



2002

CAA Environmental Review



OUR FIRST ENVIRONMENTAL REPORT IS PUBLISHED

The first environmental report by the Finnish Civil Aviation Administration Group was completed in September 2002. It details the effects that our airports and air transport have on our environment and explains the role of the CAA and the possibilities we have for controlling and reducing these effects. The report concentrates on the environmental aspects of our own activities, such as winter-time maintenance, but because this was our first such report, it also contains basic information on the influence that aviation has on the environment in general. The environmental information concerning the airports is based on a report compiled according to our environmental management system in 2001. The report is available on the Internet at: www.ilmailulaitos.com.

The CAA will compile its next environmental report in 2005 and this will concentrate on our own activities. By this time, the methods we use for collecting and processing the data, as well as the key figures we use for monitoring, will have become established. Information for the interim years will be published in review form, both on paper and on the Internet. For this reason, environmental issues are dealt with more briefly in the Group's annual report.

HELSINKI-VANTAA ENVIRONMENTAL REPORTS FOR FUTURE DEVELOPMENT AND REGIONAL PLANNING

The creation of noise mitigation plans for Helsinki-Vantaa Airport and cooperation with the stakeholders formed the most extensive part of the CAA's environmental work during 2001 and 2002. The airport's third runway came into operation on November 28th, 2002, almost ten years after the first environmental permit decision was received.

The planning report on aircraft noise was completed in December 2001. During the spring of 2002, seven information exhibitions were arranged in cooperation with local authorities in the Capital area. Based on feedback

from the residents and local authorities, the plans and forecasts, which extend to 2020, were refined, making it possible to define the aircraft noise contours to be included in the land-use plan for the Uusimaa region. The planning report on aircraft noise is available on the Internet at: www.ilmailulaitos.com/kiitotie3.

MEASURABLE GOALS NEED BETTER DEFINITION

The operational plan and budget of the Ministry of Transport and Communications for 2003-2006 requires that organizations and departments under its control shall operate an environmental management system through which they can contribute to the environmental programme of their administrative branch. The Ministry also imposed such a requirement on the CAA when it approved the budget for 2002.

The CAA approved its own environmental management system and related environmental policy, based on ISO 14001, in January 2001. The first management review was arranged in December 2002. It was felt that the setting of operational environmental targets, as part of CAA's entire operational planning, worked well, but that there was still room for improvement when it came to defining measurable goals.

The Ministry is planning to audit the environmental management systems of its departments and organizations in 2004.

INTERNATIONAL DECISIONS TAKEN INTO ACCOUNT

The International Civil Aviation Organization ICAO has divided aircraft into various noise categories (chapters). A ban on the use of chapter 2 aircraft within the European Union came into effect at the beginning of April, 2002. This meant that scheduled traffic using the last chapter 2 aircraft came to an end.

Also during 2002, an EU directive came into force concerning the procedures by which the use of aircraft that only marginally meet the requirements of chapter 3 could gradually be restricted. In Finland, the directive only concerns Helsinki-Vantaa Airport. The directive is of minor importance because of the small number of aircraft affected by it.

A general EU environmental noise directive also came into force during the year under review, which required environmental noise to be described in L_{den} figures, which the CAA has long used in its aircraft noise reports. The noise surveys required in the directive have mainly been carried out as far as aircraft noise reports are concerned.

At the beginning of 2002, the European Union Commission published a number of surveys on reducing air traffic greenhouse gas emissions by the use of financial controls. The CAA and the Ministry of Transport and Communications commissioned a background report on the proposals which looked at the matter from Finland's point of view. The results indicated that the kinds of financial controls for reducing emissions proposed for the Union area, in which the penalty would increase with the length of the flight, would be disadvantageous to Finland, be-

cause Finland's international flights tend to be longer than those of many other European countries.

FOLLOW-UP COMMITTEE TO ASSESS ENVIRONMENTAL PERMIT PROCEDURES FOR AIRPORTS

The report of an inter-ministerial committee on the environmental responsibilities of civil and military aviation was published in January 2002. It concluded that already established operational airports did not, in the main, require new environmental permits. Nor, to judge by the registration notices distributed to regional environmental bodies in February 2002, was any permit obligation ordered during the review year. However, the finite nature of previous permits may mean that permits shall have to be applied for at such places as Tampere-Pirkkala Airport, which in fact has applied for a permit for both the airport's operations as well as those of the Satakunta Air Command which is based there.

