OR

ENVIRONMENTAL REPORT 2004

Orkuveita Reykjavíkur (OR) was awarded the Kudungur (Conch), the Ministry for the Environment's Environmental Award, for the year 2004. This award is granted annually to companies that have been environmentally sensitive in their operations. Through this award, the Ministry for the Environment wishes to call attention to companies that distinguish themselves in environmental matters so as to encourage them and other companies to continue to integrate their ideas on sustainable development and environmental matters in their operations, image and culture.

Orkuveita Reykjavíkur is proud to receive this award and grateful for the honour bestowed on the company.

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ORKUVEITA REYKJAVÍKUR

Orkuveita Reykjavíkur is an independently-operated utility company which endeavours to offer the best available service to its customers.

Orkuveita Reykjavíkur is owned by the City of Reykjavík (93.539%), Akranesbær (Akranes Town) (5.528%), Borgarbyggð (Community of Borgarbyggð) (0.761%) and Borgarfjarðarsveit (Community of Borgarfjarðarsveit) (0.172%).

Orkuveita Reykjavíkur is a power company which produces, distributes and sells, wholesale and retail, electricity, cold water for consumption and fire prevention, hot water for space heating and snow melting, and sea water to use in ponds, animal pools, etc. The company designs and sells street lighting and sells excess energy to companies. Furthermore, the company operates a fibre optic system for the distribution of data.

ENVIRONMENTAL POLICY OF ORKUVEITA REYKJAVÍKUR

Orkuveita Reykjavíkur (OR) is determined to be at the forefront in respecting the environment and that environmental management should be one of the company's priorities.

In order to pursue its environmental policy, OR puts emphasis on the following points:

- To take environmental matters into account in all its operations, and thus promote improvements in the environment.
- To lead the market in the sale of environmentally safe products and offer services that provides customers with the most economically viable solutions at any given time.
- To ensure that each natural resource is utilized with as little environmental impact as possible.
- To work systematically toward the further utilization of sustainable energy, not least within fields where fossil fossil fuel is used today.
- To continuously train staff to promote environmental matters and be responsible in its daily duties, and to take care of unexpected events.
- To set for itself measurable goals in environmental matters.
- To meet all governmental requirements concerning environmental matters, as well as other requirements that the company has accepted.
- To meet the requirements of ISO 14001 and continually improve the effectiveness of the environmental management system.
- To work in close co-operation with customers and suppliers to ensure that they meet OR's environmental objectives.

CEO'S INTRODUCTION

"To adapt ourselves to this country, to learn to live in harmony with it, and to enjoy what it has to offer, should be an important element in the upbringing of each Icelander."

We can all adopt these word spoken by one of our foremost geologists, the late Sigurður Þórarinsson, who was not only a talented and respected scientist, but also a dedicated environmentalist and lover of nature. We, the employees of Orkuveita Reykjavíkur, have undertaken the role of adapting the plans for the utilization of power to the country, ensuring that such utilization is made in harmony with nature. We make every effort to ensure that everyone has the opportunity to enjoy what the land has to offer.

I believe that there are not many operations so closely connected to nature as that of Orkuveita Reykjavíkur. We are confident that there are not many instances of work being carried out where environmental concerns are as high on the agenda. From environmentally-oriented thinking in completing simple tasks within populated areas to comprehensive and year-long work at the environmental assessment of our chief projects in the harnessing of power. Suffice it to say that the licence to construct the Hellisheiði power plant is subject to at least eleven public licences.

Every year, Orkuveita Reykjavíkur has published an environmental report, compiling key figures on data involving environmental matters.

As usual, the company's environmental concerns have been in focus during 2004. The environmental management system according to ISO 14001 has become active, having been subject to repeated internal audits. The certification of the system is expected in autumn 2005. Thereby, Orkuveita Reykjavíkur will have joined the group of companies in other countries that adapt their operations to the strictest requirements of an environmental management system.

Orkuveita Reykjavíkur has set measurable goals in environmental matters that form part of the company's Balanced Scorecard. Our staff has received training in environmental matters during special courses which explain the environmental management system and how it affects the company.

Various projects in connection with environmental matters have been initiated. The operations of the company have been systematically reviewed, and all hazardous substances have been registered. Attempts have been made to find other substances which have less environmental impact to replace any hazardous materials that are necessary for the company's operations.

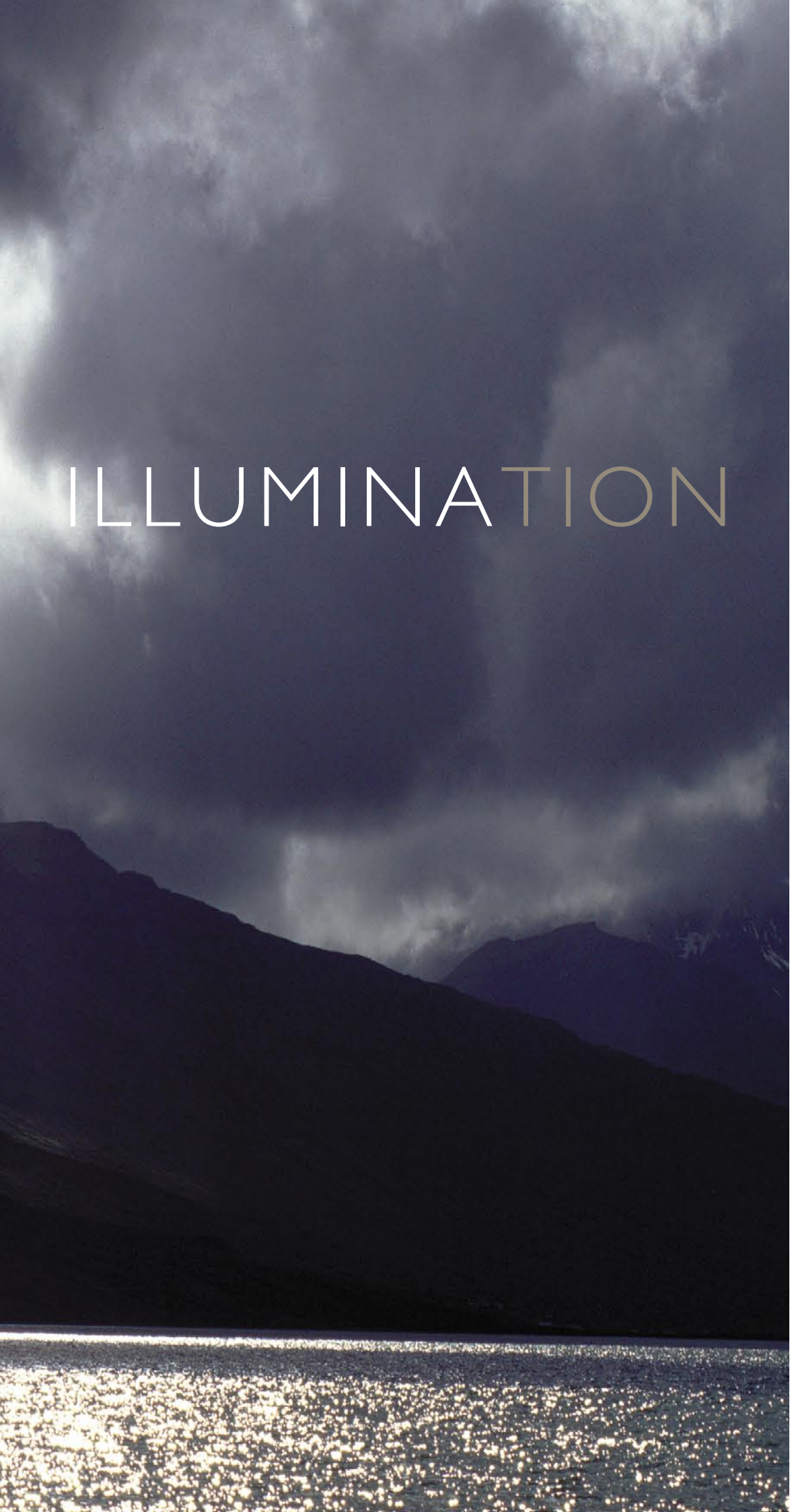
Orkuveita Reykjavíkur has also held courses in eco-driving for those employees who drive the company's vehicles. Eco-driving has proved to result in up to 20% fossil fuel savings. Decrease in fossil fuel use reduces emissions from vehicles.

