



# SUSTAINABILITY REPORT

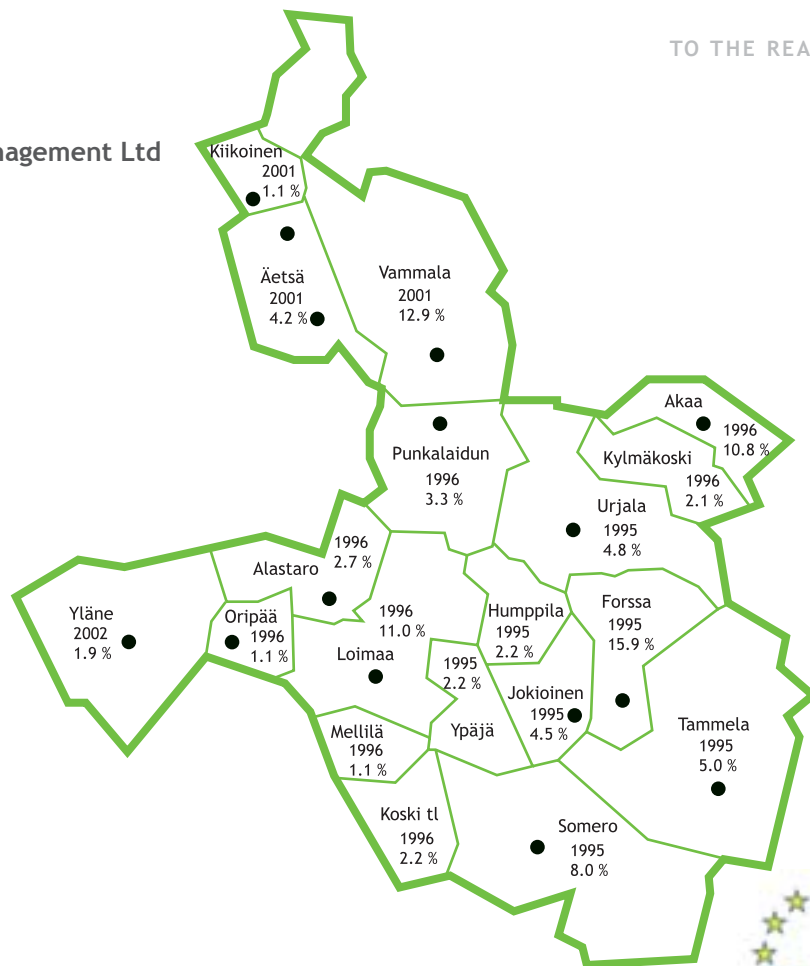
# 2006

LHJ WASTE MANAGEMENT





Owner Municipalities of LHJ Waste Management Ltd



# TO THE READER

**First Sustainability Report,  
Fourth Environmental Statement**

LHJ Waste Management Ltd now publishes its first sustainability report. A combined economical, social and environmental report includes for the fourth time an environmental statement which is completed in compliance with EU's EMAS statute. The environmental statement has been published annually. The company does not publish a separate annual report over the year 2006.

**The Scope and Boundary of the Report**

This report covers all sectors of corporate responsibility of LHJ Waste Management Ltd. The information of economical, environmental and social responsibility is included in the report. The emphasis is still on the environmental responsibility. The sustainability report has been written to give exhaustive information to all interested parties, especially to the owners, partners and local residents. In addition to this, the report contains mostly environmental information of the joint venture companies Cool-Finland

Oy, CRT-Finland Oy and Suomen Erityisjäte Oy. All four companies operate under the shared environmental management system and environmental permit. In 2006 there were no significant changes in ownership or operations among the companies.

**Reporting Principles**

The reporting period is a calendar year 2006. The report contains comparison data also from previous years. The data presented in the report is based on both the systems used in the company accounting and administration and the environmental, quality and occupational safety management systems. The information in the environmental responsibility part of the report is based on the monitoring programme approved by the Häme Regional Environment Center and the information reported to the authorities. The economical and financial information is based on audited accounting and closing of the books. The guidelines given by Finnish Accounting Board have been used in the social part. This report also follows the GRI3 sustainability guidelines in describing economical, social and environmental information.

**GRI Application Level Table**

	C	C+	B	B+	A	A+
Self Declared	✓					

# REVIEW BY MANAGING DIRECTOR

## DEAR READER,

I have a pleasant duty to make an overview on the past year and for the future. Shortly, the year has been the best in the history of LHJ Waste Management and its joint venture companies. Also the operative activities have succeeded well. It is a pleasure to tell about the company's activities for the first time via sustainability report. The commitment to corporate social responsibility can be seen in many ways in a company that is owned by municipalities.

Economically, the year 2006 did not bring any major changes. The volume and the net sales of the company have been stable. In joint venture companies that operate in electronics recycling the growth

was significant. Last year was the first whole operational year after the beginning of the producer's responsibility in electronics recycling which. In LHJ Waste Management the operations are aimed in the area of the owner municipalities. There have not been any major changes during the last couple of years. The target of the municipal waste management is cost-efficiency. High quality and well covered services are carried out at a competitive price level. The company does not distribute dividend. The positive result is shared as a reasonable price level to all waste producers in the owner municipalities. The treatment fee has been under the average in Finland during the recent years.

The company and its partners have created a network of three joint venture companies in the Forssa Envitech area. These companies operate in the national level and also internationally. The market presence of these companies have increased competition and this has resulted in more cost-efficient solutions and services to the customers. Growing treatment and recycling activities have increased the economical activity in the Forssa region. This can be seen in the growing number of employees, construction work and purchases.

Environmentally, the company's main tasks have been:

- Safe, environmentally friendly and emission free waste management
- Material and energy utilization of the waste
- Effective use of the natural resources
- Guidance, counselling and education
- Transparency in communicating environmental issues

To secure the continuous improvement, the company has implemented ISO 14001 and EMAS certified environmental management system. It is evaluated in management reviews twice a year. The system is taken into use in all organisation levels using operation and working guidelines. LHJ Waste Management and its joint venture companies strive to use the best available technologies in order to reach high utilization rates.

The environmental technology consists of recycled

fuel facility, electric and electronic waste process plants and contaminated soil treatment technologies. The utilization rates are close to 100 per cent in some of the waste fractions. The comprehensive monitoring programme indicates that the waste management activities have not caused adverse changes in the surrounding nature. The communications have been open and honest in the local media, company magazine and in the internet.

Social responsibility, means increasing amount of employees in LHJ Waste Management and in the joint venture companies. The companies have increased the amount of employees to already over 100 persons, which is a significant amount in the Forssa Region. The working conditions are organised to be stable and safe for the whole personnel. The occupational safety and health as well as education are emphasized systematically in the companies. In 2006, LHJ Waste Management succeeded well. The proportion of permanent contracts have increased and occupational accidents have decreased.

The companies have a wide variety of interest groups, both nationally and internationally. The whole personnel participate actively in interest group communications. The interest groups are also invited occasionally to different PR events. As a local social responsibility operation, LHJ Waste Management has been active in developing Forssa Envitech area co-operation. It was one of the founding member and active opinion leader in establishing the Forssa Envitech club. The club promotes environmental entrepreneurship, research and education in the Forssa region.

The future outlook contains some changes in the short run. The year 2006 was quiet compared to previous years. In 2007 the company has new challenges and tasks. The municipality of Suodenniemi merged with town of Vammala in the beginning of 2007. In the national level, the Finnish Parliament made a partial change in the Waste Act. This may weaken the position of the municipal waste management companies while the waste of better quality from the companies may be handled more by the private waste management companies and recyclers. If the waste amount decreases in the municipal waste management, it may increase the treatment fees in the future.



In a longer range the waste management seems to change more and more from waste management into a management of raw material flows. New technological innovations will enable the utilization of more difficult wastes that have not been able to be recovered before. The legislation processes still has a significant role in the changes. The more scarce natural resources will make some materials more tempting for recycling and raw material use also without legislative pressure.

In the future the growth in energy recovery of waste is evident. There are two ongoing power plant projects in Finland. More new plants are required in order to increase the energy recovery of waste in the LHJ Waste Management's region. In the year 2007 the Finnish Parliament is going to start the total renewal of the Waste Act. The result from that process will be seen after couple of years.

The clarification of the roles between the private and public waste management companies have to be dealt with in the future. This means changes in the collection and logistics system. The contract based system where individual households choose the collection company independently can be considered inefficient and worse way for environment to handle the household waste. We have to take into consideration the change that many regions have already done in Finland. Centrally organised household waste collection has to be brought up in the agenda in the owner municipalities.

The future for LHJ Waste management seems promising. The strategy will continue to concentrate on both the development of cost-efficient municipal waste management and national environmental business activities. The location of the company is excellent and the range of services is versatile. The whole operational model is not sensitive for the market changes. The expertise is specialised and it is difficult to transfer or duplicate. However, the companies must follow the markets actively and stay competitive, efficient and strong also in the future.

Best wishes for the year 2007,

*Immo Sundholm*  
Managing Director

## Milestones of LHJ Waste Management

**1985**

A need for a new landfill in the Forssa region

**1988-1990**

Research and evaluation activities at the area of the present waste management center

**1994**

Environmental permit was granted for the waste management center

**1995**

LHJ Waste Management Ltd was established (seven municipalities and Forssan Energia Ltd)

**1996**

Ten new municipalities joined the company. Waste management center and the first landfill to meet the EU requirements was completed in Forssa

**1997**

The separate collection of biowaste started in the owner municipalities

**1998**

The company started to build a network of collection points for recoverable waste fractions and household waste

**1999**

REF-Facility was completed and the production of recovered fuel started

**2000**

The treatment of electronic waste and contaminated soil started in Forssa

**2001**

Three new municipalities join the company

**2002**

Thermal treatment of contaminated soil started. One new municipality join the company. Environmental impact assessment (EIA) was conducted at the waste management center

**2003**

CRT-Finland Oy was established to recycle televisions and monitors. LHJ Waste Management became a minority owner

**2004**

Suomen Erityisjäte Oy was established for contaminated soil, industrial and hazardous waste treatment. CRT-Finland process plant was completed. The company was granted ISO 14001 and EMAS certificates. New environmental permit was granted by Häme Regional Environment Center

**2005**

Cool-Finland Oy was established for refrigerator recycling. The recycling plant for refrigerators was completed. The new landfill for contaminated soil, industrial and hazardous waste was completed

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# LHJ WASTE MANAGEMENT

## LHJ Waste Management in Brief

LHJ Waste Management is a regional waste management company owned by 19 municipalities. In 2006 there were 20 owners but in the beginning of 2007 two municipalities Toijala and Viiala merged and established a town of Akaa. The company was established in 1995 and the actual waste management operations started a year later. The ownership and liabilities are divided in proportion to the numbers of inhabitants of the municipalities. Vapo Ltd. owns 2.8 per cent of the shares. LHJ operates mainly in the area of its owner municipalities. Approximately 115 000 inhabitants lived in this area in the

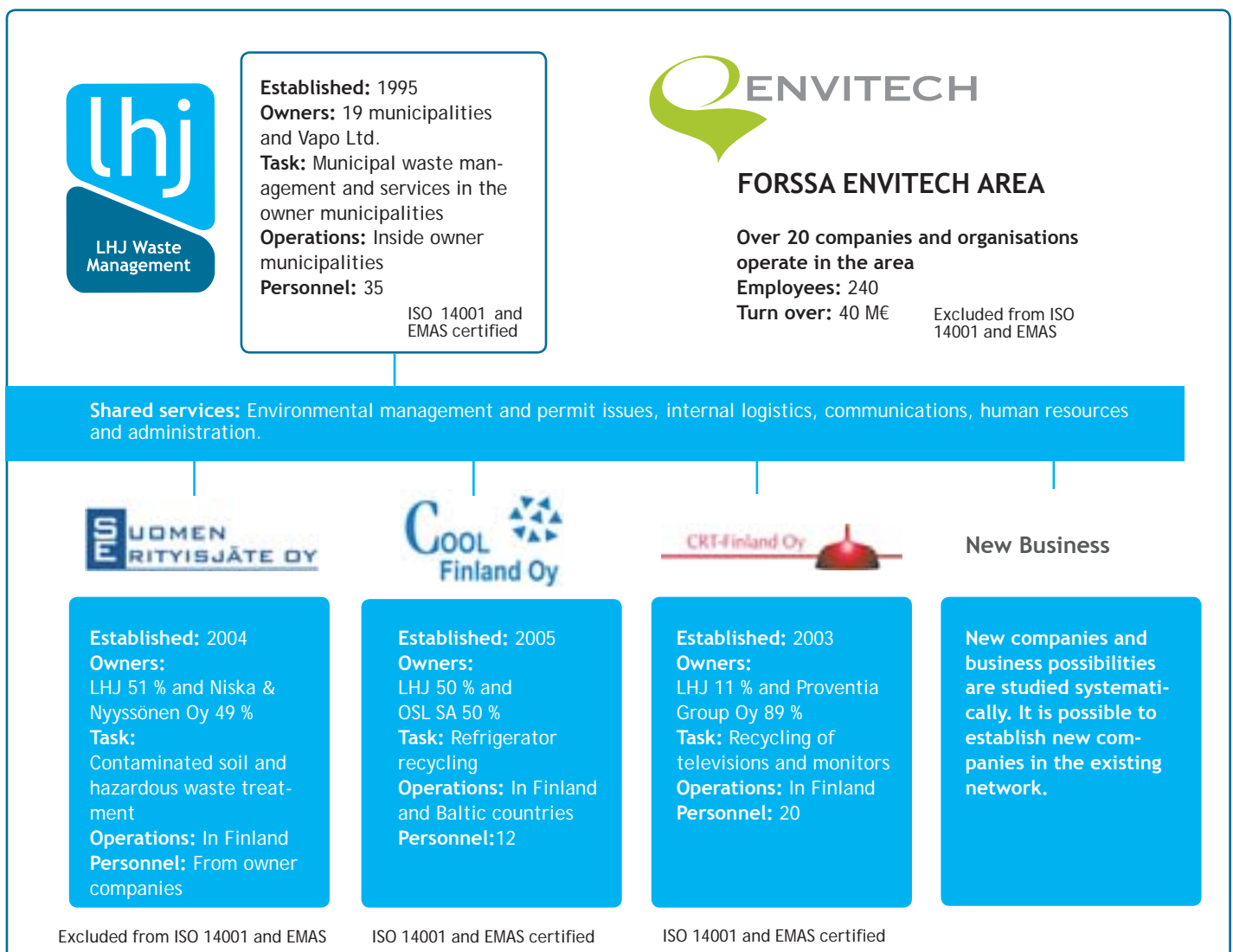
end of year 2006. The company's net sale's amounted to 6,7 million euros in 2006.

