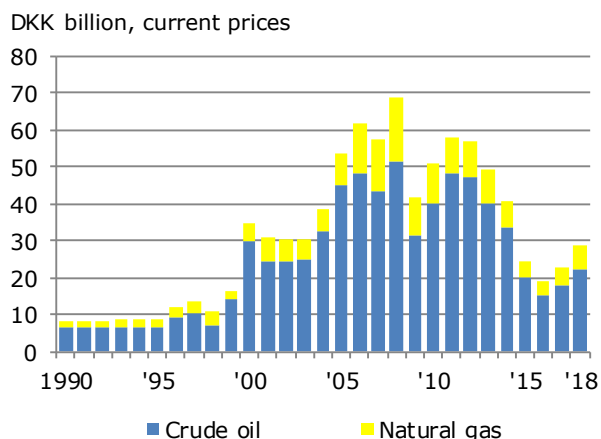


Total expenses for Public Service Obligations (PSO) were DKK 5.8 billion in 2018, compared with DKK 7.9 billion the year before. The decrease in PSO expenses from 2017 to 2018 is attributable in particular to a decrease in wind power production and electricity from small-scale CHP units.

For 2018, total funding support for environmentally friendly electricity production was DKK 5.6 billion, divided between DKK 3.2 billion for wind power, DKK 0.9 billion for small-scale CHP and DKK 1.5 billion for biomass etc.

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

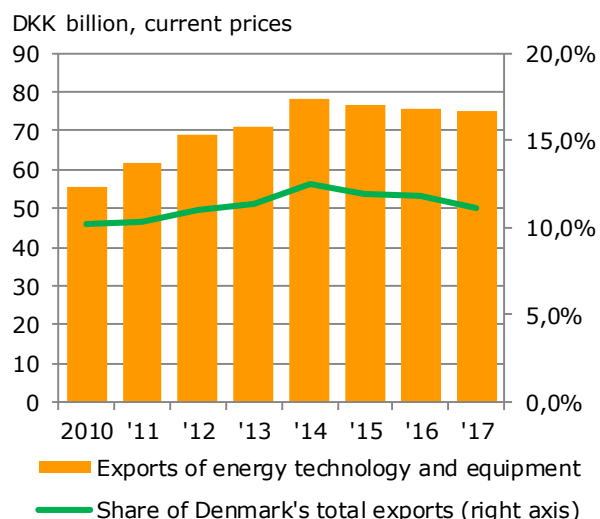


The value of the crude oil and natural gas produced from the North Sea in 2018 was DKK 28.6 billion, compared with DKK 23.0 billion the previous year. The value of crude oil rose from DKK 17.9 billion to DKK 22.1 billion, and the value of natural gas rose from DKK 5.1 billion to DKK 6.5 billion.

The value of the North Sea production depends on the scale of production as well as on world market prices. In 2018, the production of crude oil and natural gas rose by more than the production value. Production of crude oil and natural gas fell by 15.9% and 14.9% respectively, in 2018.

Source: Danish Energy Agency.

Exports of energy technology and equipment



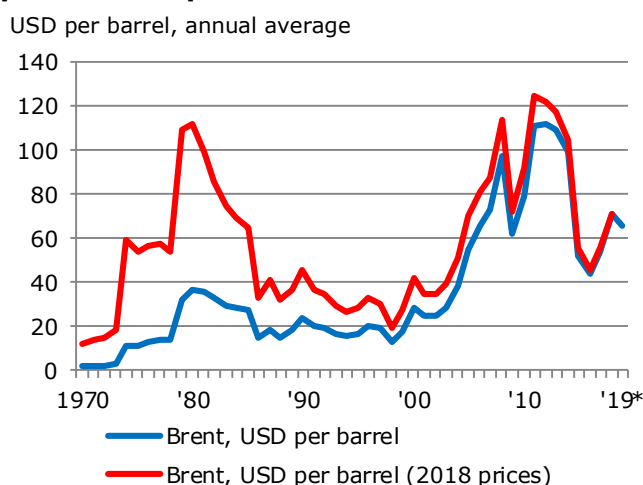
Exports of energy technology and equipment such as wind turbines, district heating pipes, thermostat valves, pumps etc. increased rapidly up to the year 2014.

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. An updated version of the publication is expected at the end of 2019.