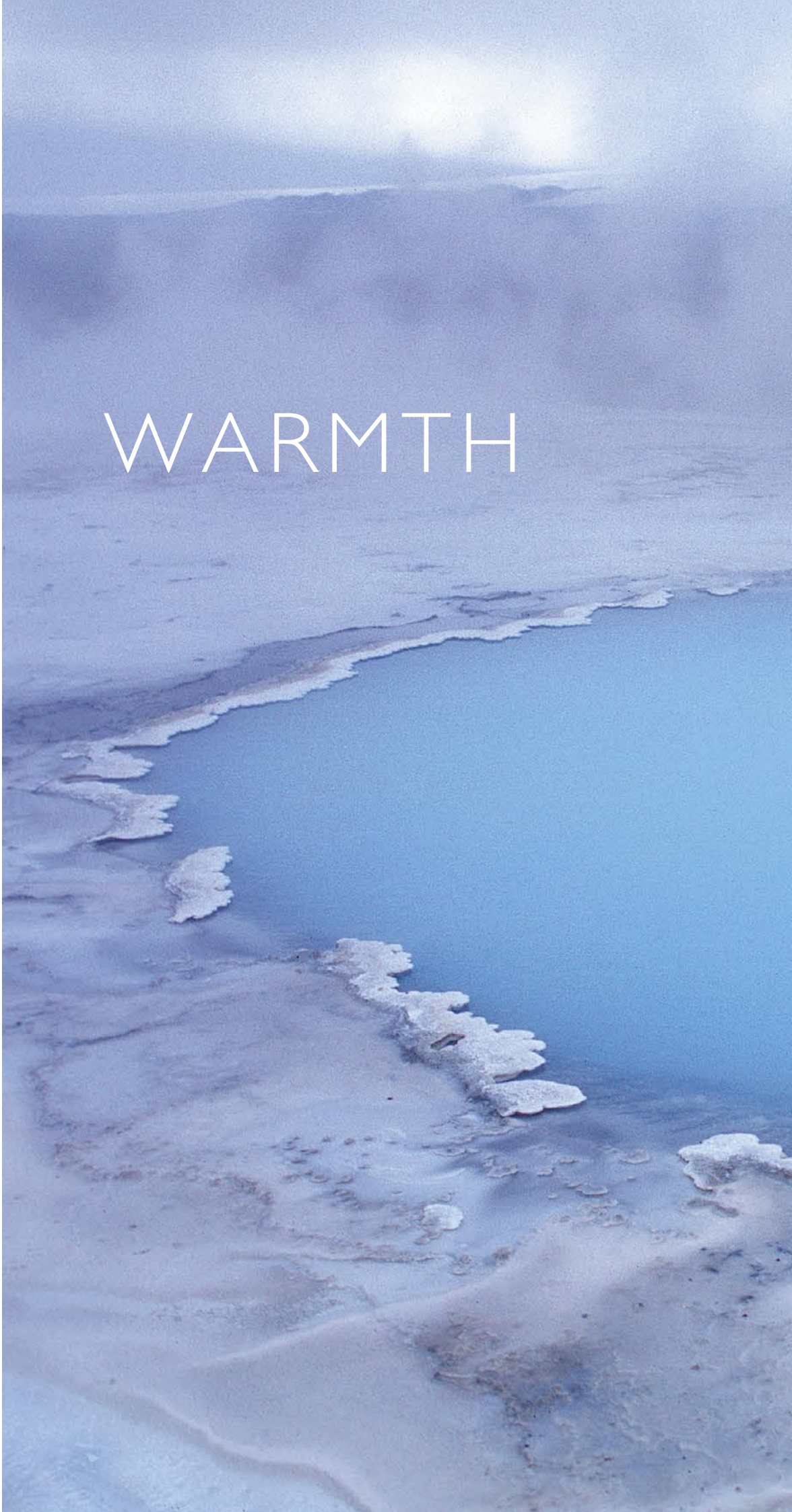
The company has decided to put tachographs in all vehicles for recording the driving behaviour of each driver. The experience gained by other companies shows that tachographs tend to promote improved driving behaviour, less fossil fuel consumption, less wear and improved life span of the vehicles, just to name a few aspects.

Orkuveita Reykjavíkur has engaged in wide-ranging soil reclamation through the years, including evening out protruding erosion remnants of the landscape, sowing them, and also in the planting of trees, including 26,120 seedlings during 2004. The carbon binding resulting from such soil reclamation through the years has been greater than what amounts to the emission of carbon dioxide from the company's vehicles.

Orkuveita Reykjavíkur keeps a close eye on the resources it exploits and has set the objective of not over-exploiting the resources.

Orkuveita Reykjavíkur hopes that this environmental report reflects the effects of the company's operations on the environment and will serve to encourage others to adopt a similar registration of environmental impact.


ILLUMINATION


WARMTH


POSITIVE CURRENTS

I. IMPORTANT ENVIRONMENTAL FACTORS

Orkuveita Reykjavíkur has decided to attain certification according to the environmental standard ISO 14001.

Important environmental factors are divided into three categories:

- Significant environmental factors
- Hazardous materials
- Other environmental factors

Significant environmental factors concern the company's core activities. The company controls and monitors significant environmental factors as much as possible, the following factors having been assessed as significant:

- Emission of greenhouse gases
- Land reclamation and afforestation
- Waste
- Utilization of natural resources

EMISSION OF GREENHOUSE GASES

The concentration of greenhouse gases has increased considerably from the time of the Industrial Revolution, this increase is mostly being caused by humans, chiefly due to the burning of fossil fuels.

Carbon dioxide (CO_2), Methane (CH_4) and Nitrous oxide (N_2O) are the greenhouse gasses released as a result of the company's operations. Sulfur hexafluoride (SF_6) is used as an isolating gas in high-voltage switchgears in the electricity supply- and distribution system. If leakage occurs the gas can be released into the atmosphere. No leakage was reported in the year 2004.

Greenhouse gases fall into five categories according to their source as follows:

- Emission from Nesjavellir geothermal plant
- Emission from Hellisheiði geothermal plant
- Emission from the use of auxiliary power stations
- Emission from a heating plant
- Emission from the company's fleet of vehicles

Table I shows a substantial rise in the emission of greenhouse gases from the company's fleet of vehicle compared with last year's report. A decision was taken to register for this report all fossil fuel use for the operations of Orkuveita Reykjavíkur. The company's vehicles are owned by the Reykjavík Municipal Machinery Centre. Therefore, the figures have been updated for the years 2002 and 2003 for the burning of fossil fuel by the Centre's vehicles used by Orkuveita Reykjavíkur. The increase between 2003 and 2004 can mostly be explained by increased operations of Orkuveita Reykjavíkur.

Table 1 **Emission of greenhouse gases**

	Origin	Measuring unit	Quantity 2002	Quantity 2003	Quantity 2004	% total emission in Iceland[3)]
Carbon dioxide (CO_2)	Nesjavellir	tonnes	15,557	11,058	11,551	
	Hellisheiði	tonnes	957	3,602	1,943	
	Auxiliary power	tonnes	44	13	2	
	Heating plant	tonnes	0	44[2)]	0	
	Operation of vehicles	tonnes	627[1)]	763[1)]	797	
	Total CO_2	tonnes	17,185	15,480	14,293	0.6
Methane (CH_4)	Nesjavellir	tonnes	25	14	21	
	Hellisheiði	tonnes	1	0	0	
	Auxiliary power	kg	2,4	1	0,2	
	Heating plant	kg	0	3[2)]	0	
	Operation of vehicles	kg	89[1)]	107[1)]	109	
	Total CH_4	tonnes	26	14.1	21.1	0.5
Nitrous oxide (N_2O)	Auxiliary power	kg	18	6	20	
	Operation of vehicles	kg	5[1)]	6[1)]	7	
	Heating plant	kg	0	0.4[2)]	0	
	Total N_2O	kg	23	12.4	27	<0.01
Sulfur hexafluoride (SF_6)	Supply and distribution system		0	0	0	

1) Figures for emission due to the operation of vehicles in 2002 and 2003 have been updated from previous reports.
2) Figures for the emission of greenhouse gases from the heating plant have been updated from the environmental report of 2003.
3) As figures for the total emission for 2004 are not available, the emission for 2002 is used as the reference year.

The reason for less emission of carbon dioxide at Nesjavellir compared to 2002 is improved utilization of the area. Instead of having boreholes blowing constantly when they are not being used, they are closed by a safety valve that keeps the pressure in the wells below danger limits, and thus releasing less pressure. Therefore, better utilization is achieved for the energy harnessed from the area, and even though production from Nesjavellir has been rising, less power is being harnessed from the area than previously, resulting in less emissions.

Emissions from Hellisheiði will fluctuate until the power plant is commissioned. The current emissions are due to test blowouts from boreholes. Attempts are made to keep this within certain limits, that is, the boreholes are closed when they have reached a certain balance, and sufficient knowledge of their behaviour has been gained. Test blowouts were much more frequent in 2003 than during 2002 and 2004, part of the reason being that wells that were drilled in summer 2004 started blowing very late. Furthermore, a larger number of boreholes were kept blowing during 2003; the average concentration of CO_2 was higher that year, which tends to increase the difference between the years.

