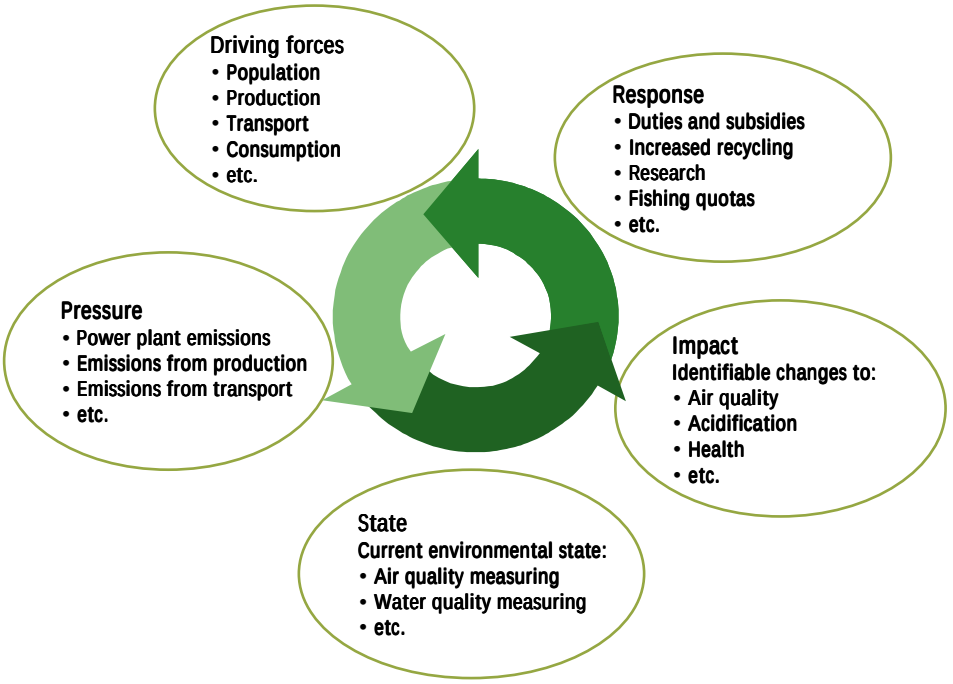
Environment and energy

1. The DPSIR model

The environmental has been based on a so-called DPSIR model, which is a theoretical and internationally recognised model. This model comprises five elements: **D**riving forces, **P**ressure, **S**tate, **I**mpact, and **R**esponse.

Figure 1 **The DPSIR model**



Driving forces

This model is based on the fact that the vast array of human activity in our society - the driving forces - may occasion environmental problems. For example, these driving forces may be the amount of energy produced. Driving forces are economic activities on which we all depend, but they do not provide any information on the state of the environment in themselves.

Pressure

Production in Denmark causes pressure on the environment in the form of emissions and discharges of large amounts of waste associated with this production. For example, electricity generation at a power station may involve the burning of coal, occasioning the release of carbon dioxide and other substances such as sulphur and nitrogen, and the task then is to identify and calculate such emissions. Carbon dioxide is a so-called greenhouse gas which is not dangerous in itself. However, as carbon dioxide quantities increase, this gas contributes to a gradual process of global heating, which may cause melting of the polar ice caps and changes in rainfall patterns.

State

Thus, human pressure on its surroundings and environment causes this environment to slowly change its nature. As is the case with other types of status supervision, regular measurement of the state of the environment is carried out. In the example quoted above, carbon-dioxide emissions contribute to a status report which shows greater carbon-dioxide concentrations in the atmosphere.

Impact

A given state will typically have an impact on the environment. In the power-station example, the impact of increased concentrations of carbon-dioxide gas in the atmosphere is an increase in global heating. Also, atmospheric concentrations of sulphur may cause greater acidification of lakes due to sulphur oxides. Such environmental impacts may not necessarily be immediately identifiable, but will be observed over a period of years in the form of changes to the state of the environment.

Response

If the state of the environment is not acceptable, this constitutes an environmental problem. Such a problem will typically entail a response from the authorities. Responses may either be political (examples include bans on environmentally harm substances or the introduction of "green taxes and duties") or behavioural. It is also possible to promote desirable behaviour by providing subsidies in support of alternative production methods and processes which are less harmful to the environment.

A response might also take the form of international agreements. As far as carbon-dioxide emissions are concerned, the Danish response has entailed the introduction of duties and international agreements. Also, the population may react by changing their behaviour as regards particular issues. Such behavioural changes may manifest themselves as deliberate product choices based on a positive or negative view of the relevant production methods or product contents. The phrase used to describe individuals who display such behaviour is "political consumers".

The five elements which comprise the DPSIR model are very different. Some of the elements are calculated as physical quantities, and some in monetary values – i.e. quantitative measures. Other elements within the model concern the agreements entered into - qualitative measures. As it is not possible to measure the five elements of the model by the same yardstick, the ways in which these five elements are addressed in the model will also differ.

Individual issues and themes from the model will be addressed below.

2. Air pollution

Greenhouse gases contribute to air pollution

The air and the environment are subjected to significant pressure from the burning of fossil fuels, which entails emissions of carbon dioxide and other substances such as sulphur and nitrogen. As was mentioned above, carbon dioxide is a so-called greenhouse gas which is not dangerous in itself, but which, in greater quantities, will contribute to a gradual increase in average global temperatures - global heating. Sulphur and nitrogen contribute to greater air acidity.

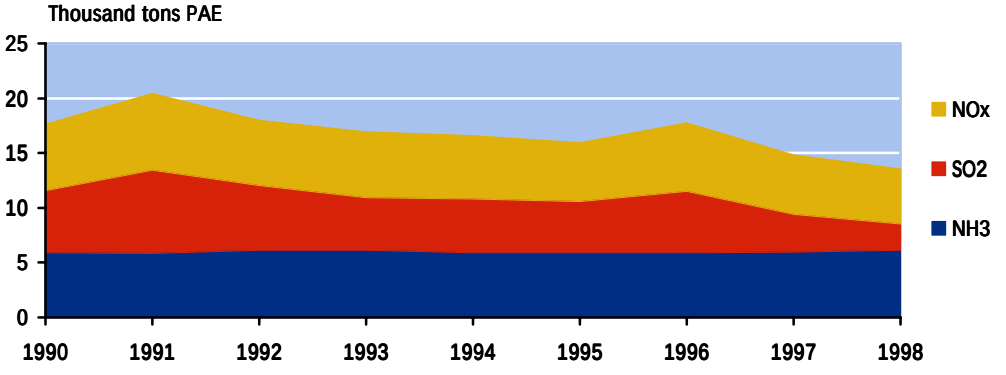
The most important greenhouse gases are carbon dioxide, methane and nitrogen oxides and a number of industrial gases such as chlorofluorocarbons (CFCs). Carbon dioxide accounts for 64 per cent of the global heating created by humans, while methane accounts for 20 per cent, nitrogen oxides for 6 per cent, and CFCs and related substances account for 10 per cent .

Denmark's emissions of carbon dioxide vary over the years, a fact which is partly due to the net export of electricity. In the years where Denmark has a large export of electricity, carbon-dioxide emissions increase as power generation increases. Efforts are being made to reduce carbon-dioxide emissions by replacing fossil fuels, such as coal, by natural gas and renewable energy. Agriculture is the main source of methane and nitrogen-oxide emissions and discharges.

Acidification

The environment is also subjected to significant pressure from the increased acidity of the air. Acidification occurs when emissions of nitrogen and sulphur fall with precipitation in the form of ammonia, nitrogen oxides and sulphur dioxides. Sulphur and nitrogen combine to form acidic chemical compounds which cause buildings to deteriorate and are harmful to plants and the aquatic environment. Acidification is calculated by means of *Potential Acidification Equivalents* (PAEs), which is a common acidification unit for all acidifying substances.

Figure 2 **Acidification from Danish activities 1990-1998**



Source: DMU.

The acidifying substances come from agriculture, from energy conversion within the energy sector, and from the transport sector. In 1990, energy conversion was the largest contributor, accounting for 35 per cent of the total Danish emissions. Agriculture accounted for 33 per cent and the transport sector for 23 per cent. These percentages have changed: in 1998, agriculture accounted for the greater share of emissions, 44 per cent, while the other two sectors contributed 24 per cent each.

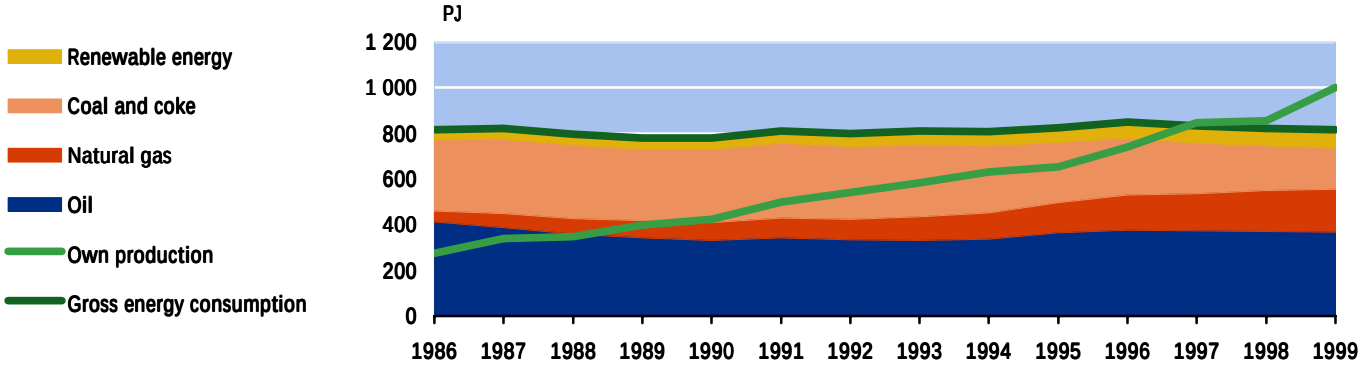
Acidifying substances are transboundary in nature. They are carried far and wide by the wind, and thus emissions from one country may fall and cause acidification of the environment in a different country. This means that part of the acidification potential from Danish activity contributes to acidification of the environment in a number of neighbouring countries, most of which are situated to the east of Denmark. Similarly, the Danish environment is not just exposed to acidification from Danish emissions, but also exposed to foreign emissions brought to Denmark by the wind.

3. Energy consumption

Energy consumption

Emissions from energy consumption are a significant cause of several of the environmental problems facing Denmark and the rest of the world. Thus, the environmental state in Denmark can be elucidated by means such as mapping the current state and development of energy consumption in Denmark.

