



Danish Energy
Agency

2021

Data, tables, statistics and maps
Energy Statistics 2021

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 1972-2021.

Descriptions of methods and revisions are also available here.

The website also includes the numeric basis of all graphs and tables in the printed version as well as a PowerPoint presentation (ppt) of the graphs.

Note

Briquettes

Wood briquettes have been included in firewood, households since 2013.

LNG

LNG (liquefied natural gas) distribution between freight and passenger transport follows the fuel gas/diesel.

Electricity

The Danish Energy Agency's data supplier for the electricity statistics, Energinet (the Danish TSO), is reorganising its databases on electricity production and consumption. This means there is some uncertainty in the electricity balance.

Natural Gas

Data collection for the gas balance has changed from 2021. The collection unit is now kWh and not Nm³. Transition from 2020 to 2021 should be interpreted with caution.

Border trade

The Danish Ministry of Taxation provides the estimate for border trade of motor gasoline and diesel. It is based on 2016 data.

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Energy Statistics 2021

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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 in 2021

Energy Statistics 2021 shows an increase in energy consumption following the large drop in 2020 as a consequence of the COVID-19 pandemic.

Energy consumption by sector

The final adjusted gross energy consumption increased by 2.4%.

The total climate-adjusted energy consumption of the *agriculture and industry sector* was 4.3% higher in 2021 than the year before. Energy consumption by *manufacturing industries* increased by 5.1%. In *commercial and public services* climate adjusted energy consumption was 6.0% higher in 2021 than in 2020, while climate-adjusted consumption by households fell by 1.8%.

Energy consumption for *transport* rose by 4.1% overall in 2021 relative to the previous year. Energy consumption for road transport rose by 1.8% and for aviation by 27.4%.

Observed energy consumption increased in 2021

The observed energy consumption decreased to 705 PJ in 2021; a decrease of 7.4%. Following the drop in energy consumption in 2020, there was a rise in coal and coke consumption of 33.2%, a rise in oil products of 3.3% and a rise in the consumption of renewable energy of 13.5%.

Adjusted gross energy consumption rose 3.3%

Besides *observed energy consumption*, the Danish Energy Agency calculates *adjusted gross energy consumption*, which is adjusted for fuel linked to foreign trade in electricity and climatic variations in relation to a normal temperature year. The purpose of the adjusted calculations is to illustrate the trends underlying the development. *Adjusted gross energy consumption* was 729 PJ in 2021, which is 3.3% above the 2020 level. Compared with 1990, adjusted gross energy consumption has decreased by 11.0%. Coal

and

coke account for the largest drop at 81%, while renewable energy, which began from a low start point, accounted for the largest increase.

Share of RE in electricity supply

In 2021, electricity from renewables accounted for 71.9% of Danish domestic electricity supply, compared to 68.0% in 2020. Wind power accounted for 43.6%. Biomass accounted for 22.0% and solar energy, hydro and biogas accounted for the remaining 6.2%.

Energy production

The Danish production of crude oil has seen a decrease of 8.1% in 2021. Production of renewable energy etc. increased by 5.1%.

Increase in consumption of renewable energy

Consumption of renewable energy increased from 259 PJ in 2020 to 295 PJ in 2021, which corresponds to an increase of 13.5%. The development is primarily due to an increase in the consumption of wood chips of 19 PJ and biogas consumption of 5 PJ.

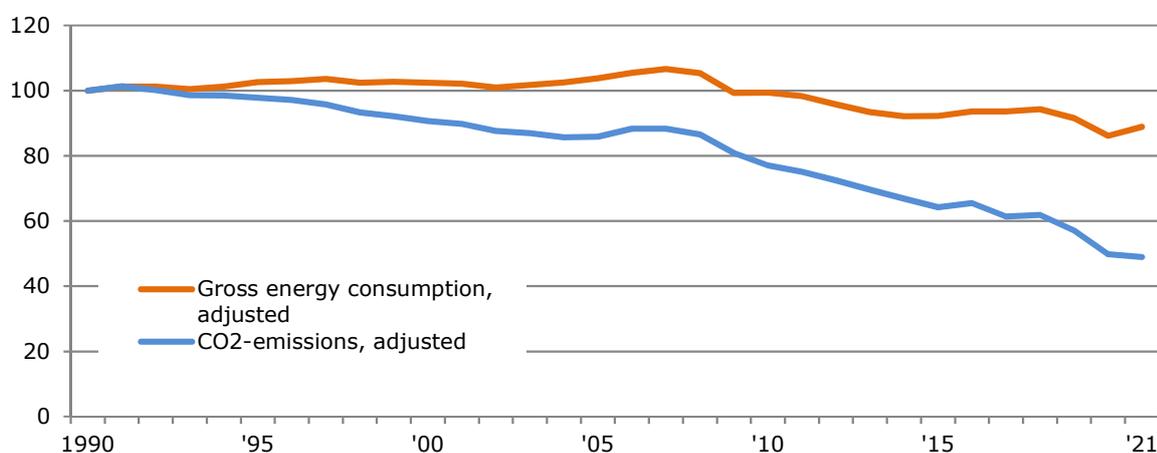
Increase in CO₂ emissions

Observed CO₂ emissions from energy consumption were 27.9 million tonnes in 2021 and rose by 1.5 tonnes compared with 2020. Danish adjusted CO₂ emissions have gone down by 47.5%. Adjusted for fuel consumption linked to foreign trade in electricity and climatic variations, CO₂ emissions decreased to 29.9 million tonnes; a decrease of 1.9%. Since 1990, Danish adjusted CO₂ emissions have gone down by 51.0%.

Greenhouse gas emissions for 2021

A preliminary statement of total observed emissions of greenhouse gases in Denmark shows a drop of 39.5% from 1990 to 2021, while total adjusted emissions of greenhouse gases shows a drop of 43.1% in the same period.

Index 1990 = 100

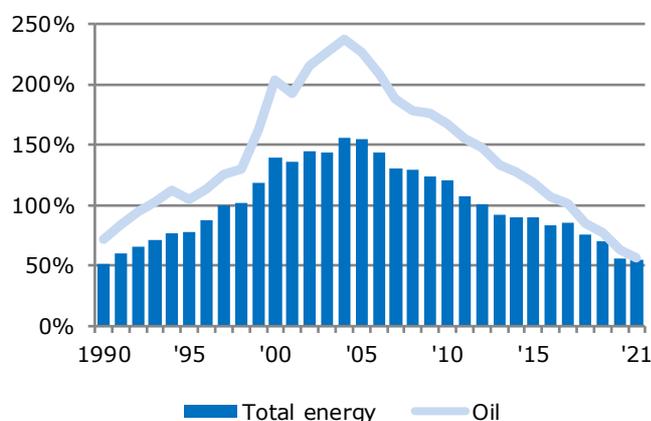


Energy balance 2021

	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	702 953	318 316	-74 498	85 874	44 638	18 270	292 714	17 528	111	-
Primary energy production	398 635	139 180	-	52 945	-	15 969	190 540	-	-	-
Recycling	1	-	1	-	-	-	-	-	-	-
Imports	707 577	222 929	195 916	86 760	19 126	2 300	108 002	72 431	111	-
Exports	-472 315	-40 157	-296 348	-64 369	-13 990	-	-2 548	-54 904	-	-
Border trade	-10 553	-	-10 553	-	-	-	-	-	-	-
International marine bunkers	-19 915	-	-19 915	-	-	-	-	-	-	-
Stock changes	96 184	2 667	50 250	10 534	35 071	-	-2 338	-	-	-
Statistical differences, input from blending	3 340	-6 303	6 151	3	4 431	-	-942	-	0	-
Energy sector	-35 174	-318 316	303 778	-15 187	-	-	-	-5 441	-8	-
Extraction and gasification	-15 187	-	-	-15 187	-	-	-	-	-	-
Petroleum products	319 191	-	319 191	-	-	-	-	-	-	-
Used in refineries	-334 764	-318 316	-15 413	-	-	-	-	-1 027	-8	-
Used in distribution	-4 414	-	-	-	-	-	-	-4 414	-	-
Transformation	-32 171	-	-3 929	-17 857	-39 125	-16 571	-206 146	110 211	140 670	577
Large-scale units	-26 682	-	-843	-1 825	-39 077	-	-73 033	39 580	48 516	-
Wind turbines and hydropower plants	-	-	-	-	-	-	-57 855	57 855	-	-
Small-scale units	-2 089	-	-31	-7 709	-	-2 309	-19 672	8 712	18 921	-
District heating units	1 685	-	-1 017	-6 564	-49	-251	-27 010	-4 674	41 250	-
Autoproducers	-144	-	-2 038	-1 351	-	-14 011	-28 344	12 829	32 771	-
Gas works	-63	-	-	-408	-	-	-232	-	-	577
Own use	-4 878	-	-	-	-	-	-	-4 090	-788	-
Distribution losses etc.	-35 060	-	-	-86	-	-	-24	-6 770	-28 156	-23
Final energy consumption	-600 548	-	-225 351	-52 744	-5 513	-1 699	-86 544	-115 527	-112 617	-554
Non-energy use	-9 454	-	-9 454	-	-	-	-	-	-	-
Transport	-185 031	-	-171 444	-286	-	-	-10 824	-2 476	-	-
Agriculture and industry	-133 203	-	-36 601	-24 922	-5 513	-1 465	-19 898	-39 415	-5 196	-194
Commercial and public services	-83 679	-	-1 243	-8 828	-	-234	-4 748	-34 637	-33 959	-29
Households	-189 183	-	-6 611	-18 707	-	-	-51 073	-39 000	-73 462	-331

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 2021 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 2021, the degree of self-sufficiency in energy was 55% as opposed to 56% the year before.

Denmark has been more than self-sufficient in oil from 1993 to 2017, resulting in annual net exports. However, the degree of self-sufficiency in oil fell to less than 100% in 2018, and in 2021, the degree of self-sufficiency in oil was 57%. The degree of self-sufficiency in oil peaked in 2004 and has been falling ever since.

PRODUCTION OF PRIMARY ENERGY

Production of primary energy

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	Change '90-'21
Total production	424 361	1 164 526	1 311 683	978 614	676 432	522 510	397 806	398 635	-6.1%
Crude oil	255 959	764 526	796 224	522 733	330 662	215 741	151 369	139 180	-45.6%
Natural gas	115 967	310 307	392 868	307 425	173 510	115 740	49 863	52 945	-54.3%
Renewable energy	45 461	76 017	105 585	131 309	156 391	174 961	180 585	190 540	319%
Waste, non-renewable	6 975	13 676	17 006	17 148	15 870	16 068	15 989	15 969	129%

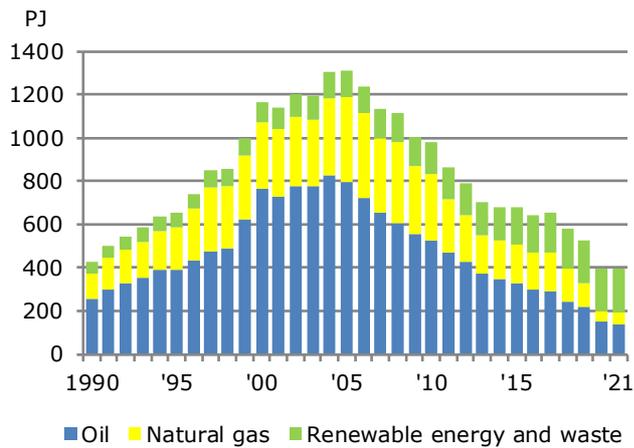
Production and consumption of renewable energy

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	Change '90-'21
Production of renewable energy	45 461	76 017	105 585	131 309	156 391	174 961	180 585	190 540	319%
Solar	100	335	419	657	3 713	6 426	7 523	7 601	7516%
Wind	2 197	15 268	23 810	28 114	50 879	58 139	58 789	57 796	2531%
Hydro	101	109	81	74	65	61	61	59	-41.8%
Geothermal	48	58	172	212	140	68	46	54	13.3%
Biomass	39 996	54 040	73 542	92 271	87 308	82 269	79 871	83 607	109%
- Straw	12 481	12 220	18 485	23 326	19 789	17 984	18 934	21 581	72.9%
- Wood chips	1 724	2 744	6 082	11 352	14 744	21 236	18 670	20 706	1101%
- Firewood	8 757	12 432	17 667	23 779	21 943	14 758	13 686	12 873	47.0%
- Wood pellets	1 575	2 984	3 262	2 407	2 697	2 149	2 027	1 667	5.8%
- Wood waste	6 191	6 895	6 500	8 500	8 102	6 360	6 934	7 091	14.5%
- Waste, renewable	8 524	16 715	20 786	20 959	19 396	19 639	19 542	19 518	129%
- Biodiesel *)	
- Biooil	744	49	761	1 949	636	143	79	171	-77.0%
Biogas	752	2 912	3 830	4 337	6 285	16 482	21 152	26 195	3383%
Heat pumps	2 267	3 296	3 731	5 643	8 001	11 516	13 143	15 229	572%
Imports of renewable energy	-	2 466	18 918	39 484	52 462	77 019	81 745	108 002	•
Firewood	-	-	1 963	2 939	2 547	1 540	1 521	1 673	•
Wood chips	-	305	1 521	4 865	2 808	9 541	17 938	21 986	•
Wood pellets	-	2 161	12 802	27 676	34 243	51 586	45 595	65 005	•
Waste, renewable	-	-	-	-	2 559	3 200	3 341	2 812	•
Bioethanol	-	-	-	1 118	1 818	1 954	3 437	3 622	•
Biodiesel	-	-	2 632	2 886	8 485	9 199	9 913	12 904	•
Exports of renewable energy	-	-	2 632	2 846	1 084	1 272	2 385	2 548	•
Biodiesel	-	-	2 632	2 846	1 084	1 272	2 385	2 548	•
Stock changes, stat. diffs. etc.	-	22	6	0	- 259	- 249	- 478	- 1 392	•
Consumption of renewable energy	45 461	78 505	121 877	167 947	207 509	250 459	259 467	294 603	548%

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

PRODUCTION OF PRIMARY ENERGY

Primary energy production



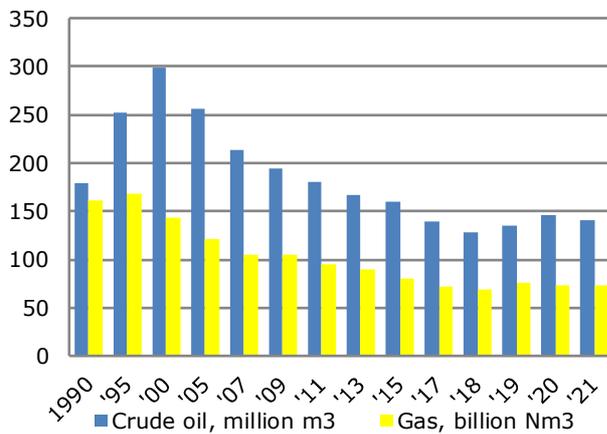
Primary energy refers to crude oil, natural gas, renewable energy (including renewable waste) and non-renewable waste.

In 2021, primary energy production was 399 PJ, and this is on par with 2020. Primary energy production peaked at 1312 PJ in 2005.

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

Production of crude oil fell by 8.1%, while production of natural gas and renewable energy etc. increased by 6.2% and 5.1% respectively.

Oil and gas reserves / resources



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

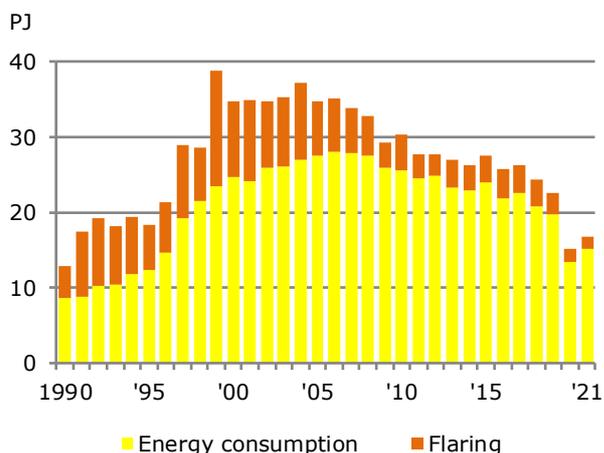
At the end of 2009, the Danish Energy Agency changed the classification system for oil and gas reserves, introducing the category *contingent resources*. For the period 2009–2021, the statement includes the sum of reserves and contingent resources so that comparison with earlier statements is possible.

At the end of 2021, the sum of reserves and contingent resources totaled 141 million m³ oil and 73 billion Nm³ gas.

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

Source: *Ressourceopgørelse og prognoser* (Published August 2022, by the Danish Energy Agency)

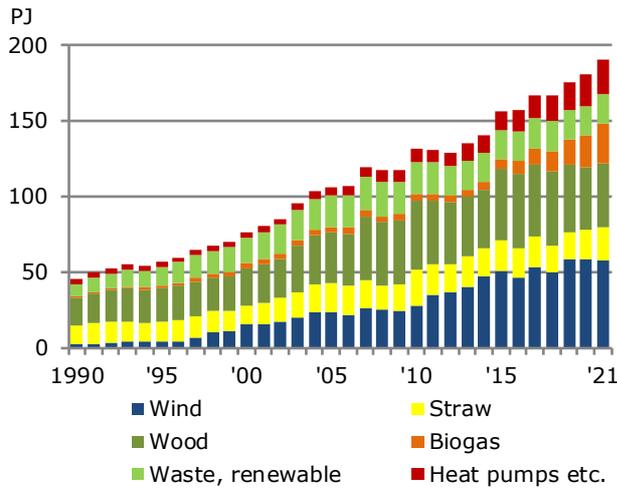
Natural gas consumption and flaring on platforms in the North Sea



Extraction of crude oil and natural gas requires natural gas consumption for production as well as for transport and off-loading ashore. In 2021 consumption was 15.2 PJ, corresponding to 17.7% of total Danish natural gas consumption. In 2020 consumption on platforms was 13.5 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 2021, flaring of natural gas was calculated at 1.6 PJ, the same as in 2020.

Production of renewable energy by energy product



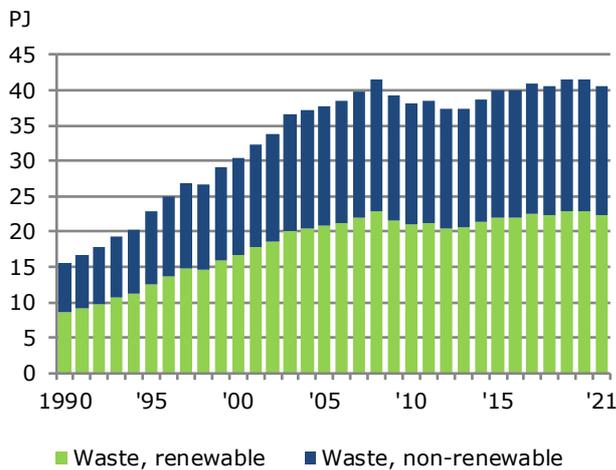
Renewable energy includes wind power, wood, straw, biogas, renewable waste and others (hydropower, geothermal energy, solar energy and heat pumps).

Production of renewable energy was 190.5 PJ in 2021, which is an increase of 5.5% compared to 2020. Production of renewable energy grew by 319% during the period 1990 to 2021.

In 2021, wind power production was 57.8 PJ, which is a decrease of 1.7% compared with 2020.

Production from straw, wood products and renewable waste in 2021 was 21.6 PJ, 42.3 PJ and 19.5 PJ, respectively. Production of biogas in 2021 was 26.2 PJ, corresponding to an increase of 23.8% relative to 2020.

Consumption of waste

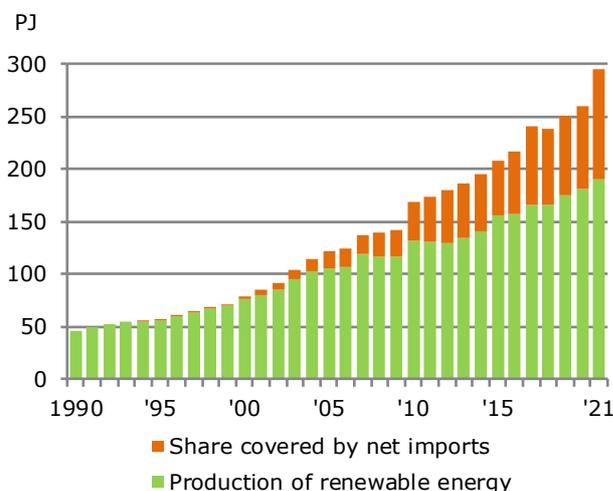


Consumption of waste for the production of electricity and district heating has increased significantly over time. Total consumption of waste decreased by 2.4% in 2021 compared with 2020. Compared with 1990, waste consumption for energy purposes increased by 162% in 2021.

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

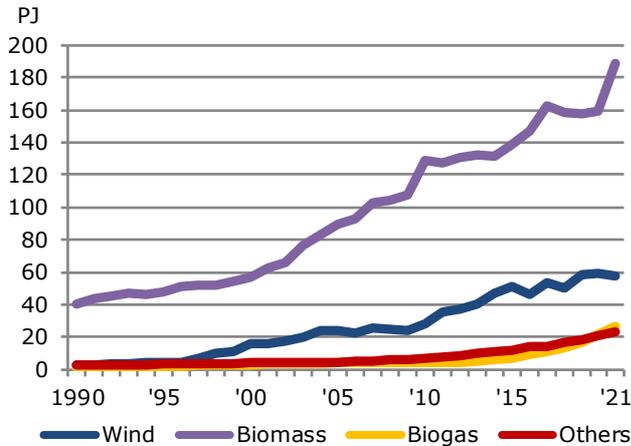


Production of renewable energy has increased dramatically since 1990. In addition, net imports, comprising biomass and biofuel, have increased. Net imports of renewable energy (including stock changes etc.) were 104.1 PJ in 2021.

In 2021 consumption of renewable energy was 294.6 PJ, which is 13.5% more than the year before. Observed consumption of renewable energy was 45.5 PJ in 1990.

RENEWABLE ENERGY

Renewable energy - consumption by energy product

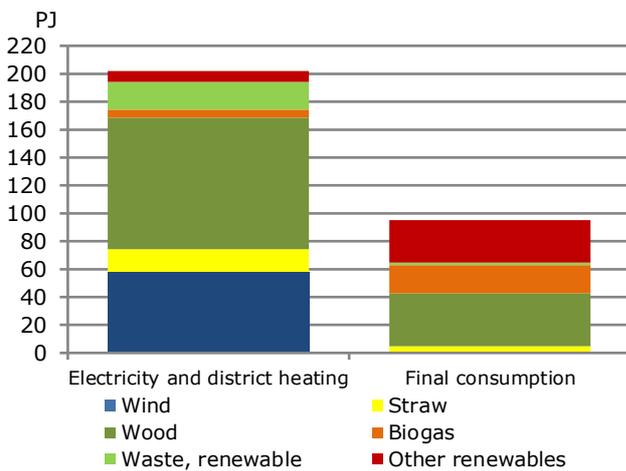


Consumption of renewable energy increased from 259.5 PJ in 2020 to 294.6 PJ in 2021.

Consumption of biomass, including liquid biofuels increased from 159.2 PJ in 2020 to 189.1 PJ in 2021; an increase of 18.7%. Consumption of wind power decreased from 58.8 PJ to 57.8 PJ.

Since 2000, the consumption of biomass has more than tripled, primarily due to increased consumption of wood chips and wood pellets. In the period 2000 to 2021 the increase was 1300% and 1196%, respectively.

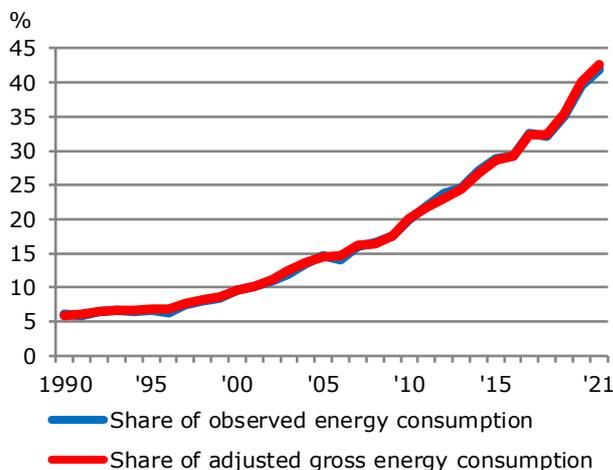
Use of renewable energy in 2021



Total consumption of renewable energy in 2021 (production plus net imports) was 295.9 PJ, of which 201.1 PJ was used in the production of electricity and district heating. Wind power, wood and renewable waste were predominant in the production of electricity and district heating, accounting for 57.8 PJ, 93.8 PJ and 20.3 PJ, respectively. Consumption of straw and biogas accounted for 16.4 PJ and 5.5 PJ, respectively.

In 2021, final energy consumption consisted of 94.9 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.

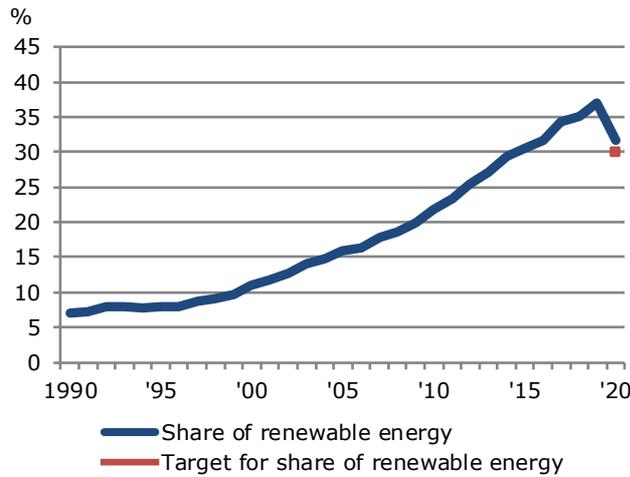
Renewable energy - share of total energy consumption



Observed energy consumption shows the registered amount of energy consumed in a calendar year. In 2021 renewable energy covered 41.8% of total observed energy consumption, as opposed to 39.5% the previous year. 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 2021 renewable energy's share of adjusted gross energy consumption was 42.7%, as opposed to 40.1% the previous year. In 1990 this figure was 5.8%.

Share of renewable energy according to the EU method of calculation



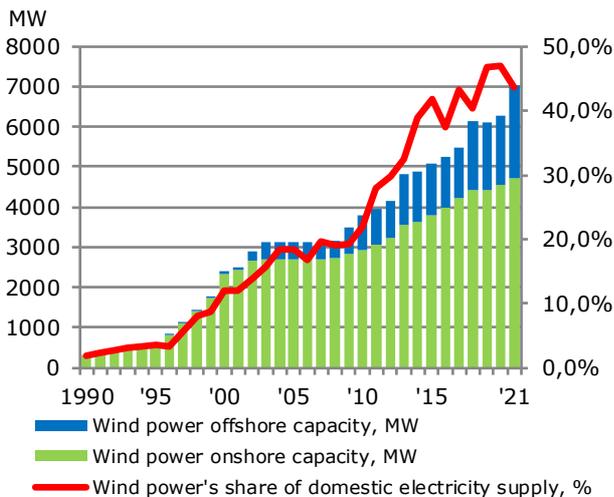
The EU Directive on renewable energy prescribes a different method for calculating the share of renewable energy than those used above.

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.

Denmark was obligated to achieve a renewable energy share of 30% in 2020. Denmark exceeded the goal and decided to transfer shares to countries with a deficit regarding achieving the goal. Following the transfer, the share in 2020 was 31.7%. A new renewable energy Directive entered into force on 1 July 2021. The share under the new Directive will be published when it is available.

Sources: 2004-2020 Eurostat. 1990-2003 Danish Energy Agency calculations.