SOIL RECLAMATION AND AFFORESTATION

Every year, the Horticultural Department of Orkuveita Reykjavíkur is active in land reclamation with planting of trees, sowing of barren areas and distribution of fertilizer (Table 2).

Table 3 shows which plant species have been sowed in recent years.

Table 2 **Planting, sowing and distribution of fertilizer**

Planting		**2002**	**2003**	**2004**
Planting in Skólaskógur	pcs	5,200	5,800	5,100
Planting in Bernskuskógur	pcs	1,700	1,500	1,700
Planting in Straumnes	pcs	500	1,450	650
Planting in Borgarvík area	pcs	-	-	150
Planting at Úlfljótsfjall	pcs	-	-	3,700
Planting at Nesjavellir[1)]	pcs	8,040	10,000	2,750
Planting at Ölfusvatn[1)]	pcs	10,150	10,000	11,200
Planting at Deildartunga[1)]	pcs	-	-	130
Planting at Andakílsárvirkjun	pcs	-	7,200	740
Total	pcs	25,590	35,950	26,120
Planting of hayseed[2)]	m^2	11,000	17,500	22,000
Artificial fertilizer[2)]	tonnes	10	15	12
Biological fertilizer[2)]	m^3	150	155	150
White clover sowed[2)]	m^2	1,000	1,000	1,000

1) New information that has not been published in previous environmental reports.
2) Updated figures from previous environmental reports due to new information.

Table 3 **Plant types planted**

Plant types		**2002[1)]**	**2003[1)]**	**2004**
Birch	pcs	20,977	24,500	19,020
Spruce	pcs	50	220	250
Pine	pcs	10,35	4,250	150
Larch	pcs	1,752	1,130	50
Alder	pcs	90	250	300
Aspen	pcs	100	150	50
Mountain ash	pcs	110	200	600
Willow types	pcs	500	900	4,500
Shrubs	pcs	1,010	4,350	1,200
Total:	pcs	25,624	35,950	26,120

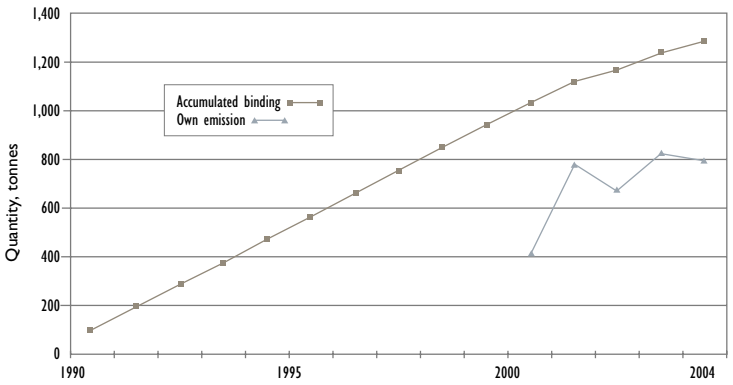
1) Updated figures from previous environmental reports due to new information.

Table 4 **Carbon binding**

		2002	2003	2004
Plant planted, total	pcs	25,624	35,950	26,120
Carbon binding (tonnes, carbon dioxide)	tonnes	48	67	49

Carbon binding plays a large role in soil reclamation. Carbon binding through soil reclamation consists of changing CO_2 into organic substances that are conserved in vegetation and the soil. It is argued that carbon binding is no less useful than direct measures that reduce the emission of CO_2. Scientists at the Mógilsá plant nursery are at the forefront of research on carbon binding with respect to afforestation in Iceland. The methods developed by these scientists are used in this report to assess the carbon binding of trees planted by Orkuveita Reykjavíkur, see Table 4. Carbon binding is converted to the equivalent of carbon dioxide to facilitate the comparison with emission from Orkuveita Reykjavíkur. Fig. 1 shows the accumulated binding of carbon dioxide due to the sowing of plants during the period 1990-2004, compared with emissions due to the use of auxiliary power, the fleet of vehicles and heating plants.

Fig. 1 **Binding and emission of CO_2**



As shown in Fig. 1, carbon binding due to Orkuveita Reykjavíkur's planting exceeds the emissions of CO_2 from the its fleet of vehicles, the use of auxiliary power and the company's heating plant.

WASTE

Table 5 shows Orkuveita Reykjavíkur's total disposal of waste for 2004. Figures for 2003 and 2002 are shown for comparison. Waste is divided into three categories depending on its disposal.

- Mixed waste for landfill
- Waste for recycling
- Hazardous waste

The proportion of waste for recycling and disposal as hazardous waste during 2004 was about 60% of the total waste disposed of by the company. General waste has increased somewhat between the years, as the company has grown larger with the purchase of new utilities. Also,

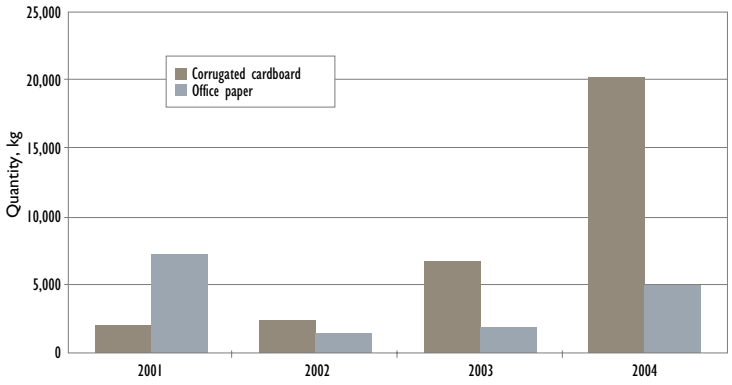
the recording and weighing of waste has become more accurate year by year. The company's policy is to reduce solid waste in coming years and increase the proportion of recycling as much as possible.

Table 5 shows changes between some waste categories from one year to the next which can, first and foremost, be traced to temporary projects and developments. Total waste quantity being recycled is mainly decided by the quantity of metals disposed of each year due to the disposal of transformers and other such heavy equipment. The amount of paper being recycled in recent years can be see in Fig. 2.

Table 5 **Total disposal of waste at Orkuveita Reykjavíkur**

	Total 2002 [kg]	Total 2003 [kg]	Total 2004 [kg]
Mixed waste for landfill	194,388	221,909	278,006
Landfill, total	194,388	221,909	278,006
Organic waste	0	4,980	10,810
Plastic containers	-	-	2,040
Wood	63,360	64,055	67,280
Corrugated cardboard	2,405	6,755	20,170
Office paper	1,490	1,890	5,001
Metals	338,110	396,646	296,045
Recycling, total	405,365	474,326	401,346
Oil waste	13,549	38,221	11,048
Organic hazardous waste cont. halogens/sulfur	2,135	879	21
Organic hazardous waste without halogens/sulfur	259	2,102	3,545
Accumulators and batteries	848	2,710	2,151
Mercury-contaminated waste	-	-	22
Preventive chemical agents			1
Inorganic hazardous waste, etc.	0	63	140
Hazardous waste, disposed of	16,791	43,975	16,928
Total disposal	616,544	740,210	696,280

Fig. 2 **Recycling of paper**



UTILITIZATION OF NATURAL RESOURCES

The operations of Orkuveita Reykjavíkur are chiefly based on the exploitation of natural resources. Electricity is produced with steam at the Nesjavellir high-temperature geothermal areas, by hydroelectric power plants at the rivers Elliðaár and Andakílsá, and with a methane machine at Álfsnes. Cold water is taken from a ground water reservoir in Heiðmörk, and from reservoirs at Akrafjall and Hafnarfjall. Geothermal water is pumped from low-temperature areas in Reykjavík and vicinity. Warm water is also produced by using geothermal steam at Nesjavellir and Hveragerði. The objective of Orkuveita Reykjavíkur is to ensure that the exploitation of these resources is as sustainable as possible.

Cold water catchment areas

The drinking water resource is assessed by monitoring the water level in test boreholes, i.e. well V18 in Heiðmörk. Table 6 shows how the average water level fluctuates from one year to the other. No measurements were made in the well during the summer months due to work being done on the well; the maximum water level measured in March 2004 was 85.14 metres above sea level (m.a.s.). In general the water level falls in autumn, but the lowest water level was measured in February, 81.18 metres above sea level.

