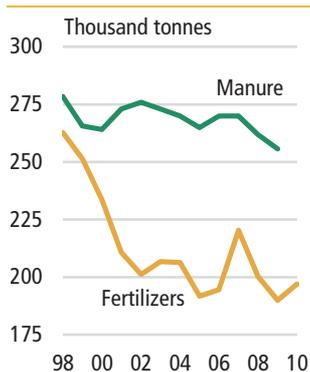


Environment and energy

1

Agriculture

Figure 1
Nitrogen in manure
and commercial ferti-
zers



www.statbank.dk/kvael2 og kvael3

Small increase in the use of fertilizers in agriculture

Agricultural production of animal and vegetable products involves the use of manure and commercial fertilizers. This causes large quantities of nitrogen and small quantities of phosphorus to be discharged into the soil. Some nitrogen and phosphorus are not received by plants and as a consequence is leached from the soil, leading to a discharge of these substances into the ocean via water run-offs.

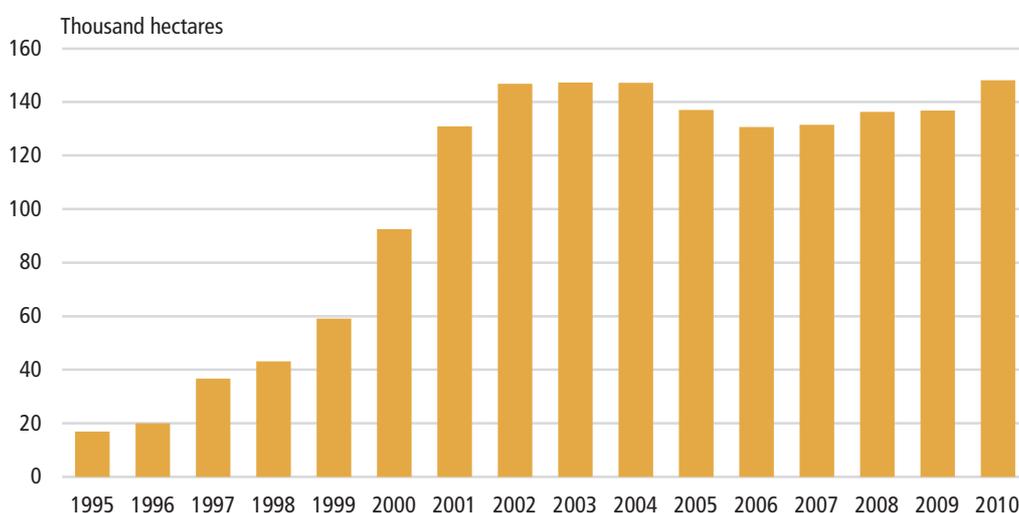
The adverse effects include undesirable algae growth, resulting in an undesirable environmental state. As a result of restrictions in the total supply of nitrogen plus a better utilization of manure, the use of commercial fertilizer has been declining since the nineties.

More organic farmland

The proportion of organic farmland has increased significantly since 1995, where organic farmland accounted for 17,000 ha. In recent years, the growth in organic farmland has been both decreasing and increasing and accounted for 148,000 hectares in 2010, corresponding to 6 per cent of all Danish farmland.

The number of organic farms has increased from 1,100 in 1995 to 2,700 in 2010.

