



Danish Energy Agency



# 2022

Data, tables, statistics and maps  
Energy Statistics 2022

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Visit the Danish Energy Agency's website for statistics and data:

### www.ens.dk/talogkort.

This website includes energy statistics that are far more detailed than the statistics published here. You can download the complete energy statistics, including tables and time series for energy consumption, emissions and calculation assumptions for the period 1972-2022.

Descriptions of methods and checks are also available here.

The data behind all figures in the PDF version and a PowerPoint of the figures are also available on the website.

## Note

### Briquettes

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

### LNG

The distribution between freight and passenger transport follows the fuel (gas/diesel).

### Electricity

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

### Natural Gas

From 2021, data collection for the gas balance has been adjusted so that the data unit collected is kWh instead of Nm<sup>3</sup> as previously. Developments from 2020 to 2022 should therefore be interpreted with some caution.

### Border trade

Estimates of border trade in motor gasoline and diesel fuel have been prepared by the Danish Ministry of Taxation and are based on 2016 data.

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### Energy Statistics 2022

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This publication may be quoted with source reference.

### Access to the statistics or parts of the statistics before publication

For a list of organisations that have access to the statistics under a special agreement see:

[www.ens.dk/talogkort](http://www.ens.dk/talogkort), click on the tab "Energistatistik: Metoder mm"

## Drop in energy consumption due to the energy crisis and high energy prices

### Energy consumption in individual sectors

Final adjusted energy consumption fell by 1.7% in 2022.

Climate-adjusted energy consumption by *households* saw the largest fall of 6.8% in 2022 relative the year before. Energy consumption by agriculture and industry was 2.6% lower in 2022 than in 2021, primarily due to lower energy consumption by manufacturing industries. In the commercial and public services sector, climate-adjusted energy fell by 3.7% in 2022.

Energy consumption for *transport*, however, increased by 5.4% in 2022 relative to the year before. The increase is attributable to an increase of 70.2% in energy consumption for aviation following two years with extremely low consumption levels due to the Covid-19 pandemic. Energy consumption for road transport, on the other hand, fell by 1.3%.

### Observed energy consumption

*Observed energy consumption* fell by 3.8% to 678 PJ in 2022. Following an increase in energy consumption in 2021, 2022 saw a fall in natural gas consumption of 29.3%, in coal/coke by 1.8%, and a fall in renewable energy consumption of 1.2%, while consumption of oil products increased by 6.4%.

### Adjusted gross energy consumption

*Adjusted gross energy consumption*, which the Danish Energy Agency estimates in addition to *observed energy consumption*, is found by adjusting observed energy consumption for the fuel consumption linked to foreign trade in electricity, and by adjusting for climate variability relative to a normal weather year in terms of temperature. The purpose of the adjustment is to illustrate any underlying trends. *Adjusted gross energy consumption* was 696 PJ in 2022, which is 4.4% below the level in 2021. Compared with 1990, adjusted gross energy consumption fell by 15.0%. Coal and coke account for the largest drop at 84%, while renewable energy, which began from a low starting point, accounted for the largest increase.

### Consumption of renewable energy

Consumption of renewable energy fell from 294 PJ in 2021 to 290 PJ in 2022, which corresponds to a fall of 1.2%. The development is primarily attributable to a drop in consumption of wood pellets of 19 PJ, of wood chips of 2 PJ and of fuel wood of 1 PJ. Consumption of wind power, solar energy and biogas increased by 11 PJ, 4 PJ and 3 PJ, respectively.

### Renewables share in electricity supply

Production of electricity from renewables accounted for 81.4% of Danish domestic electricity supply in 2022 as opposed to 71.9% in 2021. Wind power contributed 53.6%, biomass 18.9%, and solar energy and biogas the remaining 8.8%.

### Energy production

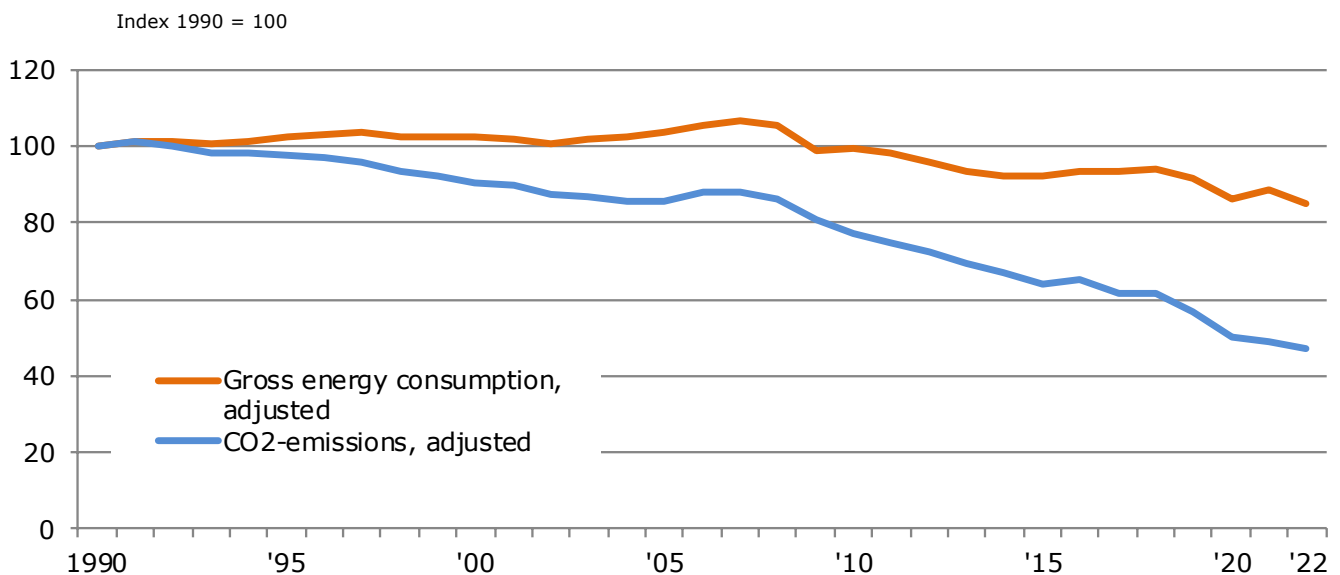
Danish production of crude oil and production of natural gas fell in 2022, by 1.6% compared with the year before. Renewable energy production however increased by 10.5% and now, for the first time, accounts for more than half of total energy production.

### CO<sub>2</sub> emissions from energy production

Observed CO<sub>2</sub> emissions from energy consumption were 27.7 million tonnes in 2022 and, thus, emissions fell by 0.2 million tonnes compared with 2021. Observed CO<sub>2</sub> emissions from energy consumption have fallen by 47.8% since 1990. Adjusted for fuel consumption linked to foreign trade in electricity and climate variability, CO<sub>2</sub> emissions fell by 4.4% to 28.7 million tonnes. Adjusted CO<sub>2</sub> emissions from energy consumption have fallen by 53.1% since 1990.

### Greenhouse gas emissions 2022

A preliminary estimate of total observed Danish greenhouse gas emissions shows a drop of 40.3% from 1990 to 2022, while total adjusted greenhouse gas emissions have dropped by 45.1%.



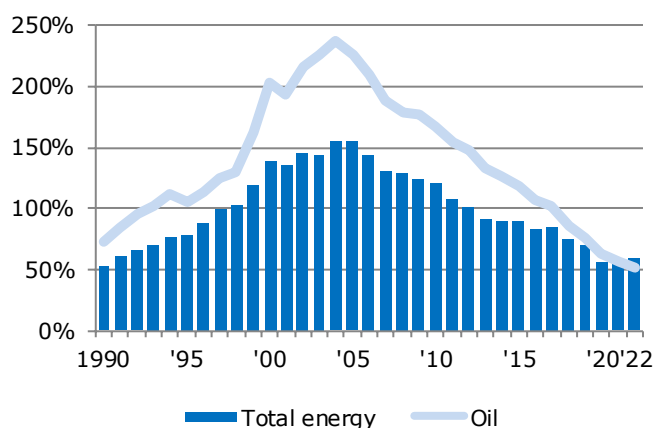
## Energy balance 2022

	Total	Crude oil and refinery feedstocks	Oil products	Natural gas	Coal and coke	Waste, non-renewable	Renewable energy	Electricity	District heating	Gas works gas
<b>Direct energy content [TJ]</b>										
<b>Total energy consumption</b>	<b>676 768</b>	<b>306 571</b>	<b>-46 129</b>	<b>60 542</b>	<b>43 848</b>	<b>17 753</b>	<b>289 174</b>	<b>4 906</b>	<b>102</b>	<b>-</b>
Primary energy production	414 813	136 949	-	52 104	-	15 427	210 334	-	-	-
Recycling	2	-	2	-	-	-	-	-	-	-
Imports	731 323	192 341	243 427	96 356	45 201	2 327	84 062	67 508	102	-
Exports	-425 060	-27 298	-249 827	-79 510	-	-	-5 822	-62 602	-	-
Border trade	-10 553	-	-10 553	-	-	-	-	-	-	-
International marine bunkers	-22 272	-	-22 272	-	-	-	-	-	-	-
Stock changes	-12 207	6 279	-8 910	-8 696	-2 316	-	1 435	-	-	-
Statistical differences, input from blending	721	-1 700	2 004	289	964	-	-835	-	0	-
<b>Energy sector</b>	<b>-33 335</b>	<b>-306 571</b>	<b>292 658</b>	<b>-13 439</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-5 975</b>	<b>-7</b>	<b>-</b>
Extraction and gasification	-13 439	-	-	-13 439	-	-	-	-	-	-
Petroleum products	307 694	-	307 694	-	-	-	-	-	-	-
Used in refineries	-322 658	-306 571	-15 037	-	-	-	-	-1 043	-7	-
Used in distribution	-4 932	-	-	-	-	-	-	-4 932	-	-
<b>Transformation</b>	<b>-29 446</b>	<b>-</b>	<b>-6 036</b>	<b>-9 769</b>	<b>-39 736</b>	<b>-16 320</b>	<b>-204 859</b>	<b>117 967</b>	<b>128 776</b>	<b>530</b>
Large-scale units	-23 929	-	-1 669	-400	-39 690	-	-59 109	34 273	42 667	-
Wind turbines and hydropower plants	-	-	-	-	-	-	-68 534	68 534	-	-
Small-scale units	-2 370	-	-65	-5 118	-	-2 270	-19 631	7 550	17 163	-
District heating units	1 834	-	-2 327	-3 360	-46	-187	-25 901	-4 778	38 432	-
Autoproducers	-532	-	-1 975	-556	-	-13 863	-31 395	16 089	31 168	-
Gas works	-92	-	-0	-335	-	-	-288	-	-	530
Own use	-4 356	-	-	-	-	-	-	-3 702	-654	-
<b>Distribution losses etc.</b>	<b>-32 646</b>	<b>-</b>	<b>-</b>	<b>-75</b>	<b>-</b>	<b>-</b>	<b>-37</b>	<b>-6 737</b>	<b>-25 776</b>	<b>-21</b>
<b>Final energy consumption</b>	<b>-581 341</b>	<b>-</b>	<b>-240 493</b>	<b>-37 258</b>	<b>-4 112</b>	<b>-1 434</b>	<b>-84 279</b>	<b>-110 161</b>	<b>-103 095</b>	<b>-509</b>
Non-energy use	-8 720	-	-8 720	-	-	-	-	-	-	-
Transport	-195 098	-	-181 667	-311	-	-	-9 932	-3 188	-	-
Agriculture and industry	-129 406	-	-41 691	-17 068	-4 112	-1 154	-21 799	-37 943	-5 451	-187
Commercial and public services	-79 585	-	-1 609	-6 830	-	-280	-5 216	-34 756	-30 868	-26
Households	-168 532	-	-6 806	-13 049	-	-	-47 331	-34 275	-66 775	-296

Note: The energy balance provides an overview of supply (production, imports and exports), 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" table on pages 18-19.

\*) LNG has been included with natural gas.

## 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 that is represented by oil.

For the first time, in 1997, Denmark produced more energy than it consumed. Self-sufficiency was 52% in 1990 and peaked at 155% in 2004. In 2013, for the first time since 1996, Denmark was again a net importer of energy. In 2022, self-sufficiency was 60% as opposed to 55% in 2021. This increase is attributable to increased production of renewable energy.

From 1993 to 2017 Denmark was more than self-sufficient in oil. Oil self-sufficiency peaked in 2004 but has since fallen and was at 52% in 2022.

## PRODUCTION OF PRIMARY ENERGY

### Production of primary energy

Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>Total production</b>	<b>424 361</b>	<b>1 164 526</b>	<b>1 311 683</b>	<b>978 614</b>	<b>676 432</b>	<b>397 793</b>	<b>398 190</b>	<b>414 813</b>	<b>-2.3%</b>
<b>Crude oil</b>	255 959	764 526	796 224	522 733	330 662	151 369	139 180	136 949	<b>-46.5%</b>
<b>Natural gas</b>	115 967	310 307	392 868	307 425	173 510	49 863	52 945	52 104	<b>-55.1%</b>
<b>Renewable energy</b>	45 461	76 017	105 585	131 309	156 391	180 573	190 277	210 334	<b>363%</b>
<b>Waste, non-renewable</b>	6 975	13 676	17 006	17 148	15 870	15 989	15 788	15 427	<b>121%</b>

Note: Data for the gas balances has been adjusted from 2021 and onwards. Developments from 2020 to 2021 should therefore be interpreted with some caution.

### Production and consumption of renewable energy

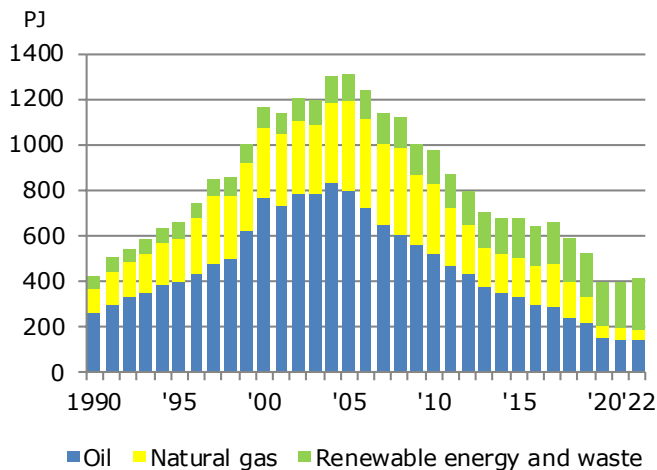
Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>Production of renewable energy</b>	<b>45 461</b>	<b>76 017</b>	<b>105 585</b>	<b>131 309</b>	<b>156 391</b>	<b>180 573</b>	<b>190 277</b>	<b>210 334</b>	<b>363%</b>
Solar	100	335	419	657	3 713	7 522	7 599	11 256	<b>11178%</b>
Wind	2 197	15 268	23 810	28 114	50 879	58 789	57 796	68 480	<b>3017%</b>
Hydro	101	109	81	74	65	61	59	54	<b>-46.6%</b>
Geothermal	48	58	172	212	140	46	54	82	<b>71.3%</b>
Biomass	39 996	54 040	73 542	92 271	87 308	79 861	83 375	84 014	<b>110%</b>
- Straw	12 481	12 220	18 485	23 326	19 789	18 934	21 582	21 186	<b>69.7%</b>
- Wood chips	1 724	2 744	6 082	11 352	14 744	18 660	20 695	21 051	<b>1121%</b>
- Firewood	8 757	12 432	17 667	23 779	21 943	13 686	12 873	12 660	<b>44.6%</b>
- Wood pellets	1 575	2 984	3 262	2 407	2 697	2 027	1 667	2 520	<b>60.0%</b>
- Wood waste	6 191	6 895	6 500	8 500	8 102	6 934	7 091	7 654	<b>23.6%</b>
- Waste, renewable	8 524	16 715	20 786	20 959	19 396	19 542	19 296	18 855	<b>121%</b>
- Biodiesel *)	..	..	..	..	..	..	..	..	
- Biooil	744	49	761	1 949	636	79	171	89	<b>-88.1%</b>
Biogas	752	2 912	3 830	4 337	6 285	21 152	26 166	28 848	<b>3736%</b>
Heat pumps	2 267	3 296	3 731	5 643	8 001	13 142	15 227	17 601	<b>676%</b>
<b>Imports of renewable energy</b>	<b>-</b>	<b>2 466</b>	<b>18 918</b>	<b>39 484</b>	<b>52 462</b>	<b>81 735</b>	<b>108 023</b>	<b>84 062</b>	<b>•</b>
Firewood	-	-	1 963	2 939	2 547	1 521	1 673	1 101	<b>•</b>
Wood chips	-	305	1 521	4 865	2 808	17 928	21 975	19 984	<b>•</b>
Wood pellets	-	2 161	12 802	27 676	34 243	45 595	65 005	44 829	<b>•</b>
Waste, renewable **)	-	-	-	-	2 559	3 341	2 844	2 844	<b>•</b>
Bioethanol	-	-	-	1 118	1 818	3 437	3 622	4 117	<b>•</b>
Biodiesel	-	-	2 632	2 886	8 485	9 913	12 904	11 188	<b>•</b>
<b>Exports of renewable energy</b>	<b>-</b>	<b>-</b>	<b>2 632</b>	<b>2 846</b>	<b>1 084</b>	<b>2 385</b>	<b>2 906</b>	<b>5 822</b>	<b>•</b>
Biodiesel	-	-	2 632	2 846	1 084	2 385	2 906	5 822	<b>•</b>
<b>Stock changes, stat. diffs. etc.</b>	<b>-</b>	<b>22</b>	<b>6</b>	<b>0</b>	<b>- 259</b>	<b>- 883</b>	<b>- 1 326</b>	<b>1 894</b>	<b>•</b>
<b>Consumption of renewable energy</b>	<b>45 461</b>	<b>78 505</b>	<b>121 877</b>	<b>167 947</b>	<b>207 509</b>	<b>259 039</b>	<b>294 068</b>	<b>290 468</b>	<b>539%</b>

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

\*\*) Imports of waste for 2022 have been based on assessment as no source data was available at the time of publication of this report.

## PRODUCTION OF PRIMARY ENERGY

### Primary energy production



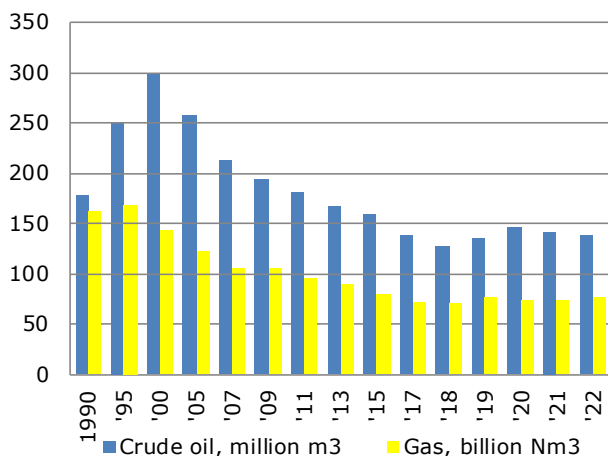
Primary energy refers to crude oil, natural gas, renewable energy (energy from hydro, solar, wind, biogas and biomass, including renewable waste) and non-renewable waste.

Energy production in 2022 was 415 PJ, corresponding to an increase of 4.2% compared with 2021, reflecting an increase in renewable energy of 10.5%. In 2022, therefore, for the first time renewable energy accounted for more than half of total primary energy production.

Production of crude oil and natural gas increased up to 2004 and 2005, respectively, after which production has been falling. Total primary energy production peaked at 1,312 PJ in 2005.

The reduction in production of crude oil and natural gas in 2020-2022 is due to the temporary shutdown of the Tyra field since 2019 in order to redevelop the field.

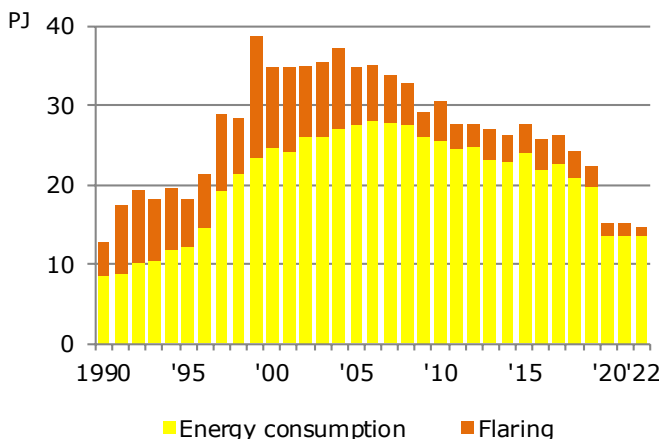
### Oil and gas reserves / resources



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 finds using known technologies. The reserves are being re-evaluated regularly against new oil discoveries and changes in the basis 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 2009 to 2022, estimates include the sum of reserves and contingent resources, so that comparison with earlier statements is possible. At the end of 2022, the sum of reserves and contingent resources was calculated at 139 million m<sup>3</sup> oil and 77 billion Nm<sup>3</sup> gas. From 2011 to 2017, Danish oil and gas reserves were estimated every second year.

Source: Resource assessment and forecasts, August 2023. Published by the Danish Energy Agency

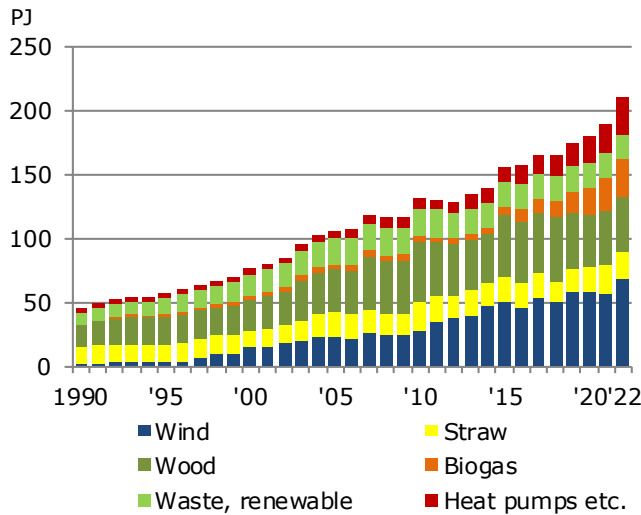
### Natural gas consumption and flaring on platforms in the North Sea



Natural gas is used in the extraction of crude oil and natural gas, for production, transport and for offloading. In 2022, natural gas consumption at platforms amounted to 13.5 PJ, corresponding to 22.2% of total Danish natural gas consumption. In 2021, consumption amounted to 13.6 PJ.

Production in the North Sea fields also involves flaring (burning) natural gas. Flaring is not included in energy consumption. However, flaring is included in Denmark's international GHG inventory report and is covered by the EU ETS. Flaring of natural gas was estimated at 1.2 PJ in 2022, as opposed to 1.4 PJ in 2021.

### Production of renewable energy by energy product



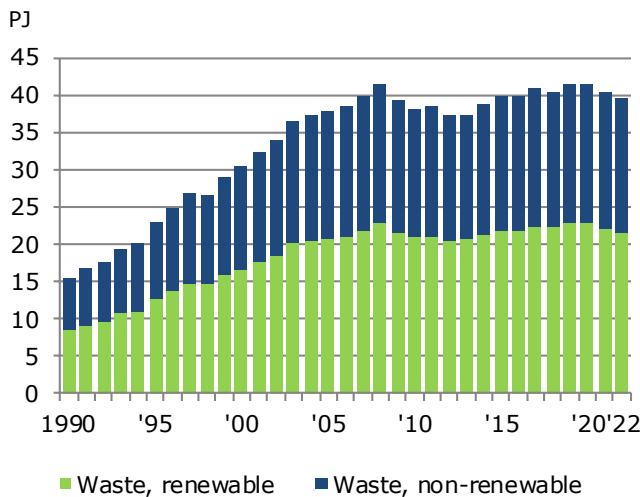
Renewable energy includes wind power, wood, straw, biogas, renewable waste and other renewable sources (solar energy, hydropower, geothermal energy and ambient heat for heat pumps).

Production of renewable energy was 210.3 PJ in 2022, which corresponds to an increase of 10.5% compared with 2021. Across the period 1990-2022, renewable energy production increased by 363%.

Production of wind power was 68.5 PJ in 2022, corresponding to an increase of 18.5% relative to 2021.

Production of straw, wood products and renewable waste was 21.2 PJ, 43.9 PJ and 18.9 PJ, respectively, in 2022. Production of biogas was 28.8 PJ in 2022, corresponding to an increase of 10.2% relative to 2021, while production of solar energy was 11.3 PJ, corresponding to an increase of 48% relative to 2021.

### Consumption of waste

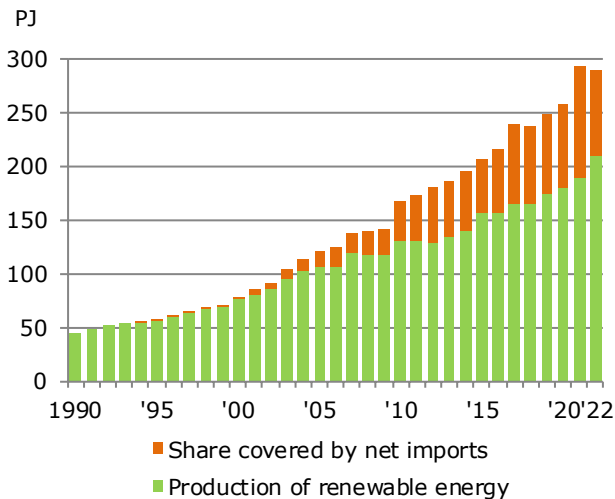


Consumption of waste for the production of electricity and district heating has increased significantly over time. However, total waste consumption fell by 1.9% from 2021 to 2022. Waste consumption for energy purposes has increased by 155% since 1990.

In statistics for energy and CO<sub>2</sub> emissions, waste is analysed by two components: Renewable waste and non-renewable waste. According to international conventions, renewable waste is included in renewable energy.

Annual Danish energy statistics assume that 55% of 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



Renewable energy consumption has increased dramatically since 1990. The increased demand has been met partly through increased domestic production and partly through net imports of renewable energy from biomass and biofuels.

In 2022, consumption of renewable energy was 290.5 PJ, which is 1.2% less than the year before. Observed consumption of renewable energy was 45.5 PJ in 1990.

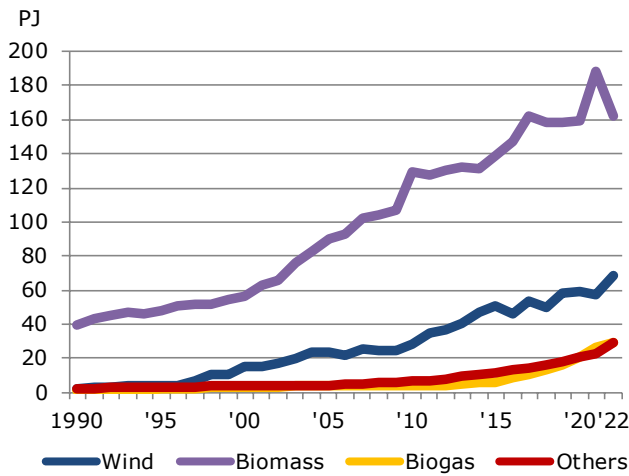
In 2022, net imports (including stock changes, etc.) of renewable energy were 80.1 PJ, which is 22.8% less than the year before.

*\* Imports of waste for 2022 are based on an assessment as no source data was available at the time of publication of this report.*



## RENEWABLE ENERGY

### Renewable energy - consumption by energy product

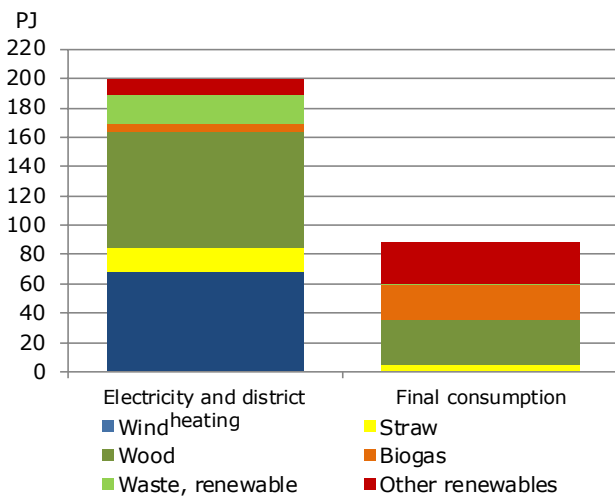


The figure shows renewable energy consumption by four groups.

Consumption of biomass including bioliquids fell from 188.5 PJ in 2021 to 162.3 PJ in 2022, corresponding to a fall of 13.9%. The fall is greatest for wood pellets, which fell from 66.7 PJ in 2021 to 47.3 PJ in 2022. Consumption of wind power increased from 57.8 PJ to 68.5 PJ.

Consumption of biomass has almost tripled since 2000, primarily due to increased consumption of wood chips and wood pellets, with increases of 1,246% and 820%, respectively, from 2000 to 2022.

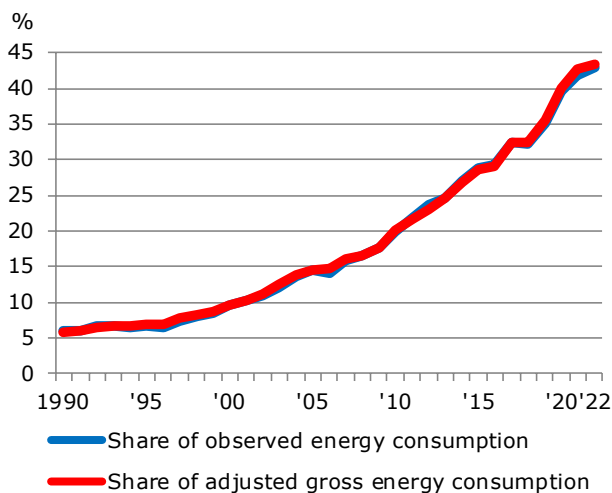
### Use of renewable energy in 2022



Total consumption of renewable energy (production plus net imports) was 288.6 PJ in 2022, of which 200 PJ was used in the production of electricity and district heating. Wind power, wood and renewable waste were predominant in electricity and district heating production, accounting for 68.5 PJ, 79.3 PJ and 19.9 PJ, respectively. Consumption of straw and biogas accounted for 16.3 PJ and 5.1 PJ, respectively.

In 2022, final energy consumption consisted of 88.6 PJ renewable energy. This was used primarily to heat households. Furthermore, it was used for heating and processes in agriculture and industry sectors, in commercial and public services sectors, as well as for transport.

### Renewable energy - share of total energy consumption

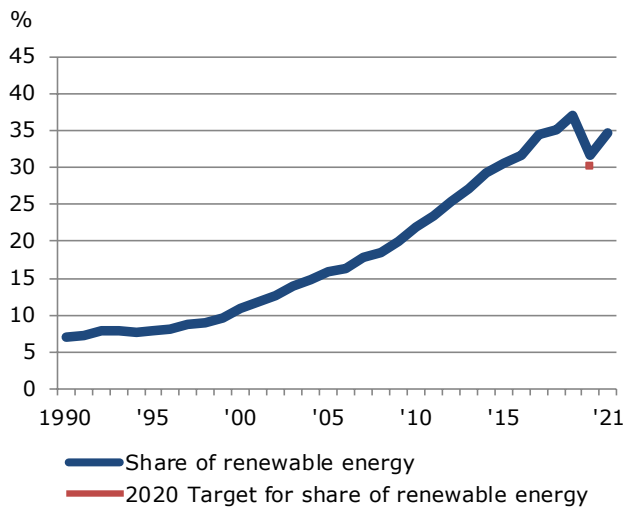


Observed energy consumption shows the registered amount of energy consumed in a calendar year. In 2022, the renewable energy share of total observed energy consumption was 42.8%, as compared to 41.7% the year before. In 1990 the share was 6.0%.