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

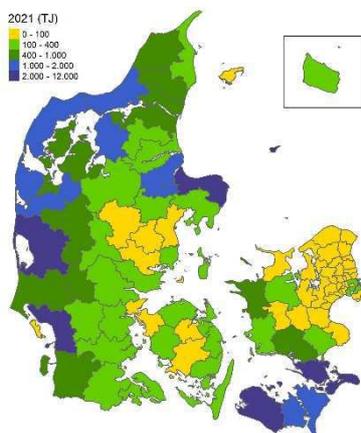


In 2021, wind power production accounted for 43.6% of domestic electricity supply, compared with 47% in 2020 and 1.9% in 1990.

Wind power capacity was 7021 MW in 2021, as opposed to 6267 MW the year before. In 2021 onshore and offshore wind turbine capacities were 4715 MW and 2306 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 57.8 PJ in 2021. Of this, onshore installations accounted for 52.8% and offshore installations accounted for 47.2%.

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.

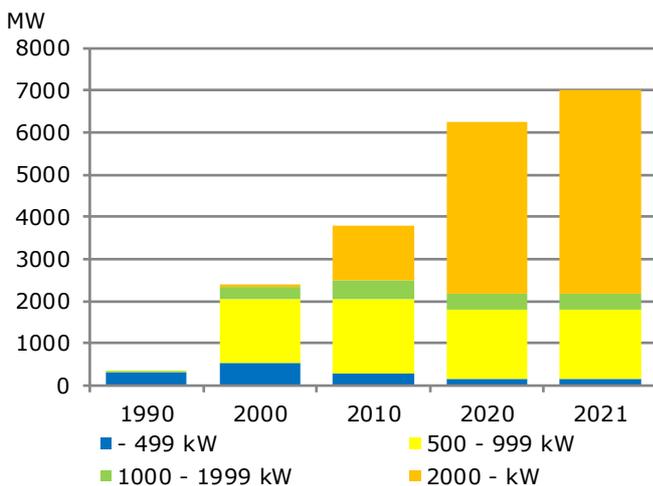
In 2021 the turbines in the ten municipalities with the highest wind power production thus together accounted for a production of 15.9 PJ, or 52% of total wind power production from onshore installations.

RENEWABLE ENERGY

Wind power - number of turbines and capacity by size

	1990	2000			2020			2021		
	Onshore	Onshore	Offshore	Total	Onshore	Offshore	Total	Onshore	Offshore	Total
Total no. of turbines	2 666	6 194	41	6 235	5 654	558	6 212	5 661	630	6 291
- 499 kW	2 656	3 652	11	3 663	2 184	-	2 184	2 165	-	2 165
500 - 999 kW	8	2 283	10	2 293	2 372	10	2 382	2 371	10	2 381
1 000 - 1 999 kW	2	251	-	251	324	-	324	316	-	316
2 000 - kW	-	8	20	28	774	548	1 322	809	620	1 429
Total wind power capacity [MW]	326	2 340	50	2 390	4 566	1 701	6 267	4 715	2 306	7 021
- 499 kW	317	533	5	538	167	-	167	165	-	165
500 - 999 kW	6	1 512	5	1 517	1 616	5	1 621	1 616	5	1 621
1 000 - 1 999 kW	3	279	-	279	399	-	399	391	-	391
2 000 - kW	-	16	40	56	2 384	1 696	4 080	2 543	2 301	4 844

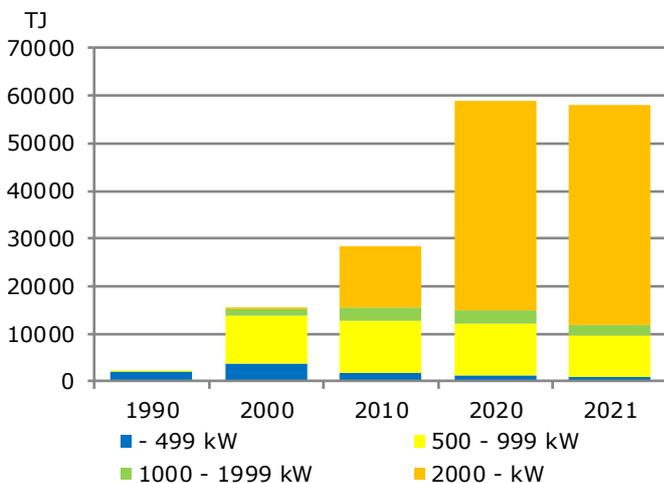
Wind power capacity by size of turbine



The total number of wind turbines increased by 79 from 2020 to 2021, and the total wind power capacity rose by 754 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 1498 turbines since 2000. The number of large wind turbines with capacities above 2 MW has increased by 1401 turbines.

Wind power production by size of turbine



The development toward larger turbines is even more evident in terms of wind power production. From 2000 to 2021, production from turbines up to 499 kW fell by 3,012 TJ, while production from turbines of more than 2 MW rose by 45,895 TJ. However, from 2020 to 2021, wind power capacity rose by 12.0%, while wind production fell by only 1.5%.

Where turbines larger than 2 MW accounted for 69.0% of wind power capacity, in 2021 these turbines produced 79.3% of the total energy from wind turbines.

Similarly, in 2021 wind turbines with a capacity up to 499 kW accounted for only 1.5% of the total production.

Wind turbines with a capacity up to 499 kW accounted for only 2.3% of the total capacity in 2021, whereas this figure was 22.5% in 2000.

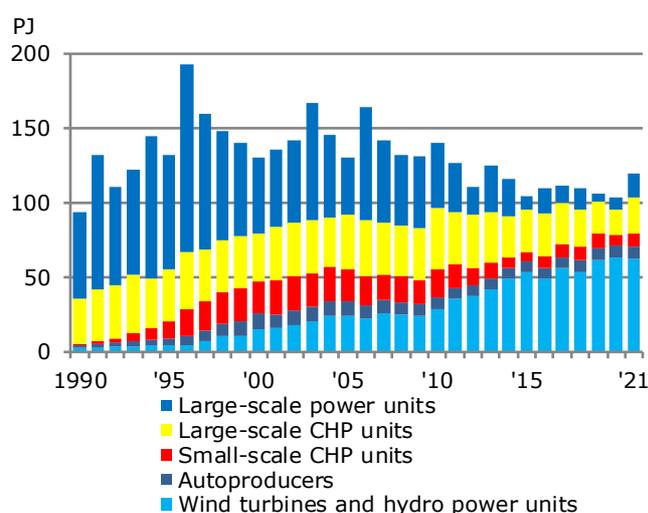
Electricity production by type of producer

Change

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	'90 - '21
Total electricity production(gross)	93 518	129 776	130 469	139 906	104 164	106 261	103 423	118 976	27.2%
Large-scale power units	7 494	8 871	49	336	46	74	63	46	-99.4%
Large-scale CHP units	80 639	73 809	74 932	83 940	37 375	27 002	24 985	39 534	-51.0%
- of which electricity production	50 157	41 584	38 402	43 221	8 936	5 716	7 913	15 688	-68.7%
Small-scale CHP units	988	21 547	21 254	19 216	5 765	9 457	7 217	8 712	782%
Autoproducers	2 099	10 168	10 336	8 203	7 858	8 060	8 058	8 117	287%
- Electricity production ¹⁾	-	9	7	6	3	3	5	5	•
- CHP ¹⁾	2 099	10 158	10 328	8 197	7 855	8 058	8 053	8 111	286%
Wind turbines ¹⁾	2 197	15 268	23 810	28 114	50 879	58 139	58 789	57 796	2531%
Hydropower units ¹⁾	101	109	81	74	65	61	61	59	-41.8%
Photovoltaics ¹⁾	-	4	8	22	2 175	3 468	4 250	4 712	•
Own use in production	-6 118	-5 776	-6 599	-7 159	-3 670	-3 001	-3 070	-4 090	-33.1%
Large-scale power units	- 590	- 312	- 2	- 17	- 0	- 8	- 3	- 3	-99.6%
Large-scale CHP units	- 5 509	- 4 993	- 6 033	- 6 602	- 3 303	- 2 515	- 2 588	- 3 619	-34.3%
Small-scale CHP units	- 19	- 472	- 564	- 541	- 368	- 477	- 479	- 469	2367%
Total electricity production (net)	87 400	123 999	123 870	132 747	100 493	103 260	100 353	114 886	31.4%
Net imports of electricity	25 373	2 394	4 932	- 4 086	21 282	20 919	24 777	17 528	-30.9%
Domestic electricity supply	112 773	126 393	128 802	128 661	121 775	124 179	125 130	132 414	17.4%
Transformation consumption	-	- 1	-	- 110	- 1 073	- 1 575	- 3 236	- 4 674	•
Distribution losses etc. ²⁾	- 8 886	- 7 650	- 5 573	- 9 482	- 6 887	- 6 776	- 5 902	- 6 770	-23.8%
Domestic electricity consumption	103 887	118 742	123 228	119 068	113 815	115 828	115 992	120 969	16.4%
Consumption in the energy sector	- 1 748	- 1 893	- 2 761	- 3 445	- 2 796	- 5 128	- 4 227	- 5 441	211%
Final electricity consumption	102 139	116 849	120 467	115 623	111 019	110 700	111 765	115 527	13.1%

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 2021, electricity production was 119 PJ, which is an increase of 15.0% compared with 2020.

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 118.9 PJ, 39.6 PJ (33.2%) were from large-scale power units – 15.7 PJ (13.2%) as separate production. Separate electricity production varies greatly from year to year due to fluctuations in foreign trade in electricity. Electricity production from small-scale units and autoproducers was 8.7 PJ (7.3%) and 8.1 PJ (6.8%), respectively. Wind turbines generated 62.6 PJ (52.6%). Solar is included under wind turbines and hydro power units in this figure.

ELECTRICITY AND DISTRICT HEATING

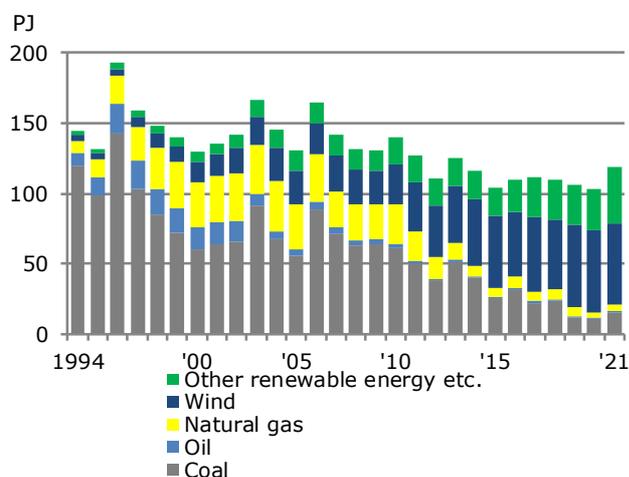
Electricity production by fuel

Direct energy content [TJ]	1994	2000	2005	2010	2015	2019	2020	2021	Change '94 - '21
Total electricity production (gross)	144 707	129 776	130 469	139 906	104 164	106 261	103 423	118 976	-17.8%
Oil	9 547	15 964	4 933	2 783	1 122	871	947	925	-90.3%
- of which orimulsion	-	13 467	-	-	-	-	-	-	•
Natural gas	8 206	31 589	31 606	28 464	6 499	6 808	3 576	4 325	-47.3%
Coal	119 844	60 022	55 665	61 222	25 596	11 920	11 022	15 716	-86.9%
Surplus heat	-	139	-	-	-	-	-	-	•
Waste, non-renewable	836	2 002	2 938	2 689	2 706	2 839	2 783	2 860	242%
Renewable energy	6 275	20 060	35 326	44 749	68 242	83 824	85 096	95 150	1416%
Solar	-	4	8	22	2 175	3 468	4 250	4 712	•
Wind	4 093	15 268	23 810	28 114	50 879	58 139	58 789	57 796	1312%
Hydro	117	109	81	74	65	61	61	59	-50.0%
Biomass	1 743	3 928	10 410	15 253	13 396	19 140	18 887	29 173	1573%
- Straw	293	654	3 088	3 968	2 080	1 792	1 771	2 629	799%
- Wood	429	828	3 730	7 998	7 987	13 878	13 714	23 048	5266%
- Biooil	-	0	1	1	22	-	-	-	•
- Waste, renewable	1 021	2 447	3 591	3 286	3 307	3 470	3 401	3 496	242%
Biogas	321	751	1 017	1 285	1 726	3 015	3 109	3 409	963%

Electricity from renewable energy: Share of domestic electricity supply

[%]	1994	2000	2005	2010	2015	2019	2020	2021	Change '94 - '21
Renewable energy	5,3	15,9	27,4	34,8	56,0	67,5	68,0	71,9	1262%
Solar	0,0	0,0	0,0	0,0	1,8	2,8	3,4	3,6	•
Wind	3,4	12,1	18,5	21,9	41,8	46,8	47,0	43,6	1169%
Hydro	0,1	0,1	0,1	0,1	0,1	0,0	0,0	0,0	-55%
Biomass	1,5	3,1	8,1	11,9	11,0	15,4	15,1	22,0	1403%
- Straw	0,2	0,5	2,4	3,1	1,7	1,4	1,4	2,0	707%
- Wood	0,4	0,7	2,9	6,2	6,6	11,2	11,0	17,4	4721%
- Biooil	-	0	0	0	0	-	-	-	•
- Waste, renewable	0,9	1,9	2,8	2,6	2,7	2,8	2,7	2,6	208%
Biogas	0,3	0,6	0,8	1,0	1,4	2,4	2,5	2,6	855%

Electricity production by fuel



In 2021, 15.7 PJ (13.2%) of total electricity production was generated by coal. Natural gas accounted for 4.3 PJ (3.6%) of electricity production. Oil and non-renewable waste accounted for 0.9 PJ (0.8%) and 2.9 PJ (2.4%) of the electricity production, respectively.

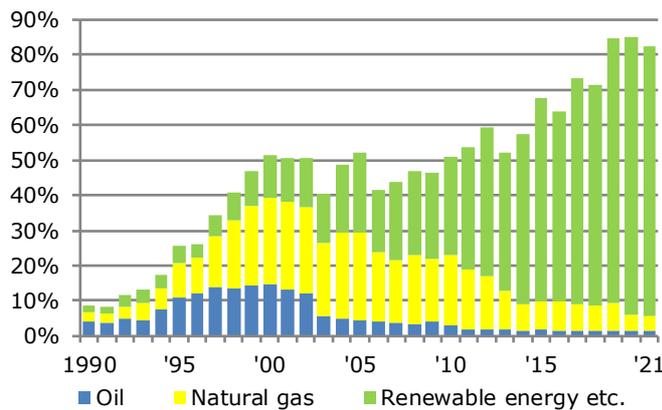
Electricity production based on renewables was 95.2 PJ (80%) in 2021. This is 2.3 percentage points lower than production in 2020.

Wind turbines contributed therefore 57.8 PJ (48.6%), while electricity production based on biomass and biogas contributed respectively 29.1 PJ (24.5%) and 3.4 PJ (2.9%).

Fuel consumption for electricity production

	1990	2000	2005	2010	2015	2019	2020	2021	Change '90 - '21
Direct energy content [TJ]									
Total fuel consumption	227 001	276 974	265 330	286 006	180 654	169 369	166 533	196 606	-13.4%
Oil	9 215	40 356	11 867	8 087	3 110	2 530	2 650	2 567	-72.1%
- of which orimulsion	-	33 503	-	-	-	-	-	-	•
Natural gas	6 181	68 868	65 912	57 229	14 302	13 467	7 292	8 422	36.3%
Coal	207 173	134 205	127 119	139 714	58 410	25 900	25 127	34 644	-83.3%
Waste, non-renewable	262	5 294	7 650	9 085	9 412	8 447	8 885	8 624	3193%
Renewable energy	4 170	28 252	52 784	71 891	95 420	119 025	122 579	142 349	3314%
Solar	-	4	8	22	2 175	3 468	4 250	4 712	•
Wind	2 197	15 268	23 810	28 114	50 879	58 139	58 789	57 796	2531%
Hydro	101	109	81	74	65	61	61	59	-41.8%
Biomass	1 428	11 009	26 470	40 808	38 665	51 360	53 340	72 983	5011%
- Straw	363	2 021	7 715	10 213	5 807	4 653	4 963	6 415	1667%
- Wood	745	2 518	9 405	19 492	21 248	36 383	37 518	56 028	7421%
- Biooil	-	0	0	-	107	-	-	-	•
- Waste, renewable	320	6 470	9 350	11 104	11 503	10 324	10 860	10 540	3193%
Biogas	444	1 861	2 415	2 872	3 635	5 996	6 139	6 799	1431%

Other fuels than coal for electricity production

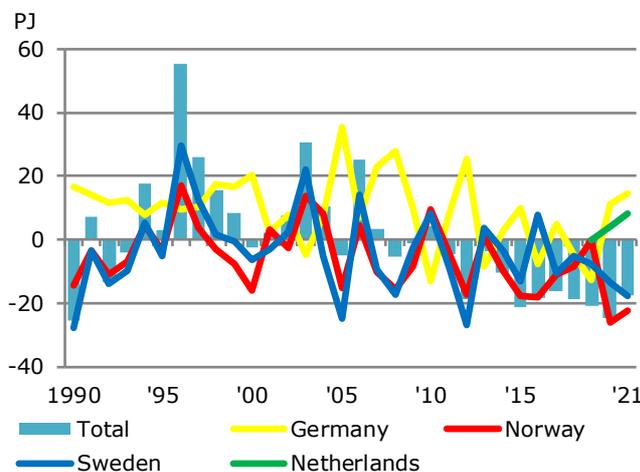


In the early 1990s, coal was the dominant fuel used in the production of electricity. In 1990, other types of fuel than coal only accounted for just 8.7% of total fuel consumption.

The share of fuels other than coal increased throughout the 1990s and in the period from 2000 to 2010 amounted to 40-52%. This was initially due to growth in the consumption of natural gas for electricity production, and later because of an increased use of renewable energy.

In recent years, this share has increased even more, driven by the growth in the share of renewable energy, and in 2021, oil, natural gas and renewable energy etc. together accounted for 82.4% of fuel consumption for electricity production.

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.

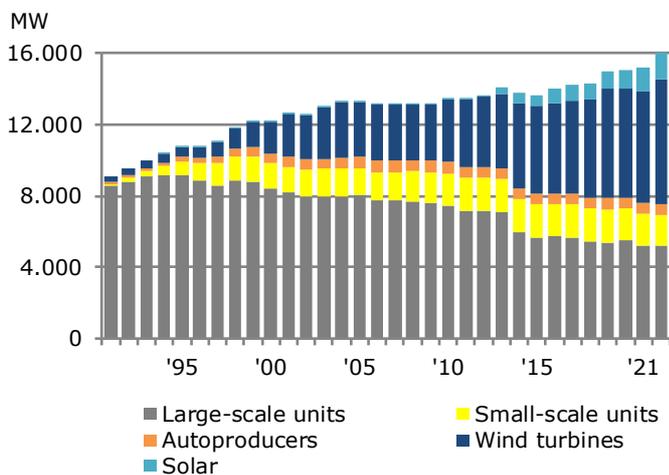
In 2021, Denmark had overall net imports of electricity of 17.5 PJ. This was the result of net imports from Norway and Sweden of 22.3 PJ and 17.5 PJ and net exports to Germany and the Netherlands of 14.3 PJ and 8.0 PJ, respectively.

ELECTRICITY AND DISTRICT HEATING

Electricity capacity, end of year

	1994	2000	2005	2010	2015	2019	2020	2021	Change '94 - '21
[MW]									
Total	10 768	12 598	13 088	13 450	13 995	15 076	15 171	16 231	50.7%
Large-scale units	9 126	8 160	7 710	7 175	5 690	5 481	5 231	5 228	-42.7%
- Electricity	2 186	1 429	834	840	839	815	815	812	-62.9%
- CHP	6 940	6 731	6 877	6 335	4 850	4 665	4 415	4 415	-36.4%
Small-scale units	773	1 462	1 579	1 819	1 836	1 810	1 776	1 706	121%
Autoproducers	339	574	657	638	604	588	585	566	66.8%
Solar	0	1	3	7	782	1 080	1 304	1 704	•
Wind	522	2 390	3 128	3 802	5 077	6 111	6 267	7 021	1246%
Hydro	8	10	11	9	7	7	7	7	-14.2%

Electricity capacity

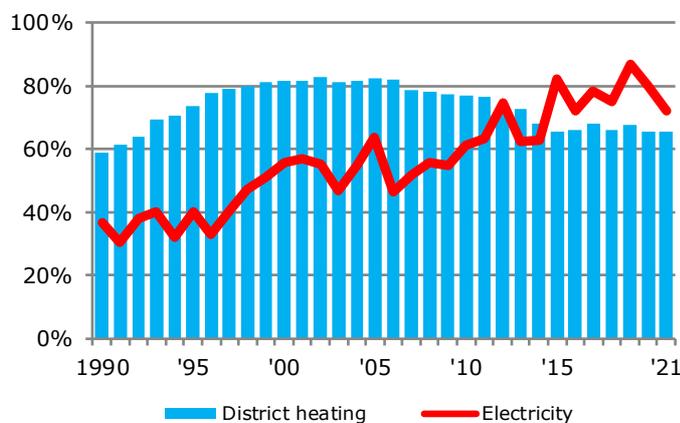


Up until the early 1990s electricity production capacity was dominated by the large-scale power units. Up through the 1990s, electricity capacity in small-scale units and secondary installations (autoproducers) increased. By the turn of the millennium, this capacity corresponded to a fifth of the capacity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

A number of units at the large-scale plants have now been scrapped and capacity at the large-scale plants therefore fell significantly. Capacity at small-scale and autoproducers' installations now corresponds to almost one-fourth of the capacity of thermal plants.

The capacity of wind turbines and photovoltaic solar modules increased in 2021, to 7021 MW and 1704 MW, respectively.

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 2021, 72.1% of thermal electricity production (i.e. total production excl. wind, solar and hydropower) was produced simultaneously with heating. This is a decrease of 8.1 percentage points compared with 2020. It is primarily because electricity production without simultaneous production of heat (condensing power) at thermal plants has increased, relatively more than electricity production from CHP. In 2021, 65.8% of district heating was produced with electricity. This is an increase of 0.2 percentage points in comparison to 2020.

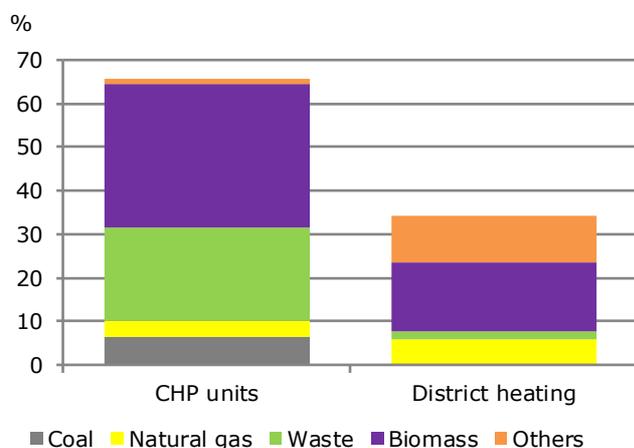
Heat production by type of production plant, 2021

	Number of units	Electricity capacity [MW]	Heat capacity [MJ/s]	Share of total heat supply [%]
Total	2 811	7 042	26 178	100
Large-scale CHP units	23	4 685	5 760	34.5
Small-scale CHP units	538	1 780	2 277	13.0
District heating units	1 891		15 810	29.2
Autoproducers				
- CHP units	237	577	1 507	18.2
- Heating units	122		823	5.1

Heat production by primary fuel, 2021

Primary fuel of unit	CHP by plant				Heat producers by plant		
	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	798	7 042	9 544	65.7	2 013	16 634	34.3
Coal	4	1 489	1 801	6.4	1	10	0.0
Natural gas	395	1 583	2 111	3.9	560	4 866	5.9
Oil	48	187	161	0.2	295	3 113	0.5
Waste	32	401	1 210	21.2	8	104	1.8
Biogas	156	125	162	1.0	23	39	0.1
Biomass	30	1 836	3 362	33.0	354	1 833	15.8
Biooil	-	-	-	0.0	36	454	0.1
Surplus heat	-	-	-	0.0	64	402	3.7
Solar heating	-	-	-	0.0	138	1 056	1.6
Heat pumps and electric boilers	-	-	-	0.0	179	1 358	4.8
No production in 2020	133	1 420	737	0.0	355	3 397	0.0

Heat supply by primary fuel, 2021



District heating supply takes place partly at CHP units and partly at units exclusively producing district heating. In 2021, CHP units produced 65.7%, of which: large-scale CHP units contributed 34.5%, small-scale CHP units contributed 13.0%, and CHP units at autoproducers contributed 18.2%.

Some CHP and district heating units use several types of fuel. A break down by types of primary fuel used by units in 2021 reveals that CHP units using coal as the primary fuel accounted for 6.4% of heat supply, while units using natural gas, waste or biomass as primary fuel accounted for 3.9%, 21.2% and 33.0%, respectively, of total district heating supply.

For units that produce district heating alone, units primarily firing with biomass contributed 15.8% and natural gas units contributed 5.9% of total district heating supply.

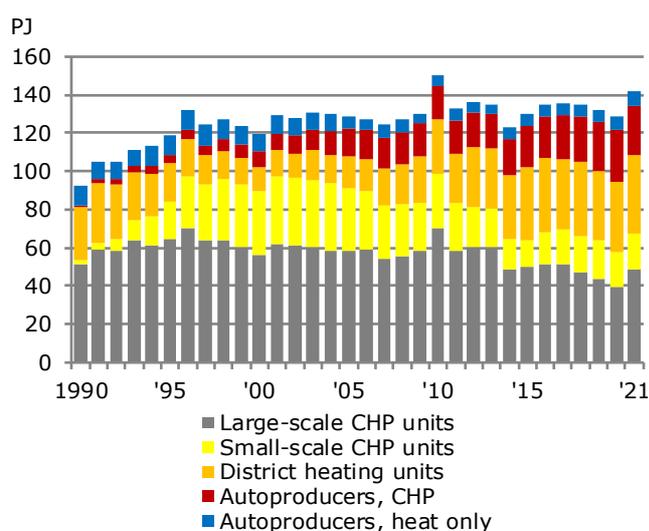
ELECTRICITY AND DISTRICT HEATING

District heating production by type of production plant

	1990	2000	2005	2010	2015	2019	2020	2021	Change '90 - '21
Direct energy content [TJ]									
Total production (gross)	92 411	119 702	128 382	150 393	130 036	132 253	128 400	141 457	53.1%
Large-scale CHP units	51 511	56 271	58 248	69 955	50 098	43 721	39 764	48 516	-5.8%
Small-scale CHP units	2 145	33 027	32 727	28 462	13 777	20 166	17 558	18 921	782%
District heating by type of producer	27 755	12 516	16 621	28 816	38 218	36 139	37 193	41 250	48.6%
Autoproducers									
- CHP units ¹⁾	694	8 375	14 884	17 625	21 589	25 560	26 811	25 593	3588%
- Heating units ¹⁾	10 306	9 513	5 901	5 537	6 354	6 666	7 074	7 177	-30.4%
Consumption in production	-	-1 539	-1 303	-1 207	- 623	- 827	- 684	- 788	•
Large-scale CHP units	-	- 866	- 384	- 331	-	-	-	-	•
Small-scale CHP units	-	- 637	- 656	- 643	- 321	- 452	- 481	- 557	•
District heating units	-	- 36	- 262	- 233	- 302	- 375	- 203	- 230	•
Total production (net)	92 411	118 163	127 079	149 187	129 413	131 426	127 716	140 670	52.2%
Net imports	122	144	153	174	151	107	107	111	-9.0%
Domestic supply	92 533	118 307	127 232	149 360	129 564	131 532	127 823	140 781	52.1%
Consumption in refineries	- 428	- 275	- 355	- 584	- 480	- 7	- 8	- 8	-98.1%
Distribution losses	-18 507	-23 661	-25 446	-29 872	-25 913	-26 306	-25 565	-28 156	52.1%
Final consumption	73 599	94 370	101 430	118 904	103 171	105 219	102 250	112 617	53.0%

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.