Figure 2 Total area extent of organic farms



www.statbank.dk/oeko1

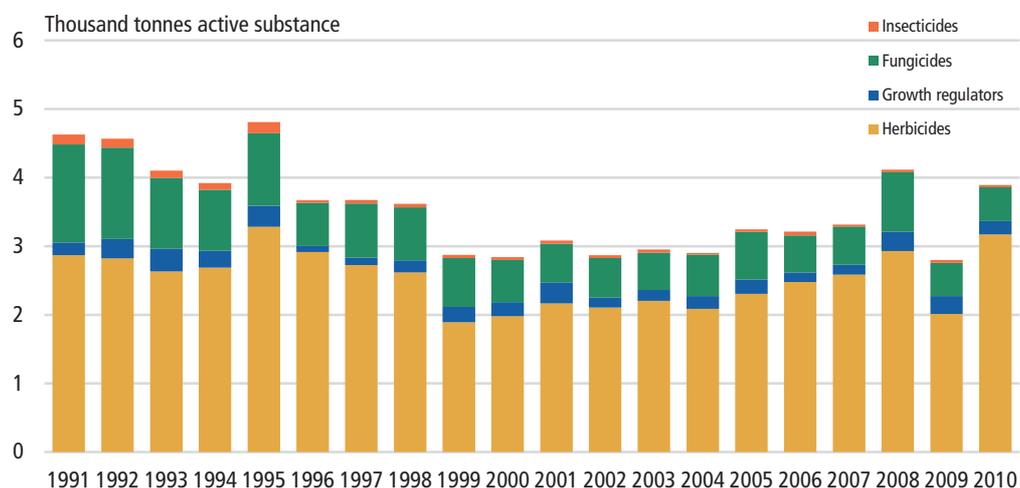
Control of weeds, pests, and fungi is harmful for the environment

Pesticides are chemical products mainly used within agriculture to control weeds, fungi, and insects. Effective control of pests, weeds, and fungi in fields has had an indirect effect on the number of animals that feed on insects.

The effect might be fatal or entail a reduction in the reproductive abilities of the relevant animals. Pesticides are divided into products that protect crops against

weeds (herbicides), against fungus infection (fungicides), and against insects (insecticides). There are also products that shorten crops (growth regulators). For a number of years, the use of pesticides has been declining. In recent years considerable variations have been observed. This is partly due to variations in sales prices.

Figure 3 Pesticide sales to agriculture



www.statbank.dk/pest1

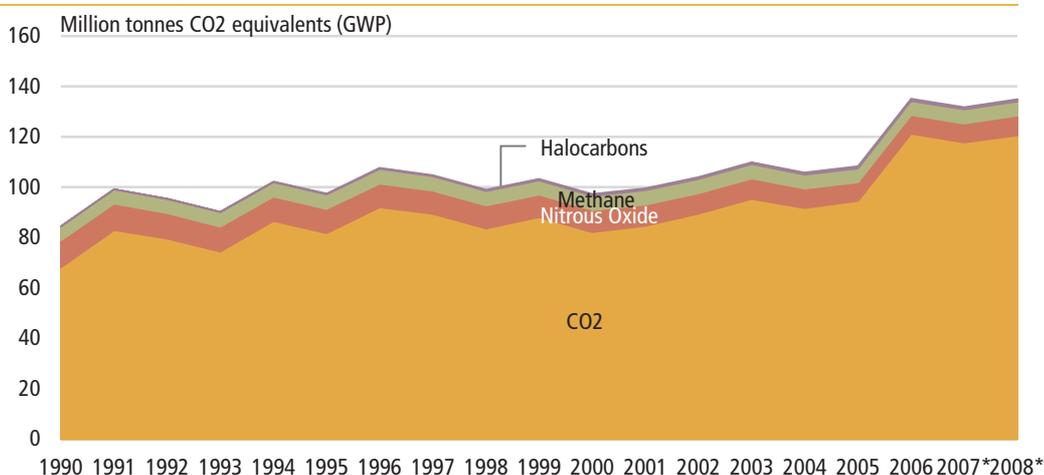
2

Greenhouse Gas Emissions

Greenhouse gases

89 per cent of the global warming potential from Danish greenhouse gases came from CO₂ in 2008. Methane accounted for 4 per cent, while nitrous oxide contributed 6 per cent. The emissions of halocarbons constituted less than 1 per cent of the total Danish global warming potential. By converting the emissions into CO₂-equivalents account have been taken for the fact that the effects of the substances on the atmosphere, and, thus, their global warming potentials, are different.