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 climate variability relative to a normal weather year. In 2022 renewable energy's share of adjusted gross energy consumption was 43.2%, as compared to 42.6% the previous year. In 1990 the share was 5.8%.



### Share of renewable energy according to the EU method of calculation



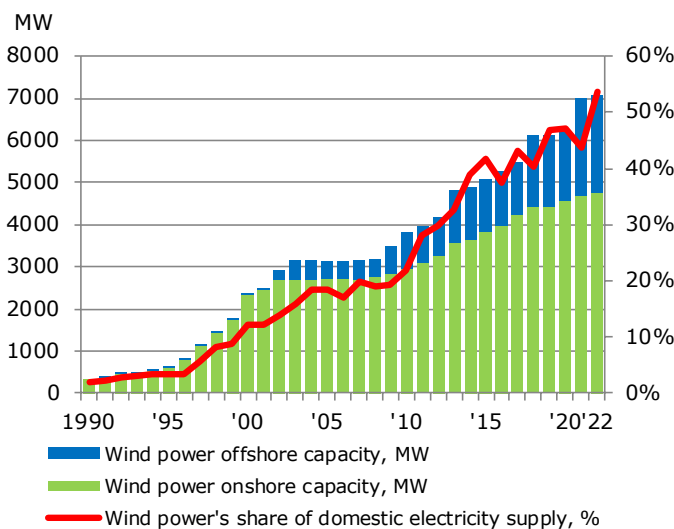
The EU Directive on renewable energy prescribes a different method for calculating the share of renewable energy than those used above.

The EU’s calculation is based on gross final energy consumption expressed as energy consumption by end-users, excluding border trade and consumption for non-energy purposes, while distribution losses are added to the gross final energy consumption. In the EU method, renewable energy is defined as final consumption of renewables as well as consumption of electricity and district heating based on renewables. Furthermore, there are certain rules for the inclusion of bioenergy.

Denmark was obligated to achieve a renewable energy share of 30% by 2020. Denmark exceeded the goal and decided to transfer shares to countries with a deficit regarding achieving the goal. The share for 2021 is under review and, as of 1 December 2023, the share for 2022 is still not known.

Sources: 2004-2021 Eurostat. 1990-2003 Danish Energy Agency calculations.

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

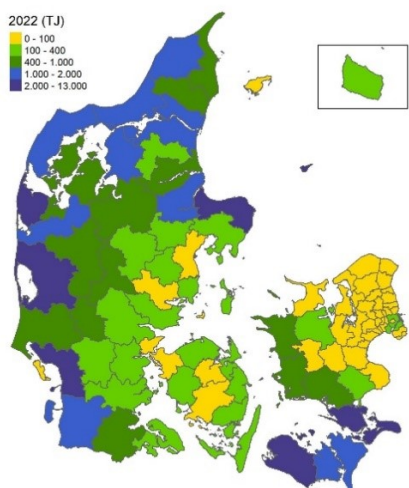


In 2022, wind power production accounted for 53.6% of domestic electricity supply, compared to 43.6% in 2021 and 1.9% in 1990.

Wind power capacity was 7,084 MW in 2022, as opposed to 7,004 MW the year before. In 2022 onshore and offshore wind turbine capacities were 4,778 MW and 2,306 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 68.8 PJ in 2022. Of this, onshore installations accounted for 54.2% and offshore installations accounted for 45.8%.

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 2022, turbines in the top ten wind-power-producing municipalities were therefore responsible for a total production of 19.8 PJ, corresponding to 53.2% of total wind power production from onshore installations.

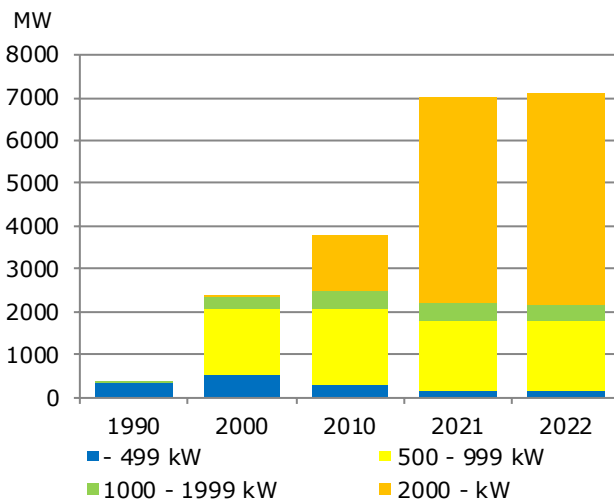
## RENEWABLE ENERGY

### Wind power - number of turbines and capacity by size

	1990	2000			2021			2022		
	Onshore	Onshore	Offshore	Total	Onshore	Offshore	Total	Onshore	Offshore	Total
<b>Total no. of turbines</b>	<b>2 666</b>	<b>6 194</b>	<b>41</b>	<b>6 235</b>	<b>5 654</b>	<b>630</b>	<b>6 284</b>	<b>5 641</b>	<b>630</b>	<b>6 271</b>
- 499 kW	2 656	3 652	11	3 663	2 160	-	2 160	2 152	-	2 152
500 - 999 kW	8	2 283	10	2 293	2 371	10	2 381	2 346	10	2 356
1 000 - 1 999 kW	2	251	-	251	316	-	316	316	-	316
2 000 - kW	-	8	20	28	807	620	1 427	827	620	1 447
<b>Total wind power capacity [MW]</b>	<b>326</b>	<b>2 340</b>	<b>50</b>	<b>2 390</b>	<b>4 698</b>	<b>2 306</b>	<b>7 004</b>	<b>4 778</b>	<b>2 306</b>	<b>7 084</b>
- 499 kW	317	533	5	538	164	-	164	164	-	164
500 - 999 kW	6	1 512	5	1 517	1 616	5	1 621	1 600	5	1 605
1 000 - 1 999 kW	3	279	-	279	391	-	391	391	-	391
2 000 - kW	-	16	40	56	2 527	2 301	4 827	2 623	2 301	4 924

Note: The first offshore wind turbines were established in 1991.

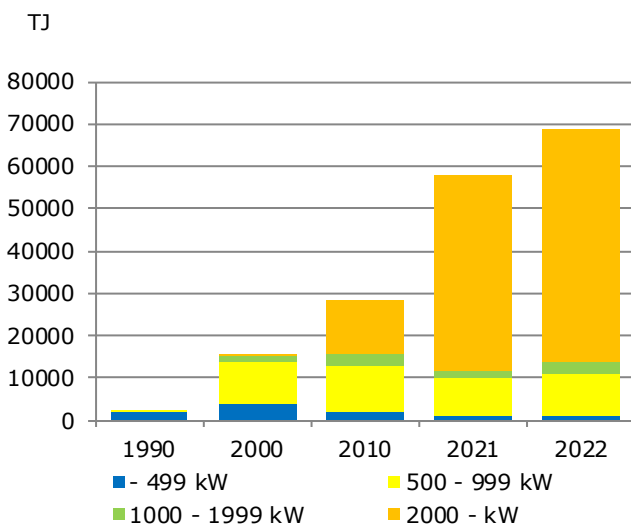
### Wind power capacity by size of turbine



The total number of wind turbines increased by 13 turbines from 2021 to 2022, and the total wind power capacity increased by 80 MW.

For years, the trend has been toward fewer but larger turbines. Since 2000, the number of small wind turbines of up to 499 kW has been reduced by 1,511, and the number of large turbines of more than 2 MW has increased by 1,419.

### 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 2022, production from turbines up to 499 kW decreased by 2,914 TJ, while production from turbines of more than 2 MW increased by 55,181 TJ. However, from 2021 to 2022, capacity increased by 1.1%, while electricity production increased by 18.6%.

Turbines above 2 MW accounted for 69.5% of installed wind power capacity and were responsible for 80.3% of total energy from wind turbines in 2022.

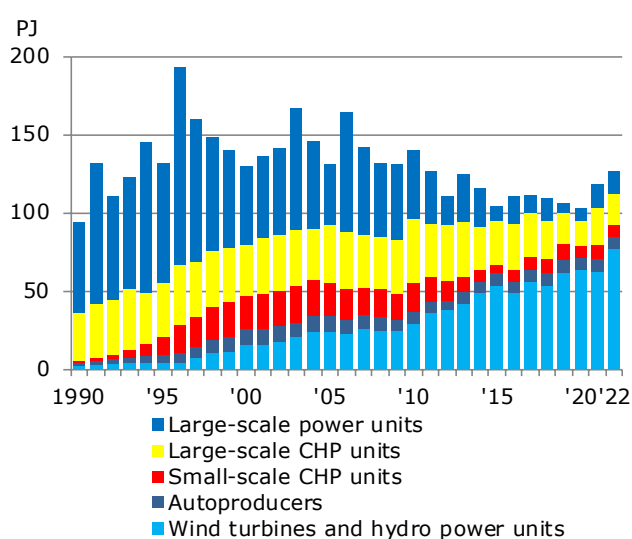
Similarly, in 2022 wind turbines with a capacity up to 499 kW accounted for only 1.4% of the total production.

Wind turbines with a capacity up to 499 kW accounted for only 2.3% of the total capacity in 2022, whereas this figure was 22.5% in 2000.

**Electricity production by type of producer**

									Change
Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	'90 - '22
<b>Total electricity production(gross)</b>	<b>93 518</b>	<b>129 776</b>	<b>130 469</b>	<b>139 906</b>	<b>104 164</b>	<b>103 423</b>	<b>118 983</b>	<b>126 446</b>	<b>35.2%</b>
Large-scale power units	7 494	8 871	49	336	46	63	46	118	-98%
Large-scale CHP units	80 639	73 809	74 932	83 940	37 375	24 985	39 534	34 155	-58%
- of which electricity production	50 157	41 584	38 402	43 221	8 936	7 913	15 688	13 690	-73%
Small-scale CHP units	988	21 547	21 254	19 216	5 765	7 217	8 719	7 550	664%
Autoproducers	2 099	10 168	10 336	8 203	7 858	8 058	8 117	8 159	289%
- Electricity production <sup>1)</sup>	-	9	7	6	3	5	5	6	
- CHP <sup>1)</sup>	2 099	10 158	10 328	8 197	7 855	8 053	8 111	8 153	288%
Wind turbines <sup>1)</sup>	2 197	15 268	23 810	28 114	50 879	58 789	57 796	68 480	3017%
Hydropower units <sup>1)</sup>	101	109	81	74	65	61	59	54	-47%
Photovoltaics <sup>1)</sup>	-	4	8	22	2 175	4 250	4 712	7 929	
<b>Own use in production</b>	<b>-6 118</b>	<b>-5 776</b>	<b>-6 599</b>	<b>-7 159</b>	<b>-3 670</b>	<b>-3 070</b>	<b>-4 090</b>	<b>-3 702</b>	<b>-39.5%</b>
Large-scale power units	- 590	- 312	- 2	- 17	- 0	- 3	- 3	- 7	-99%
Large-scale CHP units	- 5 509	- 4 993	- 6 033	- 6 602	- 3 303	- 2 588	- 3 619	- 3 242	-41%
Small-scale CHP units	- 19	- 472	- 564	- 541	- 368	- 479	- 468	- 453	2282%
<b>Total electricity production (net)</b>	<b>87 400</b>	<b>123 999</b>	<b>123 870</b>	<b>132 747</b>	<b>100 493</b>	<b>100 353</b>	<b>114 893</b>	<b>122 745</b>	<b>40.4%</b>
Net imports of electricity	25 373	2 394	4 932	- 4 086	21 282	24 777	17 528	4 906	-81%
<b>Domestic electricity supply</b>	<b>112 773</b>	<b>126 393</b>	<b>128 802</b>	<b>128 661</b>	<b>121 775</b>	<b>125 130</b>	<b>132 421</b>	<b>127 650</b>	<b>13.2%</b>
Transformation consumption	-	- 1	-	- 110	- 1 073	- 3 236	- 4 678	- 4 778	•
Distribution losses etc. <sup>2)</sup>	- 8 886	- 7 650	- 5 573	- 9 482	- 6 887	- 8 805	- 6 718	- 6 737	-24%
<b>Domestic electricity consumption</b>	<b>103 887</b>	<b>118 742</b>	<b>123 228</b>	<b>119 068</b>	<b>113 815</b>	<b>113 089</b>	<b>121 025</b>	<b>116 136</b>	<b>11.8%</b>
Consumption in the energy sector	- 1 748	- 1 893	- 2 761	- 3 445	- 2 796	- 4 227	- 5 441	- 5 975	242%
<b>Final electricity consumption</b>	<b>102 139</b>	<b>116 849</b>	<b>120 467</b>	<b>115 623</b>	<b>111 019</b>	<b>108 863</b>	<b>115 583</b>	<b>110 161</b>	<b>7.9%</b>

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

**Electricity production by type of producer**


In 2022, electricity production was 126 PJ, which is an increase of 6.3% compared with 2021.

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

Of the total electricity production of 126.4 PJ, 76.5 PJ (60.5%) was generated from wind, solar and hydro power units. Large-scale power units generate electricity, partly as separate electricity production, and partly as combined electricity and heat production. 34.2 PJ (27.0%) was from large-scale power units – of this 13.7 PJ (10.8%) as separate production. Separate electricity production varies greatly from year to year due to fluctuations in foreign trade in electricity. Electricity production from small-scale units and autoproducers was 7.6 PJ (6.0%) and 8.2 PJ (6.5%), respectively.

## ELECTRICITY AND DISTRICT HEATING

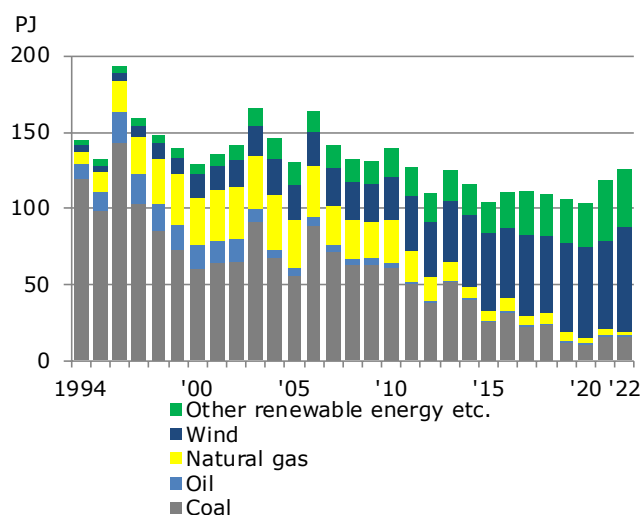
### Electricity production by fuel

Direct energy content [TJ]	1994	2000	2005	2010	2015	2020	2021	2022	Change '94 - '22
<b>Total electricity production (gross)</b>	<b>144 707</b>	<b>129 776</b>	<b>130 469</b>	<b>139 906</b>	<b>104 164</b>	<b>103 423</b>	<b>118 983</b>	<b>126 446</b>	<b>-12.6%</b>
Oil	9 547	15 964	4 933	2 783	1 122	947	925	1 194	-87.5%
- of which orimulsion	-	13 467	-	-	-	-	-	-	•
Natural gas	8 206	31 589	31 606	28 464	6 499	3 576	4 325	2 456	-70.1%
Coal	119 844	60 022	55 665	61 222	25 596	11 022	15 716	15 945	-86.7%
Surplus heat	-	139	-	-	-	-	-	-	•
Waste, non-renewable	836	2 002	2 938	2 689	2 706	2 783	2 860	3 005	260%
<b>Renewable energy</b>	<b>6 275</b>	<b>20 060</b>	<b>35 326</b>	<b>44 749</b>	<b>68 242</b>	<b>85 096</b>	<b>95 157</b>	<b>103 845</b>	<b>1555%</b>
Solar	-	4	8	22	2 175	4 250	4 712	7 929	•
Wind	4 093	15 268	23 810	28 114	50 879	58 789	57 796	68 480	1573%
Hydro	117	109	81	74	65	61	59	54	-54.2%
Biomass	1 743	3 928	10 410	15 253	13 396	18 887	29 173	24 116	1283%
- Straw	293	654	3 088	3 968	2 080	1 771	2 629	2 565	776%
- Wood	429	828	3 730	7 998	7 987	13 714	23 048	17 878	4063%
- Biooil	-	0	1	1	22	-	-	-	•
- Waste, renewable	1 021	2 447	3 591	3 286	3 307	3 401	3 496	3 673	260%
Biogas	321	751	1 017	1 285	1 726	3 109	3 417	3 266	918%

### Electricity from renewable energy: Share of domestic electricity supply

[%]	1994	2000	2005	2010	2015	2020	2021	2022	Change '94 - '22
<b>Renewable energy</b>	<b>5.3</b>	<b>15.9</b>	<b>27.4</b>	<b>34.8</b>	<b>56.0</b>	<b>68.0</b>	<b>71.9</b>	<b>81.4</b>	<b>1442%</b>
Solar	0.0	0.0	0.0	0.0	1.8	3.4	3.6	6.2	•
Wind	3.4	12.1	18.5	21.9	41.8	47.0	43.6	53.6	1459%
Hydro	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	-57%
Biomass	1.5	3.1	8.1	11.9	11.0	15.1	22.0	18.9	1189%
- Straw	0.2	0.5	2.4	3.1	1.7	1.4	2.0	2.0	717%
- Wood	0.4	0.7	2.9	6.2	6.6	11.0	17.4	14.0	3779%
- Biooil	-	0	0	0	0	-	-	-	•
- Waste, renewable	0.9	1.9	2.8	2.6	2.7	2.7	2.6	2.9	235%
Biogas	0.3	0.6	0.8	1.0	1.4	2.5	2.6	2.6	849%

### Electricity production by fuel



In 2022, 68.5 PJ (54.2%) of total electricity production was generated by wind turbines. Solar energy, biomass and biogas accounted for 7.9 PJ (6.3%), 24.1 PJ (19.1%) and 3.3 PJ (2.6%), respectively.

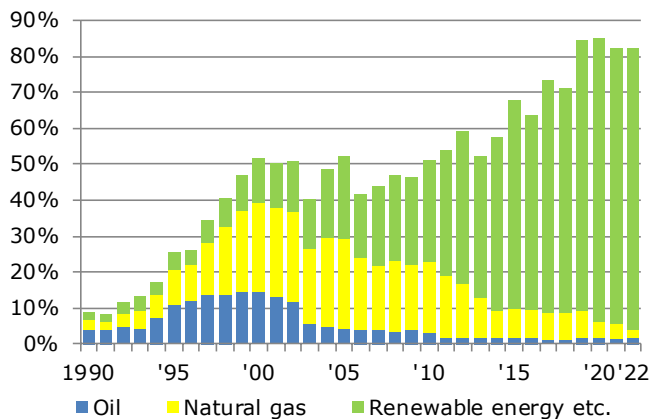
Electricity production based on renewables therefore accounted for 103.9 PJ or 82.1% of total electricity production in 2022, corresponding to an increase of 2.1 percentage points from 2021.

Coal-based electricity production contributed 15.9 PJ (12.6%), while natural gas accounted for 2.5 PJ (1.9%), oil 1.2 PJ (0.9%) and non-renewable waste 3.0 PJ (2.4%) of total electricity production.

### Fuel consumption for electricity production

									Change
Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	'90 - '22
<b>Total fuel consumption</b>	<b>227 001</b>	<b>276 974</b>	<b>265 330</b>	<b>286 006</b>	<b>180 654</b>	<b>166 533</b>	<b>196 597</b>	<b>198 629</b>	<b>-12.5%</b>
Oil	9 215	40 356	11 867	8 087	3 110	2 650	2 567	3 300	-64.2%
- of which orimulsion	-	33 503	-	-	-	-	-	-	•
Natural gas	6 181	68 868	65 912	57 229	14 302	7 292	8 422	4 656	-24.7%
Coal	207 173	134 205	127 119	139 714	58 410	25 127	34 644	34 848	-83.2%
Waste, non-renewable	262	5 294	7 650	9 085	9 412	8 885	8 624	9 420	3497%
<b>Renewable energy</b>	<b>4 170</b>	<b>28 252</b>	<b>52 784</b>	<b>71 891</b>	<b>95 420</b>	<b>122 579</b>	<b>142 340</b>	<b>146 405</b>	<b>3411%</b>
Solar	-	4	8	22	2 175	4 250	4 712	7 929	•
Wind	2 197	15 268	23 810	28 114	50 879	58 789	57 796	68 480	3017%
Hydro	101	109	81	74	65	61	59	54	-46.6%
Biomass	1 428	11 009	26 470	40 808	38 665	53 340	73 006	63 571	4351%
- Straw	363	2 021	7 715	10 213	5 807	4 963	6 433	6 418	1668%
- Wood	745	2 518	9 405	19 492	21 248	37 518	56 033	45 639	6026%
- Biooil	-	0	0	-	107	-	-	-	•
- Waste, renewable	320	6 470	9 350	11 104	11 503	10 860	10 540	11 514	3497%
Biogas	444	1 861	2 415	2 872	3 635	6 139	6 767	6 371	1335%

### Other fuels than coal for electricity production

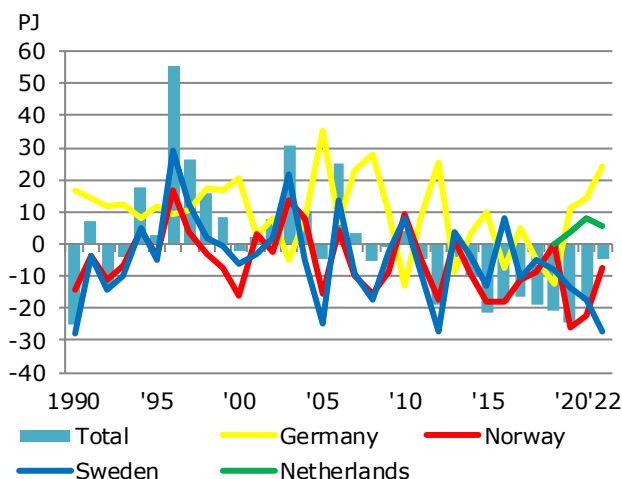


In the early 1990s, coal was the dominant fuel used in the production of electricity. In 1990, other types of fuel than coal only accounted for just 8.7% of total fuel consumption. The picture is very different today with wind power, solar energy, biomass, waste, natural gas and oil together covering 82.5% of fuel consumption in electricity production.

The share contributed by other fuels than coal increases up through the 1990s, initially driven by increased use of natural gas and later by increased use of renewable energy.

The renewable energy etc. share has increased further in recent years and accounted for 78.5% in 2022. In 2022, consumption of natural gas comprised only to 2.3% of total fuel consumption.

### Net exports of electricity by country



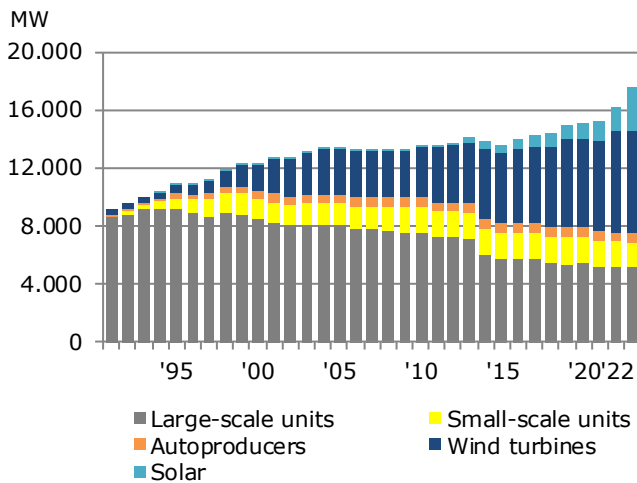
Danish foreign trade in electricity varies considerably from year to year. Foreign trade is strongly affected by price trends on the Nordic electricity exchange, Nordpool, which, in turn, is significantly influenced by varying precipitation patterns in Norway and Sweden, where electricity production is dominated by hydropower. Furthermore, the significant deployment of solar and wind power in recent years, along with fluctuating prices on natural gas and emissions allowances, are affecting prices in electricity markets and, thus, are affecting trends in electricity exchange. In 2022, Denmark had overall net imports of electricity of 4.9 PJ. This was the result of net imports from Norway and Sweden of 7.2 PJ and 27.4 PJ and net exports to Germany and the Netherlands of 24.0 PJ and 5.6 PJ, respectively.

## ELECTRICITY AND DISTRICT HEATING

### Electricity capacity, end of year

[MW]	1994	2000	2005	2010	2015	2020	2021	2022	Change '94 - '22
<b>Total</b>	<b>10 768</b>	<b>12 598</b>	<b>13 088</b>	<b>13 450</b>	<b>13 995</b>	<b>15 164</b>	<b>16 192</b>	<b>17 597</b>	<b>63.4%</b>
Large-scale units	9 126	8 160	7 710	7 175	5 690	5 231	5 228	5 228	-42.7%
- Electricity	2 186	1 429	834	840	839	815	812	812	-62.9%
- CHP	6 940	6 731	6 877	6 335	4 850	4 415	4 415	4 415	-36.4%
Small-scale units	773	1 462	1 579	1 819	1 836	1 776	1 682	1 654	114%
Autoproducers	339	574	657	638	604	587	567	555	63.6%
Solar	0	1	3	7	782	1 304	1 704	3 070	•
Wind	522	2 390	3 128	3 802	5 077	6 259	7 004	7 084	1258%
Hydro	8	10	11	9	7	7	7	7	-20.0%

### Electricity capacity

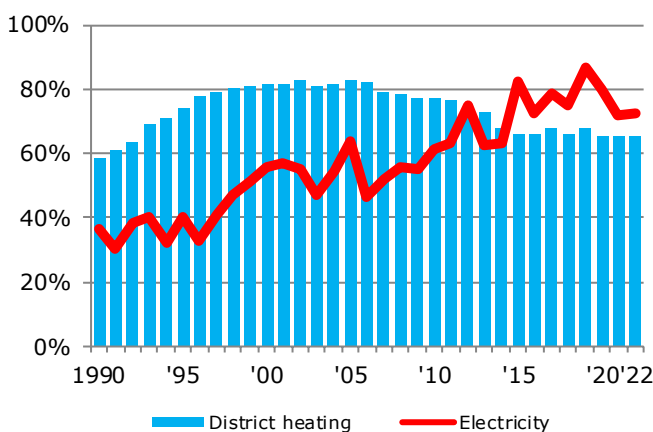


Up until the early 1990s electricity production capacity was dominated by the large-scale power units. Up through the 1990s, electricity capacity in small-scale units and secondary installations (autoproducers) increased. By the turn of the millennium, this capacity corresponded to a fifth of the capacity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

A number of units at the large-scale plants have now been scrapped and capacity at the large-scale plants therefore decreased significantly. Capacity at small-scale and secondary (autoproducers) installations now corresponds to almost one-third of the capacity of thermal plants.

Wind and solar capacity has increased and came to 7,084 MW and 3,070 MW, respectively, in 2022, corresponding to 57.7% of total electricity production capacity.

### 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 2022, 72.4% of thermal electricity production (i.e. total production excluding wind, solar and hydro) was produced simultaneously with heat, a share more or less unchanged compared to 2021.

In 2022, 65.5% of district heating was produced with electricity. This share is also more or less unchanged compared to 2021.

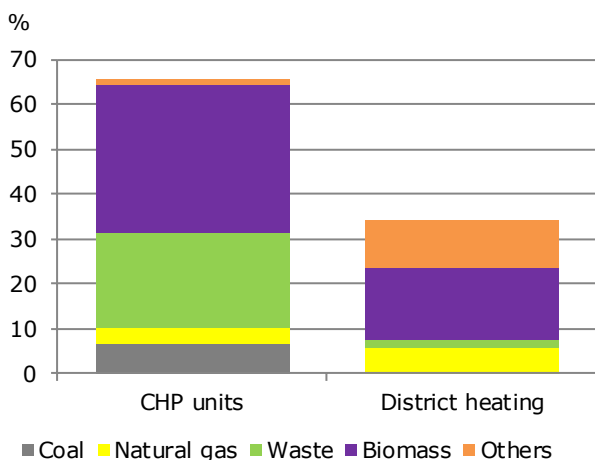
Heat production by type of production plant, 2022

	Number of units	Electricity capacity [MW]	Heat capacity [MJ/s]	Share of total heat supply [%]
<b>Total</b>	<b>2805</b>	<b>6948</b>	<b>25378</b>	<b>100</b>
Large-scale CHP units	23	4685	5760	33.1
Small-scale CHP units	506	1698	2196	13.0
District heating units	1926		15120	29.6
Autoproducers				
- CHP units	229	565	1488	19.3
- Heating units	121		815	5.0

Heat production by primary fuel, 2022

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 [%]
<b>Total</b>	<b>758</b>	<b>6948</b>	<b>9444</b>	<b>65,4</b>	<b>2047</b>	<b>15934</b>	<b>34.6</b>
Coal	4	1489	1801	5.9	1	10	0.0
Natural gas	369	1458	1742	2.9	509	4342	3.6
Oil	47	190	159	0.2	332	3593	1.7
Waste	31	393	1186	22.0	8	104	1.7
Biogas	152	124	160	1.1	23	37	0.1
Biomass	31	1847	3390	33.3	356	1844	16.2
Biooil	-	-	-	0.0	40	485	0.1
Surplus heat	-	-	-	0.0	63	409	3.8
Solar heating	-	-	-	0.0	139	1077	2.1
Heat pumps and electric boilers	-	-	-	0.0	219	1532	5.4
No production in 2022	124	1448	1005	0.0	357	2500	0.0

Heat supply by primary fuel, 2022



District heating supply takes place partly at CHP units and partly at units exclusively producing district heating. CHP units produced 65.4%, of which large-scale CHP units contributed 33.1%, small-scale CHP units contributed 13.0%, and CHP units at autoproducers contributed 19.3%.

Many CHP and district heating units use several types of fuel. A break-down by primary fuel in 2022 reveals that CHP units using biomass as primary fuel accounted for 33.3% of heat supply, while units using waste, coal and natural gas as primary fuel accounted for 22.0%, 5.9% and 2.9%, respectively, of total district heating supply.

For units that produce district heating alone, units primarily firing with biomass contributed 16.2%, while the group "Other" (which includes surplus heat, electric boilers and heat pumps) contributed a total of 13%. Natural gas units contributed only 3.6% of total district heating supply.