Source: Eksport af energiteknologi og -service 2017

Spot market prices for crude oil



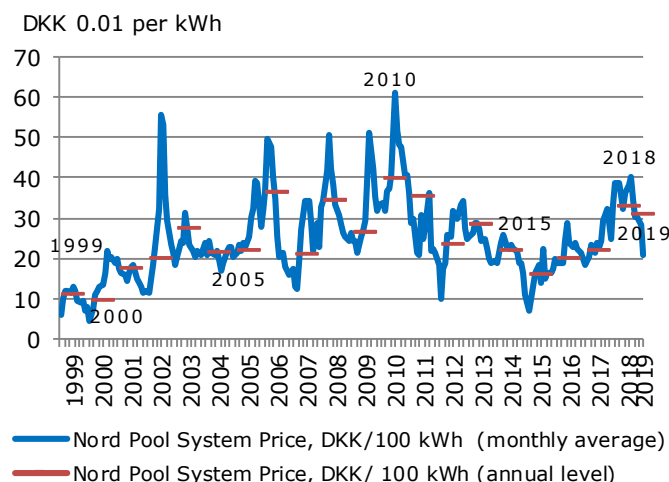
The average crude oil price was USD 71 per barrel in 2018. This is a relatively high price compared with the level in the mid-1980s and 20 years onwards, but it is a relatively low price compared with the level just before and during the economic crisis in 2008 and the period from 2011 to mid-2014.

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 2019)

*Prices for 2019 cover only the first six months.

Spot market prices for electricity



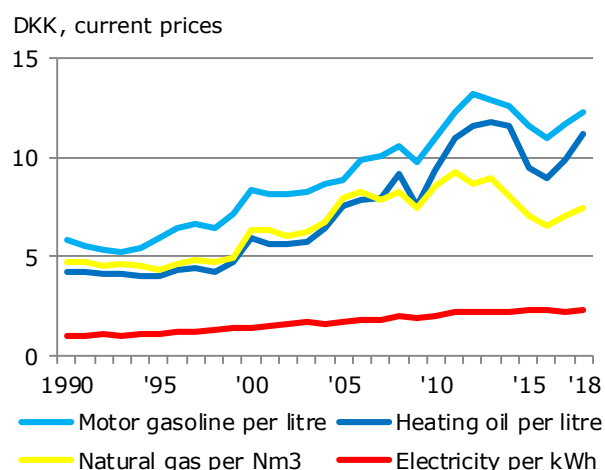
The system price of electricity on Nord Pool is set hour by hour on the basis of supply and demand. The price is affected by a number of factors, including precipitation and temperature. For example, the winter 2010/2011 was affected by concerns over water shortages and increasing electricity consumption 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 0.33 in 2018 compared with DKK 0.22 in 2017.

In the first half of 2019, the average system price was DKK 0.31 per kWh.

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 11.22 per litre in 2018, as opposed to DKK 9.88 per litre the year before, corresponding to a rise of 13.6%. In the period 1990-2018 the price increased by 165%.

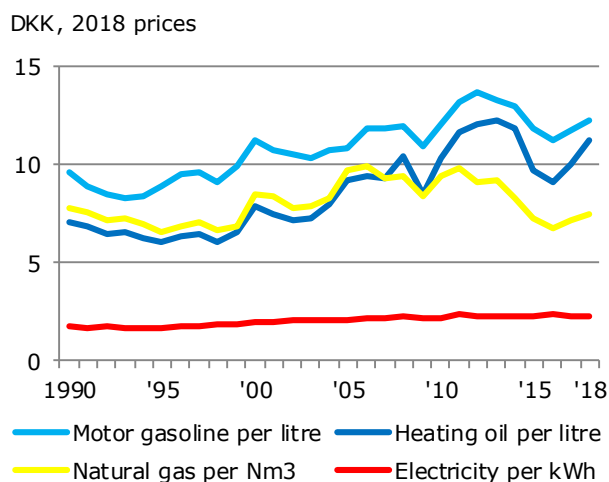
The price of natural gas for households was DKK 7.51 per Nm³ in 2018, compared with DKK 7.07 per Nm³ the year before, corresponding to a rise of 6.2%.

The price of a litre of motor gasoline was DKK 12.26 in 2018, compared with DKK 11.69 in 2017, corresponding to a rise of 4.9%. The increase in price is attributable to a higher price of crude oil in 2018 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 2.33 per kWh in 2018, compared with DKK 2.25 in 2017, corresponding to an increase of 3.4%.