From 2002 to 2015, the production from small-scale CHP units has decreased substantially. However from 2015 to 2019 the production once again increased slightly, after which it fell again in 2020. It rose again in 2021.

In 2021, total district heating production was 141.5 PJ, which is an increase of 10.2% compared with 2020. Compared with 2000, district heating production increased by 18.2%, compared with 1990 it increased by 53.1%.

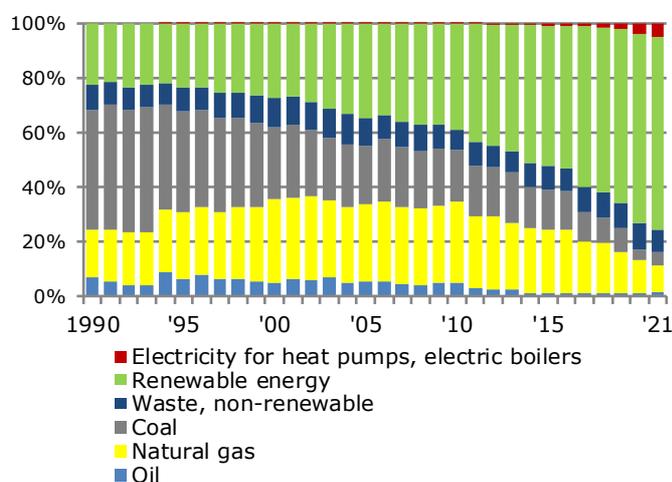
District heating production by fuel

Direct energy content [TJ]	1994	2000	2005	2010	2015	2019	2020	2021	Change '94 - '21
Total production (gross)	113 103	119 702	128 382	150 393	130 036	132 253	128 400	141 457	25.1%
Oil	6 335	4 433	6 103	4 627	1 281	1 087	907	1 465	-76.9%
- of which orimulsion	-	1 291	-	-	-	-	-	-	•
Natural gas	25 370	41 620	39 377	44 844	23 654	16 845	11 885	11 104	-56.2%
Coal	55 748	38 873	34 189	36 337	26 050	12 691	7 284	8 857	-84.1%
Surplus heat	2 838	3 676	3 174	2 518	3 130	4 367	4 840	5 030	77.2%
Electricity excl. heat pumps	-	-	-	110	1 036	1 389	2 798	3 555	•
Electricity, heat pumps	23	9	2	0	29	172	418	1 115	4672%
Waste, non-renewable	6 084	8 651	10 713	10 627	12 245	13 194	13 480	12 910	112%
Renewable energy	16 704	22 440	34 823	51 331	62 610	82 508	86 789	97 422	483%
Solar	6	24	53	139	956	2 334	2 616	2 244	38959%
Geothermal	21	29	86	106	70	34	23	27	28.2%
Biomass	16 304	21 462	33 509	49 912	59 329	75 795	78 629	87 805	439%
- Straw	4 318	5 696	7 681	11 507	11 359	10 594	11 633	12 405	187%
- Wood	4 327	5 153	12 086	23 731	32 495	48 945	50 451	59 466	1274%
- Biooil	223	39	650	1 685	508	129	69	155	-30.6%
- Waste, renewable	7 436	10 574	13 093	12 989	14 966	16 126	16 476	15 779	112%
Biogas	348	903	1 169	1 173	2 173	3 871	4 435	5 133	1376%
Heat pumps	25	22	6	0	82	473	1 086	2 213	8907%

Fuel consumption for district heating production

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	Change '90 - '21
Total fuel consumption	69 833	73 249	78 764	95 892	87 359	88 557	84 668	93 266	33.6%
Oil	4 766	3 726	4 322	4 554	1 039	867	713	1 362	-71.4%
- of which orimulsion	-	646	-	-	-	-	-	-	•
Natural gas	12 131	22 203	22 044	28 454	20 134	13 416	10 295	9 028	-25.6%
Coal	30 898	19 459	17 121	18 245	13 117	7 621	3 665	4 481	-85.5%
Electricity	-	75	76	149	1 121	1 639	3 306	4 762	•
Waste, non-renewable	6 289	7 675	8 138	7 122	7 649	8 422	8 136	7 947	26.4%
Renewable energy	15 749	20 112	27 063	37 367	44 298	56 593	58 554	65 686	317%
Solar	6	24	53	143	956	2 347	2 662	2 278	37862%
Geothermal	48	58	172	212	140	68	46	54	13.3%
Biomass	15 611	19 425	26 125	36 290	41 739	51 160	51 686	57 641	269%
- Straw	3 640	5 013	5 934	8 272	9 068	8 464	9 233	10 002	175%
- Wood	3 541	4 983	9 484	17 365	22 793	32 260	32 429	37 755	966%
- Biooil	744	49	761	1 949	529	143	79	171	-77.0%
- Waste, renewable	7 686	9 380	9 946	8 705	9 349	10 293	9 944	9 713	26.4%
Biogas	84	582	707	721	1 380	2 554	3 088	3 592	4176%
Heat pumps	-	22	6	0	82	464	1 072	2 121	•

Fuel consumption for district heating production



The upper table shows output, the amount of district heating produced, and the type of fuel used. For example, in 2021 a total of 141.5 PJ district heating was produced. The lower table shows input and the amount of fuel used to produce district heating. For example, in 2021, a total of 93.3 PJ fuel was used.

Input can well be less than output. This is because of variations in the heat efficiency by which the different fuels are converted into district heating, and because it is assumed that combined heat and power plants produce heat with an efficiency of 200%. An example would be consumption of 4.5 PJ coal in 2021 (lower table) results in district heating production of 8.9 PJ (upper table).

There has been a significant change in the fuel used in the production of district heating since 1990. Consumption of coal for production of district heating has fallen from almost 50% to just 4.8% in 2021. On the other hand, the percentage of renewables increased from around 20% to covering 70.4% of district heating production in 2021.

ENERGY SUPPLY AND CONSUMPTION 2021

Energy supply and consumption 2021

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	398 635	139 180	-	-	-	-	-	-	-	-	-	-	-	-
- Recycling	1	-	-	-	-	-	-	-	-	-	-	1	-	-
- Imports	707 577	222 929	-	-	998	12	14 659	-	14 069	73 430	75 662	-	7 537	9 550
- Exports	-472 315	-36 714	-3 443	-	-2 329	-	-52 919	-	-8 327	-74 208	-158 447	-	-	-117
- Border trade	-10 553	-	-	-	-	-	1 643	-	-	-12 195	-	-	-	-
- International marine bunkers	-19 915	-	-	-	-	-	-	-	-	-15 307	-4 508	-	-	-101
- Supply from blending	- 838	-8 356	- 216	-	-	-	- 676	-	- 94	514	7 923	-	-	1
- Stock changes	96 184	2 933	- 266	-	140	15	798	-	10 206	13 415	26 198	-	- 653	131
Statistical differences	4 178	2 189	80	0	81	- 1	576	22	- 121	-2 236	172	-	-	- 10
Extraction and gasification	-15 187	-	-	-	-	-	-	-	-	-	-	-	-	-
Refineries														
- Input and net production	875	-322 162	3 845	16 939	3 998	-	88 801	-	3 995	150 238	55 221	-	-	-
- Own use in production	-16 448	-	-	-15 272	-	-	-	-	-	-	-141	-	-	-
Used in distribution	-4 414	-	-	-	-	-	-	-	-	-	-	-	-	-
Large-scale power units														
- Fuel used and production	- 123	-	-	-	-	-	-	-	-	- 153	- 17	-	-	-
- Own use in production	- 3	-	-	-	-	-	-	-	-	-	-	-	-	-
Large-scale CHP units														
- Fuel used and production	-26 559	-	-	-	- 0	-	-	-	-	- 40	- 633	-	-	-
- Own use in production	-3 619	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable energy, selected														
- Wind	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Small-scale CHP units														
- Fuels used and production	-2 089	-	-	-	-	-	-	-	-	- 30	- 1	-	-	-
- Own use in production	-1 026	-	-	-	-	-	-	-	-	-	-	-	-	-
District heating units														
- Fuels used and production	1 685	-	-	-	-	-	-	-	-	- 987	- 29	- 0	-	-
- Own use in production	- 230	-	-	-	-	-	-	-	-	-	-	-	-	-
Autoproducers														
- Electricity units	- 12	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHP units	-4 725	-	-	-1 667	-	-	-	-	-	- 169	- 197	- 0	-	-
- Heat units	4 508	-	-	-	-	-	-	-	-	- 3	- 2	- 0	-	-
Gas works	- 63	-	-	-	-	-	-	-	-	-	-	-	-	-
Biogas upgrading plants														
Distribution losses etc.	-34 973	-	-	-	-	-	-	-	-	-	-	-	-	-
Final consumption														
- Non-energy use	-9 454	-	-	-	-	-	-	-	-	-	-	-	-	-9 454
- Road	-154 742	-	-	-	-	-	-52 143	-	-	-90 642	-	-	-	-
- Rail	-4 124	-	-	-	-	-	-	-	-	-2 493	-	-	-	-
- Domestic sea transport	-5 761	-	-	-	-	-	-	-	-	-4 922	- 839	-	-	-
- International aviation	-17 893	-	-	-	-	-	-	-	-17 893	-	-	-	-	-
- Domestic aviation	- 765	-	-	-	-	-26	-	-	- 739	-	-	-	-	-
- Military transport	-1 746	-	-	-	-	-	- 0	-	-1 097	- 649	-	-	-	-
- Agriculture, forestry and horticulture	-24 971	-	-	-	- 246	-	- 126	-	-	-11 112	-	-	-	-
- Fishing	-5 000	-	-	-	- 6	-	-	-	-	-4 993	-	-	-	-
- Manufacturing	-94 465	-	-	-	-1 258	-	-	- 3	-	-4 973	- 302	-	-6 884	-
- Construction	-8 768	-	-	-	- 149	-	- 31	-	-	-6 516	-	-	-	-
- Wholesale	-11 033	-	-	-	- 38	-	-	- 1	-	- 118	- 0	-	-	-
- Retail trade	-9 677	-	-	-	- 31	-	-	- 1	-	- 50	- 0	-	-	-
- Private service	-37 757	-	-	-	- 143	-	-	- 3	-	- 160	- 20	- 0	-	-
- Public service	-25 211	-	-	-	- 150	-	-	- 5	-	- 504	- 17	-	-	-
- Single-family houses	-136 904	-	-	-	- 634	-	- 580	-	-	-4 622	-	-	-	-
- Multi-family houses	-52 279	-	-	-	- 231	-	-	- 9	-	- 512	- 22	-	-	-

ENERGY SUPPLY AND CONSUMPTION 2021

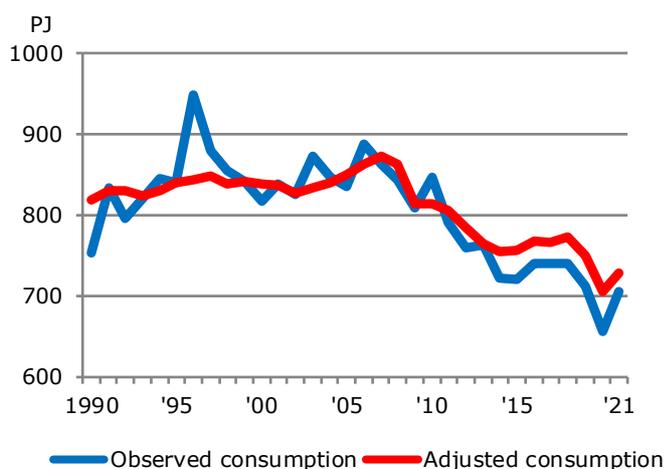
Natural gas	Coal	Coke etc.	Solar energy	Wind power	Hydro power	Geo-thermal	Straw	Wood chips	Fire-wood	Wood pellets	Wood waste	Biogas	Bio-methane	Waste	Biooil, biodiesel etc.	Heat pumps	Electricity	District heating	Gas-works gas
52 945	-	-	7 601	57 796	59	54	21 581	20 706	12 873	1 667	7 091	26 195	-	35 487	171	15 229	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86 760	18 785	341	-	-	-	-	-	21 986	1 673	65 005	-	-	-	5 112	16 526	-	72 431	111	-
-64 369	-13 990	-	-	-	-	-	-	-	-	-	-	-	-	-	-2 548	-	-54 904	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66	-	-	-	-
10 534	35 076	-4	-	-	-	-	-	-	-	-	-	-	-	-	-2 338	-	-	-	-
3	4 431	-0	-	-	-	-	-	-55	-0	-	-0	-	8	-0	-962	-	-	0	-0
-15 187	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1 027	-8	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-4 414	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-3	-	-
-1 825	-39 077	-	-	-	-	-	-4 831	-22 071	-	-44 991	-625	-7	-508	-	-	-	39 534	48 516	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-3 619	-	-
-	-	-	-	-57 796	-	-	-	-	-	-	-	-	-	-	-	-	57 796	-	-
-	-	-	-	-	-59	-	-	-	-	-	-	-	-	-	-	-	59	-	-
-7 709	-	-	-	-	-	-	-4 434	-5 899	-	-439	-568	-3 364	-2 146	-5 132	-	-	8 712	18 921	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-469	-557	-
-6 564	-49	-	-2 278	-	-	-54	-7 139	-12 373	-	-1 977	-833	-50	-1 828	-558	-171	-	-4 674	41 250	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-230	-
-	-	-	-4 712	-	-	-	-	-	-	-	-	-18	-	-	-	-	4 718	-	-
-1 245	-	-	-	-	-	-	-12	-181	-	-3 329	-2 044	-347	-29 239	-	-	-	8 111	25 593	-
-106	-	-	-	-	-	-	-1	-186	-	-312	-49	-29	-1 896	-	-	-	-86	7 177	-
-408	-	-	-	-	-	-	-	-	-	-	-	-119	-114	-	-	-	-	-	577
-	-	-	-	-	-	-	-	-	-	-	-	-19 672	19 672	-	-	-	-	-	-
-86	-	-	-	-	-	-	-	-	-	-	-	-	-24	-	-	-	-6 684	-28 156	-23
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-286	-	-	-	-	-	-	-	-	-	-	-	-	-80	-	-10 745	-	-846	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1 630	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-1 171	-127	-	-	-	-	-	-2 066	-28	-	-	-188	-96	-326	-	-	-1 297	-6 640	-1 548	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-23 461	-5 049	-337	-	-	-	-	-	-1 657	-	-1 450	-1 220	-391	-6 532	-3 255	-	-2 778	-31 074	-3 648	-194
-290	-	-	-	-	-	-	-	-	-	-	-	-	-81	-	-	-	-1 700	-	-
-1 176	-	-	-	-	-	-	-	-	-	-	-	-	-327	-	-	-	-4 925	-4 447	-
-908	-	-	-	-	-	-	-	-	-	-	-	-	-253	-	-	-	-5 001	-3 433	-
-3 806	-	-	-	-	-	-	-	-0	-	-	-16	-385	-1 060	-520	-	-	-16 678	-14 955	-11
-2 938	-	-	-92	-	-	-	-	-156	-	-1 356	-	-	-818	-	-	-	-8 033	-11 124	-17
-15 728	-	-	-428	-	-	-	-3 099	-86	-14 546	-16 460	-	-	-4 379	-	-	-11 154	-29 155	-35 854	-180
-2 979	-	-	-92	-	-	-	-	-	-	-	-	-	-829	-	-	-	-9 845	-37 608	-151

GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Gross energy consumption

	1990	2000	2005	2010	2015	2019	2020	2021	Change '90-'21
Adjusted total gross energy consumption. Fuel equivalent [PJ]	819	839	850	814	755	749	706	729	-11.0%
By fuel	819	839	850	814	755	749	706	729	-11.0%
Oil	355	376	352	312	278	281	238	245	-31.1%
Natural gas	82	192	192	176	133	113	96	91	11.2%
Coal and coke	327	175	166	147	111	70	69	63	-80.6%
Waste, non-renewable	8	14	17	16	18	19	20	19	140%
Renewable energy	48	81	123	163	216	266	283	311	552%
By energy product	819	839	850	814	755	749	706	729	-11.0%
Oil	338	329	333	300	273	277	234	240	-28.9%
Natural gas	59	98	100	94	87	79	68	67	13.2%
Coal and coke	17	12	11	6	5	5	5	6	-68.0%
Waste, non-renewable	0	1	1	1	1	2	2	2	261%
Renewable energy	28	32	43	54	70	77	82	85	207%
Electricity	297	286	279	274	229	218	225	237	-20.2%
District heating	77	79	81	86	91	92	91	92	18.2%
Gas works gas	2	1	1	1	1	1	0	0	-78.5%
By use	819	839	850	814	755	749	706	729	-11.0%
Energy sector	28	44	52	46	42	36	29	32	13.9%
Non-energy use	13	13	12	11	11	8	9	9	-27.3%
Transport	172	203	218	212	209	222	180	188	9.4%
Agriculture and industry	226	226	213	187	160	160	165	173	-23.7%
Commercial and public services	132	125	127	130	114	110	106	113	-14.2%
Households	248	228	229	228	220	214	216	214	-13.8%
Observed total energy consumption [PJ]	752	816	835	846	719	713	657	705	-6.3%
Oil	343	370	348	316	276	279	236	244	-29.0%
Natural gas	76	186	188	185	120	105	84	86	13.0%
Coal and coke	255	166	155	164	76	38	34	45	-82.5%
Waste, non-renewable	7	14	17	17	18	19	19	18	162%
Renewable energy	45	79	122	168	208	250	259	295	548%
Foreign trade in electricity, net imports	25	2	5	- 4	21	21	25	18	
Foreign trade in district heating, net imports	0	0	0	0	0	0	0	0	

Observed energy consumption and adjusted gross energy consumption



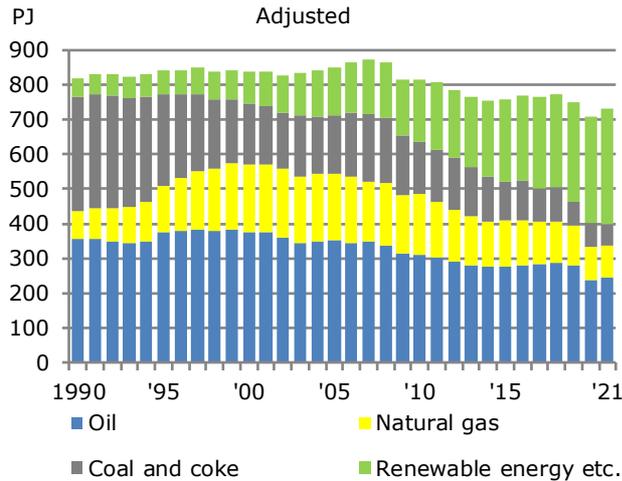
Observed energy consumption shows the registered amount of energy consumed in a calendar year. Gross energy consumption is derived by adjusting observed energy consumption for the fuel consumption linked to foreign trade in electricity. The adjusted gross energy consumption is moreover adjusted for climate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

Adjusted gross energy consumption was 729 PJ in 2021, which is 3.3% higher than the 2020 level. Compared with 1990, consumption has fallen by 11%.

Observed energy consumption was 705 PJ in 2021, which is 7.4% higher than the 2020 level. Compared with 1990, observed energy consumption was 6.3% lower.

GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Gross energy consumption by fuel

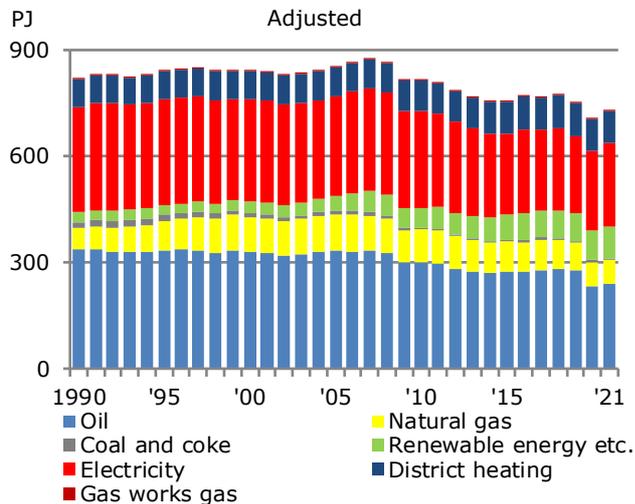


Adjusted gross energy consumption was 11% lower in 2021 than in 1990. However, consumption of individual fuels has followed rather varied trends.

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 up to 2008, after which it fell again. From 1990 to 2021, oil consumption fell by 31.1%. Consumption of coal, which primarily takes place at CHP units, has decreased by 80.6% since 1990. In the period, consumption of natural gas and renewable energy etc. (i.e. renewable energy and non-renewable waste) went up by 11.2% and 495%, respectively.

In 2021, consumption of natural gas and coal decreased by 4.9% and 8.7%, respectively, compared with the year before. In 2021, consumption of oil and renewable energy etc. increased by 2.8% and 8.9%, respectively, compared with 2020.

Gross energy consumption by energy product after transformation

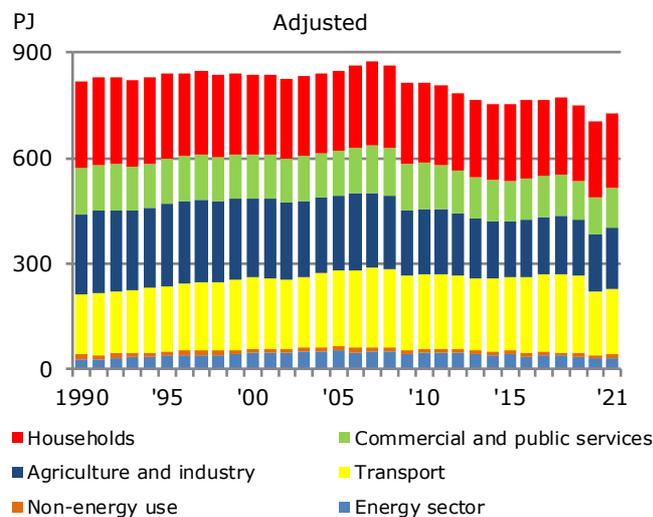


Gross energy consumption by energy product shows gross energy consumption after a number of fuels have been transformed to electricity, district heating, and gas works gas. In other words, the consumption of oil, natural gas, coal and renewable energy etc. is a statement of the volumes of these fuels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

Fuel consumption for electricity production was 237 PJ in 2021, which is 5.5% more than in 2020. Compared with 1990, fuel consumption fell by 20.2% due to more efficient electricity production and a growing share of wind power.

Fuel consumption for district heating was 92 PJ in 2021, which is 1.2% higher than in 2020. Compared with 1990, fuel consumption increased by 18.2%. Also in this regard, production has become more efficient, as district heating production has increased by 53.1% 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.

Adjusted gross energy consumption increased in all sectors in 2021, except for households. In the energy sector (platforms in the North Sea and oil refineries) gross energy consumption increased by 8.3%. Gross energy consumption for commercial and public services, the agriculture and industry sector and transport was 6.8%, 4.8% and 4.4% higher, respectively, in 2021 than the year before. In the households, gross energy consumption fell by 1.1%.

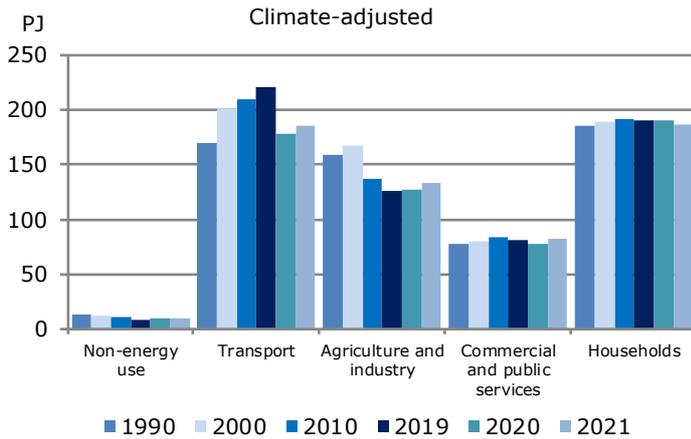
Compared with 1990, gross energy consumption for transport increased by 9.4%. In the agriculture and industry sector, gross energy consumption fell by 23.7%, while it fell by 14.2% and 13.8%, respectively, for the commercial and public services sector and for households. From 1990 to 2021, developments 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	2019	2020	2021	'90-'21
Total final energy consumption Climate adjusted	604 097	650 815	665 869	633 250	614 982	625 795	582 599	596 556	-1.2%
By energy product									
Oil	321 946	312 354	312 290	283 644	257 500	262 746	219 927	225 590	-29.9%
Natural gas	50 060	72 674	72 415	67 638	62 309	58 677	54 380	51 867	3.6%
Coal and coke	17 243	12 389	10 826	5 559	4 972	4 563	4 736	5 510	-68.0%
Waste, non-renewable	470	763	1 239	922	908	1 830	1 718	1 694	261%
Renewable energy	27 833	32 228	43 216	53 578	69 897	76 938	82 027	85 376	207%
Electricity	103 212	117 590	120 731	114 700	111 323	111 001	109 914	115 380	11.8%
District heating	81 679	102 127	104 604	106 725	107 398	109 441	109 321	110 590	35.4%
Gas works gas	1 654	691	547	485	675	599	576	549	-66.8%
By use									
Non-energy use	13 004	12 619	12 064	11 026	10 529	8 465	9 473	9 454	-27.3%
Total transport	170 216	201 209	215 789	209 731	207 836	220 204	177 901	185 114	8.8%
Road transport	129 943	153 666	161 923	161 215	159 245	164 047	152 066	154 742	19.1%
Rail transport	4 765	4 339	4 488	4 728	4 785	4 505	4 180	4 124	-13.5%
Sea transport, domestic	6 344	6 857	8 026	6 533	4 211	5 164	4 989	5 845	-7.9%
Aviation	27 515	34 822	37 627	35 785	38 246	45 104	14 645	18 658	-32.2%
Military transport	1 649	1 525	3 726	1 470	1 350	1 384	2 020	1 746	5.9%
Total agriculture and industry	158 790	167 113	158 242	137 014	122 085	125 740	127 361	132 850	-16.3%
Agriculture, forestry and horticulture	33 087	32 428	29 322	29 146	27 542	25 628	25 481	24 810	-25.0%
Fishing	10 785	9 451	7 488	6 049	5 205	4 732	4 575	5 000	-53.6%
Manufacturing	108 624	117 583	113 280	94 679	82 783	88 443	89 729	94 287	-13.2%
Construction	6 295	7 651	8 152	7 140	6 554	6 936	7 577	8 753	39.1%
Total commercial and public services	77 047	80 599	85 045	83 893	81 281	81 336	78 121	82 791	7.5%
Wholesale	13 795	13 893	12 906	11 493	10 883	10 764	10 468	10 936	-20.7%
Retail trade	8 883	9 323	9 991	10 939	10 332	9 503	9 176	9 590	8.0%
Private service	28 812	32 901	36 238	36 653	35 507	36 669	35 013	37 370	29.7%
Public service	25 557	24 481	25 909	24 807	24 558	24 400	23 464	24 895	-2.6%
Total households	185 039	189 275	194 729	191 585	193 252	190 050	189 744	186 347	0.7%
Single-family houses	137 383	139 568	144 258	140 888	142 015	138 453	138 616	134 853	-1.8%
Multi-family houses	47 656	49 706	50 471	50 696	51 237	51 598	51 128	51 494	8.1%
Observed consumption Total final energy consumption	580 458	632 528	658 455	659 750	606 080	617 141	568 131	600 632	3.5%

Final energy consumption by use

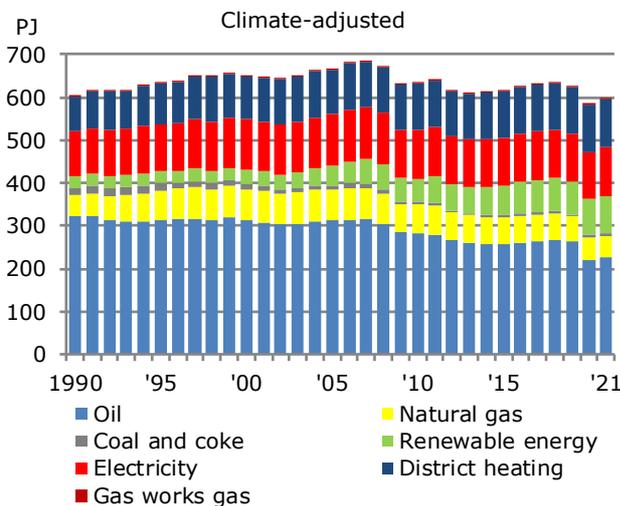


Final energy consumption includes consumption for transport and non-energy purposes (such as lubricants and asphalt), and energy consumption for production and heating by the agriculture and industry sector, the commercial and public services sector, and energy consumption by households.