Figure 4 Greenhouse gas emissions from Danish economic activities



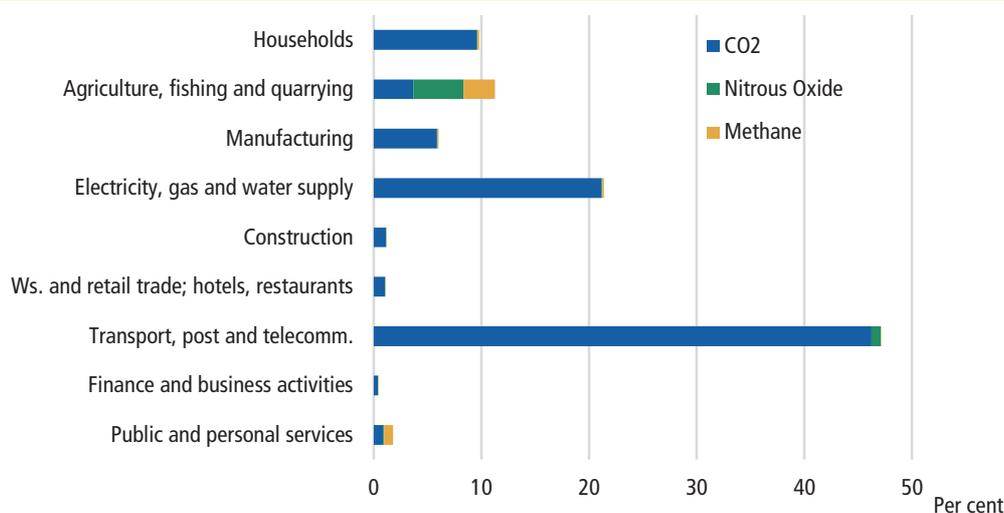
Note: The halocarbons (at the top of the figure) constitute less than 1 million tonnes CO₂-equivalents and are hardly visible.

Greenhouse gas emissions from industries and households

When CO₂, methane and nitrous oxide emissions are taken as a whole and assessed in relation to their global warming potential, between 1990 and 2008, the industries have contributed 90 per cent of all Danish man-made emissions, with households making up the remaining 10 per cent.

Agriculture, fishing and quarrying contributed 11 per cent of the global warming potential. It is largely due to emissions of methane and nitrous oxide from agriculture, while emissions of CO₂ played a minor role.

Figure 5 Greenhouse gas emissions from industries and households. 2008



Note: Emissions are calculated as CO₂-equivalents (GWP).

In 2008, *electricity, gas and water supply* contributed 21 per cent of the global warming potential from greenhouse gases. This includes all Danish production of electricity and district heating.

All emissions in connection with production of electricity and district heating come from this industry, while the use of electricity and district heating in the industries and households cause no direct emissions.

Transport, post and telecommunication caused 47 per cent of the global warming potential from CO₂, methane and nitrous oxide. Included are all emissions from businesses that carry out transport as a service to other businesses and households.

On the other hand, it does not include transport activities carried out by businesses and households on their own behalf, using their own cars and lorries, etc.

Greenhouse Gas Emissions from transport

Greenhouse Gas Emissions from transport activities in industries and the households made up 60 per cent of the total greenhouse gas emissions. Emissions from Danish operated ships abroad contributed 46 per cent of total emissions and 77 per cent of emissions from all transport activities.

Emissions from the households' use of cars contributed 35 per cent of greenhouse gas emissions when that part of the emissions related to Danish operated ships and planes bunkering of fuel abroad is excluded.

3 Public sector response

Environmental taxes

Denmark's environmental policy involves an increasing use of environmental taxes or more precise environmentally related taxes. Environmental taxes comprise of pollution, energy, resource, and transport related taxes.

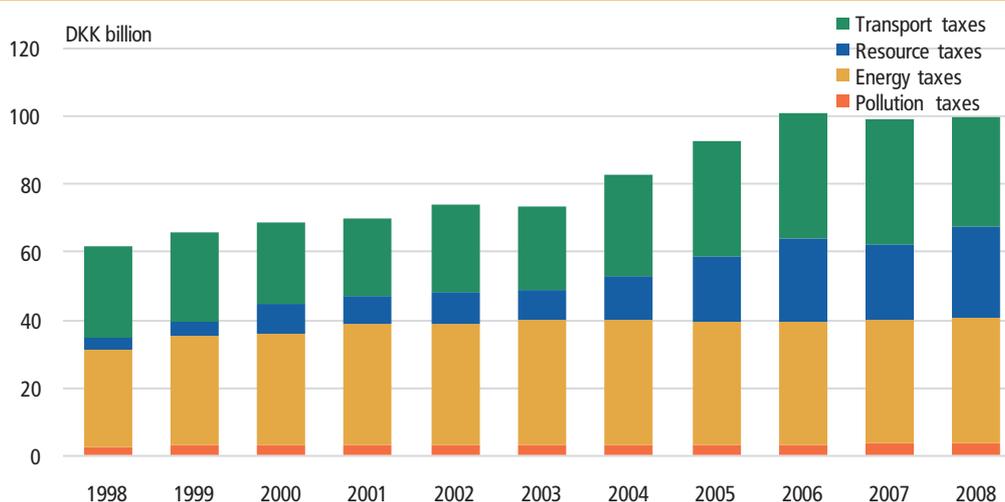
In 2009, the total revenue generated from these taxes was DKK 79.4 billion, corresponding to around 10 per cent of total revenues from taxes and duties.