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

Energy prices for households



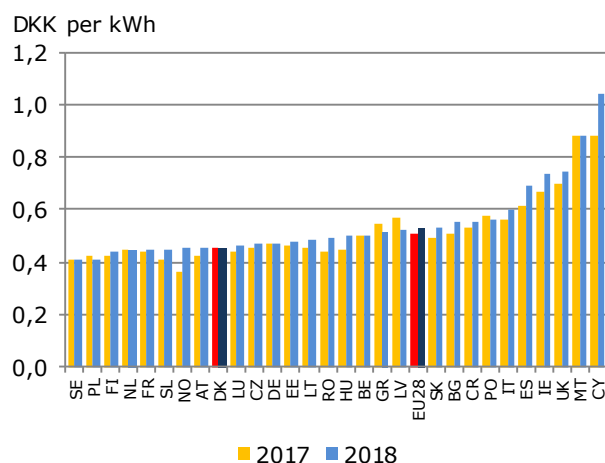
Household energy prices have been calculated at 2018 prices by adjusting current prices for changes in the general price level as stated in the consumer price index. Measured in 2018 prices, the price per litre of motor gasoline has risen 4.1% in 2018 compared with 2017.

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 2018 it was DKK 11.22 per litre, which is 12.7% higher than in 2017. The price of natural gas was DKK 7.51 per Nm³ in 2018, which is 5.4% higher than the year before. The price of electricity in 2018 prices was 2.6% higher in 2018 than the year before.

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

ENERGY PRICES

Electricity prices for industrial customers



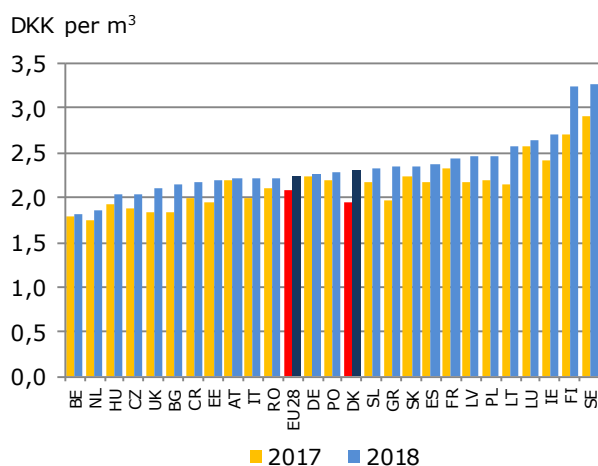
Electricity prices are shown in current prices (DKK per kWh) exclusive of taxes for industry customers with an annual consumption between 2 - 20 GWh.

In 2018, the price of electricity per kWh varied in the EU Member States (EU28) from DKK 0.41 in Sweden to DKK 1.04 in Cyprus. Norway had an electricity price of DKK 0.45 per kWh.

In 2018 the Danish electricity price was DKK 0.46 per kWh. This was 13.7% lower than the average price in EU28, which was DKK 0.53 per kWh. The Danish electricity price was unchanged in 2018 compared with the year before. In EU28, the average electricity price rose by 4.0% between 2017 and 2018.

Source: Eurostat

Natural gas prices for industrial customers



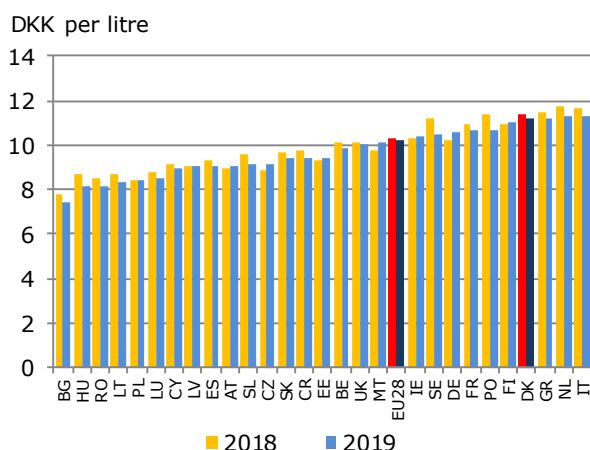
Natural gas prices are shown in current prices (DKK per m³) exclusive of taxes for industry customers with an annual consumption of 10 TJ to 100 TJ.

In 2018, the price of natural gas per m³ varied in the EU28 Member States from DKK 1.82 in Belgium to DKK 3.27 in Sweden. The Danish price in 2018 was DKK 2.31, while the average EU28 price was DKK 2.23.

In 2018, the Danish price of natural gas was 17.9% higher than in 2017, while the average EU28 price was 7.0% higher compared to the year before.