Final energy consumption in 2021 was 597 PJ, which is 2.4% higher than in 2020. Final consumption was 1.2% lower compared with 1990.

Energy consumption for transport increased by 29.4% from 1990 to 2019. It fell sharply by 19.2% from 2019 to 2020, and rose by 4.1% in 2021. From 1990 to 2021 consumption for transport went up by 8.8%. Energy consumption in the agriculture and industry sector fell by 16.3% from 1990 to 2021, while consumption in the commercial and public services sector and households increased by 7.5% and 0.7%, respectively.

Final energy consumption by energy product

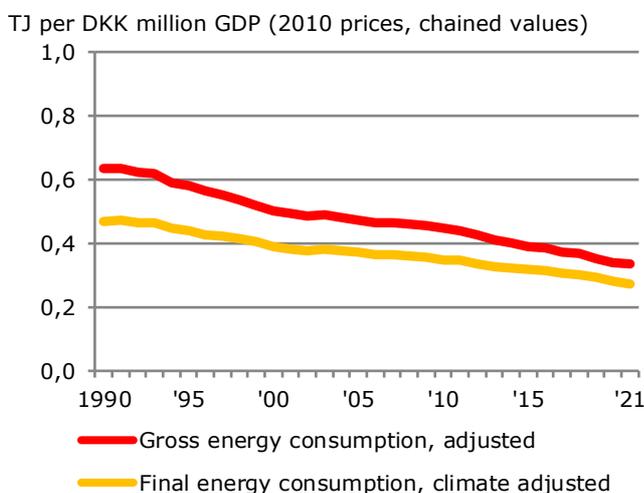


Consumption of oil increased by 2.6% and consumption of natural gas (for other uses than electricity and district heating production) decreased by 4.6% from 2020 to 2021. Consumption of electricity and district heating increased by 5.0% and 1.2%, respectively, in 2021.

Since 1990, final consumption of natural gas has increased by 3.6%, while consumption of electricity and district heating has increased by 11.8% and 35.4%, respectively. In the same period, consumption of oil and coal fell by 29.9% and 68.0%, respectively.

In 2021, final consumption of renewable energy etc. was 4.0% higher than in 2020. Consumption of renewable energy etc. has increased by 437% 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 2021, gross energy consumption was 0.334 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 47.4% during this period. Intensity in 2021 decreased by 1.5% compared with the year before.

If developments in GDP are instead compared to developments in final energy consumption, energy intensity fell by 41.6% from 1990 to 2021. This reduction is less than the figure above, because the efficiency of the transformation sector is not included. Intensity decreased by 2.3% in 2021 compared with the year before.

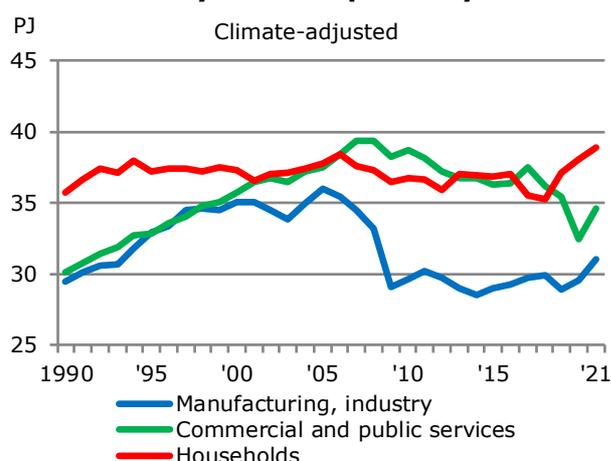
GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

Final electricity consumption

Change

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	'90-'21
Total final electricity consumption Climate adjusted	103 212	117 590	120 731	114 700	111 323	111 001	109 914	115 380	11.8%
Rail transport	736	1 253	1 351	1 455	1 429	1 664	1 889	2 476	236%
Agriculture and industry	36 633	43 283	44 092	37 851	36 735	36 837	37 544	39 397	7.5%
Agriculture, forestry and horticulture	6 143	7 047	6 874	6 841	6 441	6 593	6 534	6 632	8.0%
Manufacturing	29 436	35 022	35 943	29 638	28 994	28 884	29 585	31 065	5.5%
Construction	1 054	1 214	1 274	1 372	1 300	1 360	1 425	1 700	61.2%
Commercial and public services	30 147	35 715	37 479	38 656	36 303	35 412	32 424	34 615	14.8%
Wholesale	5 451	5 936	5 973	5 740	5 269	5 107	4 829	4 923	-9.7%
Retail trade	5 202	5 742	6 260	6 543	6 075	5 158	4 833	4 999	-3.9%
Private services	11 715	14 903	15 866	17 108	16 379	16 914	15 494	16 665	42.3%
Public services	7 778	9 134	9 380	9 266	8 580	8 233	7 268	8 027	3.2%
Households	35 696	37 339	37 810	36 738	36 855	37 088	38 057	38 892	9.0%
Single-family houses	27 011	28 210	28 279	27 335	27 772	28 096	28 845	29 057	7.6%
Multi-family houses	8 686	9 129	9 530	9 403	9 084	8 993	9 212	9 835	13.2%
Observed electricity consumption	102 139	116 849	120 467	115 623	111 019	110 700	109 405	115 527	13.1%

Final electricity consumption by use

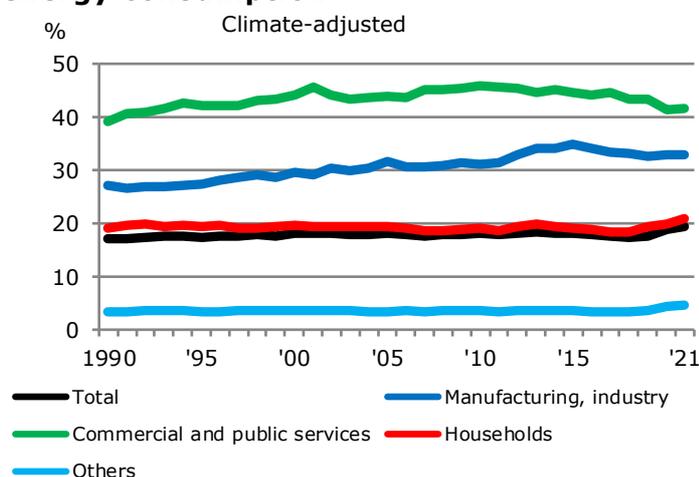


Electricity consumption by manufacturing industries was 5.0% higher in 2021 than in 2020. Compared with 1990, electricity consumption has increased by 5.5%.

In the commercial and public services sector, electricity consumption increased until 2008, after which it fell. Following a significant fall in 2020, it rose by 6.8% from 2020 to 2021. From 1990 to 2021 electricity consumption went up by 14.8%.

The electricity consumption of households fluctuated in the period 1990 to 2021 between 35.7 PJ and 38.9 PJ. Electricity consumption increased by 2.2% in 2021. Consumption increased by 9.0% relative to 1990.

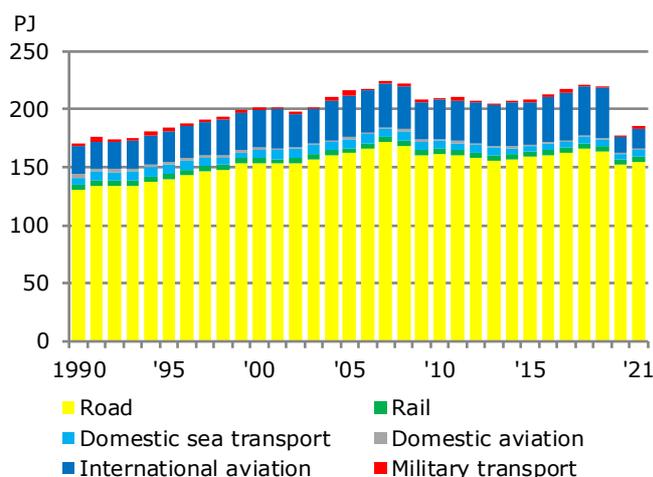
Electricity consumption's share of total energy consumption



During the period from 1990 to 2021 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 2021 it was 19.3%.

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 2021, electricity consumption accounted for 41.8% of the sector's total energy consumption. Manufacturing industries has seen a steady increase across the period 1990-2015. After this, the percentage of electricity fell. In 2021, the share was 32.9% against 27.1% in 1990. Electricity consumption's share for households remains more or less unchanged with 19.3% in 1990 and 20.9% in 2021.

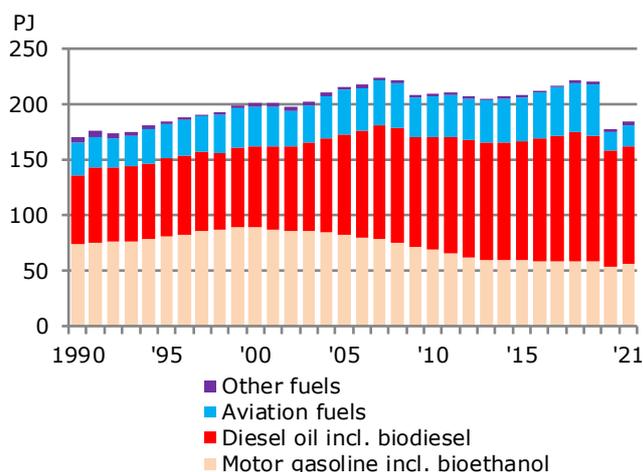
Energy consumption for transport by type



Energy consumption for transport followed an upward trend from 1990 until 2007, when energy consumption was at 224.0 PJ. In 2009, energy consumption fell to 208.4 PJ. Following the drop in 2020, energy consumption for transport totalled 185.1 PJ in 2021, which is an increase of 4.1% since 2020. Compared with 1990, energy consumption for transport had increased by 8.8% overall in 2021.

Energy consumption for road transport was 154.7 PJ in 2021, which is 1.8% higher compared with 2020. 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 1990-2019. In 2020, consumption fell substantially. From 2020 to 2021 it rose by 28.4%, but it is still 59.1% lower than in 2019.

Energy consumption for transport by fuel type

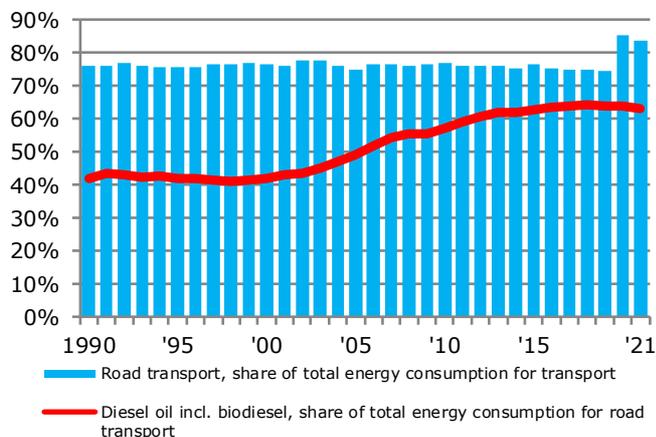


Consumption of motor gasoline (including bioethanol) increased by 2.5% from 2020 to 2021, while consumption of diesel oil (including biodiesel) increased by 1.2%. Consumption of bioethanol and biodiesel together increased by 2% from 2020 to 2021.

Considering developments from 1990 to 2021, consumption of motor gasoline (including bioethanol) fell by 25.2%, while consumption of diesel oil (including biodiesel) grew by 71.9%. Consumption of aviation fuels decreased by 31.8%.

Consumption of other types of fuel fell by 27.9% in the same period. Other types of fuel include electricity consumption by railways.

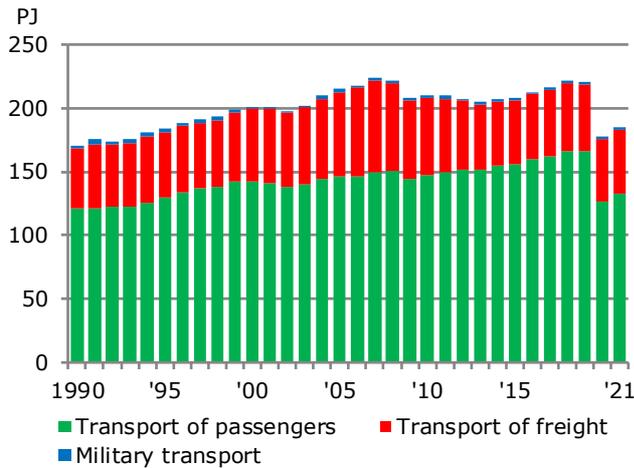
Energy consumption for road transport



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 2019. In 2020, road transport accounted for 85.5% of total energy consumption for transport. The change should be considered in light of the substantial fall in consumption of jet fuel for air transport, which occurred during the COVID-19 pandemic restrictions. The percentage was 83.6% in 2021.

Consumption of diesel oil has increased significantly and diesel oil has been the most common fuel for road transport since 2006. In 2021, diesel oil (including biodiesel) accounted for 63.3% of total energy consumption for transport, as opposed to 42.1% in 1990.

Final energy consumption by passenger and freight transport



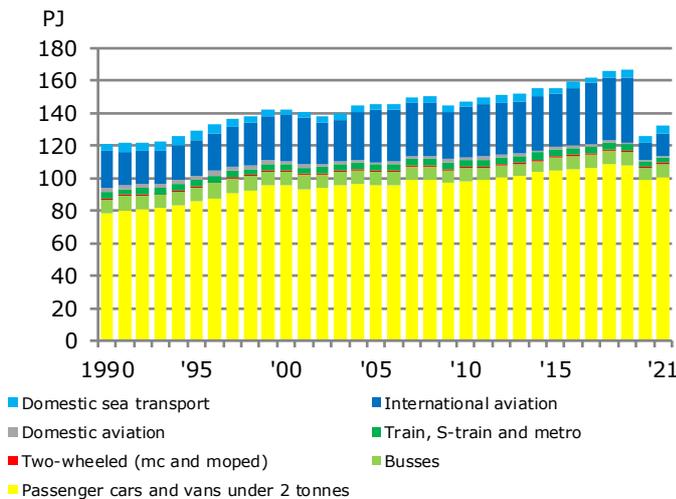
In the distribution of energy consumption for transport of passengers and freight, vans less than two tonnes are included under passenger transport, whereas vans of 2-6 tonnes are included under freight transport.

Out of the total energy consumption for transport in 2021, which amounted to 185.1 PJ, passenger transport accounted for 132.7 PJ, corresponding to 71.6%. Energy consumption for freight transport was 50.7 PJ, corresponding to 27.4%, while energy consumption for transport by Danish military was 1.7 PJ.

Energy consumption for passenger transport increased by 4.9% from 2020 to 2021, while energy consumption for freight transport increased by 2.5%. Considering the trend from 1990 to 2021, energy consumption for passenger transport increased by 9.3%, while energy consumption for freight transport increased by 7.4%.

*LNG is included with the same distribution as gas/diesel in shipping.

Energy consumption for passenger transport by means of transport

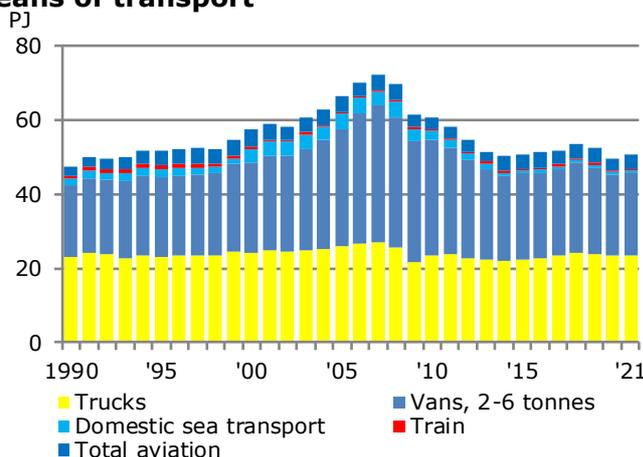


Energy consumption for passenger transport is mainly used for transport by car and for international aviation. In 2021, energy consumption for these categories made up 76.1% and 10.5%, respectively, of total energy consumption for passenger transport.

After the large drop in 2020, energy consumption for cars and vans (less than 2 tonnes) increased by 1.9% from 2020 to 2021, while energy consumption for international aviation increased by 29.3%. From 1990 to 2021, energy consumption for cars and vans increased by 28.3%, while energy consumption for international aviation fell by 38.4%.

*LNG is included with the same distribution as gas/diesel in shipping.

Energy consumption for freight transport by means of transport



Energy consumption for freight transport is mostly by trucks and vans (2-6 tonnes). In 2021, energy consumption by these types of vehicle made up 46.1% and 43.5%, respectively, of total energy consumption for freight transport.

Energy consumption for trucks increased by 0.5% from 2020 to 2021, and energy consumption for vans increased also by 1.2%. Energy consumption for trucks increased by 0.8% from 1990 to 2021, while energy consumption for vans increased by 15.4%.

*LNG is included with the same distribution as gas/diesel in shipping.

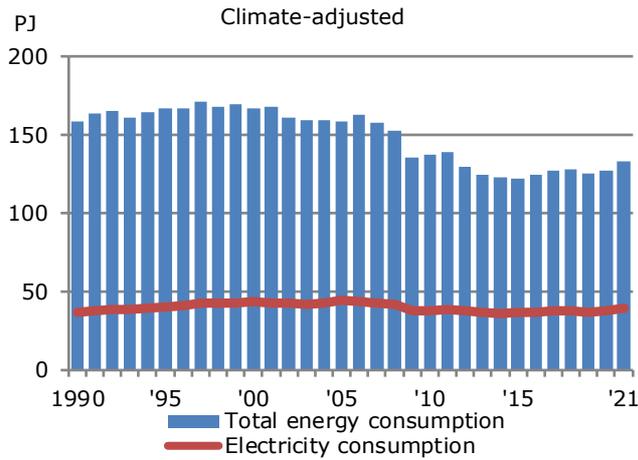
Final energy consumption for transport

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	Change '90-'21
Total transport Observed consumption	170 216	201 209	215 789	209 731	207 836	220 204	177 901	185 114	8.8%
LPG	464	425	323	3	-	-	-	-	-100%
Aviation gasoline	155	119	107	76	57	41	44	26	-82.9%
Motor gasoline	74 327	88 976	82 126	67 726	57 443	56 810	50 861	52 143	-29.8%
Petroleum	462	39	14	0	-	-	-	-	-100%
JP1	28 828	35 810	39 959	36 577	38 927	46 008	16 132	19 729	-31.6%
Gas/diesel oil	61 685	73 077	90 529	101 893	100 825	105 589	97 607	98 707	60.0%
Fuel oil	3 560	1 509	1 379	868	39	204	430	839	-76.4%
Natural gas					76	300	278	286	•
LNG	-	-	-	-	71	77	77	84	•
Bio methane					1	33	53	80	•
Bioethanol	-	-	-	1 118	1 840	1 829	3 339	3 427	•
Biodiesel	-	-	-	16	7 129	7 648	7 190	7 318	•
Electricity	736	1 253	1 351	1 455	1 429	1 664	1 889	2 476	236%
Road	129 943	153 666	161 923	161 215	159 245	164 047	152 066	154 742	19.1%
Rail	4 765	4 339	4 488	4 728	4 785	4 505	4 180	4 124	-13.5%
Domestic sea transport	6 344	6 857	8 026	6 533	4 211	5 164	4 989	5 845	-7.9%
Domestic aviation	2 856	1 981	1 449	2 000	1 415	1 331	714	765	-73.2%
International aviation	24 659	32 842	36 178	33 785	36 831	43 773	13 931	17 893	-27.4%
Military transport	1 649	1 525	3 726	1 470	1 350	1 384	2 020	1 746	5.9%
Passenger transport	121 342	142 227	145 898	147 700	155 830	166 560	126 405	132 652	9.3%
Freight transport	47 225	57 458	66 166	60 562	50 656	52 260	49 476	50 716	7.4%
Military transport	1 649	1 525	3 726	1 470	1 350	1 384	2 020	1 746	5.9%

Final energy consumption in agriculture and industry

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	Change '90-'21
Total for agriculture and industry Climate adjusted	158 790	167 113	158 242	137 014	122 085	125 740	127 361	132 850	-16.3%
By energy product									
Oil	65 613	58 460	53 743	44 071	35 757	34 975	35 532	36 512	-44.4%
Natural gas	25 281	35 606	32 433	30 901	29 134	26 901	24 884	24 824	-1.8%
Coal and coke	16 315	12 339	10 817	5 531	4 972	4 563	4 736	5 510	-66.2%
Waste, non-renewable	13	72	591	759	771	1 520	1 465	1 465	11511%
Renewable energy	9 377	8 098	7 759	11 509	10 392	15 753	17 557	19 819	111%
Electricity	36 633	43 283	44 092	37 851	36 735	36 837	37 544	39 397	7.5%
District heating	5 409	9 210	8 788	6 353	4 115	4 987	5 446	5 131	-5.2%
Gas works gas	149	45	19	41	208	207	196	193	29.6%
By use									
Agriculture, forestry and horticulture	33 087	32 428	29 322	29 146	27 542	25 628	25 481	24 810	-25.0%
Fishing	10 785	9 451	7 488	6 049	5 205	4 732	4 575	5 000	-53.6%
Manufacturing industries	108 624	117 583	113 280	94 679	82 783	88 443	89 729	94 287	-13.2%
Construction	6 295	7 651	8 152	7 140	6 554	6 936	7 577	8 753	39.1%

Energy and electricity consumption in agriculture and industry

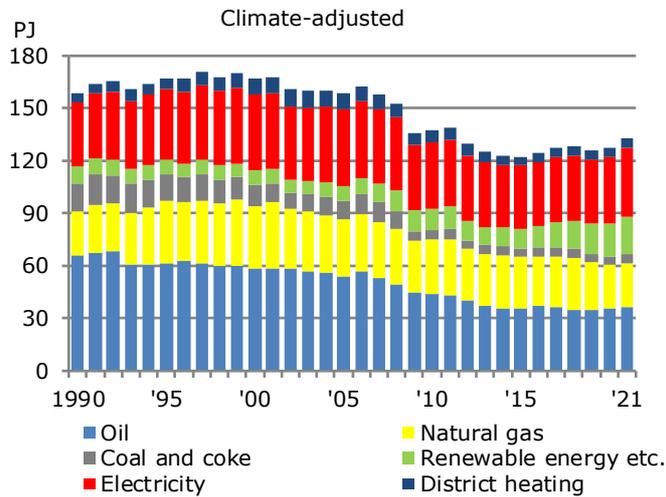


Agriculture and industry covers agriculture, forestry and horticulture, fishing, manufacturing industries (excl. refineries), as well as construction.

In 2021, climate-adjusted energy consumption in agriculture and industry was 132.8 PJ, which is 4.3% higher than the year before. Compared with 1990, energy consumption decreased by 16.3%.

Electricity consumption in 2021 was 39.4 PJ after adjusting for climate variation. This is an increase by 4.9% compared with the year before. Compared with 1990, electricity consumption increased by 7.5%.

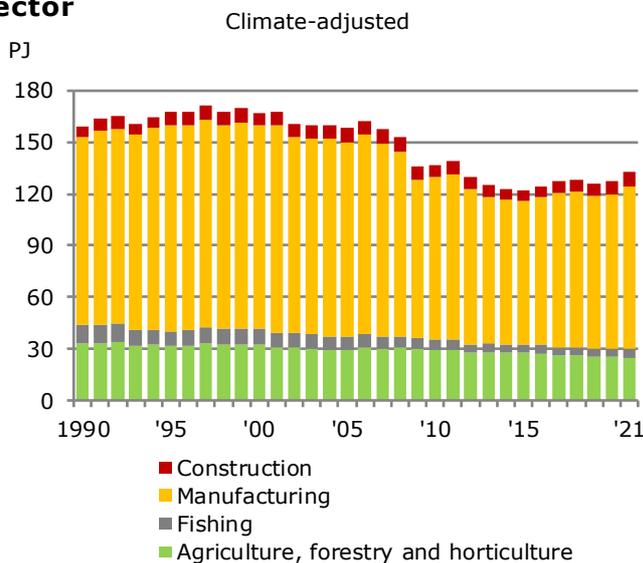
Energy consumption in agriculture and industry by energy products



In 2021, consumption of oil, coal and renewable energy etc. for agriculture and industry grew by 2.8%, 16.3% and 11.9%, respectively, compared with 2020. Consumption of natural gas decreased by 0.2%. Consumption of electricity increased with 4.9%, while consumption of district heating was 5.8% lower in 2021 than the year before.

Consumption of coal, oil and natural gas in the period 1990-2021 decreased by 66.2%, 44.4% and 1.8%, respectively. Consumption of renewable energy etc. increased by 126.7%. Since 1990, consumption of electricity has increased by 7.5%, while consumption of district heating has fallen by 5.2%.

Energy consumption by individual industry in the agriculture and industry sector

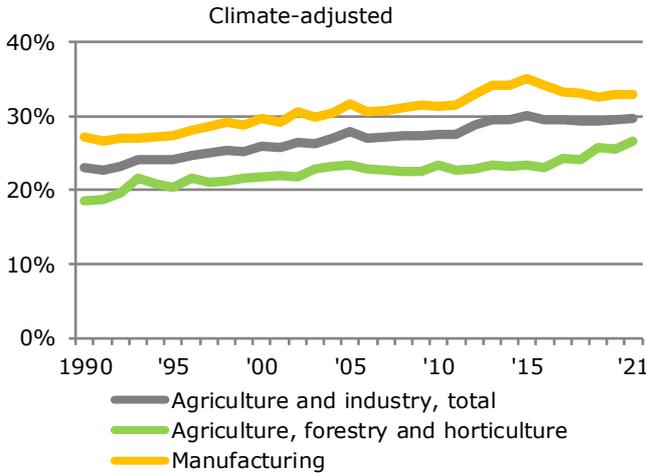


Compared with 2020 energy consumption fell by 2.6% in agriculture, forestry and horticulture. Energy consumption in fishing, manufacturing industries and in construction increased by 9.3%, 5.1% and 15.5%, respectively, in 2021.