Figure 3 **Gross energy consumption**

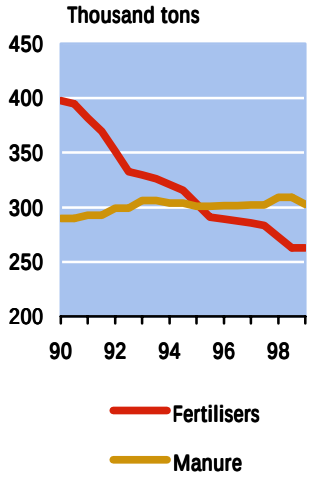


Since the early 1980s, Denmark has become steadily less dependent on imported oil and coal - thanks to the increased extraction of crude oil and natural gas from the North Sea. Since 1997, Denmark has been self-sufficient as regards energy. Renewable energy has played a particularly important part as regards environmental issues, as an increase in the use of such energy can cause a reduction in carbon-dioxide emissions by replacing the use of fossil fuels such as coal and oil. Renewable energy sources include the *carbon-dioxide free* types of energy such as wind power and solar power as well as *carbon-dioxide neutral* fuels such as hay and wood, which absorb carbon dioxide from the atmosphere during growth, only to release it again when burnt.

Gross energy consumption comprises the consumption of oil, natural gas, coal, and renewable energy. When calculating gross energy consumption, adjustments are made to take into account imports and exports of electricity. Gross energy consumption has shown an increase in the consumption of natural gas and renewable energy and a corresponding decrease in coal consumption.

4. Agriculture

Figure 4
Nitrogen in manure and fertilisers



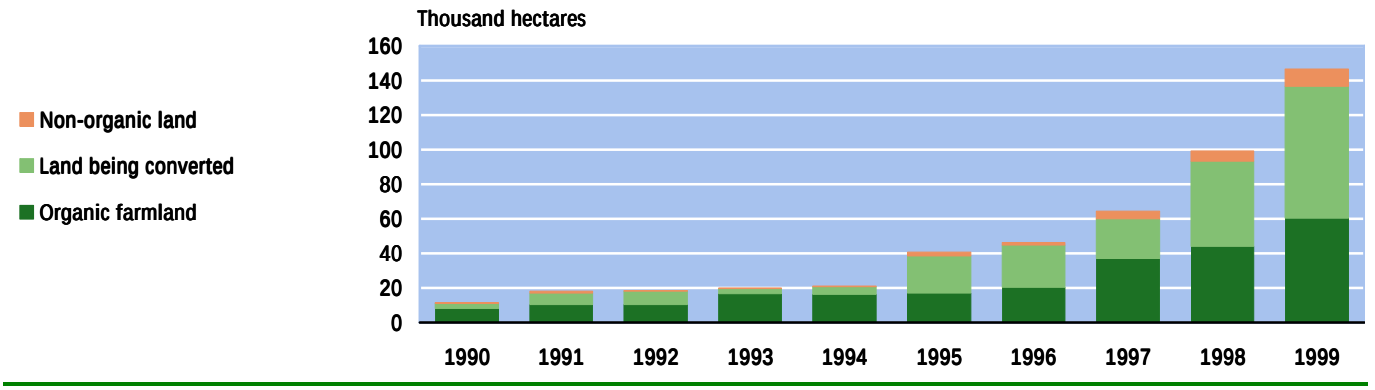
Use of fertilisers

Agricultural production of animal and vegetable products involves the use of manure and fertilisers. This causes large quantities of nitrogen and small quantities of phosphorus to be discharged into the soil. Some nitrogen and phosphorus is not received by plants and as a consequence is leached from the soil, leading to a discharge of these substances into the ocean via the watercourses. The adverse effects include undesirable algae growth, resulting in an undesirable environmental state.

The Aquatic Environment Action Plan II constitutes a response to this state. The leaching of nitrogen is to be reduced by measures such as extending wetlands, organic farming, and sowing crops after harvesting to absorb nitrogen from the soil. Another measure concerns stricter "harmony requirements", i.e. stricter regulations to ensure greater balance between the amount of manure produced and the corresponding land farmed at individual farms.

The proportion of organic farmland has increased significantly during recent years. For example, the amount of land used for organic farming doubled from 1994 to 1995 and again from 1997 to 1998. The amount of land used for organic farming increased by 37 per cent from 1998 to 1999 and now covers 60,232 hectares. Thus, organic farming accounted for 2.3 per cent of all Danish farmland in 1999.

Figure 5 **Total areal extent of organic farms**

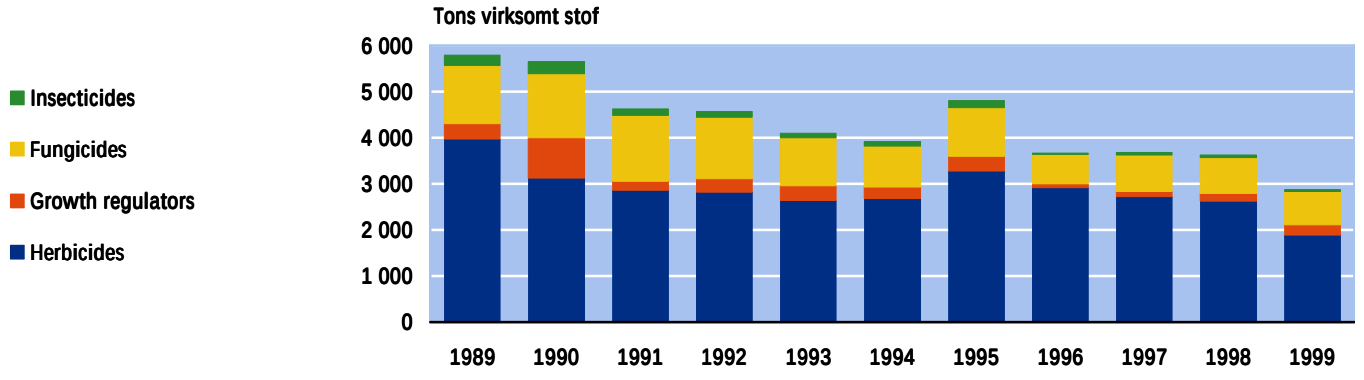


Source: the Plant Directorate. The areal extent includes forests.

Pesticides

Pesticides are chemical products which are mainly used within agriculture to combat weeds, fungi, and insects. Effective control of pests, weeds, and fungi in fields has had an indirect effect on the number of animals which feed on insects. The effect might be fatal or entail a reduction in the reproductive abilities of the relevant animals. Such harmful pressure on the environment entails a reduction in global biodiversity.

Figur 6 **Pesticide sales to agriculture**



Source: the Danish Environmental Protection Agency

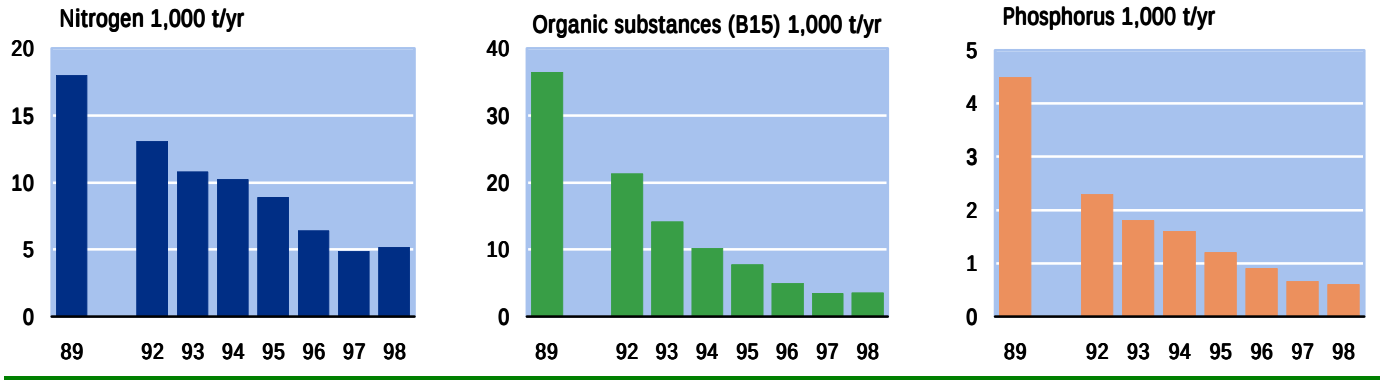
Pesticides are divided into products which protect crops against weeds, *herbicides*, against fungus infection, *fungicides*, and against insects, *insecticides*. There are also products which shorten crops, *growth regulators*.

5. Waste water

Emissions of nitrogen and organic substances

The majority of all buildings in Denmark are connected to sewers, and most waste water passes through municipal sewage-treatment plants before being discharged into lakes, watercourses, or the ocean.

Figure 7 **Discharges from sewage-treatment plants**



Source: the Danish Environmental Protection Agency

Discharges of nitrogen and organic substances from sewage-treatment plants increased from 1997 to 1998, whereas the discharges of phosphorus have fallen slightly. This development is due in part to the high rainfall in 1998.

When rainfall goes up, water quantities in sewage-treatment plants also rise. This entails a reduction in the effectiveness of the measures to remove nitrogen and organic substances, whereas the removal of phosphorus is not affected.

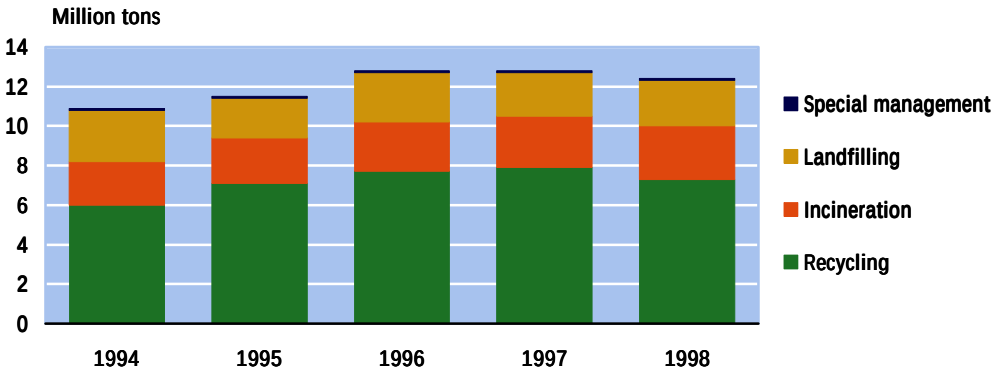
Almost 90 per cent all Danish residential properties are connected to a municipal sewerage system. In the sewers, waste water from households is mixed with industrial effluents and water from the special drains for rainwater from roofs, roads, etc. A few enterprises have their own discharge points because of their distant location.

6. Waste

Waste

Approximately 12.4 million tons of waste were produced in Denmark in 1998. This constituted a 3.4 per cent reduction compared to 1997. The amount of waste produced in 1997 corresponded to 1996 levels.