In December, the Ministry of the Environment set up a new committee, continuing the work of the previous one, whose task is to examine the special circumstances relating to environmental permits for airports, such as the consideration of the safety regulations governing aviation activities when setting environmental controls. The committee's term comes to an end in June 2003.

The Ministry of the Environment ordered that a project by the defence forces to develop Utti as a base for army transport helicopters would have to go through the regulation environmental impact assessment process (EIA). The Defence Staff is responsible for the EIA. The CAA will participate in this as an expert on aircraft noise.

PROMISING RESULTS FOR DE-ICING AGENT RESEARCH

The laboratory phase of an extensive study by the Finnish Environmental Institute into the environmental effects of de-icing agents (MIDAS) was completed. Filtration tests suggested that potassium formate would be the most promising substitute for traditional road salt because it breaks down quickly and consumes less oxygen than the other de-icing agents looked at in the study. Formates have already been used in conjunction with acetates at certain airports for a number of years. The research will continue during 2002-2003 with ground tests to determine how formates break down in the soil under true de-icing conditions. The CAA has participated in funding this research.

WASTE MANAGEMENT TO MEET LOCAL DEMANDS

During the year under review, the CAA ordered all airports also to compile new surveys of environmental risks, as part of the safety programme. In addition, airports were ordered to draw up waste management plans on the basis of local waste management orders and legal regulations.

The city of Helsinki conducted a survey of soil pollution at Helsinki-Malmi Airport, which revealed that although limited patches of pollution were discovered near the aircraft hangars, there was no immediate need to renovate the soil.



GROUND VEHICLE FUEL STATIONS RENEWED

As required by what is known as the fuel station decision of the Ministry of Trade and Industry, 12 airports have carried out, or will carry out by autumn 2003, soil protection measures and upgrades to their rainwater drainage systems through oil separation pits, at fuel storage and distribution points. In addition, small fuel stations not covered by the Ministry decision will also be similarly equipped by the CAA. The average cost of the modification work for a single airport is about 20,000 euros.

KEY FIGURES FOR AIRPORTS AND AVIATION

The following graphs and tables show the quantities of runway and aircraft de-icing agents used by each airport, as well as the amount of waste produced and energy and water consumed. Time-series are also given for these.

The tables also illustrate traffic volumes for the airports and the volume of emissions from aircraft at airports. Emissions from CAA ground vehicles and equipment are also presented.

Aircraft exhaust gas emissions as calculated by the CAA for Finland's entire airspace are published via the LIPASTO system, at: <http://lipasto.vtt.fi/>.

Vantaa, April 2, 2003

Director General, Mikko Talvitie

Manager, Environment Mikko Viinikainen

Fig 1. Consumption of runway de-icing agents at CAA airports between 1991 - 2002 during the winter periods. The total amount takes into account a reduction of the water content (50%) of the liquid acetate and formate solutions used. The use of urea has been reduced for environmental reasons, the primary de-icing agent nowadays being liquid acetate.

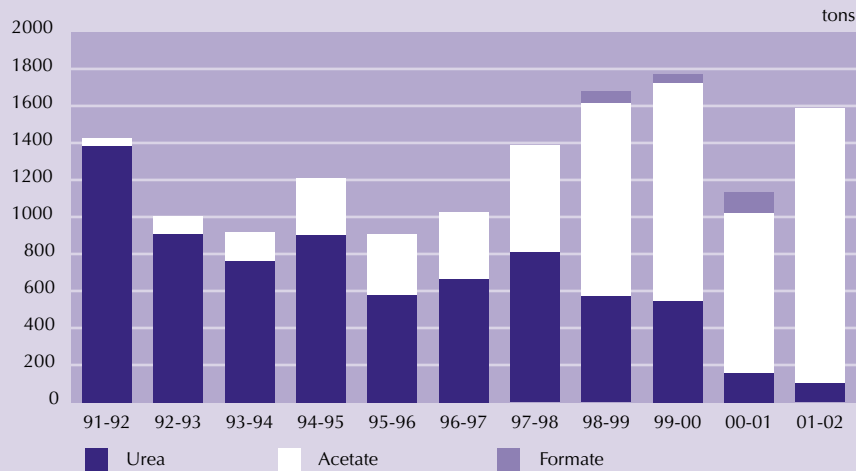


Table 1. Number of aircraft landings at CAA airports during 2002 and the change from the previous year.