## Municipal Waste Management and Business Operations

LHJ Waste Management was established to organise the municipal waste management in its owner municipalities. The main task is to fulfil the obligations that are set in the Finnish Waste Act. These include household waste treatment, recoverable and hazardous waste collection and counselling and communications about the waste management. Only the role of the local author-

ity is maintained in the municipalities. The main investments to the basic waste management services were completed in the end of the 90's.

In the beginning of the century the LHJ Waste Management started to develop recycling and waste management services in the national level. Logistically central location, good basic infrastructure in the area and synergy advantages with the other existing waste management services gave a solid ground for this development. The strategy was to find reliable and competent partners. The focus was aimed to develop new services especially in the electronics recycling and contaminated soil treatment that had good prospects. This strategy has been very successful. Joint venture companies CRT-Finland and Cool-Finland have strong market positions in their own fields. Suomen Erityisjäte Oy and partner Niska & Nyssönen are able to provide treatment solutions for almost every contaminated soil types. Several new business plans are taken into consideration. It is very likely that the number of companies and/or business areas will increase in the future.



## Forssa Envitech Area - Technology and Services

The treatment, recycling operations and the head office of LHJ Waste Management and its joint venture companies are located in the Forssa Envitech Area. Companies and organisations in the area provide services in recycling, treatment, raw material production, research, planning and environmental expertise. More than ten companies are located next to each other in the area. Other companies include

- Combined power and heat plant using renewable raw materials
- Composting plant
- Recycling processes for paper, cardboard, glass and metals
- Glass purification and processing plant
- Treatment center for construction waste
- Heavy vehicle wash and disinfection service

Outside the actual Envitech area operate an environmental consultant company, a research institute, the University of Applied Sciences and public co-operation organisations.

### Values

The company have identified its core values in a process together with the whole personnel. The process was carried out in several parts by an external expert organisation in 2005. The leading values in the company are

- Progress
- Service orientation
- Responsibility
- Efficiency

These values formed a basis for the company's operational policy and strategy setting. They are emphasized in every day work and the working conditions are built to support the realization of the values. The values are communicated through internal trainings and newsletters.

### Company's Strategy Is to Be Versatile

LHJ Waste Management's vision is to stay in the front row in the development of waste management services in Finland. The company has introduced a four step strategy to meet the targets on the way to fulfil the company vision.

- The company will stay versatile in its services and operations. It will not be dependent on only one operation.
- The existing and new business operations will be done with right partners.
- The development activities will be done with an open mind.
- The responsibility and care of the well being of the environment, personnel and society is respected.

Strategy has focused on these issues already for a longer time. There have not been major changes during this decade. Only the focus between different parts of strategy may have been emphasized differently over the years.

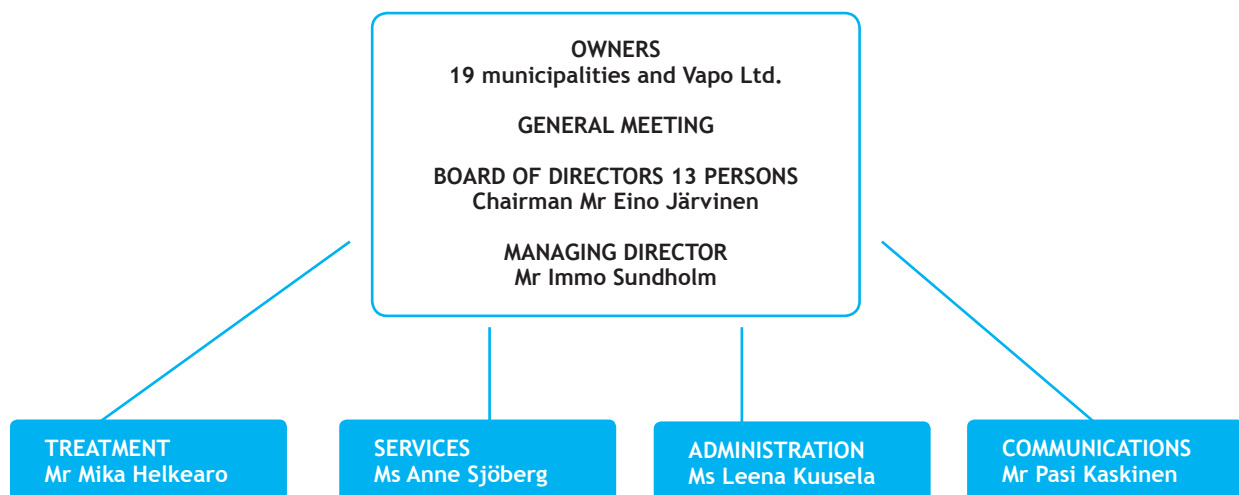
### The Company Governance and Management Principles

In the highest position in LHJ Waste Management are the owners. Every owner municipality has its representative in the

general meeting that gathers at least once a year. The most important decisions like expansion of the company or significant investment are made in the general meeting. Every municipality chooses its representative to the board of directors. Because there are fewer places in the board compared to the number of the owners, smaller municipalities have representation in the board by turns. The responsibility and power are divided by the proportion of the inhabitants in the municipalities. Bigger owners have more shares and votes in the meetings.

Strategic guidelines and operational management are planned by the managing director and approved by the board of directors. The board of directors is provided with the necessary information before decision making. The managing director, chairman and deputy chairman of the board are discussing and preparing issues regularly together for the board meetings.

The operative activities are managed and carried out in four departments. The number of the departments and the key personnel in the management changed in 2006. The planning department does not exist anymore, a new financial manager was appointed and two members left the management group. In addition to the managing director and four management group members, the directors of the joint venture companies join in the weekly management meetings and management reviews.



## LHJ Operational Policy

We in LHJ Waste Management Ltd and our joint venture companies CRT-Finland Oy, Cool-Finland Oy and Suomen Erityisjäte Oy provide waste management services under LHJ Waste Managements environmental permit. We are pledged to carry out our services

### **Progressively**

We develop, improve and diversify actively our operations to ensure high quality

### **Service oriented**

We carry out interactive co-operation with our interest groups to achieve continuous improvement in our operations and high customer satisfaction. We inform openly and honestly every interest group about our environmental impacts.

### **Responsibly**

Our goal is to increase the utilization of the waste and to minimize environmental impacts in our treatment operations. We comply and follow the rules and regulations set by the authority. We strive to meet the national and regional waste management targets. In planning and implementation of the treatment services, we aim to fulfil the environmental, quality and occupational safety targets that we have agreed upon the company. We audit the achievement of the targets regularly.

We take care of the education and maintenance of the occupational skills of our employees. We also take care that every employee understands his or her own work's environmental and occupational safety impacts. Each member of the staff is obliged to work towards meeting the company targets.

### **Effectively**

Utilizing the resources effectively, we strive to create good opportunities for development of the operations and profitable waste management.

LHJ Waste Management and its joint venture companies' boards have confirmed this operational policy. It will be followed in decision making and every operation in the

companies. It will be attached annually to a public annual report.

## **Operational Policy in Practise:**

### **Progressively**

LHJ and the joint venture companies have introduced several treatment, recycling and service activities as first or among the first companies in Finland and also world-wide. These include for example REF-facility, CRT-process plant, landfill and collection services. New technologies and services are evaluated continuously.

### **Service Oriented**

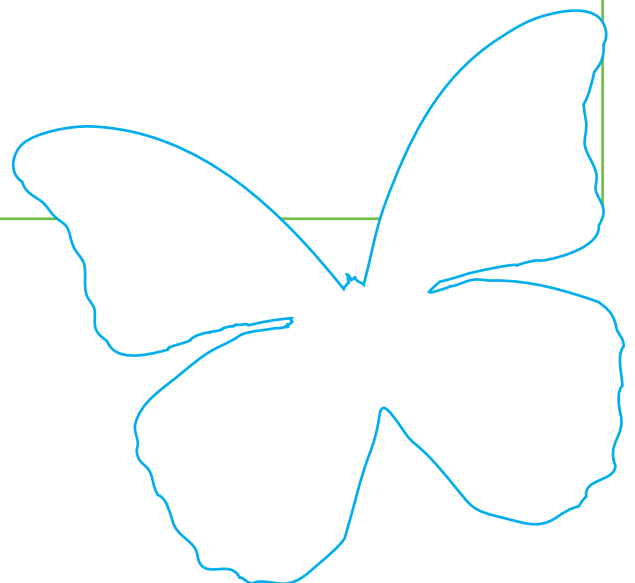
The number of collection points and services as well as availability of them are increased constantly. The open communications is systematic through e.g. the EMAS environmental statement and regular company communications.

### **Responsibly**

The certified ISO 14001/EMAS environmental management system is in use. The operational management system includes also occupational safety and quality management. The waste management system is designed to maximize the recovery of the waste by using technologies and services. The personnel is educated internally and externally (first aid, fire, hazardous waste, environmental management system, occupational safety).

### **Efficiently**

LHJ and the joint venture companies strive to use resources efficiently. For example infrastructure, support services and treatment capacity are used by four companies. The company price level has stayed close to average and it had been below average in Finland for several years.



## The Management Systems, Standards and Certificates in Use

	Environment ISO 14001	Environment EMAS	Quality (ISO 9001) and safety (OHSAS 18001)	Standard for refrigerator treatment RAL
LHJ	Certified	Registered organisation	Not certified	-
Cool Finland	Certified	Registered organisation	Not certified	Not certified RAL under construction
CRT-Finland	Certified	Registered organisation	Not certified	-
Suomen Erityisjäte	Not certified	Not registered	Not certified	-

The operations of LHJ Waste Management Ltd and its joint venture companies are managed and developed according to an operational management system. It contains an ISO 14001 and an EMAS certified environmental management system, an ISO 9001 based quality system and an OHSAS 18001 based occupational safety system. The environmental part of the system is certified and only the hazardous waste and contaminated soil operations of Suomen Erityisjäte Oy are excluded from the certification. Cool-Finland Oy is building up a system to be certified according to a special RAL standard for refrigerator treatment. The quality and safety part of the system are not going to be certified in the near future. The development of the system is evaluated in the management review twice a year where the management group and the directors from joint venture companies are represented. The companies have named persons to be responsible for environmental, quality and safety operations. The department managers are responsible of the work in their own departments. They are responsible of communicating the management system targets to the employees in their department.

### Research and Development

There were no major research projects in 2006. However, in 2006, LHJ Waste Management was involved in few development projects with local and national focus. One was a project which concentrated on the development of Forssa Envitech area's new business possibilities. A regional EcoTRIM

project with Agropolis Oy continued. A national development program in order to improve reporting in Finnish waste management companies started at the end of the year 2006. The company's managing director is a member of the R&D section of the Finnish Solid Waste Association.

### Services in the Owner Municipalities

LHJ Waste Management provides services for mainly households and summer residents, but also for companies. They include collection, treatment, waste station and counselling services:

- Organisation of biowaste collection and treatment services
  - o Collection, transportation and composting are outsourced
- Regional collection system for household waste
  - o Organisation of shared and individual collection points to complement the household waste collection in the area
  - o Transportation is outsourced
- Waste stations and hazardous waste collection points
  - o The company has six manned waste stations and several hazardous waste collection points in the area of the owner municipalities
  - o In addition to these there are two private waste stations in co-operation with the company
- Collection campaigns
  - o Hazardous waste collection is organised annually. The collection is partly outsourced.