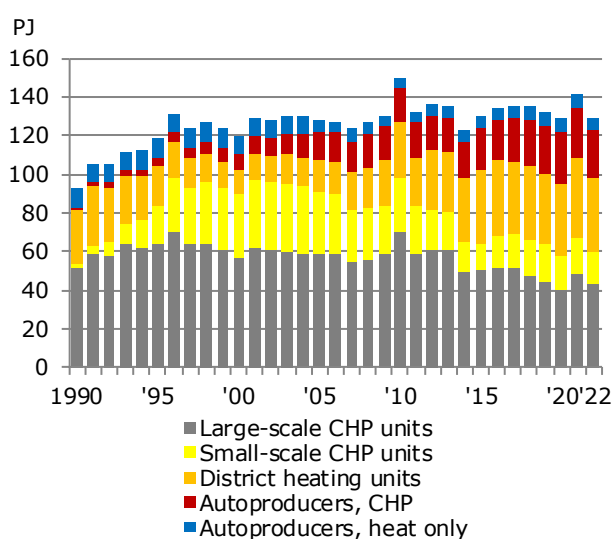
## ELECTRICITY AND DISTRICT HEATING

### District heating production by type of production plant

	1990	2000	2005	2010	2015	2020	2021	2022	Change '90 - '22
<b>Direct energy content [TJ]</b>									
<b>Total production (gross)</b>	<b>92 411</b>	<b>119 702</b>	<b>128 382</b>	<b>150 393</b>	<b>130 036</b>	<b>128 741</b>	<b>141 681</b>	<b>129 430</b>	<b>40.1%</b>
Large-scale CHP units	51 511	56 271	58 248	69 955	50 098	39 764	48 516	42 667	-17.2%
Small-scale CHP units	2 145	33 027	32 727	28 462	13 777	17 559	18 840	17 163	700%
District heating by type of producer	27 755	12 516	16 621	28 816	38 218	37 440	41 550	38 432	38.5%
<b>Autoproducers</b>									
- CHP units <sup>1)</sup>	694	8 375	14 884	17 625	21 589	26 811	25 593	24 887	3486%
- Heating units <sup>1)</sup>	10 306	9 513	5 901	5 537	6 354	7 168	7 181	6 281	-39.1%
<b>Consumption in production</b>	-	<b>-1 539</b>	<b>-1 303</b>	<b>-1 207</b>	<b>- 623</b>	<b>- 683</b>	<b>- 758</b>	<b>- 654</b>	•
Large-scale CHP units	-	- 866	- 384	- 331	-	-	-	-	•
Small-scale CHP units	-	- 637	- 656	- 643	- 321	- 481	- 529	- 412	•
District heating units	-	- 36	- 262	- 233	- 302	- 202	- 229	- 242	•
<b>Total production (net)</b>	<b>92 411</b>	<b>118 163</b>	<b>127 079</b>	<b>149 187</b>	<b>129 413</b>	<b>128 059</b>	<b>140 923</b>	<b>128 776</b>	<b>39.4%</b>
Net imports	122	144	153	174	151	107	111	102	-16.3%
<b>Domestic supply</b>	<b>92 533</b>	<b>118 307</b>	<b>127 232</b>	<b>149 360</b>	<b>129 564</b>	<b>128 166</b>	<b>141 034</b>	<b>128 878</b>	<b>39.3%</b>
Consumption in refineries	- 428	- 275	- 355	- 584	- 480	- 8	- 8	- 7	-98.3%
Distribution losses	-18 507	-23 661	-25 446	-29 872	-25 913	-25 633	-28 207	-25 776	39.3%
<b>Final consumption</b>	<b>73 599</b>	<b>94 370</b>	<b>101 430</b>	<b>118 904</b>	<b>103 171</b>	<b>102 525</b>	<b>112 819</b>	<b>103 095</b>	<b>40.1%</b>

<sup>1)</sup> Gross and net productions are by definition identical.

### District heating production by type of production plant



In 2022, total district heating production was 129.4 PJ, which constitutes a decrease of 8.6% compared with 2021. Compared with 2000, district heating production increased by 8.1%, compared with 1990 it increased by 40.1%.

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. However, this share has decreased since the 1990s, from more than 50% to just 33% in 2022.

Furthermore, district heating units contributed 29.7%, CHP autoproducers contributed 19.2%, small-scale CHP units contributed 13.3% and heating units at autoproducers (typically based on surplus heat) contributed 4.9% to total district heating production in 2022.

### District heating production by fuel

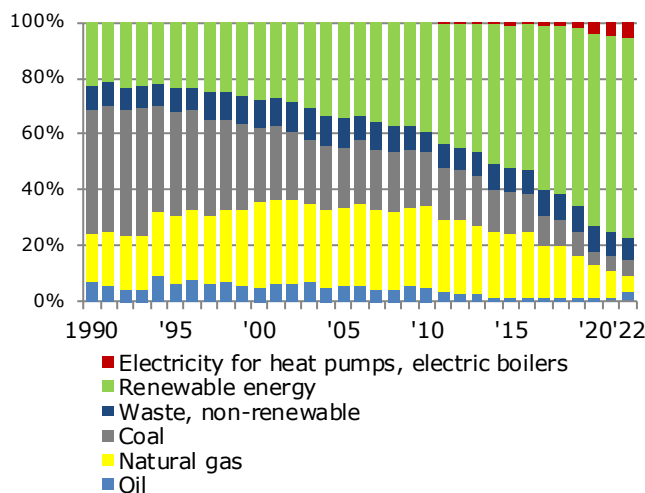
Direct energy content [TJ]	1994	2000	2005	2010	2015	2020	2021	2022	Change '94 - '22
Oil	6 335	4 433	6 103	4 627	1 281	908	1 502	2 755	-56.5%
- of which orimulsion	-	1 291	-	-	-	-	-	-	•
Natural gas	25 370	41 620	39 377	44 844	23 654	11 909	11 114	5 995	-76.4%
Coal	55 748	38 873	34 189	36 337	26 050	7 284	8 857	9 668	-82.7%
Surplus heat	2 838	3 676	3 174	2 518	3 130	5 399	5 740	5 179	82.5%
Electricity excl. heat pumps	-	-	-	110	1 036	2 980	3 987	4 034	•
Electricity, heat pumps	23	9	2	0	29	334	773	799	3320%
Waste, non-renewable	6 084	8 651	10 713	10 627	12 245	13 480	12 910	12 312	102%
<b>Renewable energy</b>	<b>16 704</b>	<b>22 440</b>	<b>34 823</b>	<b>51 331</b>	<b>62 610</b>	<b>86 448</b>	<b>96 797</b>	<b>88 688</b>	<b>431%</b>
Solar	6	24	53	139	956	2 680	2 367	2 697	46832%
Geothermal	21	29	86	106	70	23	27	41	94%
Biomass	16 304	21 462	33 509	49 912	59 329	78 625	87 765	79 592	388%
- Straw	4 318	5 696	7 681	11 507	11 359	11 633	12 371	12 381	187%
- Wood	4 327	5 153	12 086	23 731	32 495	50 447	59 460	52 085	1104%
- Biooil	223	39	650	1 685	508	69	155	79	-64.6%
- Waste, renewable	7 436	10 574	13 093	12 989	14 966	16 476	15 779	15 048	102%
Biogas	348	903	1 169	1 173	2 173	4 454	5 159	4 776	1273%
Heat pumps	25	22	6	0	82	666	1 479	1 582	6339%

### Fuel consumption for district heating production

Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	Change '90 - '22
Oil	4 766	3 726	4 322	4 554	1 039	713	1 398	2 736	-42.6%
- of which orimulsion	-	646	-	-	-	-	-	-	•
Natural gas	12 131	22 203	22 044	28 454	20 134	10 306	9 035	4 778	-60.6%
Coal	30 898	19 459	17 121	18 245	13 117	3 665	4 481	4 888	-84.2%
Electricity	-	75	76	149	1 121	3 310	4 766	4 879	•
Waste, non-renewable	6 289	7 675	8 138	7 122	7 649	8 136	7 947	6 899	9.7%
<b>Renewable energy</b>	<b>15 749</b>	<b>20 112</b>	<b>27 063</b>	<b>37 367</b>	<b>44 298</b>	<b>58 130</b>	<b>65 004</b>	<b>59 748</b>	<b>279%</b>
Solar	6	24	53	143	956	2 661	2 276	2 715	45158%
Geothermal	48	58	172	212	140	46	54	82	71%
Biomass	15 611	19 425	26 125	36 290	41 739	51 666	57 599	52 073	234%
- Straw	3 640	5 013	5 934	8 272	9 068	9 233	9 985	9 862	171%
- Wood	3 541	4 983	9 484	17 365	22 793	32 410	37 729	33 690	851%
- Biooil	744	49	761	1 949	529	79	171	89	-88.1%
- Waste, renewable	7 686	9 380	9 946	8 705	9 349	9 944	9 713	8 432	9.7%
Biogas	84	582	707	721	1 380	3 090	3 597	3 296	3824%
Heat pumps	-	22	6	0	82	666	1 479	1 582	•

1) All use of electricity excluding electricity for heat pumps, with ambient heat. 2) Electricity for heat pumps, with ambient heat.

### 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 2022 a total of 129.4 PJ district heating was produced. The lower table shows input and the amount of fuel used to produce district heating. For example, in 2022, a total of 83.9 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 CHP units produce heat with an efficiency of 200%. An example would be consumption of 4.9 PJ coal in 2022 (lower table) results in district heating production of 9.7 PJ (upper table).

There has been a significant change in the fuel used in production of district heating since 1990. Consumption of coal for production of district heating decreased from almost 50% to just 5.8% in 2022. The share of production based on renewables, however, increased, from around 20% to 71.2% in 2022.

## ENERGY SUPPLY AND CONSUMPTION 2022

### Energy supply and consumption 2022

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
<b>Energy supply</b>														
- Primary production	414 813	136 949	-	-	-	-	-	-	-	-	-	-	-	-
- Recycling	2	-	-	-	-	-	-	-	-	-	-	2	-	-
- Imports	731 323	191 678	663	-	2 387	5	15 087	-	28 855	76 528	105 169	-	6 309	9 087
- Exports	-425 060	-24 667	-2 631	-	-2 220	-	-48 104	-	-37	-64 140	-135 159	-	-	-168
- Border trade	-10 553	-	-	-	-	-	1 643	-	-	-12 195	-	-	-	-
- International marine bunkers	-22 272	-	-	-	-	-	-	-	-	-14 011	-8 161	-	-	-101
- Supply from blending	-421	-15	-1 393	-	-0	-	-873	7	-12	333	1 737	-	-	1
- Stock changes	-12 207	6 448	-169	-	-10	-	706	-	-2 305	8 506	-16 672	-	950	-84
<b>Statistical differences</b>	1 142	-288	-4	0	45	-	-502	-	-67	1 056	295	-	-0	-16
<b>Extraction and gasification</b>	-13 439	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Refineries</b>														
- Input and net production	1 123	-310 105	3 534	16 515	3 410	-	84 495	-	6 255	141 303	55 716	-	-	-
- Own use in production	-16 087	-	-	-14 878	-	-	-	-	-	-	-158	-	-	-
<b>Used in distribution</b>	-4 932	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Large-scale power units</b>														
- Fuel used and production	-296	-	-	-	-	-	-	-	-	-353	-62	-	-	-
- Own use in production	-7	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Large-scale CHP units</b>														
- Fuel used and production	-23 632	-	-	-	-0	-	-	-	-	-65	-1 189	-	-	-
- Own use in production	-3 242	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Renewable energy, selected</b>														
- Wind	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Small-scale CHP units</b>														
- Fuels used and production	-2 370	-	-	-	-	-	-	-	-	-65	-	-	-	-
- Own use in production	-865	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>District heating units</b>														
- Fuels used and production	1 834	-	-	-	-	-	-	-	-	-2 300	-25	-2	-	-
- Own use in production	-242	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Autoproducers</b>														
- Electricity units	-16	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHP units	-4 343	-	-	-1 637	-	-	-	-	-	-138	-190	-0	-	-
- Heat units	3 740	-	-	-	-	-	-	-	-	-2	-7	-0	-	-
<b>Gas works</b>	-92	-	-	-	-	-	-	-	-	-0	-	-	-	-
<b>Biogas upgrading plants</b>														
<b>Distribution losses etc.</b>	-32 559	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Final consumption</b>														
- Non-energy use	-8 720	-	-	-	-	-	-	-	-	-	-	-	-	-8 720
- Road	-152 748	-	-	-	-	-	-51 823	-	-	-89 283	-	-	-	-
- Rail	-4 218	-	-	-	-	-	-	-	-	-2 431	-	-	-	-
- Domestic sea transport	-5 089	-	-	-	-	-	-	-	-	-4 731	-355	-	-	-
- International aviation	-30 729	-	-	-	-	-	-	-	-30 729	-	-	-	-	-
- Domestic aviation	-1 027	-	-	-	-	-5	-	-	-1 022	-	-	-	-	-
- Military transport	-1 287	-	-	-	-	-	-	-	-936	-351	-	-	-	-
- Agriculture, forestry and horticulture	-24 918	-	-	-	-264	-	-73	-	-	-12 574	-10	-	-	-
- Fishing	-5 078	-	-	-	-7	-	-	-	-	-5 071	-	-	-	-
- Manufacturing	-90 561	-	-	-	-1 886	-	-	-3	-	-6 796	-857	-	-7 258	-
- Construction	-8 848	-	-	-	-163	-	-33	-	-	-6 697	-	-	-	-
- Wholesale	-10 322	-	-	-	-43	-	-	-0	-	-148	-0	-	-	-
- Retail trade	-9 206	-	-	-	-35	-	-	-0	-	-64	-0	-	-	-
- Private service	-36 428	-	-	-	-160	-	-	-1	-	-306	-29	-0	-	-
- Public service	-23 628	-	-	-	-168	-	-	-1	-	-636	-18	-	-	-
- Single-family houses	-120 615	-	-	-	-626	-	-523	-	-	-4 673	-	-	-	-
- Multi-family houses	-47 918	-	-	-	-261	-	-	-2	-	-698	-23	-	-	-

## ENERGY SUPPLY AND CONSUMPTION 2022

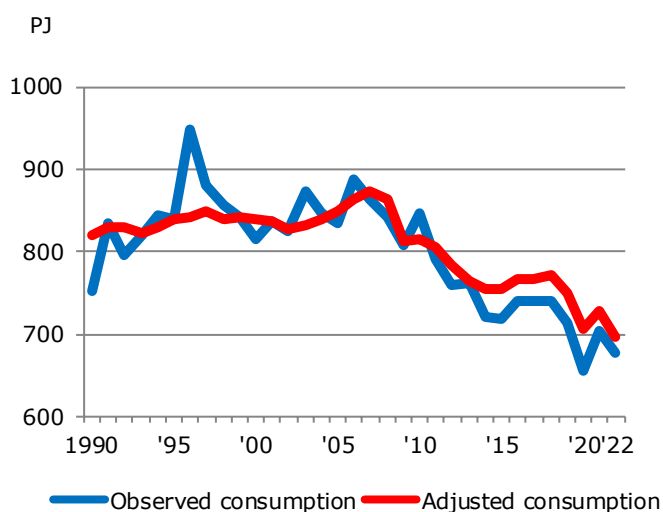
Natural Gas (incl. LNG)	Coal	Coke etc.	Solar energy	Wind power	Hydro power	Geo-thermal	Straw	Wood chips	Fire-wood	Wood pellets	Wood waste	Biogas	Bio-methane	Waste	Biooil, biodiesel etc.	Heat pumps	Electricity	District heating	Gas-works gas
52 104	-	-	11 256	68 480	54	82	21 186	21 051	12 660	2 520	7 654	28 848	-	34 281	89	17 601	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96 356	44 829	372	-	-	-	-	-	19 984	1 101	44 829	-	-	-	5 170	15 305	-	67 508	102	-
-79 510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-5 822	-	-62 602	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-206	-	-	-	-
-8 696	-2 314	-2	-	-	-	-	-	-	-	-	-	-	-	-	1 435	-	-	-	-
289	985	-21	-0	-	-	-	-	-73	-	-	0	-	374	-	-930	-	-	0	-0
-13 439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1 043	-7	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-4 932	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	118	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-7	-	-
-400	-39 690	-	-	-	-	-	-4 559	-20 775	-	-33 153	-422	-5	-195	-	-	-	34 155	42 667	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-3 242	-	-
-	-	-	-	-68 480	-	-	-	-	-	-	-	-	-	-	-	-	68 480	-	-
-	-	-	-	-	-54	-	-	-	-	-	-	-	-	-	-	-	54	-	-
-5 118	-	-	-	-	-	-	-4 746	-5 492	-	-257	-835	-3 030	-2 497	-5 044	-	-	7 550	17 163	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-453	-412	-
-3 360	-46	-	-2 715	-	-	-82	-6 968	-11 902	-	-1 406	-810	-60	-1 640	-415	-89	-	-4 778	38 432	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-242	-
-	-	-	-7 929	-	-	-	-	-	-	-	-	-22	-	-	-	-	7 935	-	-
-491	-	-	-	-	-	-	-7	-198	-	-3 349	-1 918	-240	-29 215	-	-	-	8 153	24 887	-
-65	-	-	-	-	-	-	-	-392	-	-338	-33	-26	-1 591	-	-	-	-87	6 281	-
-335	-	-	-	-	-	-	-	-	-	-	-	-124	-163	-	-	-	-	-	530
-	-	-	-	-	-	-	-	-	-	-	-	-22 611	22 611	-	-	-	-	-	-
-75	-	-	-	-	-	-	-	-	-	-	-	-	-37	-	-	-	-6 650	-25 776	-21
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-309	-	-	-	-	-	-	-	-	-	-	-	-	-151	-	-9 782	-	-1 401	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1 787	-	-
-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-436	-132	-	-	-	-	-	-1 962	-28	-	-	-216	-90	-213	-	-	-1 519	-5 985	-1 415	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-16 458	-3 632	-349	-	-	-	-	-	-1 945	-	-1 003	-1 647	-569	-8 037	-2 564	-	-3 075	-30 260	-4 036	-187
-173	-	-	-	-	-	-	-	-	-	-	-	-	-85	-	-	-	-1 698	-	-
-906	-	-	-	-	-	-	-	-	-	-	-	-	-442	-	-	-	-4 740	-4 042	-
-699	-	-	-	-	-	-	-	-	-	-	-	-	-341	-	-	-	-4 946	-3 121	-
-2 962	-	-	-	-	-	-	-	-0	-	-	-38	-385	-1 445	-622	-	-	-16 876	-13 594	-10
-2 263	-	-	-92	-	-	-	-	-149	-	-877	-	-	-1 104	-	-	-	-8 194	-10 112	-16
-10 973	-	-	-428	-	-	-	-2 944	-82	-13 761	-10 652	-	-	-5 355	-	-	-13 006	-24 841	-32 590	-161
-2 076	-	-	-92	-	-	-	-	-	-	-	-	-	-1 013	-	-	-	-9 433	-34 185	-135

## GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

### Gross energy consumption

	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>By fuel</b>	<b>819</b>	<b>839</b>	<b>850</b>	<b>814</b>	<b>755</b>	<b>705</b>	<b>729</b>	<b>696</b>	<b>-15.0%</b>
Oil	355	376	352	312	278	238	246	262	-26.2%
Natural gas	82	192	192	176	133	96	91	63	-23.1%
Coal and coke	327	175	166	147	111	69	63	52	-84.1%
Waste, non-renewable	8	14	17	16	18	20	18	18	140%
Renewable energy	48	81	123	163	216	283	311	301	531%
<b>By energy product</b>	<b>819</b>	<b>839</b>	<b>850</b>	<b>814</b>	<b>755</b>	<b>705</b>	<b>729</b>	<b>696</b>	<b>-15.0%</b>
Oil	338	329	333	300	273	234	241	255	-24.4%
Natural gas	59	98	100	94	87	68	67	51	-13.5%
Coal and coke	17	12	11	6	5	5	6	4	-76.1%
Waste, non-renewable	0	1	1	1	1	2	2	1	207%
Renewable energy	28	32	43	54	70	82	86	86	210%
Electricity	297	286	279	274	229	225	237	211	-29.1%
District heating	77	79	81	86	91	90	91	87	12.4%
Gas works gas	2	1	1	1	1	0	0	0	-81.8%
<b>By use</b>	<b>819</b>	<b>839</b>	<b>850</b>	<b>814</b>	<b>755</b>	<b>705</b>	<b>729</b>	<b>696</b>	<b>-15.0%</b>
Energy sector	28	44	52	46	42	29	30	29	5.0%
Non-energy use	13	13	12	11	11	9	9	9	-32.9%
Transport	172	203	218	212	209	180	188	198	15.4%
Agriculture and industry	226	226	213	187	160	165	173	163	-28.1%
Commercial and public services	132	125	127	130	114	106	114	106	-19.3%
Households	248	228	229	228	220	215	214	191	-22.9%
Oil	343	370	348	316	276	236	245	260	-24.2%
Natural gas	76	186	188	185	120	84	86	61	-20.4%
Coal and coke	255	166	155	164	76	34	45	44	-82.8%
Waste, non-renewable	7	14	17	17	18	19	18	18	155%
Renewable energy	45	79	122	168	208	259	294	290	539%
Foreign trade in electricity, net imports	25	2	5	-4	21	25	18	5	-80.7%
Foreign trade in district heating, net imports	0	0	0	0	0	0	0	0	

### Observed energy consumption and adjusted gross energy consumption



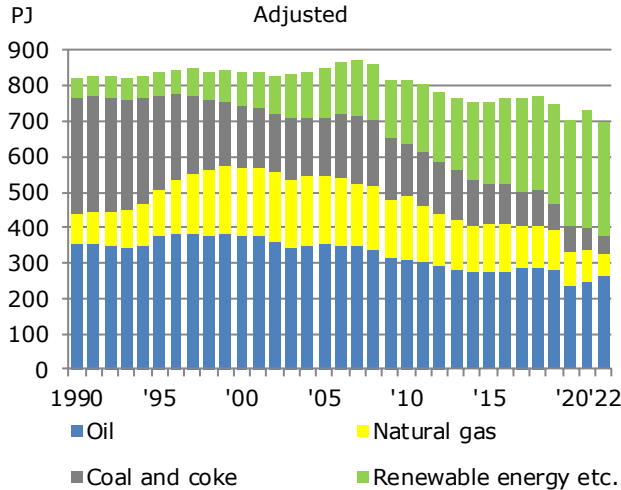
Observed energy consumption shows the registered amount of energy consumed in a calendar year. Gross energy consumption is derived by adjusting observed energy consumption for the fuel consumption linked to foreign trade in electricity. The adjusted gross energy consumption is moreover adjusted for climate variability 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 696 PJ in 2022, which is 4.4% below the level in 2021. Compared with 1990, consumption has fallen by 15.0%.

Observed energy consumption was 678 PJ in 2022, which is 3.8% below the level in 2021. Compared with 1990, observed energy consumption was 9.9% lower.

## GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

### Gross energy consumption by fuel

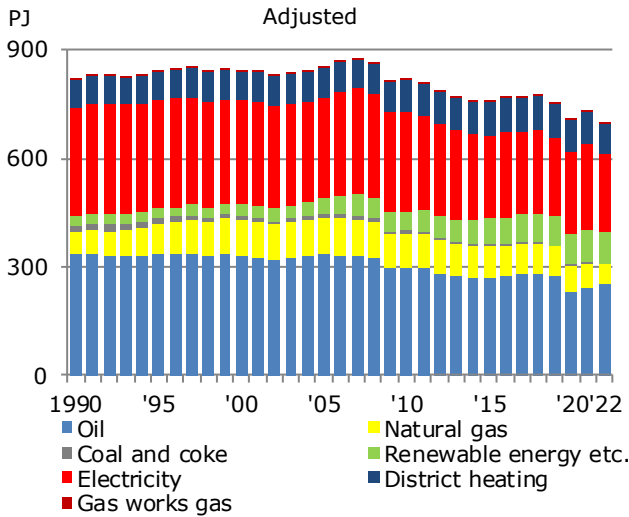


Adjusted gross energy consumption was 15.0% lower in 2022 than in 1990. However, consumption of individual fuels has followed rather varied trends.

Consumption of oil fell by 26.2% from 1990 to 2022. Consumption of coal, which primarily takes place at CHP units, has decreased by 84.1% since 1990. Consumption of natural gas increased up to 2005 but has been falling since then. From 2021 to 2022, consumption of natural gas fell from 91 PJ in to 63 PJ. Consumption of renewable energy and non-renewable waste increased by 477% in the period from 1990 to 2022.

In 2022, consumption of natural gas and coal decreased by 30.5% and 18.1%, respectively, compared with 2021, and consumption of oil increased by 6.6%. Consumption of renewable energy etc. fell by 2.8% relative to 2021.

### Gross energy consumption by energy product after transformation

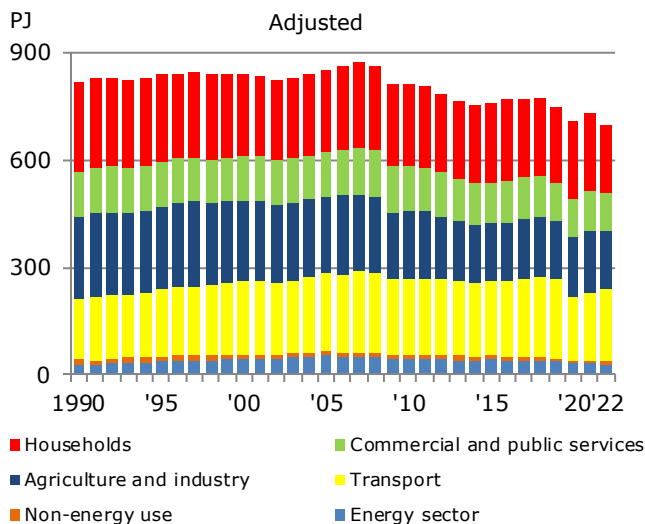


Gross energy consumption by energy product shows gross energy consumption after a number of fuels have been transformed to electricity, district heating, and gas works gas. In other words, the consumption of oil, natural gas, coal and renewable energy etc. is a statement of the volumes of these fuels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

Fuel consumption for electricity production was 211 PJ in 2022, which is 11.1% less than in 2021. Compared with 1990, fuel consumption fell by 29.1% due to more efficient electricity production and a growing share of wind power.

Fuel consumption for district heating was 87 PJ in 2022, which is 4.3% less than in 2021. Compared with 1990, fuel consumption increased by 12.4%. Also in this regard, production has become more efficient, as district heating production has increased by 40.1% 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 fell in all sectors in 2022, except for in the transport sector, in which consumption increased by 5.5%. At 10.4%, the household sector saw the largest fall. Consumption in the commercial and public services sector, in the agriculture and industry sector and in the energy sector (North Sea platforms and oil refineries) was 7.0%, 6.1% and 2.9% lower, respectively, in 2022 than the year before.

Compared with 1990, gross energy consumption for transport increased by 15.4%. In the agriculture and industry sector, gross energy consumption fell by 28.1%, while it fell by 19.3% and 22.9%, respectively, in the commercial and public services sector and for households. From 1990 to 2022, developments were affected by the fact that electricity and district heating can be generated with even smaller fuel consumption.

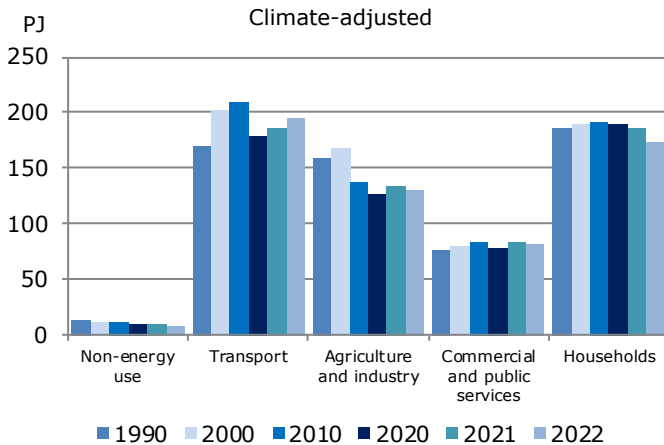
## GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

### Final energy consumption

									Change
Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	'90-'22
<b>Total final energy consumption Climate adjusted</b>	<b>604 097</b>	<b>650 815</b>	<b>665 869</b>	<b>633 250</b>	<b>614 982</b>	<b>582 324</b>	<b>598 858</b>	<b>588 948</b>	<b>-2.5%</b>
<b>By energy product</b>									
Oil	321 946	312 354	312 290	283 644	257 500	219 927	226 425	241 448	-25.0%
Natural gas	50 060	72 674	72 415	67 638	62 309	54 367	53 084	37 803	-24.5%
Coal and coke	17 243	12 389	10 826	5 559	4 972	4 736	5 510	4 119	-76.1%
Waste, non-renewable	470	763	1 239	922	908	1 718	1 539	1 444	207%
Renewable energy	27 833	32 228	43 216	53 578	69 897	82 023	85 523	86 261	210%
Electricity	103 212	117 590	120 731	114 700	111 323	109 362	115 436	110 422	7.0%
District heating	81 679	102 127	104 604	106 725	107 398	109 614	110 792	106 931	30.9%
Gas works gas	1 654	691	547	485	675	576	548	519	-68.6%
<b>By use</b>									
<b>Non-energy use</b>	<b>13 004</b>	<b>12 619</b>	<b>12 064</b>	<b>11 026</b>	<b>10 529</b>	<b>9 473</b>	<b>9 454</b>	<b>8 720</b>	<b>-32.9%</b>
<b>Total transport</b>	<b>170 216</b>	<b>201 209</b>	<b>215 789</b>	<b>209 731</b>	<b>207 836</b>	<b>177 901</b>	<b>185 105</b>	<b>195 098</b>	<b>14.6%</b>
Road transport	129 943	153 666	161 923	161 215	159 245	152 066	154 732	152 748	17.5%
Rail transport	4 765	4 339	4 488	4 728	4 785	4 180	4 124	4 218	-11.5%
Sea transport, domestic	6 344	6 857	8 026	6 533	4 211	4 989	5 845	5 089	-19.8%
Aviation	27 515	34 822	37 627	35 785	38 246	14 645	18 658	31 756	15.4%
Military transport	1 649	1 525	3 726	1 470	1 350	2 020	1 746	1 287	-21.9%
<b>Total agriculture and industry</b>	<b>158 790</b>	<b>167 113</b>	<b>158 242</b>	<b>137 014</b>	<b>122 085</b>	<b>127 358</b>	<b>133 505</b>	<b>130 087</b>	<b>-18.1%</b>
Agriculture, forestry and horticulture	33 087	32 428	29 322	29 146	27 542	25 481	24 761	25 214	-23.8%
Fishing	10 785	9 451	7 488	6 049	5 205	4 575	5 000	5 078	-52.9%
Manufacturing	108 624	117 583	113 280	94 679	82 783	89 725	94 991	90 920	-16.3%
Construction	6 295	7 651	8 152	7 140	6 554	7 577	8 753	8 875	41.0%
<b>Total commercial and public services</b>	<b>77 047</b>	<b>80 599</b>	<b>85 045</b>	<b>83 893</b>	<b>81 281</b>	<b>78 198</b>	<b>84 377</b>	<b>81 266</b>	<b>5.5%</b>
Wholesale	13 795	13 893	12 906	11 493	10 883	10 478	11 144	10 503	-23.9%
Retail trade	8 883	9 323	9 991	10 939	10 332	9 184	9 749	9 371	5.5%
Private service	28 812	32 901	36 238	36 653	35 507	35 047	38 072	37 173	29.0%
Public service	25 557	24 481	25 909	24 807	24 558	23 489	25 411	24 219	-5.2%
<b>Total households</b>	<b>185 039</b>	<b>189 275</b>	<b>194 729</b>	<b>191 585</b>	<b>193 252</b>	<b>189 394</b>	<b>186 418</b>	<b>173 778</b>	<b>-6.1%</b>
Single-family houses	137 383	139 568	144 258	140 888	142 015	137 802	134 896	124 384	-9.5%
Multi-family houses	47 656	49 706	50 471	50 696	51 237	51 592	51 522	49 395	3.6%
<b>Observed consumption Total final energy consumption</b>	<b>580 458</b>	<b>632 528</b>	<b>658 455</b>	<b>659 750</b>	<b>606 080</b>	<b>567 847</b>	<b>602 964</b>	<b>581 341</b>	<b>0.2%</b>



**Final energy consumption by use**

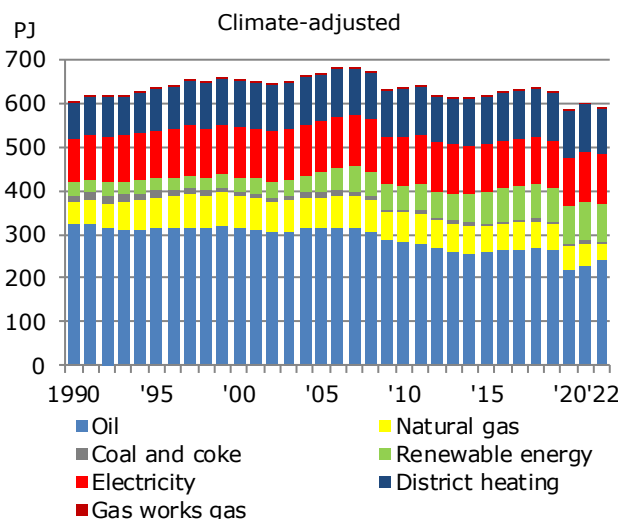


Final energy consumption includes consumption for transport and non-energy purposes (such as lubricants and asphalt), and energy consumption for production and heating by the agriculture and industry sector, the commercial and public services sector, and energy consumption by households.