From 1990 to 2021, energy consumption in manufacturing industries fell by 13.2%. Energy consumption in agriculture, forestry and horticulture fell by 25.0%, while in construction consumption increased by 39.1%. In fishing, energy consumption fell by 53.6%.

In 2021, agriculture, forestry and horticulture's share of total energy consumption by the agriculture and industry sector was 18.7%, while the share of manufacturing industries was 71%. In 2021, fishing and construction accounted for 3.8% and 6.6%, respectively, of energy consumption in the agriculture and industry sector.

Electricity consumption's share of total energy consumption

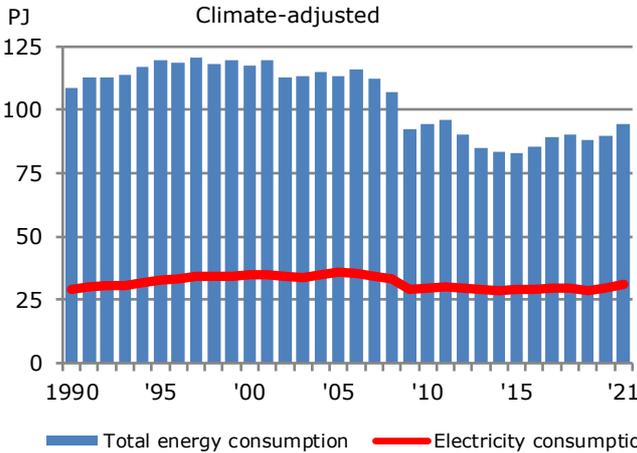


Electricity consumption's share of total energy consumption in the agriculture and industry sector increased from 23.1% in 1990 to 29.7% in 2021.

In manufacturing industries the share of electricity increased from 27.1% in 1990 to 32.9% in 2021.

In agriculture, forestry and horticulture the share of electricity was 18.6% in 1990. In 2021, this share was 26.7% of total energy consumption in agriculture, forestry and horticulture.

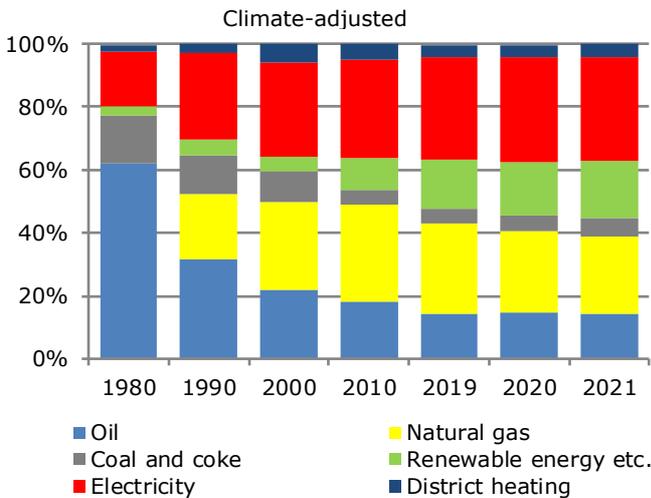
Energy and electricity consumption in manufacturing industries



Climate-adjusted energy consumption in manufacturing industries increased from 89.7 PJ in 2020 to 94.3 PJ in 2021, corresponding to an increase of 5.1%. Compared with 1990, energy consumption decreased by 13.2%.

In 2021, electricity consumption was 31.1 PJ, which is 5.0% more than the year before. Electricity consumption has risen by 5.5% since 1990.

Composition of energy consumption in manufacturing industries



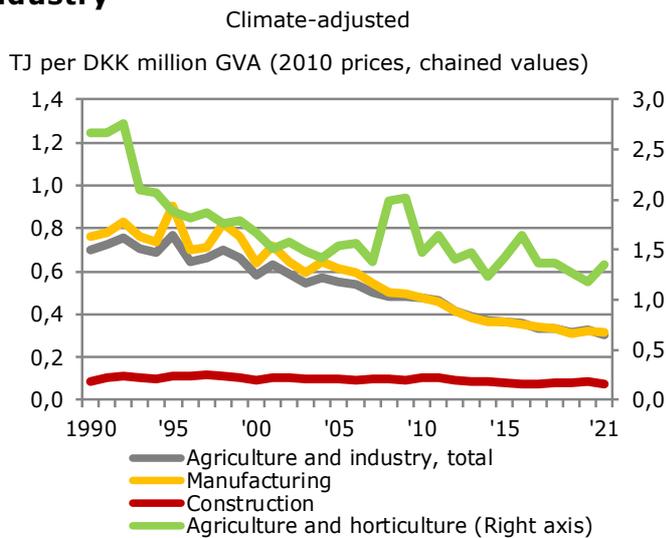
The composition of energy consumption in manufacturing industries has changed significantly since 1980, when oil consumption was dominant by 62.2% of the total energy consumption. In 1990, oil consumption accounted for almost one-third of total energy consumption. In 2021, this figure was 14.2%.

Consumption of natural gas accounted for 24.8% of energy consumption in manufacturing industries in 2021, 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 2021. The contribution from renewable energy etc. and district heating has increased from 1990 to 2021. In 2021, their shares were 18.3% and 3.8%, respectively.

The share of electricity consumption grew from 27.1% in 1990 to 32.9% in 2021.

Energy intensities in agriculture and industry



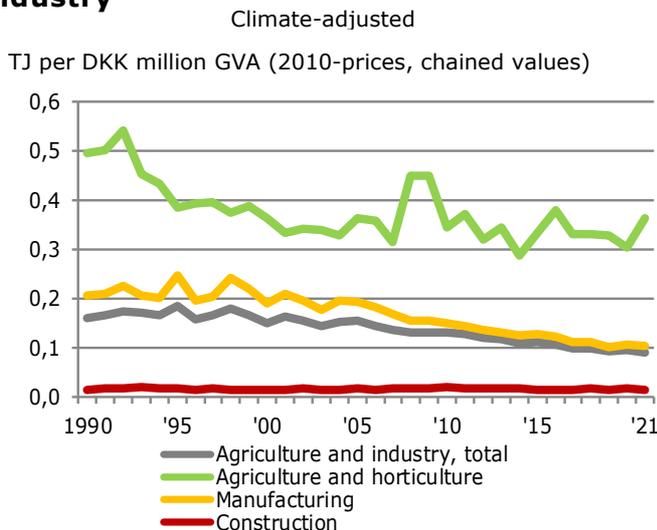
Energy intensity has been calculated as climate-adjusted energy consumption in relation to the gross value added (GVA), measured at 2010 prices, chained values.

Energy intensity in agriculture and industry dropped by 56.6% from 1990 to 2021. The annual average fall in energy intensity from 1990 to 2021 was 2.5% per year.

In manufacturing industries, energy intensity fell by 58.8% from 1990 to 2021. In 2021, energy intensity decreased by 2.7% compared with 2020.

In agriculture, forestry and horticulture, energy intensity increased by 14.8% in 2021. The energy intensity has fallen by 49.3% since 1990. Since 2005, the trend has been influenced by significant fluctuations in agricultural, forestry and horticultural GVA.

Electricity intensities in agriculture and industry

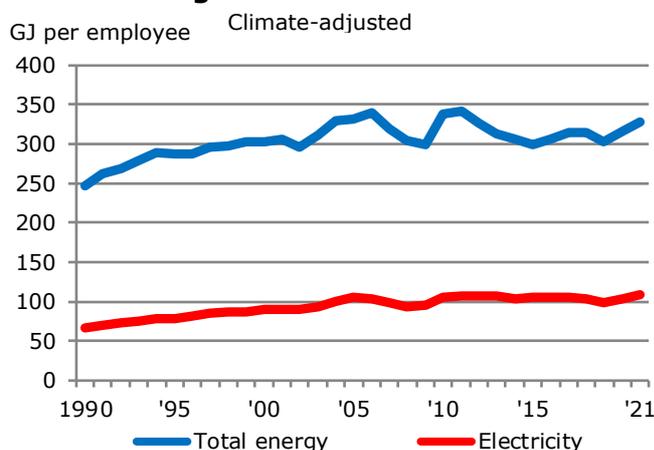


Electricity intensity has been calculated as climate-adjusted electricity consumption in relation to GVA, measured at 2010 prices, chained values.

After a period of fluctuating electricity intensity in agriculture and industry in the 1990s, it fell steadily up to 2021. In the period 1990 to 2021, electricity intensity fell by 44.3%. In 2021, electricity intensity was 0.090, i.e. 0.090 TJ of electricity (corresponding to 25,000 kWh) where used for every DKK 1 million GVA in the agriculture and industry sector. In 2021, electricity intensity fell by 7.0% compared with 2020.

Electricity intensity in manufacturing industries decreased by 2.8% in 2021. In agriculture, forestry and horticulture intensity increased by 19.6%. Both compared with 2020. Electricity intensity in construction rose by 11.7%.

Energy consumption per employee in manufacturing industries

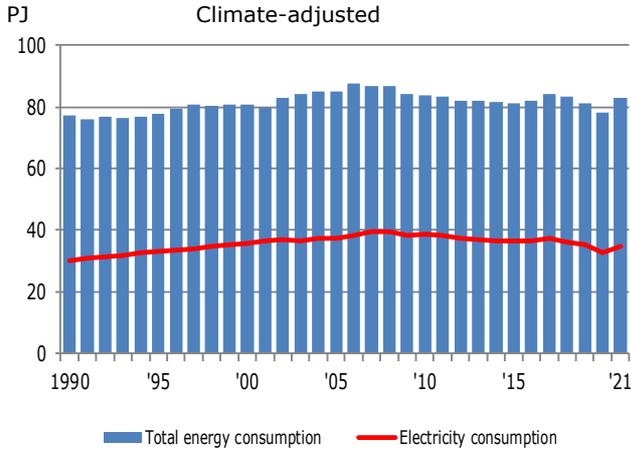


Energy and electricity consumption per employee in manufacturing industries have developed differently than the intensities shown above. This is due to a considerable increase in productivity, i.e. measured as GVA per employee in this sector.

Energy consumption per employee was 328 GJ in 2021, as opposed to 316 GJ the year before. This corresponds to an increase of 3.8%. Compared with 1990, energy consumption per employee grew by 33.0%.

Electricity consumption per employee was 108 GJ in 2021, which is 3.7% higher than the year before. Compared with 1990, electricity consumption per employee increased by 61.7%.

Energy and electricity consumption in the commercial and public services

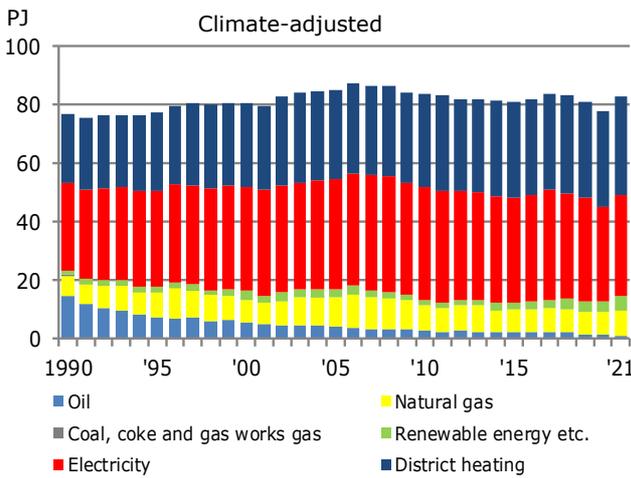


The commercial and public services sector includes wholesale, retail, private and public services.

Climate-adjusted energy consumption was 82.8 PJ in 2021, which is 6.0% higher than the year before. Compared with 1990, consumption increased by 7.5%.

In 2021, climate-adjusted electricity consumption was 34.6 PJ, which is 6.8% higher than the year before. Compared with 1990, electricity consumption increased by 14.8%.

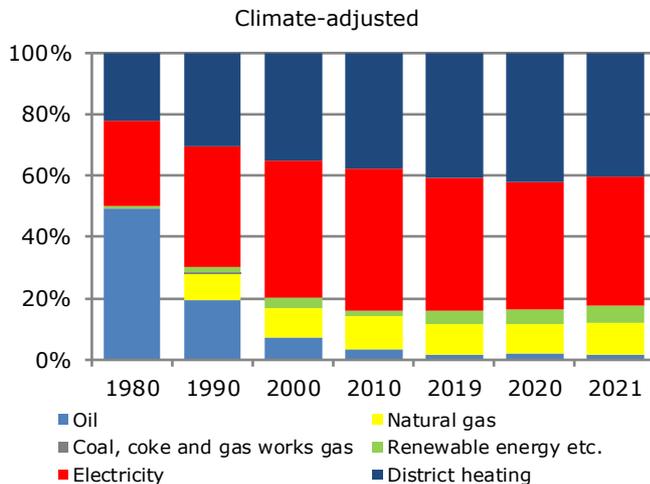
Energy consumption by energy product



Electricity and district heating are predominant energy sources in the commercial and public services sector. In 2021, consumption of electricity and consumption of district heating increased by 6.8% and 1.6%, respectively, compared with the year before.

Compared with 1990, oil consumption fell by 91.7%, while natural gas consumption increased by 25.8%. In 2021, consumption of electricity and consumption of district heating was 14.8% and 42.2% higher, respectively, compared with 1990.

Composition of energy consumption in the commercial and public services

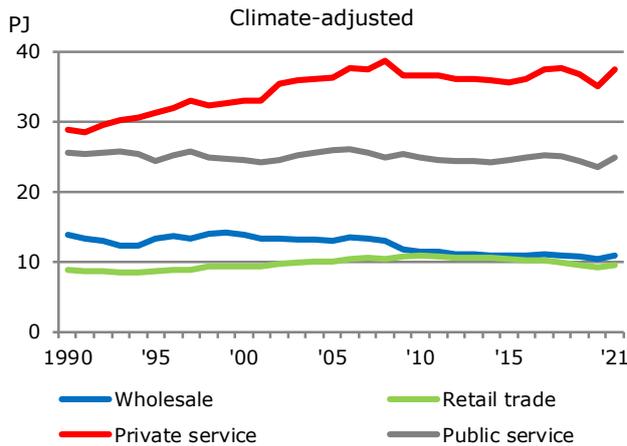


The composition of energy consumption in the commercial and public services sector has changed significantly since 1980, when oil consumption was dominant. In 1990, electricity and district heating together accounted for 69.6% of total energy consumption in the commercial and public services sector (electricity 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 2021, electricity and district heating consumption together accounted for 82.1% of total energy consumption (electricity 41.8% and district heating 40.3%). The share of oil was 1.5%, while the share of natural gas was 10.5%. The share of renewable energy etc. was 5.9%.

COMMERCIAL AND PUBLIC SERVICES

Energy consumption by sector



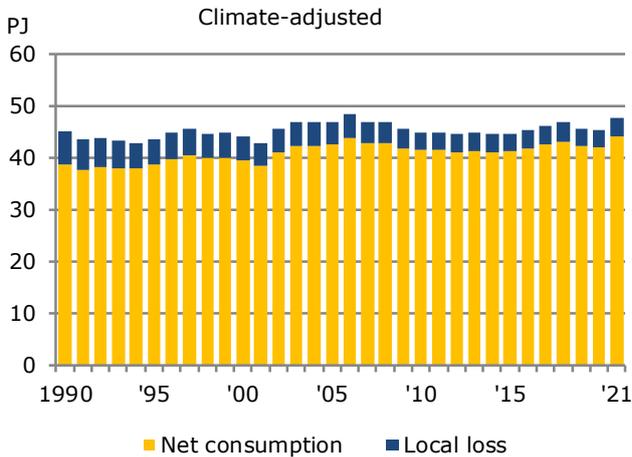
In 2021, 75.2% of energy consumption in the commercial and public services sector was in private and public services, while wholesale and retail accounted for the remaining 24.8%.

From 2020 to 2021, energy consumption in private services and public services increased by 6.7% and 6.1%, respectively. Energy consumption in both wholesale and retail trade increased by 4.5%.

Compared with 1990, energy consumption in wholesale fell by 20.7%, while energy consumption in retail grew by 8.0%.

Energy consumption in the private service sector is higher today than in 1990. Since 1990, growth has been 29.7%. In the public service sector, energy consumption is 2.6% lower compared with 1990.

Energy consumption for heating in the commercial and public services

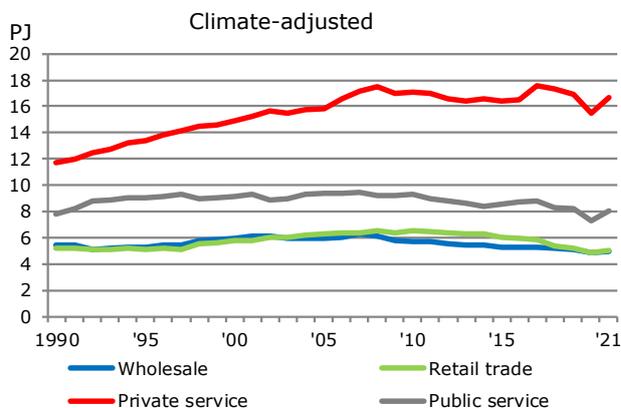


Energy consumption for heating (space heating and hot water) can be calculated in different ways. While final energy consumption is the volume of energy paid for, net energy consumption is the volume of energy utilised. The difference is local losses by the individual consumers, e.g. from oil and natural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

Final energy consumption for heating in the commercial and public services sector was 47.6 PJ in 2021, which is 5.3% higher than the year before. Compared with 1990, consumption grew by 5.9%.

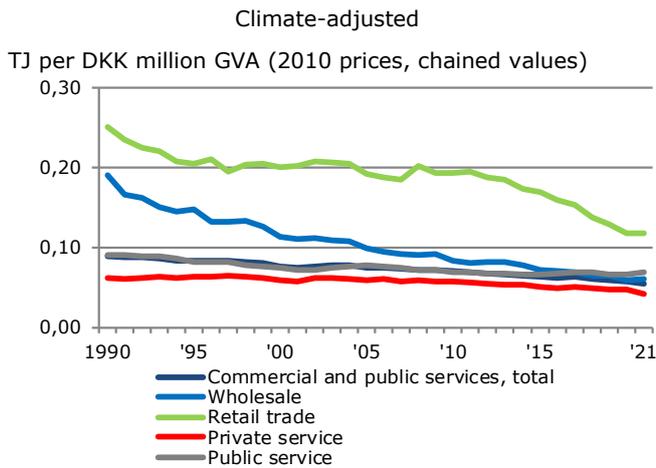
Net energy consumption was 44.0 PJ in 2021, which is 5.2% higher than the year before. Compared with 1990, net energy consumption increased by 14.2%.

Electricity consumption by sector



From 1990 to 2021, electricity consumption in wholesale decreased by 9.7% and in retail by 3.9%. In the public service sector, electricity consumption increased by 3.2% and in the public service sector by 42.3%. In 2021, electricity consumption was 2.0% lower in wholesale and 3.5% lower in retail, compared with 2020. In private service, electricity consumption increased by 7.6% and electricity consumption in public services increased by 10.4%.

Energy intensities in the commercial and public services

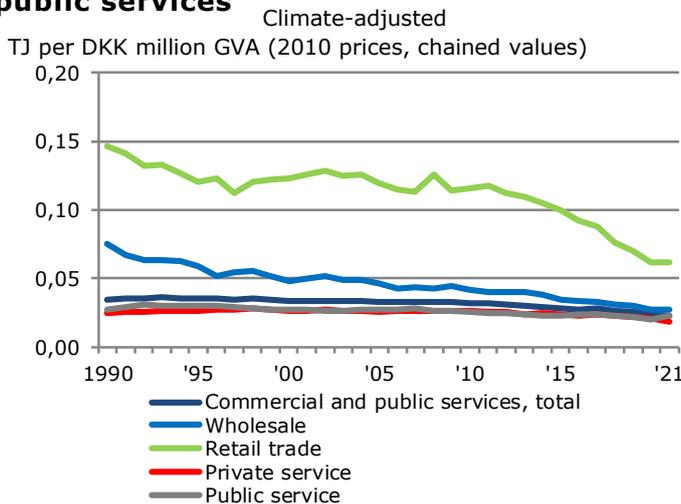


Energy intensities have been calculated as climate-adjusted energy consumption in relation to gross value added (GVA), measured at 2010 prices, chained values.

Energy intensity was 0.054 in 2021, i.e. for every DKK 1 million GVA in the commercial and public services sector, 0.054 TJ of energy were used. This is 5.4% less than the year before.

Energy intensity in the commercial and public services sector fell by 39% from 1990 to 2021. For wholesale and retail, energy intensities fell by 68.2% and 52.9%, respectively. For the private service sector and the public service sector, intensities fell by 32.1% and 22.9%, respectively.

Electricity intensities in commercial and public services

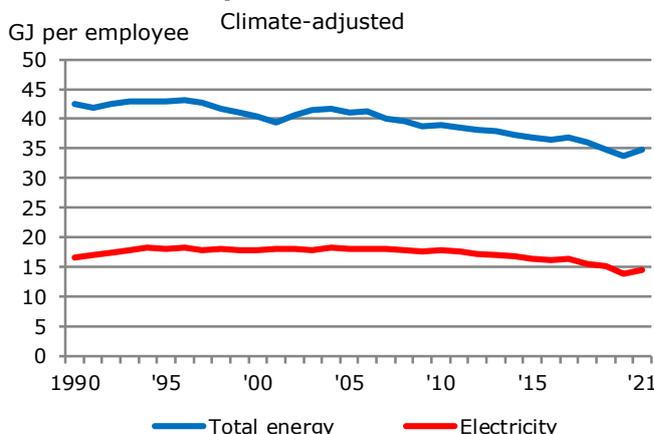


Electricity intensities have been calculated as climate-adjusted electricity consumption in relation to GVA, measured at 2010 prices, chained values.

In 2021 electricity intensity was 0.023, i.e. for every DKK 1 million GVA in the commercial and public services sector, 0.023 TJ of electricity (corresponding to 6,389 kWh) were used. Electricity intensity fell by 4.7% relative to the year before.

Electricity intensity in the commercial and public services sector fell by 34.9% from 1990 to 2021. For wholesale and retail, electricity intensities fell by 63.8% and 58.1%, respectively. In private services, electricity intensity fell by 25.5%, while electricity intensity in the public service sector fell by 18.3%.

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 34.9 GJ in 2021, as opposed to 33.6 GJ the year before. This corresponds to an increase of 3.6%. Compared with 1990, energy consumption per employee fell by 18%.

In 2021, electricity consumption per employee was 14.6 GJ as opposed to 14.0 GJ the year before, which is an increase of 4.4%. Compared with 1990, electricity consumption per employee decreased by 12.3%.

COMMERCIAL AND PUBLIC SERVICES/HOUSEHOLDS

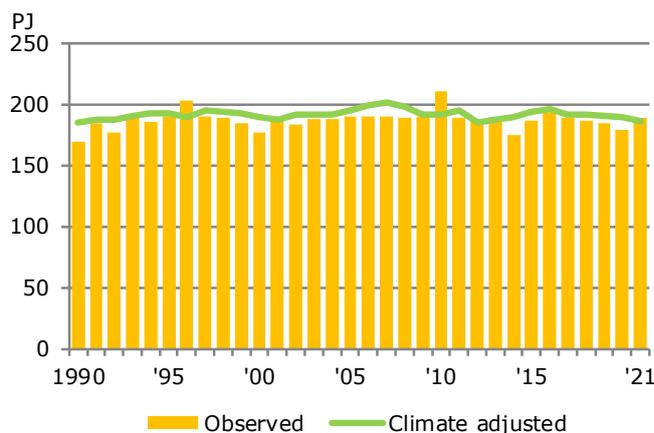
Final energy consumption in the commercial and public services

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	Change '90-'21
Total commercial and public services. Climate adjusted	77 047	80 599	85 045	83 893	81 281	81 336	78 121	82 791	7.5%
Oil	14 850	5 874	4 428	2 810	2 671	1 453	1 631	1 227	-91.7%
Natural gas	6 902	7 739	9 989	8 977	7 680	7 964	7 527	8 680	25.8%
Coal and coke	98	-	-	-	-	-	-	-	-100%
Waste, non-renewable	457	691	648	163	137	310	253	230	-49.8%
Renewable energy	1 022	2 078	2 178	1 491	1 813	3 155	3 437	4 667	357%
Electricity	30 147	35 715	37 479	38 656	36 303	35 412	32 424	34 615	14.8%
District heating	23 449	28 451	30 281	31 761	32 639	33 010	32 818	33 345	42.4%
Gas works gas	121	52	42	35	37	31	30	28	-76.5%
By use									
Wholesale	13 795	13 893	12 906	11 493	10 883	10 764	10 468	10 936	-20.7%
Retail	8 883	9 323	9 991	10 939	10 332	9 503	9 176	9 590	8.0%
Private service	28 812	32 901	36 238	36 653	35 507	36 669	35 013	37 370	29.7%
Public service	25 557	24 481	25 909	24 807	24 558	24 400	23 464	24 895	-2.6%

Final energy consumption in households

Direct energy content [TJ]	1990	2000	2005	2010	2015	2019	2020	2021	Change '90-'21
Total households. Climate adjusted	185 039	189 275	194 729	191 585	193 252	190 050	189 744	186 347	0.7%
Oil	58 998	35 444	27 617	18 595	11 105	8 791	7 807	6 504	-89.0%
Natural gas	17 877	29 329	29 993	27 761	25 495	23 813	21 970	18 364	2.7%
Coal and coke	830	49	8	28	-	-	-	-	-100%
Renewable energy	17 434	22 052	33 279	39 444	48 724	48 553	50 504	50 146	188%
Electricity	35 696	37 339	37 810	36 738	36 855	37 088	38 057	38 892	9.0%
District heating	52 820	64 466	65 536	68 612	70 644	71 445	71 057	72 115	36.5%
Gas works gas	1 384	594	486	408	429	361	349	327	-76.4%
Single-family houses	137 383	139 568	144 258	140 888	142 015	138 453	138 616	134 853	-1.8%
Oil	52 233	32 741	25 032	16 910	9 408	7 233	6 698	5 742	-89.0%
Natural gas	15 143	24 907	25 472	23 554	21 529	20 020	18 464	15 439	2.0%
Coal and coke	136	17	0	13	-	-	-	-	-100%
Renewable energy	17 420	22 006	33 226	39 370	48 594	48 038	49 739	49 240	183%
Electricity	27 011	28 210	28 279	27 335	27 772	28 096	28 845	29 057	7.6%
District heating	24 685	31 364	31 985	33 486	34 479	34 869	34 680	35 196	42.6%
Gas works gas	754	323	264	221	234	196	190	177	-76.5%
Multi-family houses	47 656	49 706	50 471	50 696	51 237	51 598	51 128	51 494	8.1%
Oil	6 766	2 703	2 585	1 685	1 696	1 557	1 109	762	-88.7%
Natural gas	2 733	4 422	4 522	4 207	3 966	3 793	3 505	2 924	7.0%
Coal and coke	693	32	8	15	-	-	-	-	-100%
Renewable energy	14	46	54	74	129	515	765	906	6338%
Electricity	8 686	9 129	9 530	9 403	9 084	8 993	9 212	9 835	13.2%
District heating	28 135	33 103	33 550	35 125	36 166	36 576	36 377	36 918	31.2%
Gas works gas	630	271	222	187	196	165	159	149	-76.3%

Energy consumption in households

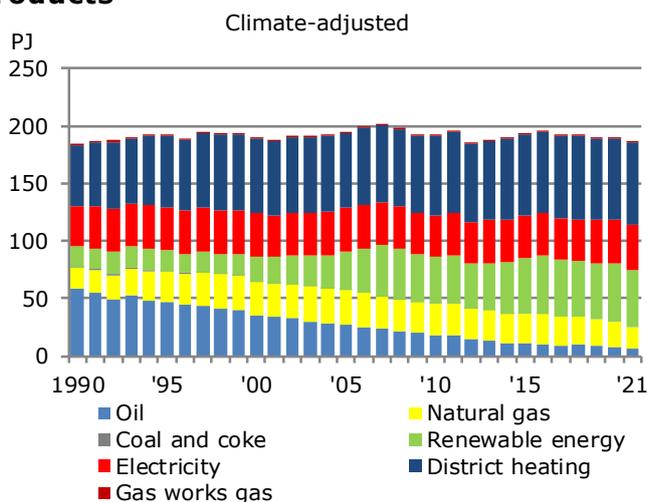


Household energy consumption is greatly influenced by the weather. The years 1990, 2000 and 2014 were very hot years with low energy consumption, whereas 1996 and 2010 were exceptionally cold.