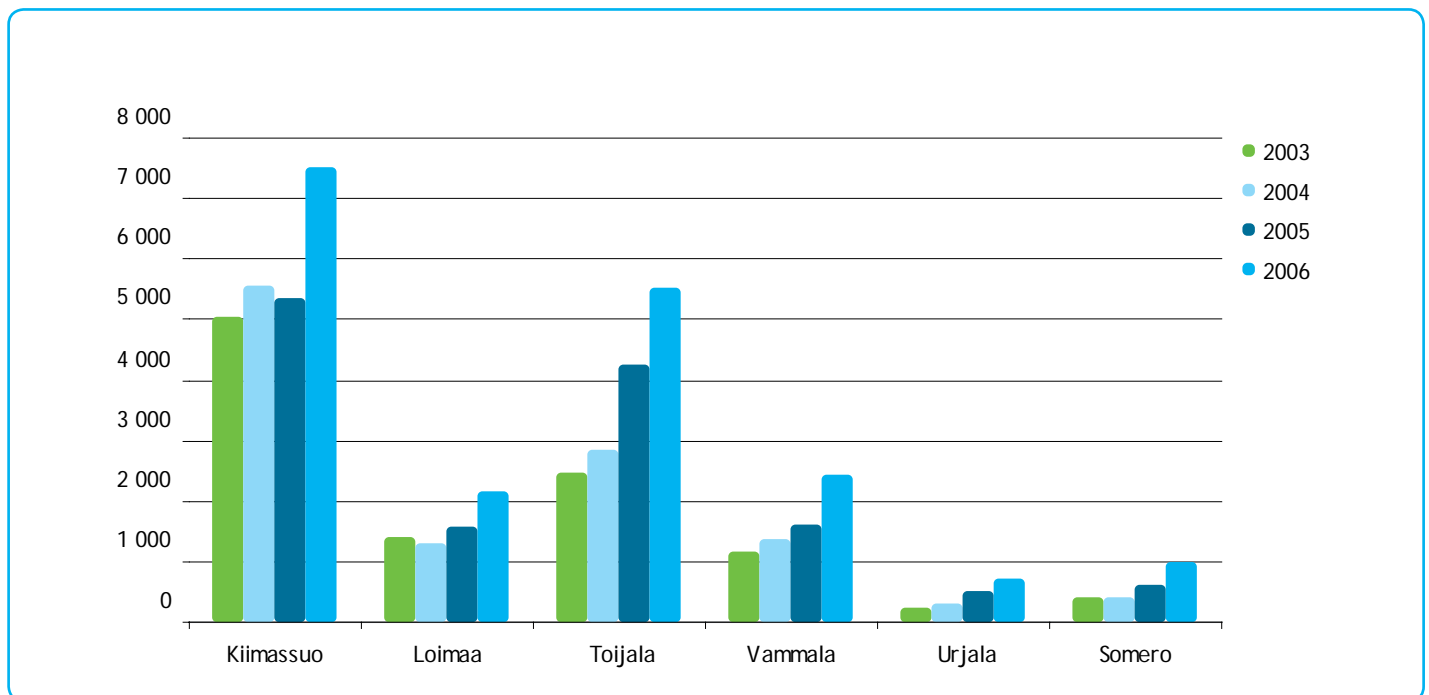
o Metal collection campaign is organised every now and then. The collection is partly outsourced.

- Counselling and communications
  - o Personal counselling, lectures, internet, information dissemination, visitor groups, events etc.
  - o The waste counselling is done by the company staff
  - o It is aimed mainly to the households but also companies are counselled
- Other services
  - o Demolition of archives, separate collection of energy and recoverable wastes etc.

## Collection Points for Recoverable and Household Waste

	Number of points	Inhabitants/point
Glass points	203	568
Metal points	203	568
Paper points	203	568
Shared household waste points	132	100
Individual household waste points	318	-

## Customers at the Waste Stations 2003-2006



The most positive development in the services has realized in the waste stations. The number of paying customers increased in 2006 by almost 40 per cent compared to the previous year. The total amount of customers were approximately 19 400. The number of customers has almost doubled in four years. The growth is even bigger if the customers who have brought free of charge wastes like metals would have been included. The exact amount of these customers is not monitored, but it is estimated that the total amount would exceed even

over 30 000. The other clearly growing waste management service is the regional collection of household waste. LHJ registered a 26 per cent growth in the number of customers in the regional collection system compared to the previous year. The household waste collection can be considered fairer, when also those households are connected to the collection system, which have been outside any collection service before. Also the misuse of the collection points by "not paying" customers decreased.

Other services developed more moder-

ately. In the counselling parameters there was clear decrease in the figures. This was caused because of the slightly smaller resources and the lack of totally new operations and mass events in the waste management center. Company counselling is loosing its significance but the contacts via e-mail and internet are increasing. In the hazardous waste services, people have found the waste stations and fixed collection points. The importance of hazardous waste collection campaign is decreasing.

## Treatment Operations

LHJ Waste Management, its joint venture companies and co-operation partners operate in a wide range of treatment and recycling activities at the Waste Management Center in Forssa. There are different solutions for each waste type.

- REF production
  - LHJ Waste Management operates a recycled fuel production plant for municipal and energy waste
  - Operation was started in 1999
- Final disposal
  - The first landfill that met the EU's landfill directive was completed in 1996
  - LHJ Waste Management operates this municipal waste landfill site
- Other LHJ treatment
  - Composting of garden waste and REF plants underflow
  - Treatment of oily waste
  - Electronic and electric equipment waste treatment
- Contaminated soil treatment
  - Solidification, stabilization and thermal treatment methods
  - Operation is done in co-operation by LHJ Waste Management and Niska & Nyssönen Oy

- Operation was started in 1999
- Hazardous and industrial waste treatment
  - Final disposal for contaminated soil and industrial waste that exceed hazardous waste limits
  - Operator is Suomen Erityisjäte Oy
  - Operation was started in 2004
- Treatment of refrigerators and freezers
  - Cool-Finland Oy operates a recycling plant for cooling equipment
  - Operation was started in 2000, Cool-Finland was established to continue the service in 2005
  - Processes refrigerators also from the Baltic countries
- Treatment of televisions and monitors
  - CRT-Finland Oy operates a recycling plant for cathode ray tube based televisions and monitors.
  - Operation begun in 2003

All treatment operations in the waste management center in Forssa are ISO 14001 and EMAS certified excluding the hazardous and industrial waste treatment by Suomen Erityisjäte Oy. The companies have invested in technologies and they can be considered as pioneers in their line of business.

## Raw Material Products

The recycling and treatment processes produce different raw material products for the different industries. The typical raw materials are

- metals
- plastics
- recycled fuel (REF)
- glass

A large proportion of the raw materials are sold and used in Finland. Some of the products are transported into international raw material markets.

## Counselling Parameters 2002-2006

	2002	2003	2004	2005	2006
Company visits, pcs.	60	46	40	22	8
Information events, pcs.	51	30	34	35	21
Visitor groups, pcs.	59	73	76	70	45
Information events, persons	2991	1212	1423	4425	1563
Visitor groups, persons	1018	1555	1596	1549	1230
Costs, €/inhabitant	0,87	1,16	1,18	1,29	1,23

# ECONOMICAL RESPONSIBILITY

LHJ Waste Management is committed to develop its activities efficiently. This means cost-efficiency in municipal waste management services and a competitive price-quality ratio compared to the other regions in Finland. The company operates in cost-price principle and it does not distribute dividend. In addition to municipal waste management the company strives to develop business operations with partners. The objective is to provide competitive and high quality solutions for different types of waste materials in Finland and in the Baltic area. We utilize effectively the existing synergy benefits from the infrastructure and the treatment capacity in the Forssa Envitech area. Economical Responsibility part of the report includes information only from the LHJ Waste Management. Joint venture companies are excluded.

## A Good Result Enables Sustainable Waste Management

The net sales and the total income in the financial period grew slightly compared to the previous year. The solvency remained good and the gearing ratio continued to improve for the third year in a row. With a 6,4 million euros net sales the company managed to produce 0,6 million euro profit. Behind the good result was a cost-efficient operation and also the dividend from the joint venture company. The Government returned also a significant amount of waste tax that was collected earlier. The profit is invested in the development of the waste management. In the long run, company does not produce profit.

A good financial result enables the company to develop the basic operations steadily. The nature of the municipality owned waste management company is to secure that the operations are done responsibly also after many years from now. The investments in the future require a stable economical ground in order to survive also from the unexpected changes.

The net sales can be divided in to seven categories. Most of the income comes from the waste treatment fees and the waste tax. Other typical income is eco fees and collection fees as well as the sales of the products and services. The most significant expenses are the salaries and the use of external services.

The investments in waste management have been connected very closely to the environmental improvements. The company has invested in safe structures and utilization technology. The majority of the investments have had direct or indirect positive

environmental impacts. In 2006 the company had a gap year in investments. The company has not received any significant subsidies from the EU or government during the recent years.

The company paid 0,9 million euros of waste tax to the government in 2006. The

waste tax is generated from the waste treatment in the landfill. The tax is not paid from those waste materials that are recycled. There was a slight decrease in the amount of tax in 2006 compared to previous years.

## Financial Parameters 2004-2006 (M€)

	2004	2005	2006
<b>Net Sales</b>	6,4	6,3	6,4
<b>Other operating income</b>	0,2	0,3	0,3
<b>All income in the financial period</b>	6,6	6,6	6,7
<b>Operating profit</b>	0,4	0,5	0,7
<b>Operating profit % from the net sales</b>	5,5	7,1	10,5
<b>Profit for the financial period</b>	0,1	0,1	0,6
<b>Waste tax</b>	1,1	1,2	0,9
<b>Investments</b>	1,3	1,4	0,2
<b>Balance sheet</b>	10,6	10,5	10,5
<b>After care reserve (total)</b>	0,5	0,6	0,7
<b>Gearing ratio %</b>	32,0	34,3	40,5
<b>Municipal Waste, €/tonne (incl. waste tax and VAT)</b>	85,0	96,0	100,0

### Changes in Environmental Demands Changes the Business Operations

The new waste legislation and stricter demands are already visible in today's waste management. The demands in landfill construction, treatment and collection processes have increased the cost level of the operation. This has meant a higher price level for the end customer. Also the increases in waste tax have increased the price level during this decade. In LHJ Waste Management Ltd the price level has also increased. In 2005, for example there was a bigger step because of the increase in waste tax. Otherwise the increase has been moderate and LHJ has been able to maintain the price level under the average in Finland.

The next change in the municipal waste management fees might be caused, because the amount of waste that ends up in the municipality owned companies' treatment

might decrease. The new legislation where some of the business waste is directed to private waste companies as well as higher material recovery in the future decreases the amount of waste in the conventional municipal waste treatment facilities. This may increase the waste treatment fees already in the near future. The next changes can be seen also in the struggle with climate change. In order to decrease the harmful methane emissions, biodegradable materials have to be removed from the landfill into composting plants, material recovery or into waste power plants. The total effect on the economies in the waste management cannot be predicted.

### The Number of Personnel is Growing

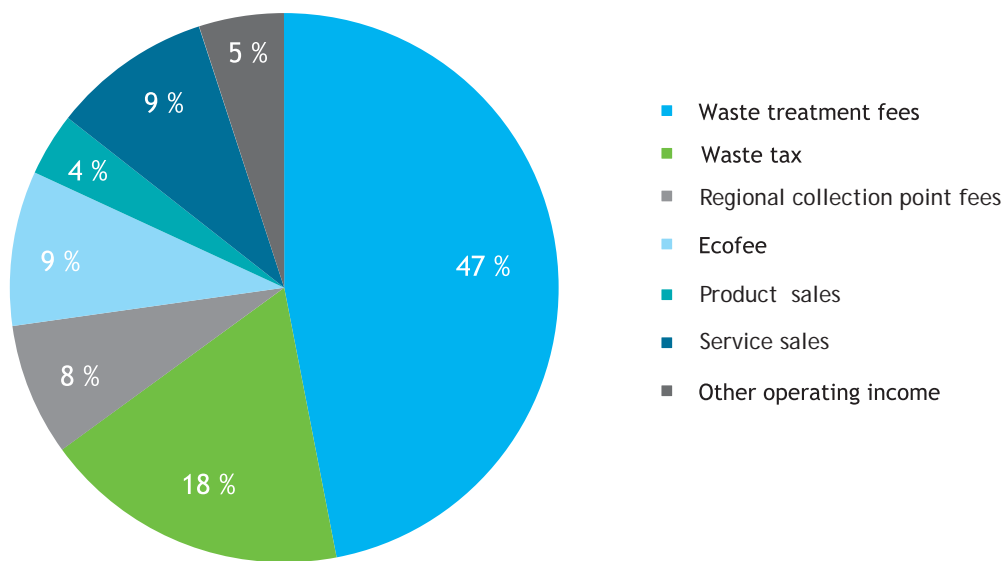
LHJ Waste Management has had a positive local effect on employment. The basic waste

management activities and the business activities with co-operation partners have created a lot of new jobs in the Forssa Envitech Area. The number of employees have grown from few in 1996 to approximately 100 in 2006. The number includes 40 employees that work for LHJ Waste Management and the employees that work for the joint venture companies.

### Co-operation Partners and Suppliers

A large proportion of the company's waste management activities and support services are provided by private companies. Because LHJ Waste Management is owned by municipalities, it follows the procurement legislation that is set for the public organisations. The environmental, social and safety matters are considered in the tendering processes as well as in the contracts.

### The Distributrion of the Net Sales



# SOCIAL RESPONSIBILITY

Responsible waste management and corporate citizenship means in the LHM Waste management that we are a good and stable employer who takes care of the personnel's education and occupational safety. Every employee realizes his or hers impact in the occupational safety and environmental impacts in the company. We communicate our environmental performance and targets openly with interested parties. Social Responsibility part of the report includes information only from the LHM Waste Management. Joint venture companies are excluded.

## Employees

The number of employees has stayed close to 40 persons during the past three years. In 2004 several employees changed to the service of joint venture companies. This explains the drop in employees in 2005 and the rather high employee turnover rate in 2004. In 2006 the turnover rate decreased significantly. If the joint venture companies are included the actual number of employees would be from 80 to 100 depend on the time of the year. This part of the report is concentrating only on LHM Waste Management.

One third of the employees are working in the office while the rest are employed in the production tasks. The average age of the employees is 43 and they are divided evenly among the different age groups. The proportion of the female employees increased close to 30 per cent from the total work force. The proportion of the permanent contracts increased significantly. In 2006 already 88 per cent of the employees had permanent contracts. Contracts are based on the collective agreement for municipality employees. The employees have chosen a shop steward among them to represent employees towards the company management.