Airport	Year 2002				Change from previous year (%)			
	Commercial Aviation	General Aviation	Military Aviation	Total	Commercial Aviation	General Aviation	Military Aviation	Total
Enontekiö	60	20	0	80	-44,4	42,9	-100,0	-62,8
Halli	3	244	2 043	2 290	0,0	-13,5	-14,2	-14,1
Helsinki-Malmi	19	38 829	83	38 931	-26,9	-2,7	-24,5	-2,7
Helsinki-Vantaa	75 354	2 390	1 127	78 871	-4,4	-24,8	-0,6	-5,1
Ivalo	873	212	181	1 266	-0,6	-22,6	56,0	-0,2
Joensuu	1 858	2 645	122	4 625	-3,6	57,4	20,8	24,7
Jyväskylä	3 288	5 647	3 494	12 429	3,6	8,0	-5,5	2,7
Kajaani	985	167	270	1 422	-2,2	-12,1	6,7	-1,9
Kauhava	35	269	10 765	11 069	-20,5	-9,7	-12,6	-12,5
Kemi-Tornio	1 235	703	41	1 979	-5,9	-24,9	105,0	-12,7
Kittilä	1 106	365	203	1 674	6,0	52,1	-50,5	-1,1
Kruunupyy	1 837	3 654	500	5 991	-14,1	36,4	15,2	14,1
Kuopio	2 385	2 703	6 013	11 101	-1,1	-1,0	6,5	2,9
Kuusamo	683	196	14	893	-6,2	-1,0	-54,8	-6,7
Lappeenranta	1 744	3 034	127	4 905	-11,0	-21,8	38,0	-17,3
Maarianhamina	2 563	1 192	0	3 755	-18,0	-15,1	0,0	-17,1
Oulu	5 961	3 663	1 470	11 094	-16,8	-18,8	3,4	-15,3
Pori	1 817	8 820	174	10 811	-21,2	6,0	205,3	1,2
Rovaniemi	2 475	3 052	5 371	10 898	-11,6	11,4	-3,1	-1,7
Savonlinna	1 143	331	78	1 552	-1,5	4,4	-4,9	-0,4
Tampere-Pirkkala	5 031	5 837	6 479	17 347	-13,9	-21,3	-5,0	-13,6
Turku	6 699	7 776	722	15 197	-9,0	6,4	3,4	-1,1
Utti	24	773	4 407	5 204	9,1	-21,4	29,2	17,8
Vaasa	4 432	2 484	348	7 264	-12,9	-23,9	-28,0	-17,8
Varkaus	970	133	3	1 106	-5,4	-53,0	100,0	-15,4
Total	122 580	95 139	44 035	261 754	-6,8	-3,2	-2,9	-4,8

Fig 2. Oxygen consumption and nitrogen loading caused by runway de-icing agents between 1991 - 2002 during the winter periods. The loading has been considerably reduced in the past ten years as a result of the diminished use of urea.

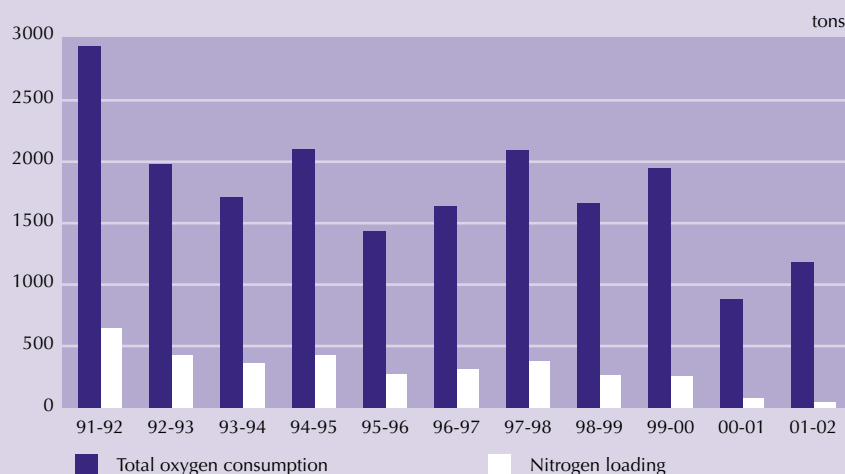


Table 2. Runway and aircraft de-icing agent consumption, plus waste volumes for each airport in 2002. The runway de-icing agents are applied by the CAA, whilst aircraft de-icing agents (glycol) are applied by the airlines or ground handling companies working for them. The waste volumes include waste received by the CAA under agreements with various operators at the airports.

