

Greenhouse gases 2007

Official figures on emissions in 2007 to the UNFCCC and the Kyoto Protocol

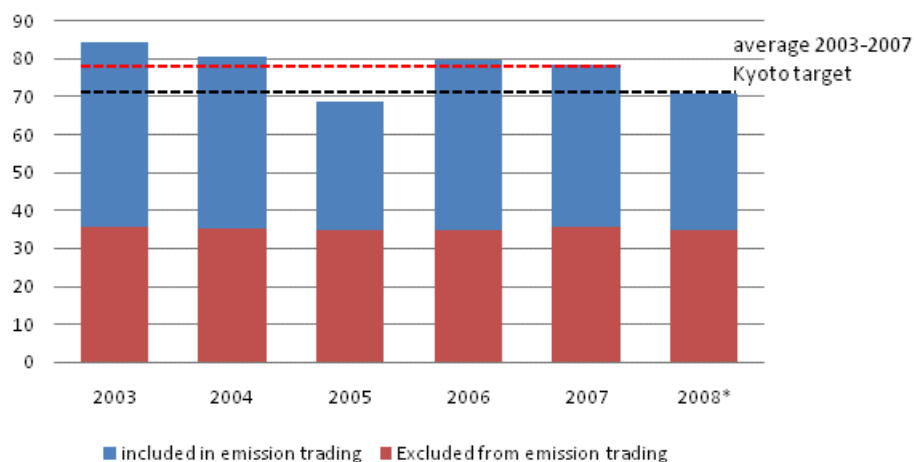
Statistics Finland submitted official figures on Finland's greenhouse gas emissions in 2007 to the United Nations Framework Convention on Climate Change on 8 April 2009. In 2007, the emissions totalled 78.3 Tg CO₂ eq. (million tonnes of CO₂ equivalent). Statistics Finland will report preliminary data on greenhouse gas emissions in the first year (2008) of the commitment period to the European Union in December 2009.

[The whole reporting concerning year 2007.](#)

Statistics Finland's new Finnish-language publication [Suomen kasvihuonekaasupäästöt 1990-2007](#) (Finland's greenhouse gas emissions 1990-2007) can be downloaded from Statistics Finland's website. Besides data on actual emissions the publication contains diverse indicators on the development of emissions and data on emission trends in various countries. It also includes an evaluation of achievement of the targets set for the commitment period under the Kyoto Protocol.

According to [Preliminary Energy Statistics](#), emissions will be slightly under the Kyoto target level in 2008. During the Kyoto commitment period Finland should keep its emissions at the 1990 level (approximately 71 million tonnes carbon dioxide equivalent per year) or acquire emission rights for amounts exceeding it by means of emissions trading or projects under the Kyoto mechanisms. The preliminary estimate for 2008 describes well the emissions of the energy sector, while the emissions of other sectors have been taken as being of the same magnitude as in the previous year. In the five years preceeding the first commitment period year emissions have exceeded the target level by an average of approximately 10 per cent and shown considerable annual fluctuations (Figure 1). In the national Climate and Energy Strategy Finland has been estimated to require additional emission units in the Kyoto commitment period in order to meet its commitment level.

Figure 1. Greenhouse gas emissions in 2003-2008 relative to the Kyoto target level, Tg CO₂ eq. * Data on 2008 are based on Preliminary Energy Statistics.



*Preliminary Energy Statistics, 24 March 2009, and Release of the Energy Market Authority, 1 April 2009

Table 1. Finland's greenhouse gas emissions (million t CO₂ eq.) exclusive of land use, land-use change and forestry sector (see Table 2). Emissions as amounts corresponding to CO₂ tonnes.