## Occupational Health and Safety

The company makes systematic contribution to occupational health care and activity maintaining work (so-called TYKY activity). The target is to minimize occupational accidents, sick leaves and maintain a good general health. Occupational safety and health is managed by the safety manager and the safety committee. It consists of both

employer's and employees' representatives. The company's health and safety system is audited by authority regularly. In 2006, one inspection took place. The occupational health care is outsourced to a local medical center. All the employees go through regular medical check-ups. The personnel in the waste management activities are tested more often in order to monitor the harmful substances. Two occupational accidents occurred in 2006. The number of sick days decreased and the relative absence hours decreased from 4,9 per cent in 2005 into 4,5 per cent in 2006. There was couple of longer sick leaves that hold the rate higher than in 2004. The expenditure for health care increased quite significantly from previous year.

## Personnel Parameters 2004-2006

	2004	2005	2006
Number of employees in production	28	22	24
Number of office employees	13	14	14
Total number of employees	41	36	38
Female employees, %	23	33	29
Male Employees, %	77	67	71
Average age of the employees	40	42	43
Permanent contracts, %	70	82	88
The average turnover of employees, %	43	15	12
Number of occupational accidents	3	5	2
Absence due to the sick leaves, %	2,8	4,9	4,5
Healthcare, €/person	491	415	537
Leisure time activities, €/person	416	399	299
Training, €/person	847	722	701

In 2006, the company carried out occupational health measurements for both dust and noise. According to the dust measurements the proper protection equipment must be used in certain treatment activities. The results showed that the dust does not spread beyond the waste center borders. The noise is monitored regularly according to the noise monitoring programme. Ear protection is used inside the treatment plants where the noise level is higher.

Leisure time committee organises both physical and cultural activities to the personnel. These like health care services are equally available to every member of the personnel. In 2006 committee organised several recreation events over the year. Regular exercise benefits such as free swimming pool entrance and gym were widely used. The amount of events stayed in the same level although the expenditure in these activities dropped from previous years.

## Education and Training

The company has drawn up a training programme for its employees. It guarantees that required training has been given to right persons among the personnel. The trainings are given most often by outside professional, but also internal trainings are being held regularly. In 2006 the company used approximately 700 euros per person to educational services which was approximately in the same level as in 2005. The training and education possibilities are available for the whole personnel. The company encourages personnel to attend into different vocational courses in order to increase their know-how. In 2006 most usual courses were related to safety and health. The personnel attended also several events organised by the Finnish Solid Waste Association.

## Society and Interest Groups

LHJ Waste Management Ltd is an organisation owned by municipalities. It has a long lasting responsibility from its actions. It has to guarantee safe waste management service for decades ahead and also after the operation ends. For example landfill must be secured and monitored after the disclosure. The effects on society have been evaluated along with the environmental impacts in the environmental impact assessment (EIA) in 2002. It affected also on the environmental permit that was received in 2004. The company has been involved in several development projects related to the regional development in the owner municipalities and also more widely through Finnish Solid Waste Association. Regionally the company co-operates with kindergardens, schools and other organisations in environmental education.

The company communicates several ways with its interest groups. The every day

communications as well as bigger issues go through several channels. Every employee has a responsibility to advance effective communications. Personal communication by the employees cannot be over emphasized. The company has identified its interest groups and drafted a plan for communications with personal responsibilities. The sustainability issues are communicated annually in the sustainability or annual report. The important public subjects are communicated also via internet, company newsletter and media releases. The feedback from the interest groups is collected personally, via feedback channels or customer surveys.

## Responsibility of the Services

The company monitors customer satisfaction and issues related to their health and safety by collecting information from the waste points and other services. In 2006 company received 67 feedbacks via tele-

phone. It was less than in previous two years. Most of the feedback was given because the waste bin was either full or the surrounding area was littered or it contained waste regarded as hazardous waste. 20 written feedbacks were received by mail or e-mail. Two of them were positive concerning successful communications of the services. Most of the other written feedback was related to the waste collection services like full or littered collection points or missing cardboard collection. One written complaint was received from the environment board of one owner municipality. Every feedback was handled through personal contact by the company staff.

A separate customer surveys were not done during 2006. However, the company has conducted surveys almost annually. Customer satisfaction, customer profiles, collection activity and awareness have been monitored in three larger and few smaller surveys during this decade.

### Interest Groups

Interest Group	Form of communications														
	Personal communications	Counselling	Public relations	Events and trade fairs	Customer service	Customer newsletter	Media co-operation	Information dissemination	Internet	Sustainability Report	Education	Internal communications	Advertising	Visits	
Household customers	x	x		x	x	x		x	x				x	x	
Company customers	x	x		x	x	x		x	x		x		x	x	
Personnel	x					x			x	x	x	x			
Suppliers and subcontractors	x		x			x			x	x	x				
Media	x		x	x		x	x		x	x					
Authorities	x		x	x		x			x	x					
Schools	x					x			x		x			x	
Neighbourhood	x			x		x			x					x	
Owners	x		x			x			x	x					
Political decision makers	x		x			x			x	x				x	
Investors	x		x			x			x	x					
Joint venture companies and partners	x					x			x	x		x			
Persons interested in the industry	x								x	x	x			x	
Collague companies	x					x			x	x					
Competitors									x						

# ENVIRONMENTAL RESPONSIBILITY

LHJ Waste Management is committed to develop its activities progressively and responsibly. These two key factors from the company values and operational policy, emphasize the commitment to find new ways of improving the utilization and technology in waste management as well as to fulfil the task with a minimum level of environmental impacts. The environmental management system is an important tool in managing the environmental responsibility in the company.

## ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

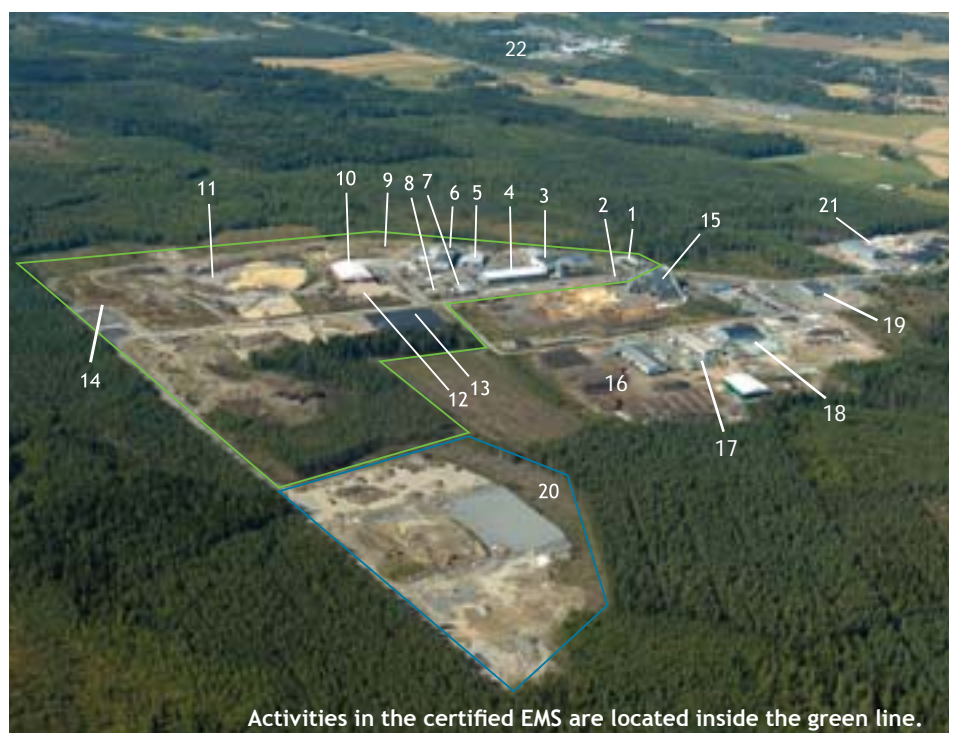
The EMS is in place to identify significant environmental aspects, to control these and to establish environmental improvements.

Environmental aspects and impacts have been managed in LHJ Waste Management through an environmental management system (EMS) since the beginning of 2000. The system is established in accordance with the international ISO 14 001 standard and the European EMAS regulation. LHJ Waste Management and CRT-Finland Oy's shared environmental management system was granted the ISO 14001 and EMAS certifications in 2004. A new company, Cool-Finland Oy, was established to continue the refrigerator treatment in 2005. It remained in the shared EMS, so there are now three independent companies sharing one certified EMS. The daughter company Suomen Erityisjäte Oy is excluded from the certification, but is planned to be included in the future.

The EMS covers the operations of the companies and their subcontractors carried out at the Kiimassuo Waste Management Center. The services outside the Center are excluded from the certification. Nevertheless they are included in the management system in order to develop the services systematically along with the treatment activities. The operations in the EMS are managed in seven different departments. The separate REF and treatment departments were combined in 2006 because of the staff changes in the operative management. The activities inside every department are described in the operation and working guidelines.

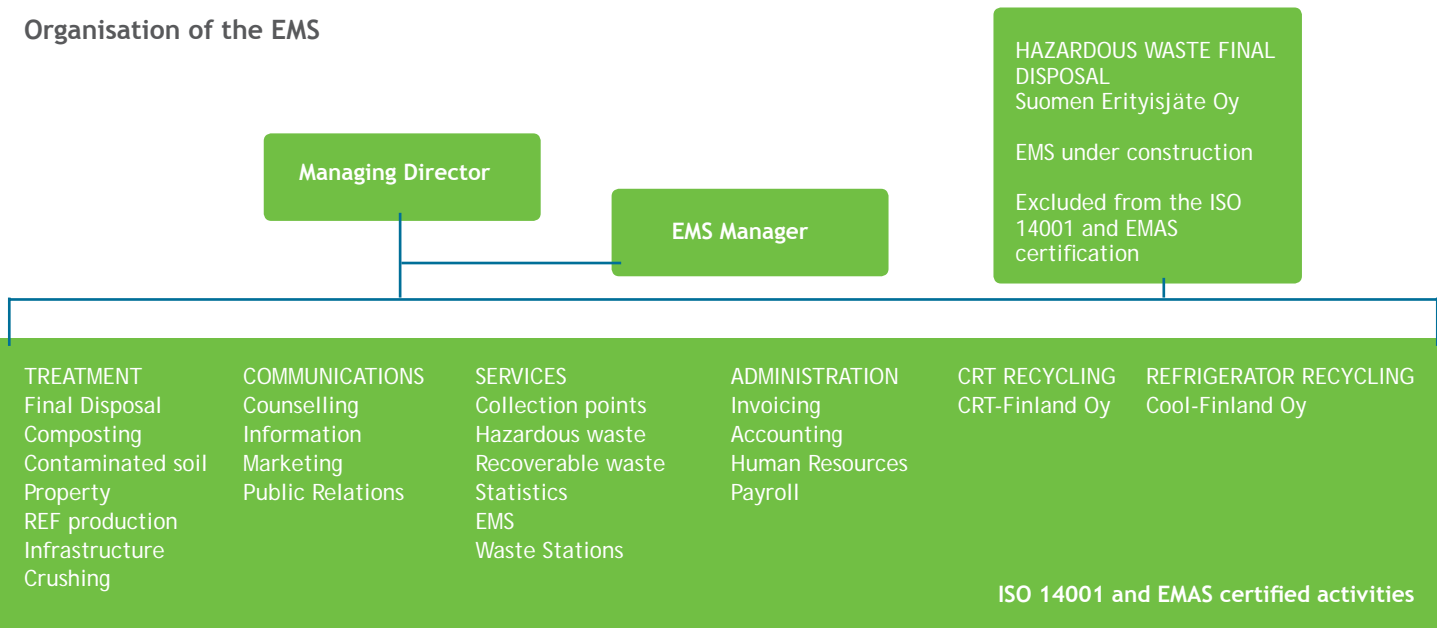
## EMS in Kiimassuo Waste Management Center

- |                                    |  |
|------------------------------------|--|
| 1. LHJ Office                      | 15. VAPO CPH-plant                               |
| 2. Weighing station                | 16. Envor Biotech Composting plant               |
| 3. REF-Facility                    | 17. Envor Processing paper recycling             |
| 4. REF Storage                     | 18. Envor Recycling glass and plastics recycling |
| 5. CRT-Finland oy                  | 19. Envor Group Office and heavy vehicle wash    |
| 6. Cool-Finland Oy                 | 20. Suomen Erityisjäte Oy contaminated soil      |
| 7. Hazardous waste station         | 21. J Syrjänen Oy construction waste             |
| 8. Oil Processing                  | 22. Suomen Uusioaines Oy glass recycling plant   |
| 9. Inert Waste                     |  |
| 10 and 13. Niska & Nyysönen Oy     |  |
| 11. Landfill                       |  |
| 12. Composting field               |  |
| 14. Landfill water pumping station |  |

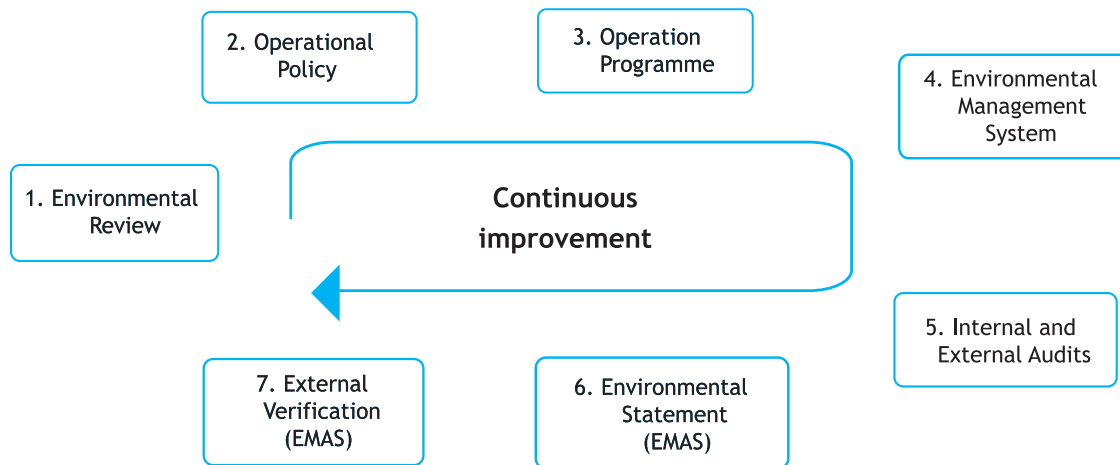


Activities in the certified EMS are located inside the green line.

