



Printing House **Ecoprint**  
Environmental Statement 2007



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## Introduction

This is the first environmental statement of the printing house Ecoprint (in July 2007, there was a merger between three companies with the same owners: the print preparation company OÜ Repro, the print house AS Guttenberg and the printing agency AS Triip). It has been prepared in order to offer an overview of the impact that the company's activities and use of resources have on the surrounding environment. The preparation of environmental as well as social statements is a universal and widespread practice among forward-looking companies and is becoming more popular in Estonia as well. Ecoprint is the first printing house in Estonia to prepare and publish its environmental statement.

In the previous five years (2002 to 2006), AS Triip prepared its environmental statement to reflect the increase and decrease in environmental impact in various measurable categories (electrical and thermal energy, transport of people and goods, water, waste etc.) as the company developed through the years.

There is no doubt that Ecoprint is the leading Estonian printing house in terms of environmental awareness, both among printing companies and all other companies, because Ecoprint is constantly looking for different environmentally friendly options and applying these in the company's everyday operation and also in its long-term investments. The difference between Ecoprint and most other companies lies primarily in the attitudes of the company owners and management and in the amount of courage to implement new solutions.

The printing service Green Print (materials printed with natural inks on environmentally friendly paper) is a registered trademark since 2004. Green Print is increasingly popular among clients; and in 2007, Green Print already accounted for 23 percent of the turnover of Triip. In general, this means that every fifth client of the company is environmentally aware and can appreciate the value of environmentally friendly print materials. There are other printing houses who print on recycled paper made from recovered waste paper. However, only our Green Print service uses environmentally friendly printing inks which have been manufactured from rapeseed and soy oil (instead of crude oil) and contain pine resin as the binder.

The actual application of the knowledge gathered is just as important as the assessment of the environmental impact. And in this respect, Ecoprint is recognised as the pioneer among all legal entities in the Republic of Estonia, because after completing its first environmental statement the entire staff of Ecoprint (then known as Triip) planted new trees in order to balance out the company's environmental impact. By now, the tree-planting has become an annual tradition and our customers and business partners are also involved in the initiative.

Ecoprint is a 'green' company not only because it offers the Green Print service. Rather, Ecoprint is a 'green' company because each year the company implements an environmentally friendly idea. The company has leased out its ecologically renovated former office and production building – which has a lawn roof for both the reduction of heating expenses and the creation of a recreational and alternative work environment (in summers, the lawn-covered roof terrace is used as an open-air office). The new production and office building is taking an even longer step towards sustainability and utilises the wind and the sun for electrical and thermal energy respectively.

Electrical energy is produced using three Airdolphin wind turbines (the rated capacity of each

wind turbine at a wind speed of 12.5 m/s is 1kW and special network invertors connect the wind turbines to the power supply system of the production building) and solar panels are used to supply hot water for the production and office premises. Additionally, the residual heat from the operation of the production equipment is utilised for the heating of the production premises in the winter season (using a panel exchanger in the ventilation system). Also, AS Triip has for years been a customer of the Green Energy system which utilises renewable natural resources, and was the first printing house to become a user of the Green Energy service.

The company was the first in Estonia to purchase photopolymer technology equipment which helps to considerably reduce the amount of chemicals used in the traditional printing process; it also reduces the number of initialisation sheets and the time spent on print preparation, which in turn reduces the printing shop's consumption of electrical and heating power, and so on.

Ecoprint is the only printing house in Estonia which has been issued with a FSC Chain-of-Custody certificate by the FSC (Forest Stewardship Council). The aim of this certificate is to guarantee the proper movement, handling and processing of wood grown in FSC-certified forests (the wood comes from forests which are managed in accordance with the principles of sustainable forestry – this means that any logging there has not been illegal, the forest's ecosystem has not been damaged by the logging, and no illegal or child labour has been used in the process), from the stump in the forest to the end-product. Only companies with an appropriate certificate can use the FSC logo and/or trademark to label their products. The FSC has established individual requirements for each industry, including printing and print houses.

The methods of the measurement of the ecological footprint and CO<sub>2</sub> emissions have been used in the preparation of Ecoprint's environmental statement. More detailed explanations as well as specific data on all measured components are included in the statement.

In 2007, the total number of employees at Ecoprint (and at its predecessor companies) was 46. The company's turnover was 23 million kroons.