Figure 8 **Total waste quantities in Denmark**



Note: Improved data input is one of the causes of the significant increase up until 1996.
Source: the Danish Environmental Protection Agency

Of the 1998 figure of 12.4 million tons waste referred to above, approximately 2.8 million tons were household waste. This corresponds to approximately 500 kg per citizen. A large proportion of all household waste is collected or deposited as general domestic waste. Other household waste is collected or deposited as separated waste: paper waste, glass and glass containers, metal, organic waste, garden waste, bulky waste, and environmentally harmful waste.

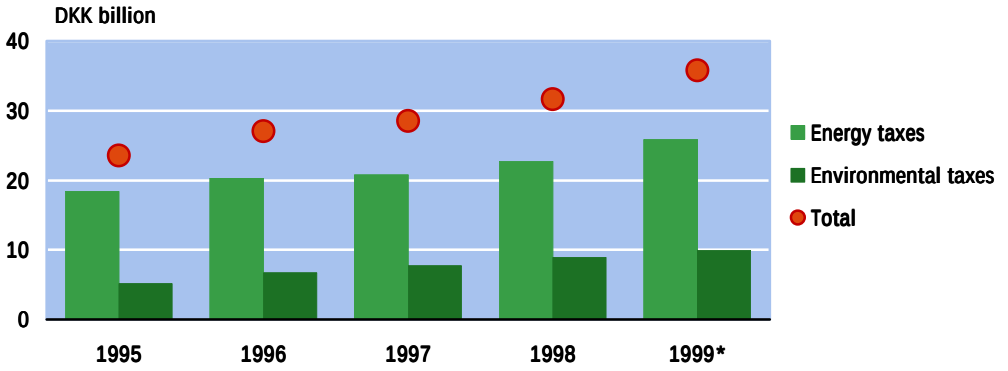
As a response to the large quantities of waste, pilot projects have been initiated for recycling schemes for specific types of waste. Waste separation is a prerequisite for recycling and reusing waste. In 1998, 59 per cent of all waste was recycled. This constitutes a slight reduction in comparison to 1997 levels; this is mainly due to the fact that less sludge from sewage-treatment plants was used to fertilise farmland in 1998.

7. Public-sector response

Environmental taxes and energy taxes

Denmark's environmental policy involves an increasing use of environmental taxes and energy taxes. In 1998, the total revenue generated from these taxes was DKK 31.7 billion, corresponding to 8.5 per cent of total revenues from taxes and duties. In 1998, revenues from energy taxes accounted for 72 per cent all revenue from environmental taxes and energy taxes. In 1998, the revenues generated by environmental taxes came to DKK 8.9 billion. Revenues from CO_2 taxes, waste taxes, and water taxes constituted 78 per cent of this figure.

Figure 9 **Environmental taxes and energy taxes**



Note.: the statistics for 1999 are budget figures.

8. International comparisons

Contaminant emissions

Denmark's rate of emission and discharge of various contaminants per capita is slightly higher that those found in the countries usually used for comparisons. In Denmark, carbon-dioxide emissions from energy conversion constitutes a relatively greater proportion of total carbon-dioxide emissions. This is partly due to the composition of fuels used, where coal constitutes a relatively large proportion.

Transport at world level constitutes a very significant factor as regards the development of carbon-dioxide emissions. The developed countries dominate in this connection, as the OECD countries are behind 70 per cent of the world's total carbon-dioxide emissions from transport.

Table 1 Area, population and coastline 2000

	Land and inland water area km²	Population	Density of population per km²	Jutland and Islands in the sea (with official names) Number	Jutland and Islands in the sea (with official names) Area km²	Inline water area 1959 km²	Coastline 1959 km
Denmark	**43 095.88**	**5 330 020**	**123.7**	**405**	**43 095.88**[1]	**700**	**7 314**
Regions							
Zealand	7 448.28	2 235 839	300.2	97	7 448.28[2]	184	1 735
Bornholm	588.53	44 337	75.3	9	588.53	3	141
Lolland-Falster	1 795.34	114 688	63.9	45	1 795.34[3]	24	587
Funen	3 485.84	471 974	135.4	100	3 485.84[4]	26	1 130
The Islands, total	13 317.99	2 866 838	215.3	251	13 317.99	237	3 593
Jutland	29 777.89	2 463 182	82.7	154	29 777.89[1.5]	463	3 721
Counties							
Copenhagen Municipality	88.25	495 699	5 617.0	2	0.23[6]	3	92
Frederiksberg Municipality	8.77	90 327	10 299.5	•	•	0	•
Copenhagen County	525.95	613 444	1 166.4	2	111.33[6]	15	121
Frederiksborg County	1 347.42	365 306	271.1	14	2.40	80	248
Roskilde County	891.44	231 559	259.8	18	0.27	7	154
West Zealand County	2 983.77	295 086	98.9	28	49.00	66	608
Storstrøm County	3 398.02	259 106	76.3	77	2 049.09	36	1 099
Bornholm County	588.53	44 337	75.3	9	588.53	3	141
Funen County	3 485.84	471 974	135.4	100	3 485.84	27	1 130
North Schleswig County	3 939.12	253 482	64.3	14	450.07	119	567[7]
Ribe County	3 131.61	224 345	71.6	4	64.83	23	207
Vejle County	2 996.64	347 542	116.0	10	17.04	26	264
Ringkøbing County	4 853.94	272 857	56.2	23	16.84	80	598
Århus County	4 560.73	637 122	139.7	40	148.73	77	635
Viborg County	4 122.48	233 681	56.7	15	392.49	90	646
North Jutland County	6 173.37	494 153	80.0	46	127.96	48	804
Faroe Islands	**1 398.85**	**45 751**	**32.7**	**17**[8]	**1 398.85**	. . .	**1 117**[9]
Greenland	**410 449.00**[10]	**56 124**	**0.1**	. . .	. . .	. . .	. . .

Note 1. The most southern point in Denmark is Gedserodde on Falster, 11°58'15" east, 54°33'35" north, the most northerly point is near Skagen 10°36'11" east, 57°45'07" north, the most westerly point is Blåvandshuk 08°04'22" east, 55°33'36" north, and the most easterly point is Christiansø (Østerskær), 15°11'55" east, 55°19'17" north. *European Datum, 1950.*

Note 2. The basic measurements were carried out by the Geodætisk Institut between 1953-1959 on the topographical maps current at that time (1:20,000), cf. *Danmarks Areal* (Statistiske Meddelelser 1968:4). Areas were transferred by Statistics Denmark in planimetric measurements to the current 4 cm maps (1:25.000).

Note 3. Areas in column 1 include all areas within the contours of the country. Fjords and inlets which have free passage to the sea (e.g. Ringkøbing fjord), are not included in the figures.

Note 4. The figures in columns 6 and 7 are from the 1959 planimetric measurements and they have not been transferred to more modern maps. In column 6, 4 lakes and 2 closed fjords, each of over 100 hectares (10 km²) are included: these are Arresø, Esrumsø, Mossø, Tissø, Saltbæk Vig and Stadil Fjord. There are 53 named islands in the Danish lakes with a total area of 1.97 km². The coastline is divided into counties according to the local authority allocation of 1 April 1970.

Note 5. Named lakes, water courses, etc. in parishes which were divided into municipalities, each in its own county, on 1 April 1970 are included in that county with the largest part of the parish.

[1] Including the Jutland peninsular of 23,874.21 km². [2] Including the island of Zealand with 7,031.30 km². [3] Including the islands of Lolland, 1,242.86 km² and Falster 513.76 km². [4] Of this, the island of Funen accounts for 2,984.55 km². [5] Including Vendsyssel-Thy, 4,685.72 km². [6] All of the island of Amager is included under Copenhagen Municipality with 95.34 km². [7] The border with Germany was measured as 67.7 km. In length. [8] Inhabited islands. [9] Measured in 1955. [10] Only the part of Greenland free of ice is included. The total area of Greenland is 2,166,086 km², of which 85 pct. is covered by inland ice.

Source: National Survey and Cadastra.

Table 2 Division of administration, Denmark 2000

	Municipality	Parish	Customs and tax region	Assessment districts	Valuation districts	Constituency[1]		Judicial district
						Counties and large constituencies	Constituency	
Total	**275**	**2 123**	**29**	**27**	**224**	**17**	**103**	**82**
The Islands	**134**	**892**	**16**	**14**	**121**	**10**	**58**	**40**
Copenhagen Municipality	1	71	2	1	13	3	16	1
Frederiksberg Municipality	1	10					3	1
Copenhagen County	18	70	4[2,3]	2	22	1	9	10
Frederiksborg County	19	78	2[2]	2	17	1	4	5
Roskilde County	11	68	1[3]	1	10	1	3	2
West Zealand County	23	167	2[5]	2	17	1	6	7
Storstrøm County	24	181	2[5]	2	16	1	6	6
Bornholm County	5[6]	22	1	1	3	1	2	1
Funen County	32	225	2	3	23	1	9	7
Jutland	**141**	**1 231**	**13**	**13**	**103**	**7**	**45**	**42**
South Jutland County	23	116	2	2	12	1	7	6
Ribe County	14	88	1	1	9	1	4	5
Vejle County	16	135	1[8]	2	13	1	6	5
Ringkøbing County	18	143	2	1	12	1	4	6
Århus County	26	284	3[8,9]	3	22	1	10	6
Viborg County	17	225	2[10,11]	2	14	1	5	5
North Jutland County	27	240	2[9,10,11]	2	21	1	9	9

Note1: Judicial system: There are two High-Court districts and15 jury districts. The East High-Court District covers the islands which are divided into 9 jury districts. The West High-Court District covers Jutland and is divided into 6 jury districts.

Note 2: Conscription districts: There are 6 conscription districts, 2 east and 4 west of Storebælt. With regard to ecclesiastical matters, there are 10 parishes (111 rural deans and 1,353 reverends).

Note 3: The Working Environment Authority: There are 14 Inspection Districts: Copenhagen and Frederiksberg Municipality comprise 1 district, Roskilde and Bornholm county comprise 1 district, whilst the remainder of Denmark's 12 counties each comprise 1 district.

Note 4: The Public Employment Office: There are 14 public employment offices: Copenhagen and Frederiksberg municipality and Copenhagen county which has 1 office, whilst the remainder of Denmark's 13 counties each have 1 office.