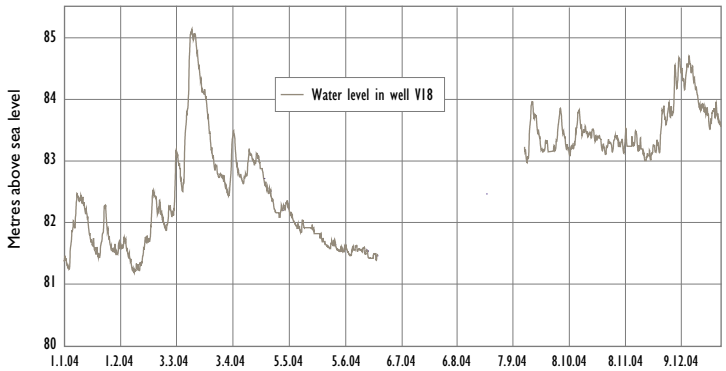
Table 6 **Groundwater level in V18**

		1996	1997	1998	1999	2000	2001	2002	2003	2004
Average water level V18	m.a.s.	81.60	81.64	81.45	81.52	81.93	81.31	81.95	81.99	82.73
Max. water level V18	m.a.s.	83.72	83.53	83.69	83.43	84.68	82.79	83.38	84.50	85.14
Min. water level V18	m.a.s.	80.75	80.85	80.48	80.77	80.99	80.54	80.59	80.80	81.18

m.a.s. = Metre above sea level

Fig. 3 shows the groundwater level in well V18 for 2004. The measurements are made automatically every hour. A guideline limit has been put at 80 metres above sea level. This limit, however, is not critical. Should the water level approach this threshold, a decision will be made if any action is to be initiated; the water level has not fallen below this limit during the past decade.

Fig. 3 **Water level in well V18**



The cold water resource is monitored at Akranes by observing the overflow sluice at the dam twice a week. If there is no overflow, this could mean cold water shortage. There was overflow at the dam every day of the year 2004.

Low-temperature geothermal areas

To monitor the exploitation of the low-temperature areas, it is possible to compare the water level in the test boreholes and the pumping depth in the production wells. Should water level decrease and approach the pumping depth, a decision will be taken if acton is to be initiated involving either to "rest" the area or lower the pumps.

Figs. 4-7 show the water level (grey lines) in specific test boreholes in the four low-temperature areas that Orkuveita Reykjavíkur exploits within the Reykjavík Metropolitan Area. The grey area shows the pumping depth for the pumps located in the production wells in a specific area. The water level has risen in all the areas after the exploitation of geothermal water started at Nesjavellir.

Fig. 4 **Reykir**

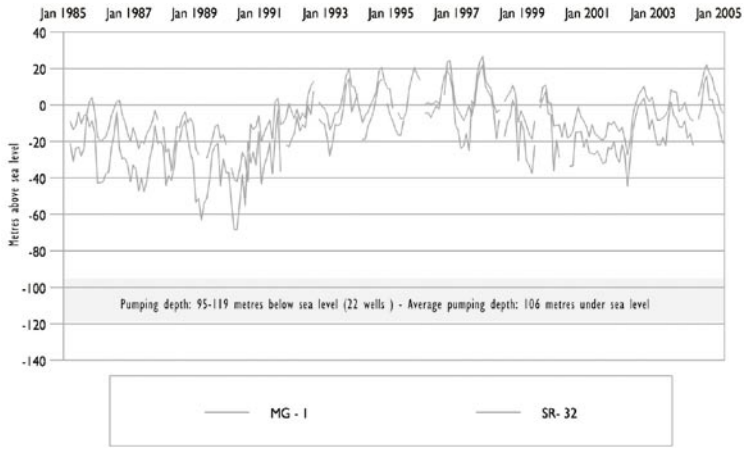


Fig. 5 **Reykjahlíð**

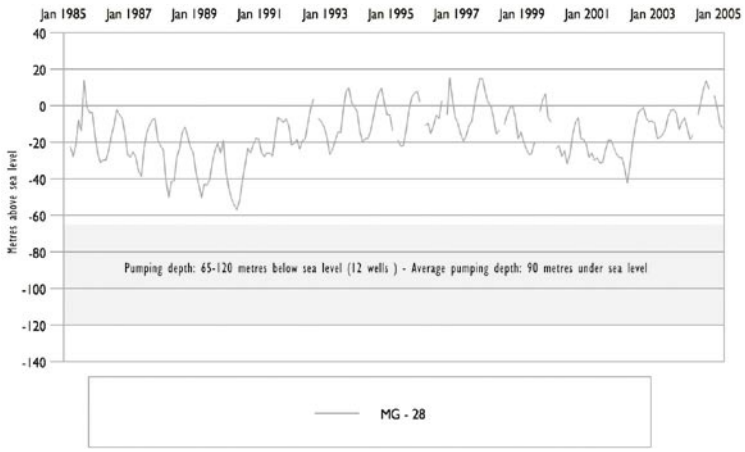


Fig. 6 **Laugarnes**

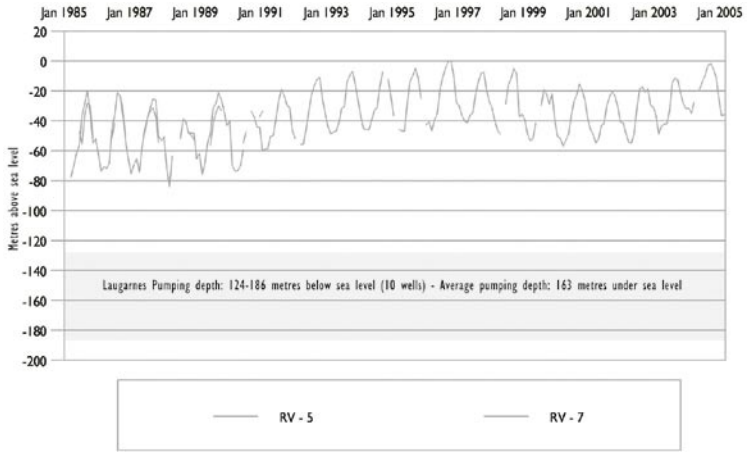
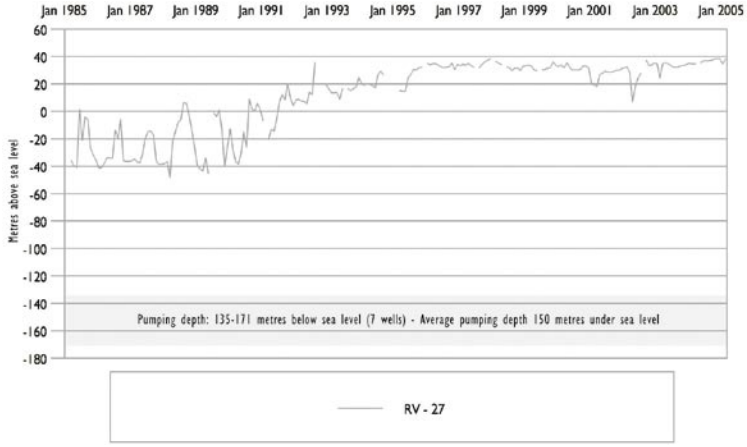


Fig. 7 **Elliðaár**



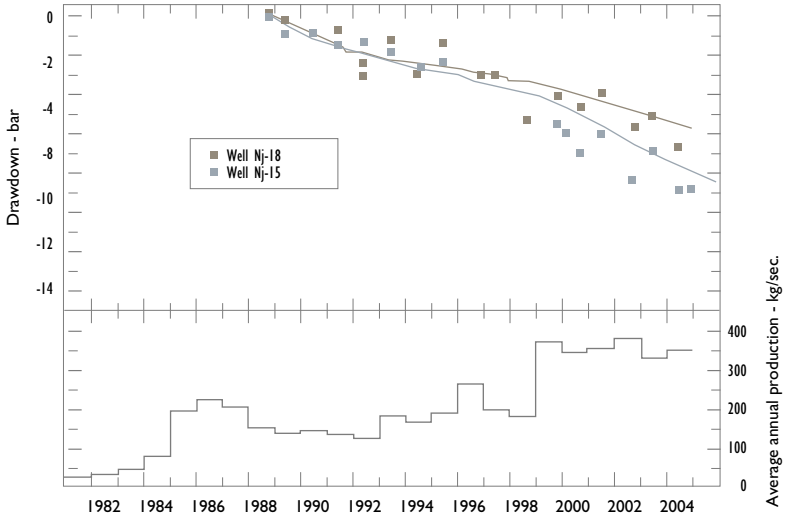
The exploitation of the geothermal resource at Akranes and Borgarnes is monitored by recording the overflow at Deildartunguhver. There was overflow at Deildartunguhver all through 2004. Should there be no overflow, this could mean shortage of hot water; however, then water could be pumped from wells in the area.

High-temperature geothermal areas

The method used to measure the exploitation of the high-temperature areas is to assess the actual exploitation of the areas compared with an operational model (forecast model) prepared by Iceland GeoSurvey for Nesjavellir and Hellisheiði. Our experience is that, usually, the areas produce more energy than predicted by forecast models.

Fig. 8 shows calculated and measured values of pressure drop in high-temperature wells at Nesjavellir.