Final energy consumption was 589 PJ in 2022, which is 1.7% lower than in 2021. Final consumption was 2.5% 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 has since risen by 9.7%. From 1990 to 2022, consumption for transport went up by 14.6%. Energy consumption in the agriculture and industry sector fell by 18.1% from 1990 to 2022, while consumption in the commercial and public services sector increased by 5.5%. Energy consumption by households fell by 6.1% from 1990 to 2022.

**Final energy consumption by energy product**

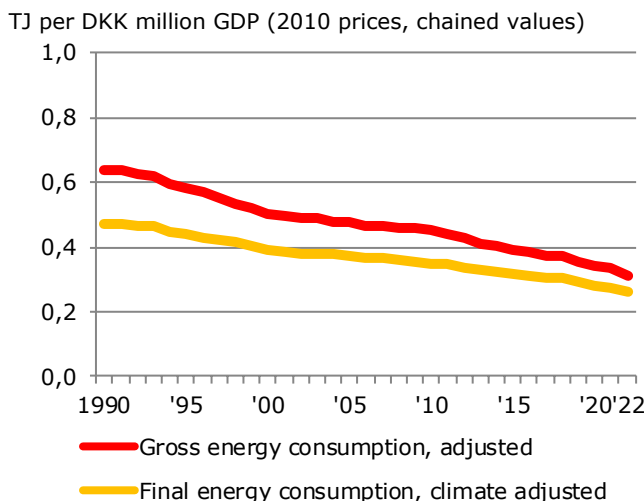


Consumption of oil increased by 6.6% and consumption of natural gas (for other uses than electricity and district heating production) fell by 28.8% from 2021 to 2022. Consumption of electricity and district heating fell by 4.3% and 3.5%, respectively, in 2022.

From 1990 to 2021, final consumption of natural gas went up by 6.0%. From 2021 to 2022, natural gas consumption fell by 28.8%. Consumption of electricity and district heating has increased by 7.0% and 30.9%, respectively, since 1990. In the same period, consumption of oil and coal fell by 25.0% and 76.1%, respectively.

In 2022, final consumption of renewable energy etc. was 0.7% higher than in 2021. Consumption of renewable energy etc. has increased by 209.9% since 1990.

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



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

In 2022, gross energy consumption was 0.308 TJ per DKK million GDP (calculated in 2010 prices, chained values), as opposed to 0.636 TJ in 1990, corresponding to a 51.6%-reduction in fuel intensity during this period. In 2022, intensity fell by 7.9% relative to the year before.

Comparing developments in GDP with developments in final energy consumption shows a fall in energy intensity of 44.5% from 1990 to 2022. The reduction is smaller here because efficiency improvements in the transformation sector have not been included. Intensity decreased by 5.3% in 2022 relative to 2021.

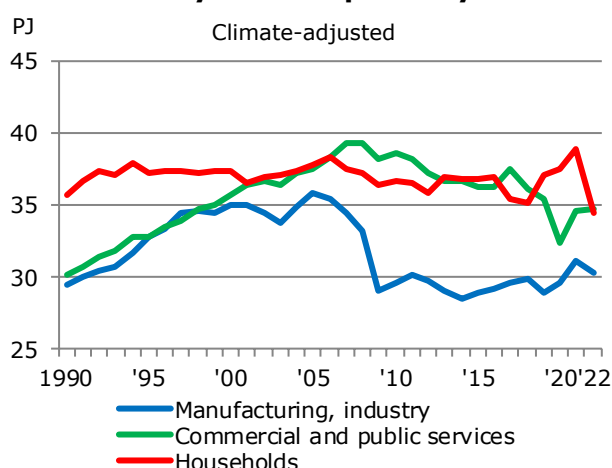
## GROSS ENERGY CONSUMPTION AND FINAL ENERGY CONSUMPTION

### Final electricity consumption

Change

Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	'90-'22
<b>Total final electricity consumption</b>	<b>103 212</b>	<b>117 590</b>	<b>120 731</b>	<b>114 700</b>	<b>111 323</b>	<b>109 362</b>	<b>115 436</b>	<b>110 422</b>	<b>7.0%</b>
<b>Climate adjusted</b>									
<b>Rail transport</b>	<b>736</b>	<b>1 253</b>	<b>1 351</b>	<b>1 455</b>	<b>1 429</b>	<b>1 889</b>	<b>2 452</b>	<b>3 188</b>	<b>333%</b>
<b>Agriculture and industry</b>	<b>36 633</b>	<b>43 283</b>	<b>44 092</b>	<b>37 851</b>	<b>36 735</b>	<b>37 543</b>	<b>39 453</b>	<b>37 976</b>	<b>3.7%</b>
Agriculture, forestry and horticulture	6 143	7 047	6 874	6 841	6 441	6 534	6 632	6 001	-2.3%
Manufacturing	29 436	35 022	35 943	29 638	28 994	29 584	31 121	30 277	2.9%
Construction	1 054	1 214	1 274	1 372	1 300	1 425	1 700	1 698	61.0%
<b>Commercial and public services</b>	<b>30 147</b>	<b>35 715</b>	<b>37 479</b>	<b>38 656</b>	<b>36 303</b>	<b>32 424</b>	<b>34 621</b>	<b>34 800</b>	<b>15.4%</b>
Wholesale	5 451	5 936	5 973	5 740	5 269	4 829	4 923	4 744	-13.0%
Retail trade	5 202	5 742	6 260	6 543	6 075	4 833	4 999	4 950	-4.8%
Private services	11 715	14 903	15 866	17 108	16 379	15 494	16 672	16 900	44.3%
Public services	7 778	9 134	9 380	9 266	8 580	7 268	8 027	8 206	5.5%
<b>Households</b>	<b>35 696</b>	<b>37 339</b>	<b>37 810</b>	<b>36 738</b>	<b>36 855</b>	<b>37 507</b>	<b>38 910</b>	<b>34 459</b>	<b>-3.5%</b>
Single-family houses	27 011	28 210	28 279	27 335	27 772	27 934	29 075	25 006	-7.4%
Multi-family houses	8 686	9 129	9 530	9 403	9 084	9 573	9 835	9 453	8.8%
<b>Observed electricity consumption</b>	<b>102 139</b>	<b>116 849</b>	<b>120 467</b>	<b>115 623</b>	<b>111 019</b>	<b>108 863</b>	<b>115 583</b>	<b>110 161</b>	<b>7.9%</b>

### Final electricity consumption by use

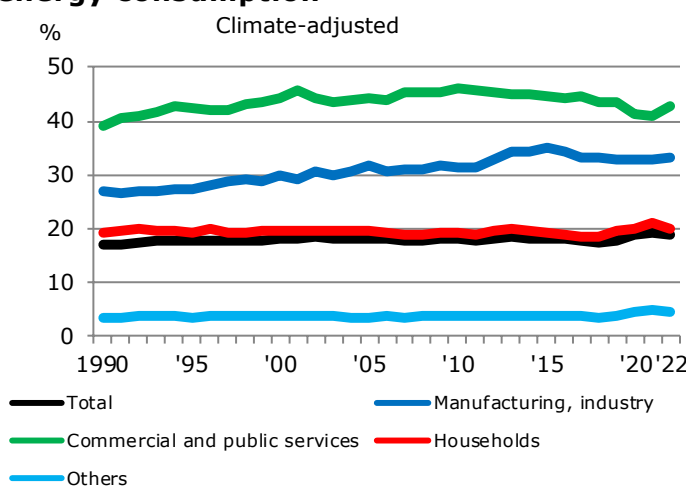


Electricity consumption by manufacturing industries was 2.7% lower in 2022 than in 2021. Compared with 1990, electricity consumption has increased by 2.9%.

The commercial and public services sector has seen increasing electricity consumption until 2008, after the trend changed. From 2021 to 2022, electricity consumption in the commercial and public services sector increased by 0.5%. From 1990 to 2022, electricity consumption increased by 15.4%.

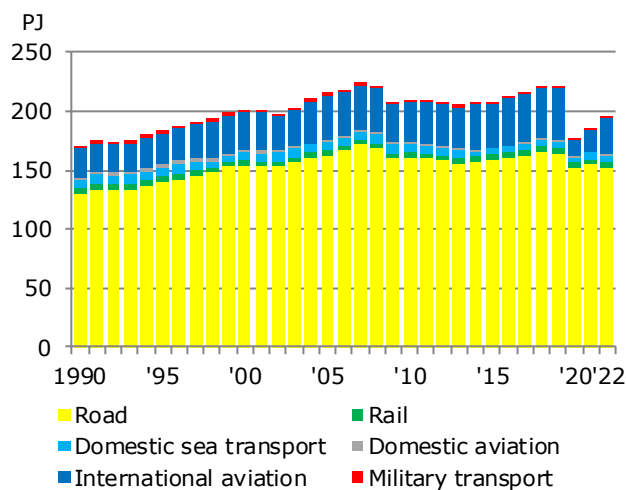
The electricity consumption of households fluctuated in the period 1990 to 2021 between 35.7 PJ and 38.9 PJ. Electricity consumption fell by 11.4% to 34.5 PJ in 2022. Compared with 1990, consumption fell by 3.5%.

### Electricity consumption's share of total energy consumption



During the period from 1990 to 2022 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 2022 it was 18.7%. In the commercial and public services sector, electricity consumption's share of total energy consumption grew steadily from 1990 when the share was 39.1% and up to 2001 when it was 45.7%. From 2002 to 2019, the share fluctuated between 43.4% and 46.1%. In 2022, electricity consumption accounted for 42.8% of the sector's total energy consumption. The manufacturing industries sector has seen a steady increase across the period 1990-2015. After this, the share of electricity fell. In 2022, the share was 33.3% against 27.1% in 1990. Electricity consumption's share for households remains more or less unchanged with 19.3% in 1990 and 19.8% in 2022.

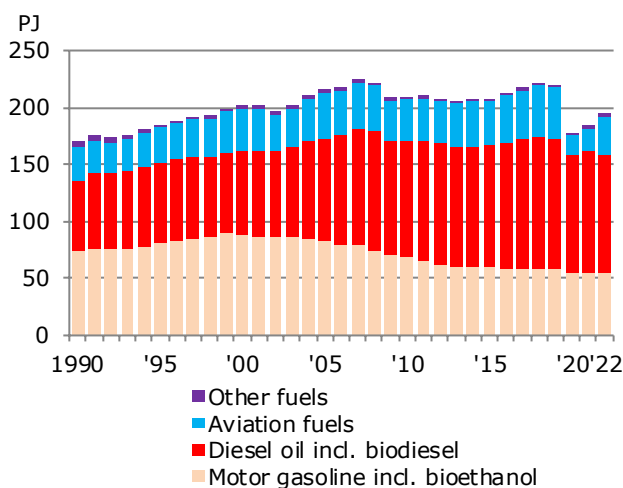
### Energy consumption for transport by type



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 brought on by the Covid-19 pandemic, energy consumption for transport totalled 195.1 PJ in 2022, which is an increase of 5.4% since 2021. Compared with 1990, energy consumption for transport increased by 14.6% in 2022. Energy consumption for road transport was 152.7 PJ in 2022, which is 1.3% lower than in 2021. Energy consumption for international aviation grew steadily throughout almost the whole period 1990-2019. In 2020, consumption fell substantially. From 2021 to 2022, it rose by 71.7%, but it is still 29.8% lower than in 2019.

\*Estimates of border trade in motor gasoline and diesel are from the Danish Ministry of Taxation and are based on 2016 data.

### Energy consumption for transport by fuel type

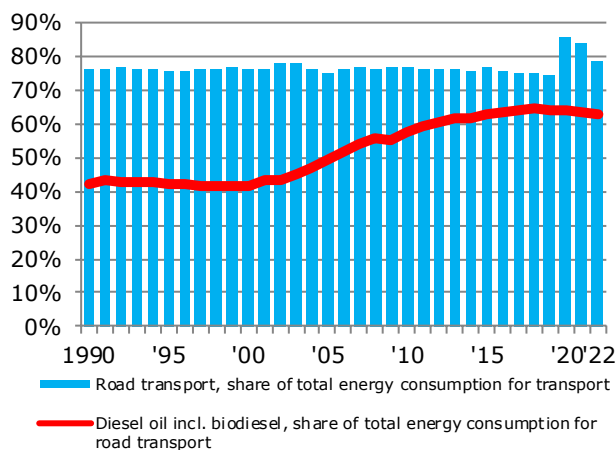


Consumption of motor gasoline (including bioethanol) fell by 0.7% from 2021 to 2022, while consumption of diesel oil (including biodiesel) fell by 2.6%. Consumption of bioethanol and biodiesel together fell by 8.9% from 2021 to 2022.

Considering developments from 1990 to 2022, consumption of motor gasoline (including bioethanol) fell by 25.8%, while consumption of diesel oil (including biodiesel) grew by 67.4%. Consumption of aviation fuels increased by 12.8%.

Consumption of other types of fuel fell by 23.3% in the same period. Other types of fuel include electricity consumption by railways.

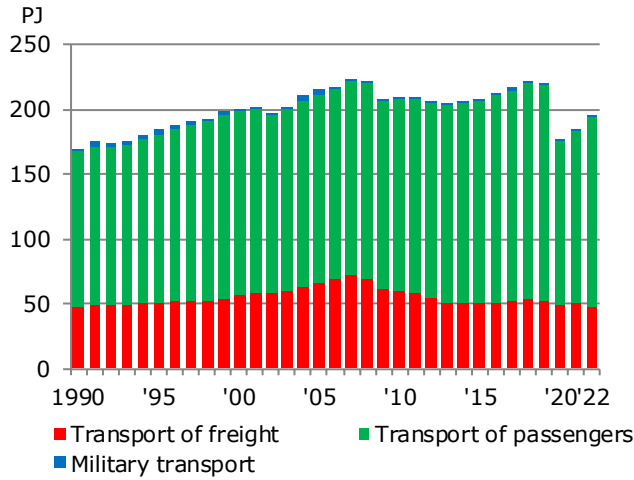
### Energy consumption for road transport



Energy consumption for road transport is by far the largest contributor to total energy consumption for transport. Road transport's share 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 share was 78.3% in 2022.

Consumption of diesel oil has increased significantly and diesel oil has been the most common fuel for road transport since 2006. In 2022, diesel oil (including biodiesel) accounted for 62.7% of total energy consumption for transport, as opposed to 42.1% in 1990.

**Final energy consumption by passenger and freight transport**



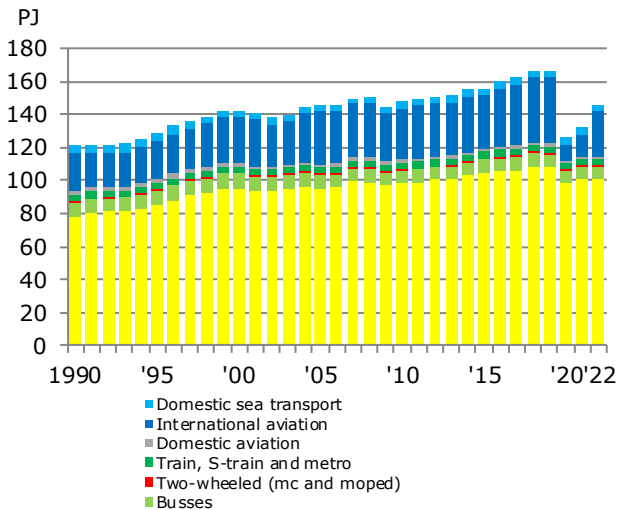
In the distribution of energy consumption for transport of passengers and freight, vans less than 2 tonnes have been included under passenger transport, whereas vans of 2-6 tonnes have been included under freight transport.

Out of the total of 195.1 PJ energy consumption for transport in 2022, passenger transport accounted for 146 PJ, corresponding to 74.8%. Energy consumption for freight transport was 47.8 PJ, corresponding to 24.5%, while energy consumption for transport by Danish military was 1.3 PJ.

Energy consumption for passenger transport increased by 10% from 2021 to 2022, while energy consumption for freight transport fell by 5.5%. Considering the trend from 1990 to 2022, energy consumption for passenger transport increased by 20.3%, while energy consumption for freight transport increased by 1.2%.

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

**Energy consumption for passenger transport by means of transport**

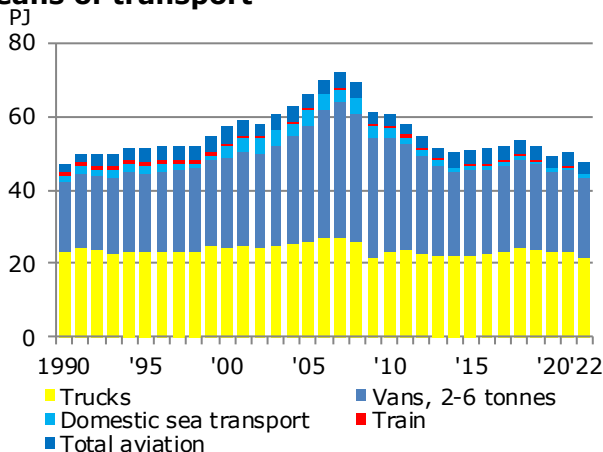


Energy consumption for passenger transport is mainly used for transport by car and for international aviation. In 2022, energy consumption for these categories made up 69.0% and 18.8%, respectively, of total energy consumption for passenger transport.

Following a large drop in 2020, from 2021 to 2022, energy consumption for cars and vans (less than 2 tonnes) fell only slightly by 0.4%, while energy consumption for international aviation increased by 97.4%. From 1990 to 2022, energy consumption for cars and vans increased by 28.0%, and energy consumption for international aviation by 21.7%.

\*LNG is included with the same distribution as gas/diesel in sea transport.

**Energy consumption for freight transport by means of transport**



Energy consumption for freight transport is mostly by trucks and vans (2-6 tonnes). In 2022, energy consumption by these types of vehicle made up 45.5% and 45.1%, respectively, of total energy consumption for freight transport.

Energy consumption for trucks fell by 6.9% from 2021 to 2022, while energy consumption for vans fell by 1.9%. From 1990 to 2022, energy consumption for trucks fell by 6.3%, while energy consumption for vans increased by 12.9%.

\*LNG is included with the same distribution as gas/diesel in sea transport.

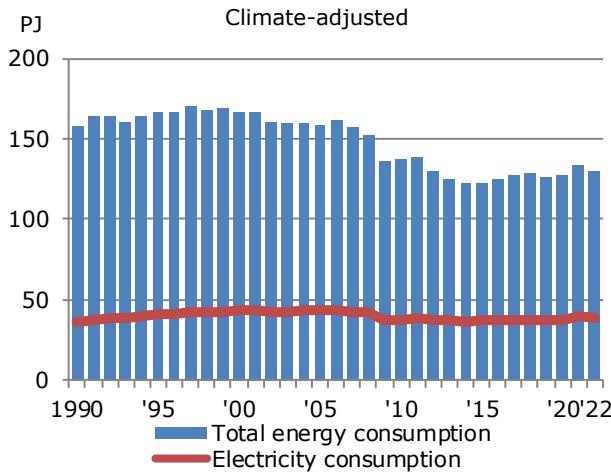
## Final energy consumption for transport

Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>Total transport</b>	<b>170 216</b>	<b>201 209</b>	<b>215 789</b>	<b>209 731</b>	<b>207 836</b>	<b>177 901</b>	<b>185 105</b>	<b>195 098</b>	<b>14.6%</b>
<b>Observed consumption</b>									
LPG	464	425	323	3	-	-	-	-	-100%
Aviation gasoline	155	119	107	76	57	44	26	5	-96.5%
Motor gasoline	74 327	88 976	82 126	67 726	57 443	50 861	52 143	51 823	-30.3%
Petroleum	462	39	14	0	-	-	-	-	-100%
JP1	28 828	35 810	39 959	36 577	38 927	16 132	19 729	32 687	13.4%
Gas/diesel oil	61 685	73 077	90 529	101 893	100 825	97 607	98 707	96 796	56.9%
Fuel oil	3 560	1 509	1 379	868	39	430	839	355	-90.0%
Natural gas					76	278	298	309	•
LNG	-	-	-	-	71	77	84	2	•
Bio methane					1	53	83	151	•
Bioethanol	-	-	-	1 118	1 840	3 339	3 427	3 346	•
Biodiesel	-	-	-	16	7 129	7 190	7 318	6 436	•
Electricity	736	1 253	1 351	1 455	1 429	1 889	2 452	3 188	333%
Road	129 943	153 666	161 923	161 215	159 245	152 066	154 732	152 748	17.5%
Rail	4 765	4 339	4 488	4 728	4 785	4 180	4 124	4 218	-11.5%
Domestic sea transport	6 344	6 857	8 026	6 533	4 211	4 989	5 845	5 089	-19.8%
Domestic aviation	2 856	1 981	1 449	2 000	1 415	714	765	1 027	-64.0%
International aviation	24 659	32 842	36 178	33 785	36 831	13 931	17 893	30 729	24.6%
Military transport	1 649	1 525	3 726	1 470	1 350	2 020	1 746	1 287	-21.9%
Passenger transport	121 342	142 227	145 898	147 700	155 785	126 413	132 754	146 006	20.3%
Freight transport	47 225	57 458	66 166	60 562	50 702	49 467	50 596	47 805	1.2%
Military transport	1 649	1 525	3 726	1 470	1 350	2 020	1 746	1 287	-21.9%

## Final energy consumption in agriculture and industry

Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>Total for agriculture and industry</b>	<b>158 790</b>	<b>167 113</b>	<b>158 242</b>	<b>137 014</b>	<b>122 085</b>	<b>127 358</b>	<b>133 505</b>	<b>130 087</b>	<b>-18.1%</b>
<b>Climate adjusted</b>									
<b>By energy product</b>									
Oil	65 613	58 460	53 743	44 071	35 757	35 532	37 333	41 911	-36.1%
Natural gas	25 281	35 606	32 433	30 901	29 134	24 884	24 824	17 189	-32.0%
Coal and coke	16 315	12 339	10 817	5 531	4 972	4 736	5 510	4 119	-74.8%
Waste, non-renewable	13	72	591	759	771	1 465	1 309	1 154	9046%
Renewable energy	9 377	8 098	7 759	11 509	10 392	17 556	19 627	21 965	134%
Electricity	36 633	43 283	44 092	37 851	36 735	37 543	39 453	37 976	3.7%
District heating	5 409	9 210	8 788	6 353	4 115	5 446	5 259	5 585	3.2%
Gas works gas	149	45	19	41	208	196	190	188	26.0%
<b>By use</b>									
Agriculture, forestry and horticulture	33 087	32 428	29 322	29 146	27 542	25 481	24 761	25 214	-23.8%
Fishing	10 785	9 451	7 488	6 049	5 205	4 575	5 000	5 078	-52.9%
Manufacturing industries	108 624	117 583	113 280	94 679	82 783	89 725	94 991	90 920	-16.3%
Construction	6 295	7 651	8 152	7 140	6 554	7 577	8 753	8 875	41.0%

**Energy and electricity consumption in agriculture and industry**

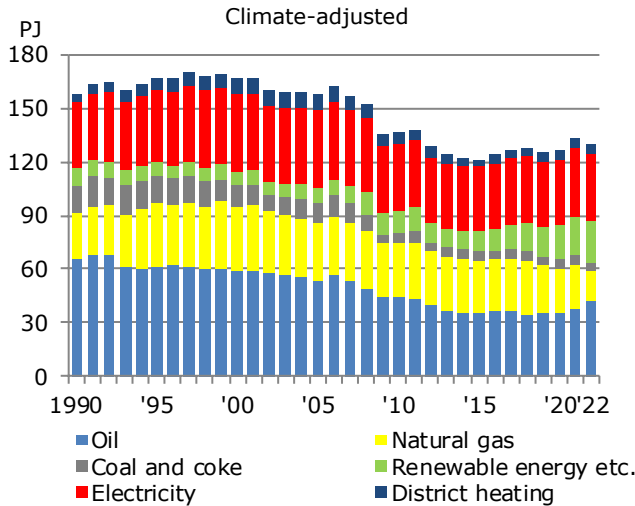


Agriculture and industry covers agriculture, forestry and horticulture, fishing, manufacturing industries (excl. refineries), as well as construction.

In 2022, climate-adjusted energy consumption in agriculture and industry was 130.1 PJ, which is 2.6% lower than the year before. Compared with 1990, energy consumption decreased by 18.1%.

Electricity consumption was 38.0 PJ in 2022 after adjusting for climate variability. This is a fall of 3.7% compared with the year before. Compared with 1990, electricity consumption increased by 3.7%.

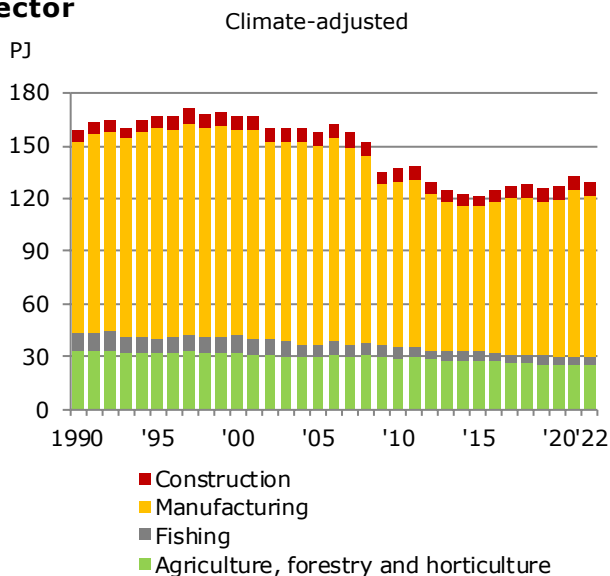
**Energy consumption in agriculture and industry by energy products**



In 2022, consumption of oil and renewable energy etc. by agriculture and industry increased by 12.3% and 10.4%, respectively, relative to 2021, while consumption of natural gas fell by 30.8% and consumption of coal and coke fell by 25.2%. Consumption of electricity fell by 3.7%, while consumption of district heating was 6.2% higher in 2022 than in the year before.

Consumption of coal, oil and natural gas in the period 1990-2022 decreased by 74.8%, 36.1% and 32.0%, respectively. Consumption of renewable energy etc. increased by 146.2%. Since 1990, consumption of electricity has increased by 3.7% and consumption of district heating by 3.2%.

**Energy consumption by individual industry in the agriculture and industry sector**

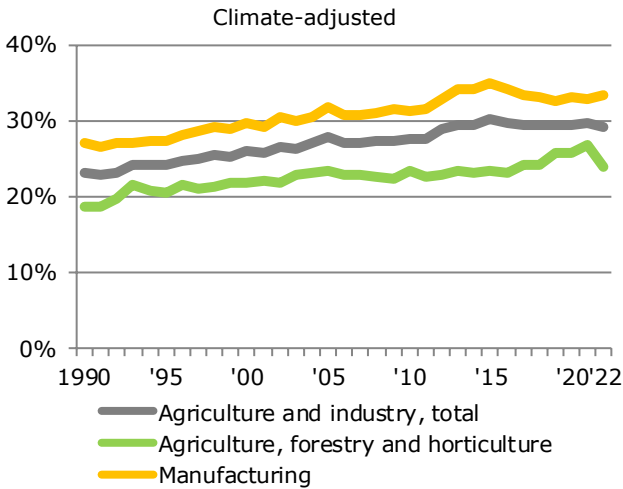


Compared with 2021, energy consumption in manufacturing industries fell by 4.3%. Energy consumption by agriculture, forestry and horticulture, fishing, and construction increased by 1.8%, 1.6% and 1.4%, respectively, in 2022.

From 1990 to 2022, energy consumption by manufacturing industries, agriculture, forestry and horticulture, and fishing fell by 16.3%, 23.8% and 52.9%, respectively. Energy consumption in construction increased by 41.0% during the same period.

In 2022, agriculture, forestry and horticulture's share of total energy consumption by the agriculture and industry sector was 19.4%, while manufacturing industries' share was 69.9%. In 2022, fishing and construction accounted for 3.9% and 6.8%, respectively, of energy consumption in the agriculture and industry sector.

**Electricity consumption's share of total energy consumption**

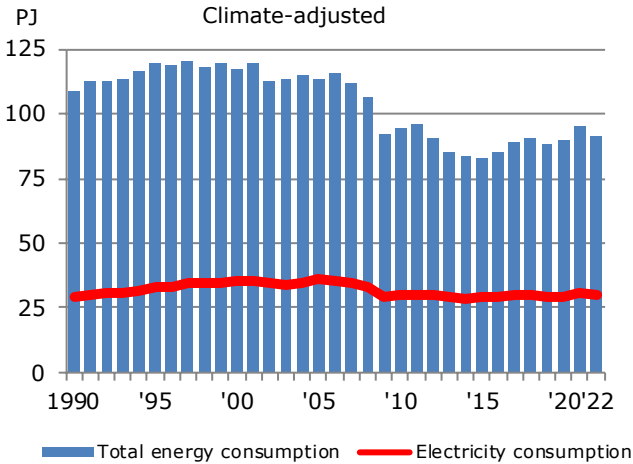


Electricity consumption's share of total energy consumption in the agriculture and industry sector increased from 23.1% in 1990 to 29.2% in 2022.

Electricity's share of energy consumption in manufacturing industries increased from 27.1% in 1990 to 33.3% in 2022.

In agriculture, forestry and horticulture the share of electricity was 18.6% in 1990. In 2022, this share made up 23.8% of total energy consumption in the agriculture and industry sector.