[1] In accordance with Act no. 488 of 11 June 1998 regarding election to the Folketing. [2] Farum Municipality and Frederiksborg County are under the auspices of Ballerup Customs and Tax Region, which is included in Copenhagen County. [3] Greve Municipality and Roskilde County are under the auspices of Høje Tåstrup Customs and Tax Region, which is included in Copenhagen County. [4] Part of Police District 13 Køge is in Storstrøm County. [5] Haslev Municipality and West Zealand County are under the auspices of Næstved Customs and Tax Region, which is included in Storstrøm County. [6] With the exception of Christiansø, which is not comprised by the division of municipalities; the island is administered by the Ministry of Defence. [7] Part of judicial district 51, Grindsted, is in Vejle County. [8] Brædstrup, Gedved, Horsens and Juelsminde municipalities, and Vejle County, are under the auspices of Horsens Customs and Tax Region, which is included in Århus County. [9] Hobro Municipality and North Jutland County are under the auspices of Randers Customs and Tax Region, which is included in Århus County. [10] Farsø, Nørager and Aars Municipalities, and North Jutland County, are under the auspices of Viborg Customs and Tax Region, which is included in Viborg County. [11] Brovst, Fjerritslev and Løgstør Municipalities, and North Jutland County, are under the auspices of Thisted Customs and Tax Region, which is included in Viborg County. [12] Part of Judicial District 78, Hobro, and part of Police District 52, Hobro, is in Viborg County.

Table 3 Area and population. Regions and inhabited islands 1999-2000

Municipality code		Area in ha	Population 1999	Population 2000
	Whole country	**4 309 588**	**5 313 577**	**5 330 020**
	Zealand and its islands	**744 828**	**2 223 895**	**2 235 839**
-	Zealand	703 130	2 056 488	2 067 606
331	Agersø	684	263	247
-	Amager	9 534	153 479	154 207
365	Bogø	1 307	1 066	1 048
373	Enø	340	292	283
229	Eskilsø	139	4	1
365	Farø	93	4	5
373	Gavnø	575	28	26
331	Glænø	559	62	60
221	Hesselø	71	2	2
361	Langø	127	6	8
365	Lindholm	7	4	4
397	Masnedø	168	132	140
365	Møn	21 775	10 406	10 542
301	Nekselø	223	26	22
365	Nyord	499	50	47
331	Omø	452	168	159
315	Orø	1 502	1 017	1 007
185	Saltholm	1 599	8	8
301	Sejerø	1 237	365	392
101	Slotsholmen	21	22	21
361	Tærø	175	3	4
	75 named islands	611	•	•
	Lolland, Falster and their islands	**179 534**	**114 829**	**114 688**
-	Lolland	124 286	70 747	70 640
-	Falster	51 376	43 199	43 171
363	Askø	282	62	55
381	Barneholm	10	2	2
379	Fejø	1 600	603	606
379	Femø	1 138	184	182
363	Lilleø	86	17	18
379	Skalø	106	11	11
379	Vejlø	37	2	2
379	Vejrø	157	2	1
	35 named islands	456	•	•
	Bornholm and its islands	**58 853**	**44 529**	**44 337**
-	Bornholm	58 813	44 426	44 238
411	Christiansø[1]	25	103	99
411	Frederiksø[1]	4		
411	6 named islands	11	•	•

Municipality code		Area in ha	Population 1999	Population 2000
	Funen and its islands	**348 584**	**471 732**	**471 974**
	Funen	298 455	439 229	439 608
431	Avernakø	586	124	115
443	Birkholm	92	9	9
431	Bjørnø	150	36	40
421	Bågø	623	29	32
479	Drejø	426	78	81
445	Fænø	394	3	3
479	Hjortø	90	16	17
-	Langeland	28 384	14 511	14 412
431	Lyø	605	134	132
487	Siø	131	26	26
479	Skarø	197	20	27
431	Store Svelmø	27	1	1
475	Strynø	488	213	208
479	Thurø	753	3 627	3 682
447	Tornø	21	1	1
421	Torø	64	2	2
479	Tåsinge	6 979	6 200	6 184
423	Æbelø	232	1	2
-	Ærø	8 807	7 472	7 392
	80 named islands	1 080	•	•
	Jutland	**2 977 789**	**2 458 592**	**2 463 182**
-	Jutland peninsular	2 387 421	2 062 521	2 067 637
-	Vendsyssel-Thy	468 572	307 955	307 745
773	Agerø	385	33	32
727	Alrø	751	179	177
-	Als	31 222	51 620	51 526
707	Anholt	2 237	163	164
545	Barsø	266	19	26
851	Egholm	600	51	50
615	Endelave	1 308	166	163
563	Fanø	5 578	3 267	3 214
783	Fur	2 229	966	949
813	Hirsholm	17	4	4
619	Hjarnø	321	120	110
675	Jegindø	791	551	544
529	Kalvø	18	15	12
827	Livø	331	8	8
825	Læsø	10 122	2 282	2 293
571	Mandø	763	75	69
773	Mors	36 331	23 001	22 957
531	Rømø	12 886	788	771
741	Samsø	11 206	4 318	4 233
503	Store Okseø	11	3	3
727	Tunø	352	92	92
671	Venø	646	198	188
515	Årø	566	197	215
	129 named islands	2 859	•	•

Note: Als includes the following municipalities: 501, 523, 535 plus 24,441 people in Sønderborg Municipality. - Amager includes the following municipalities: 155 and 185 (excl. Saltholm) plus 102,060 people in Copenhagen Municipality. - Bornholm includes the following municipalities: 401, 403, 405, 407 and 409. - Falster includes

the following municipalities: 369 (excl. Toreby parish), 375, 391 and 395. - Langeland includes the following municipalities: 475 (excl. the island of Strynø), 481 and 487 (excl. the island of Siø). - Lolland includes the following municipalities: 355, 359, 363 (excl. the islands of Askø and Lilleø), Toreby parish in Nykøbing F. Municipality, 367, 371, 379 (excl. the islands of Fejø, Femø, Skalø, Vejlø and Vejrø, 381 (excl. Barneholm), 383 and 387.- Vendsyssel-Thy includes the following municipalities: 675 (excl. the island of Jegindø), 765, 785, 787, 803, 805, 807, 811, 813 (excl. Hirsholm), 817, 819, 821, 829, 835, 839, 841, 847, 849 plus 37,420 people in Aalborg Municipality, Aggersborg parish 555 people in Løgstør Municipality. - Ærø includes municipality 443 (excl. the island of Birkholm) and municipality 493.

[1] Not included in the division of municipalities, administered by the Ministry of Defence.

Table 4 Area analysed by use 1965-1995

	1965	1982	1995	1995
	km^2			pct.
Total area	**43 070**	**43 080**	**43 095**	**100**
Urban areas, residential and industrial[1]	3 890	5 350	8 185	19
Hedgerows, ditches, track roads, etc.	1 370	1 130	. . .	. . .
Cultivated land, market gardens and orchards	26 930	26 510	27 260	63
Forests and plantations, incl. agricultural forests	4 720	5 010	4 450	10
Meadows, marshland, etc.	3 250	2 460	1 170	3
Mooreland, sand dunes and bogs	2 230	1 980	1 380	3
Lakes and streams	680	640	650	2

Note. Figures are partly estimates and include some uncertainty.

[1] Urban areas, residential and industrial includes summer dwelling areas, roads, and spread residences.

Table 5 Preserved areas by date of preservation 1999

	Preserved areas before and incl. 1990	Pre-served in 1991-1995	Pre-served in 1996	Pre-served in 1997	Pre-served in 1998	Pre-served in 1999	Preserved areas total up to 1999	Preserved areas as pct. of the total area
	km²							
All Denmark	**1 846**	**97**	**30**	**6**	**3**	**2**	**1 984**	**4.6**
Copenhagen region[1]	285	14	11	4	1	0	**315**	**11.0**
Divided after 1997:								
- Copenhagen County	. . .	. . .	. . .	. . .	-	-	**-**	**. . .**
- Frederiksborg County	. . .	. . .	. . .	. . .	1	-0	**0**	**. . .**
- Roskilde County	. . .	. . .	. . .	. . .	0	1	**1**	**. . .**
West Zealand County	121	21	-	0	1	-	**143**	**4.8**
Storstrøm County	108	16	-	-	-	0	**124**	**3.7**
Bornholm County	36	-	-	2	0	0	**38**	**6.4**
Funen County	54	11	-	-	-	-	**65**	**1.9**
South Jutland County	92	4	0	-	-	2	**98**	**2.5**
Ribe County	111	2	-	-	-	-	**112**	**3.6**
Vejle County	131	1	15	-	-	-	**146**	**4.9**
Ringkøbing County	181	1	0	0	0	-	**183**	**3.8**
Århus County	204	12	0	-	-	-	**217**	**4.8**
Viborg County	254	11	-	-	-	-	**265**	**6.4**
North Jutland County	271	5	3	-	1	-	**279**	**4.5**
Territorial waters	**1 381**	**-**	**840**	**105**	**37**	**-**	2 452	**. . .**

Note. Figures cover areas where preservation has been determined by the *Fredningsnævn* (preservation board) or the *Overfredningsnævnet* (head preservation board) (for territorial waters by statutory order).

[1] Up to and including 1997 the Copenhagen region included Copenhagen, Frederiksborg and Roskilde counties, as well as Copenhagen and Frederiksberg municipalities.

Source: National Forest and Nature Agency.

Table 6 Denmark's largest lakes 1953-1989

Lake's name	Location	1953-59	1980-89	Lake's name	Location	1953-59	1980-89
		km^2				km^2	
Arresø	Zealand	40.6	39.5	Skanderborg Lake	East Jutland	8.6	8.0
Stadil Fjord[1]	West Jutland	18.8	18.5	Julsø and Borre Lake	East Jutland	7.6	7.8
Esrum Lake	Zealand	17.4	17.4	Tystrup-Bavelse Lake	Zealand	7.5	7.4
Mossø	East Jutland	16.9	16.6	Sebber Sund[1]	North Jutland	6.0	. . .
Saltbæk Vig[1]	Zealand	14.2	15.6	Tange Lake	West Jutland	5.8	5.5
Tissø	Zealand	12.9	12.7	Lund Fjord[1]	North Jutland	6.8	5.4
Furesø	Zealand	9.4	9.3	V. Stadil Fjord[1]	West Jutland	5.6	4.0
Søndersø	Lolland	9.0	8.5				

Note. 1953-59: Measurements were taken in the period 1953-59 on the basis of the Geodætisk Institut's scale 1:20000. The result s therefore refer to the year the maps were published, but with changes in later revisions. The year of publication spans from about 1900 to the 1950s. 1980-89: Areas are calculated on the basis of the latest edition of the Geodætisk Institut's 4 cm maps up to 1988-89. The measurement basis spans from revised older maps, wh ere the degree of revision is unknown, to modern photogrametric maps. Named lakes are lakes which are named on maps.

[1] Area of brackish water.

Source: The Ministry of Food, Agriculture and Fisheries, the *Statens Planteavlsforsøg* (a plant-growing research establishment), *Afdeling for Arealdata og Kortlægning* (area-data and mapping department).