Fig. 8 **Calculated and measured values of pressure drops in high-temperature wells at Nesjavellir**



The brown and blue lines show the calculated pressure drop according to a model of the geothermal area at Nesjavellir. The squares then show measurements taken at a depth of 800-1,000 metres in the wells. What is presented here are two wells near the edge of the area to the north and east, specifically wells NJ-18 (brown values) and NJ-15 (blue values). Only a few wells can be used for measuring as most of them are being used by the power plant. The values presented here are considered satisfactory.

If measurements reveal deviations from the calculated line, production is not consistent with the forecast for the area, and then the model has to be reviewed. The model is recalibrated every five years to involve all new measurements, and a forecast made for the next 30 years. The rule of thumb is that it is possible to make forecasts with some accuracy for the same number of years as the length of production history on which it is based. The first forecast made for Nesjavellir was based on only 3-5 years of production, and, therefore, the accuracy of the forecast proved to be limited. In the beginning of 2005, when the model was last recalibrated, the production history spanned 15-20 years at Nesjavellir, and the forecast was thus substantially better than earlier forecasts.

Compared with measurements made during 2004, no changes inconsistent with the forecast model were revealed. Should results show that the resources are being overexploited, steps will be taken. Exploitation is controlled by increasing production in some areas and reducing it in others, and by adding harvesting areas due to growth in the market.

2. OTHER FACTORS

POWER GENERATION AND ENERGY USE

Total production

Orkuveita Reykjavíkur produced 672.8 GWh of electricity with geothermal steam in 2004. This is a 9.35% increase from the previous year. About 42.2 GWh of electricity were produced by hydroelectric power, an increase of 7.93% from 2003. The company's production of hot water rose by 5.30% in 2004, the total production coming to about 64 million cubic metres. Production of cold water rose also during the year, coming to about 26.2 million cubic metres, an increase of 8.94% from the previous year. Less electricity was produced by landfill gas during the year due to maintenance of the machinery.

Table 7 **Production and own use**

	Measuring unit	2002	2003	2004	Change from last year
Total production					
Hot water	m^3	62,911,000	60,780,000	64,000,000	+5.30%
Cold water	m^3	23,900,000	24,050,000	26,200,000	+8.94%
Electricity from geothermal steam	MWh	601,337	615,300	672,800	+9.35%
Electricity from hydro sources	MWh	35,986	39,100	42,200	+7.93%
Electricity from landfill gas	MWh	1,787[3)]	3,181	2,300	-27.70%
Own use of Orkuveita Reykjavíkur					
Electricity	MWh	113,541	111,949[3)]	122,760	+9.66%
Hot water	m^3	264,924	453,720[3)]	611,050	+34.68%
Cold water	m^3	34,100	72,659[3)]	294,023	+304.66%
Fossil fuel use of Orkuveita Reykjavíkur					
Petrol	litres	96,466[3)]	114,916[3)]	115,334,49	+3.64%
Diesel oil[1)]	litres	187,057[3)]	196,829[3)]	210,493	+6.94%
Heavy fuel oil[2)]	litres	0	14,880	0	-

1) Use of diesel-powered vehicles and oil boilers.
2) Heavy fuel oil used for the heating plant.
3) Corrected figures from the previous environmental report.

Own use of Orkuveita Reykjavíkur

The company used about 122.8 GWh of electricity, 611,050 m^3 of hot water and 294,023 m^3 of cold water for the operation of real estate, production and distribution system. The company's own use of electricity amounted to about 17% of the electricity production. This consumption, is by and large due to the pumping of all hot and cold water from wells. It is also due to losses in the transformers in the supply system and distribution network. Use of electricity for the operation of the company's real estate is, thus, only a small part of its own use.

Measurements of the system are constantly being improved, and information is being more accurate. Table 7 shows a tremendous increase in the company's own use of cold water. This increase can be traced to measurements that have been improved and new water gauges that have been installed at locations that were previously not measured. The same applies to hot water. The use of cold water by Orkuveita Reykjavíkur can chiefly be traced to water use at Nesjavellir and in Perlan.

Fossil fuel consumption of Orkuveita Reykjavíkur

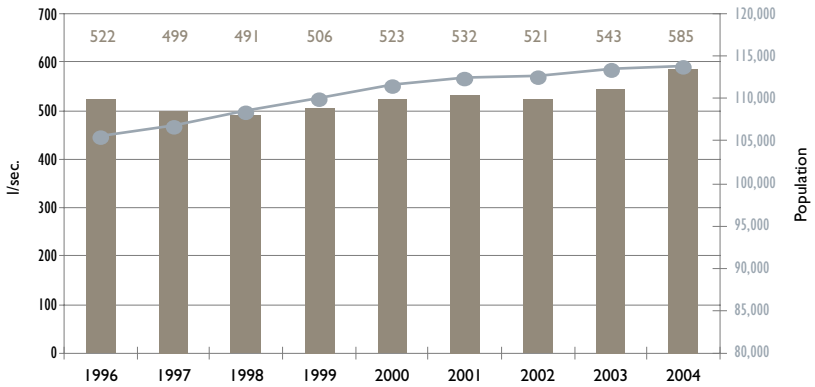
Orkuveita Reykjavíkur does not operate its own fleet of vehicles, as it is owned and supervised by the Reykjavík Municipal Machinery Centre. The company also rents vehicles for temporary use according to individual projects. Orkuveita Reykjavíkur makes efforts to examine all environmental impact caused by the company's operations, and, therefore, information on fossil fuel use from all companies that have serviced Orkuveita Reykjavíkur by rental of vehicles has been accumulated and published in the company's green accounting. Due to new information from service companies, we have decided to correct the figures for 2002 and 2003, in addition to publishing the fossil fuel use for 2004 in as much detail as possible.

Table 7 shows that the company's fossil fuel consumption has risen slightly, by some 3.64% rise in the use of petrol and 6.94% in the use of diesel oil. This can be traced to the company's new ventures, as vehicle use has increased with the acquisition of new utilities in other parts of the country, and also due to research and operations on the new power plant at Hellisheiði.

WATER USE IN REYKJAVÍK CITY

Fig. 9 shows how much drinking water has been pumped to the city of Reykjavík from 1996 to 2004. While the population increase in the metropolitan area has created a need for increased pumping between years the systematic monitoring of leakage, maintenance and improvements, the utilization of the water has improved from what it used to be. There has been about 7.4% increase in the pumping of cold water to the city since 2003.

Fig. 9 **Use of drinking water in the municipality of Reykjavík**



ACID GASES

Rain contaminated by sulfuric acid (H_2SO_4) and nitric acid (HNO_3) is called acid rain. These acids are formed mostly by the burning of oil and coal. Orkuveita Reykjavíkur burns an insignificant amount of oil and coal, as is the case for almost all industry in Iceland. Therefore, problems posed by acid rain are negligible in Iceland.

The results of our emission accounting for 2004 are shown in Table 8 and Fig. 10.

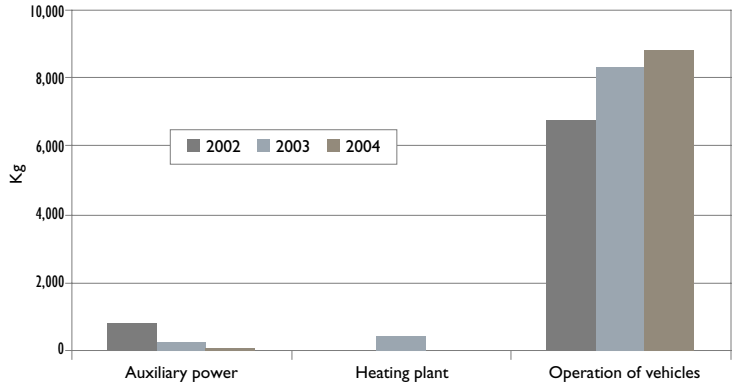
The total emission of acid gases from the operations of Orkuveita Reykjavíkur is in all instances below 0.01% of the total emission of these gases in Iceland.

Table 8 **Emission of acid gases**

	Origin	Quanity	2002	2003	2004
Sulfur dioxide (SO_2)	Auxiliary power	kg	41.6	-[1]	-[1]
	Heating plant	kg	0	52	0
	Operation of vehicles	kg	51.5	-[1]	-[1]
Nitrogen oxide (NO_x)	Auxiliary power	kg	781	239	44
	Heating plant	kg	0	452	0
	Operation of vehicles	kg	6,800[2]	8,307[2]	8,800

1) As of the year 2003, only diesel oil containing less than 350 ppm of sulfur has been imported to Iceland. Therefore, the quantity of sulfur dioxide caused by the burning of the oil is negligible.
2) Corrected figures from previous reports due to new information on the burning fossil fuel.

Fig. 10 **Acid gas NO_x**



HEATING PLANT

Under the Hygiene and Pollution Control Act, No. 71/1998, the operation of the company's heating plant comes under activities subject to emission accounting (green accounting). While the heating plant is used as an auxiliary plant for hot water, its only use consists of tests of the machinery which last for a few hours at a time. The heating plant is tested every other year, no testing being carried out in 2004. Table 9 shows the emission accounting for the heating plant for the years 2002-2004.