Ecoprint's environmental statement for 2007 was prepared by Anu Kõnnusaar, the environmental manager (volunteer) of the Estonian Fund for Nature (ELF).

## Methods for the Assessment of Environmental Impact

The calculation of the use of resources is based on the principle that the components are measured in the extent that Ecoprint has consumed the resources as the end-user (e.g. using thermal energy for heating the premises). The range of the measurements is parallel to the range of financial interests and all source data come from the accounting records.

In addition to the data acquired from Ecoprint's accounting records, similar data on the resource usage at the Guttenberg print shop and the print preparation company Repro has also been taken into account. Since in the previous years, the environmental statement has only taken into account the resource usage connected with the printing house Triip, the data and results from the previous years (from 2002 to 2006) cannot be compared with the data and results of 2007.

In the course of preparing Ecoprint's environmental statement, 13 components were measured (electricity, heat, water, waste, transport for the carriage of people and goods, use of office paper, etc). The source data thus received were processed using several methods which are widely used around the world; the aim was to facilitate the understanding of the measuring results. The main method used is the ecological footprint, and also the measurement of the emissions of CO<sub>2</sub> and its equivalents. The Montreal (1987) and Kyoto (1997) protocols and the aims of Agenda 21 as well as the general principles of sustainable development have been used as the basis.

By measuring the use of resources, we do not prepare an ecological balance sheet where both the positive and negative environmental impact would be balanced. Instead, we measure the negative environmental impact, i.e., the use of natural resources for the company's activities.

**Therefore, the environmental statement of Ecoprint specifies the amount of natural resources used in the course of the daily activities of Ecoprint.**

## Ecological Footprint<sup>1</sup>

The calculation of the ecological footprint is **based on land as a limited resource** which people use to satisfy their needs. The surface of the Earth has been divided into categories:

- Energy land (land necessary for the production of energy and for distribution networks);
- Developed land (buildings, roads, etc.);
- Cultivated land (garden, farming, cattle and forest land);
- Bio-productive sea (main fishing territory);
- Biological diversity land (intact nature);
- Other land (rocks, deserts, etc).

The ecological footprint is a tool which is used to measure the use of natural resources required for a company's activities. **The ecological footprint measures the use of space related to the life cycle of a product or service and is measured in hectares per year (ha-year).**

The ecological footprint index shows how much productive land and water is occupied and utilised for the production, use and absorption of the materials consumed.

The calculation of an organisation's ecological footprint is based on two simple factors. It is possible to monitor and identify most of the resources consumed by a company, and also most of the waste substances that are created.

Most resource and waste flows can be re-calculated to determine the size of biologically productive area which is required for the production of these resources and for the elimination and neutralisation of the waste.<sup>2</sup>

## Environmental Impact Measured Using the Ecological Footprint Method

In the calculation of the ecological footprint, 11 different components<sup>3</sup> have been taken into account; these components correspond to the goods and services used or created as part of Ecoprint's activities. The components, in turn, are divided into six sub-groups (transport of people, electrical energy, thermal energy, water, waste and transport of goods). For better comparability, the ecological footprint per each employee has been specified<sup>4</sup>.

<sup>1</sup> According to ELF (The Estonian Fund for Nature), the ecological footprint method is one of the best and increasingly popular methods in the world at the moment, allowing the comprehensive assessment of the environmental impact of organisations and countries. Please refer to Chambers et al, *Sharing Nature's Interest*, 2000 (available at the library of ELF).

<sup>2</sup> "Riikide koormus ökosüsteemidele" (translated from the book "Ecological Footprint of Nations"), Ministry of the Environment and Estonian Green Cross, 1997, 32 pp.

<sup>3</sup> The quantities of office paper used and hazardous waste are not included in the components of the ecological footprint because the appropriate ecological footprint factors are missing.

<sup>4</sup> The number of employees has been determined on the basis of the average number of employees of all three companies.

It must be emphasised that a comparison of the ecological footprints per person between different companies is fair only when companies that offer similar products or services are compared (e.g. an automobile manufacturer can be compared to another car manufacturer, but not to a bicycle manufacturer; although at first, it would seem that all companies are producing a means of transport).