Table 7 Meteorological conditions. Temperature and degree-days 1999

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	All year
Maximum temperature													
1874-1999 Temp.	12.0	15.8	22.2	28.6	32.8	35.5	35.3	36.4	32.3	24.1	18.5	14.5	36.4
Measured during the years	*1999*	*1990*	*1990*	*1993*	*1892*	*1947*	*1941*	*1975*	*1906*	*1978*	*1968*	*1953*	*1975*
1999	12.0	10.0	17.3	19.6	28.4	25.7	30.3	31.5	28.4	18.4	15.4	10.8	31.5
Average daily temperature[1]													
Normal (1961-1990)	2.0	2.2	4.9	9.6	15.0	18.7	19.8	20.0	16.4	12.1	7.0	3.7	10.9
1999	4.3	3.7	6.1	11.5	14.9	17.3	21.6	21.1	20.2	12.2	8.1	4.4	12.1
Mean temperature													
Normal (1961-1990)	-	-	2.1	5.7	10.8	14.3	15.6	15.7	12.7	9.1	4.7	1.6	7.7
1999	2.3	1.0	3.7	7.7	10.8	13.6	17.3	16.6	16.2	9.4	5.5	2.3	8.9
Average nightly temperature[2]													
Normal (1961-1990)	- 2.9	- 2.8	- 0.8	2.1	6.5	9.9	11.5	11.3	9.1	6.1	2.3	- 0.7	4.3
1999	-0.1	-2.1	1.3	4.0	6.6	9.6	12.8	12.1	12.7	6.5	2.6	-0.4	5.5
Minimum temperature													
1874-1999 Temp.	- 31.2	- 29.0	- 27.0	- 19.0	- 8.0	- 3.5	- 0.9	- 2.0	- 5.6	- 11.9	- 21.3	- 25.6	- 31.2
Measured during the years	*1982*	*1942*	*1888*	*1922*	*1900*	*1936*	*1903*	*1885*	*1886*	*1880*	*1973*	*1981*	*1982*
1999	-12.6	-18.5	-8.6	-4.6	-3.6	1.0	5.0	3.7	1.2	-3.0	-7.2	-13.3	-18.5
Degree-days													
Normal (1971-1990)	516	473[3]	452	339	186	. . .	. . .	. . .	136	251	361	461	3 175
1999	455	448	412	280	193	. . .	. . .	. . .	35	237	343	453	2 855

Note. Daily measurements at a number of stations throughout the country - as a rule 40 stations - have been used as the basis for the monthly national averages in the table. Annual values may take account of decimals which are not included in the monthly averages. Normals are averages for a number of years, as a rule 30, and they state the expected figures for a day in January, February, etc.

[1] The average day temperature/night temperature is calculated from the highest/lowest daily temperatures at 30 stations. Mean temperature is calculated from 3 or 8 daily observations. Degree days are used as a measurement for heating needs in the heating season (1 September - 31 May). Degre e days are shade-temperature days and they are stated as averages for the whole country. The degree-days figure is the sum of the degree days for individual months. The size of the degree-days figure is converted to a percentage of the normal to give consumption in the individual heating season. [2] A maximum/minimum thermometer registers the highest/lowest temperature in a day from all the about 150 stations. Absolute maximum/minimum in the years 1874-1999 are found by extracting the highest/lowest temperature from the about 150 stationer (approx. 100 before 1960). Measured during the most recent year the temperature occurred. [3] 28 days, 506 when there are 29 days in February.

Source: Danish Meteorological Institute.

Table 8 Meteorological conditions. Precipitation, sunshine hours, etc. 1999

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year total
	Precipitation in mm												
Normal (1961-1990)	57	38	46	41	48	55	66	67	73	76	79	66	712
All Denmark	78	54	85	39	45	121	56	87	86	86	33	137	905
Cph Municipality, Frb.Municipality, Cph. County, Fr.borg County, and Roskilde County	61	40	57	40	49	95	26	127	36	44	18	108	701
West Zealand County	63	40	63	28	44	120	51	88	35	56	10	99	697
Storstrøm County	69	38	70	24	51	91	53	79	29	52	19	105	680
Bornholm County	55	45	51	60	51	72	54	82	45	59	54	127	755
Funen County	77	48	85	27	48	95	56	88	46	55	19	117	761
South Jutland County	91	74	105	36	41	108	56	88	108	101	40	172	1 020
Ribe County	80	79	100	39	29	111	65	68	161	135	33	169	1 069
Vejle County	91	54	96	34	41	119	55	78	102	93	31	153	947
Ringkøbing County	81	71	87	51	32	137	64	74	112	119	56	174	1 058
Aarhus County	55	44	85	38	48	140	49	109	74	74	23	104	843
Viborg County	81	56	82	50	48	130	64	76	103	85	53	152	980
North Jutland County	77	41	87	47	55	149	62	104	78	77	30	117	924
	per cent												
Relative humidity, all Denmark[1]													
Normal (1961-1990)	91	90	87	80	75	77	79	79	83	87	89	90	84
1999	92	90	90	84	80	85	81	82	86	88	90	92	87
Cloud cover, all Denmark[2]													
Normal (1961-1990)	79	73	69	63	60	59	62	59	63	70	74	77	67
1999	79	66	79	60	55	63	54	55	54	66	72	73	65
	hours												
Bright sunshine, all Denmark[3]													
Normal (1961-1990)	41	71	117	178	240	249	236	224	152	99	57	39	1 701
1999	41	91	77	195	277	246	306	259	189	126	57	40	1 905
	HPa												
Mean air pressure (sea level)													
Aalborg	1007.7	1004.3	1010.1	1010.8	1016.6	1014.8	1015.2	1011.6	1011.4	1013.0	1016.0	998.5	1010.8
Copenhagen Airport	1010.4	1005.9	1011.5	1011.9	1017.6	1016.4	1016.2	1012.1	1013.3	1014.6	1017.9	1001.3	1012.4
	per cent												
Wind incidence[4]	100	100	100	100	100	100	100	100	100	100	100	100	100
North	7	8	4	9	9	5	8	6	3	7	9	10	7
North-East	9	3	9	9	5	2	8	4	2	8	13	4	6
East	9	2	14	13	23	7	12	15	24	13	4	3	12
South-East	8	3	19	11	12	12	8	12	23	12	8	4	11
South	21	11	23	11	8	17	9	9	20	10	23	20	15
South-West	28	25	12	18	19	19	16	12	21	17	22	25	20
West	13	31	12	19	15	24	26	24	6	25	16	25	20
North-West	5	18	6	10	10	14	13	17	2	8	6	9	10
Calm	1	<	1	1	<	1	1	1	<	<	2	1	1
	m/s												
Mean wind force[5]													
1999	6.2	6.0	5.5	5.8	5.1	4.7	4.4	4.4	5.1	6.1	5.8	7.0	5.5

Note. *Precipitation* is stated as the height the surface of water would rise if it could not run away or evaporate. The figures stated are national averages of approximately 100 stations throughout the country. Totals for months and years are calculated taking account of decimals. Account is taken of area for the individual counties. See also note to the table on temperature and degree days. 'All Denmark' does not include Bornholm.

Air pressure is the weight of a column of air with a cross-sectional area of 1 cm^2 which rests on a horizontal plane. It is measured in hPa = hectopascals = millibar.

[1] *Humidity* states, in percent, the relationship between the actual water vapour in the air and the amount which would be necessary to saturate the air at the given temperature. [2] *Cloud cover* is the percentage of the sky which is covered by clouds. [3] *Sunshine hours* (bright sunshine, i.e. 200 watt pr. m^2) is registered throughout the day on a sunshine recorder. [4] *Wind incidence* from 10 coastal stations states the percentage distribution of the daily observations in the 8 wind directions and no wind.< *means less than 0.5 %.* [5] *Mean wind force* m/s from 10 coastal stations.

Source: Danish Meteorological Institute.

Table 9 Meteorological conditions. Daily information 1999

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year total
Number of days within a month all Denmark													
Summer days (max. >25°)													
Normal (1961-1990)	-	-	-	-	0.2	1.9	2.6	2.3	0.1	-	-	-	7.2
1999	-	-	-	-	0.4	-	5.0	5.7	1.6	-	-	-	12.8
Ice days (max. <0°)													
Normal (1961-1990)	8.6	7.5	2.2	0.1	-	-	-	-	-	-	0.6	4.0	23.0
1999	5.1	3.4	<	-	-	-	-	-	-	-	-	1.3	9.9
Frost days (min. <0°)													
Normal (1961-1990)	19.0	19.0	15.0	6.6	0.7	<	-	-	0.2	1.8	7.3	15.0	84.0
1999	11.8	16.1	7.0	2.1	0.5	-	-	-	-	1.4	7.1	14.0	59.8
Days with fog													
Normal (1961-1990)	10.0	9.3	9.2	7.5	5.1	2.6	2.6	3.2	4.3	7.0	5.7	7.0	74.0
1999	3.8	8.4	8.1	5.3	4.0	4.1	4.5	4.8	5.2	4.0	6.6	5.3	64.2
Precipitation days (R ³ 0.1 mm)													
Normal (1961-1990)	17	13	14	12	12	12	13	13	15	16	18	17	171
1999	21.3	18.1	20.6	11.5	11.6	17.3	12.0	13.5	12.4	19.6	13.4	24.6	196.0
Heavy precipitation days (R ³ 10 mm)													
Normal (1961-1990)	1.1	0.5	0.7	0.7	1.1	1.5	1.8	1.8	2.0	2.2	2.0	1.6	17.0
1999	1.0	0.2	2.1	0.8	1.2	4.2	1.4	3.2	2.6	1.9	0.4	4.0	22.9
Days with snow													
Normal (1961-1990)	7.6	6.4	5.3	2.6	0.2	-	-	-	-	0.1	2.3	5.8	30.0
1999	4.5	6.8	3.8	0.9	-	-	-	-	-	<	2.0	5.9	23.8
Windy days in pct.													
1999	7	10	4	6	2	2	1	2	2	8	9	15	6
Days with thunder													
Normal (1961-1990)	0.1	0.1	0.1	0.2	1.3	2.0	2.3	2.2	1.3	0.6	0.3	0.1	11.0
1999	<	0.5	-	0.2	0.8	2.3	2.8	3.1	2.9	1.0	0.2	0.5	14.3

Note. *Summer days* are days where the highest temperature is over 25° Celsius. *Ice days* are days where the highest temperature is under 0° Celsius. *Frost days* are days where the lowest temperature is under 0° Celsius. *Days with fog* are days where fog is observed around the station. *Precipitation days* are days with precipitation of 0.1 mm or more. *Heavy precipitation days* are days with precipitation of 10 mm or more. *Days with snow* are days with snowfall of 0.1 mm or more measured after melting. *Windy days* have wind of more than 10.8 m/sec. Registered at coastal stations. *Days with thunder* are a national average of thunder days from individual stations. When the number of days is less than 10, a tenth is included.

< means less than 0.1 but greater than 0.0. See also the note to the table on temperature and degree days.

Source: Danish Meteorological Institute.