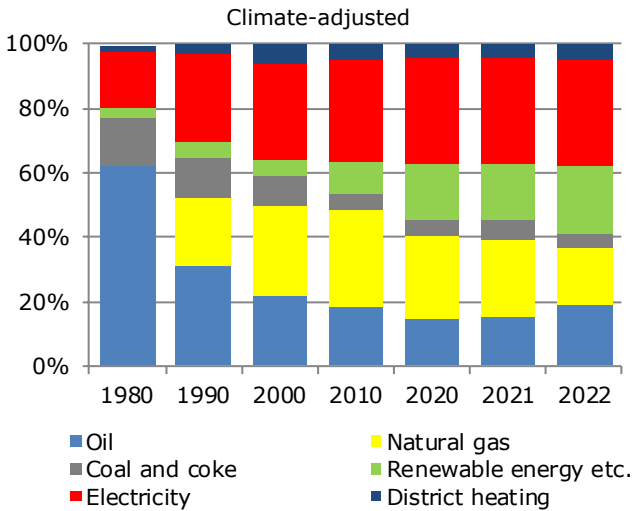
**Energy and electricity consumption in manufacturing industries**



Climate-adjusted energy consumption in manufacturing industries fell from 95.0 PJ in 2021 to 90.9 PJ in 2022, corresponding to a fall of 4.3%. Compared with 1990, energy consumption decreased by 16.3%.

In 2022, electricity consumption was 30.3 PJ, which is 2.7% lower than the year before. Electricity consumption has risen by 2.9% since 1990.

**Composition of energy consumption in manufacturing industries**



The composition of energy consumption in manufacturing industries has changed significantly since 1980, when oil consumption was dominant by 62.2% of the total energy consumption. In 1990, oil consumption accounted for almost one-third of total energy consumption. In 2021, the share was 14.9% and in 2022 it increased to 18.6%.

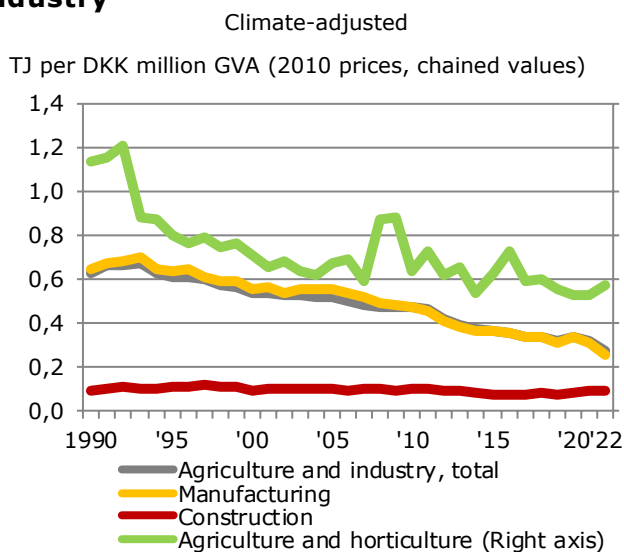
The natural gas share was 18.2% in 2022, as opposed to 24.6% in 2021 and 20.8% in 1990.

Coal's share fell from 12.3% in 1990 to 4.4% in 2022. The contribution from renewable energy etc. and district heating increased from 1990 to 2022, with shares of 20.8% and 4.5%, respectively, in 2022.

Electricity consumption's share increased from 27.1% in 1990 to 33.3% in 2022.



**Energy intensities in agriculture and industry**



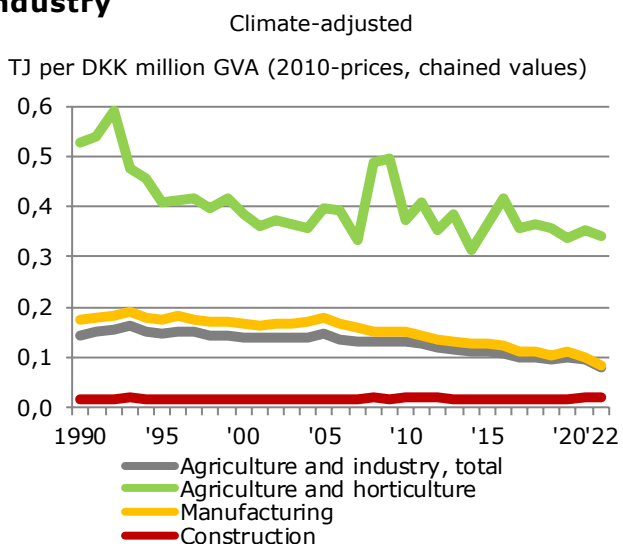
Energy intensity has been calculated as climate-adjusted energy consumption in relation to the gross value added (GVA), measured at 2010 prices, chained values.

Energy intensity in agriculture and industry dropped by 56.9% from 1990 to 2022. The annual average fall in energy intensity from 1990 to 2022 was 1.8% per year.

In manufacturing industries, energy intensity fell by 60.8% from 1990 to 2022. In 2022, energy intensity fell by 18.2% relative to 2021 as a result of an increase in GVA in manufacturing industries combined with a fall in energy consumption.

In agriculture, forestry and horticulture, energy intensity increased by 7.9% in 2022. Energy intensity has fallen by 49.7% since 1990. Since 2005, the trend has been influenced by significant fluctuations in agricultural, forestry and horticultural GVA.

**Electricity intensities in agriculture and industry**

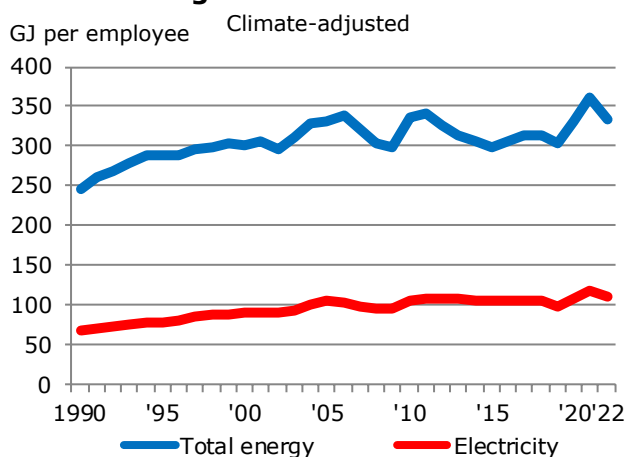


Electricity intensity has been calculated as climate-adjusted electricity consumption in relation to GVA, measured at 2010 prices, chained values.

In the period 1990 to 2022, electricity intensity in agriculture and industry fell by 45.5%. In 2022, electricity intensity was 0.081, i.e. 0.081 TJ of electricity (corresponding to 22,500 kWh) where used for every DKK 1 million GVA in the agriculture and industry sector. In 2022, electricity intensity fell by 13.7% compared with 2021.

In manufacturing industries, agriculture, forestry and horticulture, and construction electricity intensity fell by 16.9%, 4.1% and 0.8%, respectively, in 2022 compared with 2021.

**Energy consumption per employee in manufacturing industries**

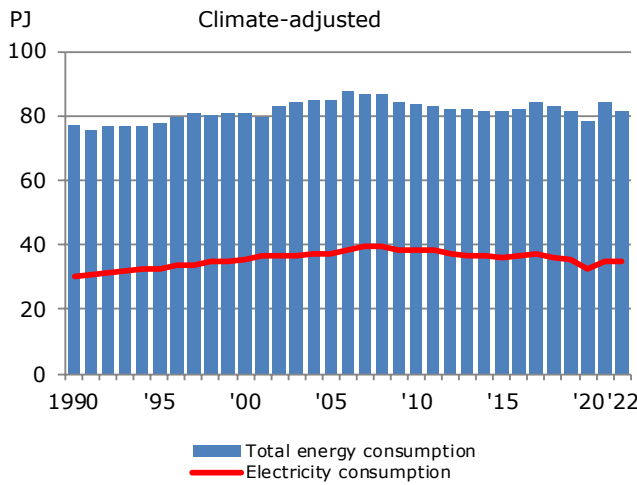


Energy and electricity consumption per employee in manufacturing industries have developed differently than the intensities shown above. This is due to a considerable increase in productivity, i.e. measured as GVA per employee in this sector.

Energy consumption per employee was 333 GJ in 2022, as opposed to 362 GJ the year before. This corresponds to a decrease of 8.2%. Compared with 1990, energy consumption per employee grew by 34.9%.

Electricity consumption per employee was 111 GJ in 2022, which is 6.7% lower than the year before. Compared with 1990, electricity consumption per employee increased by 65.7%.

### Energy and electricity consumption in the commercial and public services

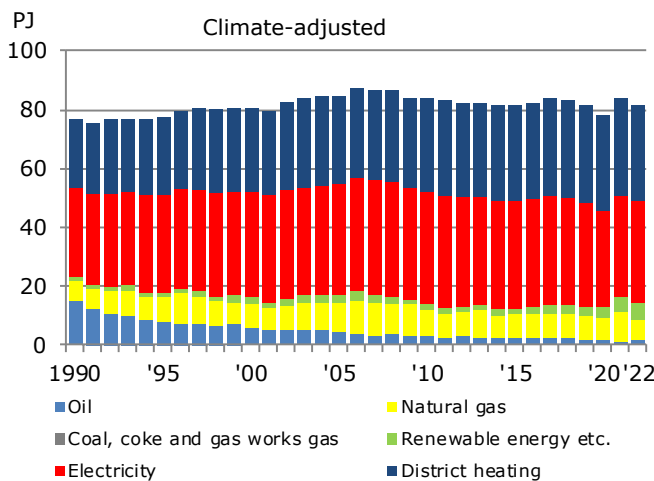


The commercial and public services sector includes wholesale, retail, private and public services.

Climate-adjusted energy consumption was 81.3 PJ in 2022, which is 3.7% lower than the year before. Compared with 1990, consumption increased by 5.5%.

In 2022, climate-adjusted electricity consumption was 34.8 PJ, which is 0.5% higher than the year before. Compared with 1990, electricity consumption increased by 15.4%.

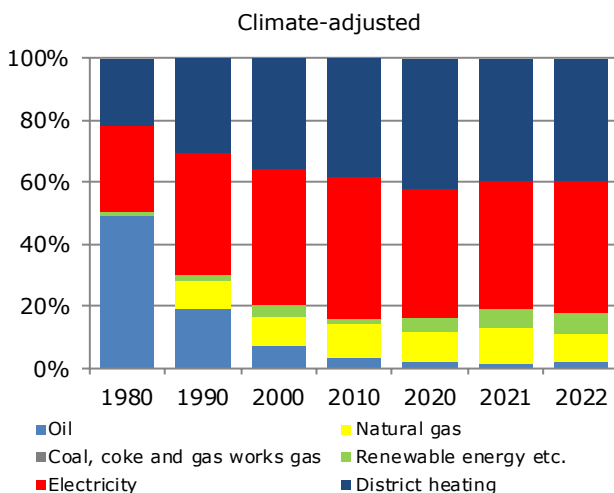
### Energy consumption by energy product



Electricity and district heating are predominant energy sources in the commercial and public services sector. In 2022, electricity consumption increased by 0.5%, relative to the previous year, while district heating consumption fell by 4.0%.

Compared with 1990, oil consumption fell by 88.9%, while natural gas consumption increased by 2.4%. In 2022, consumption of electricity and consumption of district heating was 15.4% and 36.6% higher, respectively, than in 1990.

### Composition of energy consumption in the commercial and public services

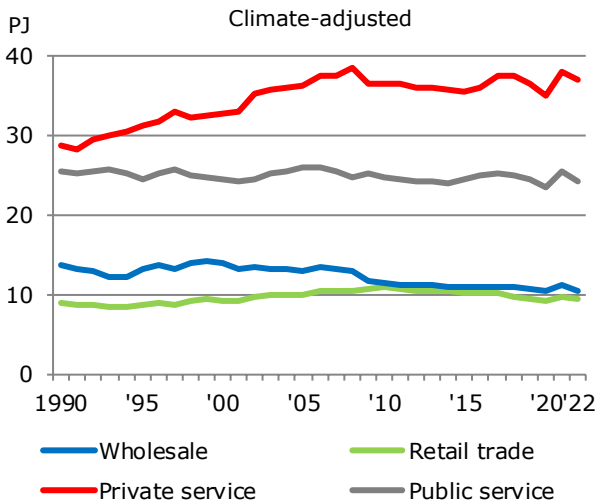


The composition of energy consumption in the commercial and public services sector has changed significantly since 1980, when oil consumption was dominant. In 1990, electricity and district heating together accounted for 69.5% of total energy consumption in the commercial and public services sector (electricity 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 2022, electricity and district heating consumption together accounted for 82.2% of total energy consumption (electricity 42.8% and district heating 39.4%). The share of oil was 2.0%, while the share of natural gas was 8.7%. The share of renewable energy etc. was 7.0%.

## COMMERCIAL AND PUBLIC SERVICES

### Energy consumption by sector



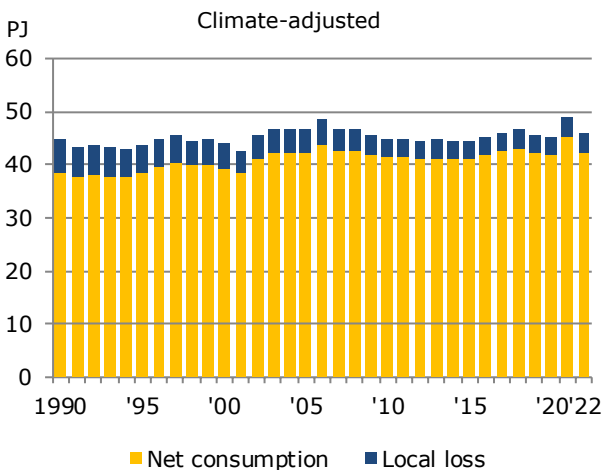
In 2022, 75.5% of energy consumption in the commercial and public services sector was in private and public services, while wholesale and retail accounted for the remaining 24.5%.

From 2021 to 2022, energy consumption in private services and public services fell by 2.4% and 4.7%, respectively. For wholesale and retail, energy consumption fell by 5.7% and 3.9%, respectively.

Compared with 1990, energy consumption in wholesale fell by 23.9%, while energy consumption in retail grew by 5.5%.

Energy consumption in the private service sector is higher today than in 1990. Since 1990, growth has been 29.0%. In the public services sector, energy consumption is 5.2% lower compared with 1990.

### Energy consumption for heating in the commercial and public services

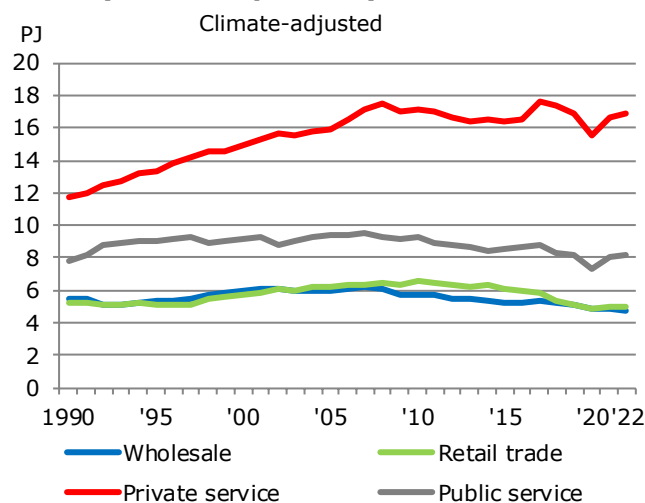


Energy consumption for heating (space heating and hot water) can be calculated in different ways. While final energy consumption is the volume of energy paid for, net energy consumption is the volume of energy utilised. The difference is local losses by the individual consumers, e.g. from oil and natural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

Final energy consumption for heating in the commercial and public services sector was 45.9 PJ in 2022, which is 6.4% lower than the year before. Compared with 1990, consumption grew by 2.1%.

Net energy consumption was 42.4 PJ in 2022, which is 6.4% lower than the year before. Compared with 1990, net energy consumption increased by 10.0%.

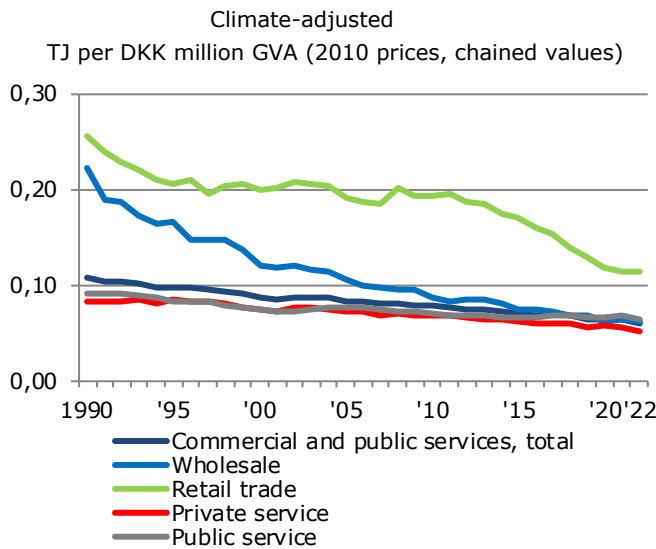
### Electricity consumption by sector



From 1990 to 2022, electricity consumption in wholesale decreased by 13.0% and in retail by 4.8%. Electricity consumption increased by 5.5% in the public services sector and by 44.3% in the private services sector.

In 2022, electricity consumption in wholesale and retail was 3.6% and 1.0% lower, respectively, than in 2021. In the private services sector, electricity consumption increased by 1.4%, while in the public services sector it increased by 2.2%.

**Energy intensities in the commercial and public services**

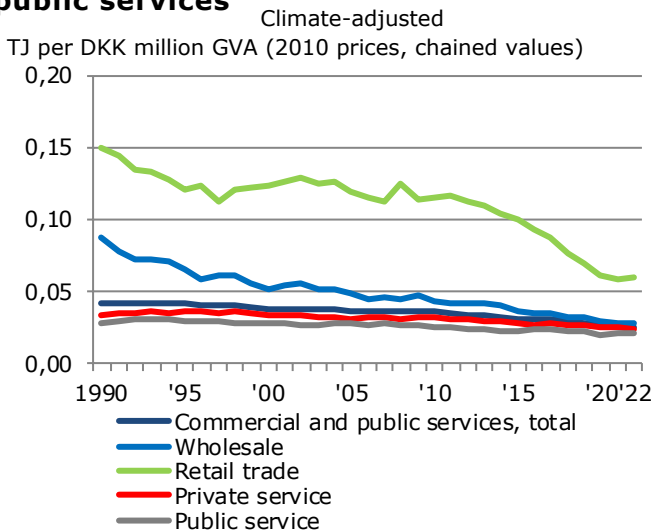


Energy intensities have been calculated as climate-adjusted energy consumption in relation to gross value added (GVA), measured at 2010 prices, chained values.

Energy intensity was 0.061 in 2022, i.e. for every DKK 1 million GVA in the commercial and public services sector, 0.061 TJ of energy were used. This is 6.4% less than the year before.

Energy intensity in the commercial and public services sector fell by 44.2% from 1990 to 2022. For wholesale and retail, energy intensities fell by 72.5% and 55.7%, respectively. For private and public services, intensities fell by 37.4% and 29.5%, respectively.

**Electricity intensities in commercial and public services**

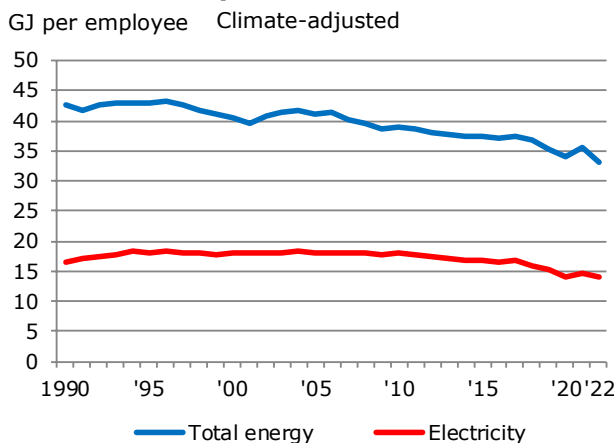


Electricity intensities have been calculated as climate-adjusted electricity consumption in relation to GVA, measured at 2010 prices, chained values.

In 2022 electricity intensity was 0.026, i.e. for every DKK 1 million GVA in the commercial and public services sector, 0.026 TJ of electricity (corresponding to 7,222 kWh) were used. Electricity intensity fell by 2.4% relative to the year before.

Electricity intensity in the commercial and public services sector fell by 38.9% from 1990 to 2022. For wholesale and retail, electricity intensities fell by 68.6% and 60.0%, respectively. In the private services sector, electricity intensity fell by 30.0%, while in the public services sector it fell by 21.5%.

**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 33.1 GJ in 2022, as opposed to 35.7 GJ the year before. This corresponds to a decrease of 7.3%. Compared with 1990, energy consumption per employee fell by 22.1%.

In 2022, electricity consumption per employee was 14.2 GJ, as opposed to 14.7 GJ the year before, which is a fall of 3.2%. Compared with 1990, electricity consumption per employee decreased by 14.8%.

## COMMERCIAL AND PUBLIC SERVICES/HOUSEHOLDS

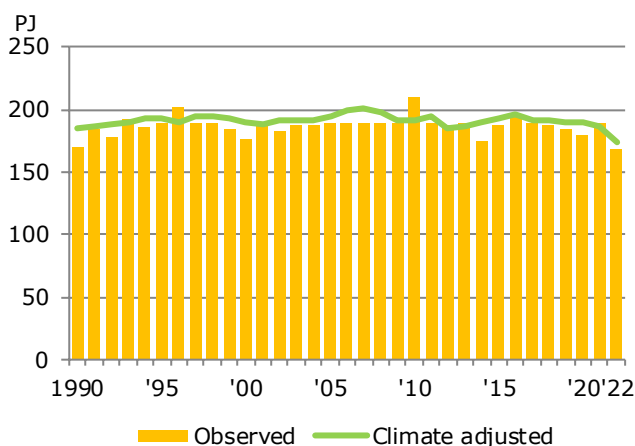
### Final energy consumption in the commercial and public services

Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>Total commercial and public services. Climate adjusted</b>	<b>77 047</b>	<b>80 599</b>	<b>85 045</b>	<b>83 893</b>	<b>81 281</b>	<b>78 198</b>	<b>84 377</b>	<b>81 266</b>	<b>5.5%</b>
Oil	14 850	5 874	4 428	2 810	2 671	1 631	1 227	1 652	-88.9%
Natural gas	6 902	7 739	9 989	8 977	7 680	7 514	9 897	7 068	2.4%
Coal and coke	98	-	-	-	-	-	-	-	-100%
Waste, non-renewable	457	691	648	163	137	253	230	291	-36.5%
Renewable energy	1 022	2 078	2 178	1 491	1 813	3 435	5 006	5 400	428%
Electricity	30 147	35 715	37 479	38 656	36 303	32 424	34 621	34 800	15.4%
District heating	23 449	28 451	30 281	31 761	32 639	32 910	33 368	32 028	36.6%
Gas works gas	121	52	42	35	37	30	29	27	-78.1%
<b>By use</b>									
Wholesale	13 795	13 893	12 906	11 493	10 883	10 478	11 144	10 503	-23.9%
Retail	8 883	9 323	9 991	10 939	10 332	9 184	9 749	9 371	5.5%
Private service	28 812	32 901	36 238	36 653	35 507	35 047	38 072	37 173	29.0%
Public service	25 557	24 481	25 909	24 807	24 558	23 489	25 411	24 219	-5.2%

### Final energy consumption in households

Direct energy content [TJ]	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>Total households. Climate adjusted</b>	<b>185 039</b>	<b>189 275</b>	<b>194 729</b>	<b>191 585</b>	<b>193 252</b>	<b>189 394</b>	<b>186 418</b>	<b>173 778</b>	<b>-6.1%</b>
Oil	58 998	35 444	27 617	18 595	11 105	7 807	6 504	7 037	-88.1%
Natural gas	17 877	29 329	29 993	27 761	25 495	21 970	18 364	13 546	-24.2%
Coal and coke	830	49	8	28	-	-	-	-	-100%
Renewable energy	17 434	22 052	33 279	39 444	48 724	50 504	50 146	49 114	182%
Electricity	35 696	37 339	37 810	36 738	36 855	37 507	38 910	34 459	-3.5%
District heating	52 820	64 466	65 536	68 612	70 644	71 258	72 165	69 318	31.2%
Gas works gas	1 384	594	486	408	429	349	330	304	-78.0%
<b>Single-family houses</b>	<b>137 383</b>	<b>139 568</b>	<b>144 258</b>	<b>140 888</b>	<b>142 015</b>	<b>137 802</b>	<b>134 896</b>	<b>124 384</b>	<b>-9.5%</b>
Oil	52 233	32 741	25 032	16 910	9 408	6 698	5 742	6 018	-88.5%
Natural gas	15 143	24 907	25 472	23 554	21 529	18 464	15 439	11 391	-24.8%
Coal and coke	136	17	0	13	-	-	-	-	-100%
Renewable energy	17 420	22 006	33 226	39 370	48 594	49 739	49 240	47 971	175%
Electricity	27 011	28 210	28 279	27 335	27 772	27 934	29 075	25 006	-7.4%
District heating	24 685	31 364	31 985	33 486	34 479	34 778	35 221	33 831	37.0%
Gas works gas	754	323	264	221	234	190	179	166	-78.0%
<b>Multi-family houses</b>	<b>47 656</b>	<b>49 706</b>	<b>50 471</b>	<b>50 696</b>	<b>51 237</b>	<b>51 592</b>	<b>51 522</b>	<b>49 395</b>	<b>3.6%</b>
Oil	6 766	2 703	2 585	1 685	1 696	1 109	762	1 018	-84.9%
Natural gas	2 733	4 422	4 522	4 207	3 966	3 505	2 924	2 155	-21.2%
Coal and coke	693	32	8	15	-	-	-	-	-100%
Renewable energy	14	46	54	74	129	765	906	1 143	8025%
Electricity	8 686	9 129	9 530	9 403	9 084	9 573	9 835	9 453	8.8%
District heating	28 135	33 103	33 550	35 125	36 166	36 480	36 944	35 487	26.1%
Gas works gas	630	271	222	187	196	159	151	139	-78.0%

### Energy consumption in households

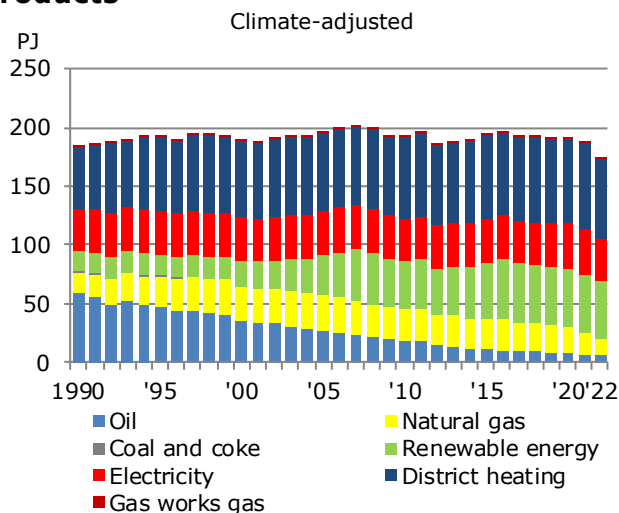


Household energy consumption is greatly influenced by the weather. The years 1990, 2000 and 2014 were very hot years with low energy consumption, whereas 1996 and 2010 were exceptionally cold.

In 2022, climate-adjusted energy consumption by households was 173.8 PJ, accounting for 29.5% of total final energy consumption in Denmark. Of the 173.8 PJ, on average 143.5 PJ were used for heating and 30.3 PJ for electrical appliances etc.

The climate-adjusted energy consumption of households was 6.8% lower in 2022 than the year before. Compared with 1990, energy consumption has fallen by 6.1%.

### Household consumption by energy products

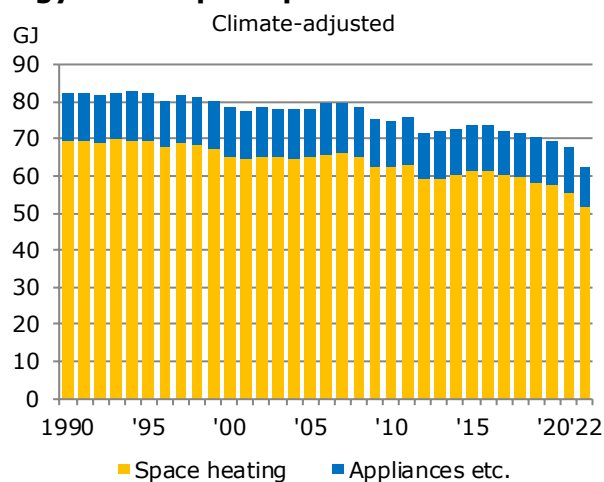


There have been significant changes in the composition of household energy consumption since 1990. Oil consumption decreased throughout the period shown due to a shift to district heating and natural gas.

In 2022, district heating amounted to 39.9% of household energy consumption, and renewable energy and electricity amounted to 28.3% and 19.8%, respectively. Consumption of natural gas, oil and gas works gas amounted to 7.8%, 4.0% and 0.2%, respectively.

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 between 35 PJ and 39 PJ. Electricity consumption fell to 34.5 PJ in 2022, down by 11.4% relative to 2021.

### Energy consumption per household



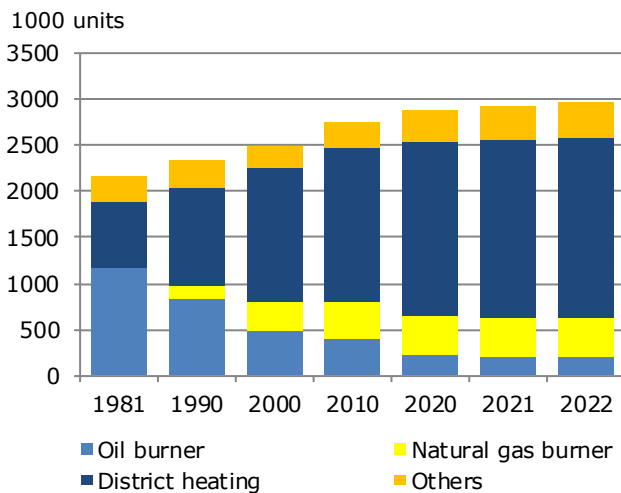
In 2022, average energy consumption per household was 62.5 GJ, which is 7.8% lower than the year before. Of this, 51.6 GJ – corresponding to 82.6% - were used for space heating and hot water. Energy consumption by households went down by 24.1% compared with 1990.

In 2022, average electricity consumption per household for electrical appliances and lighting was 9.8 GJ, corresponding to approximately 2,722 GWh. This is a fall of 10.3% compared to the year before and 16.4% 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.

## HOUSEHOLDS

### Heating installations in dwellings

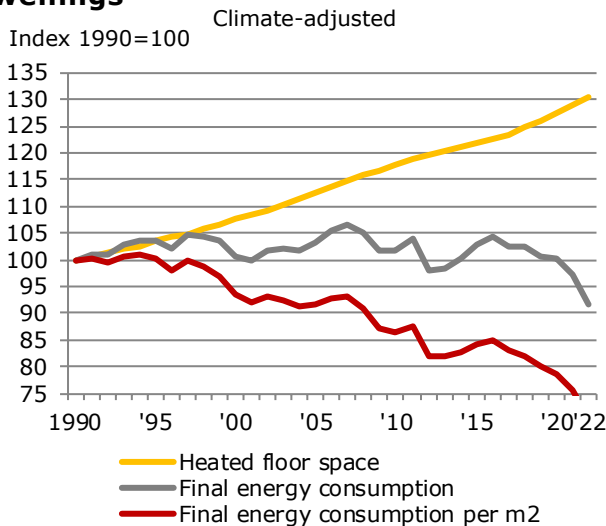


The significant changes in the composition of energy consumption by energy type reflect changes in the composition of heating installations in dwellings over time. Until the mid-1980s, oil-fired boilers clearly dominated the market, after which district heating became the most common source of heating. 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 2022, the total of nearly 3.0 million heating installations could be analysed as follows: District heating installations 66.0%, natural gas boilers 14.5%, oil-fired boilers 6.6% and other installations, including heat pumps, electric heating and wood-fired boilers 13.0%.