Source: Eurostat

Motor gasoline prices

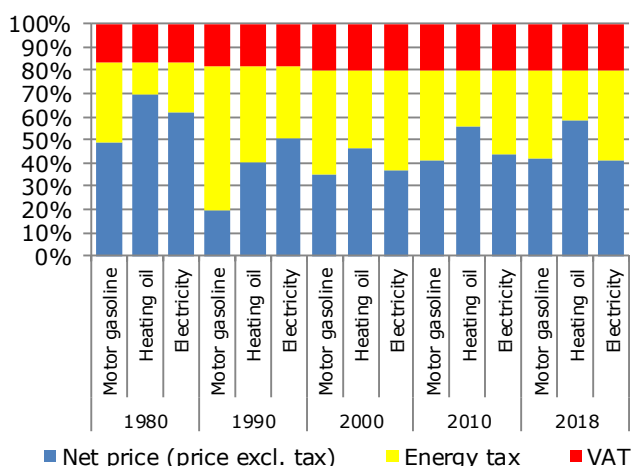


The price of motor gasoline in week 1 in 2018 and 2019, respectively, are shown in current prices (DKK per litre). Prices are for motor gasoline 95 unleaded, including taxes. The average for the EU28 Member States is a weighted average.

In 2019, the lowest price, DKK 7.45 per litre, was in Bulgaria, while the highest price, DKK 11.32, was in Italy. In Denmark, the price per litre was DKK 11.19, while the average price in EU28 was DKK 10.18 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.

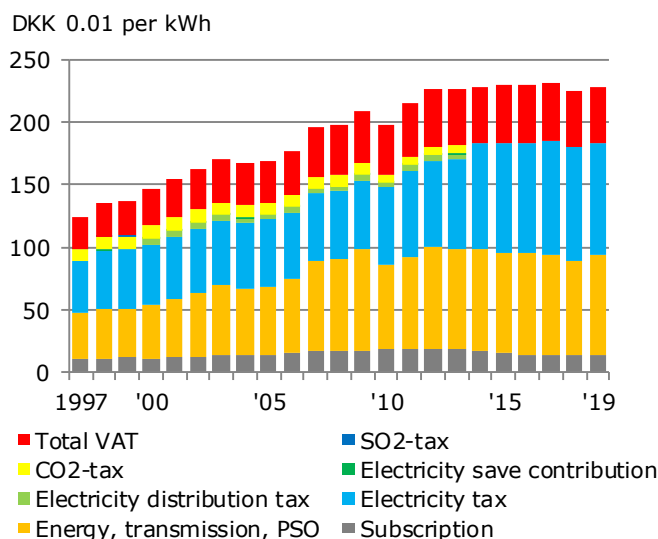
The price of motor gasoline in 2018 of DKK 12.26 per litre was made up as follows: Price exclusive of taxes and VAT 42.4%, taxes 37.6% and VAT 20.0%.

The price of heating oil in 2018 of DKK 11.22 per litre was made up as follows: Price exclusive of taxes and VAT 58.1%, taxes 21.9% and VAT 20.0%.

The price of electricity in 2018 of DKK 2.33 per kWh was made up as follows: Price inclusive of PSO and exclusive of taxes and VAT 40.8%, taxes 39.2% and VAT 20.0%.

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

Electricity prices for households 1997-2019 (as of 1 January), consumption of 4000 kWh



At the beginning of 2019, the average price of electricity for household customers with an annual consumption of 4,000 kWh was DKK 2.28 per kWh, which constitutes a slight increase of 1.2% from the year before. The price of electricity has increased by 47.8% since 2001.

Total tax revenues for the state per kWh in 2019 were DKK 1.34 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 0.79 in 2019, as opposed to DKK 0.46 in 2001, while subscription costs per kWh were DKK 0.15 as opposed to DKK 0.13 in 2001.

Source: Danish Energy and Danish Utility Regulatory

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 26 euros in June 2019.