In 2021, climate-adjusted energy consumption by households was 186.3 PJ, accounting for 31.2% of total final energy consumption in Denmark. 152.4 PJ of the 186.3 PJ were used for heating and 34 PJ were used for electrical appliances etc.

The climate-adjusted energy consumption of households was 1.8% lower in 2021 than the year before. Compared with 1990, energy consumption grew by 0.7%.

Household consumption by energy products

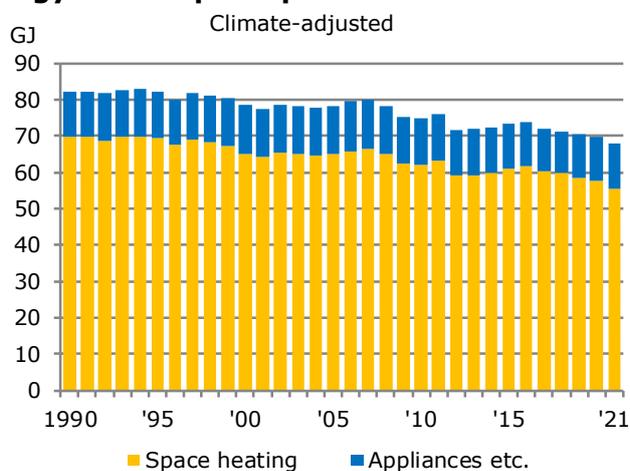


There have been significant changes in the composition of household energy consumption since 1990. Oil consumption decreased throughout the period shown due to a shift to district heating and natural gas.

In 2021, district heating amounted to 38.7% of household energy consumption, and renewable energy and electricity amounted to 26.9% and 20.9%, respectively. Consumption of natural gas, oil and gas works gas amounted to 9.9%, 3.5% 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 2021 has fluctuated around 35 and 39 PJ. Electricity consumption rose in 2021 by 2.2% compared with 2020.

Energy consumption per household

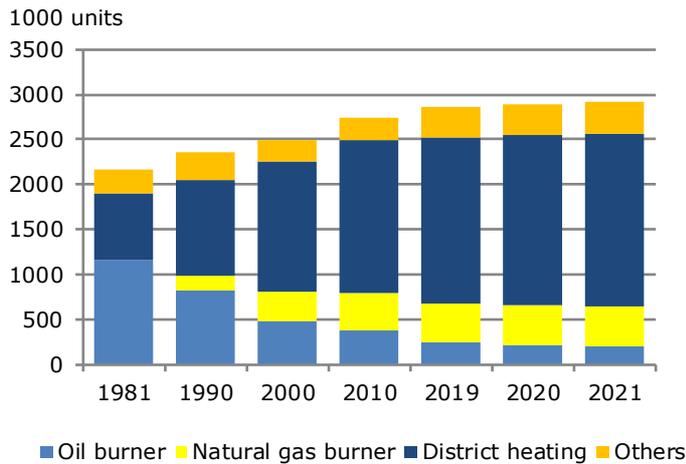


In 2021, average energy consumption per household was 67.8 GJ, which is 2.8% lower than the year before. Of this, 55.4 GJ – corresponding to 81.8% – were used for space heating and hot water. Energy consumption by households went down by 17.7% compared with 1990.

In 2021, average electricity consumption per household for electrical appliances and lighting was 12.4 GJ, corresponding to approximately 3444 kWh. This is an increase of 1.1% compared to the year before and 2.8% 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

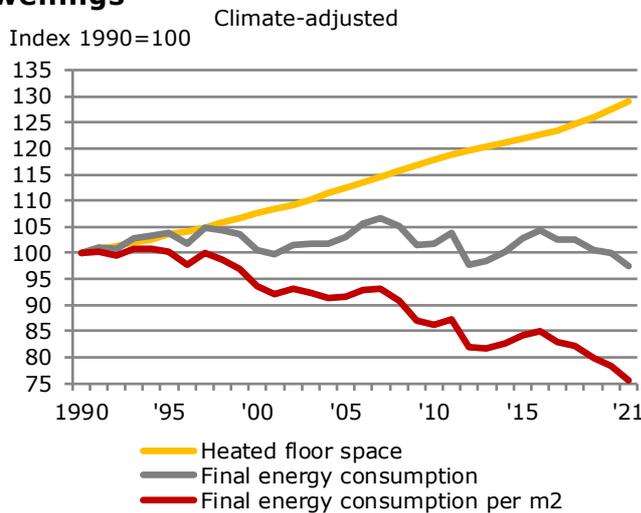


The significant changes in the composition of energy consumption by energy type reflect changes in the composition of heating installations in dwellings over time. Until the mid-1980s, oil-fired boilers clearly dominated the market, after which district heating became the most common source of heating. 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 2021, the total of 2.9 million heating installations could be analyzed as follows: District heating installations 65.6%, natural gas boilers 14.8%, oil-fired boilers 7.2% and other installations, including heat pumps, electric heating and wood-fired boilers 12.4%.

Source: Statistics Denmark

Energy consumption for heating in dwellings



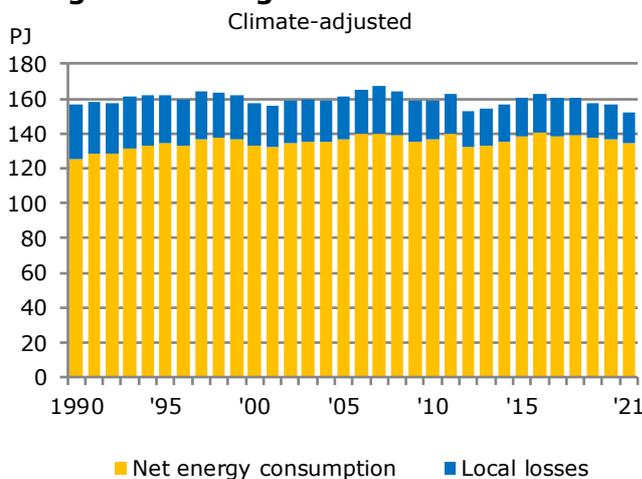
Except from 2001, 2012 and 2013, climate-adjusted energy consumption for heating (space heating and hot water) has been between 0.2% and 6.7% above the 1990 level. In 2021, energy consumption was 2.6% below the 1990 level.

The background for this is a 28.9% increase in total heated area in the period from 1990 to 2021.

In the period 1990 to 2021, energy consumption for heating per m² fell by 24.5%. 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.

Source: Statistics Denmark

Net energy consumption and heat loss for heating in dwellings

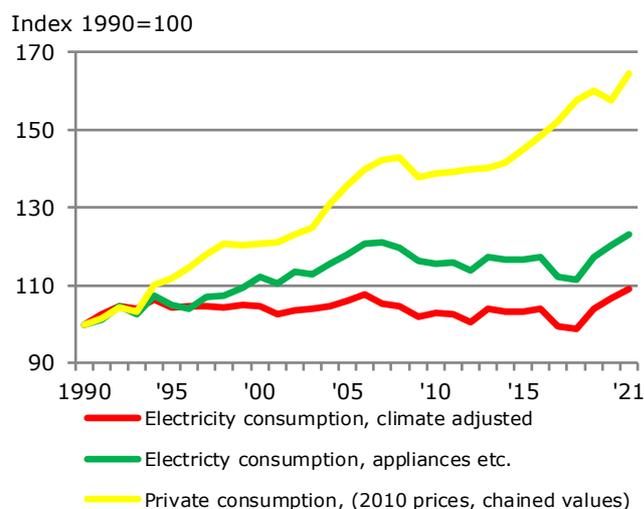


Net energy consumption means the utilized energy. The difference between final energy consumption and net energy consumption is local heat loss in individual dwellings, e.g. from oil and natural gas boilers.

While, as mentioned above, final consumption for heating has decreased from 1990 to 2021, net energy consumption for space heating and hot water in households increased by 6.9% 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



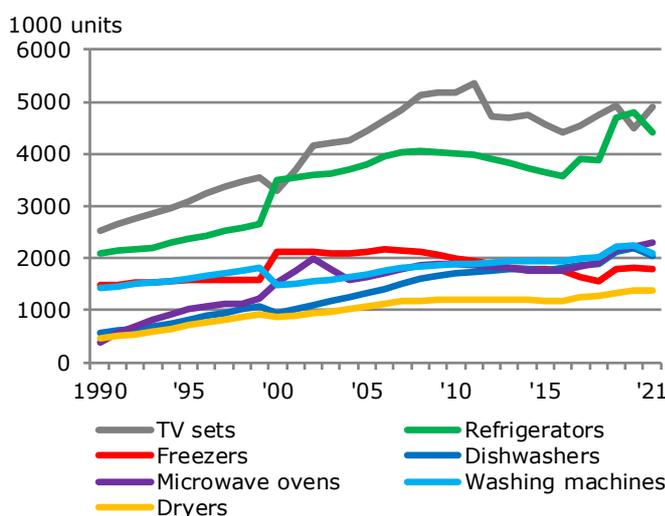
In the period 1990-2021, total household electricity consumption increased by 9.0%, whereas electricity consumption for appliances and lighting etc. increased by 23.1%.

Taking into account the large increase in the number of electrical appliances per household, see below, and a general increase of 64.5% 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.

Source for private consumption: Statistics Denmark

Household stock of electrical appliances

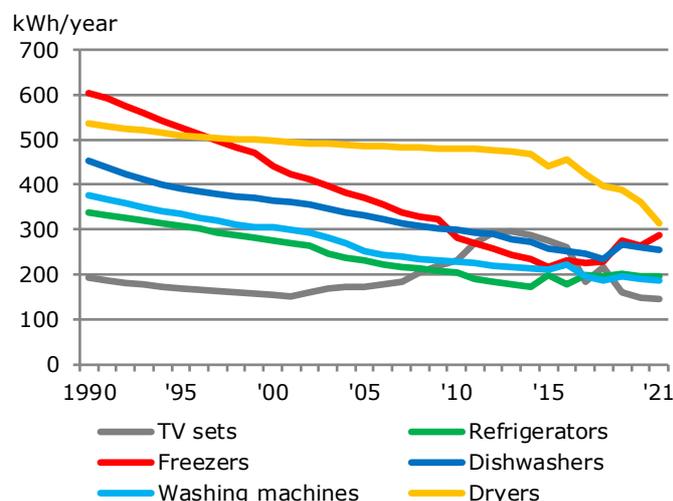


In the period from 1990 to 2010, there has been a sharp increase in the stock of almost all electricity-consuming household appliances.

From 1990 to 2021, the number of microwaves has increased by 507%, while the number of tumble dryers and dishwashers has increased by 198% and 258%, respectively. Television sets, washing machines and refrigerators have also increased considerably in numbers. The number of separate freezers has increased by 22.2% 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 195 kWh in 2021, i.e. by 42.0%. Electricity consumption for a separate freezer fell by 52.4%, while the fall for a washing machine was 50.6% in the same period.

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 (CH₄, N₂O and the fluorinated greenhouse gases (f gasses)) 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. Furthermore, annual permitted non-ETS emissions have been set under the ESD for the period 2013-2020. In 2020, the maximum allowed emissions for Denmark was 32.1 million tonnes CO₂ equivalents.

In 2020, observed total emissions of greenhouse gases were 41.7 million tonnes CO₂ equivalents, which is 41.3% lower than in 1990. Including adjustments in the Energy Statistics for fluctuations in temperature and net exports of electricity, the level in 2020 was 45.9 million tonnes CO₂ equivalents, corresponding to a drop of 42.0% relative to the adjusted emissions in

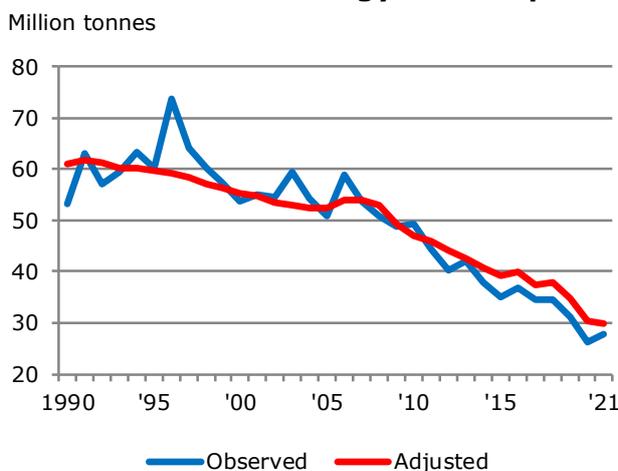
1990. In 2020, total observed emissions of greenhouse gases outside the ETS (ESD) were 30.8 million tonnes CO₂ equivalents, which is 23.7% lower than the 2005 base-year emissions and 1.2 million tonnes CO₂ equivalents lower than the emissions permitted under the ESD for 2020.

The greenhouse gas inventory for 2021 will be ready in 2023. 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 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

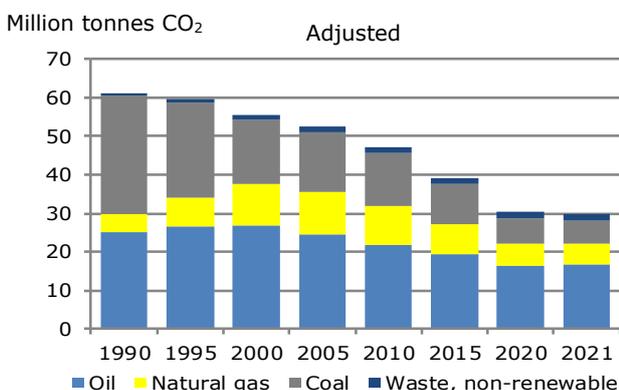


The Danish Energy Agency calculates observed CO₂ emissions as well as adjusted CO₂ emissions (incl. international aviation and the effect of cross-border trade), which take annual temperature variations and foreign trade in electricity into account, see the statement of energy consumption on pages 18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

In 2021, observed CO₂ emissions from energy consumption were 27.9 million tonnes, which is 5.8% higher than in 2020. Observed CO₂ emissions dropped by 47.5% compared with 1990.

Adjusted CO₂ emissions from energy consumption fell to 29.9 million tonnes in 2021; a decrease of 1.9% compared with the previous year. Compared with 1990, the drop is 51.0%.

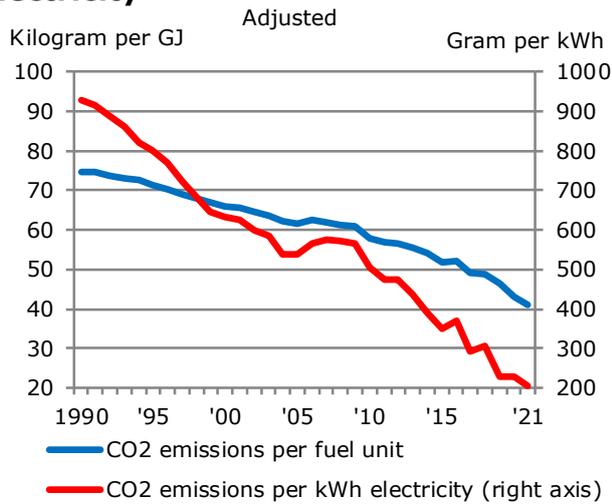
CO₂ emissions by fuel



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 11.0% since 1990, adjusted CO₂ emissions have fallen by 51.0%.

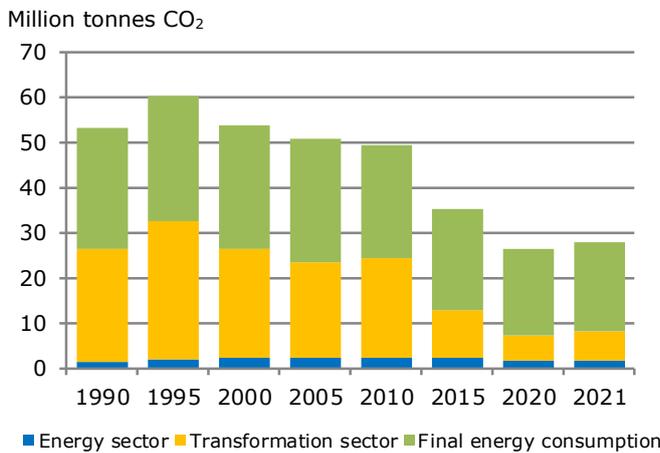
CO₂ emissions per fuel unit and per kWh electricity



From 1990-2021, gross energy consumption has fallen by 11.0%, 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 2021, each GJ of adjusted gross energy consumption was linked to 41.1 kg CO₂, compared with 74.6 kg in 1990. This corresponds to a reduction of 44.9%.

One kWh of electricity sold in Denmark in 2021 led to 207 grams of CO₂ emissions. In 1990, CO₂ emissions were 929 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

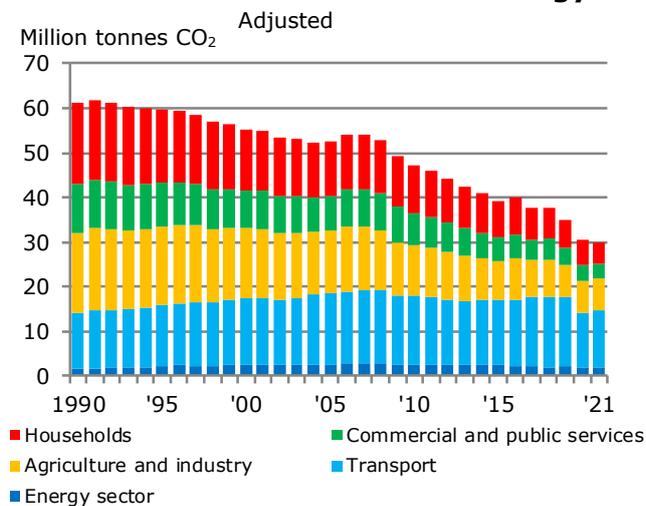


The energy system is divided into three sectors: The *energy sector* (extraction and refining), the *transformation sector* (production of electricity, district heating, and gas works gas), and *final consumption* (transport and consumption by households and industries).

In 1990, total observed CO₂ emissions were 53.1 million tonnes. Of these, 25.1 million tonnes came from the transformation sector and 26.6 million tonnes came from final energy consumption, while the energy sector emitted 1.4 million tonnes.

In 2021, total observed CO₂ emissions were 27.9 million tonnes, of which 6.5 million tonnes were from the transformation sector, 19.6 million tonnes were from final energy consumption, and 1.7 million tonnes were from the energy sector. The transformation sector saw a fall of 18.6 million tonnes of CO₂ from 1990 to 2021, 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 2021, the transport and the agriculture and industry sectors were responsible for the largest shares of total CO₂ emissions, with 42.7% and 24.4%, respectively. Households and the commercial and public services sector accounted for 16.4% and 10.5%, respectively, while the energy sector accounted for 6.1% of CO₂ emissions.

Compared with 1990, CO₂ emissions from transport increased by 1.3%. Industries and households have seen significant decreases. In the agriculture and industry sector, and the commercial and public service sectors, CO₂ emissions fell by 59.1% and 71.0% respectively, while for households they fell by 73.0%.

EMISSIONS OF CO₂ AND OTHER GREENHOUSE GASES

Observed CO₂ emissions from energy consumption

1000 tonnes

Change

Observed emissions	1990	2000	2005	2010	2015	2019	2020	2021	'90-'21
Total CO₂ emissions	53 097	53 613	50 891	49 420	35 171	31 247	26 344	27 879	-47.5%
By fuel	53 097	53 613	50 891	49 420	35 171	31 247	26 344	27 879	-47.5%
Oil	24 228	26 247	24 235	22 106	19 219	19 560	16 300	16 820	-30.6%
Natural gas	4 323	10 629	10 676	10 572	7 026	6 334	5 114	5 124	18.5%
Coal	23 972	15 612	14 582	15 331	7 229	3 587	3 162	4 209	-82.4%
Waste, non-renewable	573	1 124	1 398	1 410	1 697	1 765	1 768	1 725	201%
By sector	53 097	53 613	50 891	49 420	35 171	31 247	26 344	27 879	-47.5%
Energy sector	1 401	2 323	2 440	2 324	2 261	2 116	1 726	1 749	24.8%
Transformation sector	25 136	24 215	21 133	21 957	10 657	6 526	5 547	6 508	-74.1%
Electricity production	20 562	20 163	17 234	17 673	7 435	4 163	3 785	4 712	-77.1%
District heating production	4 474	4 010	3 866	4 249	3 187	2 335	1 737	1 773	-60.4%
Gas works gas production	101	42	33	35	35	28	25	23	-77.6%
Final energy consumption	26 559	27 075	27 318	25 139	22 252	22 604	19 071	19 622	-26.1%
Transport	12 427	14 646	15 719	15 202	14 483	15 324	12 164	12 630	1.6%
Agriculture and industry	7 796	7 588	7 032	5 839	4 952	4 803	4 705	4 873	-37.5%
Commercial and public services	1 408	869	923	803	623	563	527	601	-57.3%
Households	4 928	3 971	3 645	3 295	2 194	1 913	1 675	1 519	-69.2%

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

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

CO₂ emissions from energy consumption, adjusted*)

1000 tonnes

Change

Adjusted emissions	1990	2000	2005	2010	2015	2019	2020	2021	'90-'21
Total CO₂ emissions	61 074	55 363	52 439	47 054	39 236	34 846	30 484	29 918	-51.0%
By fuel	61 074	55 363	52 439	47 054	39 236	34 846	30 484	29 918	-51.0%
Oil	25 087	26 767	24 511	21 805	19 350	19 653	16 427	16 846	-32.8%
Natural gas	4 646	10 961	10 955	10 054	7 737	6 828	5 758	5 401	16.3%
Coal	30 758	16 500	15 570	13 798	10 448	6 594	6 522	5 947	-80.7%
Waste, non-renewable	583	1 136	1 403	1 398	1 701	1 770	1 777	1 723	196%
By sector	61 074	55 363	52 439	47 054	39 236	34 846	30 484	29 918	-51.0%
Energy sector	1 401	2 323	2 440	2 324	2 261	2 116	1 726	1 749	24.8%
Transformation sector	32 258	25 456	22 498	20 121	14 581	10 005	9 498	8 595	-73.4%
Electricity production	27 071	20 965	18 418	16 576	11 084	7 363	7 284	6 931	-74.4%
District heating production	5 079	4 446	4 047	3 513	3 461	2 613	2 189	1 642	-67.7%
Gas works gas production	108	45	33	32	36	29	25	22	-79.3%
Final energy consumption	27 414	27 584	27 501	24 609	22 394	22 725	19 259	19 573	-28.6%
Transport	12 427	14 646	15 719	15 202	14 483	15 324	12 164	12 630	1.6%
Agriculture and industry	7 975	7 700	7 073	5 721	4 983	4 829	4 746	4 860	-39.1%
Commercial and public services	1 545	935	950	728	646	584	560	591	-61.7%
Households	5 468	4 302	3 760	2 959	2 282	1 988	1 790	1 492	-72.7%

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

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

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

EMISSIONS OF CO₂ AND OTHER GREENHOUSE GASES

Total emissions of greenhouse gases									Change
1000 tonnes CO₂ equivalents	1990	1995	2000	2005	2010	2015	2019	2020	'90¹⁾-²⁾20
Observed emissions in total²⁾	71 122	79 024	71 463	67 034	63 817	48 941	44 504	41 746	-41.3%
Of which ETS excl. aviation (ETS) ^{3a)}	-	-	-	26 476	25 266	15 796	12 040	10 832	-59.1%
- CO ₂ from domestic aviation (ETS) ^{3a)}	226	219	177	161	187	137	148	78	-51.6%
- Non-ETS (ESD) ^{3a)}	-	-	-	40 397	38 364	33 008	32 316	30 835	-23.7%
Emissions ceiling for non-ETS (ESD) ^{3b)}	-	-	-	-	-	35 021	32 967	32 063	-
Over fulfillment for non-ETS (ESD) ^{3c)}	-	-	-	-	-	2 013	651	1 228	-
Observed net emissions in total⁴⁾	77 995	84 425	76 598	72 136	66 275	49 733	47 397	44 853	-42.5%
Emissions from energy consumption	51 899	59 900	52 461	49 899	48 556	34 164	29 746	26 905	-48.2%
Energy and transformation sector	26 257	32 581	26 078	23 196	24 111	12 906	8 714	7 351	-72.0%
Final energy consumption	25 642	27 318	26 383	26 702	24 445	21 258	21 032	19 555	-23.7%
- Transport (incl. military)	10 957	12 429	12 669	13 976	13 619	12 925	13 314	12 278	12.0%
- Industry	5 580	5 992	5 889	5 385	4 390	3 767	3 710	3 577	-35.9%
- Commercial and public services and households, agriculture etc.	9 104	8 897	7 824	7 341	6 436	4 566	4 008	3 700	-59.4%
Industrial process, flaring etc.	2 870	3 620	4 827	3 690	2 512	2 243	2 148	2 126	-25.9%
Transient emissions and flaring	526	720	1 128	920	598	408	306	201	-61.9%
Industrial process	2 343	2 899	3 698	2 770	1 913	1 835	1 842	1 925	-17.8%
Emissions from agriculture	13 338	12 719	11 871	11 443	11 069	11 092	11 183	11 268	-15.5%
Animals digestion	4 039	3 967	3 631	3 483	3 631	3 667	3 695	3 680	-8.9%
Animal manure	2 822	3 071	3 319	3 478	3 120	2 960	2 830	2 871	1.7%
Agricultural land	5 860	5 143	4 649	4 255	4 159	4 285	4 468	4 458	-23.9%
Others (liming of soils etc.)	616	537	272	226	159	180	190	259	-57.9%
Other emissions	1 896	1 729	1 467	1 319	1 191	1 130	1 160	1 210	-36.2%
Waste deposit	1 536	1 331	1 073	909	772	653	534	537	-65.1%
Sewage treatment	280	288	220	213	188	202	196	200	-28.7%
Other waste (biomass gasification etc.)	79	109	174	197	231	274	430	473	497%
Forestry and land use⁵⁾	6 874	5 401	5 135	5 102	2 458	792	2 893	3 107	-55%
Forestry ⁵⁾	-1 229	-1 233	-1 329	- 897	-2 269	-4 008	-2 490	-2 172	77%
Land use ⁵⁾	8 102	6 634	6 464	5 999	4 727	4 800	5 383	5 280	-35%
Indirect CO₂-emissions	1 120	1 058	838	684	489	313	267	237	-78.9%

Note 1: This table only includes Denmark's emissions and removal of greenhouse gases. In the total climate accounts in relation to Denmark's climate commitment under the Kyoto Protocol, credits that are part of the CO₂ removal under "Forestry and land use", and credits from reductions achieved through projects in other countries and purchases of emission allowance, must also be included.

1) The changes have been stated in relation to 1990, except for ETS, ESD and domestic aviation, where the reductions have been stated in relation to 2005.

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 under the Kyoto Protocol.

3a) 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 "Forestry and land use". Data shown here is from the most recently data collection with recalculations, and therefore differs from the EU's annual compliance assessment for historical years.

3b) The ESD emissions ceilings are applicable in the EU. The emissions ceilings 2017-2020 are lower under Kyoto Protocol.