Source: Statistics Denmark

### Energy consumption for heating in dwellings



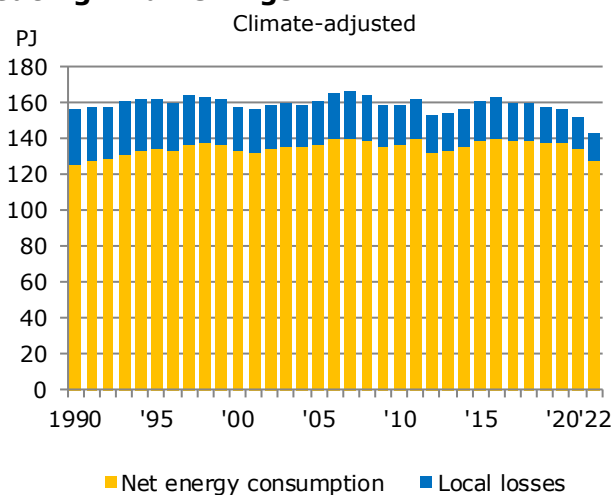
Except for in the years 2001, 2012 and 2013, climate-adjusted energy consumption for heating (space heating and hot water) has been between 0.2% and 6.7% above the 1990 level. In 2022, energy consumption was 8.3% below the 1990 level.

The background for this is a 30.5% increase in total heated area in the period from 1990 to 2022.

In the period 1990 to 2022, energy consumption for heating per m<sup>2</sup> fell by 29.7%. 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 m<sup>2</sup> 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



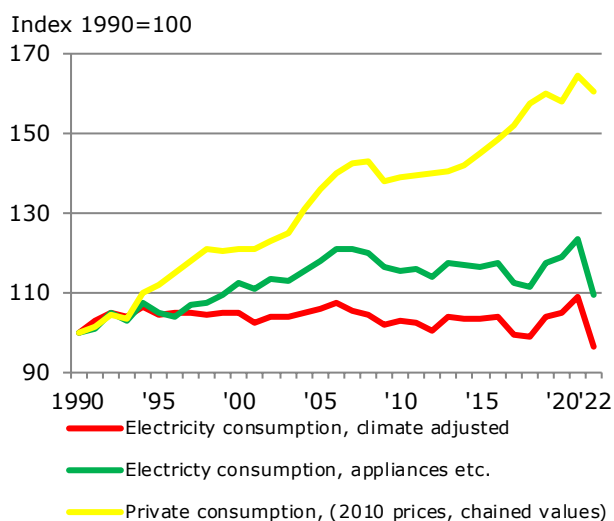
Net energy consumption means the utilized energy. The difference between final energy consumption and net energy consumption is local heat loss in individual dwellings, e.g. from oil and natural gas boilers.

While, as mentioned above, final consumption for heating has decreased from 1990 to 2022, net energy consumption for space heating and hot water in households increased by 1.3% 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 and heat pumps, and these types of heating system are associated with considerably smaller local losses. 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 m<sup>2</sup>.



### Private consumption and electricity consumption in households



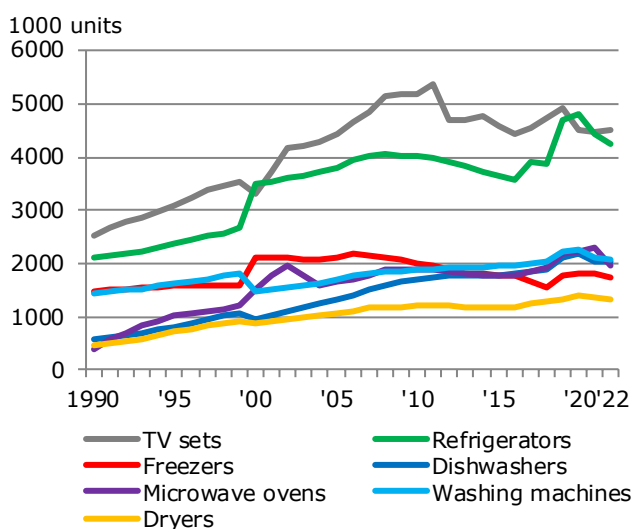
In the period 1990-2022, total household electricity consumption fell by 3.5%, while electricity consumption for appliances and lighting etc. increased by 9.4%.

Taking into account the large increase in the number of electrical appliances per household, see below, and a general increase of 60.6% in total private consumption, i.e. considerably larger growth in private consumption than in electricity consumption for appliances and lighting etc., this may seem like a surprise.

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

Source for private consumption: Statistics Denmark

### Household stock of electrical appliances

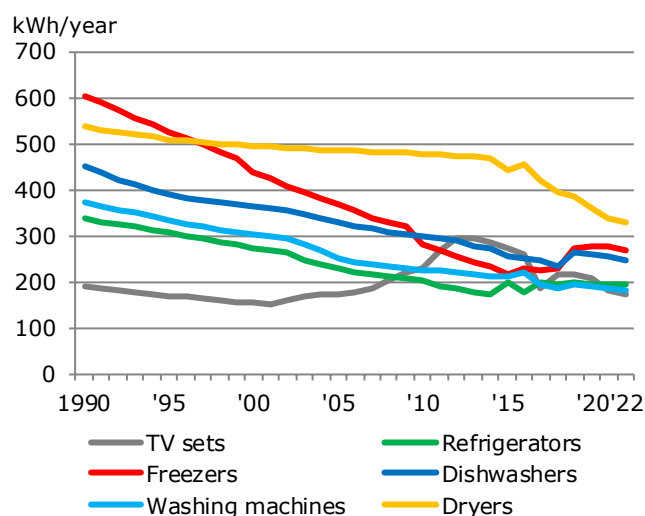


In the period from 1990 to 2010, there has been a sharp increase in the stock of almost all electricity-consuming household appliances.

From 1990 to 2022, the number of microwaves has increased by 411%, while the number of tumble dryers and dishwashers has increased by 187% and 258%, respectively. Television sets, washing machines and refrigerators have also increased considerably in numbers. The number of separate freezers has increased by 17.6% since 1990.

Source: ElmodelBOLIG

### Specific electricity consumption of household appliances



All else being equal, 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 2022, i.e. by 42.0%. Electricity consumption for a separate freezer fell by 55.7%, while the fall for a washing machine was 52.0% in the same period.

Source: ElmodelBOLIG



## EMISSIONS OF CO<sub>2</sub> AND OTHER GREENHOUSE GASES

### Inventories of CO<sub>2</sub> and other greenhouse gases

Emission inventories of CO<sub>2</sub> and the remaining greenhouse gases (CH<sub>4</sub>, N<sub>2</sub>O and fluorinated gases (F-gasses)) are used to track Denmark's progress towards meeting its international GHG emissions reduction targets. Pursuant to the EU's Effort Sharing Regulation (EU ESR) on binding annual emissions reduction targets from 2021 to 2030, Denmark must reduce its greenhouse gas emissions from certain sectors within energy, industrial processes and product use, agriculture, and waste by 2030. Denmark is obligated to reduce its greenhouse gas emissions by 50% by 2030 relative to its 2005 baseline year emissions, which have been estimated at 40.4 million tonnes CO<sub>2</sub> equivalents. The EU ESR also sets annual emission allowances for the years 2021-2029. Denmark's emission allowances were 32.1 million tonnes CO<sub>2</sub> equivalents in 2021.

Total Danish observed ESR emissions amounted to 32.1 million tonnes CO<sub>2</sub> equivalents in 2021, which is 20.4% lower than in the 2005 baseline year.

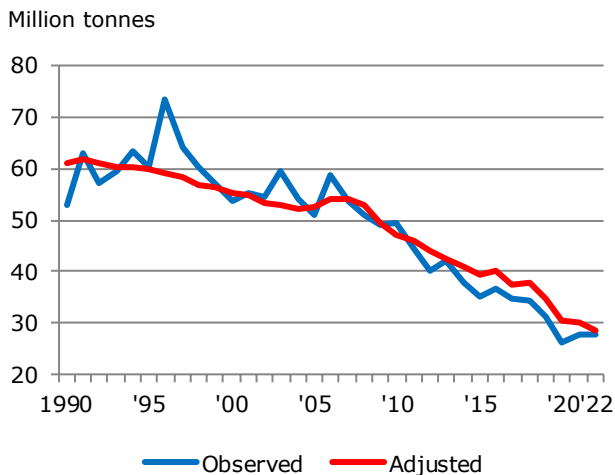
Total Danish observed greenhouse gas emissions (including LULUCF) amounted to 46.3 million tonnes CO<sub>2</sub> equivalents in 2021, which is 41.0% lower than emissions in 1990.

Including the energy statistics' adjustments for fluctuations in temperature and net exports of electricity, emissions (including LULUCF) in 2021 amounted to 48.3 million tonnes CO<sub>2</sub> equivalents, corresponding to a fall of 44.1% relative to adjusted emissions in 1990.

The GHG emissions inventory for 2022 will be ready in 2024. The total GHG emissions inventory includes CO<sub>2</sub> emissions from energy use (excluding emissions from international aviation and the effect of border trade in motor gasoline and diesel oil, both of which are included in the CO<sub>2</sub> accounts in the energy statistics), as well as CO<sub>2</sub> emissions from other sources (flaring of gas in the North Sea and certain industrial processes). Emissions of six other greenhouse gases are also included: methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>) and nitrogen trifluoride (NF<sub>3</sub>), which are converted to CO<sub>2</sub> equivalents. Danish reduction efforts contribute to meeting the EU's overall reduction target under the Paris Agreement to reduce the EU's total greenhouse gas emissions by 55% from 1990 to 2030.

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

### CO<sub>2</sub> emissions from energy consumption

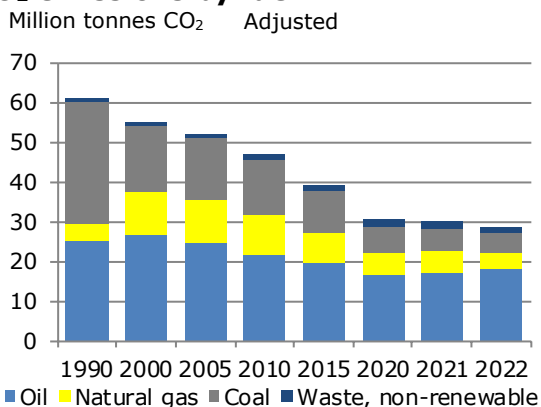


The Danish Energy Agency calculates observed CO<sub>2</sub> emissions as well as adjusted CO<sub>2</sub> emissions including international aviation and the effect border trade. The adjusted figures take annual temperature variations and foreign trade in electricity into account (see pages 18 and 19 on energy consumption). The purpose of the adjustment is to illustrate any underlying trends.

In 2022, observed CO<sub>2</sub> emissions from energy consumption were 27.7 million tonnes, which is 0.8% lower than in 2021. Observed CO<sub>2</sub> emissions dropped by 47.8% compared with 1990.

Adjusted CO<sub>2</sub> emissions from energy consumption fell by 4.4% to 28.7 million tonnes in 2022. Compared with 1990, the drop is 53.1%.

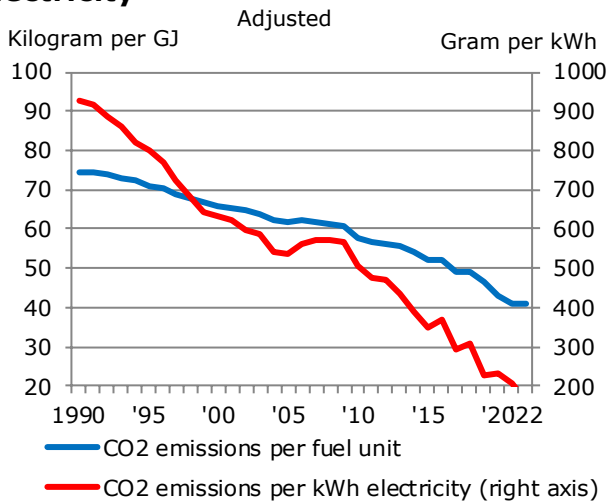
### CO<sub>2</sub> emissions by fuel



Since 1990, there has been a significant shift in energy consumption analysed by fuel. Consumption of natural gas and renewable energy has increased, while consumption of oil and coal has been reduced. Recent years have seen a significant decrease in consumption of natural gas.

This shift in fuels has led to a reduction in CO<sub>2</sub> emissions, as consumption of oil and coal entails greater CO<sub>2</sub> emissions than consumption of natural gas and renewable energy. While gross energy consumption has fallen by 15.0% since 1990, adjusted CO<sub>2</sub> emissions have fallen by 53.1%.

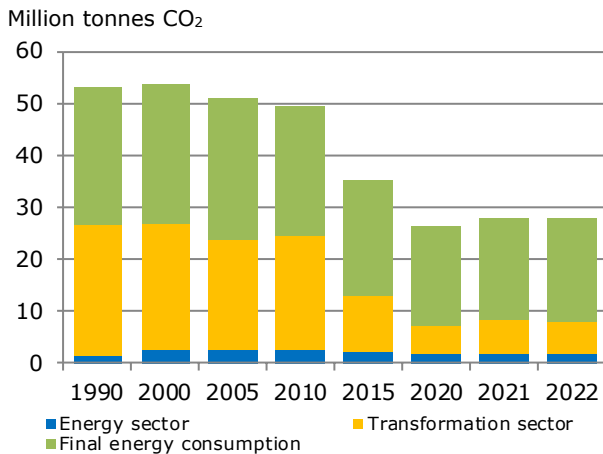
**CO<sub>2</sub> emissions per fuel unit and per kWh electricity**



From 1990-2022 gross energy consumption fell by 15.0% and the breakdown by fuel changed significantly. As a result of the shift from fossil fuels to renewables, still less CO<sub>2</sub> is emitted for each unit of fuel consumed. In 2022, each GJ of adjusted gross energy consumption was linked to 41.2 kg CO<sub>2</sub>, as opposed to 74.6 kg in 1990. This corresponds to a reduction of 44.8%.

One kWh of electricity sold in Denmark in 2022 led to 162 grams of CO<sub>2</sub> emissions. The 200% method has been used in the breakdown of energy consumption by CHP units between electricity and district heating. In 1990, CO<sub>2</sub> 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 solar energy and of wind power, in particular.

**Observed CO<sub>2</sub> emissions by sector**

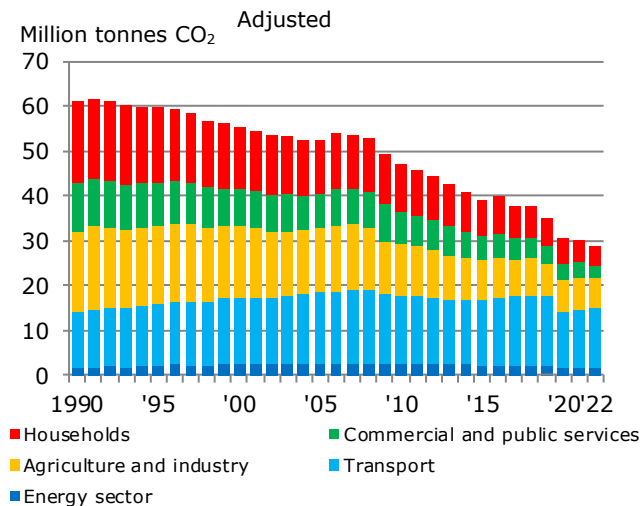


The energy system is divided into three sectors: the *energy sector* (extraction and refining), the *transformation sector* (production of electricity, district heating, and gas works gas), and *final consumption* (transport and consumption by households and industries).

In 1990, total observed CO<sub>2</sub> 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 2022, total observed CO<sub>2</sub> emissions were 27.7 million tonnes, of which 6.3 million tonnes were from the transformation sector, 19.8 million tonnes were from final energy consumption, and 1.7 million tonnes were from the energy sector. The transformation sector saw a fall of 18.9 million tonnes of CO<sub>2</sub> from 1990 to 2022, although electricity and district heating production grew significantly in this period.

**CO<sub>2</sub> emissions from end-use of energy**



CO<sub>2</sub> emissions from energy use in the production of electricity, district heating and gas works gas can be broken down by end consumer to illustrate how emissions distribute across the energy sector, transport, industries and households.

In 2022, transport, and agriculture and industry accounted for the largest shares of total CO<sub>2</sub> emissions, with 47.1% and 23.0%, respectively. Households and the commercial and public services sector accounted for 14.3% and 9.5%, respectively, while the energy sector accounted for 6.1% of CO<sub>2</sub> emissions.

Compared with 1990, CO<sub>2</sub> emissions from transport increased by 7.0%. Industries and households have seen significant decreases. In the agriculture and industry sector, and the commercial and public services sectors, CO<sub>2</sub> emissions fell by 63.1% and 74.8% respectively, while for households they fell by 77.4%.

## EMISSIONS OF CO<sub>2</sub> AND OTHER GREENHOUSE GASES

### Observed CO<sub>2</sub> emissions from energy consumption

Observed emissions	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>Total CO<sub>2</sub> emissions</b>	<b>53 097</b>	<b>53 613</b>	<b>50 891</b>	<b>49 420</b>	<b>35 171</b>	<b>26 344</b>	<b>27 961</b>	<b>27 739</b>	<b>-47.8%</b>
<b>By fuel</b>	<b>53 097</b>	<b>53 613</b>	<b>50 891</b>	<b>49 420</b>	<b>35 171</b>	<b>26 344</b>	<b>27 961</b>	<b>27 739</b>	<b>-47.8%</b>
Oil	24 228	26 247	24 235	22 106	19 219	16 300	16 942	18 127	-25.2%
Natural gas	4 323	10 629	10 676	10 572	7 026	5 114	5 110	3 812	-11.8%
Coal	23 972	15 612	14 582	15 331	7 229	3 162	4 198	4 124	-82.8%
Waste, non-renewable	573	1 124	1 398	1 410	1 697	1 768	1 711	1 677	192%
<b>By sector</b>	<b>53 097</b>	<b>53 613</b>	<b>50 891</b>	<b>49 420</b>	<b>35 171</b>	<b>26 344</b>	<b>27 961</b>	<b>27 739</b>	<b>-47.8%</b>
<b>Energy sector</b>	<b>1 401</b>	<b>2 323</b>	<b>2 440</b>	<b>2 324</b>	<b>2 261</b>	<b>1 726</b>	<b>1 720</b>	<b>1 703</b>	<b>21.5%</b>
<b>Transformation sector</b>	<b>25 136</b>	<b>24 215</b>	<b>21 133</b>	<b>21 957</b>	<b>10 657</b>	<b>5 547</b>	<b>6 500</b>	<b>6 251</b>	<b>-75.1%</b>
Electricity production	20 562	20 163	17 234	17 673	7 435	3 785	4 703	4 650	-77.4%
District heating production	4 474	4 010	3 866	4 249	3 187	1 738	1 775	1 582	-64.6%
Gas works gas production	101	42	33	35	35	25	23	19	-81.3%
<b>Final energy consumption</b>	<b>26 559</b>	<b>27 075</b>	<b>27 318</b>	<b>25 139</b>	<b>22 252</b>	<b>19 071</b>	<b>19 741</b>	<b>19 785</b>	<b>-25.5%</b>
Transport	12 427	14 646	15 719	15 202	14 483	12 164	12 631	13 355	7.5%
Agriculture and industry	7 796	7 588	7 032	5 839	4 952	4 705	4 922	4 671	-40.1%
Commercial and public services	1 408	869	923	803	623	526	669	527	-62.5%
Households	4 928	3 971	3 645	3 295	2 194	1 675	1 519	1 231	-75.0%

**Observed CO<sub>2</sub> emissions** have been calculated based on observed energy consumption as shown in the energy balance on page 4. By using emission factors specific to fuel, energy consumption is converted to

CO<sub>2</sub> emissions. The emission factors applied are shown on page 59. Renewable energy, including renewable waste, is not linked to CO<sub>2</sub> emissions in the calculations.

### CO<sub>2</sub> emissions from energy consumption, adjusted\*)

Adjusted emissions	1990	2000	2005	2010	2015	2020	2021	2022	Change '90-'22
<b>Total CO<sub>2</sub> emissions</b>	<b>61 074</b>	<b>55 363</b>	<b>52 439</b>	<b>47 054</b>	<b>39 236</b>	<b>30 480</b>	<b>29 995</b>	<b>28 668</b>	<b>-53.1%</b>
<b>By fuel</b>	<b>61 074</b>	<b>55 363</b>	<b>52 439</b>	<b>47 054</b>	<b>39 236</b>	<b>30 480</b>	<b>29 995</b>	<b>28 668</b>	<b>-53.1%</b>
Oil	25 087	26 767	24 511	21 805	19 350	16 427	16 969	18 183	-27.5%
Natural gas	4 646	10 961	10 955	10 054	7 737	5 758	5 386	3 954	-14.9%
Coal	30 758	16 500	15 570	13 798	10 448	6 518	5 932	4 849	-84.2%
Waste, non-renewable	583	1 136	1 403	1 398	1 701	1 777	1 708	1 681	188%
<b>By sector</b>	<b>61 074</b>	<b>55 363</b>	<b>52 439</b>	<b>47 054</b>	<b>39 236</b>	<b>30 480</b>	<b>29 995</b>	<b>28 668</b>	<b>-53.1%</b>
<b>Energy sector</b>	<b>1 401</b>	<b>2 323</b>	<b>2 440</b>	<b>2 324</b>	<b>2 261</b>	<b>1 726</b>	<b>1 720</b>	<b>1 703</b>	<b>21.5%</b>
<b>Transformation sector</b>	<b>32 258</b>	<b>25 456</b>	<b>22 498</b>	<b>20 121</b>	<b>14 581</b>	<b>9 495</b>	<b>8 584</b>	<b>7 093</b>	<b>-78.0%</b>
Electricity production	27 071	20 965	18 418	16 576	11 084	7 283	6 916	5 247	-80.6%
District heating production	5 079	4 446	4 047	3 513	3 461	2 187	1 646	1 827	-64.0%
Gas works gas production	108	45	33	32	36	25	22	19	-82.2%
<b>Final energy consumption</b>	<b>27 414</b>	<b>27 584</b>	<b>27 501</b>	<b>24 609</b>	<b>22 394</b>	<b>19 258</b>	<b>19 690</b>	<b>19 871</b>	<b>-27.5%</b>
Transport	12 427	14 646	15 719	15 202	14 483	12 164	12 631	13 355	7.5%
Agriculture and industry	7 975	7 700	7 073	5 721	4 983	4 746	4 909	4 695	-41.1%
Commercial and public services	1 545	935	950	728	646	559	658	545	-64.7%
Households	5 468	4 302	3 760	2 959	2 282	1 790	1 492	1 276	-76.7%

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

**Adjusted CO<sub>2</sub> 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 CO<sub>2</sub> AND OTHER GREENHOUSE GASES

### Total emissions of greenhouse gases

									Change
1000 tonnes CO <sub>2</sub> equivalents	1990	1995	2000	2005	2010	2015	2020	2021	'90 <sup>1)</sup> - <sup>21</sup>
<b>Observed emissions in total<sup>2)</sup></b>	<b>71 516</b>	<b>79 602</b>	<b>72 028</b>	<b>67 844</b>	<b>64 668</b>	<b>49 658</b>	<b>42 853</b>	<b>43 851</b>	<b>-38.7%</b>
Of which ETS excl. aviation (ETS) <sup>3a)</sup>	-	-	-	26 476	25 266	15 796	10 832	11 618	-56.1%
- CO <sub>2</sub> from domestic aviation (ETS) <sup>3a)</sup>	226	219	177	161	187	137	78	85	-47.1%
- Non-ETS (ESD) <sup>3a)</sup>	-	-	-	41 207	39 216	33 726	31 942	32 148	-22.0%
Emissions ceiling for non-ETS (ESD) <sup>3b)</sup>	-	-	-	-	-	35 021	32 063	32 128	-
Over fulfillment for non-ETS (ESD) <sup>3c)</sup>	-	-	-	-	-	1 295	121	- 20	-
<b>Observed net emissions in total <sup>4)</sup></b>	<b>78 412</b>	<b>85 029</b>	<b>77 197</b>	<b>72 988</b>	<b>67 185</b>	<b>50 507</b>	<b>45 955</b>	<b>46 271</b>	<b>-41.0%</b>
<b>Emissions from energy consumption</b>	<b>51 911</b>	<b>59 952</b>	<b>52 526</b>	<b>49 958</b>	<b>48 592</b>	<b>34 060</b>	<b>26 944</b>	<b>28 274</b>	<b>-45.5%</b>
Energy and transformation sector	26 249	32 603	26 109	23 222	24 117	12 902	7 349	8 315	-68.3%
Final energy consumption	25 662	27 349	26 416	26 736	24 476	21 158	19 595	19 959	-22.2%
- Transport (incl. military)	10 923	12 376	12 593	13 880	13 522	12 713	12 180	12 423	13.7%
- Industry	5 729	6 148	6 051	5 573	4 536	3 881	3 725	3 812	-33.5%
- Commercial and public services and households, agriculture etc.	9 009	8 825	7 772	7 283	6 418	4 563	3 690	3 724	-58.7%
<b>Industrial process, flaring etc.</b>	<b>2 614</b>	<b>3 495</b>	<b>4 596</b>	<b>3 597</b>	<b>2 447</b>	<b>2 201</b>	<b>2 095</b>	<b>2 023</b>	<b>-22.6%</b>
Transient emissions and flaring	490	672	1 043	866	565	380	188	172	-64.8%
Industrial process	2 124	2 823	3 554	2 731	1 882	1 820	1 906	1 851	-12.9%
<b>Emissions from agriculture</b>	<b>13 896</b>	<b>13 453</b>	<b>12 674</b>	<b>12 432</b>	<b>12 085</b>	<b>12 029</b>	<b>12 389</b>	<b>12 074</b>	<b>-13.1%</b>
Animals digestion	4 489	4 409	4 034	3 874	4 038	4 077	4 117	4 142	-7.7%
Animal manure	3 381	3 776	4 138	4 370	3 949	3 746	3 760	3 660	8.2%
Agricultural land	5 410	4 733	4 232	3 963	3 940	4 028	4 255	3 993	-26.2%
Others (liming of soils etc.)	616	536	270	224	158	178	257	279	-54.7%
<b>Other emissions</b>	<b>1 975</b>	<b>1 643</b>	<b>1 394</b>	<b>1 171</b>	<b>1 053</b>	<b>1 050</b>	<b>1 184</b>	<b>1 234</b>	<b>-37.5%</b>
Waste deposit	1 526	1 241	978	737	611	546	458	434	-71.6%
Sewage treatment	368	289	236	229	201	214	219	214	-41.8%
Other waste (biomass gasification etc.)	81	113	179	205	241	290	507	587	625%
<b>Forestry and land use <sup>5)</sup></b>	<b>6 897</b>	<b>5 427</b>	<b>5 168</b>	<b>5 144</b>	<b>2 517</b>	<b>849</b>	<b>3 102</b>	<b>2 420</b>	<b>-64.9%</b>
Forestry <sup>5)</sup>	-1 232	-1 232	-1 321	- 880	-2 247	-3 988	-2 154	-2 921	137%
Land use <sup>5)</sup>	8 128	6 659	6 489	6 024	4 764	4 837	5 256	5 341	-34.3%
<b>Indirect CO<sub>2</sub>-emissions</b>	<b>1 120</b>	<b>1 059</b>	<b>839</b>	<b>686</b>	<b>491</b>	<b>318</b>	<b>242</b>	<b>245</b>	<b>-78.1%</b>

Note 1: The table includes only Danish GHG emissions and removals.

1) Changes are relative to 1990. However, for ETS, ESD/ESR, and domestic aviation reductions are relative to 2005.

2) Total emissions without contributions from "Forestry and land use".

3a) CO<sub>2</sub> emissions from domestic aviation are shown here separately and as part of ETS, although, in practice, these emissions were included under ESD in the period 2005-2011. ESD emissions (2005-2020) and ESR emissions (from and including 2021) have been calculated by deducting ETS emissions from total observed emissions without "Forestry and land use". This data shown us from the most recently reported inventory with recalculations, and the data therefore differs from the EU's annual compliance assessment for historical years.

3b) Emissions ceilings applicable in the EU. Under the UN Kyoto Protocol, emissions ceilings for 2017-2020 were lower.

3c) Gap towards current EU ceilings. A positive figure means emissions are below the ceiling.

4) Total net emissions including contributions from "Forestry and land use", in which CO<sub>2</sub> removals have been included as negative emissions.

5) The figures are not directly comparable with the contributions from forests and soils that, from 2021, are included in Denmark's climate accounts pursuant to the EU LULUCF Regulation.

### Observed and adjusted emissions of greenhouse gases

									Change
1000 tonnes CO <sub>2</sub> equivalents	1990	2000	2005	2010	2015	2020	2021	2022*	'90-'22
<b>Observed emissions, total <sup>1)</sup></b>	<b>71 516</b>	<b>72 028</b>	<b>67 844</b>	<b>64 668</b>	<b>49 658</b>	<b>42 853</b>	<b>43 851</b>	<b>42 705</b>	<b>-40.3%</b>
<b>Adjusted emissions, total <sup>1)</sup></b>	<b>79 493</b>	<b>73 779</b>	<b>69 392</b>	<b>62 303</b>	<b>53 724</b>	<b>46 989</b>	<b>45 885</b>	<b>43 634</b>	<b>-45.1%</b>

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 CO<sub>2</sub> emissions connected to Denmark's own energy consumption.

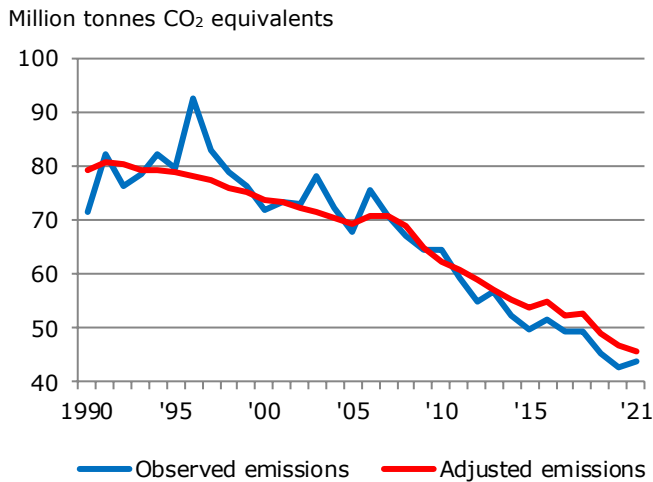
1) See 2) above.

\* The preliminary emissions statement for 2022 is solely based on CO<sub>2</sub> emissions from energy consumption and flaring as calculated in the Energy Statistics 2022 (although excluding international aviation). Total greenhouse gas emissions are calculated by assuming that all emissions other than CO<sub>2</sub> from energy consumption and flaring (although excluding international aviation) are constant at the values for 2021, calculated by DCE - Danish Centre for Environment and Energy.