Airport	Volume of buildings m ³	Runway and aircraft de-icing agents (winter 2001-2002)				Energy and water consumption (2002)			Waste volumes (2002)		
		Urea t	Acetate 100% t	Formate 100% t	Glycol factory solution m ³	Electricity MWh	Heat MWh	Water m ³	Landfill waste t	Recyclable waste t	Hazardous waste t
Enontekiö	13192	0	4	0	10	0*	329	41	3	1	0,5
Halli	7251	0	15	0	0	33	272	219	3	5	1,3
Helsinki-Malmi	89268	2	5	0	0	986	2450	868	92	72	2,0
Helsinki-Vantaa	512089	0	676	0	1788	49564	28101	112444	708	901	16,5
Ivalo	24952	21	10	0	43	934	1822	3093	29	1	0,0
Joensuu	42025	0	27	0	13	667	2095	1086	7	2	2,6
Jyväskylä	28308	18	35	0	31	1705	2113	3995	79	6	1,0
Kajaani	17632	9	19	0	13	549	1381	2138	18	12	13,8
Kauhava	8157	1	42	0	0	96	374	232	20	2	0,1
Kemi-Tornio	18626	0	38	0	23	626	1568	936	21	6	7,5
Kittilä	19018	0	40	0	40	1285	1073	2351	50	3	1,5
Kruunupyy	20788	1	45	0	13	519	1106	2373	1	52	0,6
Kuopio	61452	2	44	0	34	1678	2718	8172	130	16	11,3
Kuusamo	14155	0	44	0	23	425	741	613	16	5	6,8
Lappeenranta	14984	0	26	0	3	450	1022	1215	5	8	6,1
Maarianhamina	14553	0	5	0	3	461	1025	3831	17	11	12,8
Oulu	68579	0	82	0	94	3215	3455	6934	48	18	12,8
Pori	24930	2	30	0	2	635	1904	1677	12	13	0,8
Rovaniemi	100251	40	37	0	65	3797	5923	7199	56	24	1,9
Savonlinna	12902	2	17	0	3	448	428	2062	7	7	0,7
Tampere-Pirkkala	48618	3	104	0	46	1660	2058	3315	31	34	9,4
Turku	40312	0	79	0	44	2295	2446	5990	26	33	2,2
Utti	3560	0	6	0	0	51	152	186	2	2	0,7
Vaasa	51095	0	49	0	43	1368	2920	3813	16	87	5,8
Varkaus	10834	1	9	0	2	509	330	320	6	4	3,1
Total	1267531	102	1488	0	2336	73954	67802	175103	1404	1327	121,7

* The amount of electrical energy consumed is included in heating consumption

Table 3. Consumption of aircraft fuel and exhaust gas emissions below 915 metres (3,000 feet) altitude (during the so called LTO cycle) plus fuel consumption and exhaust gas emissions from CAA vehicles and equipment for each airport during 2002. Exhaust gas emission figures for 2002 are not comparable with data for the previous year because emission calculation methods for aircraft and ground equipment have been altered and refined.