Year	Emission category									
	Energy industries	Manufacturing industries and construction	Transport	Solvents and other product use	Agriculture	Waste	F-gases	Industrial processes (excl. F-gases)	Other energy	Total
1990	19.19	13.42	12.79	0.18	7.13	3.98	0.09	4.90	9.18	70.86
1991	18.96	12.90	12.45	0.17	6.68	4.02	0.07	4.54	8.85	68.65
1992	18.73	12.38	12.39	0.16	6.21	4.04	0.04	4.27	8.97	67.19
1993	21.47	12.49	11.94	0.15	6.23	4.04	0.03	4.31	8.56	69.20
1994	26.40	12.79	12.31	0.15	6.22	3.98	0.04	4.52	8.22	74.63
1995	24.12	12.22	12.13	0.14	6.32	3.93	0.10	4.47	7.78	71.22
1996	29.83	12.11	12.12	0.14	6.22	3.85	0.15	4.80	7.93	77.15
1997	27.44	12.28	12.74	0.14	6.21	3.75	0.24	4.99	7.87	75.66
1998	24.18	11.94	12.92	0.14	6.06	3.60	0.30	4.85	8.14	72.13
1999	23.67	11.92	13.16	0.14	5.93	3.52	0.40	4.92	7.86	71.50
2000	22.12	11.93	13.09	0.12	5.97	3.32	0.58	4.92	7.50	69.54
2001	27.51	11.48	13.24	0.12	5.85	3.19	0.73	4.91	7.71	74.74
2002	30.26	11.17	13.46	0.11	5.83	2.98	0.53	4.85	7.64	76.83
2003	37.19	11.54	13.69	0.10	5.75	2.80	0.71	5.17	7.58	84.52
2004	32.95	11.63	14.07	0.11	5.62	2.67	0.73	5.45	7.26	80.49
2005	21.91	11.33	14.14	0.11	5.60	2.46	0.89	5.31	6.95	68.70
2006	32.85	11.59	14.35	0.10	5.59	2.52	0.80	5.29	6.85	79.93
2007	30.79	11.40	14.75	0.10	5.53	2.43	0.93	5.74	6.67	78.35

Table 2. Emissions and removals (million t CO₂ eq.) of the land use, land-use change and forestry sector in Finland. Emissions and sinks as amounts corresponding to CO₂ tonnes (Emissions are positive figures, removals negative).

Year	Emission category					Total
	Forest land	Cropland	Grassland	Peat production areas	Harvested wood products	
1990	-23.19	7.41	-2.13	1.08	-0.95	-17.77
1991	-37.68	5.61	-0.83	1.10	0.31	-31.50
1992	-31.50	5.44	-1.07	1.14	-0.22	-26.22
1993	-30.04	5.43	-0.60	1.16	-0.09	-24.15
1994	-22.82	5.24	-0.13	1.20	-0.76	-17.27
1995	-23.12	6.90	-0.68	1.21	-0.87	-16.56
1996	-32.16	7.13	-0.88	1.25	-1.05	-25.71
1997	-24.99	6.70	-0.57	1.29	-2.12	-19.69
1998	-22.37	6.13	0.09	1.32	-1.77	-16.59
1999	-24.59	5.80	0.96	1.34	-2.04	-18.53
2000	-25.71	5.28	1.92	1.37	-1.27	-18.42
2001	-30.06	5.09	2.42	1.37	-0.31	-21.50
2002	-30.18	4.62	2.15	1.35	-0.44	-22.50
2003	-29.80	4.17	2.66	1.35	-0.89	-22.51
2004	-30.77	3.86	3.01	1.43	-0.83	-23.30
2005	-36.36	3.55	3.44	1.41	-0.34	-28.31
2006	-40.69	3.24	4.24	1.40	-0.39	-32.21
2007	-32.81	3.33	4.06	1.38	-1.22	-25.27

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Tables

Table 1: Greenhouse gas emissions in Finland 1990–2007 (million t CO₂-eq.) by emission category