3c) These calculations show the deviation to the applicable EU emissions ceilings. A positive deviation means that emissions are under the ceiling.

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 CO₂ equivalents	1990	2000	2005	2010	2015	2019	2020	2021*	Change '90-'21
Observed emissions, total¹⁾	71 122	71 463	67 034	63 817	48 941	44 504	41 746	42 996	-39.5%
Adjusted emissions, total¹⁾	79 099	73 214	68 582	61 452	53 006	48 103	45 886	45 034	-43.1%

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.

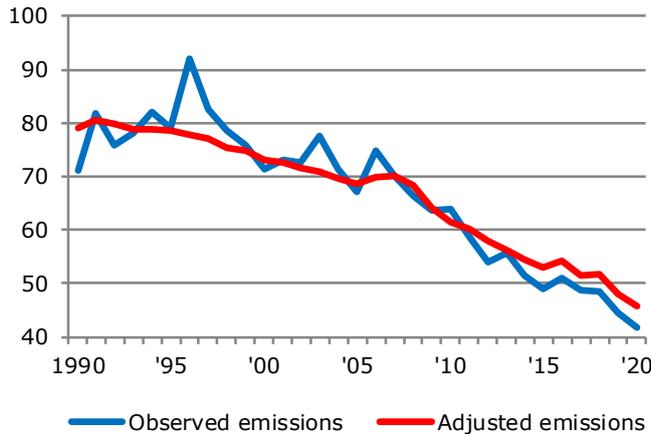
* The preliminary emissions statement for 2021 is solely based on CO₂ emissions from energy consumption and flaring as calculated in the Energy Statistics 2021 (although excluding international aviation). Total greenhouse gas emissions are calculated by assuming that all emissions other than CO₂ from energy consumption and flaring (although excluding international aviation) are constant at the values for 2020, 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.

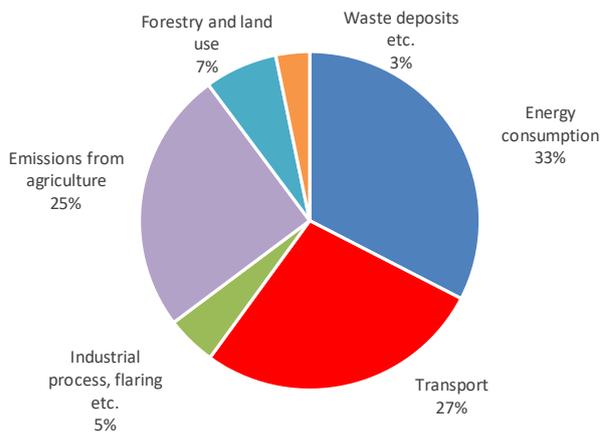
Observed emissions of greenhouse gases were 41.7 million tonnes of CO₂ equivalents in 2020, which is 6.2% less than in 2019.

Adjusted for climatic variations and fuel consumption linked to foreign trade in electricity, emissions of greenhouse gases were 45.9 million tonnes of CO₂ equivalents in 2020, which is 4.6% less than in 2019.

Source: DCE - Danish Centre for Environment and Energy

www.dce.au.dk

Total observed emissions from greenhouse gases distributed by origin 2020



The three largest sources of emissions of greenhouse gases are energy consumption (excl. transport), transport and agriculture. Emissions from energy consumption (excl. transport) derive from the energy and transformation sector as well as final energy consumption in industry, trade and service, households, agriculture etc.

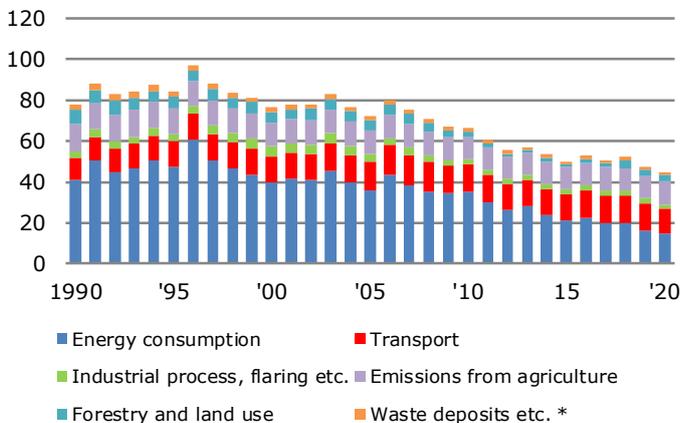
In 2020, CO₂ contributed 68.1%, methane (CH₄) 17.1%, nitrous oxide (N₂O) 13.8% and F gases 0.9% to total emissions of greenhouse gases (excluding forests and land use). The primary source of CO₂ emissions is fuel consumption for energy purposes, including transport. The primary source of both methane and nitrous oxide emissions is agriculture, but waste also significantly contributes to methane emissions.

Source: DCE - Danish Centre for Environment and Energy

www.dce.au.dk

Total observed emissions from greenhouse gases distributed by origin

Million tonnes CO₂ equivalents



Observed net emissions of greenhouse gases fell by 42.5% from 1990 to 2020. If emissions from forestry and land use are not included, the fall for the same period was 41.3%. The largest drop was for energy consumption (excl. transport), and emissions were reduced by 64.3% from 1990 to 2020. There has been an increase for transport of 12.0%. However, in 2020 there was unusually low fuel consumption because of specific circumstances surrounding the COVID-19 pandemic. Emissions of greenhouse gases from agriculture fell by 15.5% from 1990 to 2020, primarily due to falling emissions of N₂O.

Note: Exclusive of LULUCF and indirect CO₂-emissions.

Source: DCE - Danish Centre for Environment and Energy.

www.dce.au.dk

* Waste deposits etc.: Waste deposit, Sewage treatment, Other waste and Indirect CO₂-emissions

ETS and non-ETS CO₂ emissions from energy consumption 2019-2021

Observed CO₂ emissions from energy consumption

1000 tonnes	Total			EU ETS			Non-EU ETS		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Total	31 247	26 344	27 879	10 731	9 457	10 258	20 516	16 887	17 621
Energy sector	2 116	1 726	1 749	2 116	1 726	1 749	-	-	-
Transformation sector	6 526	5 547	6 508	6 239	5 315	6 266	288	232	242
Final energy consumption	22 604	19 071	19 622	2 376	2 416	2 243	20 228	16 655	17 379
Transport*	15 324	12 164	12 630	3 248	1 055	1 343	12 077	11 110	11 287
Agriculture and industry	4 803	4 705	4 873	2 280	2 364	2 188	2 523	2 340	2 685
- agriculture, forestry and horticulture	1 000	961	926	13	8	5	987	952	921
- manufacturing	3 050	2 964	3 066	2 267	2 356	2 183	782	608	883
- other industry	754	780	881				754	780	881
Commercial and public services	563	527	601				563	527	601
Households	1 913	1 675	1 519				1 913	1 675	1 519

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

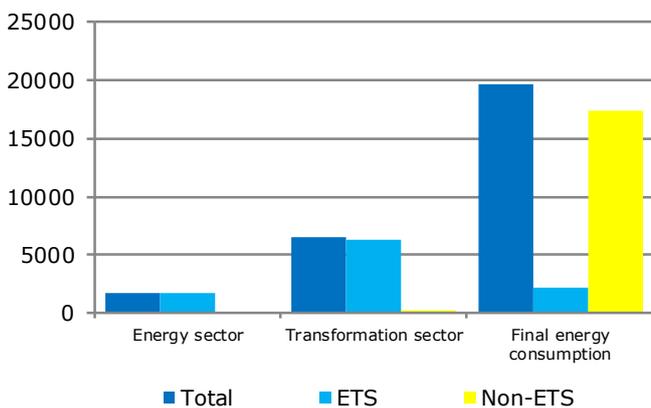
Note 2: The table does not include emissions from industrial processes and flaring.

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

* The CO₂ emissions from domestic and international aviation, as stated in Energy Statistics, are both included under the EU Emissions Trading System (EU ETS). No distinction is made between whether aviation fuels are sold for flights covered by the EU ETS or not.

Observed CO₂ emissions from energy consumption in 2021, EU ETS and non-EU ETS sectors

Thousand tonnes



The share of CO₂ emissions included under the EU Emissions Trading System (EU ETS) varies from sector to sector.

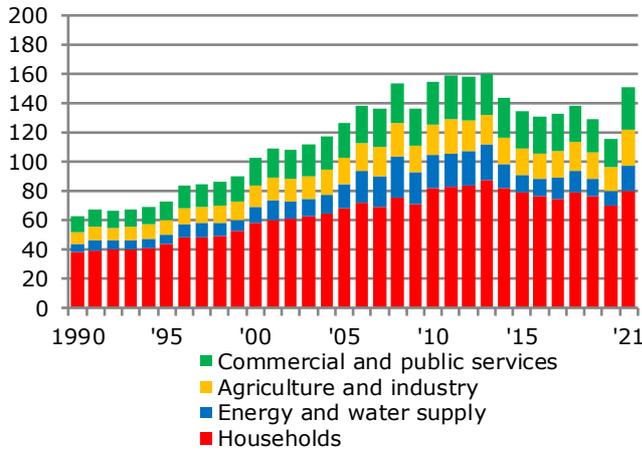
In the energy sector, which includes refineries and oil and gas production plants in the North Sea, all emissions are covered by the EU ETS. In the transformation sector, which includes power plants and district heating plants, if non-renewable waste is excluded, the picture is almost the same.

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*, 11% is covered by the EU ETS. In this context, almost all emissions can be attributed to manufacturing industries.

* The CO₂ emissions from domestic and international aviation, as stated in Energy Statistics, are both included under the EU Emissions Trading System (EU ETS). No distinction is made between whether aviation fuels are sold for flights covered by the EU ETS or not.

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.

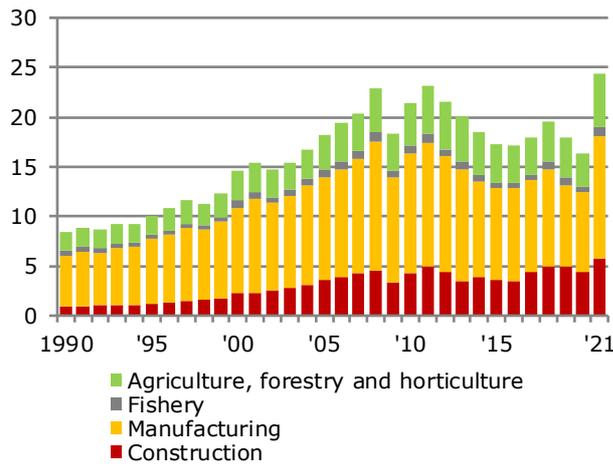
Total energy expenses by selected industries and households amounted to DKK 150.9 billion in 2021, which is 30.4% more than the year before. For households energy expenses were DKK 80.0 billion; for agriculture and industry (excluding oil refineries) expenses were DKK 24.4 billion; while for commercial and public services expenses were DKK 28.7 billion.

Energy expenses in current prices increased during the period from 1990-2013. 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 2017 is a drop in consumer prices. Higher costs in 2021 are due to increasing energy prices.

Source: Statistics Denmark.

Energy expenses in agriculture and industry

Billion DKK, current prices



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

Energy expenses for manufacturing industries (DKK 12.4 billion) accounted for the major part of agriculture and industry's energy expenses in 2021 (50.8%).

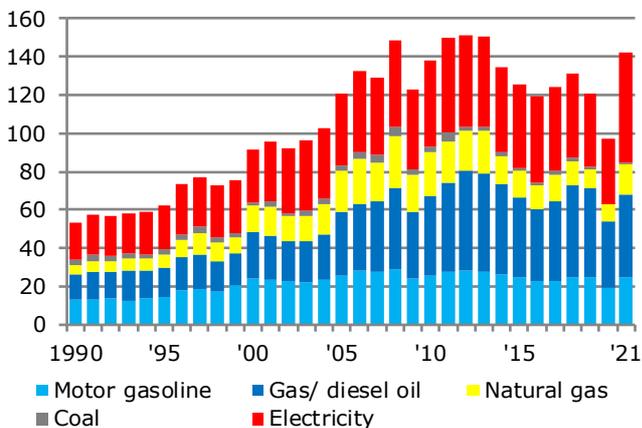
With DKK 5.7 billion (23.5%), construction contributed the second-largest share. The third-largest share was contributed by agriculture, forestry and horticulture with DKK 5.7 billion (22.3%). Finally, with DKK 0.8 billion (3.4%), fishing accounted for the smallest share of energy expenses.

In the period 1990-2019, 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. Higher costs in 2021 are due to increasing energy prices.

Source: Statistics Denmark

Energy expenses by fuel

Billion DKK, current prices



Energy expenses include i.a. motor gasoline, gas/diesel oil, natural gas, coal and electricity. These five fuels account for almost 50.7% of total energy expenses of DKK 256 billion, when including expenses for foreign bunkering of Danish vessels and oil refineries.

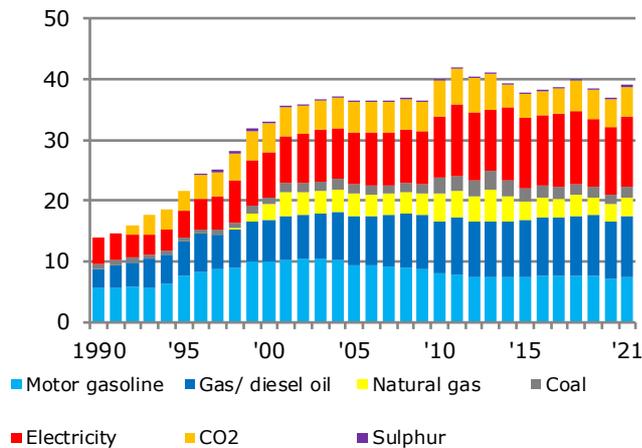
Of these fuels, the greatest share of energy expenses in 2021 was attributable to electricity (DKK 57.6 billion). Gas/diesel oil accounted for the second-largest share (DKK 43.0 billion).

This is followed by motor gasoline (DKK 25.0 billion), natural gas (DKK 15.9 billion), and coal (DKK 0.9 billion).

Source: Statistics Denmark

Revenue from energy, CO₂ and sulphur taxes

Billion DKK, current prices



In 2021, revenues from energy taxes calculated in current prices were DKK 39.1 billion, which is an increase of 6.5% compared with 2020. In addition to energy taxes, revenues include CO₂ and sulphur taxes. The largest contributions to revenues in 2021 are from electricity (DKK 11.7 billion), gas/diesel oil (DKK 10.2 billion), motor gasoline (DKK 7.4 billion) and CO₂ taxes (DKK 4.7 billion).

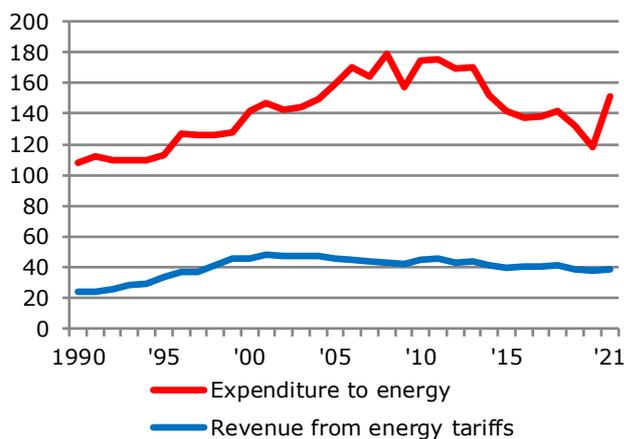
The 2021 revenues in current prices increased by 181% compared with 1990, when there were no CO₂ and sulphur taxes. Gas/diesel oil, electricity and motor gasoline have seen growths of 224%, 171% and 31%, respectively, since 1990.

In both 2020 and 2021, energy, CO₂ and sulphur taxes amounted to 3.3%, respectively, of total tax and VAT revenues in Denmark.

Source: Statistics Denmark

Energy expenditures and tax revenues, fixed prices

Billion DKK, fixed 2021 prices



In order to assess changes in energy expenses and tax revenues in relation to general price fluctuations, the figures have been converted to 2021 prices.

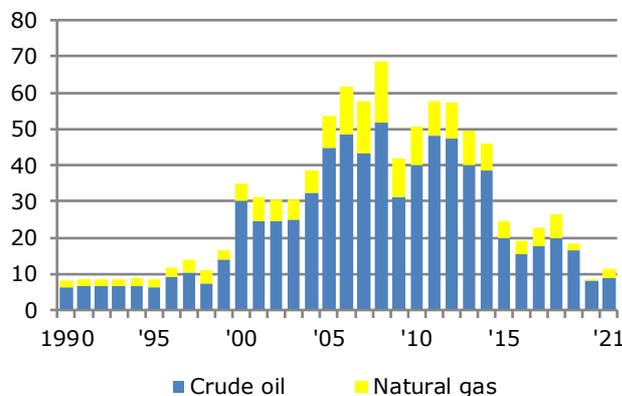
Measured as 2021 prices, energy expenses in 2021 were 30.4% higher than in the previous year. Compared with 1990, energy expenses have increased by 39.9%.

Revenues from energy taxes measured in 2021 prices rose by 64.2% from 1990 to 2021.

Source: Statistics Denmark

Value of crude oil and natural gas production

Billion DKK, current prices

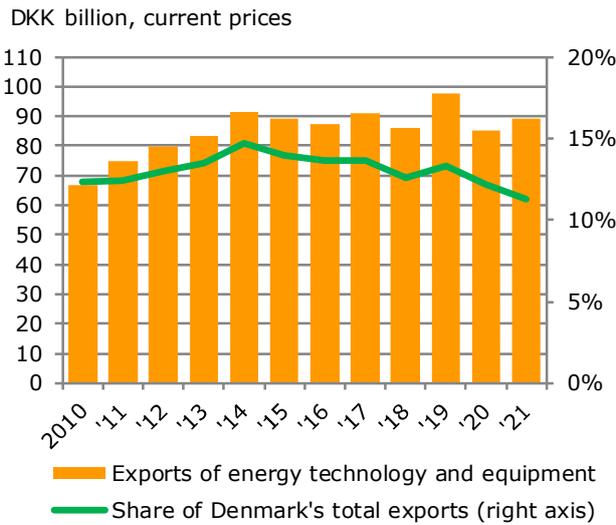


The value of crude oil and natural gas produced from the North Sea in 2021 was DKK 11.5 billion, compared with DKK 8.4 billion the previous year. The value of crude oil increased from DKK 8.0 billion to 8.7 billion, and the value of natural gas increased from DKK 0.4 billion to 2.8 billion.

The value of the North Sea production depends on the scale of the production as well as on world market prices. Following the drop in 2020, production of natural gas increased by 6.2% in 2021, while crude oil production fell again by 8.1% relative to 2020.

Source: Danish Energy Agency

Exports of energy technology and equipment



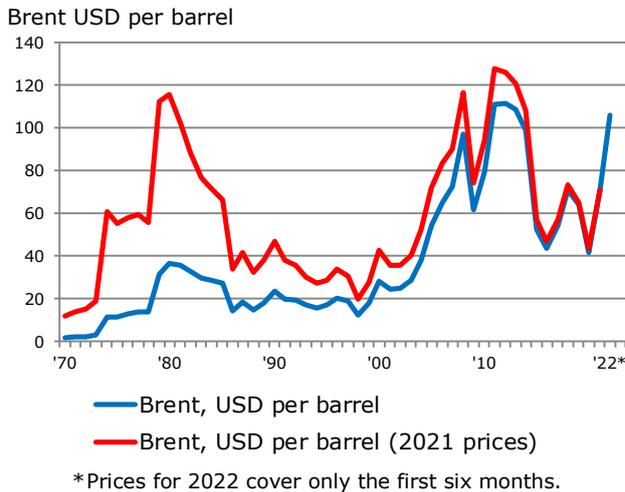
Exports of energy technology and equipment such as wind turbines, district heating pipes, thermostat valves, pumps etc. increased rapidly up to the year 2014.

The exports increased by 4.6% from 2020 to 2021. In 2021, Denmark exported energy technologies and equipment at a value of DKK 89.1 billion, corresponding to 11.3% of total Danish goods exports.

For more information see the publication on Danish energy technology and service exports 2021, "Eksport af energiteknologi og -service 2021", which is published as collaboration between the Danish Energy Agency, DI Energy and Danish Energy Association. The publication is available in Danish at the website of the Danish Energy Agency.

Source: Eksport af energiteknologi og -service 2020

Spot market prices for crude oil

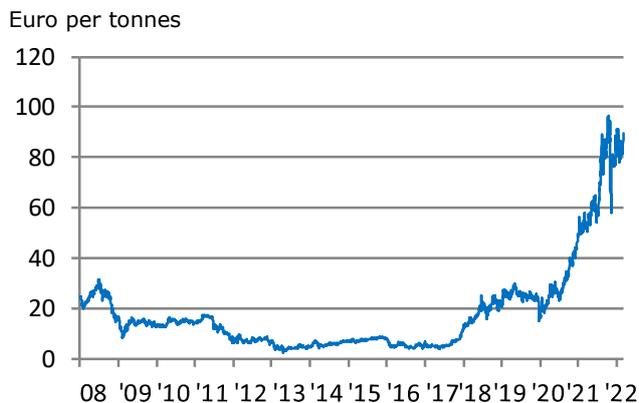


The average crude oil price was USD 71 per barrel in 2021. This is a relatively high price compared with the level in the mid-1990s, but it is a relatively low price compared with the level just before and during the economic crisis in 2008.

The current price level was established in 2014, when, in the second half-year of 2014 up to the start of 2015, the price halved from around USD 100 to about USD 50 per barrel. The price of oil rose by approx. 70% in 2021 compared with the previous year because of the great demand for oil. The price of oil rose to USD 105 during the first half of 2022. One explanation for this increase is the war in Ukraine.

Source: BP and the World Bank (prices for 2022)

CO₂ prices

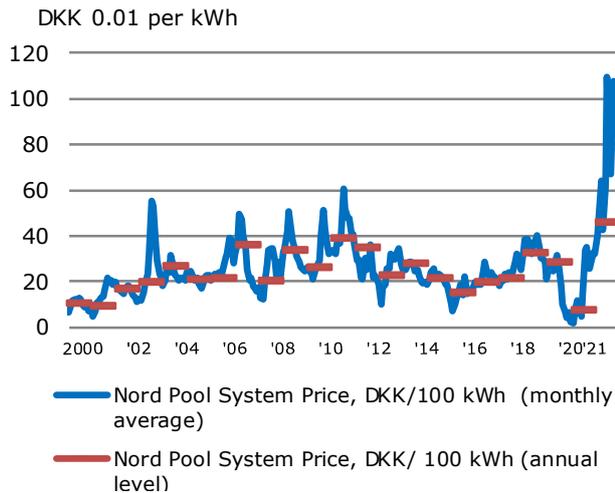


The price of allowances in the EU ETS has varied greatly since the beginning in 2008.

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 89 euros in June 2022.

Source: Point Carbon and European Energy Exchange

Spot market prices for electricity



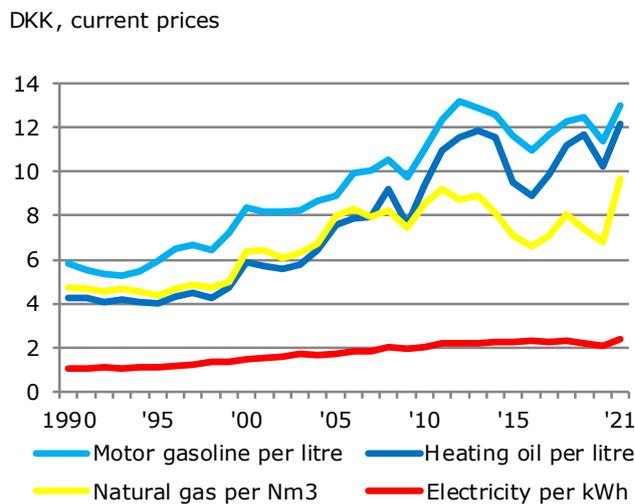
The system price of electricity on Nord Pool is set hour by hour on the basis of supply and demand. The price is affected by a number of factors, including precipitation and temperature. For example, the winter 2010/2011 was affected by concerns over water shortages and increasing electricity consumption 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 0.46 in 2021 compared with DKK 0.08 in 2020.

In the first half of 2022, the average system price was DKK 0.86 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 12.18 per litre in 2021, as opposed to DKK 10.24 per litre the year before, corresponding to an increase of 19.0%. In the period 1990-2021 the price increased by 187%.

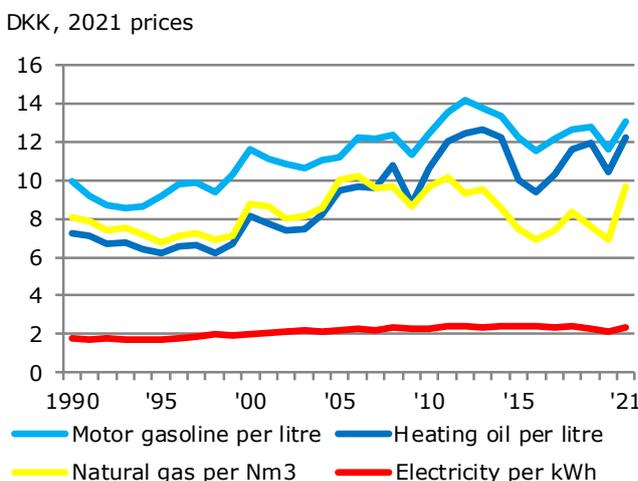
The price of natural gas for households was DKK 9.68 per Nm³ in 2021, compared with DKK 6.79 per Nm³ the year before, corresponding to an increase of 42.5%.

The price of a litre of motor gasoline was DKK 13.02 in 2021, compared with DKK 11.37 in 2020, corresponding to an increase of 14.5%. The tax on motor gasoline has varied considerably over time and this has affected the price.

The price of electricity was DKK 2.36 per kWh in 2021, compared with DKK 2.11 in 2020, corresponding to an increase of 12.0%.

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

Energy prices for households



Household energy prices have been calculated at 2021 prices by adjusting current prices for changes in the general price level as stated in the consumer price index.

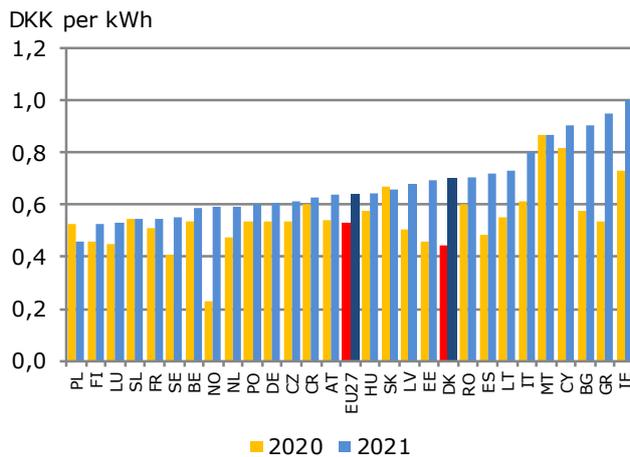
Measured in 2021 prices, the price per litre of motor gasoline increased by 12.3% in 2021 compared with 2020.

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 2021 it was DKK 12.18 per litre, which is 16.7% higher than in 2020. The price of natural gas was DKK 9.68 per Nm³ in 2021, which is 39.8% higher than the year before. The electricity prices was 9.9% higher in 2021 than the year before.