Total revenue generated from energy related taxes amounted to DKK 36.4 billion in 2009, corresponding to 45.8 per cent of total revenue from environmental related taxes.

In 2009, transport related taxes accounted for 31.4 per cent of environmental related taxes while resource related taxes accounted for 19.0 per cent and pollution related taxes accounted for 3.7 per cent.

The decline from 2008 to 2009 in resource related taxes can mainly be explained by a fall in corporation tax on hydrocarbon manufacturing of DKK 5 billion and a fall in hydrocarbon tax of DKK 5.8 billion. The decline in transport related taxed can be attributed to a fall in the motor vehicle registration duty of DKK 7.4 billion.

Figure 6 Environmental taxes



Compared to Statistical Yearbook 2009 the relationship between "pollution taxes" and "resource taxes" has changed. The change is caused by the hydrocarbon tax and corporation tax on hydrocarbon manufacturing as these taxes are now classified as resource taxes instead of pollution taxes. The change has been implemented back in time.

www.statbank.dk/mreg2s

4

Energy consumption

Denmark self-sufficient as regards energy

Since 1997, Denmark has been energy self-sufficient thanks to the extraction of crude oil and natural gas from the North Sea and the production of renewable energy. The total production has increased until 2005.

In 2006 there was a significant decrease in the production of energy, primarily due to a decrease in the production of oil and natural gases. The decrease has continued in the years after, but still the production of energy remains higher than the total consumption of energy in Denmark.

Changed composition of the energy consumption

Gross energy consumption consists of oil, natural gas, coal and renewable energy, etc. When calculating gross energy consumption, adjustments are made to take into account imports and exports of electricity. Total gross energy consumption increased by 3 per cent from 2009 to 2010.

Since 1990, the composition of fuel use has changed significantly as there has been an increase in the consumption of natural gas and renewable energy and a decrease particularly in the coal consumption.