### Organisation of the EMS



### Environmental Management System Cycle



#### Environmental Permit

Häme Regional Environment Center granted LHJ Waste Management an Environmental Permit on 31st March 2004. The renewed permit covers all operations carried out in the Kiimassuo Waste Management Center by LHJ Waste Management and its joint venture companies and subcontractors. In 2006 the authority visited the site once for discussing the operations of the treatment of contaminated soil and the waste recovery. The company received feedback concerning the annual report to authority.

These did not require any immediate correction, but the feedback is used in development of the report. Also the monitoring programme was updated and instructions were given by the authority. An environmental permit application for animal by-product treatment plant was removed from the permit process by LHJ during 2006. The realization of the project had too many uncertainties in the present market situation.

## Internal and External Audits

The effectiveness of the EMS and its compliance with the internal guidelines and the standards are assessed regularly through internal and external audits. All operations are audited according to an audit plan at least in every three years. There were seven internal audits made in 2006. Eleven non-conformances were found. They were related to outdated working guidelines, occupational safety and practices that were made against the valid guidelines. These non-conformances did not present major threat to the environment or personnel.

An external audit was carried out by BVQI in March 2006. Three non-conformances were found. They did not present major threat to environment and they were corrected in time.

## Monitoring Programme

The programme fulfils the monitoring obligations of environmental impacts set by the regulations and environmental permit. The most recent version of the monitoring programme was introduced in 2004. It was approved by Häme Regional Environment Center. LHJ Waste Management started the updating process of the programme in 2006. The next modification will be completed in 2007. The monitoring programme includes:

- Amount, quality and suitability of the waste accepted to the treatment
- Characteristics of the landfill (water, gas, depression)
- Properties of the compost, treatment and storage fields (water, depressions, cracks)
- Treatment of waste in a process plant (REF Facility, electric and electronic waste treatment)
- Emissions (ground water, surface water, dust, odour)
- Monitoring of operations (landfill and composting processes, structures)

Regular and systematic monitoring enables the companies to act promptly and to make repairs if some non-conformances are observed.

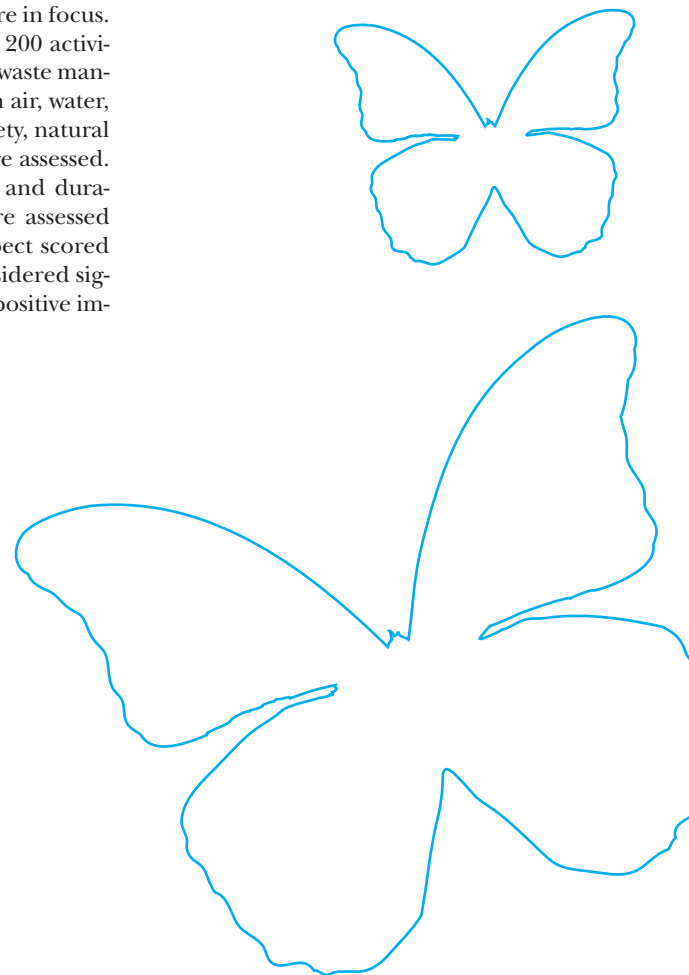
The monitoring programme describes the minimum observation activities performed regularly in the waste management center. In addition to the programme the four companies carry out other voluntary monitoring and maintenance activities related to environmental impacts. According to the programme, different samples are taken and analyzed regularly from several obser-

vation points located in the waste management center and the neighbouring area. Visual inspection and evaluation is used during the observation rounds. Every three years, all the water samples taken in August are analyzed more widely. The monitoring is done by the company staff and external expert: the Water Protection Association of River Kokemäenjoki.

## Significant Environmental Aspects

An environmental aspect is a company's activity that causes or may cause changes in the environment locally or more widely. The impact of the aspect on environment can be either positive or negative. The negative environmental impacts are assessed and scored in LHJ's aspect assessment. The positive impacts are identified in the same process. Both positive and negative impacts are considered and evaluated before drafting an operation programme or some other improvement tool.

The assessment is done every two years or when the operations are significantly changed. The most recent assessment was done in spring 2006 and the previous one in 2005. The update in the assessment was regarded necessary, because the operations in the waste management center had grown and expanded during the last years. Especially the hazardous waste final disposal and subcontractor evaluation were in focus. The assessment included almost 200 activities, which are carried out in the waste management center. Their impact on air, water, soil, occupational health and safety, natural resources, scenery and waste were assessed. The probability, severity, extent and duration of the negative impact were assessed and scored separately. If the aspect scored more than 100 points it was considered significant. Three aspects that had positive impacts were also identified.



Significant Environmental Aspects

Significant aspect with negative impacts	Situation	Score of the assessed aspect by company			
		LHJ	SE	CRT	Cool
1. Disposal of biowaste at a landfill site (formation of landfill gas)	normal	225			
2. Composting of biowaste in a plant (odour nuisance)	normal	180			
3. Decomposition of waste at the landfill site (formation of landfill gas)	normal	225			
4. Impurities in the leachate water (emissions to waste water)	normal	100			
5. Damage in the base structure of the landfill (emissions to groundwater)	accident	150			
6. Damage in the structure of solidified contaminated soil (heavy metal emissions)	abnormal	120			
7. Dismantling of refrigerator units (emissions of CFC in the air)	normal, abnormal, accident				100
8. Overfilling of a gas cylinder containing refrigerant (emissions of CFC in the air)	abnormal				100
9. Crushing of CFC-containing refrigerator units (emissions of CFC in the air)	abnormal				100
10. Damage in the structures in the hazardous waste final disposal (heavy metal emissions)	abnormal		120		

Positive impacts

11. Counselling and information	Counselling and information dissemination influence positively on the sorting activity. Positive influence on better realization of the municipal waste management.
12. Material and energy recovery of the waste	The natural resources can be saved by refining waste into raw materials for industries or heat and electricity production.
13. Waste treatment	Modern waste management technologies and practices reduce emissions to water, air and soil and nuisance like odour, noise and dust.

The first operation programme was introduced in 2001. Since then the four companies have drafted a new operation programme that includes both environmental and safety targets for two year periods. This is the third programme.

1. OBJECTIVE:

To reduce environmental impacts of the waste management center

- Target 1: To improve the monitoring of the impacts
  - Actions:
    1. Monitoring of the depression of the landfill started by GPS technology,
    2. Monitoring programme is under updating
    3. A shared internet based odour surveillance system was introduced with two other companies in Forssa region
- Target 2: To prevent and reduce the environmental impacts

• Actions:

1. Contract made for a project to improve check-ups for waste loads in the landfill and REF Facility
2. The need for separate water purification technique was evaluated. The emissions in leachate water did not require separate purification at the moment.

2. OBJECTIVE:

To improve the collection and treatment methods

- Target1: To increase the utilization rate of waste

• Actions:

1. LHJ decided to start the production of methane oxidizer. Municipal waste will be treated in the REF-facility and the underflow from the facility will be refined and utilized to oxidize methane on top of the landfill
  2. To increase the sorting activity of household metals via Information campaigns. During the 2006 the amount of metals in the collection points decreased slightly. Campaign will continue in 2007.
- Target 2: To improve treatment technology

Operation Programme 2006-2007

Based on the significant aspects and operational policy, the companies draft a two year operation programme. The aspects can be controlled and monitored also by operation and working guidelines, collection services, treatment technology or monitoring programme.

### Actions done by the companies

Operation programme: 2004-2005, Services: Biowaste collection  
Technology: REF-Facility, Guidelines: Yes, Monitoring: Yes (gas samples and monitoring)

Composting treatment subcontracted, Monitoring: Yes (odour follow-up)

Operation programme: 2004-2005 and 2006-2007, Technology: Use of REF underflow as oxidizer  
Guidelines: Yes, Monitoring: Yes (gas samples and monitoring)

Purification by waste water treatment plant of Forssa town, Operation programme: 2004-2005 and 2006-2007  
Technology: preparations made for own purification techniques, Guidelines: Yes, Monitoring: Yes (water samples)

Operation programme: 2004-2005 and 2006-2007, Technology: Watertight sealing layers and construction techniques  
Guidelines: Contract instructions, Monitoring: Yes (water samples)

Operation programme: 2006-2007, Technology: Solidification and stabilization technologies  
Guidelines: Yes (partner), Monitoring: Yes (water samples)

Operation programme: 2004-2005 and 2006-2007, Technology: CFC collection and separation technology in pre treatment,  
Guidelines: Yes, Monitoring: Yes (continuous follow-up system)

Operation programme: 2004-2005, Technology: Weighing system  
Guidelines: Yes, Monitoring: Yes (filling follow-up)

Operation programme: 2004-2005, Technology: CFC collection and separation technology in crushing phase  
Guidelines: Yes, Monitoring: Yes (continuous follow-up system)

Operation programme: 2006-2007, Technology: Watertight sealing layers and construction techniques  
Guidelines: Yes, Monitoring: Yes (water samples)

Operation programme: 2004-2005 and 2006-2007, Guidelines: Yes  
Monitoring: Yes (amounts of waste collected, people in events and number of information output)

Operation programme: 2004-2005 and 2006-2007, Guidelines: Yes  
Monitoring: Yes (amounts of waste collected and recovered)

Operation programme: 2004-2005 and 2006-2007, Guidelines: Yes  
Monitoring: Yes (amounts of waste collected and treated, emissions monitored)

#### • Actions:

1. CRT-Finland invested in new process technique in order to increase the efficiency in cable and printed circuit board treatment. A new device increased the treatment amounts.
2. The internal logistics were developed in Cool-Finland Oy.

- Target 3: To develop regional collection point system

#### • Actions:

1. To avoid the misuse of regional collection points, the customer register were updated and checked in 2006. Households that were outside of the organised waste management were connected to the collection system.
2. To increase the number of customers by 5 % in the waste stations, company

increased the marketing activities and optimized the opening hours. In 2006, the amount of customers increased at most 40 % compared to the previous year.

### 3. OBJECTIVE:

#### To improve safety and know-how

- Target 1: To improve occupational safety activities
  - Actions:
    1. A new cleaning device was introduced in CRT in order to decrease the amount of dust in the works space.
- Target 2: To improve the knowledge of the staff and interest groups

#### • Actions:

1. A new annual education and training plan was introduced in the end of 2006 concerning year 2007.
2. Subcontractors are informed of the operation guidelines in the waste management center during the contractor negotiations.