Source: Point Carbon and European Energy Exchange

Energy consumption in EU28 and other countries 2017 - 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	
Latvia	191	34	22	1	0	43 (39)	1	0
Sweden	2113	22	2	4	32	41 (54)	2	-3
Finland	1420	26	6	8	16	35 (41)	1	5
Denmark	762	39	15	9	0	33 (36)	2	2
Austria	1441	36	23	9	0	29 (33)	2	2
Croatia	371	39	28	4	0	21 (27)	0	7
Lithuania	309	39	26	2	0	21 (26)	0	10
Portugal	1004	44	23	13	0	20 (28)	1	-1
Estonia	241	4	7	0	0	18 (29)	1	-4
Italy	6678	35	39	6	0	18 (18)	1	2
Romania	1400	29	29	16	9	18 (24)	0	-1
Slovenia	284	34	11	17	22	16 (22)	1	-1
EU28	70126	35	24	14	13	14 (18)	1	0
Germany	13489	35	23	22	6	13 (15)	1	-1
Spain	5491	44	21	10	12	13 (18)	0	1
Greece	1015	49	17	20	0	12 (16)	0	2
Hungary	1117	28	32	8	15	11 (13)	1	4
Czech Republic	1818	22	17	36	16	10 (15)	1	-3
France	10717	31	15	4	41	10 (16)	1	-1
Bulgaria	791	24	15	32	21	10 (19)	0	-2
UK	7765	39	37	5	8	10 (10)	1	1
Slovakia	722	21	24	20	23	9 (11)	1	2
Ireland	614	49	29	7	0	9 (11)	1	0
Poland	4399	29	15	47	0	8 (11)	1	0
Belgium	2371	40	26	5	19	7 (9)	1	1
Cyprus	107	93	0	0	0	7 (10)	1	0
Luxembourg	182	64	16	1	0	6 (6)	1	12
Netherlands	3278	41	39	12	1	5 (7)	1	0
Malta	35	57	29	0	0	5 (7)	0	9
Norway	1281	38	15	3	0	47 (71)	1	-4
USA	90235	45	30	15	10	8	0	0
Japan	18088	37	23	27	2	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 2017

	Consumption of renewable energy and waste, PJ	Share in percentage					
		Hydro	Wind	Solar	Geo- thermal	Biomass, incl. waste	Biofuels
Latvia	81	19.5	0.7	0.0	0.0	79.3	0.6
Sweden	876	26.8	7.2	0.1	0.0	50.6	8.0
Finland	493	10.8	3.5	0.0	0.0	77.2	3.8
Denmark	250	0.0	21.3	2.0	0.1	69.0	4.0
Austria	416	33.2	5.7	2.9	0.4	50.6	3.1
Croatia	79	24.1	5.5	1.0	0.4	68.9	0.0
Lithuania	65	3.3	7.5	0.4	0.0	84.9	4.0
Portugal	202	10.5	21.8	3.6	4.1	54.7	5.3
Estonia	44	0.2	5.9	0.0	0.0	93.8	0.0
Italy	1207	10.8	5.3	8.0	19.1	41.0	6.7
Romania	253	20.6	10.5	2.7	0.7	60.6	4.9
Slovenia	45	30.8	0.0	3.3	4.5	57.2	3.4
EU28	9775	11.1	13.3	6.2	2.9	54.7	7.0
Germany	1788	4.1	21.3	9.5	0.6	55.4	6.8
Spain	715	9.5	24.7	19.6	0.1	35.1	7.5
Greece	122	11.7	16.3	21.1	0.3	34.8	6.1
Hungary	124	0.6	2.2	1.4	4.5	85.8	3.5
Czech Republic	189	3.6	1.1	4.6	0.0	81.0	7.1
France	1113	16.2	8.0	3.7	1.6	49.2	12.6
Bulgaria	82	12.5	6.6	7.4	1.8	58.8	8.8
UK	764	2.8	23.6	5.7	0.0	56.4	5.2
Slovakia	67	23.4	0.0	3.1	0.5	63.5	11.1
Ireland	55	4.5	48.5	1.0	0.0	32.8	7.7
Poland	373	2.5	14.4	0.8	0.3	74.7	6.3
Belgium	171	0.6	13.7	7.5	0.0	64.9	12.0
Cyprus	7	0.0	10.9	51.1	0.9	31.2	2.1
Luxembourg	11	2.7	7.4	4.2	0.0	43.0	0.0
Netherlands	179	0.1	21.3	5.1	1.7	59.9	9.4
Malta	2	0.0	0.0	45.5	0.0	9.2	22.0
Norway	607	84.1	1.7	0.0	0.0	8.0	3.5
USA	6801	16.0	13.6	5.1	5.7	34.9	24.6
Japan	971	30.7	2.4	21.4	9.7	34.0	1.8