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

ENERGY PRICES

Electricity prices for industrial customers



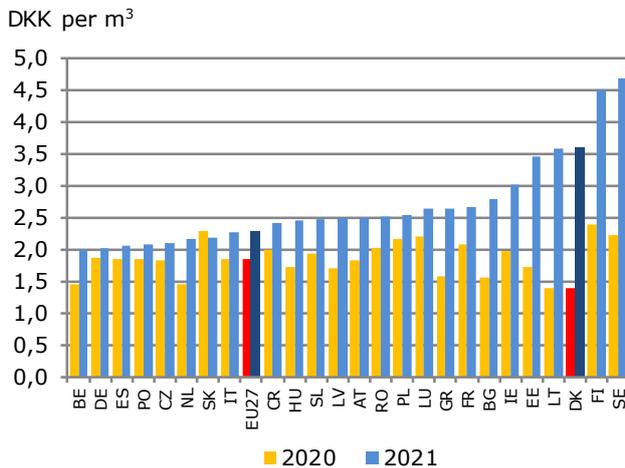
Electricity prices are shown in current prices (DKK per kWh) exclusive of taxes for industry customers with an annual consumption between 2 - 20 GWh.

In 2021, the price of electricity per kWh varied in the EU Member States (EU27) from DKK 0.46 in Poland to DKK 1.0 in Ireland. Norway had an electricity price of DKK 0.59 per kWh.

In 2021, the Danish electricity price was DKK 0.70 per kWh. This was 9.5% higher than the average price in EU27, which was DKK 0.64 per kWh. The Danish electricity price increased by 57.2% between 2020 and 2021. In EU27, the average electricity price was 19.8% higher in 2021 compared with the year before.

Source: Eurostat

Natural gas prices for industrial customers



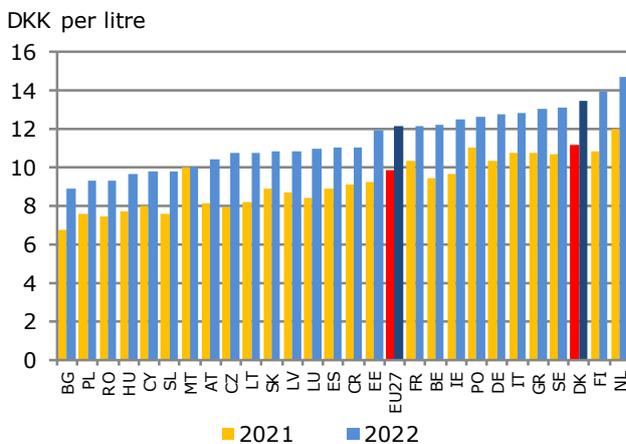
Natural gas prices are shown in current prices (DKK per m³) exclusive of taxes for industry customers with an annual consumption of 10 TJ to 100 TJ.

In 2021, the price of natural gas per m³ varied in the EU27 Member States from DKK 2.00 in Belgium to DKK 4.69 in Sweden. The average EU27 price was DKK 2.28.

In 2021, the Danish price of natural gas of DKK 3.6 per m³, was 159% higher than in 2020, while the average EU27 price was 23.4% higher compared to the year before.

Source: Eurostat

Motor gasoline prices

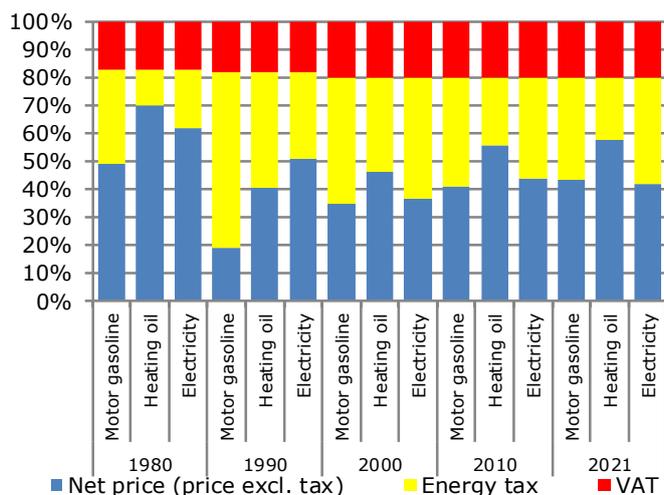


The price of motor gasoline in week 1 in 2021 and 2022, respectively, are shown in current prices (DKK per litre). Prices are for motor gasoline 95 unleaded, including taxes. The average for the EU27 Member States is a weighted average.

In 2022, the lowest price, DKK 8.89 per litre, was in Bulgaria, while the highest price, DKK 14.72, was in the Netherlands. In Denmark, the price per litre was DKK 13.44, while the average price in EU27 was DKK 12.12 per litre.

Source: Oil Bulletin, European Commission

Composition of energy prices for households



The tax share 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. However, in 2020 and 2021 there was an increase.

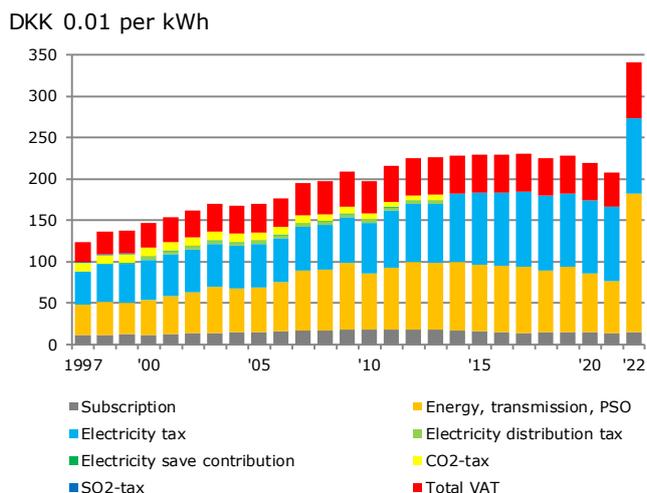
The price of motor gasoline in 2021 of DKK 13.02 per litre was made up as follows: Price exclusive of taxes and VAT 43.5%, taxes 36.5% and VAT 20.0%.

The price of heating oil in 2021 of DKK 12.18 per litre was made up as follows: Price exclusive of taxes and VAT 57.6%, taxes 22.4% and VAT 20.0%.

The price of electricity in 2021 of DKK 2.36 per kWh was made up as follows: Price inclusive of PSO and exclusive of taxes and VAT 41.9%, taxes 38.1% and VAT 20.0%.

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

Electricity prices for households 1997-2022 (as of 1 January), consumption of 4000 kWh



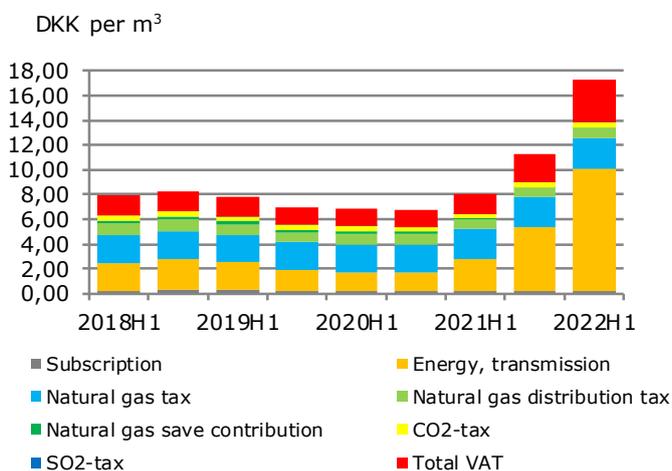
At the beginning of 2022, the average price of electricity for household customers with an annual consumption of 4,000 kWh was DKK 3.41 per kWh, which constitutes an increase of 64.0% from the year before. The price of electricity has increased by 121% since 2001.

Total tax revenues for the state per kWh in 2022 were DKK 1.58 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. Since 2014 there has only been electricity tax and VAT.

The payment for the actual energy per kWh (inclusive of PSO and electricity transmission) was DKK 1.68 in 2022, as opposed to DKK 0.46 in 2001, while subscription costs per kWh were DKK 0.15 in 2022, a little higher compared to 2001.

Source: Danish Energy and Danish Utility Regulatory

Natural gas prices for households 2018H1-2021H1



The price of natural gas for households is shown at current prices (DKK per m³).

The average price of natural gas for households in the first half-year of 2022 was DKK 17.3 per m³. The price has more than doubled since the first half of 2021 and this is related to the war in Ukraine.

The average price of natural gas for households in the first half-year of 2022 increased by 114% relative to the first half of 2021. Comparing the second half-year of 2021 with the same period the year before, the increase was 67%.

Source: Danish Energy Agency

Energy consumption in EU27 and other countries 2020 - by share of renewable energy

	Energy consumption ¹⁾ , PJ	Share in percentage						Waste, non-renewable	Net import of electricity
		Oil	Natural gas	Coal	Nuclear power	Renewable energy and waste ²⁾			
Sweden	1893	18	3	3	27	51.3(60.1)	2	-5	
Latvia	183	33	21	1	0	41.5(42.1)	1	3	
Denmark	665	37	13	4	0	39.1(31.7)	3	4	
Finland	1345	24	7	6	17	37.4(43.8)	1	4	
Austria	1349	34	23	8	0	32.6(36.5)	1	1	
Portugal	895	42	24	3	0	29.8(34.0)	0	1	
Estonia	188	0	8	0	0	29.2(30.1)	1	7	
Croatia	348	34	30	4	0	26.4(31.0)	0	5	
Lithuania	320	38	26	2	0	21.7(26.8)	0	9	
Italy	5928	32	41	4	0	20.7(20.4)	1	2	
Romania	1349	30	30	11	9	18.6(24.5)	0	1	
Slovenia	265	32	12	16	24	18.6(25.0)	0	-3	
EU27	56109	33	24	10	13	17.9(22.1)	1	0	
Spain	4681	41	25	3	14	17.1(21.2)	0	0	
Germany	11921	35	26	16	6	16.5(19.3)	1	-1	
Greece	856	47	24	9	0	16.4(21.7)	0	4	
Bulgaria	747	24	14	24	24	14.3(23.3)	0	-2	
Slovakia	689	22	25	14	25	13.1(17.3)	0	0	
Ireland	574	45	33	3	0	12.9(16.2)	1	0	
France	9367	29	16	2	41	12.8(19.1)	1	-2	
Czech republic	1684	21	18	30	19	12.7(17.3)	0	-2	
Poland	4312	29	17	40	0	12.6(16.1)	0	1	
Cyprus	96	86	0	1	0	12.3(16.9)	1	0	
Hungary	1095	29	34	6	15	11.3(13.9)	0	4	
Luxembourg	166	60	16	1	0	10.0(11.7)	1	12	
Belgium	2154	38	30	5	16	9.6(13.0)	1	0	
Netherlands	3012	39	44	6	1	9.4(14.0)	1	0	
Malta	32	46	42	0	0	7.5(10.7)	0	5	
Norway	1192	31	16	3	0	54.6(77.4)	1	-6	
UK	6444	33	40	4	9	13.6	1	1	
USA	85324	42	35	11	11	8.4	0	0	
Japan	16109	32	24	27	3	7.0	0	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.

³⁾ The UK is excluded from EU27.

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

Consumption of renewable energy in EU27 and other countries in 2020

	Consumption of renewable energy and waste, PJ	Share in percentage					
		Hydro	Wind	Solar	Geo-thermal	Biomass, incl. waste	Biofuels
Sweden	972	26.8	10.2	0.4	0.0	47.6	7.7
Latvia	76	12.4	0.8	0.1	0.0	83.9	2.7
Denmark	260	0.0	22.6	2.9	0.0	65.1	3.9
Finland	503	11	6	0	0	74.3	3.7
Austria	440	34.4	5.6	3.4	0.3	48.4	2.3
Portugal	267	16.3	16.6	3.9	3.1	44.8	3.7
Estonia	55	0.2	5.5	0.8	0.0	90.5	0.0
Croatia	92	22.2	6.7	1.1	2.7	63.5	1.8
Lithuania	69	1.6	8.1	0.7	0.0	81.7	6.9
Italy	1229	13.9	5.5	8.1	18.2	38.4	7.4
Romania	251	22.1	10.0	2.5	0.4	57.0	8.1
Slovenia	49	36.1	0.0	3.6	1.0	47.3	7.4
EU27	10037	12.4	14.3	6.9	2.9	50.6	7.5
Spain	799	13.7	25.4	19.0	0.0	29.4	7.4
Germany	1965	3.4	24.2	10.5	0.8	50.5	7.6
Greece	140	8.6	23.9	20.2	0.2	28.7	7.8
Bulgaria	107	9.5	5.0	6.1	1.4	66.9	6.9
Slovakia	90	18.1	0.0	3.0	0.4	68.8	8.4
Ireland	74	4.5	56.2	1.1	0.0	25.8	6.7
France	1198	18.7	12.0	4.7	1.7	43.0	10.3
Czech republic	215	3.6	1.2	4.2	0.0	79.2	7.7
Poland	542	1.4	10.5	1.9	0.2	75.6	7.6
Cyprus	12	0.0	7.4	35.5	0.0	29.8	4.5
Hungary	124	0.7	1.9	7.6	5.1	74.7	6.0
Luxembourg	17	2.0	7.6	4.1	0.0	50.1	0.0
Belgium	206	0.5	22.3	9.5	0.1	50.7	14.4
Netherlands	284	0.1	19.5	11.5	2.2	53.1	15.6
Malta	2	0.0	0.0	44.5	0.0	4.8	25.4
Norway	650	78.0	5.5	0.0	0.0	8.3	2.5
UK	878	2.8	30.9	5.6	0.0	47.6	7.4
USA	7196	14.4	17.1	7.8	5.4	30.9	20.7
Japan	1120	25.3	2.9	26.0	10.1	32.7	1.6

¹⁾The UK is excluded from EU27.

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

Key figures 2020 – 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	2020
Estonia	98	0	0	141	93	384	240
Sweden	77	0	0	183	134	149	108
Romania	69	35	76	70	54	400	190
Latvia	62	0	0	96	85	273	198
Bulgaria	61	0	2	107	62	692	405
Denmark	60	62	56	114	97	88	59
Czech Republic	58	1	2	157	102	363	217
Finland	57	0	0	243	188	189	162
Poland	56	3	19	114	85	353	212
Slovenia	55	0	1	126	92	225	155
France	55	1	0	139	88	140	108
Croatia	45	24	28	86	72	241	175
EU27	43	5	13	125	91	151	117
Slovakia	41	0	1	126	83	410	198
Hungary	40	14	15	112	84	306	211
Austria	38	5	9	152	127	104	102
Netherlands	38	4	55	173	133	157	120
Germany	34	3	5	143	108	135	100
Portugal	32	0	0	87	67	149	126
Spain	32	0	0	99	69	149	112
Belgium	26	0	0	187	139	197	148
Ireland	26	0	36	116	93	101	44
Greece	24	1	0	80	57	173	127
Lithuania	27	1	0	114	96	367	199
Italy	27	13	6	99	77	106	97
Cyprus	10	0	0	108	74	186	120
Luxembourg	8	0	0	265	220	106	76
Malta	5	0	0	62	41	243	281
Norway	734	1 066	2 158	222	166	97	78
UK	76	101	55	96	71	115	0
USA	106	83	110	258	185	0	0
Japan	11	0	2	128	88	0	0

¹⁾The UK is excluded from EU27.

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

Reserves, production, stocks and consumption of oil by regions

	1990	2000	2005	2010	2015	2019	2020	2021 ²⁾	Change '90 - '21
Oil reserves¹⁾, 1000 million barrels									
The world	1001	1301	1372	1637	1684	1735	1732		73.1%
North America	101	237	223	220	229	244	243		140%
South and Central America	71	96	101	320	323	324	323		356%
Europe and Eurasia	76	141	139	158	155	160	160		111%
Middle East	660	697	756	766	803	836	836		26.7%
Africa	59	93	112	125	128	125	125		113%
Asia and the Pacific	35	38	41	48	47	45	45		30.3%
Oil production, million tonnes									
The world	3 158	3 598	3 932	3 979	4 365	4 478	4 171	4 221	33.7%
North America	655	643	638	639	911	1 108	1 059	1 075	64.2%
South and Central America	234	345	375	379	411	323	305	304	29.7%
Europe and Eurasia	788	728	849	860	851	879	828	834	5.9%
Middle East	837	1 129	1 222	1 210	1 406	1 408	1 295	1 316	57.1%
Africa	318	372	465	487	386	397	331	345	8.5%
Asia and the Pacific	326	382	383	403	400	361	353	348	6.8%
Oil stocks^{*)}, million tonnes									
The OECD	217	212	212	212	212	212	212	212	-2.4%
North America	90	75	75	75	75	75	75	75	-16.8%
Europe	106	110	110	110	110	110	110	110	4.2%
Pacific	22	27	27	27	27	27	27	27	24.6%
Oil consumption, million tonnes									
The world	3 147	3 569	3 891	3 982	4 219	4 429	4 019	4 246	34.9%
North America	922	1 058	1 122	1 009	1 003	1 025	890	958	3.9%
South and Central America	165	229	241	275	296	270	238	261	57.9%
Europe and Eurasia	1 139	932	960	898	861	897	792	831	-27.0%
Middle East	163	234	286	345	388	392	362	375	129%
Africa	96	118	138	163	182	187	166	180	88.5%
Asia and the Pacific	662	997	1 144	1 292	1 489	1 659	1 571	1 640	148%
Total energy consumption, Mtoe									
The world	8 214	9 479	10 969	12 150	13 092	14 030	13 471	14 215	73.1%
North America	2 312	2 737	2 802	2 730	2 746	2 815	2 598	2 716	17.5%
South and Central America	341	495	547	636	700	685	637	680	99.5%
Europe and Eurasia	3 259	2 865	3 007	2 984	2 875	2 956	2 780	2 931	-10.1%
Middle East	257	410	541	699	830	898	874	904	251%
Africa	225	276	327	384	434	478	451	478	112%
Asia and the Pacific	1 820	2 697	3 744	4 717	5 508	6 198	6 131	6 507	258%
Oil dependency, %									
The world	38	38	35	33	32	32	30	30	
North America	40	39	40	37	37	36	34	35	
South and Central America	48	46	44	43	42	39	37	38	
Europe and Eurasia	35	33	32	30	30	30	28	28	
Middle East	64	57	53	49	47	44	41	41	
Africa	43	43	42	43	42	39	37	38	
Asia and the Pacific	36	37	31	27	27	27	26	25	

1) Crude oil, at the end of the year

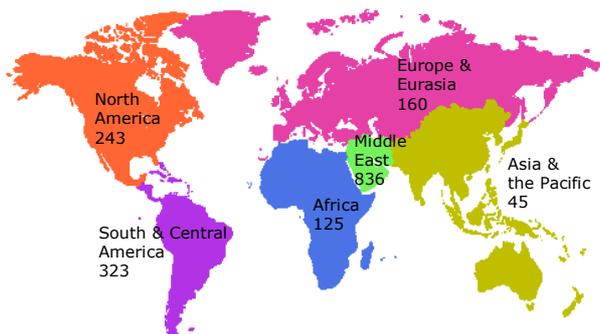
2) 2021 was not available at the date of publication

*) At the end of the year

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

Proved oil reserves at end 2020

Billion barrels



At the end of 2020¹⁾, the world’s total proved oil reserves totalled 1732 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.

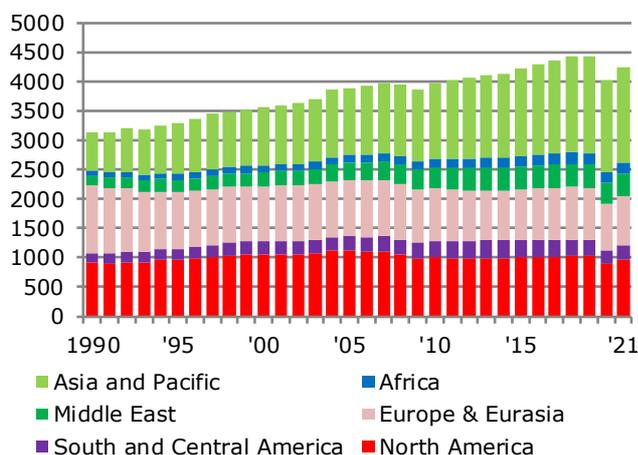
Comparing proved regional oil reserves with actual regional oil production (reserves-to-production ratio, R/P), shows that Europe and Eurasia have reserves for 10.4 years’ and 29.6 years’ unchanged production, respectively, while North America has reserves for 28.2 years. The R/P ratio for total world oil reserves is 53.6 years’ unchanged production. However, new oil reserves are being discovered continually, and for 2020, oil reserves are almost unchanged compared with 2019.

Source: BP Statistical Review of World Energy

¹⁾ 2021 was not available at the date of publication

Oil consumption by region

Million tonnes



In 2021, total world oil consumption was 4.2 billion tonnes, which is 5.7% more than the year before. A total of 22.6% of this oil was consumed in North America, which accounted for 25.5% of the world’s crude oil production. Europe & Eurasia accounted for 19.6% of oil consumption and 19.8% crude oil production.

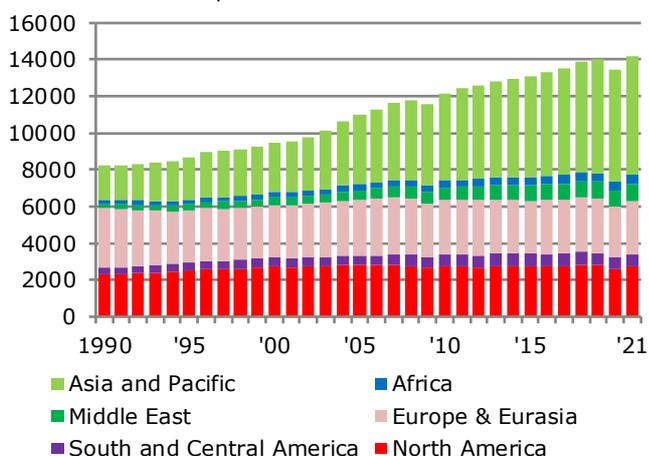
Asia and the Pacific’s share of consumption was 38.6% in 2021, the Middle East’s share was 8.8%, South and Central America’s share was 6.1%, while Africa’s share was 4.2%.

Total world oil consumption in 2021 was 30% of total world energy consumption, which is on a par with consumption 2020. For Europe & Eurasia, this figure was 28.4% compared with 28.5% in 2020.

Source: BP Statistical Review of World Energy

Energy consumption by region

Million tonnes oil equivalents



World energy consumption was 14.22 billion tonnes oil equivalents in 2021, which is 5.5% higher than in 2020. Except for in 2009 and 2020, world consumption increased steadily over the period 1990-2021. The fall from 2008 to 2009 was due to economic recession, especially in North America and in Europe & Eurasia. The drop in 2020 is due to the unusual circumstances regarding the COVID-19 pandemic.

In 2021, energy consumption increased in all regions. The increase was largest in South and Central America and Asia and Pacific at about 6.7% and 6.1%, respectively.

The percentage increase in energy consumption from 2020 to 2021 in Africa, Europe & Eurasia, North America and the Middle East was 5.9%, 5.4%, 4.5% and 3.4%, respectively. Asia and the Pacific accounted for 45.8% of total world energy consumption. Europe & Eurasia accounted for 20.6%.

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 petrole 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 Masnedø have also been defined as large scale power plants.
LNG	Liquefied Natural Gas. Use as a fuel. In Denmark LNG is kept secret with a rounded figure.
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	2019	2020	2021	'90-'21
Energy intensity, gross energy consumption [TJ per million GDP]	0,636	0,500	0,474	0,450	0,391	0,353	0,339	0,334	-47,4%
Energy intensity, final energy consumption [TJ per million GDP]	0,469	0,388	0,372	0,350	0,319	0,295	0,280	0,274	-41,6%
Gross energy consumption per capita [GJ]	159	157	157	147	133	129	121	125	-21,8%
Final energy consumption per capita [GJ]	118	122	123	114	109	108	100	102	-13,2%
Degree of self-sufficiency [%]	52	139	154	120	90	70	56	55	5,6%
Oil consumption - share of gross energy consumption [%]	43	45	41	38	37	38	34	34	-22,5%
Renewable energy - share of gross energy consumption [%]	5,8	9,6	14,5	20,0	28,6	35,4	40,1	42,7	633%
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	15 076	15 171	16 231	77,9%
Wind turbine capacity – share of total electricity capacity [%]	3,6	19,0	23,9	28,3	36,3	40,5	41,3	43,3	1110%
Net electricity import - share of domestic supply [%]	22,5	1,9	3,8	-3,2	17,5	16,8	19,8	13,2	•
CHP production - share of total thermal electricity production [%]	37	56	64	61	82	87	80	72	95,9%
CHP production - share of total district heating production [%]	59	82	82	77	66	68	66	66	11,8%
Renewable electricity - share of total domestic electricity supply [%]	2,6	15,9	27,4	34,8	56,0	67,5	68,0	71,9	2664%
CO ₂ emission per capita [tonnes]	11,9	10,4	9,7	8,5	6,9	6,0	5,2	5,1	-56,9%
CO ₂ emissions per GDP [tonnes per million GDP]	47	33	29	26	20	16	15	14	-71,0%
CO ₂ emissions per fuel unit [kilogram per GJ]	75	66	62	58	52	46	43	41	-44,9%
CO ₂ emissions per kWh electricity sold [gram per kWh]	929	632	537	505	350	228	230	207	-77,8%
CO ₂ emissions per consumed unit of district heating [kilogram per GJ]	62	43	39	33	32	24	20	15	-76,0%

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 2021

	Calorific values	CO ₂ emissions factors
	GJ/ton	Kg/GJ
Crude oil/ North Sea	43,00	
Refinery feedstocks	42,70	
Refinery gas	52,00	56,81
LPG	46,00	64,80
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	74,10
Fuel oil	40,65	79,03
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	36,62	55,47
Gas works gas/1000 m ³	20,84	
Coal in electricity plants	23,96	94,20
Other hard coal	25,42	94,20
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)	36,62	
Waste	10,60	
Biodiesel	37,50	
Bioethanol	26,70	
Bio oil	37,20	

Climate adjustments

Year	Degree days	
	Specific year	Normal year
2014	2664	3131
2015	2921	3112
2016	2998	3070
2017	2970	3057
2018	2900	3041
2019	2847	3030
2020	2715	3021
2021	3098	3012

Tax rates in 2021

	Energy taxes	CO ₂ taxes
Transport		
Motor gasoline (DKK 0.01 per l)	520,7	42,8
Light diesel oil (DKK 0.01 per l)	314,7	47,4
Low-sulphur diesel oil (DKK 0.01 per l)	279,3	44,1
Other uses		
LPG (DKK 0.01 per l)	190,5	28,8
Other kerosene (DKK 0.01 per l)	314,7	47,4
Heating diesel oil (DKK 0.01 per l)	225,2	47,4
Fuel oil (DKK 0.01 per kg)	255,2	56,6
Petroleum coke (DKK 0.01 per l)	314,7	47,4
Natural gas (DKK 0.01 per Nm ³)	248,6	40,3
Electricity plant coal (DKK per tonne)	1758	474,7
Coke (DKK per tonne)	2073	541,8
Brown coal (DKK per tonne)	1194	322,1
Electricity (DKK 0.01 per kWh)	90	
Electricity for space heating ¹⁾ (DKK 0.01 per kWh)	0,8	

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

Source: Ministry of Taxation

Volume weights in 2021

	tonne/m ³
Motor gasoline	
Aviation gasoline	0,75
JP4	0,71
Other kerosene	0,76
JP1	0,80
Gas-/diesel-oil	0,80
Bioethanol	0,84
Biodiesel	0,79
	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 liters
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

Here you can find:

Energy Statistics 2021

- Publications as pdf
- Figures in PowerPoint
- Time series and tables
- Denmark's energy flows 2021

Data

- Monthly energy statistics
- Wind turbine data

Maps

- Electricity generation and transmission
- Heat supply

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