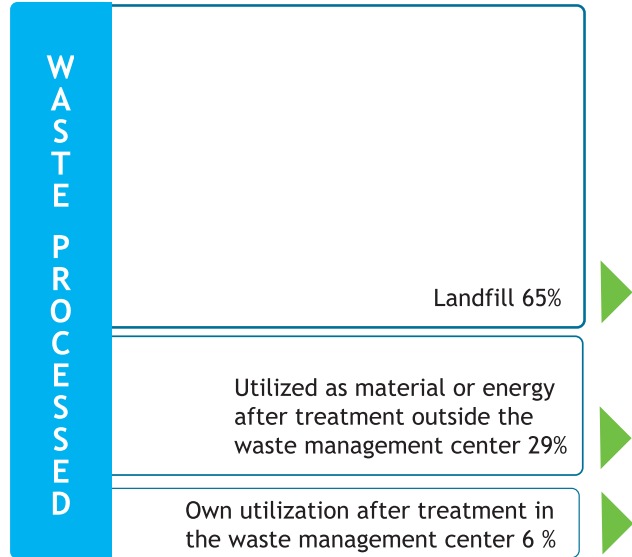
**In the operation programme the company sets objectives and targets for environmental and safety improvements. It includes an action plan, timetables, resources and responsibilities in order to meet the objectives. The programme is monitored and it is evaluated in the management review twice a year.**

## MATERIAL FLOWS

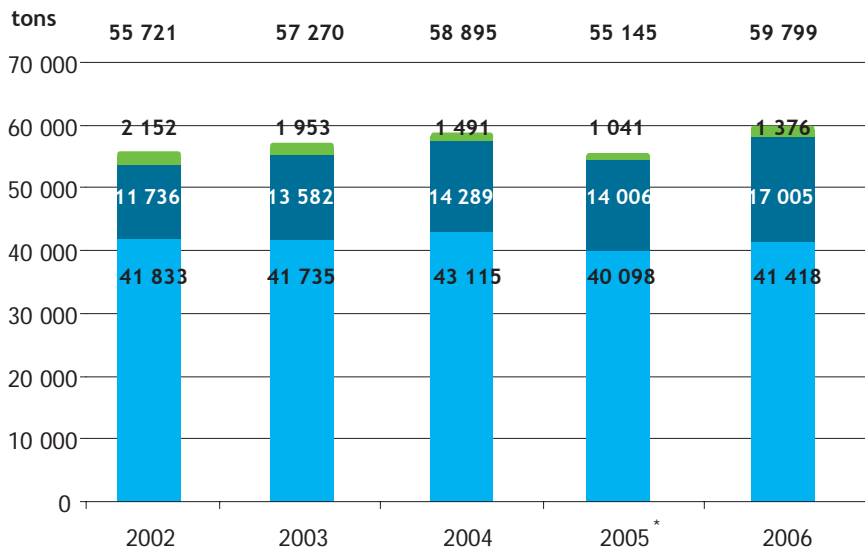
### Municipal Waste to Treatment

The LHJ waste management center receives waste from household, company and organisational customers. The waste types are categorized as recoverable waste that can be utilized, landfill waste and hazardous waste. The two latter types of waste can be also partly recovered especially hazardous and electronics waste. Most of the landfill waste is disposed off in the landfill. The total quantities of municipal solid waste and waste types that can be considered to be similar have developed steadily. The trend has been slightly growing during the past five years although the number of inhabitants in the area has decreased. The proportion of the recoverable waste has grown compared to the beginning of the decade. Especially the amounts of recoverable biowaste and energy waste have grown since 2002. Amounts of biowaste increased by 2 per cent and energy waste by 5,5 per cent. This indicates that the separation at the source has improved. Also combined amounts of glass and metal in the regional collection points continued to increase in 2006.

LHJ Municipal Waste Material Flow



### Municipal Waste Accumulation



■ Waste fractions that are placed mainly in to the landfill: Mixed household waste and waste similar to it, Industrial waste, construction waste, special waste and inert waste.

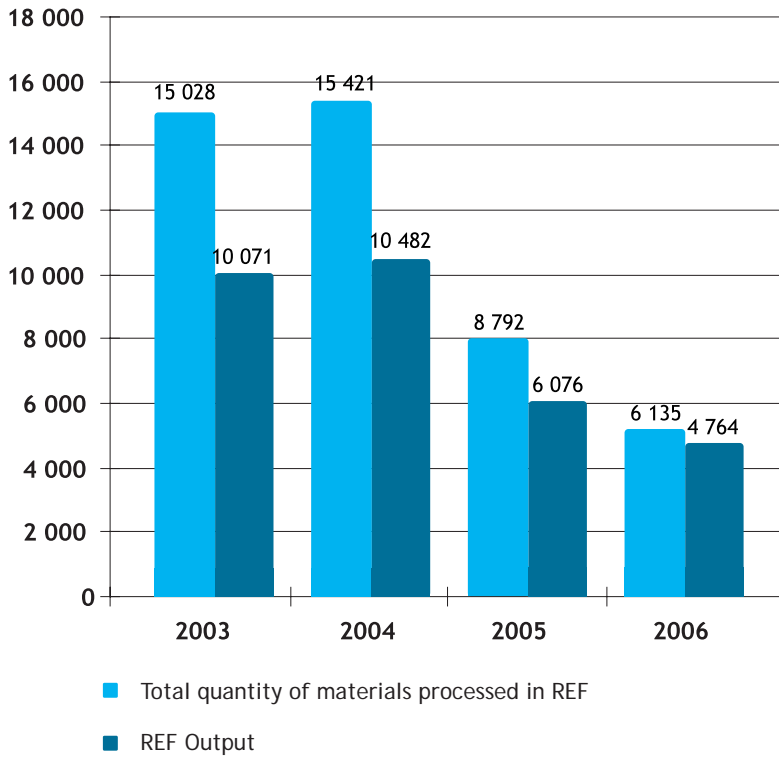
■ Recoverable waste fractions: Biowaste, energy waste, sludge, other recoverable materials.

■ Hazardous and electronic waste from the household and small company customers

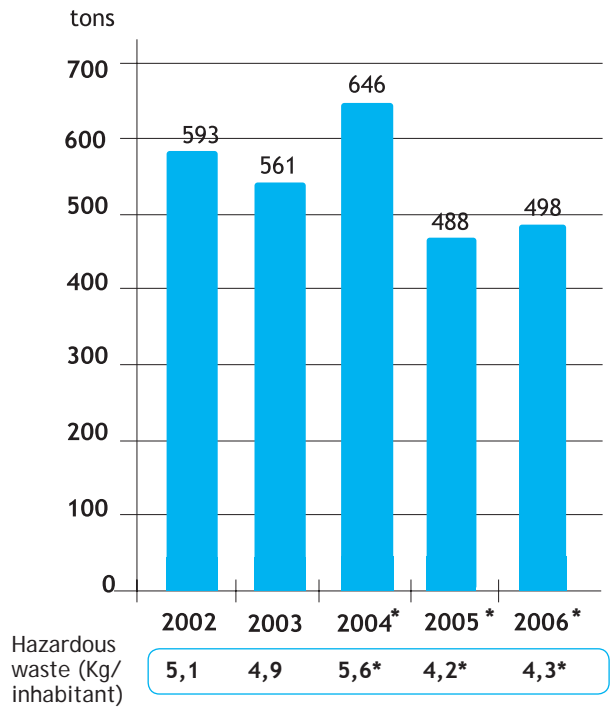
All soil and stone materials as well as waste received by Cool-Finland, CRT-Finland and Suomen Erityisjäte Oy are excluded from the chart

\* The amount of waste received in 2005 is changed compared to the previous environmental statement due to a manual correction in the weighing system afterwards. The amount of recyclable waste and the total amount of waste grew from what was reported before.

Production of Recycled Fuel 2003-2006

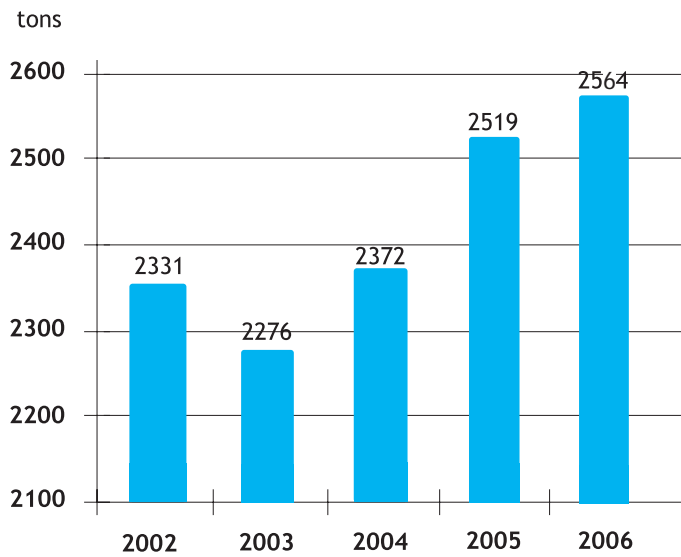


Hazardous Waste 2002-2006

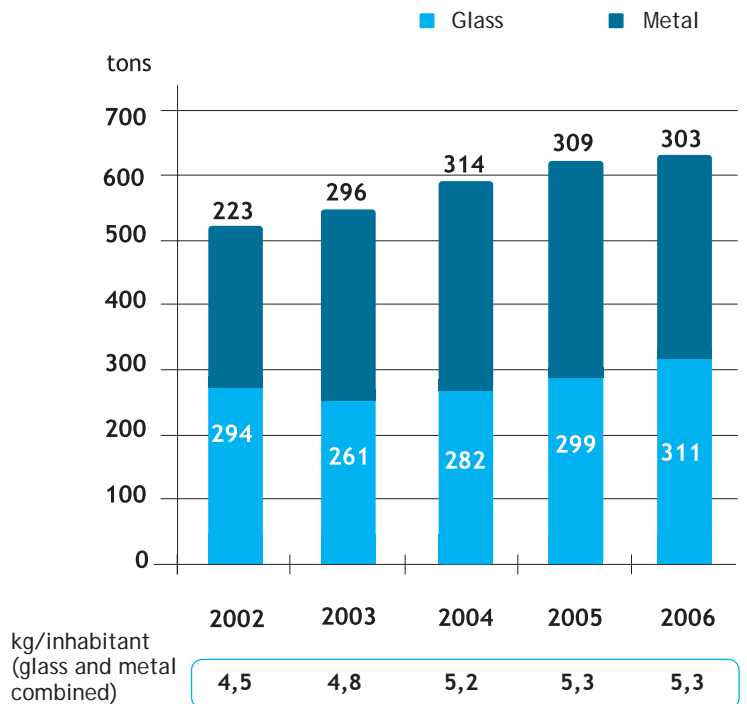


\* The separate monitoring of impregnating wood started in 2004. It was included into the hazardous waste numbers in 2006. Impregnating wood was not included in the previous environmental statements.

Separately Collected Biowaste 2002-2006



Collection point flows 2002-2006



## Waste Management Center's Utilization Rate

The highest possible recovery rate has been the objective of LHJ Waste Management Ltd from the beginning. The company managed to reach over 50 % utilization rate in 2003. After this, among others, the external factors have caused decline in the recovery rates. Especially the waste incineration directive caused a significant drop in energy recovery of waste in Finland. This affected the company already in 2005. The REF production of municipal waste and sales of the REFIII fuel declined strongly during 2005 and 2006. However, the amount of received energy waste from the companies increased and LHJ was able to increase the production of the better quality REFI-fuel. The in-

crease in energy waste did not compensate the drop of the municipal waste treatment in the REF-facility.

The processed raw materials from the joint venture companies were included in the amounts of utilized waste until the end of 2005. From 2006, those mostly recoverable materials are reviewed separately. This decreased the utilization rate even further. Also the own recovery of the waste declined in 2006, when less materials were utilized in the waste center structures compared to the previous years. These three factors altogether affected the utilization rate. With 35 per cent, this was the lowest in five years.

65 per cent of the treated waste materials were placed in the landfill. In order to reduce the percentage, the energy recovery possibilities must be widened in Finland.

The municipal waste received in the waste management center contains several burnable fractions, which are very difficult to recycle. The utilization rate cannot be increased significantly before the energy utilization situation in Finland has changed.

The 35 per cent utilization rate does not include any soil substances that are accepted in the waste center. Most of the pure and contaminated soil materials are utilized in base structures and other construction works. Also significant proportion of the recyclable waste materials that are on the producers' responsibility, for example paper and cardboard, are not received in the waste management center. Because of this the reported rate does not represent the whole truth of the waste recovery rate in the area of LHJ.

## Utilization Rate

$$\frac{\text{Waste utilized in own operations or sold or transported for utilization elsewhere}}{\text{Total amount of waste handled}} \times 100$$

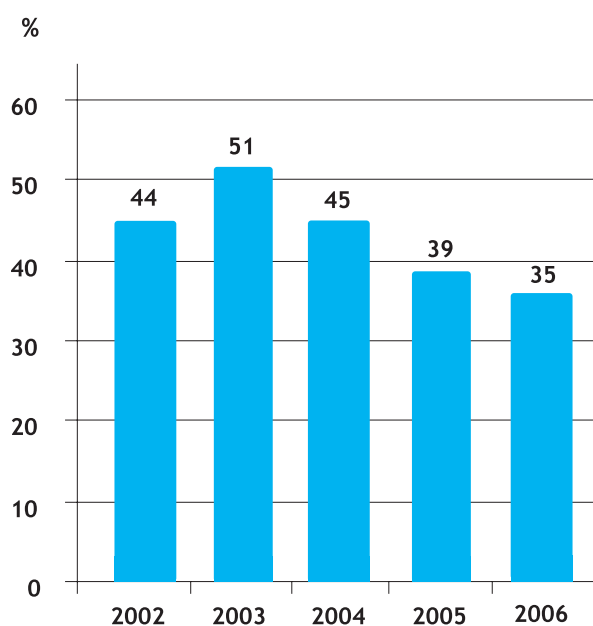
### Examples of recovery:

**Own utilization:** Rejects from the treatment processes can be utilized in the construction work

**Utilization elsewhere:** Composted sludge can be utilized in gardening

**Sold materials:** Collected metals sold to smelters

## Utilization Rate of the Waste 2002-2006



This chart does not include any soil materials (pure or contaminated), electronic waste received by CRT-Finland and Cool-Finland Oy nor waste materials received by Suomen Erityisjäte Oy.