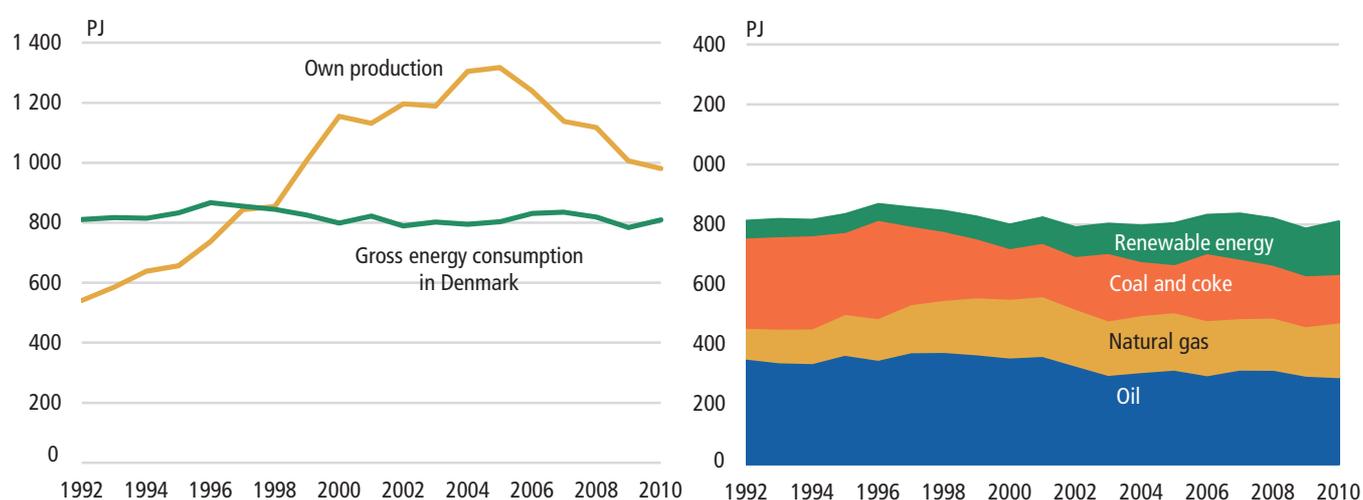
More renewable energy sources

The consumption of renewable energy has increased over a number of years and now accounts for 22 per cent of total gross energy consumption.

Renewable energy plays a particularly important part with regard to environmental issues like emissions of greenhouse gases and global warming, as an increase in the use of such energy causes a reduction in greenhouse gas emissions by replacing the use of fossil fuels, e.g. coal and oil.

Renewable energy sources include the greenhouse gas emission free types of energy, e.g. wind power and solar power as well as carbon-dioxide neutral fuels, e.g. hay and wood, which absorb carbon dioxide from the atmosphere during growth, only to release it again when they are incinerated.

Figure 7 Gross energy consumption



	1990	1995	2000	2010
	m ³ in thousands			
Extraction of raw materials, total	33 976	34 210	40 945	29 700
Extraction from land area:	28 106	28 558	33 809	23 977
Sand, gravel and stone	22 534	21 721	27 587	18 269
Quartz sand	186	191	479	346
Granite	811	662	199	144
Clay	462	739	788	346
Expanded clay	303	311	313	179
Moler	195	186	227	199
Chalk, limestone	2 924	4 049	3 405	2 510
Peat	399	259	247	173
Other raw materials	292	440	563	1 812
Extraction from sea area				
Sand, gravel, sand for land filling etc.	5 870	5 652	7 136	5 723

Source: National Forest and Nature Agency

www.statbank.dk/rst01 and rst3

	1990	1995	2000	2005	2006	2007*	2008*
	1 000 tonnes CO ₂ equivalents						
Agriculture, fishery and quarrying	17 102	16 246	15 900	14 824	14 563	14 392	14 698
Manufacturing	8 281	9 365	9 331	8 787	7 937	8 278	8 288
Electricity, gas and water supply	24 999	30 318	23 054	23 374	20 072	27 721	22 931
Construction	821	934	1 093	1 365	1 375	1 448	1 562
Ws. and retail trade, hotels and restaurants	1 424	1 358	1 204	1 290	1 300	1 389	1 423
Transport, post and telecommunication	14 774	17 199	24 891	31 100	39 110	49 096	54 895
Finance and business activities	381	343	389	478	480	512	507
Public and personal services	2 704	2 761	2 487	2 676	2 710	2 547	2 544
Industries, total	70 350	78 406	78 167	84 039	87 779	105 346	106 790
Households	9 854	10 918	10 406	10 627	10 413	10 146	9 885
Others	3 715	1 667	2 660	2 901	2 248	2 223	2 147
Total	83 920	90 991	91 234	97 567	100 440	117 714	118 821
Reduction due to biomass growth	-2 831	-2 993	-664	-3 465	-1 797	-2 783	-2 977
Greenhouse gas emissions from the Danish economy	81 089	87 998	90 569	94 101	98 643	114 931	115 844
Of which							
Danish operated ships' bunkering abroad	9 360	11 166	19 330	25 858	32 955	42 543	48 177
Danish operated planes' bunkering abroad	275	431	520	465	1 628	1 820	1 856
Total industries, excl. bunkering abroad	60 716	66 809	58 317	57 716	53 195	60 984	56 757
Emissions from biomass	4 641	5 869	7 169	10 142	10 893	11 335	12 110