Source: DCE - Danish Centre for Environment and Energy

## EMISSIONS OF CO<sub>2</sub> AND OTHER GREENHOUSE GASES

### Emissions of greenhouse gases



The figure shows emissions of greenhouse gases, excluding the effects of CO<sub>2</sub> removal by forests and land use.

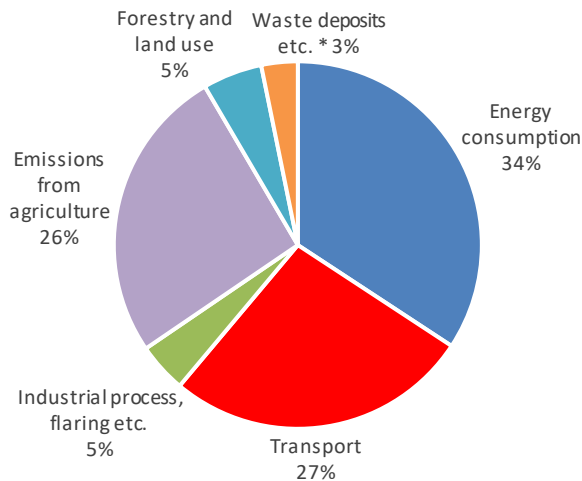
Observed emissions of greenhouse gases were 43.9 million tonnes of CO<sub>2</sub> equivalents in 2021, which is an increase of 2.3% compared with 2020.

Adjusted for climate variability and fuel consumption linked to foreign trade in electricity, emissions of greenhouse gases were 45.9 million tonnes of CO<sub>2</sub> equivalents in 2021, which is 2.3% less than in 2020. As 2020 saw considerable net imports of electricity, adjusted emissions were lower in 2021 than in 2020.

Source: DCE - Danish Centre for Environment and Energy

[www.dce.au.dk](http://www.dce.au.dk)

### Observed emissions of greenhouse gases distributed by origin 2021



\* Landfills etc.: Landfills, Sewage treatment, Other waste (biogasification etc.), and Indirect CO<sub>2</sub>-emissions

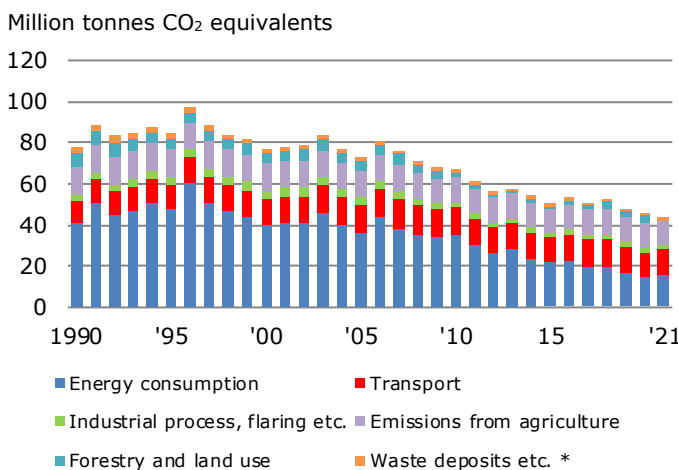
The three largest sources of emissions of greenhouse gases are energy consumption (excluding transport), transport and agriculture. Emissions from energy consumption (excluding transport) derive from the energy and transformation sector as well as final energy consumption in industry, commercial and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

In 2021, CO<sub>2</sub> contributed 67.9%, methane (CH<sub>4</sub>) 19.7%, nitrous oxide (N<sub>2</sub>O) 11.7% and F gases 0.7% to total emissions of greenhouse gases (excluding forests and land use). The primary source of CO<sub>2</sub> 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](http://www.dce.au.dk)

### Trends in observed emissions of greenhouse gases



\* Waste deposits etc.: Waste deposit, Sewage treatment, Other waste and Indirect CO<sub>2</sub>-emissions

Observed net emissions of greenhouse gases fell by 41.0% from 1990 to 2021. If emissions from forestry and land use are not included, the fall for the same period is 38.7%. Energy consumption (excluding transport) saw the largest fall with a reduction of 61.3% from 1990 to 2021. Observed net emissions from transport increased by 13.7%. 2021 still saw lower fuel consumption than before the Covid-19 pandemic. Emissions of greenhouse gases from agriculture fell by 13.1% from 1990 to 2021, primarily due to falling emissions of N<sub>2</sub>O.

Note: Exclusive of LULUCF and indirect CO<sub>2</sub>-emissions.

Source: DCE - Danish Centre for Environment and Energy.

[www.dce.au.dk](http://www.dce.au.dk)

ETS and non-ETS CO<sub>2</sub> emissions from energy consumption 2020-2022

Observed CO<sub>2</sub> emissions from energy consumption

1000 tonnes	Total			EU ETS			Non-EU ETS		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
<b>Total</b>	<b>26 344</b>	<b>27 961</b>	<b>27 739</b>	<b>10 460</b>	<b>11 546</b>	<b>12 396</b>	<b>15 884</b>	<b>16 415</b>	<b>15 343</b>
<b>Energy sector</b>	<b>1 726</b>	<b>1 720</b>	<b>1 703</b>	<b>1 726</b>	<b>1 720</b>	<b>1 703</b>	-	-	-
<b>Transformation sector</b>	<b>5 547</b>	<b>6 500</b>	<b>6 251</b>	<b>5 315</b>	<b>6 251</b>	<b>6 197</b>	<b>232</b>	<b>249</b>	<b>54</b>
<b>Final energy consumption</b>	<b>19 071</b>	<b>19 741</b>	<b>19 785</b>	<b>3 419</b>	<b>3 575</b>	<b>4 496</b>	<b>15 652</b>	<b>16 165</b>	<b>15 289</b>
Transport*	12 164	12 631	13 355	1 055	1 343	2 286	11 110	11 287	11 069
Agriculture and industry	4 705	4 922	4 671	2 364	2 232	2 210	2 340	2 690	2 462
- agriculture, forestry and horticulture	961	927	992	8	4	0	952	922	992
- manufacturing	2 964	3 114	2 784	2 356	2 228	2 210	608	886	574
- other industry	780	881	895				780	881	895
Commercial and public services	526	669	527				526	669	527
Households	1 675	1 519	1 231				1 675	1 519	1 231

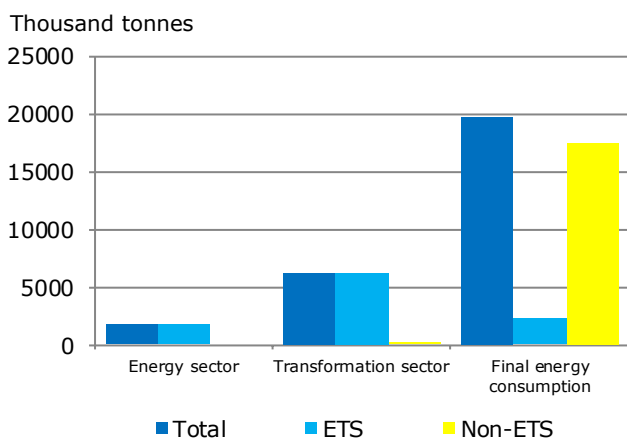
Note 1: The first three columns of figures include CO<sub>2</sub> emissions from oil, natural gas and non-renewable waste.

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). CO<sub>2</sub> emissions from own consumption by waste incineration plants (industry code 383921) have been included under the transformation sector.

\* The CO<sub>2</sub> 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 CO<sub>2</sub> emissions from energy consumption in 2022, EU ETS and non-EU ETS sectors



The share of CO<sub>2</sub> emissions covered by the EU Emissions Trading System (EU ETS) varies considerably from sector to sector.

All emissions in the energy sector (which includes refineries and oil and gas production plants in the North Sea) are covered by the EU ETS. The picture is the same for emissions in the transformation sector (which includes power plants and district heating plants) if disregarding non-renewable waste.

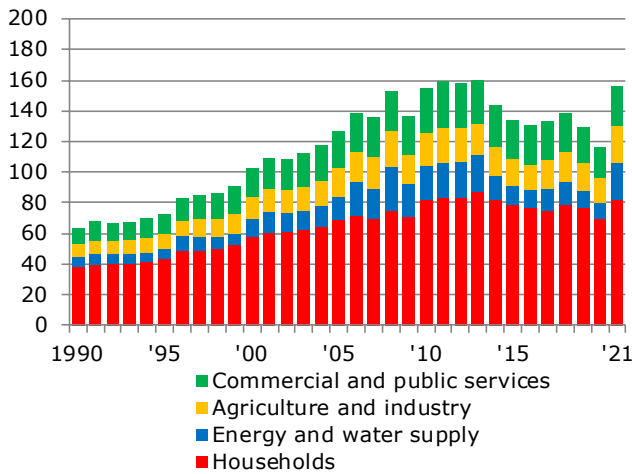
With regard to emissions linked to final energy consumption, i.e. emissions from burning oil, natural gas and coal by enterprises, households and means of transport\*, 23% of these are covered by the EU ETS.

\* The CO<sub>2</sub> 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

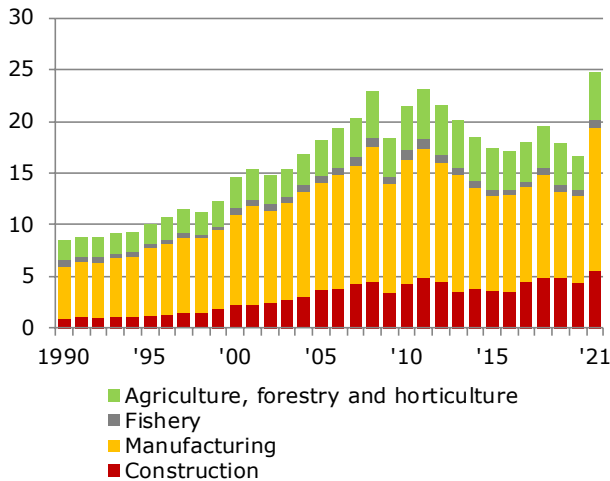


Energy expenses have been calculated based on purchase prices for the year, including taxes and VAT. For industries, as a general rule, a full refund of energy taxes (but not CO<sub>2</sub> taxes) and VAT applies. Total energy expenses by industries and households amounted to DKK 156.3 billion in 2021, which is 34.7% more than the year before. For households energy expenses were DKK 81.8 billion, for agriculture and industry (excluding oil refineries) expenses were DKK 24.7 billion, and for commercial and public services they were DKK 26.0 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 energy prices. Higher costs in 2021 were the result of rising energy prices. Data for 2022 has not been consolidated on the date of publication.

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 14.0 billion) accounted for the major part of the agriculture and industry sector's energy expenses in 2021 (56.5%).

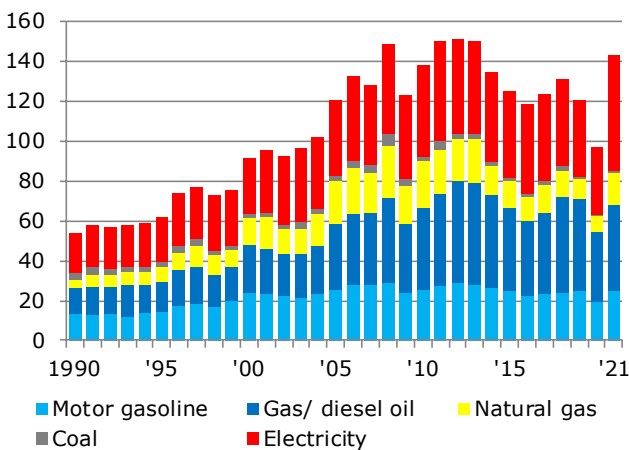
With DKK 5.5 billion (22.2%), construction contributed the second-largest share. The third-largest share was contributed by agriculture, forestry and horticulture with DKK 4.5 billion (18.2%). Finally, with DKK 0.8 billion (3.2%), fishing accounted for the smallest share of energy expenses.

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 were the result of rising energy prices. Data for 2022 has not been consolidated on the date of publication.

Source: Statistics Denmark

**Energy expenses by fuel**

Billion DKK, current prices



Energy expenses include expenses for motor gasoline, gas/diesel oil, natural gas, coal and electricity. These fuels account for almost 53.1% of total energy expenses of DKK 269 billion, when including expenses for foreign bunkering of Danish operated ships and oil refineries.

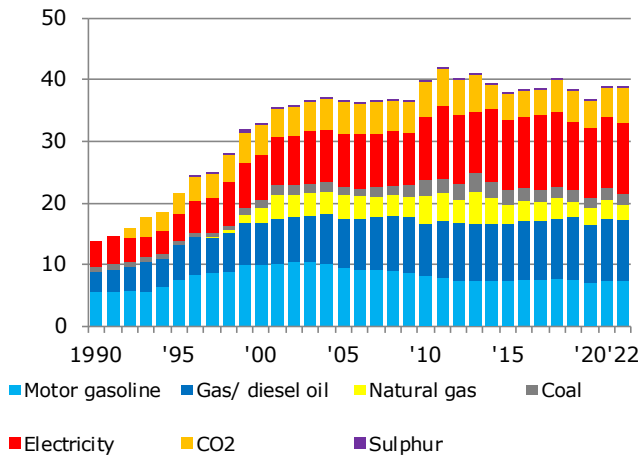
Of these fuels, electricity accounted for the largest share (DKK 57.5 billion) of energy expenses in 2021. Gas/diesel oil accounted for the second-largest share (DKK 43.3 billion).

This is followed by motor gasoline (DKK 25.1 billion), natural gas (DKK 16.1 billion), and coal (DKK 0.9 billion). Data for 2022 has not been consolidated on the date of publication.

Source: Statistics Denmark

### Revenue from energy, CO<sub>2</sub> and sulphur taxes

Billion DKK, current prices



In 2022, revenues from energy taxes in current prices were DKK 38.6 billion, which corresponds to a fall of 0.3% compared with 2021. In addition to energy taxes, revenues include CO<sub>2</sub> and sulphur taxes. The largest contributions to revenues in 2022 came from electricity (DKK 11.5 billion), gas/diesel oil (DKK 9.9 billion), motor gasoline (DKK 7.3 billion) and CO<sub>2</sub> taxes (DKK 5.6 billion).

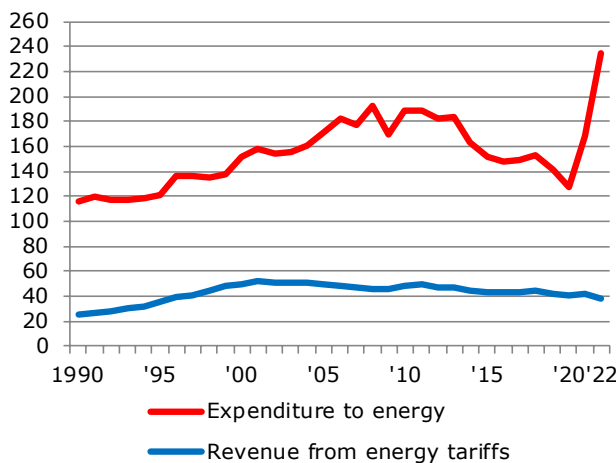
In current prices, 2022 revenues increased by 177% relative to 1990, when there were no tax on CO<sub>2</sub> and sulphur. Gas/diesel oil, electricity and motor gasoline have seen increases of 216%, 167% and 30%, respectively, since 1990.

In 2022, energy, CO<sub>2</sub> and sulphur taxes amounted to 3.2% of total tax revenues in Denmark.

Source: Statistics Denmark

### Energy expenditures and tax revenues, fixed prices

Billion DKK, fixed 2022 prices



To assess changes in energy expenses and tax revenues in relation to general price fluctuations, the figures have been converted to 2022 prices.

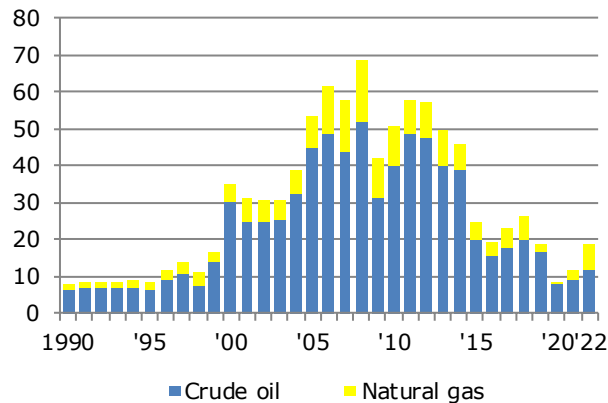
Measured in 2022 prices, energy expenses were 39.6% higher in 2022 than the year before. Compared with 1990, energy expenses increased by 102%.

Revenues from energy taxes in 2022 prices increased by 50.7% from 1990 to 2022.

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 2022 was DKK 18.5 billion, compared with DKK 11.5 billion the previous year. The value of crude oil increased from DKK 8.7 billion to 11.8 billion, and the value of natural gas increased from DKK 2.8 billion to 6.7 billion.

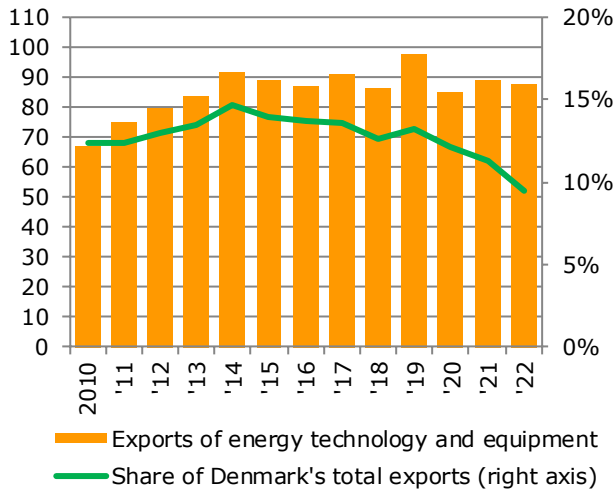
The value of the North Sea production depends on the scale of the production as well as on world market prices. The value of Danish production of natural gas increased by 141% in 2022 compared with 2021, while the value of crude oil production increased by 35.7%. Production fell in 2022 and the increases in value can be attributed to price increases (see page 6).

Source: Danish Energy Agency



**Exports of energy technology and equipment**

DKK billion, current prices



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

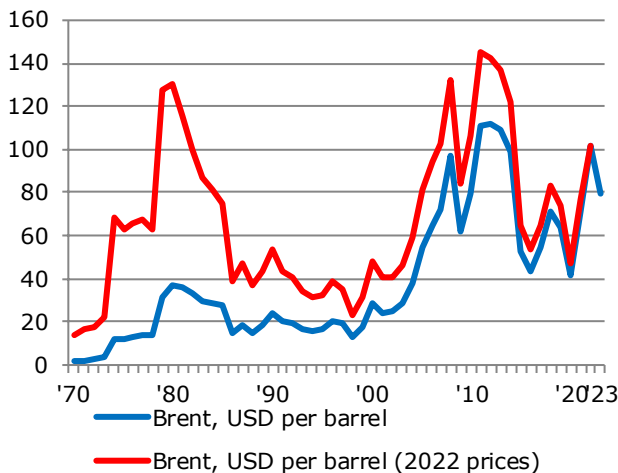
From 2021 to 2022 exports fell by 1.2%. In 2022, Denmark exported energy technologies and equipment at a value of DKK 88 billion, corresponding to 9.5% of total Danish goods exports.

For more information, see the publication on Danish exports of energy technology and energy services 2022 (*Eksport af energiteknologi og -service 2022*), 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**

Brent USD per barrel



\*Prices for 2023 cover only the first six months.

The average crude oil price was USD 101.3 per barrel in 2022. 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 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. 42.9% in 2022 compared with the previous year because of the great demand for oil. The price of oil fell to USD 79.9 during the first half of 2023.

Source: *BP and the World Bank (prices for 2023)*

**CO<sub>2</sub> prices**

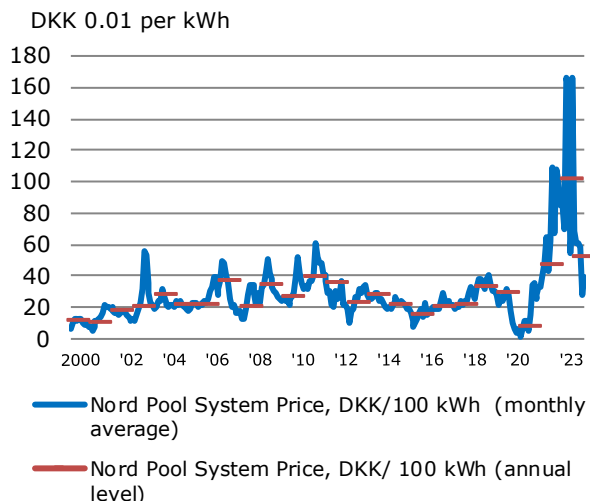
Euro per tonnes



The average allowance price was EUR 80.8 in 2022. The EU ETS allowance price has varied greatly since the beginning of 2008. The allowance price for the period 2008-2012 started to fall in the summer of 2008 as the financial crisis led to expectations for lower energy consumption and fewer emissions in the following years. The allowance price was relatively stable from April 2009 to June 2011. The allowance price fell further after this time in step with an increasing surplus of allowances due to continuing economic slowdown and the steeply falling price of international climate credits. In 2017, an EU agreement was reached on revision of the EU Emissions Trading System Directive (EU ETS) for the period 2021-2030, which included a series of structural reforms aimed at addressing the large surplus of emissions allowances. Since the conclusion of the agreement, the price of emissions allowances has increased significantly.

Source: *Point Carbon and European Energy Exchange*

### Spot market prices for electricity



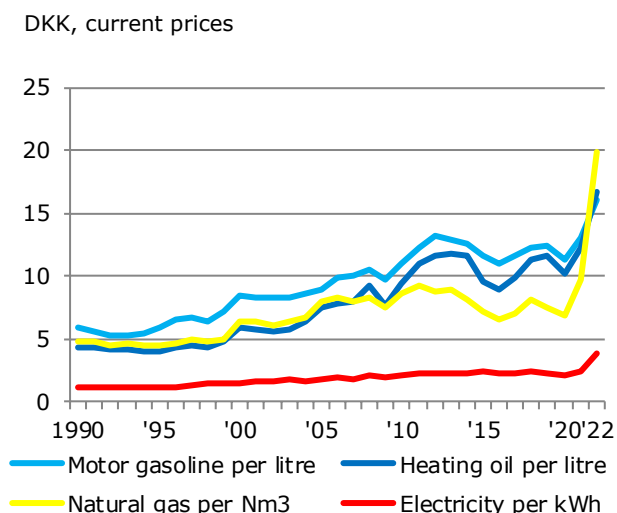
The system price of electricity on Nord Pool is set hour by hour on the basis of supply and demand. The price is affected by a number of factors, including wind, sun, precipitation and temperature. For example, the winter 2010/2011 was affected by concerns over water shortages and increasing electricity consumption in Norway because of low temperatures. 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 electricity price areas.

The average system price of electricity per kWh was DKK 1.85 in 2022, as opposed to DKK 0.4625 in 2021.

In the first half of 2023, the average system price was DKK 0.53 per kWh.

Source: Nord Pool

### Energy prices for households



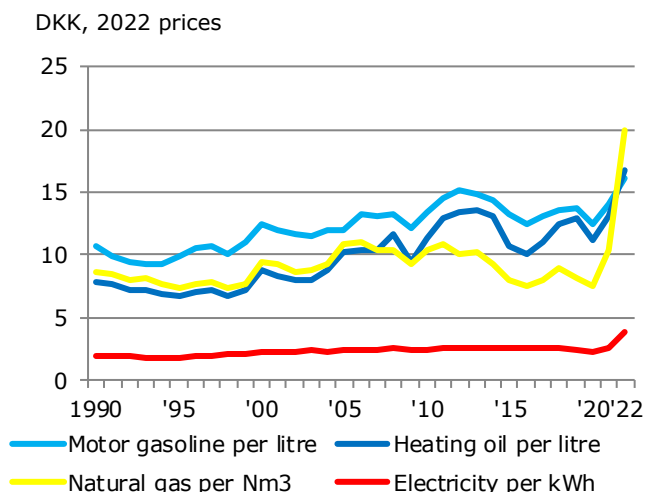
The energy prices shown are annual averages of current consumer prices, i.e. including energy and CO<sub>2</sub> taxes and VAT. 2021 and 2022 saw high energy prices and this was evident in the energy prices for households in particular.

The price of natural gas for households was DKK 19.88 per m<sup>3</sup> in 2022, compared with DKK 9.68 per m<sup>3</sup> the year before, corresponding to an increase of 105.3%. The price of heating oil was DKK 16.71 per litre in 2022, as opposed to DKK 12.19 per litre the year before, corresponding to an increase of 37.1%. In the period 1990-2022, the price increased by 294%. The price of a litre of motor gasoline was DKK 16.14 in 2022, as opposed to DKK 13.05 in 2021, corresponding to an increase of 23.7%. The tax on motor gasoline has varied considerably over time and this has affected the price.

The price of electricity was DKK 3.87 per kWh in 2022, compared with DKK 2.38 kWh in 2021, corresponding to an increase of 62.6%.

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

### Energy prices for households



Household energy prices have been calculated at fixed 2022 prices by adjusting current prices for changes in the general price level as stated in the consumer price index.

Measured in 2022 prices, the price per litre of natural gas increased by 90.7% in 2022 relative to 2021.

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 2022 it was 27.3% higher than in 2021.

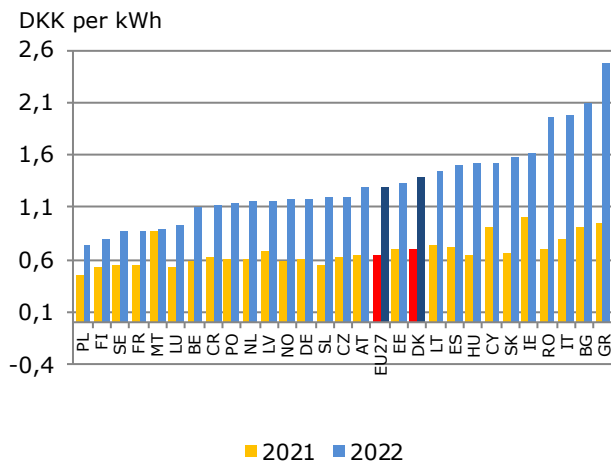
Measured in 2022 prices, the price per litre of motor gasoline increased by 14.9% in 2022 relative to 2021.

The price of electricity in 2022 prices was 51% higher in 2022 than the year before.

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

## ENERGY PRICES

### Electricity prices for industrial customers



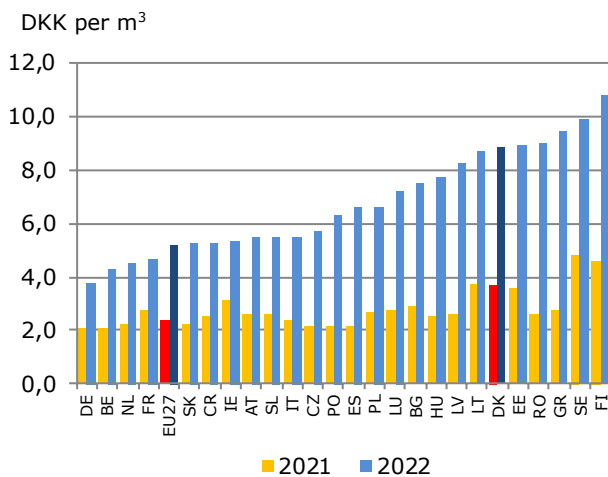
Electricity prices are shown in current prices (DKK per kWh) exclusive of taxes for corporate and industrial customers with annual consumption of between 2 - 20 GWh.

2022 saw increasing prices in all countries. The price of electricity per kWh varied among EU Member States (EU27), from DKK 0.75 in Poland to DKK 2.47 in Greece. Norway had an electricity price of DKK 1.17 per kWh.

The Danish electricity price was DKK 1.38 per kWh in 2022. This was 7.1% higher than the average price in EU27, which was DKK 1.29 per kWh. The 2022 Danish electricity price increased by 98.1% relative to the year before. In EU27, the average electricity price was 102.6% than the year before.

Source: Eurostat

### Natural gas prices for industrial customers



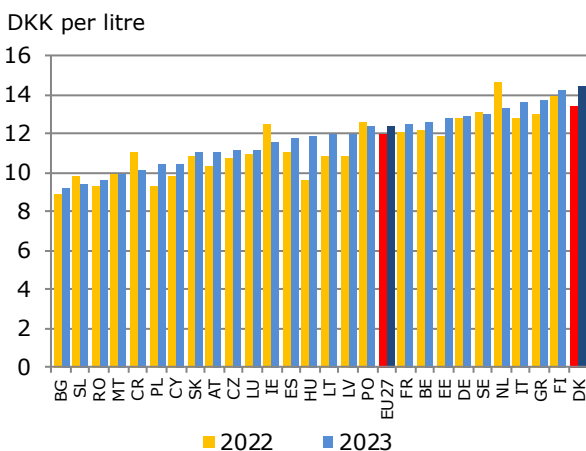
Natural gas prices are shown in current prices (DKK per m<sup>3</sup>) exclusive of taxes for corporate and industrial customers with annual consumption of between 10 - 100 TJ.

In 2022, the price of natural gas per m<sup>3</sup> varied in the EU27, from DKK 3.76 in Germany to DKK 10.78 in Finland. The average EU27 price was DKK 5.23.

In 2022, at DKK 8.81 per m<sup>3</sup>, the Danish price of natural gas was 137% higher than in 2021, while the average EU27 price was 122% higher in 2022 compared to the year before.

Source: Eurostat

### Motor gasoline prices

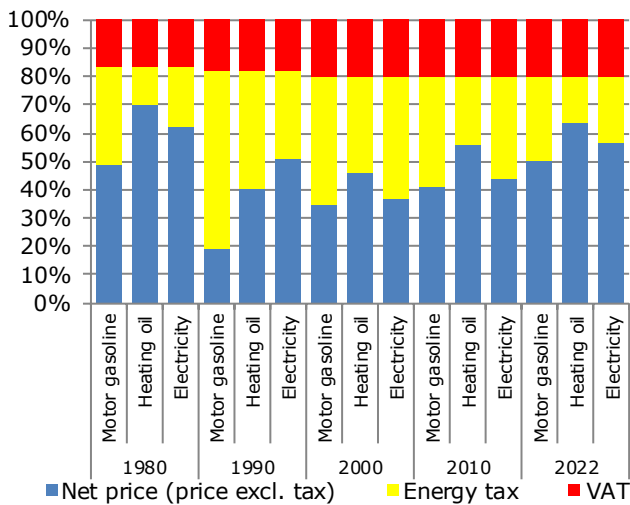


The price of motor gasoline in week 1 in 2022 and 2023, respectively, is shown in current prices (DKK per litre). Prices are for motor gasoline 95 unleaded, including taxes. The average for the EU27 Member States is a weighted average.

In 2023, the lowest price, DKK 9.18 per litre, was in Bulgaria, while the highest price, DKK 14.42, was in Denmark. The average price in the EU27 was DKK 12.44 per litre.

Source: Oil Bulletin, European Commission. The prices cover the first week of 2022 and 2023.

### Composition of energy prices for households



The tax share increased considerably from 1980 to 1990. Since then, the tax share of the consumer price has been falling for motor gasoline and for heating oil. For electricity, the tax share continued to increase up to 2000, after which it went down again. In 2022, the tax share increased for electricity as a result of increasing electricity prices.