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

Key figures 2017 – 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	2017
Estonia	100	0	0	183	91	454	317
Denmark	87	97	158	133	107	92	69
Romania	76	36	89	71	49	443	206
Sweden	73	0	0	211	137	164	123
UK	64	62	53	118	85	149	88
Czech Republic	63	1	3	172	101	360	239
Bulgaria	62	1	2	111	58	766	426
Poland	61	3	23	116	78	364	232
Latvia	57	0	0	98	86	315	213
Netherlands	53	3	107	192	123	164	129
Finland	53	0	0	258	192	211	173
Slovenia	52	0	1	137	99	231	173
France	52	1	0	160	93	147	119
Croatia	47	20	49	89	70	240	186
EU28	45	11	26	137	92	159	121
Hungary	42	9	17	114	79	312	230
Slovakia	37	0	3	133	86	423	211
Germany	36	2	8	163	111	146	111
Austria	36	6	13	164	136	115	105
Ireland	33	0	66	128	103	115	55
Greece	31	1	0	94	65	165	141
Belgium	26	0	0	209	133	208	162
Spain	26	0	0	118	76	150	121
Lithuania	24	2	0	108	79	398	210
Italy	23	7	7	110	80	113	101
Portugal	22	0	0	97	67	156	137
Cyprus	5	0	0	125	91	187	144
Luxembourg	4	0	0	307	297	119	90
Malta	4	0	0	75	57	272	302
Norway	698	681	2 340	244	150	95	84
USA	92	49	100	277	196		
Japan	10	0	3	143	97		

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

Reserves, production, stocks and consumption of oil by regions

	1990	2000	2005	2010	2015	2016	2017	2018	Change '90 - '18
Oil reserves¹⁾, 1000 million barrels									
The world	1027	1300	1377	1642	1684	1692	1728	1730	68.4%
North America	125	232	224	222	227	228	238	237	88.7%
South and Central America	72	98	103	322	324	324	324	325	354%
Europe and Eurasia	76	141	139	158	155	158	158	159	109%
Middle East	660	697	756	766	803	808	834	836	26.8%
Africa	59	93	111	125	126	126	125	125	113%
Asia and the Pacific	36	39	43	50	49	48	48	48	33.0%
Oil production, million tonnes									
The world	3 158	3 597	3 931	3 977	4 355	4 368	4 380	4 474	41.7%
North America	655	643	638	639	910	881	919	1 027	56.9%
South and Central America	234	345	375	379	398	379	367	335	43.2%
Europe and Eurasia	788	728	849	859	848	860	861	872	10.6%
Middle East	837	1 129	1 222	1 210	1 412	1 500	1 478	1 490	77.9%
Africa	318	372	465	487	387	364	386	389	22.3%
Asia and the Pacific	326	382	383	403	401	384	369	362	11.0%
Oil stocks*), million tonnes									
The OECD	217	212	209	216	224	226	215	215	-0.8%
North America	90	75	78	84	87	87	83	84	-6.8%
Europe	106	110	108	109	113	115	108	106	0.2%
Pacific	22	27	22	22	24	24	24	26	19.3%
Oil consumption, million tonnes									
The world	3 162	3 587	3 931	4 086	4 343	4 422	4 477	4 529	43.2%
North America	923	1 061	1 130	1 045	1 047	1 058	1 062	1 077	16.6%
South and Central America	178	237	251	300	328	318	316	316	76.9%
Europe and Eurasia	1 135	933	966	916	878	900	911	908	-20.0%
Middle East	166	239	296	357	402	402	397	396	138%
Africa	96	118	138	164	181	182	185	184	92.5%
Asia and the Pacific	663	999	1 151	1 304	1 506	1 562	1 606	1 648	149%
Total energy consumption, Mtoe									
The world	8 116	9 357	10 888	12 100	13 046	13 229	13 475	13 865	70.8%
North America	2 280	2 698	2 772	2 710	2 736	2 737	2 755	2 832	24.2%
South and Central America	333	477	533	627	695	691	700	702	111%
Europe and Eurasia	3 209	2 820	2 979	2 968	2 865	2 909	2 941	2 981	-7.1%
Middle East	259	413	549	710	844	865	881	902	248%
Africa	223	273	326	384	430	439	449	462	107%
Asia and the Pacific	1 812	2 675	3 729	4 702	5 476	5 587	5 748	5 986	230%
Oil consumption - total share of energy consumption, %									
The world	39	38	36	34	33	33	33	33	
North America	40	39	41	39	38	39	39	38	
South and Central America	54	50	47	48	47	46	45	45	
Europe and Eurasia	35	33	32	31	31	31	31	30	
Middle East	64	58	54	50	48	47	45	44	
Africa	43	43	42	43	42	41	41	40	
Asia and the Pacific	37	37	31	28	27	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 2018

Billion barrels



At the end of 2018, the world's total proved oil reserves totalled 1730 billion barrels.