Table 10 Air pollution in cities 1990-1999

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	µg/m3 sulphur dioxide									
Copenhagen	19.3	18.1	14.1	11.5	8.7	9.0	7.0	4.6	4.3	4.0
Ålborg	11.5	11.8	7.1	6.6	4.6	4.0	5.0	2.7	2.7	1.8
Odense	9.1	11.0	6.9	6.5	4.3	3.8	4.9	2.6	2.1	1.7
	µg/m3 nitrogen dioxide									
Copenhagen	53.4	51.7	51.7	43.4	46.7	53.0	44.7	42.6	42.9	46.8
Ålborg	36.3	40.4	37.8	38.0	36.1	37.4	37.6	33.6	34.2	40.1
Odense	35.2	42.3	36.4	36.6	35.8	34.4	34.0	35.5	31.6	32.9
	ng/m3 lead									
Copenhagen	250.1	236.9	198.6	119.1	37.1	26.0	24.8	16.6	16.4	16.6
Ålborg	292.4	262.7	212.0	140.1	44.7	31.4	18.6	13.9	13.0	12.5
Odense	148.5	168.4	130.4	96.5	31.9	22.3	22.0	14.9	14.5	13.6
	µg/m3 particulates									
Copenhagen	73.6	77.4	73.6	69.6	64.7	61.1	65.3	46.8	45.5	47.2
Ålborg	70.4	71.4	59.1	63.5	61.1	55.7	68.9	53.7	50.7	51.3
Odense	61.2	66.6	59.8	62.1	55.6	53.2	62.7	61.4	45.6	46.6

Note. µg/ m^3 corresponds to a millionth of a gram per cubic meter, while ng/m^3 corresponds to a billionth of a gram per cubic meter.

Source: Danish National Environmental Research Institute.

Table 11 Ozone layer over Denmark 1980-1999

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	All year
	DU1												
1980	354	357	396	417	403	376	367	327	300	308	302	323	353
1985	375	383	392	395	371	366	339	311	296	265	300	321	343
1990	310	344	361	380	356	351	340	317	294	274	297	308	328
1995	321	357	372	358	350	324	311	294	297	269	277	307	320
1999	342	382	399	376	370	347	332	325	283	293	278	314	345

1 The ozone layer in Dobson units (DU). This measurement states how many hundredths of a millimetre thick the ozone layer would be if it was collected on the surface of the earth.

Source: Danish Meterological Institute.

Table 12 Emissions and depositions in Denmark 1997

	Danish emissions transported to selected countries			Depositions in Denmark from selected countries		
	Sulphur from SO_2	Nitrogen from NOx	Nitrogen from NH_4	Sulphur from SO_2	Nitrogen from NOx	Nitrogen from NH_4
	tons					
Denmark	7 300	3 700	21 800	7 300	3 700	21 800
Sweden	5 700	7 200	6 800	400	800	700
Norway	1 800	2 500	2 600	100	700	100
Finland	900	1 600	1 000	0	100	0
United Kingdom	400	800	500	4 400	5 800	1 300
Germany	2 300	3 400	3 900	4 900	3 700	6 200
Netherlands	100	200	200	500	1 600	1 100
Belgium	100	100	100	900	800	400
France	400	800	300	2 100	1 900	1 100
Poland	2 400	4 200	3 000	2 800	1 000	800
Czech Republic and Slovakia	400	700	500	900	400	300
Former USSR, European part	5 400	9 800	4 900	800	500	100
Sea areas	24 900	19 200	36 800	6 200	6 900	0
Other	2 452	21 305	1 490	4 100	1 700	1 000

Note: Data for 1997 has been calculated using a new dispersion model.

Source: EMEP/the Norwegian Meteorological Office.

Table 13 Emissions from the transport sector 1998

	CO_2	NO_x	SO_2	CO
	thousand tons			
Total	**14 311**	**96**	**6**	**309**
Road transport	11 204	77	2	306
Railway transport	247	2	0	0
Air transport	2 451	10	0	2
Sea transport	409	7	3	1
	per cent			
Total	**100**	**100**	**100**	**100**
Road transport	78	79	36	99
Railway transport	2	2	2	0
Air transport	17	11	4	1
Sea transport	3	8	58	0

Source: Danish Meteorological Institute.

Table 14 Bathing water quality 1980-2000

	Monitoring stations	Acceptable water quality	Unacceptable water quality	Beach areas where bathing is forbidden
1980	1 304	1 101	179	24
1985	1 374	1 017	288	69
1990	1 338	1 199	70	69
1991	1 307	1 216	54	37
1992	1 282	1 197	55	30
1993	1 282	1 226	33	23
1994	1 288	1 267	33	21
1995	1 301	1 281	52	20
1996	1 299	1 280	57	19
1997	1 310	1 293	18	17
1998	1 300	1 282	45	18
1999	1 300	1 283	30	17
2000	1 300	1 255	28	17

Source: Environmental Protection Agency and municipalities.

Table 15 Consumption of drinking water by counties 1996-1998

	1996	1997	1998
	m^3 in mio.		
All Denmark	**483.5**	**464.8**	**441.3**
Copenhagen Municipality	36.2	35.7	35.7
Frederiksberg Municipality	6.6	6.5	6.2
Copenhagen County	46.6	45.5	43.9
Frederiksborg County	28.7	27.8	25.5
Roskilde County	18.1	17.3	16.2
West Zealand County	29.9	28.8	29.1
Storstrøm County	22.5	21.3	19.6
Bornholm County	4.8	4.6	4.3
Funen County	42.4	41.0	38.2
South Jutland County	24.7	23.6	23.1
Ribe County	24.5	22.7	21.6
Vejle County	34.2	32.9	30.5
Ringkøbing County	31.8	30.3	28.6
Aarhus County	57.0	54.3	50.4
Viborg County	26.0	25.0	23.1
North Jutland County	49.6	47.5	45.4

Note. Water consumption of industry, agriculture and fish farming has not been included where recovery is based on separate individual borings.

Table 16 Consumption of drinking water by purpose 1996-1998

	1996	1997	1998
	m^3 in mio.		
All Denmark	**483.5**	**464.8**	**441.3**
Households	290.7	277.1	266.2
Industry and institutions	150.5	147.0	142.6
Losses, etc.	42.3	40.7	32.5

Note. Water consumption of industry, agriculture and fish farming has not been included where recovery is based on separate individual borings.

Table 17 Waterworks by content of nitrates in drinking water 1998

	Waterworks by content of nitrates per litre			
	0.0 - 4.9 mg	5.0 - 24.9 mg	25.0 - 49.9 mg	- 50.0 mg
	per cent			
All Denmark	**76**	**15**	**7**	**2**
Copenhagen County[1]	78	20	-	2
Frederiksborg County	81	16	2	1
Roskilde County	87	10	3	-
West Zealand County	88	8	3	1
Storstrøm County	81	17	2	0
Bornholm County	77	18	5	-
Funen County	84	12	3	1
South Jutland County	81	15	3	1
Ribe County	78	19	2	1
Vejle County	85	10	4	1
Ringkøbing County	82	11	6	1
Aarhus County	68	17	11	4
Viborg County	62	19	10	9
North Jutland County	52	22	22	4

Note. The recommended limit value for nitrates in drinking water is 25 mg/l.

[1] Copenhagen County includes Copenhagen and Frederiksberg Municipalities.

Table 18 Recycling of paper and glassware packaging 1996-1998

	1996	1997	1998
Paper	tons thousands		
Consumption of paper in Denmark[1]	**1 208**	**1 349**	**1 304**
Production of paper in Denmark	330	342	350
Waste paper collected	537	607	656
Waste paper used in production[2]	385	407	409
Glassware packaging[3]			
Consumption, total	**181**	**190**	**184**
Collected, total	123	115	126
Recycled[4]	105	108	118

[1] Danish production + imports - exports of paper and card. [2] Waste paper added as raw material in Danish paper production where there is an estimated process waste of 15-20 pct. [3] Excl. bottles with deposits which replace glass consumption of about 300,000 tons glass. [4] Of which 57,000 tons washed and refilled bottles and 52,000 tons broken glass for recycling in 1998.

Source: Dansk Center for Affald og Genanvendelse (Danish centre for waste and recycling).

Table 19 Amount of waste analysed by type of waste and treatment 1998

	Recycling	Incineration	Depositing	Special treatment	Total
	thousand tons				
Total	**7 319**	**2 748**	**2 277**	**84**	**12 428**
Daily refuse	350	1 367	109	0	1 825
Bulky waste	96	239	234	4	572
Garden waste	553	9	24	0	586
Commercial and industrial waste	4 324	858	1 105	1	6 288
Hazardous waste	51	1	5	76	133
Special hospital waste	0	4	0	3	7
Processing residue	1 940	270	799	0	3 008
Not known	7	0	1	0	8

Note: The data originates from the information system on waste and recycling (ISAG) which is kept by the Danish Environmental Protection Agency.

Source: Environmental Protection Agency, sugar factories, the recycling industry, and power stations.

Table 20 Sales of pesticides 1994-1999

	1994	1995	1996	1997	1998	1999
	Tons					
Sales of pesticide products[1]						
Total sale	**16 722**	**19 430**	**15 295**	**14 825**	**14 179**	**12 445**
Repellents	187	136	64	59	56	84
Fungicides	2 120	2 395	1 626	2 105	1 911	1 999
Rodenticides	309	246	412	306	375	441
Herbicides	7 825	9 782	7 898	7 584	7 320	5 740
Insecticides	1 194	1 501	738	1 030	1 185	900
Soil disinfectants	24	21	48	3	0	4
Combined fungicides and insecticides	32	31	18	19	26	16
Algicides	364	58	0	0	0	1
Slimicides for use in paper pulp	84	91	50	50	39	60
Products against pests on farm animals	279	594	378	355	141	111
Products for the protection of woodwork	3 884	4 026	3 890	3 044	2 756	2 657
Plant growth regulators	421	551	173	271	369	432
Of which active ingredients[2]						
Active ingredients, total	**5 615**	**6 630**	**5 271**	**4 582**	**4 326**	**3 605**
Repellents	10	9	4	4	4	6
Fungicides	1 096	1 246	791	1 027	891	884
Rodenticides	3	3	3	4	4	3
Herbicides	3 070	3 690	3 127	2 923	2 781	2 059
Insecticides	159	220	90	97	102	86
Soil disinfectants	23	19	31	3	0	4
Combined fungicides and insecticides	19	6	3	3	3	2
Algicides	11	5	0	0	0	0
Slimicides for use in paper pulp	25	33	31	33	33	42
Products against pests on farm animals	4	5	2	2	2	1
Products for the protection of woodwork	935	1 069	1 097	346	297	261
Plant growth regulators	260	325	93	140	209	257

[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

Table 21 Extraction of raw materials 1990-1999

	1990	1995	1998	1999
	m^3 in thousands			
Extraction of raw materials, total	**33 975**	**34 211**	**37 603**	**47 858**
Land:				
Granite	810	662	183	180
Chalk, limestone	2 924	4 049	3 445	3 343
Quartz sand	186	191	191	279
Clay	462	739	779	828
Plastic clay and bentonite	303	311	325	352
Moler	195	186	256	197
Stone, gravel, sand	22 534	21 721	24 885	28 414
Peat and sphagnum	399	259	336	253
Other raw materials	292	440	205	1 149
Sea				
Sand, gravel, sand for land filling etc.	5 870	5 652	6 999	12 863

Source: Counties and the National Forest and Nature Agency.