	Emission category							
Year	Energy	Industrial processes	Solvents and other product use	Agriculture	Waste	Land use, land use change and forestry ¹	Total	Total excl.land use, land use change and forestry
1990	54.60	5.00	0.20	7.10	4.00	-17.80	53.10	70.90
1991	53.20	4.60	0.20	6.70	4.00	-31.50	37.20	68.70
1992	52.50	4.30	0.20	6.20	4.00	-26.20	41.00	67.20
1993	54.40	4.30	0.20	6.20	4.00	-24.10	45.00	69.10
1994	59.70	4.60	0.10	6.20	4.00	-17.30	57.30	74.60
1995	56.30	4.60	0.10	6.30	3.90	-16.60	54.60	71.20
1996	62.00	4.90	0.10	6.20	3.80	-25.70	51.30	77.00
1997	60.30	5.20	0.10	6.20	3.80	-19.70	55.90	75.60
1998	57.20	5.10	0.10	6.10	3.60	-16.60	55.50	72.10
1999	56.60	5.30	0.10	5.90	3.50	-18.50	52.90	71.40
2000	54.60	5.50	0.10	6.00	3.30	-18.40	51.10	69.50
2001	59.90	5.60	0.10	5.90	3.20	-21.50	53.20	74.70
2002	62.50	5.40	0.10	5.80	3.00	-22.50	54.30	76.80
2003	70.00	5.90	0.10	5.70	2.80	-22.50	62.00	84.50
2004	65.90	6.20	0.10	5.60	2.70	-23.30	57.20	80.50
2005	54.30	6.20	0.10	5.60	2.50	-28.30	40.40	68.70
2006	65.60	6.10	0.10	5.60	2.50	-32.20	47.70	79.90
2007	63.60	6.70	0.10	5.50	2.40	-25.30	53.00	78.30

1) Emissions are positive figures, removals negative

Table 2: Carbon dioxide emissions in Finland 1990, 1995, 1997–2007 (million t CO₂-eq.) by emission category

Emission category ¹	Year												
	1990	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Public electricity and heat production	16.45	21.05	24.35	20.92	20.33	19.00	24.38	26.86	33.64	29.41	18.66	29.41	27.33
Oil refineries	2.26	2.56	2.51	2.64	2.68	2.55	2.53	2.73	2.80	2.79	2.59	2.68	2.76
Manufacturing of solid fuels and other energy industries	0.35	0.32	0.34	0.38	0.42	0.35	0.32	0.36	0.39	0.42	0.39	0.40	0.35
Manufacturing industries and construction	13.23	12.04	12.07	11.74	11.72	11.73	11.28	10.99	11.35	11.44	11.15	11.41	11.23
Transport	12.52	11.77	12.33	12.48	12.68	12.59	12.71	12.91	13.10	13.45	13.48	13.67	14.04
Heating of buildings, other fuel use in agriculture, forestry and fisheries	7.04	5.70	5.83	5.92	5.83	5.46	5.66	5.60	5.43	5.35	5.13	4.98	4.92
Industrial processes	3.24	3.00	3.54	3.46	3.56	3.55	3.61	3.51	3.75	3.94	3.67	3.84	4.25
Fugitive emissions from fuels	0.22	0.17	0.20	0.14	0.13	0.13	0.12	0.12	0.12	0.11	0.13	0.11	0.14
Solvents and other products use	0.12	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06
Other fuel use	1.19	1.20	1.13	1.38	1.23	1.27	1.26	1.26	1.35	1.16	1.09	1.13	1.02
Land use, land use change and forestry	-17.96	-16.74	-19.90	-16.80	-18.74	-18.63	-21.72	-22.71	-22.72	-23.53	-28.53	-32.44	-25.49
Total	38.65	41.13	42.48	42.35	39.92	38.06	40.23	41.69	49.28	44.60	27.82	35.27	40.61
Total excl. land use, land use change and forestry	56.61	57.87	62.38	59.15	58.66	56.69	61.95	64.40	72.00	68.12	56.35	67.71	66.10

1) Positive figures are emissions, negative removals

Table 3: Methane emissions in Finland 1990, 1995, 1997–2007 (1000 t) by emission category