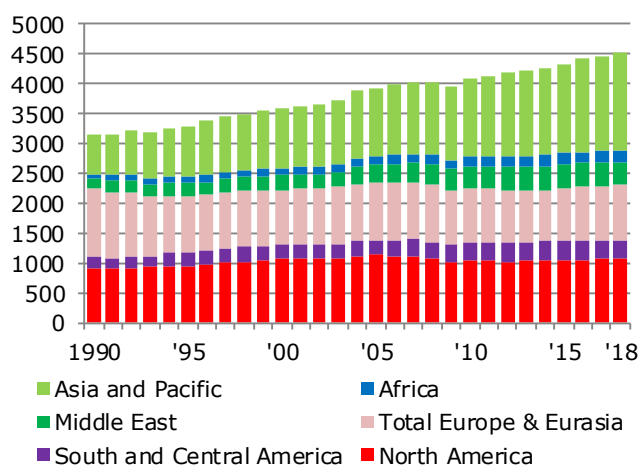
Of which, 48.3% of crude oil reserves are in the Persian Gulf region, where the fields are relatively large and geologically easily accessible, which means production costs are low.

Comparing proved regional oil reserves with actual regional oil production (reserves-to-production ratio, R/P), shows that Europe and Eurasia have reserves for 19.6 years' unchanged production, while North America has reserves for 28.7 years. The R/P ratio for total world oil reserves is 50.0 years' unchanged production. However, new oil reserves are being discovered continually, and for 2018 oil reserves are almost unchanged compared with 2017.

Source: BP Statistical Review of World Energy

Oil consumption by region

Million tonnes



In 2018, total world oil consumption was 4.529 billion tonnes, which is 1.2% more than the year before. A total of 23.8% of this oil was consumed in North America, which accounted for 23.0% of the world's crude oil production. Europe & Eurasia accounted for 21.5% of oil consumption and 19.5% crude oil production. Neither North America nor Europe & Eurasia are self-sufficient in oil, as their consumption is greater than their production.

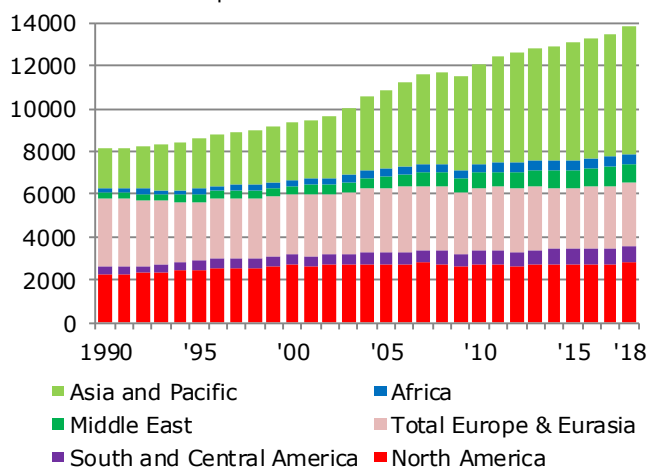
Asia and the Pacific's share of consumption was 36.4% in 2018, the Middle East's share was 8.7%, South and Central America's share was 7.0%, while Africa's share was 4.1%.

Total world oil consumption in 2018 was 32.7% of total world energy consumption compared with 33.2% in 2017. For Europe & Eurasia, this figure was 30.5% compared with 31.0% in 2017.

Source: BP Statistical Review of World Energy

Energy consumption by region

Million tonnes oil equivalents



World energy consumption was 13.865 billion tonnes oil equivalents in 2018, which is 2.9% higher than in 2017. Except for in 2009, world consumption increased steadily over the period 1990-2018. 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 2018. In North America and South and Central America, the increase was 2.8% and 0.3% respectively.

The largest percentage increase in energy consumption from 2017 to 2018 was in the Asia and Pacific region, where energy consumption went up 4.1% and accounts for 43.2% of total world energy consumption.