www.statbank.dk/mreg5

	1990	1995	2000	2006	2007*	2008*
	1 000 tonnes CO ₂ equivalents					
Total	22 167	25 728	34 004	59 148	67 959	73 157
Road traffic, households	4 623	5 598	6 037	6 122	6 164	5 966
Road traffic, industries	4 804	5 166	5 343	6 619	7 178	7 130
Trains	295	306	230	229	230	239
Danish operated ships' bunkering in Denmark	810	1 103	933	727	704	758
Danish operated ships' bunkering abroad	9 360	11 166	19 330	42 591	50 639	56 126
Danish operated planes' bunkering in Denmark	2 001	1 959	1 610	1 027	1 074	1 074
Danish operated planes' bunkering abroad	275	431	520	1 833	1 970	1 864
	per cent					
Total	100.0	100.0	100.0	100.0	100.0	100.0
Road traffic, households	20.9	21.8	17.8	10.4	9.1	8.2
Road traffic, industries	21.7	20.1	15.7	11.2	10.6	9.7
Trains	1.3	1.2	0.7	0.4	0.3	0.3
Danish operated ships' bunkering in Denmark	3.7	4.3	2.7	1.2	1.0	1.0
Danish operated ships' bunkering abroad	42.2	43.4	56.8	72.0	74.5	76.7
Danish operated planes' bunkering in Denmark	9.0	7.6	4.7	1.7	1.6	1.5
Danish operated planes' bunkering abroad	1.2	1.7	1.5	3.1	2.9	2.5

	1990	2008*
	mio. tonnes	
Total CO₂ emissions from the Danish economy (Environmental Accounts)	68.2	120.6
- Binding of CO ₂ in biomass	5.6	11.9
Biomass used as fuels	4.6	11.7
Further biomass growth	1.0	0.2
- Danish CO ₂ emissions abroad	11.4	57.5
Ships	9.2	55.0
Planes	0.3	1.8
- Other differences related to transports and cross border trade	2.0	0.6
= Total emissions accounted for in the Kyoto Protocol	51.2	51.2

www.statbank.dk/mreg5

	1985	1990	1995	2000	2005	2009	2010	2011
Monitoring stations	1 374	1 370	1 301	1 295	1 249	1 260	1 169	1 130
Acceptable water quality	1 017	1 251	1 227	1 250	1 225	1 203
Unacceptable water quality	288	70	54	28	10	44
Beach areas where bathing is forbidden	69	49	20	17	14	13

Source: Environmental Protection Agency

www.blst.dk

	2008	2009	2010
	tonnes		
Sales of pesticide products¹			
Total sale	11 944	9 673	12 919
Herbicides	7 023	4 872	8 368
Fungicides	1 889	1 452	1 753
Algicides	46	22	17
Insecticides	882	1 475	804
Slimicides for use in paper pulp	-	-	-
Products against pests on farm animals	21	17	60
Plant growth regulators	480	419	321
Combined fungicides and insecticides	18	12	9
Soil disinfectants	7	10	17
Rodenticides	287	275	585
Repellents	26	14	15
Products for the protection of woodwork	1 265	1 105	969
Of which active ingredients²			
Active ingredients, total	4 528	3 267	4 291
Herbicides	2 988	2 218	3 362
Fungicides	958	572	562
Algicides	8	4	3
Insecticides	94	74	50
Slimicides for use in paper pulp	-	-	-
Products against pests on farm animals	1	2	1
Plant growth regulators	311	270	203
Combined fungicides and insecticides	7	5	3
Soil disinfectants	7	9	16
Rodenticides	3	1	3
Repellents	5	4	4
Products for the protection of woodwork	146	108	115

¹ A pesticide product comprises one or more effective substances, emulators, adhesives and inactive fillers. ² That part of the product which has a toxic effect.