Emission category	Year													
	1990	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Energy industries	0.4	0.6	0.8	0.8	0.8	0.7	0.9	1.2	1.3	1.2	1.0	1.2	1.1	
Manufacturing industry and construction	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Transport	4.7	3.9	3.6	3.5	3.4	3.2	3.0	2.9	2.8	2.6	2.4	2.2	2.1	
Enteric fermentation	91.9	80.7	82.2	80.4	79.1	79.0	77.9	78.2	76.9	75.9	75.4	75.4	74.3	
Manure management	10.9	11.7	12.5	12.3	12.2	12.3	12.0	12.6	12.9	12.9	13.2	13.5	13.5	
Solid waste disposal	173.5	170.9	162.4	155.2	151.7	142.1	135.8	125.4	116.8	110.2	100.0	102.8	98.1	
Sewage treatment	7.3	7.0	6.7	6.6	6.4	6.3	6.2	6.4	6.3	6.4	6.2	6.3	6.3	
Heating of institutional and commercial buildings	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Residential heating	7.8	8.1	8.5	8.6	8.4	8.2	8.5	8.6	8.6	8.5	8.4	8.6	8.4	
Fuel use in agriculture, forestry and fisheries	0.6	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Fugitive emissions from fuels	0.5	3.8	3.4	3.5	2.8	2.6	3.2	2.7	2.9	2.6	3.1	2.6	2.4	
Industrial processes	0.2	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	
Other fuel use	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Land use, land use change and forestry	4.8	5.4	5.8	5.9	6.0	6.0	6.1	6.0	6.0	6.4	6.3	6.4	6.2	
Compost production	1.0	1.7	1.9	2.0	2.2	2.3	2.4	2.5	2.6	2.7	3.0	3.0	3.3	
Total	304.9	295.8	289.7	280.6	274.9	264.6	258.0	248.6	239.2	231.4	220.9	224.1	217.7	

Table 4: Nitrous oxide emissions in Finland 1990, 1995, 1997–2007 (1000 t) by emission category

Emission category	Year												
	1990	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Energy industries	0.4	0.6	0.7	0.7	0.7	0.7	0.8	0.9	1.1	1.0	0.8	1.1	1.1
Manufacturing and construction	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
Transport	0.6	0.9	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.0	2.0	2.1
Industrial processes	5.3	4.7	4.7	4.4	4.3	4.4	4.2	4.3	4.5	4.8	5.2	4.6	4.8
Solvents and other product use	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1
Manure management	2.1	1.8	1.9	1.9	1.8	1.8	1.7	1.7	1.7	1.6	1.6	1.7	1.6
Agricultural soils	13.9	12.3	11.7	11.4	11.1	11.3	11.1	10.9	10.8	10.5	10.4	10.3	10.3
Waste	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Heating of buildings, other fuel use in agriculture, forestry and fisheries	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Fugitive emissions from fuels ¹	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other fuel use	1.4	1.2	1.2	1.1	1.1	1.0	1.0	1.0	1.1	1.0	0.9	1.0	0.9
Land use, land use change and forestry	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total	25.6	23.3	23.1	22.6	22.2	22.4	22.1	22.2	22.6	22.6	22.7	22.4	22.4

1) Notation 0.0 means that the value of the quantity is less than half of the unit of measurement used.

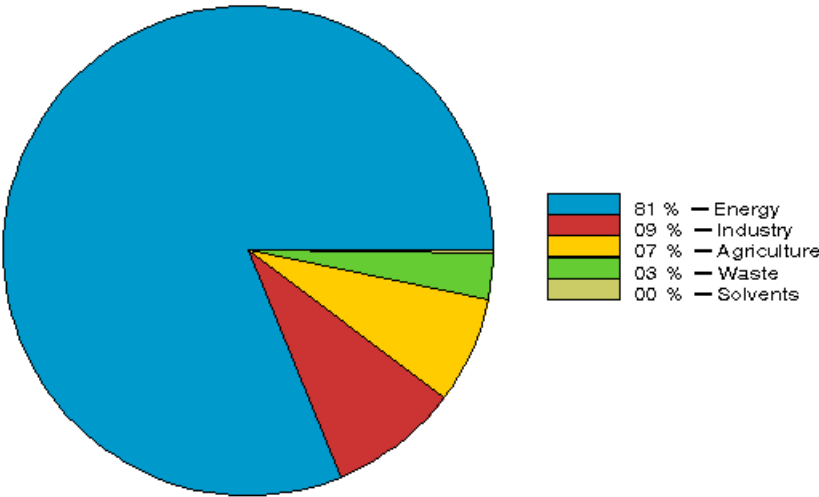
Table 5: Emissions of F-gases in Finland 1990–2007 (1000 t CO₂-eq.)