## Electronic Waste in the Waste Management Center

Cool-Finland Oy and CRT-Finland Oy have process plants in the waste management center. Both companies are significant recyclers of electronic waste in their own fields. Cool-Finland Oy operates in refrigerator recycling in Finland and in Baltic countries. It has significant share of the market in both areas. CRT-Finland Oy is a television and monitor recycler that operates in Finland. The majority of the discarded Finnish appliances are treated in Forssa. The electronic waste flow in the waste management center has multiplied during the last three years. The beginning of producer's responsibility in electronics grew the amounts of e-waste in the official collection points all around Finland. Both companies have treatment contracts with the major producer's responsibility organizations.

The both plants are specialized in treating and refining the discarded appliances into raw materials. The WEEE directive sets utilization targets for e-waste. For refrigerators the recycling rate target is 75 per cent. For televisions the rate is 65 per cent. In Refrigerator recycling the target was exceeded clearly with a 94 per cent recycling rate. In CRT recycling the utilization rate has developed also positively, although the target was missed by one per cent. The 64 per cent recycling rate is estimated to rise in 2007, because of the investments in the glass refining process. It will increase the material recovery of the glass cullets. The Different metals, plastics and glass are the main raw material groups that are refined in the process plants.

## Soil and Industrial Waste

Pure soil, contaminated soil and industrial waste treatment is operated under the LHJ's environmental permit. There are

three operators that are responsible for the treatment. LHJ is responsible for the areas, weighing and monitoring of the treatment. Niska & Nyssönen Oy is in charge of the technical implementation. The two companies established Suomen Erityisjäte Oy in 2004 to operate a final disposal site for materials categorized as hazardous waste. The three companies can provide a treatment solution for almost every type of contaminated soil.

Almost all of the contaminated soil can be utilized after treatment in the construction of new treatment field and landfill structures in the waste management center. Only hazardous waste materials cannot be utilized and those are placed in the special landfill.

## Soil and Industrial Waste

Pure and slightly contaminated soil	▶	Utilized in the landfill and waste management center construction work	Operator - LHJ	utilized
Contaminated soil	▶	Stabilization, solidification and/or thermal treatment. Utilized in the waste management center construction work	Operator - Niska & Nyssönen Oy	utilized
Industrial waste and contaminated soil that are categorized as hazardous	▶	Treated and disposed off in the hazardous waste landfill	Operator - Suomen Erityisjäte Oy	not utilized

## ENVIRONMENTAL IMPACTS

### Impacts on Water

Water flows from northwest to south and east in the waste management center area. The area is not classified as important or water sensitive and there is no small water supply in the area. In fact, there is no real groundwater yield in the area. Most of the water in the groundwater observation points is coming from the surface. Landfill emission leakages into a wider area are highly unlikely because of the conditions. The closest groundwater area with water supply is located approximately 4 kilometres from the waste management center.

The watertight base structures of the two final disposal areas and the water collection system in the waste management

centre are installed to secure that the waste water does not drift away from the waste management center. All of the leachate water from the landfill and rainwater from the treatment and storage fields are pumped to the waste water treatment plant of Forssa town.

LHJ Waste Management observes surface water, ground water and landfill water in 29 inspection points which are located in the waste management center and the surrounding area. The samples are taken and analyzed according to the monitoring programme approved by the regional environmental authority. Every three years the samples are analyzed more widely. This was done also in 2006.

### Surface Water

The waste center impact on surface water was examined in three observation points. Two of the points did not show any landfill impact. There was no evidence of straight surface water flows from the waste management center. Only in one ditch leading south indicated some landfill burden. This did not require any special operations nor cause any risk to the surrounding area.

The increased burden in the south leading ditch can be explained by the leakage in the leachate water collection system in 2004. During the equalizing basin renovation the collection system was improved and the landfill impact in the surface waters in

the south have decreased. The concentrations were relatively high in 2006 also because of the low level of water flows due to an exceptionally rainless summer.

### Ground Water

According to the samples and analyzes in the ground water observation points, the landfill impact is not visible in the groundwater or in the wells in the surrounding area.

### Landfill water

The amount of landfill water has grown in the past years because of the new landfill areas that were completed in 2004 and 2005. In 2006, altogether 69 958 m<sup>3</sup> of landfill and surface waters were pumped to the waste water treatment plant in Forssa. The total amount of landfill water decreased in 2006 because of the exceptionally dry summer. According to a report of the Water Protection Association of River Kokemäenjoki, the ammonium load in the landfill water has continued to increase during the past years.

### Number of Observation Points for Water Quality

	Waste center	Surrounding area
Surface water		3
Groundwater		
• observation point	1	12
• well		12
Landfill water	1	

In 2006 there were no significant changes. The organic and phosphor burden decreased compared to the previous year. The observed burden is typical for the landfill waters. The waste water treatment plant removed the limiting value for ammonium in 2005. This was mentioned in the previous

statements. There was one exceeding in the chromium value in the analyzed landfill water compared to the access agreement with LHJ and water plant in 2006.

### Quality of Surface Waters in the Surrounding Ditches of the Waste Management Center 2004-2006

Factor	Basic condition of the landfill site in 1996		Surface water 2004		Surface water 2005		Surface water 2006	
	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest
pH	6,7	6,9	3,9	7,0	4,2	7,1	3,8	7,3
COD <sub>Mn</sub> (mg/l)	9,9	48	41	92	39	89	35	140
El.conduct. (mS/ml)	11,5	52,2	4	27,9	6,5	68,2	5	124
NH <sub>4</sub> -N (µg/l)	5	970	<5	1700	8	2100*	42	3200

\* In the previous report there was a typing error in the 2005 NH<sub>4</sub>-N figures. The right amount of ammonium was 2 100 not 21 000. There are altogether three measuring points. The highest readings are measured in the ditch leading south.

### Quality of Groundwater of the Landfill Site in 2006 Compared to the Basic Condition

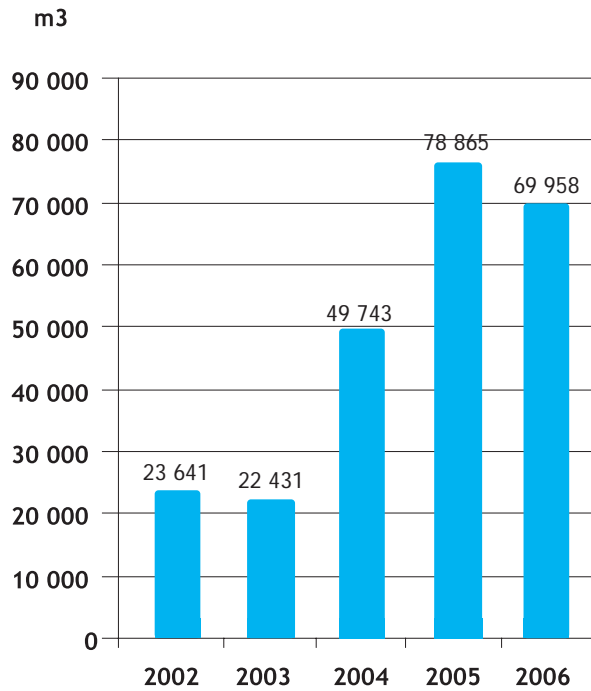
Factor	Basic condition of the landfill site in 1996		Upstream the landfill site		Below the landfill site		Downstream the landfill site	
	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest
pH	6,1	6,5	6,3	6,5	6,8	7,1	5,4	6,8
COD <sub>Mn</sub> (mg/l)	-	-	<0,32	0,56	3,7	6,8	0,43	96,0
El.conduct. (mS/ml)	6	20,6	5,8	6,5	12,2	12,7	7,7	45,1
NH <sub>4</sub> -N (µg/l)	5	970	<5	14	19	590	<5	3100

Groundwater samples are taken in 13 observation points.

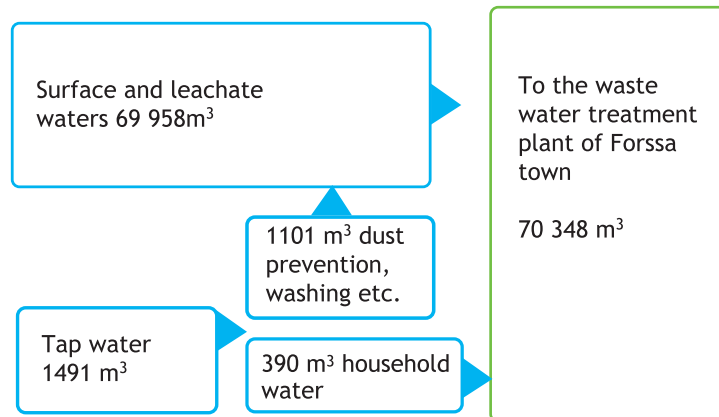
Quality of Landfill Water 2004-2006

Factor	2004		2005		2006	
	Lowest	Highest	Lowest	Highest	Lowest	Highest
pH	7,2	7,9	7,7	7,9	7,6	8
NH <sub>4</sub> -N (mg/l)	13	170	55	310	61	270
Tot. phosphor (µg/l)	350	2300	930	2800	1400	2700
El.conduct. (mS/ml)	142	403	191	603	310	550
Solid matter (mg/l)	12	520	32	170	23	57
COD <sub>Cr</sub> (mg/l O <sub>2</sub> )	160	1500	380	1300	520	940
BOD <sub>7</sub> (mg/l O <sub>2</sub> )	21	<210	69	190	54	98

Landfill Water Pumped to the Waste Water Treatment Plant



Water Balance in the Waste Management Center



**Impacts on air**

**Dust**

The origins of dust causing activities were identified in 2006. The most typical cause of dust in the waste management center is compost windrows, treatment of construction waste, screening of soil, treatment of contaminated soil, unloading the waste trucks and traffic. The spread of dust was analyzed for the first time in 2002. Since then the dust have been measured and analyzed in 2003, 2005 and 2006.

In 2006 an expert organisation carried out a dust measurement and analysis in two observation points. The first observation period occurred during the dustiest season from May to August and, when for example the soil treatment is mostly carried out. The second observation period was in November. According to the organisations the spread of dust does not exceed the limiting values in the closest residential areas.

**Landfill gas**

Landfill gas forms when biodegradable material is decomposed inside the waste embankment. The gas consists mostly of methane and carbon dioxide. Both gases have negative climate effects. Especially methane's negative effect is multiple compared to carbon dioxide. The company has used two types of measuring techniques in monitoring the gas. One is the chamber technique and the other the micrometeorological method. The more unreliable chamber method was used last time in 2005. The Meteorological Institute has taken measurements during 2004 and 2005. The company

has decided to continue with the micro-meteorological method in 2008.

The amounts of gas in the landfill have been so low that it is not required to build a gas collection system in the waste management center yet. The company has used a new method for two years to oxidize methane into more harmless carbon dioxide by using composted underflow from the REF-Facility on top of the landfill. The positive effect has been notified in a national KAATOPRO study.

**Odour**

The waste management centers odour emissions are caused mostly from the landfill site. These can be considered relatively mild. Contaminated soil treatment as well as other treatment operations may cause occasional local odour. In the same waste management area is located a private bio-waste composting plant that produce odour emissions. Also close to the Forssa town center, there is located a waste water treatment plant with possible odour emissions.

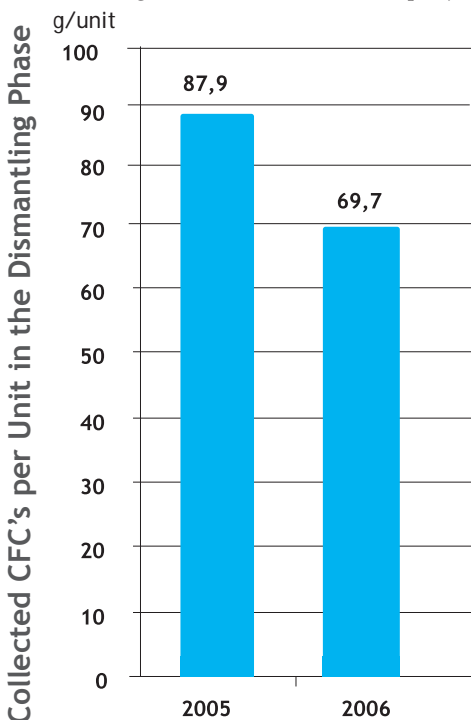
The three organisations established an internet based odour follow-up system in the end of 2005. Individual households, companies or persons can make an odour notification, which is registered in the geographical area where it is noticed. The system is free of charge and anyone in the area can register in the system freely. The companies can improve their operations according to the analyzed data from the system. For example some odour causing operations are not done in a certain climate situations, when the odour drifts into the residential areas. The year 2006 was the first whole year in operation. Altogether 184 notifications were

registered. According to the memo's of the odour follow-up steering group, the odours were originated mostly in the composting plant. Three odour notifications were acknowledged by LHJ.