Source: Danish Environmental Protection Agency

www.statbank.dk/pest2

Table 332 Energy account for Denmark. 2010

	Crude oil and semi- manufac- tured oil	Coal, coke, etc.	Oil products	Natural gas	Other gas	Renewable energy resources	Electricity	District heating
	————— thousand tonnes —————			mio. Nm ³	thousand tonnes	TJ	GWh	TJ
Production	12 432	-	6 535	7 908	442	146 593	36 762	148 827
Imports	2 878	4 596	19 028	144	10	32 495	10 599	-
Total supply	15 310	4 596	25 563	8 053	451	179 089	47 361	148 827
Exports	7 624	2	4 846	3 352	126	1 603	11 734	-
Changes in inventories	104	- 2 124	1 460	- 9	- 19	-	-	-
Distribution losses etc.	77	46	68	3	4	990	2 550	29 800
Total industries and households	7 506	6 672	19 189	4 707	340	176 496	33 077	119 027
Households	-	2	2 032	785	37	37 786	10 495	76 263
Total industries	7 506	6 671	17 157	3 921	303	138 710	22 582	42 764
Agriculture, forestry and fishing	-	54	668	48	3	2 501	1 988	1 985
Mining and quarrying	-	5	26	678	0	787	71	21
Manufacturing	7 506	172	562	824	284	5 941	7 545	5 450
Utility services	-	6 439	300	2 032	1	128 551	1 268	2 054
Electricity, gas, steam and air conditioning supply	-	6 439	264	2 012	0	128 114	632	-
Water supply, sewerage and waste management	-	-	36	20	1	437	636	2 054
Construction	-	-	442	10	2	-	238	-
Trade and transport etc.	-	-	14 797	123	3	-	5 772	12 401
Wholesale and retail trade	-	-	328	85	2	-	3 694	8 637
Transportation	-	-	14 451	9	0	-	1 346	957
Accommodation and food service activities	-	-	18	28	1	-	732	2 807
Information and communication	-	-	35	17	0	-	1 008	1 714
Financial and insurance	-	-	14	10	-	-	283	1 034
Real estate activities and renting of non-residential buildings	-	-	18	4	0	-	117	408
Dwellings	-	-	5	4	0	-	5	370
Other business services	-	-	100	38	1	-	567	3 880
Knowledge-based services	-	-	39	20	1	-	401	2 052
Travel agent, cleaning, and other operational services	-	-	61	18	0	-	165	1 828
Public administration, education and health	-	-	158	109	6	930	3 001	11 041
Public administration, defence and compulsory social security	-	-	83	15	2	121	386	1 479
Education	-	-	30	41	3	298	1 134	4 147
Human health and social work	-	-	45	54	1	512	1 481	5 415
Arts, entertainment and other services	-	-	32	24	2	-	720	2 406
Arts, entertainment and recreation activities	-	-	12	18	1	-	537	1 856
Other service activities	-	-	20	5	1	-	183	550
Activities of households as employers of domestic personnel	-	-	-	-	-	-	-	-
Of which: Bunkering abroad by Danish-operated ships	-	-	12 449	-	-	-	-	-
Of which: Bunkering abroad by Danish-operated planes	-	-	455	-	-	-	-	-

¹ The Danish operated ships and planes' bunkering abroad is part of the industry Transport.

Table 333 Gross energy consumption

	1970	1980	1990	2000	2010
	TJ				
Total industries and households	838 381	894 135	904 604	1 048 703	1 331 684
Households	329 344	325 343	292 284	286 517	313 263
Total industries	509 037	568 791	612 320	762 186	1 018 421
Agriculture, forestry and fishing	42 524	57 588	58 724	58 053	52 156
Mining and quarrying	5 424	3 908	13 322	30 395	29 625
Manufacturing	182 392	182 764	178 879	188 511	144 138
Utility services	5 685	6 875	8 693	10 681	15 194
Electricity, gas, steam and air conditioning supply	948	1 914	2 724	2 953	5 462
Water supply, sewerage and waste management	4 737	4 961	5 969	7 728	9 731
Construction	13 303	13 027	15 605	16 688	21 450
Trade and transport etc.	219 991	231 181	263 674	383 373	666 436
Wholesale and retail trade	47 864	56 794	52 839	47 895	54 696
Transportation	166 133	166 534	202 239	326 931	601 466
Accommodation and food service activities	5 994	7 853	8 597	8 547	10 275
Information and communication	5 227	7 059	7 857	8 686	11 706
Financial and insurance	2 200	3 881	4 533	3 841	4 202
Real estate activities and renting of non-residential buildings	622	877	1 447	1 789	2 242
Dwellings	865	1 622	2 198	992	734
Other business services	5 300	8 035	10 029	10 902	13 990
Knowledge-based services	2 547	4 412	6 339	6 050	7 612
Travel agent, cleaning, and other operational services	2 753	3 623	3 689	4 852	6 378
Public administration, education and health	20 766	44 620	39 811	39 251	46 213
Public administration, defence and compulsory social security	5 177	15 651	10 265	9 474	8 789
Education	6 601	12 496	12 177	11 853	16 104
Human health and social work	8 989	16 473	17 369	17 925	21 320
Arts, entertainment and other services	4 738	7 352	7 547	9 023	10 336
Arts, entertainment and recreation activities	2 628	4 545	5 078	6 326	7 237
Other service activities	2 111	2 807	2 469	2 697	3 098
Activities of households as employers of domestic personnel	0	0	0	0	0
Of which: Bunkering abroad by Danish-operated ships	91 506	96 821	117 645	242 966	502 940
Of which: Bunkering abroad by Danish-operated planes	1 448	2 360	3 777	7 144	19 808