Table 9 **Emission of gases from heating plant**

		2002	2003[2]	2004
Carbon dioxide (CO_2)	tonnes	0	44	0
Methane (CH_4)	kg	0	3	0
Sulfur dioxide (SO_2)	kg	0	52	0
Carbon monoxide (CO)	kg	0	575	0
NMVOC[1]	kg	0	110	0
Nitrogen oxides (NO_x)	kg	0	452	0

1) Volatile organic compounds none methane.
2) The figures for the emission of gases from the heating plant have been corrected from the Environmental Report of 2003.

OTHER GASES

Hydrogen sulfide (H_2S) is categorized with other gases. A certain quantity of it is emitted in connection with the procurement of hot water at Nesjavellir, and in the geothermal research at Hellisheiði.

In 2004, the emissions of hydrogen sulfide from Nesjavellir amounted to 5,048 tonnes, and the emission from tests and monitoring blowouts from Hellisheiði amounted to 748 tonnes.

HEALTH AND SAFETY MANAGEMENT

Orkuveita Reykjavíkur places great emphasis on a safe and healthy working environment. According to the company's safety policy its main objective is an accident-free work place.

The safety committees of Orkuveita Reykjavíkur are responsible for investigating accidents, near-accidents and suggestions by employees regarding their and others' safety. During 2004, 14 accidents were investigated, which comes to 2.6 accidents per each 100 full-time equivalent positions based on total working hours. Near-accidents were 36, and 63 suggestions were received from employees. There was a considerable decrease from the previous year in days of absence due to accidents, 112 days in 2003, falling down to 74.5 in 2004. There was no accident in connection with the use of hazardous substances.

ENVIRONMENTAL IMPACT PER EMPLOYEE

Table 10 **Measured environmental impact per employee**

		Use/emission per employee[1)] 2002	Use/emission per employee[2)] 2003	Use/emission per employee[3)] 2004
Energy	Electricity	213 MWh	207 MWh	227 MWh
	Hot water	496 m^3	839 m^3 [4)]	1,129 m^3
	Fossil fuel	531 litres[4)]	576 litres[4)]	602 litres
Waste	Landfill	364 kg	410 kg	514 kg
	Recycling	759 kg	877 kg	742 kg
	Hazardous waste	31 kg	81 kg	31 kg
Safety management	Accidents	2.77 Accid./100 pos	2.9 Accid./100 pos	2.59 Accid./100 pos
Emission of green--house gases	Carbon dioxide CO_2	32 tonnes	29 tonnes	26 tonnes
	Methane CH_4	47 kg	26kg	39 kg
	Dinitrogen oxide N_2O	0,04 kg	0,03 kg	0,05 kg
Emission of green-house gases from fleet of vehicles	Carbon dioxide CO_2	1.17 tonnes	1.41 tonnes	1.47 tonnes
	Methane CH_4	0,17 kg	0,20 kg	0,20 kg
	Dinitrogen oxide N_2O	0.94 kg/100 pos.	1.11 kg/100 pos.	1.29 kg/100 pos.

1) Average number of employees in 2002 was 534.
2) Average number of employees in 2002 was 541.
3) Average number of employees in 2002 was 541.
4) Updated figures from previous environmental reports due to new information.

According to Table 10, the calculated environmental impact per employee has increased from the previous year, the main reason being the growth of the company, and increased activities without a significant increase in number of employees. Some employees now have to drive longer distances to their jobs. Furthermore, with improved measurements and records, for example, the company's own use has risen from what was previously thought.

VARIOUS INFORMATION

Eco-driving

All of Orkuveita Reykjavíkur's employees who use vehicles for their jobs, about 170 people, were summoned to a course in eco-driving in 2004, the objective being to make efforts to reduce the emission from the burning of fossil fuel. The course consisted of drivers being asked to drive a specific circle with the their usual mode of driving. Computer equipment was used to monitor their driving, including fuel use, average speed, the distance driven and driving time. Subsequently, the instructor surveyed their driving mode and pointed out factors that make driving more environmentally sound. Then the same circle was driven again. The results from the later circle proved to be very surprising for most of the drivers. Up to 30% less fuel was used for the second circle, even though that drive took the same time or even less, and the average speed was higher. The main issue was to adapt the driving to the traffic, traffic lights and other obstacles. Efforts were made to use brakes sparingly, while slowing down in time when there were obstacles ahead by easing up on the accelerator. The key point was not to have the engine running at a higher rate than 2,500-3,000 rounds per minute.

Subsequently, it was decided to start preparations for the testing of tachographs in vehicles used by Orkuveita Reykjavíkur. The tachographs reveals the drivers' driving mode, and thereby indicating how they can improve their driving. The benefits of eco-driving are several:

- Reduced emission
- Less wear and tear of tyres and brakes
- Less polluting dust in the air
- Reduced wear and tear of the vehicle
- Fewer accidents and, in time, lower insurance premiums
- Reduced cost

Experience has showed that traffic accidents of companies using tachographs in their vehicles have lowered by approx. 50%.

Hazardous substances and storage

In 2004, all chemical substance storage connected with Orkuveita Reykjavíkur's operations were registered. This was followed by recording of hazardous substances and measures taken to ensure that relevant safety data sheets were available. Courses in the handling of hazardous substances were held for the employees, that included how to read safety instructions, what warnings on containers mean, and how to utilize such information in the choice and use of chemical substances.

Risk analyses

Risk analysis is used when new operations, work procedures, instruments, equipment or servicing areas are introduced. Risk analysis can be carried out with in terms of environmental matters, health and safety issues for the employees, emergency management or for internal control.

Risk analyses are one of the first things carried out when new utilities are acquired. Subsequently, a list of tasks is prepared to be implemented by responsible parties within each field.

The person responsible for the risk analysis selects a group of employees knowledgeable of the conditions in question to perform the analysis. A guided tour is made of the area, and information collected from employees knowledgeable about the conditions. All relevant kinds of information that can shed light on dangers are valid for risk analysis, including accident reports and "near-accident" reports, tips given by employees, list of absentees, monitoring reports of supervisors, manuals from the manufacturers of equipment, safety rules, in addition to laws and regulations.

Vermin within the cold water catchment areas

There is regular monitoring of vermin within the cold water catchment areas of Orkuveita Reykjavíkur. During 2004, seven field mice were caught so that they would not cause damage to strings in substations and other control equipment. Carcasses of greylags, redshanks, ravens, rabbits and mallards were removed as bacteria which form in them could pollute the ground water. Seven lesser black-backed gull young were put down due to wing injuries, and 24 minks were caught to prevent ground water pollution.

Environmental mishaps

One environmental mishap occurred on Hellisheiði in 2004 due to oil leakage. A sluice valve on two oil tanks broke down with the result that oil leaked out to the environment. Consequently, the polluted soil was dug up and taken to the Reykjavík Municipal Disposal Company, Sorpa, for disposal. In the vicinity of the accident site there is a man-made reservoir for water acquisition; oil-absorbing protective inflatable rubber tubes were placed at the intake to the water-acquisition site, and oil-absorbing covers were also placed on the oil slick on the reservoir. In spite of these measures, the banks of the reservoir seemed to infect the water with some oil. In response, the soil all round the reservoir was replaced, and since then no oil slick has been seen on the reservoir. The South Iceland Board of Public Health was immediately notified of the mishap, and measures were taken in consultation with the Board.

Environmental impact assessment (EIA)

The National Planning Agency of Iceland, which operates under the Planning and Building Act, and the Environmental Impact Act (No. 106/2000), decides on projects which possibly need to be assessed due to environmental impact before developments may be initiated. The Environmental Impact Act came into effect on 1st May 1994, the National Physical Planning Agency being responsible for such projects until it was replaced by the National Planning Agency in early 1997. Some projects are automatically subject to mandatory assessment, while others require specific examination, that is projects that come under the so-called annex to the Act. In such instances, data must be submitted to the National Planning Agency which then examines and assesses if the environmental impact of the project in question should be assessed.

All larger projects of power harnessing undertaken by Orkuveita Reykjavíkur are automatically subject to mandatory assessment under the Environmental Impact Act, while some smaller projects might come under Annex 2 to the Act, so it has to be submitted to the National Planning Agency whether they are subject to mandatory assessment. Table II gives an overview of projects that have been evaluated if they are subject to assessment of environmental impact. Also, the conclusion of administrative proceedings can be seen in the tables.