Table 22

Expenditure and revenue of the general government sector on the environment 1991-1999

	1991	1995	1999
	DKK mio.		
Environmental expenditure, total	**4 027**	**6 779**	**7 991**
Environmental protection	**1 296**	**3 190**	**3 704**
Waste	476	446	332
Water and land	289	623	509
Air	101	1 599	2 187
Other environmental protection measures	430	522	676
Forest and nature management	**1 712**	**2 165**	**2 484**
Forest and nature	1 469	1 825	1 937
Streams	195	249	238
Agriculture and the environment	48	91	309
Environmental research and surveys	**368**	**541**	**506**
Other environmental protection measures	**651**	**883**	**1 297**
Joint expenditure	632	845	1 254
Protection of buildings	19	37	38
Traffic and environment	0	1	5
Environmental revenue, total[1]	**4 055**	**7 804**	**12 001**
Environmental protection	**2 592**	**1 929**	**2 006**
Waste	320	342	342
Water and land	2 238	1 471	1 572
Other environmental protection measures	34	116	92
Forest and nature management	**193**	**329**	**495**
Forest and nature	188	317	336
Streams	5	12	7
Agriculture and the environment	0	0	152
Environmental research and surveys	**38**	**137**	**198**
Other environmental and nature measures	**89**	**67**	**82**
Environmental taxes	**1 143**	**5 342**	**9 220**
Energy and resource taxes	**14 643**	**18 390**	**26 534**

Note: Figures only cover the general government sector. [1] Not including energy and resource taxes.

Table 23

Expenditure and revenue of the general government sector on the environment, by sub sectors 1999

	Central government	Counties	Municipalities	General government sector, total[1]
	DKK mio.			
Environmental expenditure, total	**4 416**	**1 393**	**2 227**	**8 036**
Environmental protection	**2 761**	**523**	**459**	**3 743**
Waste	120	-	212	332
Water and land	94	380	74	548
Air	2 187	-	-	2 187
Other environmental protection measures	360	143	173	676
Forest and nature management	**989**	**214**	**1 286**	**2 489**
Forest and nature	677	111	1 151	1 939
Streams	3	104	135	242
Agriculture and the environment	309	-	-	309
Environmental research and surveys	**506**	**-**	**-**	**506**
Other environmental protection measures	**159**	**655**	**483**	**1 297**
Joint expenditure	116	655	483	1 254
Protection of buildings	38	-	-	38
Traffic and environment	5	-	-	5
Environmental revenue, total[2]	**9 754**	**153**	**2 201**	**12 108**
Environmental protection	**27**	**94**	**1 926**	**2 047**
Waste	5	-	337	342
Water and land	-	67	1 544	1 611
Other environmental protection measures	21	27	45	93
Forest and nature management	**247**	**33**	**220**	**500**
Forest and nature	95	28	216	339
Streams	-	5	4	9
Agriculture and the environment	152	-	-	152
Environmental research and surveys	**198**	**-**	**-**	**198**
Other environmental and nature measures	**1**	**26**	**55**	**82**
Joint expenditure	1	26	55	82
Preservation of buildings	-	-	-	-
Traffic and environment	-	-	-	-
Environmental taxes	**9 281**	**-**	**-**	**9 281**
Energy and resource taxes	**26 566**	**-**	**-**	**26 566**

Note: Figures only cover the general government sector.

[1] Incl. transfers to other public sub sectors. [2] Not including energy and resource taxes.

Table 24 Convictions for offences against the environment protection Acts 1990-1997

	1990	1996	1998
	number of convictions		
Total	**403**	**406**	**475**
Environmental Protection Act	260	170	182
Marine Environment Act	2	2	-
Nature Conservation Act	18	60	28
Washington Convention	9	16	3
Forestry Act	-	-	1
Act on urban and rural areas	18	17	25
Act on holiday dwellings and camping	6	13	13
Act on chemical compounds and products	5	2	6
Other acts relating to the environment	85	126	217

Table 25 Denmark's fauna and flora 1997

	Total number of known species	Total number of 'listed species'		Species extinct in Denmark[1]	Species requiring special protection		
					Directly endangered[2]	Vulnerable species[3]	Rare species[4]
		Number	per cent	number of species			
Total	**10 598**	**3 142**	**30**	**343**	**611**	**997**	**1 191**
Flora							
Fungi / Lichens	**3 950**	**1 452**	**37**	**112**	**268**	**453**	**619**
Fungi	3 000	878	29	31	157	248	442
Lichens	950	574	60	81	111	205	177
Vascular plants	**1 050**	**220**	**21**	**23**	**36**	**66**	**95**
Fauna							
Insects	**5 289**	**1 359**	**26**	**190**	**285**	**450**	**434**
Ephemeroptera	42	20	48	5	8	4	3
Plecoptera	25	10	40	2	2	3	3
Odonata	50	21	42	4	4	7	6
Pentatomoidea	56	15	27	0	2	7	6
Trichoptera	168	54	32	10	3	12	29
Beetles	3 674	964	26	144	233	328	259
Butterflies	73	36	49	9	8	18	1
Moths	900	141	16	13	12	45	71
Zygaenidae	8	5	63	1	1	3	0
Syrphidae	269	86	32	2	10	21	53
Simuliidae	24	7	29	0	2	2	3
Vertebrates	**309**	**111**	**36**	**18**	**22**	**28**	**43**
Freshwater fish	38	15	39	2	5	1	7
Amphibians	14	5	36	0	1	3	1
Reptiles	7	2	29	2	0	0	0
Birds	200	74	37	14	15	14	31
Mammals	50	15	30	0	1	10	4

Note. Definitions of categories are identical to those which are used in the so-called 'red lists'. These are national lists of the status of endangered animal and plant species.

[1] Species which are regarded as extinct in Denmark after 1850. [2] Species which are regarded as in danger of extinction in Denmark in the near future if the negative factors which are currently affecting them continue. [3] Species which are expected to be directly endangered in Denmark if the negative factors which are currently affecting them continue. [4] Species which are so few in number that they are particularly sensitive to random man-made or natural fluctuations and negligence.

Source: National Forest and Nature Agency.

Table 26 Breeding pairs of the 20 most common birds in Denmark 1997

No.	Species	Number of breeding pairs	Trend
1	Blackbird	2 250 000	Rising
2	Chaffinch	1 700 000	Rising
3	Skylark	1 360 000	Falling
4	House sparrow	944 000	Falling
5	Great tit	745 000	Fluctuating
6	Starling	660 000	Falling
7	Willow warbler	603 000	Stable
8	Yellowhammer	567 000	Stable
9	European greenfinch	489 000	Rising
10	Tree sparrow	482 000	Rising
11	Wren	404 000	Fluctuating
12	Whitethroat	358 000	Falling
13	Swallow	275 000	Falling
14	Wood pigeon	291 000	Rising
15	Robin	285 000	Fluctuating
16	Blackcap	284 000	Rising
17	Common linnet	283 000	Stable
18	Song thrush	259 000	Stable
19	Magpie	249 000	Rising
20	Bluetit	245 000	Fluctuating

Source: National Forest and Nature Agency

Table 27 Breeding pairs of the 20 most rare birds in Denmark 1997

No.	Species	Number of breeding pairs	Developmental trend
1	Black stork	1-3	Rising
2	Bluethroat	1-3	Rising
3	Barnacle goose	2-3	Rising
4	White-tailed eagle	3	Rising
5	Osprey	3	Stable
6	Corncrake	0-5	Falling
7	Common sandpiper	0-5	Fluctuating
8	Hen harrier	4-5	Rising
9	White-throated dipper	4-5	Rising
10	European serin	5	Fluctuating
11	Tengmalm's owl	5	Fluctuating
12	Canada goose	5	Rising
13	White stork	6	Falling
14	Stonechat	6-8	Fluctuating
15	Crane	2-9	Rising
16	Gull-billed tern	9	Rapidly falling
17	Black grouse	9	Falling
18	Golden plover	5-10	Falling
19	Hobby	5-10	Stable
20	Spotted nutcracker	10	Stable

Note. Protection of wild birds in Denmark is regulated by the Act on hunting and game management and the Nature Protection Act. Species with 0-2 breeding pairs in Denmark have been excluded.

Source: National Forest and Nature Agency.

Table 28 Number of mammals killed in Denmark 1990-1999

	1990/91	1995/96	1997/98	1998/99
	thousands			
Total	**302.5**	**326.5**	**283.3**	**279.5**
Red deer	1.9	2.9	3.3	3.3
Fallow deer	3.5	3.7	4.1	3.8
Sica	0.4	0.4	0.7	0.5
Roe deer	73.0	105.0	101.0	101.0
Hare	148.0	162.0	113.0	106.0
Rabbits	17.0	6.0	4.6	7.5
Squirrel	0.3	. . .[1]	. . .[1]	. . .[1]
Foxes	50.0	38.0	42.0	45.0
Badger	1.0	. . .[1]	. . .[1]	. . .[1]
Polecat	0.9	0.7	1.8	1.1
Mink	2.8	4.6	8.0	6.7
Stone marten	3.7	3.2	4.8	4.6

Note. Number of people holding hunting licences in the 1998/99 season was 171,000.

[1] This species is totally protected, but individual animals may be killed in accordance with the Statutory Order on game injuries.

Source: National Environmental Research Institute, Dept. of Flora and Fauna Ecology.

Table 29 Number of birds killed in Denmark 1990-1999

	1990/91	1995/96	1997/98	1998/99
	thousands			
Total	**2 866**	**2 585**	**2 281**	**2 246**
Grey partridge	85	94	65	57
Pheasant	900	812	705	742
Heron	1	1	2	1
Woodcock	27	27	22	25
Snipe	32	24	20	18
Mallard	696	768	643	670
Other surface-feeding duck	152	155	94	89
Eider duck	135	114	106	72
Other diving duck	58	45	36	34
Goose	14	16	15	18
Common coot	24	18	13	14
Gull	99	47	41	38
Wood pigeon	351	262	288	239
Eurasian collared dove	12	10	10	8
Rook	92	81	84	92
Crow	104	69	81	75
Black-billed magpie	60	38	43	43
Cormorant	. . .	3	4	4
Starling	. . .	1	7	7

Note. Number of people holding hunting licences in the 1998/99 season was 171,000.