Airport	Aircraft emissions (* (2002)							Emissions by CAA vehicles and ground equipment (2002)						
	LTO-cycle no.	CO (t)	HC (t)	NO _x (t)	SO ₂ (t)	CO ₂ (t)	Fuel (t)	CO (t)	HC (t)	NO _x (t)	Particles (t)	SO ₂ (t)	CO ₂ (t)	Fuel (t)
Enontekiö	123	1	0,1	0,6	0,0	148	47	0,3	0,1	0,4	0,02	0,001	53	17
Halli	299	2	0,1	0,0	0,0	8	3	0,3	0,1	0,5	0,02	0,001	55	18
Helsinki-Malmi	35 021	268	3,6	0,6	0,1	776	248	0,1	0,0	0,3	0,01	0,000	33	11
Helsinki-Vantaa	75 199	459	76	525	44	136 555	43 650	10,9	3,2	15,6	0,86	0,023	2 031	645
Ivalo	1 095	6	1,5	8,3	0,7	2 083	666	1,5	0,4	1,3	0,07	0,002	172	55
Joensuu	3 035	12	1,0	7,4	0,7	2 147	686	0,7	0,2	1,4	0,08	0,002	175	55
Jyväskylä	6 886	31	1,7	8,3	0,8	2 536	811	0,4	0,2	1,3	0,07	0,002	159	50
Kajaani	1 193	6	2,3	7,1	0,7	2 269	725	0,5	0,1	0,8	0,04	0,001	105	33
Kauhava	345	2	0,2	0,1	0,0	40	13	0,5	0,1	0,7	0,04	0,001	100	32
Kemi-Tornio	1 745	9	2,4	9,6	0,9	2 884	922	0,7	0,3	1,5	0,08	0,002	177	56
Kittilä	1 397	11	2,2	11,0	0,9	2 723	871	0,5	0,2	1,6	0,09	0,002	181	57
Kruunupyy	2 630	9	1,1	6,2	0,6	1 896	606	0,4	0,1	0,9	0,05	0,001	109	35
Kuopio	4 258	24	2,4	12,1	1,2	3 635	1 162	1,1	0,5	3,5	0,19	0,004	402	128
Kuusamo	867	5	1,6	5,3	0,5	1 596	510	0,5	0,2	1,5	0,08	0,002	156	49
Lappeenranta	3 462	14	0,6	1,4	0,2	560	179	0,9	0,2	0,8	0,04	0,001	107	34
Maarianhamina	3 184	42	2,6	2,0	0,2	742	237	0,3	0,1	0,4	0,02	0,001	49	16
Oulu	8 269	63	8,0	45,6	3,8	11 890	3 801	1,8	0,6	3,6	0,19	0,005	431	137
Pori	10 454	58	3,5	1,6	0,2	786	251	0,6	0,2	0,9	0,05	0,001	110	35
Rovaniemi	4 331	41	4,2	20,1	1,6	5 080	1 624	2,6	0,8	4,3	0,24	0,006	562	179
Savonlinna	1 361	3	0,3	1,1	0,1	415	133	0,7	0,2	0,8	0,04	0,001	103	33
Tampere-Pirkkala	9 050	41	1,7	10,5	1,1	3 362	1 075	1,2	0,4	2,2	0,12	0,003	274	87
Turku	12 340	83	4,8	11,9	1,2	3 977	1 271	1,7	0,5	2,3	0,13	0,003	297	94
Utti	774	6	0,1	0,0	0,0	23	7	0,3	0,1	0,2	0,01	0,001	48	15
Vaasa	5 421	22	3,6	13,4	1,4	4 353	1 392	1,4	0,4	1,7	0,09	0,003	216	69
Varkaus	1 165	3	0,2	0,6	0,1	253	81	0,3	0,1	0,5	0,03	0,001	59	19
Total	193 904	1 220	126	709	61	190 739	60 970	30,3	9,4	49,0	2,67	0,068	6 165	1 958

(*Aircraft emission figures do not cover military aviation, helicopter flights or gliders. Aircraft particle information is not available. 1 litre of kerosene = 0.800 kg.

Table 4. Heat energy, electricity and water consumption at CAA properties during 2002. Kauhava, Halli, Utti and Helsinki-Malmi airports are not included in calculating the estimated values per passenger. Total consumption of energy and water has declined compared with 2001, but the calculated consumption per passenger has increased because of the decline in the number of passengers.

	2001	2002
Consumption of heat energy	68.2 GWh	67.8 GWh
Specific consumption of heat energy	55.4 kWh/m ³	54.6 kWh/m ³
Consumption of heat energy per passenger	4.6 kWh/pax	5.0 kWh/pax
Electricity consumption	74.1 GWh	74.0 GWh
Specific electricity consumption	59.8 kWh/m ³	58.3 kWh/m ³
Electricity consumption per passenger	5.3 kWh/pax	5.6 kWh/pax
Water consumption	184.7 tm ³	175.1 tm ³
Water consumption per passenger	13.0 l/pax	13.3 l/pax

Fig 3. Winter usage of aircraft de-icing fluids at CAA airports between 1997 - 2002. Quantities are significantly affected by the frequency of the weather conditions that require de-icing fluids to be used.