Table 11 **Overview of questions relating to mandatory assessment**

Project	Type of project	Date of ruling	Ruling	Ruling appealed
Test drillings in the Hengill area	Test - Drillings	05.01.05	Part of project is subject to mandatory assessment (4 boreholes of 7)	No
Enlargement of the Nesjavellir plant from 90 to 120 MW	Geothermal plant	24.07.02	Project is subject to notification, not to assessment	No
Enlargement of the Grímsnes utility in Grímsnes and Grafningshreppur up to 10 MW	Heating utility	18.04.02	Project approved, subject to notification, not to assessment	No
Construction of path to test borehole in Hellisheidi	Path	15.10.01	Project approved, subject to notification, not to assessment	No
Second phase of test drillings in Hellisheiði - 3 boreholes	Test - Drillings	12.09.01	Project is subject to notification, not to assessment	No
Drilling of two test boreholes in the Hengill area	Test - Drillings	30.01.01	Project approved, subject to notification, not to assessment	No

Table 12 **Overview of projects that have undergone environmental impact assesment (EIA)**

Project	Type of project	Date of ruling	Ruling	Ruling appealed
Hellisheiði plant, electric power station up to 120 MW and heating plant up to 400 MW	Test - Drillings	18.02.04	Project approved on certain conditions	No
Nesjavellir plant in Grímsnes- and Grafnings-, hreppur phase 4b, enlargement of power station from 76 MW to 90 MW	Geothermal plant	05.01.01	Project approved	No
132 kV Nesjavellir transmission line	High-voltage transmission line	23.07.97	Project approved with certain conditions	Yes, but the Minister for the Environment confirmed the ruling of the National Planning Agency
Ölkelduháls, drilling of test borehole and road construction	Geothermal plant	30.09.94	Project approved with certain conditions	Yes, but the Minister for the Environment confirmed the ruling of the National Planning Agency

CHEMICAL ANALYSES OF DRINKING WATER

Orkuveita Reykjavíkur performs an annual, comprehensive analysis of the physical and chemical content of the cold tab water as specified in the regulations concerning drinking water. The quantities of all substances were within the prescribed limits for the year 2004.

Table 13 **MINERAL ANALYSIS OF COLD WATER**

Physical and chemical properties	Unit	Max recomm. value	Co	Lab	Dælustöð v/ Eiríksgötu 20-20-Hu	Jaðarsvæði 20-8-Hu, V-5	Vatnsendakriki 20-14-Hu, Vk-1	Gagnvegur, dælust. 20-23-Hu	Akranes 33-203-Hu	Borgarnes 33-305-Hu
Sample condition				UST	Normal	Normal	Normal	Normal	Normal	Normal
Turbidity	NTU	adequate	(1)	UST	0.6	0.3	0.2	0.1	0.24	< 0,1
Temperature	°C	25		UST	4.2	3.8	3.6	5.0	8.0	6.3
pH value	pH unit			UST	9.00	8.95	8.85	8.90	7.40	7.50
Conductivity	µS/cm	2500		UST	86	86	80	82	94	110
Chloride (Cl)	mg/l	250		SGAB	10.8	10.9	9.6	9.5	12.7	7.5
Sulphates (SO4)	mg/l	250		SGAB	2.1	2.1	2.1	2.2	2.7	10.8
Fluoride (F)	mg/l	1.5		SGAB	< 0,10	< 0,10	< 0,10	< 0,10	< 0,1	< 0,1
Nitrat (NO3-N)	mg/l	50		SGAB	0.05	0.04	0.04	0.04	0.082	0.033
Nitrit (NO2-N)	mg/l	0.5		SGAB	< 0,002	< 0,002	< 0,002	< 0,002	< 0,002	< 0,002
Ammonium (NH4-N)	mg/l	0.5		SGAB	< 0,05	< 0,05	< 0,05	< 0,05	< 0,05	< 0,05
TOC	mg/l	no abnormal changes		SCAB	< 1,0	< 1,0	< 1,0	< 1,0	< 1,0	< 1,0
Calcium (Ca)	mg/l	100	(3)	SGAB	4.87	4.54	5.1	5.2	5.32	12.8
Iron (Fe)	mg/l	0.2		SGAB	0.0009	0.0007	0.0004	0.0015	0.0102	0.0121
Potassium (K)	mg/l	12	(3)	SGAB	< 0,4	0.433	< 0,4	0.495	0.548	< 0,4
Magnesium (Mg)	mg/l	50	(3)	SGAB	0.787	0.893	0.9	0.909	1.97	1.77
Sodium (Na)	mg/l	200		SGAB	11.2	10.9	9.13	9.13	10.4	6.91
Sulphur (S)	mg/l		(4)	SGAB	0.711	0.708	0.664	0.609	0.873	3.39
Silica (Si)	mg/l		(4)	SGAB	6.52	6.48	6.7	6.7	6.87	3.77
Aluminium (Al)	µg/l	200		SGAB	16.7	19.6	19.8	19.1	2.66	1.38
Arsenic (As)	µg/l	10		SGAB	< 0,43	< 0,46	< 0,35	0	< 0,8	< 0,6
Boron (B)	µg/l	1000		SGAB	< 10	< 10	< 10	< 10	< 10	< 10
Barium (Ba)	µg/l	700	(3)	SGAB	0.296	0.076	0.084	0.177	0.0402	0.037
Cadmium (Cd)	µg/l	5.0		SGAB	0.003	< 0,002	0.004	< 0,002	0.0037	0.0033
Cobolt (Co)	µg/l		(4)	SGAB	< 0,005	< 0,005	< 0,005	< 0,005	0.0124	0.0082
Chromium (Cr)	µg/l	50		SGAB	0.92	0.99	0.931	0.872	0.321	0.137
Copper (Cu)	µg/l	2000		SGAB	0.13	0.182	0.206	0.307	0.56	0.26
Mercury (Hg)	µg/l	1.0		SGAB	< 0,002	< 0,002	< 0,002	< 0,002	< 0,002	< 0,002
Manganese (Mn)	µg/l	50		SGAB	0.037	< 0,03	0.033	0.058	0.616	0.201
Molybdenum (Mo)	µg/l		(4)	SGAB	0.133	0.081	0.078	0.087	0.054	0.516
Nickel (Ni)	µg/l	20		SGAB	< 0,05	0.056	< 0,05	< 0,05	0.0979	0.343
Phosphorus (P)	µg/l	5000	(3)	SGAB	16.1	17.3	22.1	21.2	18.2	3.05
Lead (Pb)	µg/l	10		SGAB	0.015	0.019	0.129	0.052	0.0814	0.0165
Antimonium (Sb)	µg/l	5.0		SGAB	0.011	< 0,01	< 0,01	< 0,01	< 0,01	< 0,01
Selen (Se)	µg/l	10		SGAB	0.141	0.183	0.13	0.127	0.0675	0.264
Strontium (Sr)	µg/l		(4)	SGAB	< 2	2.28	2.67	2.97	3.2	16.9
Zinc (Zn)	µg/l	3000	(3)	SGAB	0.598	1.42	0.77	2.09	4.1	1.08
Cyanide (CN)	µg/l	50		SGAB	< 5,0	< 5,0	< 5,0	< 5,0	< 5,0	< 5,0
Dichlormethane	µg/l			SGAB	< 1,0	< 1,0	< 1,0	< 1,0	< 1,0	< 1,0
1,1 - dichlorethane	µg/l			SGAB	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5
1,2 - dichlorethane	µg/l	3.0		SGAB	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5
Trans 1,2 - dichlorethene	µg/l			SGAB	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5
Cis 1,2 - dichlorethene	µg/l			SGAB	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5
1,2 - dichlorepropen	µg/l			SGAB	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5
Tetrachlormethane	µg/l			SGAB	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1
1,1,1 - trichloretane	µg/l			SGAB	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1
1,1,2 - trichloretane	µg/l			SGAB	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1
Trichlorethene	µg/l	10	(2)	SGAB	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1
Tetrachlorethene	µg/l		(2)	SGAB	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1
Benzene	µg/l	1.0		SGAB	< 0,2	< 0,2	< 0,2	< 0,2	< 0,2	< 0,2
Toluen	µg/l			SGAB	< 0,2	< 0,2	< 0,2	< 0,2	< 0,2	< 0,2
Ethylbenzen	µg/l			SGAB	< 0,2	< 0,2	< 0,2	< 0,2	< 0,2	< 0,2
Sum xylener	µg/l			SGAB	< 0,2	< 0,2	< 0,2	< 0,2	< 0,2	< 0,2
Trichlormethane	µg/l			SGAB	< 0,3	< 0,3	< 0,3	< 0,3	< 0,30	< 0,30
Tribrommethane	µg/l			SGAB	< 0,2	< 0,2	< 0,2	< 0,2	< 0,20	< 0,20
Dibromchlormethane	µg/l			SGAB	< 0,1	< 0,1	< 0,1	< 0,1	< 0,10	< 0,10
Bromdichlormethane	µg/l			SGAB	< 0,1	< 0,1	< 0,1	< 0,1	< 0,10	<0,10
Napthalene	µg/l			SGAB	< 0,17	< 0,17	< 0,17	< 0,17	< 0,17	< 0,17
Acenaphthylene	µg/l			SGAB	< 0,25	< 0,25	< 0,25	< 0,25	< 0,25	< 0,25
Acenaphthene	µg/l			SGAB	< 0,0070	< 0,0070	< 0,0070	< 0,0070	< 0,0070	< 0,0070
Fluorene	µg/l			SGAB	< 0,012	< 0,012	< 0,012	< 0,012	< 0,012	< 0,012
Fenantrene	µg/l			SGAB	< 0,040	< 0,040	< 0,040	< 0,040	< 0,040	< 0,040
Anthracene	µg/l			SGAB	< 0,0010	< 0,0010	< 0,0010	< 0,0010	< 0,0010	< 0,0010
Fluoranthene	µg/l			SGAB	< 0,0050	< 0,0050	< 0,0050	< 0,0050	< 0,0050	< 0,0050
Pyrene	µg/l			SGAB	< 0,0050	< 0,0050	< 0,0050	< 0,0050	< 0,0050	< 0,0050
*benz(a)anthracene	µg/l			SGAB	< 0,0030	< 0,0030	< 0,0030	< 0,0030	< 0,0030	< 0,0030
*chrysene	µg/l			SGAB	< 0,0070	< 0,0070	< 0,0070	< 0,0070	< 0,0070	< 0,0070
*benz(b)fluorantene	µg/l	0.1	(5)	SGAB	< 0,0040	< 0,0040	< 0,0040	< 0,0040	< 0,0040	< 0,0040
*benz(k)fluorantene	µg/l		(5)	SGAB	< 0,0020	< 0,0020	< 0,0020	< 0,0020	< 0,0020	< 0,0020
*benz(a)pyren	µg/l	0.01		SGAB	< 0,0020	< 0,0020	< 0,0020	< 0,0020	< 0,0020	< 0,0020
*dibenz(ah)anthracene	µg/l			SGAB	< 0,0020	< 0,0020	< 0,0020	< 0,0020	< 0,0020	< 0,0020
benzo(ghi)pherylen	µg/l		(5)	SGAB	< 0,0030	< 0,0030	< 0,0030	< 0,0030	< 0,0030	< 0,0030
*indeno(123cd)pyrene	µg/l		(5)	SGAB	< 0,0030	< 0,0030	< 0,0030	< 0,0030	< 0,0030	< 0,0030
Sum 16 EPA-PAH	µg/l			SGAB	< 0,30	< 0,30	< 0,30	< 0,30	< 0,30	< 0,30
*PAH cancerogena	µg/l			SGAB	< 0,0090	< 0,0090	< 0,0090	< 0,0090	< 0,0090	< 0,0090
PAH other	µg/l			SGAB	< 0,30	< 0,30	< 0,30	< 0,30	< 0,30	< 0,30