Year	HFCs	PFCs	Sulphur hexafluoride	Total
1990	0.0 ¹¹	0.1	94.4	94.5
1991	0.1	0.1	67.3	67.5
1992	0.1	0.1	36.6	36.8
1993	0.1	0.1	33.6	33.8
1994	6.5	0.1	34.9	41.5
1995	29.3	0.1	68.5	98.0
1996	77.3	0.2	72.2	149.7
1997	167.8	0.2	76.0	243.9
1998	245.2	0.2	53.2	298.6
1999	318.6	28.0	52.0	398.5
2000	501.7	22.5	51.5	575.7
2001	656.9	20.1	55.0	732.0
2002	463.4	13.4	51.3	528.1
2003	652.1	14.9	41.7	708.6
2004	695.1	12.2	23.2	730.5
2005	863.8	9.9	19.6	893.2
2006	747.7	15.4	40.4	803.5
2007	903.9	8.4	22.6	934.9

1) Notation 0.0 means that the value of the quantity is less than half of the unit of measurement used. LULUCF is the land use, land-use change and forestry sector

Figures

Figure 1: Greenhouse gas emissions by sectors in 2007 (%)



A zero means that contribution to the total is less than half percent

Figure 2: Greenhouse gas emissions in 1990 - 2007 (million t CO2 eq.)

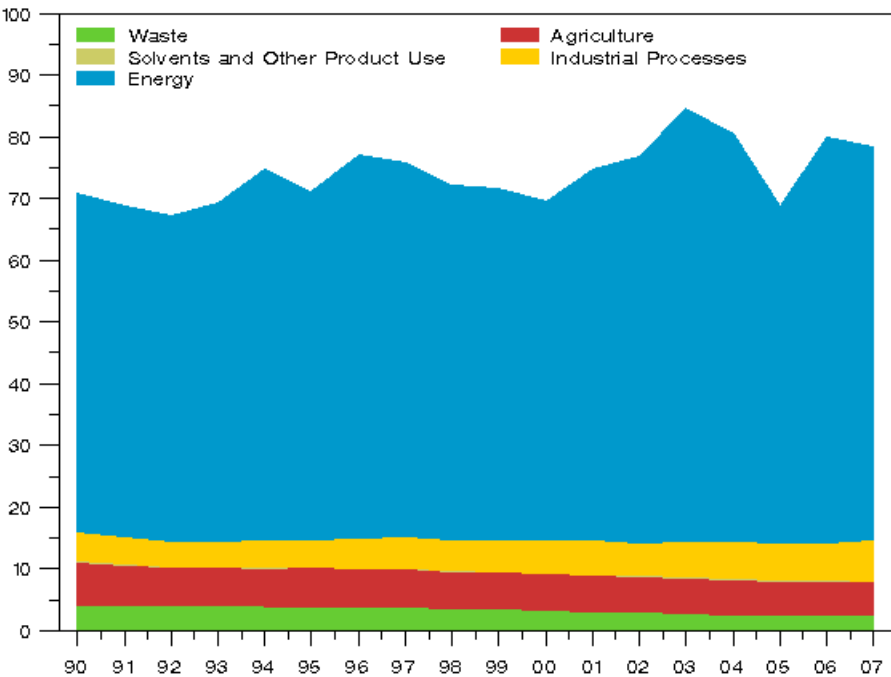


Figure 3: Development of emissions in the energy sector in 1990 - 2007 (million t CO2 eq.)