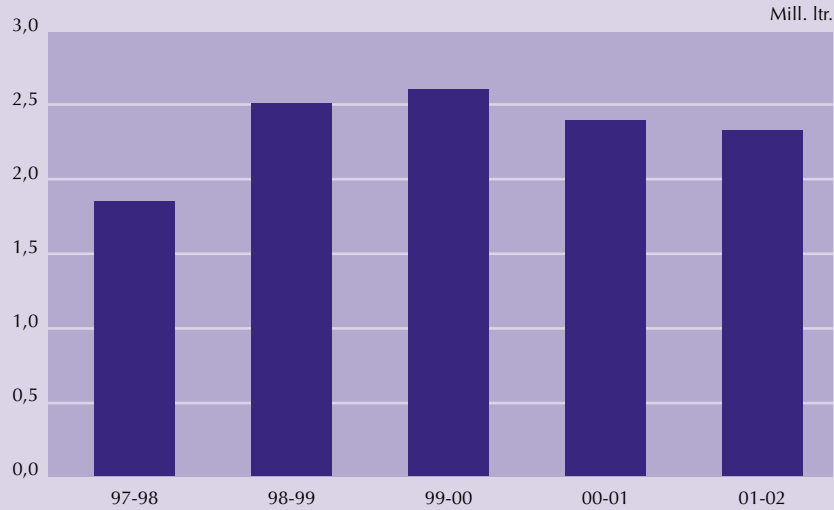
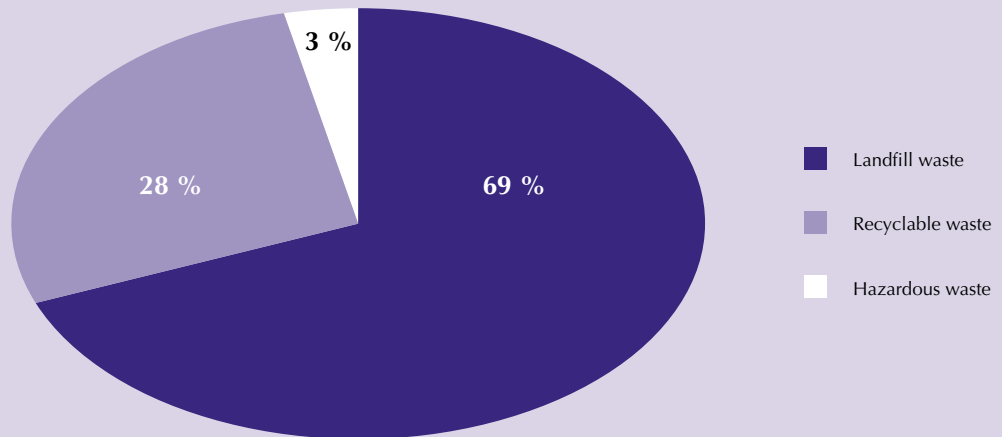
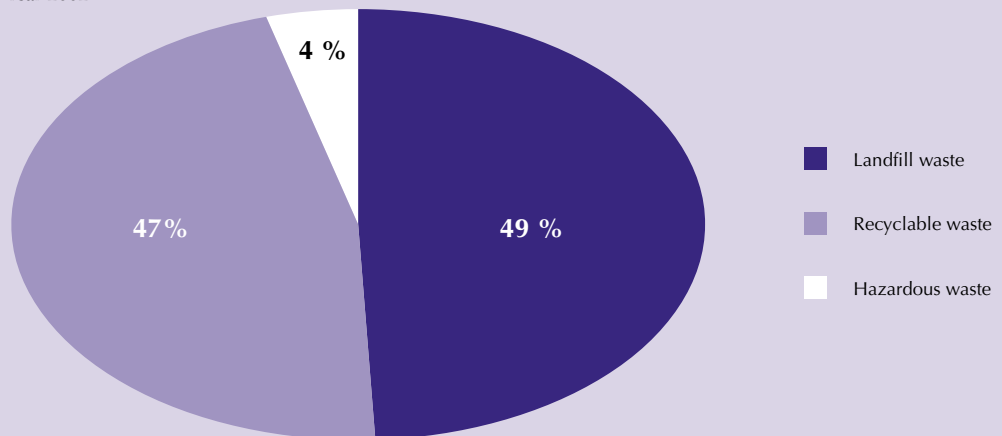


Fig 4. Landfill, recyclable and hazardous waste accumulated by the CAA's waste management scheme during 2002. Recyclable waste includes separately collected organic waste, metals, glass, plastic, recyclable paper and cardboard, lubricating oils, used tyres, electrical and electronical waste and building waste sent for sorting. The amount of landfill waste has declined whilst the quantity of recyclable waste has increased compared with 2001. This is largely because of improvements to waste sorting systems at Helsinki-Vantaa Airport.

Year 2001



Year 2002





ILMAILULAITOS
LUFTFARTSVERKET
CIVIL AVIATION ADMINISTRATION