Explanatory notes
(1) Adequate for consuption and no uncharacteristically changes
(2) Maximum value for sum of thrichlorethen and tetrachlorethen
(3) Maximum value in older Icelandic regulations 319/1995 (void)
(4) Maximum value not in Icelandic regulations
(5) Maximum value for the sum of following substances: benzo(b)fluoranten, benzo(k)fluoranten, benzo(ghi)perylen, indeno(123cd)pyren

UST: Environmental Protection Agency, SGAB: Svensk Grundämnesanalyse AB (Sweden).

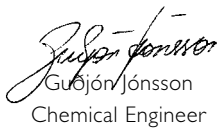
3. AUDITOR'S REPORT

I have audited the calculations and reviewed the information stated in Orkuveita Reykjavíkur's Environmental Report for the year 2004. This has been done according to requirements made in Regulation No. 851/2002 on Green Accounting. Orkuveita Reykjavíkur fills the group of companies that come under the Annex to this regulation. The Environmental Report is presented by the management of Orkuveita Reykjavíkur and at their responsibility. My responsibility consists of the opinion I give in the presented data in the Environmental Report on the basis of my audit.

The audit has been carried out in keeping with accepted auditing procedures, which demand that the auditing be arranged and carried out so as to ensure that the Environmental Report, on the whole, is without faults. The audit involves analytic measures, random samplings and the examination of data so as to verify the information presented in the Environmental Report. The audit also involves the examination of calculations that were carried out in the assessment of the magnitude of individual factors that are listed in the Environmental Report. My opinion is that the audit is a sufficiently-trustworthy basis on which to base my opinion.

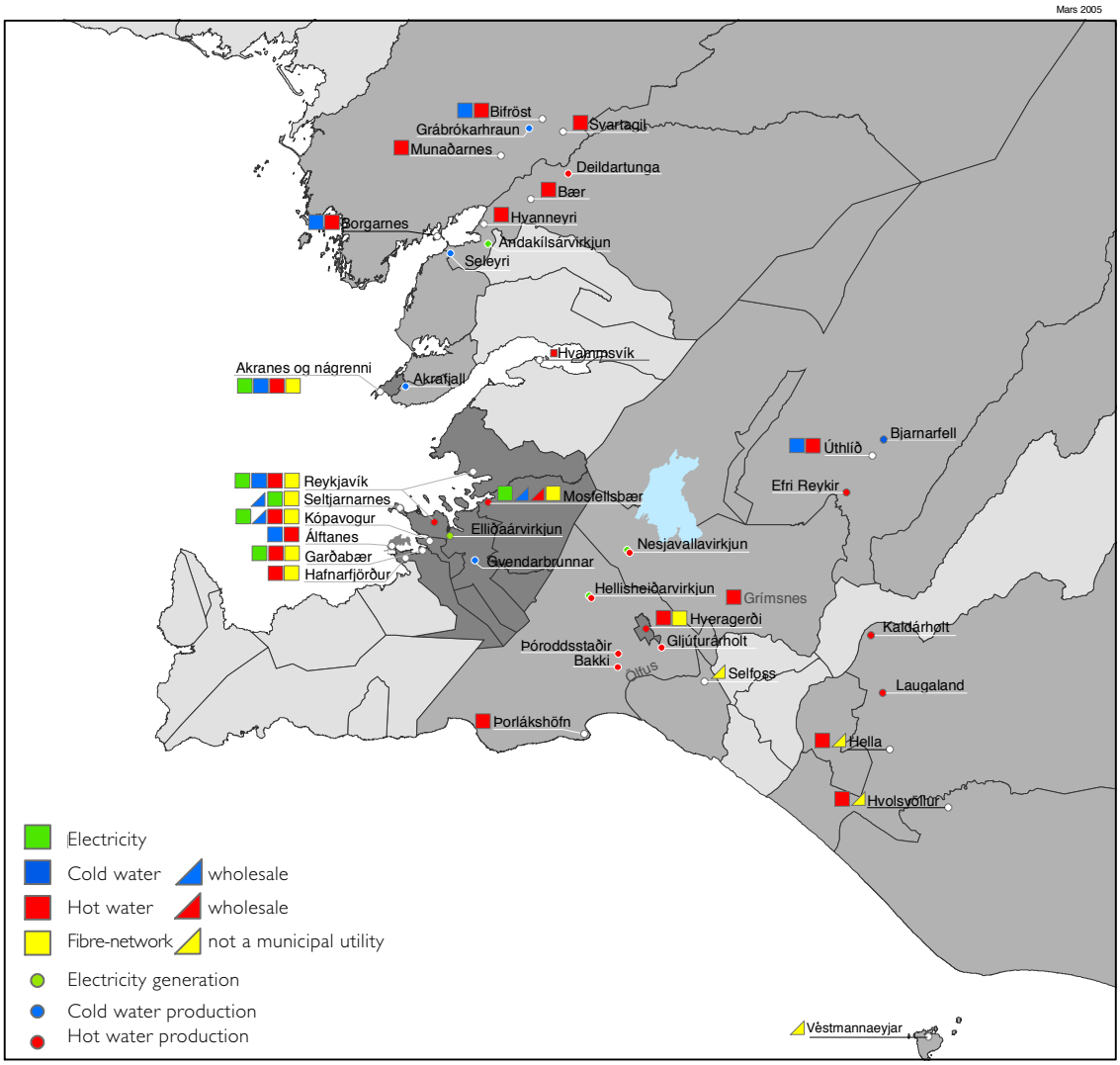
In my opinion the Environmental Report gives a clear picture of the environmental impact of the operations for the year 2004 in keeping with good and accepted procedures within this branch of industry.

Reykjavík, 13th April 2004.
VSÓ Consultants



Guðjón Jónsson
Chemical Engineer

4. ORKUVEITA REYKJAVÍKUR'S SERVICING AREA



Municipalities where Reykjavík Energy owns part of the area's utility

Municipalities where Reykjavík Energy owns all of the area's utility

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