In 2018, energy consumption increased by 1.4% in Europe and Euroasia, which accounts for 21.5% 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	<p>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.</p> <p>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.</p>
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	1990	2000	2005	2010	2015	2016	2017	2018	'90-'18
Energy intensity, gross energy consumption [TJ per million GDP]	0.636	0.500	0.474	0.450	0.393	0.390	0.382	0.381	-40.1%
Energy intensity, final energy consumption [TJ per million GDP]	0.469	0.388	0.372	0.350	0.321	0.318	0.315	0.314	-33.0%
Gross energy consumption per capita [GJ]	160	157	157	147	134	135	134	135	-15.2%
Final energy consumption per capita [GJ]	118	122	123	114	109	110	111	111	-5.2%
Degree of self-sufficiency [%]	52	139	154	120	89	83	85	75	44.9%
Oil consumption - share of gross energy consumption [%]	43	45	41	38	37	36	37	37	-14.9%
Renewable energy - share of gross energy consumption [%]	5.8	9.6	14.5	20.0	28.8	29.3	32.8	33.0	465%
Refinery capacity [million tonnes per year]	9.0	9.2	9.0	9.0	9.0	9.0	9.0	9.0	•
Electricity capacity [MW]	9 124	12 598	13 088	13 450	13 995	14 228	14 321	15 073	65.2%
Wind turbine capacity – share of total electricity capacity [%]	3.6	19.0	23.9	28.3	36.3	36.9	38.3	40.6	1037%
Net electricity import - share of domestic supply [%]	22.5	1.9	3.8	-3.2	17.5	14.8	13.3	15.1	•
CHP production - share of total thermal electricity production [%]	37	56	64	61	79	69	75	71	91.8%
CHP production - share of total district heating production [%]	59	82	82	77	66	66	68	66	12.6%
Renewable electricity - share of total domestic electricity supply [%]	2.6	15.9	27.4	34.8	56.0	54.1	64.1	60.5	2228%
CO ₂ emission per capita [tonnes]	11.9	10.4	9.7	8.5	7.0	7.0	6.5	6.6	-44.9%
CO ₂ emissions per GDP [tonnes per million GDP]	47	33	29	26	20	20	19	18	-61.0%
CO ₂ emissions per fuel unit [kilogram per GJ]	75	66	62	58	52	52	49	48	-35.0%
CO ₂ emissions per kWh electricity sold [gram per kWh]	928	632	537	505	348	369	290	306	-67.0%
CO ₂ emissions per consumed unit of district heating [kilogram per GJ]	62	43	39	33	32	30	26	26	-58.6%

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 2018

	Calorific values	CO ₂ emissions factors
	GJ/ton	Kg/GJ
Crude oil/ North Sea	43.00	
Refinery feedstocks	42.70	
Refinery gas	52.00	57.11
LPG	46.00	63.10
LVN	44.50	73.30
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	78.88
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	39.59	56.89
Gas works gas/1000 m ³	20.82	-
Coal in electricity plants	24.13	94.37
Other hard coal	26.64	94.37
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)	39.59	-
Waste	10.60	42.50
Biodiesel	37.50	-
Bioethanol	26.70	-
Bio oil	37.20	-

Climate adjustments

	Degree days	
Year	Specific year	Normal year
2011	2970	3156
2012	3234	3166
2013	3207	3155
2014	2664	3131
2015	2921	3112
2016	2998	3070
2017	2970	3057
2018	2900	3041

Tax rates in 2018

	Energy taxes	CO ₂ taxes
Transport		
Motor gasoline (DKK 0.01 per l)	505.3	41.6
Light diesel oil (DKK 0.01 per l)	305.4	46.0
Low-sulphur diesel oil (DKK 0.01 per l)	421.6	39.5
Other uses		
LPG (DKK 0.01 per l)	184.8	27.9
Other kerosene (DKK 0.01 per l)	199.2	46.0
Heating diesel oil (DKK 0.01 per l)	199.2	46.0
Fuel oil (DKK 0.01 per kg)	225.7	54.9
Petroleum coke (DKK 0.01 per l)	199.2	46.0
Natural gas (DKK 0.01 per Nm ³)	219.9	39.1
Electricity plant coal (DKK per tonne)	1555	460.7
Coke (DKK per tonne)	1833	525.8
Brown coal (DKK per tonne)	1056	312.6
Electricity (DKK 0.01 per kWh)	91.4	
Electricity for space heating ¹⁾ (DKK 0.01 per kWh)	25.7	

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

Source: Ministry of Taxation

Volume weights in 2018

	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

Please find:

Energy Statistics 2018

- Publications as pdf
- Figures in PowerPoint
- Time series and tables
- Denmark's energy flows 2018

Data

- Monthly energy statistics
- Wind turbine data

Maps

- Electricity generation and transmission
- Heat supply

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