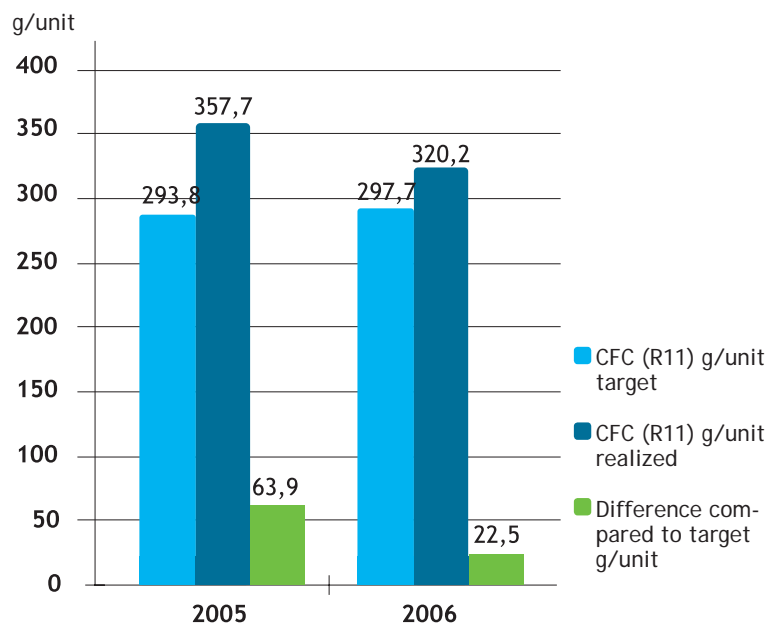
**CFC Gases**

The old refrigerators and freezers contain CFC's also known as Freons. The substances are located in the cooling circuit and also inside the insulation material. In fact most of the harmful substances are in the insulation material. These substances are harmful because they have an ozone depleting impact in the atmosphere. Old discarded appliances contain also substances with global warming potential (GWP). Both substances can be collected effectively from the old appliances in the Cool-Finland Oy treatment plant. Collection and separation technology and continuous monitoring secure the safe recycling result.

The collection of CFC gases has started effectively. In 2006 the company exceeded the target value clearly in the crushing phase. On the other hand the amount of collected CFC's in the dismantling decreased. The data between the first year of operation and the second are not comparable, because there was a large difference in the numbers of the treated equipment. The year 2006 was the first full year of operation and it gives the real comparison level for the future. The amounts of CFC's is estimated to decrease gradually in the future because the CFC gases were replaced by other substances at first and banned completely after the year 1995 in Europe.



Collected CFC's per Unit in the Crushing Phase

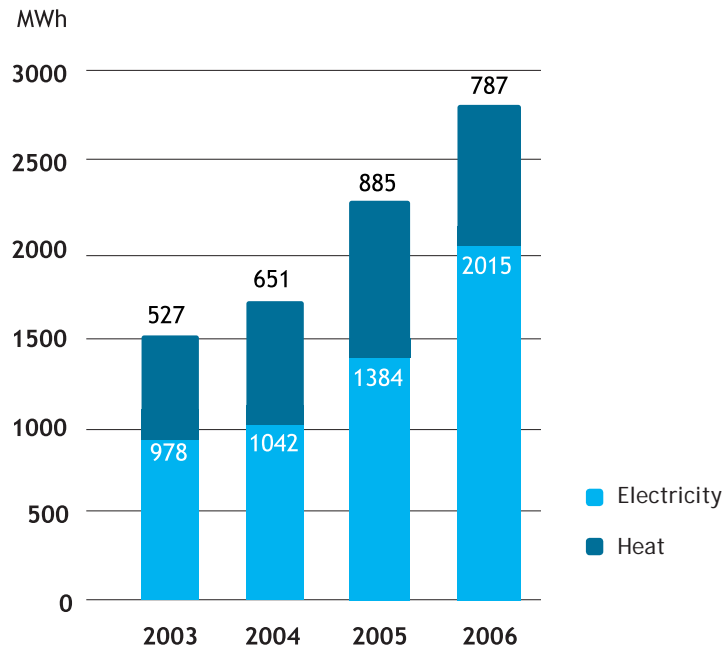


### Energy Consumption

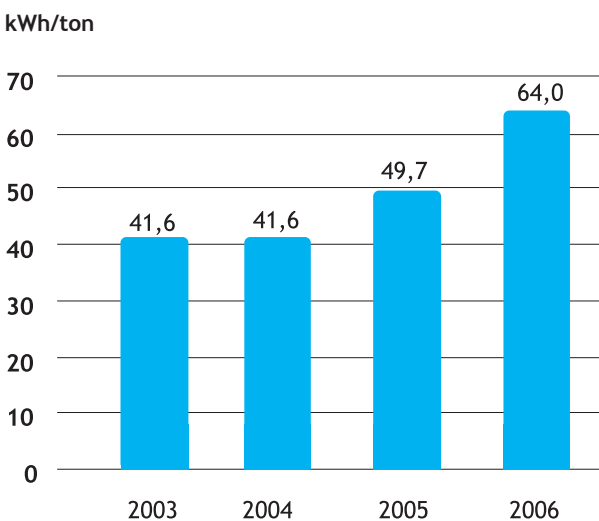
The electricity and heat consumption in the waste management center has increased from year to year when the new operations and plants have been built. All four companies operating in the center consumed 2 015 MWh electricity and 787 MWh of heat, altogether 2 803 MWh of energy. The increase in combined consumption was 24 per cent. This was especially caused by the increase in processed materials in the treatment plants. Totally new operations were not started in 2006.

The energy efficiency, when the consumption is compared to the processed tonne, has decreased during the last two years. The explanation for this is quite clear, because the production amounts in the REF-Facility have dropped from 15 000 tonnes in 2003 to 6 000 tonnes in 2006. The market situation for recovered fuel has been poor since the waste incineration directive came into force in Finland. In electronics recycling the year 2005 is not fully comparable with the year 2006 because the refrigerator recycling plant started not until the end of the year 2005. The energy efficiency can be compared better in the future years.

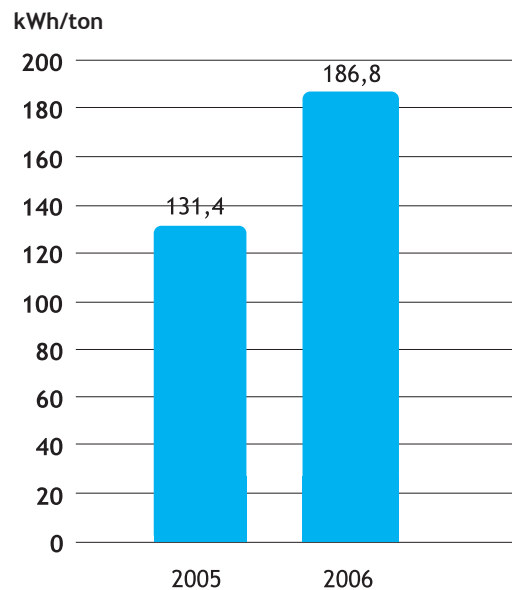
### The Total Consumption of Electricity and Heat



### The Consumption of Electricity in the REF Facility



### The Consumption of Electricity in Electronics Recycling



## Other Impacts

### Noise

The work safety committee of LHJ Waste Management and the joint venture companies drafted a noise programme in 2006. The purpose of the programme was to prevent the personnel from becoming exposed to work related noise and the noise nuisance in the surrounding residential areas. The programme is updated annually. The noise measurements are carried out twice a year with company's own equipment. The results are guiding and not officially proved.

Four of the observation points are inside the waste management center and three are located in the surrounding area. The government has given guidelines for noise levels (55 dBA daytime and 50 dBA night time). The eight exceedings compared to the guideline values were registered in the waste management center. The values were not exceeded outside the area. Noise from the traffic increase the level of noise next to the weighing station. The noise from the process caused noise increase inside the REF-plant as well as in the Cool-Finland and CRT-Finland process plants.

### Nuisance animals

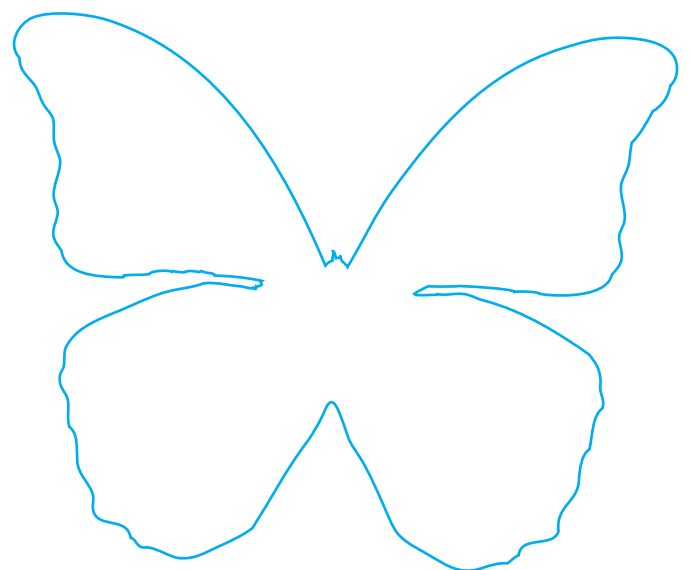
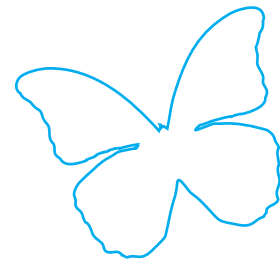
The number of rodents inside the waste management center has increased compared to the situation in 2001. The rodent prevention programme is outsourced to an expert organisation. According to the report of the organisation, 46 per cent of the bates were eaten in 2006 compared to the 21 per cent in 2001. Most of the rodent observations have been mice. The organisation completed eight inspections in the waste management center In 2006.

### Impacts on Nature and Scenery

The waste management center is not located in an important natural area. There are neither significant nature types nor endangered species that should be protected according to the Environment Protection Act. There are no special scenery values inside the waste center or in the surrounding area. The waste management center area is surrounded by forest and hills. The waste management activities are not visible in the residential areas. The landfill impact on scenery is limited so that the highest point of the landfill will not be visible in any direction from the surrounding area even in the future.

### Deviations in the Waste Management Operations

LHJ monitors and tries to control every deviation that occurs in normal operations. Six deviations were registered in 2006. Two of them concerned contaminated soil operations. Contaminated soil was placed in the hazardous waste landfill in two occasions although a solidification method would have been adequate treatment for them. Once, a contaminated soil load was received as mildly contaminated although it was discovered to exceed the hazardous waste limits. The load was replaced and treated in the hazardous waste final disposal area. Fire spread from the neighbouring power plant's storage field into waste management center area. It was brought under control by fire department. In Cool-Finland the polyurethane from the refrigerators was caught up fire twice, once in storage area and once in the process. The deviations did not cause any major damage to environment, personnel nor property.



## EMAS VALIDATION STATEMENT

This report's environmental part has been drawn up by LHJ Waste Management and its joint venture companies: CRT-Finland Oy and Cool-Finland Oy. The last statement was published in April 2006 concerning the year 2005. This report is a completely new revision from previous ones. Information of the statement will be updated annually. The next updated statement will be published by 30 June 2008 over the year 2007.

All figures concerning information on environment and waste have been verified. Social and financial parts of the report is not checked by the environmental verifier. This report has been examined by an accredited international verifier to verify that it meets the requirements of the EU regulation EMAS EC/761/2001.

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■ Fully reported

■ Partially reported

■ Not reported

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# VOCABULARY AND ABBREVIATIONS

**Accreditation:** International and official recognition of authority.

**Auditing:** A systematic and documented verification process with the objective of independently acquiring and assessing evidence to determine whether the company's environmental management system fulfils the targets set.

**Certification:** An assessment and a written assurance by an accredited body that the operations conform to the specified requirements e.g ISO 14001-standard.

**CFC gases:** These ozone-depleting gases commercially known as freons are employed in refrigeration appliances, in the electronics industry, and as propellant gases, etc.

**EIA procedure:** The potential environmental impacts of a planned project are determined in the environmental impact assessment process prior to final decision making.

**EMAS:** (Eco-Management and Audit Scheme) A voluntary environmental management and auditing system based on EU regulation.

**Environmental impact:** An adverse or a beneficial change to the environment and society resulting from the company's activities.

**Environmental management system:** Part of the company's management system that includes the organizational structure, planning activities, responsibilities, procedures, practices and resources for developing and achieving the environmental policy.

**GRI:** Global Reporting Initiative, GRI is a large global multi-stakeholder network that has provided guidelines for comparable sustainability reporting on economic, environmental, and social performance for all organizations.

**ISO:** (International Organization for Standardization) An international standards organization that approves standards used in many different business fields. The standards include the quality standards in the 9 000 series and the environmental management system standards in the 14 000 series.

**Management review:** Periodical review conducted by the company management to inspect the state of the company's management system and its suitability to stated targets and the activities of the company.

**Operational management system:** Integrated management system, covering the company activities, that includes the quality, environmental and occupational health and safety management systems.

**Operational policy:** A declaration of the plans and operational principles of the company that provides guidelines for all company activities.

**Operational programme:** The objectives and targets set by the company to itself and the means, methods, schedules, responsibilities and monitoring systems to implement the targets.

**RAL:** Deutsches Institut für Gütesicherung und Kennzeichnung, German organisation for standardization and quality labels

**Recycling:** Using the waste derived material as raw material for new products.

**Reuse:** Using a particular product more than once for the same or different purpose.

**Utilization rate (Recovery rate):** The share of waste recycled or utilized compared to the total amount of the received waste.

**Utilization (Recovery):** Utilization of waste as raw material in the industries or as energy in the power plants.

**Verification:** An accredited body can assess whether the practical activities of the company and the eco-management and audit scheme meet the requirements of the EMAS Regulation.

## Abbreviations:

<b>BOD</b>	Biological oxygen demand
<b>COD<sub>cr</sub></b>	Chemical oxygen demand
<b>CRT</b>	Cathode Ray Tube
<b>dB<sub>A</sub></b>	Average sound level in decibels
<b>TOT-N</b>	Total nitrogen
<b>tot.P</b>	Total phosphor
<b>NH<sub>4</sub>-N</b>	Total ammonium nitrogen
<b>REF</b>	(Recycled Fuel) Fuel produced from waste

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