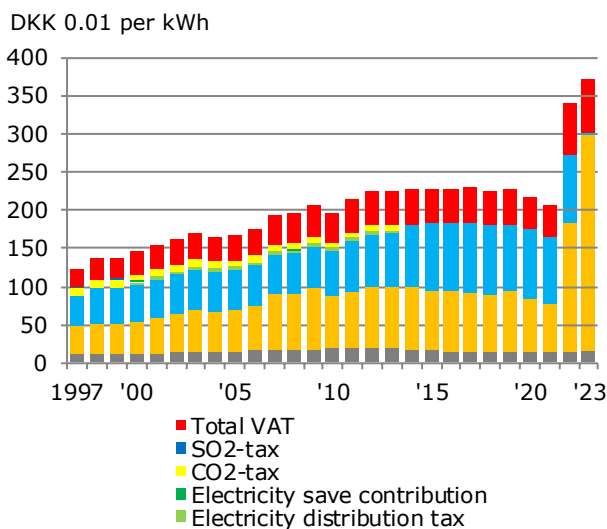
The price of motor gasoline in 2022 of DKK 16.14 per litre was made up as follows: Price exclusive of taxes and VAT 50.4%, taxes 29.6% and VAT 20.0%.

The price of heating oil in 2022 of DKK 16.71 per litre was made up as follows: Price exclusive of taxes and VAT 63.6%, taxes 16.4% and VAT 20.0%.

The price of electricity in 2022 of DKK 3.87 per kWh was made up as follows: Price exclusive of taxes and VAT 56.7%, taxes 23.3% and VAT 20.0%.

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

### Electricity prices for households 1997-2023 (as of 1 January), consumption of 4000 kWh



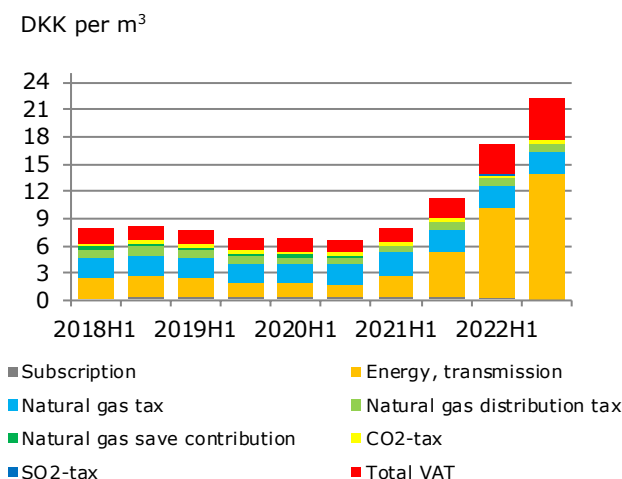
In January 2023, the average price of electricity for household customers with an annual consumption of 4,000 kWh was DKK 3.73 per kWh. This represents an increase of 9.5% from the year before. The electricity price has increased by 79.6% since January 2021.

Taxes and VAT in total amounted to DKK 0.76 per kWh in 2023, as opposed to DKK 1.55 per kWh in 2002. Before 2014 there were the following types of taxes: electricity tax, electricity distribution tax, electricity-savings contribution, CO<sub>2</sub> (energy-savings tax) and VAT. From 2014, there has only been electricity tax and VAT. The electricity price fell to DKK 0.008 per kWh in the first half of 2023.

The price of energy per kWh (including PSO and electricity transmission) was DKK 2.82 in 2023, as opposed to DKK 0.46 in 2001, while subscription costs per kWh were DKK 0.16 in 2023, which is slightly higher than in 2001.

Source: Danish Energy and Danish Utility Regulatory

### Natural gas prices for households 2018H1-2023H1



The natural gas price for households is shown in current prices (DKK per m<sup>3</sup>).

The natural gas price followed a downward trend in 2019 and 2020. Since the first half of 2021, the natural gas price has increased.

The average price of natural gas for households in the second half of 2022 was DKK 22.5 per m<sup>3</sup>. The price has more than doubled since the second half of 2021. The price increases at the time were the result of a rapid increase in the demand for energy in the wake of the Covid-19 pandemic, combined with unfavourable weather conditions for energy production with less wind and rainfall (for hydro) in the Nordic countries, as well as the cut-off of gas imports from Russia.

Source: Danish Energy Agency

## Energy consumption in EU27 and other countries 2021 - by share of renewable energy

	Energy consumption <sup>1)</sup> , PJ	Share in percentage						Net import of electricity
		Oil	Natural gas	Coal	Nuclear power	Renewable energy and waste <sup>2)</sup>	Waste, non-renewable	
Sweden	1984	20	2	3	26	50.8(62.6)	2	-5
Latvia	192	33	21	0	0	41.6(42.1)	1	3
Denmark	712	35	11	7	0	41.5(34.7)	3	2
Finland	1412	22	6	6	17	40.7(43.1)	1	5
Austria	1429	35	23	7	0	31.4(36.4)	1	2
Portugal	902	42	23	1	0	30.8(34)	0	2
Estonia	193	-2	9	0	0	28.6(38)	1	5
Croatia	364	34	28	5	0	28.9(31.3)	0	4
Lithuania	333	37	24	2	0	23.6(28.2)	1	10
Italy	6433	33	41	4	0	19.4(19)	1	2
Romania	1436	31	29	12	8	18.6(23.6)	0	1
Slovenia	274	33	12	14	21	19.2(25)	0	0
EU27	59522	32	24	11	13	17.7(21.8)	1	0
Spain	4966	42	25	3	12	17.3(20.7)	0	0
Germany	12388	33	26	18	6	15.7(19.2)	1	-1
Greece	901	47	25	8	0	17.8(21.9)	0	1
Bulgaria	808	24	15	27	22	15.1(17)	0	-4
Slovakia	745	21	26	16	23	13.1(17.4)	0	0
Ireland	599	47	31	6	0	11.5(12.5)	1	1
France	10125	28	15	4	41	12.7(19.3)	1	-2
Czech republic	1791	22	18	30	18	12.9(17.7)	0	-2
Poland	4589	29	17	42	0	11.9(15.6)	0	0
Cyprus	101	84	0	2	0	12.3(18.4)	1	0
Hungary	1146	30	34	5	15	11.8(14.1)	0	4
Luxembourg	177	61	16	1	0	9.6(11.7)	0	12
Belgium	2378	38	27	5	22	9(13)	1	-1
Netherlands	3113	38	41	8	1	10.7(13)	1	0
Malta	33	47	40	0	0	7.2(12.2)	0	6
Norway	1244	29	17	3	0	54.4(74.1)	1	-5
UK	6646	32	41	4	8	12.5	1	1
USA	89555	43	34	12	10	8.4	0	0
Japan	16731	32	22	27	5	7.2	0	0

<sup>1)</sup> 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.

<sup>2)</sup> 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. The results for 2021 are under review.

<sup>3)</sup> 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 2021

	Consumption of renewable energy and waste, PJ	Share in percentage					
		Hydro	Wind	Solar	Geo-thermal	Biomass, incl. waste	Biofuels
Sweden	1009	26.4	9.7	0.6	0.0	47.1	8.5
Latvia	80	12.2	0.6	0.1	0.0	84.4	2.6
<b>Denmark</b>	<b>296</b>	<b>0.0</b>	<b>19.5</b>	<b>2.6</b>	<b>0.0</b>	<b>68.0</b>	<b>4.0</b>
Finland	574	10	5	0	0	73.7	5.6
Austria	448	31.1	5.4	3.9	0.3	50.6	3.0
Portugal	278	15.4	17.1	4.5	2.5	44.1	4.6
Estonia	55	0.1	4.8	2.3	0.0	89.3	0.0
Croatia	105	24.4	7.1	1.2	2.0	61.1	2.3
Lithuania	78	1.8	6.2	0.9	0.0	81.0	6.6
Italy	1251	13.1	6.0	8.0	17.6	39.6	7.4
Romania	268	23.4	8.8	2.3	0.4	57.3	7.8
Slovenia	53	32.2	0.0	3.9	0.9	50.0	7.6
<b>EU27</b>	<b>10528</b>	<b>11.9</b>	<b>13.2</b>	<b>7.2</b>	<b>2.7</b>	<b>51.3</b>	<b>7.4</b>
Spain	859	12.4	26.0	20.7	0.0	28.7	6.9
Germany	1944	3.6	21.2	10.7	0.9	53.4	6.9
Greece	161	13.2	23.5	19.7	0.1	25.6	7.0
Bulgaria	122	14.2	4.2	5.3	1.2	64.8	5.8
Slovakia	97	15.7	0.0	2.9	0.3	71.1	7.9
Ireland	69	3.9	51.2	1.3	0.0	29.8	7.1
France	1289	16.7	10.3	5.0	1.5	44.0	10.3
Czech republic	230	3.8	0.9	4.0	0.0	79.9	7.2
Poland	548	1.5	10.7	3.2	0.2	72.9	8.0
Cyprus	12	0.0	7.1	39.0	0.0	28.9	3.8
Hungary	136	0.6	1.8	10.5	4.8	72.7	5.4
Luxembourg	17	2.3	6.6	4.5	0.0	51.3	0.0
Belgium	214	0.7	20.1	9.9	0.1	50.2	15.3
Netherlands	333	0.1	19.5	12.8	1.9	52.2	12.2
Malta	2	0.0	0.0	47.4	0.0	5.0	19.2
Norway	677	76.5	6.3	0.1	0.0	9.1	2.5
UK	829	2.4	28.1	5.5	0.0	57.0	7.0
USA	7497	12.2	18.4	9.1	5.3	29.7	21.5
Japan	1206	23.5	2.8	26.2	9.4	30.4	1.6

<sup>1)</sup>The UK is excluded from EU27.

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

## Key figures 2021 – 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	2021
<b>Estonia</b>	96	0	0	145	94	384	224
<b>Sweden</b>	75	0	0	191	139	149	107
<b>Romania</b>	67	31	75	75	58	400	187
<b>Bulgaria</b>	63	0	1	117	65	692	405
<b>Latvia</b>	59	0	0	101	90	273	196
<b>Finland</b>	58	0	0	255	195	189	165
<b>Czech Republic</b>	57	1	2	171	113	363	222
<b>Denmark</b>	56	55	65	122	103	88	60
<b>Poland</b>	55	3	18	121	89	353	209
<b>France</b>	54	1	0	150	94	140	109
<b>Slovenia</b>	50	0	1	130	98	225	148
<b>Croatia</b>	45	21	26	90	76	241	163
<b>EU27</b>	42	4	11	133	96	151	117
<b>Slovakia</b>	39	0	1	136	91	410	205
<b>Hungary</b>	39	13	13	118	91	306	206
<b>Austria</b>	37	5	7	160	134	104	103
<b>Netherlands</b>	36	4	51	178	135	157	117
<b>Germany</b>	35	3	5	149	110	135	101
<b>Portugal</b>	32	0	0	88	69	149	120
<b>Belgium</b>	31	0	0	206	148	197	154
<b>Spain</b>	31	0	0	105	74	149	113
<b>Lithuania</b>	28	1	0	119	100	367	196
<b>Greece</b>	24	1	0	84	59	173	124
<b>Italy</b>	24	10	4	109	84	106	99
<b>Ireland</b>	21	0	29	120	95	101	41
<b>Cyprus</b>	10	0	0	113	76	186	116
<b>Luxembourg</b>	7	0	0	279	229	106	78
<b>Malta</b>	6	0	0	65	44	243	232
<b>Norway</b>	721	1 110	2 010	231	177	97	78
<b>UK</b>	63	85	43	98	74	115	0
<b>USA</b>	104	79	112	271	195	0	0
<b>Japan</b>	13	0	2	133	89	0	0

<sup>1)</sup>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	2020	2021	2022 <sup>2)</sup>	Change '90 - '22
<b>Oil reserves<sup>1)</sup>, 1000 million barrels</b>									
<b>The world</b>	<b>1001</b>	<b>1301</b>	<b>1372</b>	<b>1637</b>	<b>1684</b>	<b>1732</b>			<b>73.1%</b>
North America	101	237	223	220	229	243			140%
South and Central America	71	96	101	320	323	323			356%
Europe and Eurasia	76	141	139	158	155	160			111%
Middle East	660	697	756	766	803	836			26.7%
Africa	59	93	112	125	128	125			113%
Asia and the Pacific	35	38	41	48	47	45			30.3%
<b>Oil production, million tonnes</b>									
<b>The world</b>	<b>3 158</b>	<b>3 598</b>	<b>3 932</b>	<b>3 978</b>	<b>4 365</b>	<b>4 175</b>	<b>4 230</b>	<b>4 407</b>	<b>39.6%</b>
North America	655	643	638	639	911	1 060	1 078	1 131	72.8%
South and Central America	234	345	375	379	411	306	305	327	39.5%
Europe and Eurasia	788	728	849	860	851	828	837	830	5.3%
Middle East	837	1 129	1 223	1 209	1 407	1 297	1 316	1 442	72.2%
Africa	318	371	465	487	386	331	345	332	4.6%
Asia and the Pacific	326	382	383	403	399	353	349	346	6.0%
<b>Oil stocks<sup>*)</sup>, million tonnes</b>									
<b>The OECD</b>	<b>217</b>	<b>212</b>	<b>209</b>	<b>216</b>	<b>225</b>	<b>222</b>	<b>196</b>	<b>199</b>	<b>-8.3%</b>
North America	90	75	78	84	87	81	73	73	-18.5%
Europe	106	110	108	109	114	116	100	101	-4.3%
Pacific	22	27	22	22	24	25	24	25	14.3%
<b>Oil consumption, million tonnes</b>									
<b>The world</b>	<b>3 147</b>	<b>3 578</b>	<b>3 907</b>	<b>3 988</b>	<b>4 235</b>	<b>4 038</b>	<b>4 260</b>	<b>4 395</b>	<b>39.6%</b>
North America	926	1 064	1 134	1 016	1 008	901	981	1 016	9.7%
South and Central America	168	234	247	279	301	241	270	286	70.2%
Europe and Eurasia	1 141	932	959	898	866	802	840	872	-23.6%
Middle East	164	236	291	347	395	359	378	414	152.6%
Africa	95	117	137	162	182	167	182	192	102.8%
Asia and the Pacific	654	995	1 139	1 286	1 483	1 568	1 609	1 615	147.0%
<b>Total energy consumption, Mtoe</b>									
<b>The world</b>	<b>8 220</b>	<b>9 489</b>	<b>10 989</b>	<b>12 152</b>	<b>13 074</b>	<b>13 530</b>	<b>14 269</b>	<b>14 427</b>	<b>75.5%</b>
North America	2 316	2 742	2 814	2 737	2 750	2 620	2 752	2 837	22.5%
South and Central America	344	500	554	641	705	640	691	719	109.1%
Europe and Eurasia	3 260	2 865	3 007	2 985	2 876	2 794	2 954	2 822	-13.4%
Middle East	257	410	546	701	835	866	896	935	263.7%
Africa	224	275	326	383	434	453	482	484	115.8%
Asia and the Pacific	1 820	2 697	3 744	4 706	5 474	6 157	6 493	6 630	264.4%
<b>Oil dependency, %</b>									
<b>The world</b>	<b>38</b>	<b>38</b>	<b>36</b>	<b>33</b>	<b>32</b>	<b>30</b>	<b>30</b>	<b>30</b>	
North America	40	39	40	37	37	34	36	36	
South and Central America	49	47	45	43	43	38	39	40	
Europe and Eurasia	35	33	32	30	30	29	28	31	
Middle East	64	58	53	50	47	41	42	44	
Africa	42	43	42	42	42	37	38	40	
Asia and the Pacific	36	37	30	27	27	25	25	24	

1) Crude oil, at the end of the year

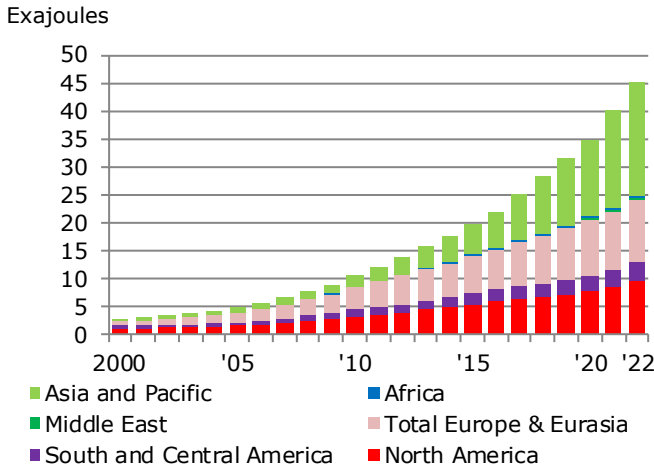
2) 2021 and 2022 was not available at the date of publication

\*) At the end of the year

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



### Consumption of renewable energy



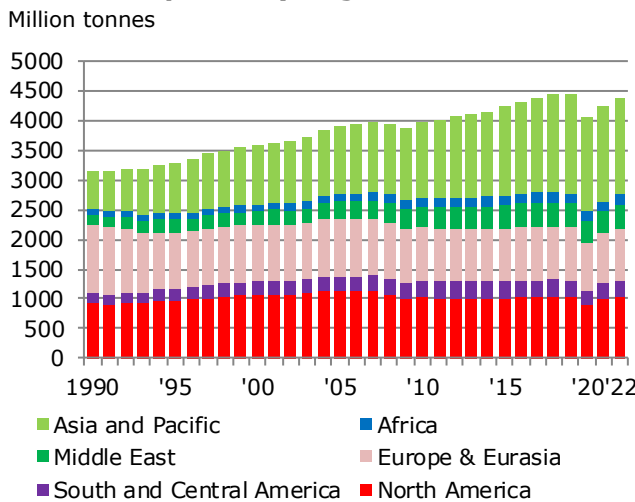
Renewable energy has seen increasing consumption, from around 3 Exajoules in 2000 to more than 45 Exajoules in 2022.

In 2022, Asia and the Pacific accounted for 45% of world renewable energy consumption and for 46% of total world energy consumption. Europe and Eurasia, and North America accounted for 25% and 21%, respectively, of world renewable energy consumption. South and Central America accounted for 8%, and Africa and the Middle East for 1% for each.

World renewable energy consumption increased by 13.1% from 2021 to 2022. The increase in consumption was greatest in the Middle East, with 23.8%. Consumption of renewable energy increased by 17.2% in Asia and the Pacific, and by 11.3% in North America. Renewable energy consumption in Europe and Eurasia increased by 9.5% from 2021 to 2022.

Source: BP Statistical Review of World Energy

### Oil consumption by region



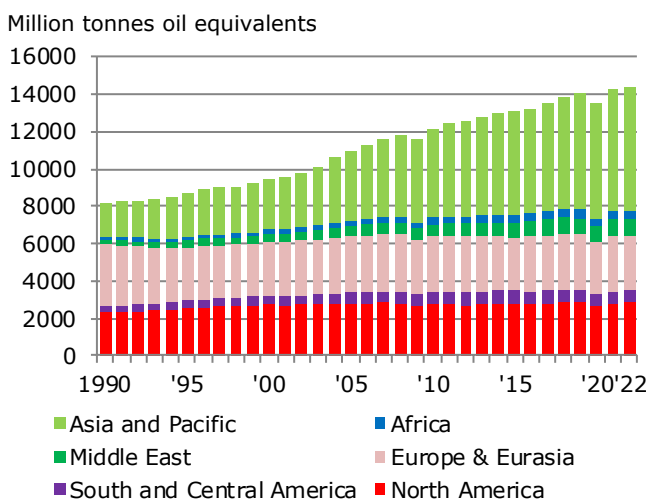
In 2022, total world oil consumption was 4.4 billion tonnes, which is 3.2% more than the year before. A total of 23.1% of this oil was consumed in North America, which accounted for 25.7% of world crude oil production. Europe and Eurasia accounted for 19.8% of oil consumption and 18.8% of crude oil production. Neither North America nor Europe and Eurasia are self-sufficient in oil, as their consumption is greater than their production.

Asia and Pacific's share of consumption was 36.8% in 2022, the Middle East's share was 9.4%, South and Central America's share was 6.5%, while Africa's share was 4.4%.

Total world oil consumption made up 30.5% of total world energy consumption in 2022, which is on a par with consumption 2021. For Europe and Eurasia, this figure was 30.9%, as opposed to 28.4% in 2021.

Source: BP Statistical Review of World Energy

### Energy consumption by region



World energy consumption was 14.43 billion tonnes oil equivalents in 2022, which is 1.1% higher than in 2021. Except for in 2009 and 2020, world consumption increased steadily over the period 1990-2022. The fall from 2008 to 2009 was due to economic recession, especially in North America and in Europe and Eurasia. The drop in 2020 is attributable to the unusual circumstances created by the Covid-19 pandemic.

In 2022, energy consumption increased in all regions, except for in Europe and Eurasia where consumption fell by 4.5%. The increase was largest in South and Central America and in Asia and Pacific, which saw increases of around 4.1% and 4.3%, respectively.

Asia and Pacific accounted for 46% of total world energy consumption and Europe and Eurasia and North America accounted for 19.6% and 19.7%, respectively.

Source: BP Statistical Review of World Energy

<b>Adjustments for trade in electricity</b>	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.
<b>Agriculture and industry</b>	Includes agriculture, forestry, horticulture, fishing, manufacturing and construction.
<b>Autoproducers</b>	Producers of electricity and/or district heating, whose primary activity is not transformation, e.g. manufacturing companies, horticulture or waste treatment facilities.
<b>Bitumen</b>	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.
<b>Border trade with oil products</b>	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.
<b>CO<sub>2</sub> emissions</b>	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.
<b>Calorific value</b>	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.
<b>Climate adjustment</b>	Energy consumption for heating in Denmark is somewhat dependent on outdoor temperature, which varies from year to year. A measurement of climatic variations is "degree days", registered by the Danish Meteorological Institute (DMI). The number of "degree days" is calculated as the sum of the days when the mean outdoor temperature is below 17 degrees Celsius multiplied by the difference between 17 degrees Celsius and the mean temperature of the 24-hour period. The climate-adjusted energy consumption for heating purposes is therefore the consumption that would have taken place, had the year been a normal weather year. From the 2005 statistics, the "degree days" of a normal weather year have been fixed as the moving average of degree days in the last twenty years. This causes the amount of degree days to show a declining tendency when looking over a longer period of years. However, some of the fuel consumption for heating purposes is independent of outdoor climate, for example heating of water, heat loss from installations and grids etc. This varies according to types of industry and fuel. As a general rule, it is assumed that 65 % of fuel consumption in households as well as the service sector and 50 % in manufacturing are dependent on "degree days". For each sector, the individual fuels have specific values for heating purposes.
<b>Combined heat and power production (CHP)</b>	Simultaneous production of electricity and heat.
<b>Commercial and public services</b>	Includes wholesale, retail, private services and public services. Public services are limited to administration and services available to society on non-market terms.
<b>Condensing production of electricity</b>	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.
<b>Consumption in distribution</b>	Consumption of electricity in connection with electricity, district heating and gas works gas supply.
<b>Consumption in production/own use</b>	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.
<b>Degree of self-sufficiency</b>	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.
<b>Direct energy content</b>	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.
<b>Distribution loss</b>	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

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<b>Electricity capacity</b>	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.
<b>Electricity intensity</b>	Electricity consumption in relation to gross domestic product (GDP) or gross value added (GVA) at 2010 prices, chained values.
<b>Electricity plant coal</b>	Hard coal used in Danish power plants.
<b>Energy consumption, observed</b>	Registered energy consumption for a given calendar year.
<b>Energy intensity</b>	Energy consumption in relation to gross domestic product (GDP) or gross value added (GVA) at 2010 prices, chained values.
<b>Extraction and refining</b>	Production of natural gas and crude oil and the processing of crude oil and refinery feedstocks.
<b>Final energy consumption</b>	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.
<b>Fuel equivalent</b>	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.
<b>Gas/diesel oil</b>	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.
<b>Gas works gas</b>	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.
<b>Geothermal energy</b>	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.
<b>Gross domestic product (GDP)</b>	The total market value of all final goods and services produced within the borders of a nation during a specified period.
<b>Gross energy consumption</b>	Observed energy consumption adjusted for fuel consumption related to foreign trade in electricity. See "Adjustments for trade in electricity" above.
<b>Gross energy consumption, adjusted</b>	Observed gross energy consumption adjusted for climatic variations in relation to a normal weather year.
<b>Gross value added (GVA)</b>	Equal to GDP at base prices and calculated for the individual enterprise as production at base prices minus production-related consumption at purchasing prices.
<b>Heat pumps</b>	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.
<b>Imports and exports</b>	Imports and exports refer to goods that have crossed national borders. Greenland and the Faroe Islands are regarded as abroad.
<b>International marine bunkers</b>	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.
<b>Joule</b>	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).
<b>JP1 (Kerosene type jet fuel)</b>	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.
<b>Large-scale power plants</b>	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.
<b>LNG</b>	Liquefied Natural Gas. Use as a fuel. In Denmark LNG is kept secret with a rounded figure.
<b>LPG</b>	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.

<b>LVN</b>	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.
<b>Manufacturing</b>	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.
<b>Non-energy use</b>	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.
<b>Orimulsion</b>	Type of heavy oil emulsified in water. It comes from the area around the Orinoco River in Venezuela.
<b>Petroleum coke</b>	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.
<b>Primary production</b>	Production of crude oil, coal, natural gas, renewable energy etc.
<b>PSO</b>	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 <sub>2</sub> taxes.
<b>Recycling</b>	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.
<b>Refinery feedstocks</b>	Processed oil destined for further processing, products in a stage between raw materials and finished products.
<b>Refinery gas</b>	The lightest fractions obtained in the distillation of crude oil. Refinery gas is non-condensable at normal atmospheric pressure. Primarily used as refinery fuel.
<b>Renewable energy</b>	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.
<b>Renewable energy etc.</b>	Renewable energy etc. is defined as "renewable energy" including non-renewable wastes.
<b>Revision of energy statistics</b>	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.
<b>Small-scale combined heat power (CHP) plants</b>	Plants not included in the list of large-scale power plants, where the production of power and heat is the main activity.
<b>Statistical difference</b>	The difference between calculations of energy consumption based on different sources, which theoretically ought to produce identical results.
<b>Structure effect</b>	Changes in energy consumption owing to shifts in the structure of industry.
<b>Surplus heat</b>	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.
<b>Thermal electricity generation</b>	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.
<b>Total energy supply</b>	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> .
<b>Transformation</b>	Production of electricity, district heating and gas works gas.
<b>Transformation loss</b>	Difference between total input and output in the transformation process.
<b>Transport</b>	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.
<b>Volume weight</b>	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 <sup>3</sup> .
<b>Waste oil</b>	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	2020	2021	2022	'90-'22
Energy intensity, gross energy consumption [TJ per million GDP]	0.636	0.500	0.474	0.450	0.391	0.339	0.334	0.307	-51.7
Energy intensity, final energy consumption [TJ per million GDP]	0.469	0.388	0.372	0.350	0.319	0.280	0.275	0.260	-44.5
Gross energy consumption per capita [GJ]	159	157	157	147	133	121	125	118	-25.8
Final energy consumption per capita [GJ]	118	122	123	114	109	100	103	100	-14.7
Degree of self-sufficiency [%]	52	139	154	120	90	56	55	60	15.1
Oil consumption - share of gross energy consumption [%]	43	45	41	38	37	34	34	38	-13.1
Renewable energy - share of gross energy consumption [%]	5.8	9.6	14.5	20.0	28.6	40.1	42.6	43.2	641
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	15 164	16 192	17 597	92.9
Wind turbine capacity – share of total electricity capacity [%]	3.6	19.0	23.9	28.3	36.3	41.3	43.3	40.3	1027
Net electricity import - share of domestic supply [%]	22.5	1.9	3.8	-3.2	17.5	19.8	13.2	3.8	•
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	65	66	11.5
Renewable electricity - share of total domestic electricity supply [%]	2.6	15.9	27.4	34.8	56.0	68.0	71.9	81.4	3029
CO <sub>2</sub> emission per capita [tonnes]	11.9	10.4	9.7	8.5	6.9	5.2	5.1	4.9	-59.0
CO <sub>2</sub> emissions per GDP [tonnes per million GDP]	47	33	29	26	20	15	14	13	-73.3
CO <sub>2</sub> emissions per fuel unit [kilogram per GJ]	75	66	62	58	52	46	43	41	-44.7
CO <sub>2</sub> emissions per kWh electricity sold [gram per kWh]	929	632	537	505	350	231	206	162	-82.5
CO <sub>2</sub> emissions per consumed unit of district heating [kilogram per GJ]	62	43	39	33	32	20	15	17	-72.5

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 CO<sub>2</sub> content in 2022

	Calorific values	CO <sub>2</sub> emissions factors
	GJ/ton	Kg/GJ
Crude oil/ North Sea	43.00	
Refinery feedstocks	42.70	
Refinery gas	52.00	56.49
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	79.15
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 <sup>3</sup>	37.41	56.38
Gas works gas/1000 m <sup>3</sup>	20.84	
Coal in electricity plants	23.75	93.94
Other hard coal	26.03	93.94
Coke	29.30	107.00
Brown coal briquettes	18.30	97.50
Straw	14.50	
Wood chips	10.40	
Firewood. hard wood GJ/m <sup>3</sup>	10.40	
Firewood. soft wood GJ/m <sup>3</sup>	7.60	
Wood pellets	17.50	
Wood waste	14.70	
Wood waste. GJ/m <sup>3</sup> loose volume	3.20	
Biogas, GJ/1000 m <sup>3</sup>	23.00	
Bio methane (GJ/1000 m <sup>3</sup> )	37.41	
Waste	10.60	
Biodiesel	37.50	
Bioethanol	26.70	
Bio oil	37.20	

Climate adjustments

Year	Degree days	
	Specific year	Normal year
2015	2921	3112
2016	2998	3070
2017	2970	3057
2018	2900	3041
2019	2847	3030
2020	2715	3021
2021	3098	3012
2022	2834	3003

Tax rates in 2022

	Energy taxes	CO <sub>2</sub> taxes
<b>Transport</b>		
Motor gasoline (DKK 0.01 per l)	522.7	43.0
Light diesel oil (DKK 0.01 per l)	315.9	47.5
Low-sulphur diesel oil (DKK 0.01 per l)	280.4	44.3
<b>Other uses</b>		
LPG (DKK 0.01 per l)	191.2	28.9
Other kerosene (DKK 0.01 per l)	315.9	47.5
Heating diesel oil (DKK 0.01 per l)	226.1	47.5
Fuel oil (DKK 0.01 per kg)	256.1	56.8
Petroleum coke (DKK 0.01 per l)	315.9	47.5
Natural gas (DKK 0.01 per Nm <sup>3</sup> )	249.6	40.5
Electricity plant coal (DKK per tonne)	1765	476.5
Coke (DKK per tonne)	2081	543.9
Brown coal (DKK per tonne)	1198	323.4
Electricity (DKK 0.01 per kWh)	90.3	
Electricity for space heating <sup>1)</sup> (DKK 0.01 per kWh)	0.8	

<sup>1)</sup> For consumption of more than 4000 kWh per year in households.

Source: Ministry of Taxation

Volume weights in 2022

	tonne/m <sup>3</sup>
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?

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Here you can find:

## Energy Statistics 2022

- Publications as pdf
- Figures in PowerPoint
- Time series and tables
- Denmark's energy flows 2022

## Data

- Monthly energy statistics
- Wind turbine data

## Maps

- Electricity generation and transmission
- Heat supply

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