¹ The Danish operated ships and planes' bunkering abroad is part of the industry Transport.

Table 334 Manufacturers' energy consumption. 2009

	Solid fuel	Liquid fuel	Gas	Electricity	District heating
	thousand GJ				
Total¹	11 253	15 130	44 780	24 222	4 922
Extraction of gravel and stone	890	421	678	187	3
Mining support service activities	0	8	9	19	17
Production of meat and meat products	89	225	1 819	1 470	107
Processing and preserving of fish	488	432	1 162	440	62
Dairy products	0	593	3 860	772	1
Grain mill and bakery products	3	61	1 217	758	80
Other food products	1 220	3 323	2 958	2 377	512
Beverages	0	67	1 411	521	61
Tobacco products	0	27	120	89	17
Textiles	0	14	370	388	42
Wearing apparel	2	3	6	17	14
Leather and footwear	22	1	13	14	0
Wood and wood products	1 639	233	249	604	232
Paper and paper products	1 637	179	1 742	877	34
Printing etc.	0	16	206	499	132
Oil refinery etc.	0	766	13 879	1 139	586
Basic chemicals	0	205	1 638	1 637	428
Paints and soap etc.	607	139	2 266	863	76
Pharmaceuticals	0	193	928	1 173	677
Rubber and plastic products	17	78	588	1 653	104
Glass and ceramic products	0	10	951	437	28
Concrete and bricks	3 824	6 433	3 152	1 543	44
Basic metals	9	60	1 292	706	77
Fabricated metal products	131	1 015	1 429	1 551	324
Computers and communication equipment etc.	12	17	254	199	30
Other electronic products	2	4	34	182	76
Electric motors, etc.	1	8	81	118	40
Wires and cables	0	5	73	157	27
Household appliances, lamps, etc.	0	3	76	91	46
Engines, windmills and pumps	9	103	836	1 301	449
Other machinery	110	329	589	697	206
Motor vehicles and related parts	9	33	233	364	37
Ships and other transport equipment	3	34	363	273	58
Furniture	525	50	183	533	62
Medical instruments, etc.	0	7	25	90	91
Toys and other manufacturing	3	11	56	355	42
Repair and installation of machinery and equipment	0	26	36	129	99

Note: The table includes workplaces in firms with 20 or more employed in the industry.

¹ Incl. extraction of gravel, clay, stone and salt, etc.

Table 335 Production of renewable energy

	1990	2000	2009
	TJ		
Total production	47 688	77 519	137 003
Solar energy	100	335	653
Wind power	2 197	15 268	28 114
Hydro power	101	109	74
Straw	12 481	12 220	23 581
Wood chips	1 724	2 744	11 184
Firewood	8 757	12 432	24 580
Wood pellets	1 575	2 984	2 407
Wood wastes	6 191	6 895	7 604
Biogas	752	2 912	4 278
Waste combustion ¹	10 508	17 870	22 377
Biodiesel	-	-	2 875
Fish oil	744	49	1 886
Geothermal heat ²	2 558	3 701	7 391

¹ In 2008 the compilation method was changed with regard to the calculation of energy for waste.

² Heat pumps and geothermal power.

Source: Danish Energy Agency

www.ens.dk