Source: National Environmental Research Institute, Dept. of Flora and Fauna ecology.

Table 30 Energy balance sheet for Denmark 1998

	Crude oil and semi-manufactured oil	Coal, coke, etc.	Oil products	Natural gas	Other gas	Renewable energy resources	Electricity	District heating
	tons in thousands			1 000 Nm3	1 000 tons	Tj	GWh	Tj
Production	**11 556**	**-**	**7 583**	**13 914**	**432**	**66 858**	**38 762**	**121 784**
Imports	**4 832**	**8 416**	**5 779**	**-**	**10**	**479**	**3 280**	**-**
Stock	**511**	**- 1 100**	**156**	**- 128**	**- 11**	**-**	**-**	**-**
Waste and cable losses	**85**	**83**	**90**	**179**	**5**	**647**	**1 999**	**24 347**
Exports	**7 907**	**140**	**4 299**	**2 785**	**78**	**57**	**7 602**	**0**
Total domestic consumption	**7 885**	**9 293**	**8 816**	**11 079**	**370**	**66 633**	**32 441**	**97 436**
Households	**-**	**10**	**2 721**	**730**	**57**	**8 014**	**10 186**	**62 874**
Agriculture, fishing and quarrying	**-**	**105**	**807**	**674**	**7**	**2 469**	**2 118**	**1 888**
Agriculture, horticulture, and forestry	-	49	555	128	6	2 469	1 974	1 885
Fishing, etc.	-	-	220	-	-	-	64	-
Quarrying and mining	-	56	32	546	-	-	80	3
Manufacturing	**7 885**	**446**	**815**	**928**	**280**	**5 336**	**9 690**	**5 970**
Mfr. of food, beverages and tobacco	-	104	228	377	5	7	2 207	1 161
Mfr. of textile, wearing apparel and leather	-	-	13	28	1	1	200	125
Mfr. of wood, paper; printing and publishing	-	-	45	94	2	3 900	1 076	1 628
Mfr. of refined petroleum products, chemicals and plastic	7 885	19	101	117	239	19	2 150	1 208
Mfr. of non-metallic mineral, etc.	-	322	288	137	18	6	831	48
Mfr. of iron and basis metals	-	1	120	162	15	108	2 826	1 610
Mfr. of furniture and manufacturing n.e.s.	-	-	21	12	1	1 297	400	190
Energy and water supply	**-**	**8 732**	**1 569**	**8 434**	**-**	**50 813**	**491**	**24**
Construction	**-**	**-**	**316**	**5**	**14**	**-**	**242**	**-**
Wholesale and retail trade, hotels and restaurants, etc.	**-**	**-**	**367**	**104**	**5**	**-**	**3 736**	**9 043**
Sale and repair of motor vehicles, gas stations, etc.	-	-	76	13	-	-	329	1 107
Wholesale and commission sale, except of motor vehicles	-	-	205	42	2	-	1 351	3 674
Retail trade and repair work, except motor vehicles	-	-	69	27	1	-	1 466	2 317
Hotels and restaurants, etc.	-	-	19	22	3	-	591	1 944
Transport, postal services and telecommunication	**-**	**-**	**1 890**	**14**	**2**	**-**	**1 467**	**1 190**
Transport	-	-	1 860	6	2	-	1 227	508
Post and telecommunication	-	-	30	8	-	-	240	682
Financial intermediation, etc. business activities	**-**	**-**	**93**	**45**	**1**	**-**	**1 010**	**3 856**
Financial intermediation and insurance, etc.	-	-	7	11	-	-	257	928
Letting and sale of real estate	-	-	27	7	-	-	128	628
Business activities, etc.	-	-	59	27	-	-	625	2 300
Public and personal services	**-**	**-**	**237**	**145**	**5**	**-**	**3 502**	**12 591**
Public administration and defence, etc.	-	-	108	20	2	-	466	1 757
Education	-	-	28	36	1	-	863	3 117
Human health activities	-	-	13	22	-	-	539	1 947
Social institution, etc.	-	-	23	27	-	-	636	2 297
Refuse disposal, organisations, entertainment, etc.	-	-	66	40	1	-	997	3 473

Table 31 Energy consumption in Denmark 1990-1998

	1990	1995	1998
	thousand tons		
Energy consumption, gross			
Hard coal etc.	9 995	10 987	9 242
Coke and furnace coke	45	51	47
Brown coal etc.	6	9	4
Waste	2 943	3 569	3 611
Fuel wood, etc.	1 110	1 255	1 090
Straw	861	843	922
Kerosene	118	14	10
Jet fuel	666	657	806
Motor gasoline	1 584	1 892	1 999
Other petrol and oil products	19	750	1 220
Gas/Diesel oil	3 906	3 897	3 789
Fuel oil	947	997	813
Petroleum-coke	182	176	179
Liquid gas (LPG)	100	87	85
Refinery gas	265	370	236
	mio. Nm3		
Natural gas[3]	1 703	3 009	3 941
	thousand GJ		
Bio gas	600	713	1 426
Wind energy and water power	2 298	3 395	10 100
	mio KWh		
Electricity supply			
Electricity sold, public works	28 548	31 470	32 588
Dwellings	9 015	9 549	9 590
Agriculture, etc.	2 349	2 544	2 559
Manufacturing	8 112	9 451	9 796
Other industries, public administration, etc.	9 068	9 892	10 536
	thousand tons		
Crude oil and natural gas			
Crude oil, Danish production	5 985	9 225	11 825
	mio. Nm3		
Natural gas, Danish production	3 081	5 164	7 313

Note. Gross energy consumption is defined as the amount of energy available after conversion in refineries and before conversion at electricity, gas, or district heating power stations. This definition is different from the 'Manufacturers' investment by sector and county', which does not include energy converted in refineries.

[1] Corrected for cross-border trade. [2] Including waste oil. From 1995 incl. orimulsion. [3] Excl. consumption on North-Sea platforms.

Source: Danish Energy Agency and Association of Danish Electric Utilities.

Table 32 Production of renewable energy 1990-1998

	1990	1995	1998
	TJ		
Total production	**54 806**	**65 725**	**76 729**
Solar heat	105	219	300
Wind energy	2 197	4 238	10 005
Water power	101	109	98
Straw	12 481	12 824	13 359
Wood chips	1 724	2 340	3 038
Wood	7 019	9 191	8 339
Wood pills	1 575	2 138	2 261
Wood waste	6 175	5 665	5 851
Bio gas	752	1 729	2 670
Waste combustion	15 006	23 931	27 310
Fish oil	744	251	14
Geothermal heat[1]	2 510	3 043	3 484

[1] Heat pumps and geothermy.

Source: Danish Energy Agency.

Table 33 Manufacturers' energy consumption 1997

		Solid fuel	Liquid fuel	Gas	Electricity	District heating
		1 000 GJ				
	Manufacturing, total[1,2]	**19 067**	**26 287**	**56 494**	**30 539**	**5 477**
14009	**Extraction of gravel, clay, stone and salt, etc.**	**1 614**	**1 112**	**378**	**264**	**2**
15009	**Mfr. of food, beverages and tobacco**[2]	**2 982**	**7 453**	**15 398**	**6 827**	**1 132**
151000	Mfr. of meat and meat products	2	1 339	2 195	1 924	122
155000	Mfr. of dairy products	-	525	3 894	1 377	220
158909	Mfr. of other food products	2 852	4 668	7 199	2 835	556
159000	Mfr. of beverages	128	904	2 004	620	223
160000	Mfr. of tobacco and related products	-	16	107	72	11
17009	**Mfr. of textiles, clothing and leather**	**1**	**239**	**1 118**	**599**	**85**
170000	Mfr. of textiles	1	200	1 023	498	42
180000	Mfr. of clothing	-	23	51	63	39
190000	Mfr. of leather and footwear	0	16	43	38	4
20000	**Mfr. of wood and wood products**	**3 454**	**853**	**202**	**985**	**8**
21009	**Mfr. of paper; printing and publishing**	**42**	**316**	**3 513**	**2 081**	**1 437**
210000	Mfr. of pulp, paper and paper products	9	282	3 301	1 414	1 186
221200	Publishing of newspapers	-	1	13	185	102
221309	Publishing activities excl. newspapers	-	4	64	116	76
222009	Printing etc.	32	29	136	365	72
23000	**Mfr. of refined petroleum, etc.**	**-**	**1 380**	**18 382**	**1 055**	**257**
24000	**Mfr. of chemicals**	**579**	**2 106**	**3 403**	**4 109**	**1 158**
241009	Mfr. of chemical raw materials	13	874	2 154	2 290	950
243009	Mfr. of paints, soap, cosmetics, etc.	566	223	709	939	86
244000	Mfr. of pharmaceuticals	-	1 009	541	880	123
25000	**Rubber and plastic products**	**3**	**244**	**1 355**	**2 097**	**67**
26000	**Mfr. of non-metallic mineral, etc.**	**9 256**	**10 360**	**6 114**	**2 708**	**38**
261009	Mfr. of glass and ceramic goods, etc.	0	123	1 484	555	19
263009	Mfr. of bricks and concrete, etc.	9 256	10 237	4 630	2 152	19
27009	**Mfr. and processing of basic metal**	**42**	**685**	**3 229**	**4 286**	**253**
270000	Mfr. of basic metal	-	196	1 950	2 373	81
281009	Mfr. of construction materials of metal	6	271	404	564	100
286009	Mfr. of hand tools, packaging of metal, etc.	36	218	876	1 349	72
29000	**Mfr. of machinery and equipment**	**0**	**838**	**1 653**	**2 221**	**502**
291000	Mfr. of marine engines, compressors, etc.	-	186	667	1 105	217
292000	Mfr. of other general purpose machinery	0	337	290	421	83
293000	Mfr. of agricultural and forestry machinery	0	118	311	167	32
294009	Mfr. of machinery for industries, etc.	-	155	171	328	126
297000	Mfr. of domestic appliances	0	41	215	201	44
30009	**Mfr. of electrical and optical equipment**	**52**	**210**	**631**	**1 047**	**294**
300009	Mfr. of computers, electric motors, etc.	-	114	198	435	168
320000	Mfr. of radios and communication equipment, etc.	52	46	220	329	27
330000	Mfr. of medical and optical instruments, etc.	0	51	213	284	99
35009	**Mfr. of transport equipment**	**4**	**201**	**729**	**903**	**125**
351000	Building and repair of ships, etc.	4	75	414	528	49
352009	Mfr. of transport equipment, excl. ships	-	126	314	375	75
36000	**Mfr. of furniture and manufacturing n.e.s.**	**1 039**	**290**	**388**	**1 357**	**120**
361000	Mfr. of furniture	1 034	258	295	1 055	58
365009	Mfr. of toys, gold and silver articles, etc.	5	32	93	303	62

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. [2] Excl. bakeries.