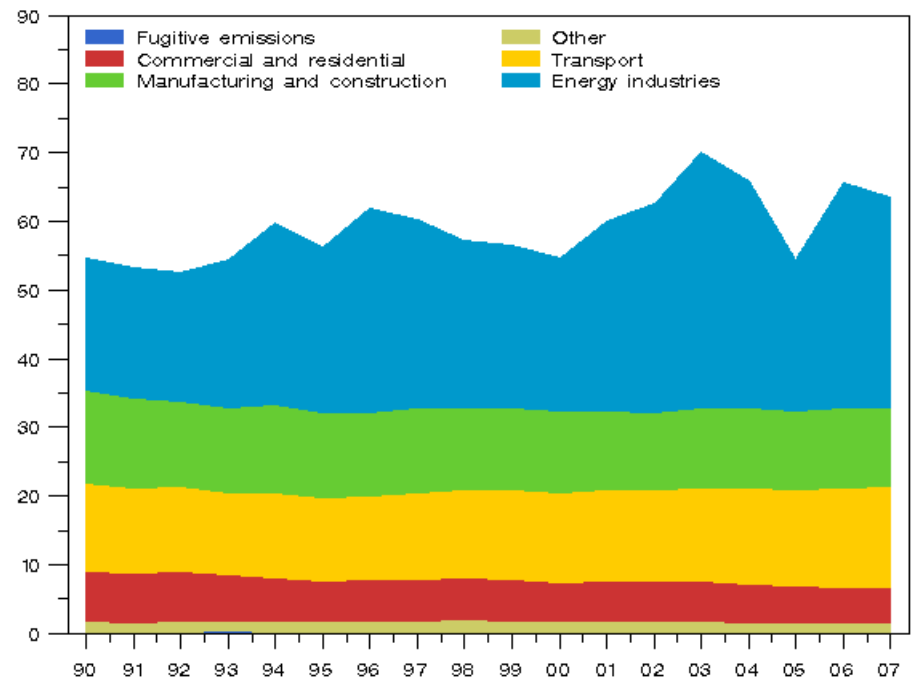
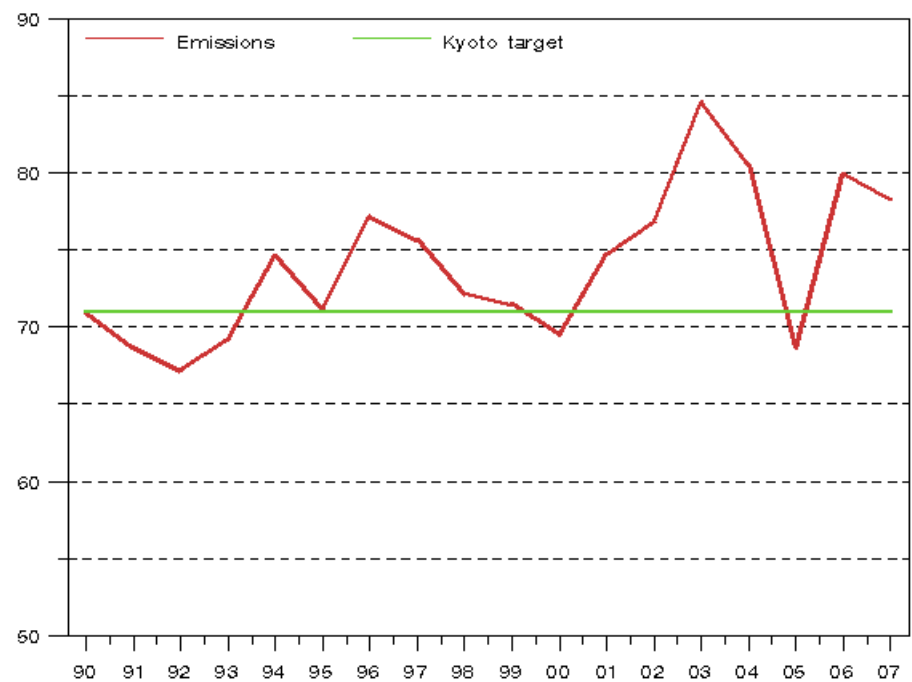


Figure 4: Greenhouse gas emission in Finland in 1990 - 2007 in relation to the Kyoto target level (million t CO2 eq.)



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