## Waste

According to the ecological footprint method, Ecoprint has the largest environmental impact in waste generation, which is 86% or 333 ha-years. At the same time, since 2002, the company has paid much attention internally on waste management. In 2002 the company launched the separate collection of waste paper and cardboard; in 2003, hazardous waste was included as an item for separate collection. In 2004, the company purchased a photopolymer technology machine because using this device reduces the generation of hazardous waste and initiation sheets (i.e. waste paper). In 2005, the electronic customer management system was introduced, and it has reduced paper consumption internally in the management of projects. The aluminium printing plates and waste paper and cardboard are recycled.

### Generation of recyclable waste:

**Waste paper and cardboard** 51 760 kg  
**Waste metal** 10 040 kg

### Generation of waste sent to landfill:

**Domestic waste** generated per year: 49 500 kg;  
**Hazardous waste** generated per year 1 880 kg  
 (special handling using a licensed waste handler).

In terms of different waste categories, the biggest amount of waste generated in 2007 was in the category of domestic waste, at 49 500 kg or 200.0 ha-years (52% of the total footprint), if measured in ecological footprint units. A total of 51 760 kg of waste paper and cardboard was generated, with an ecological footprint of 126.8 ha-years (33% of the total footprint). 10 040 kg or 6.5 ha-years of metal waste were generated (2% of the total footprint).

Most of the waste paper is generated from the cutting scraps of prints, defective products, test sheets and packaging waste. High-quality office paper, newspapers and magazines, envelopes and similar items constitute a smaller share of waste paper.

The separate collection of hazardous waste began already in 2003. Cleanout scraps and packaging are collected separately. In 2007, a total of 1 880 kg of hazardous waste were generated, and handed over to a licensed waste handler. The hazardous waste is not included in the calculations of the ecological footprint and the CO<sub>2</sub> emission because, unfortunately, there are no corresponding factors.

The waste generated per employee in a year can be broken down as follows: 1 080 kg of domestic waste, 1 130 kg of waste paper and cardboard, 220 kg of metal waste and 40 kg of hazardous waste.

Waste handling (domestic and hazardous waste) requires 0.3% of the company's total turnover, but the ecological footprint of the company's domestic waste accounts for 52% of the total ecological footprint (in addition to this, waste paper and cardboard, as a recycled type of waste, account for 33% of the footprint; financially, this waste category did not have fixed costs in the first 9 months, because the waste paper and cardboard were handed over to the waste handler free of charge and in the last three months of the year, this waste was sold to the waste handler as a valuable material for further production).

## Electrical Energy

In 2002, Ecoprint started to use cleanly produced wind and hydro-energy (known as Green Energy, a trademark). Ecoprint owns the category III license and consumes 6 000 kWh of Green Energy annually. In the footprint calculation, 19% of line loss has been added to both wind energy and hydro-energy as well as to energy produced from oil shale; this loss of electricity happens upon distribution from the producer to the consumer.

Together with line losses, a total of 7 140 kWh of Green Energy and 264 210 kWh of oil shale power was consumed in 2007. Although the energy produced from renewable natural resources accounted for about 3% of the annual energy consumption, the footprint of wind and hydro-energy amounted to 0.2 ha-years and that of oil shale power to 42.5 ha-years (which is a 200-fold difference).

## Thermal Energy

During the year, 92 170 kWh of thermal energy were consumed, of which 54% or 49 450 kWh was produced from peat, 35% or 32 430 kWh from natural gas, 11% or 10 250 kWh from wood and wood waste, and less than 1% or 30 kWh from rape waste and less than 1% or 20 kWh from coal. Utility line loss (14.73%) in the distribution of heat from producer to consumer has also been included in Ecoprint's total consumption of thermal energy. Thus, in calculating the ecological footprint, 14.73% has been added to the figure representing the consumed thermal energy in kWh in Ecoprint's accounting records. The ecological footprint of thermal energy produced from biomass (peat, wood and rape waste) is 2.2 ha-years; the footprint value for the natural gas and coal (used for thermal energy) is 3.1 ha-years.

The thermal energy consumption at Ecoprint clearly demonstrates the nature of the ecological footprint method and gives a good overview of the environmental impact of the use of different types of fuel. The boiler house produced 65% (approx. three fifths) of the total thermal energy using bio-fuel (peat + wood + rape waste), but the resulting ecological footprint only constitutes 42% (approx. two fifths) of the total thermal energy footprint. In a comparison of the environmental impact of different types of fuel, the ecological footprint of bio-fuels is among the smallest. For example, the emission of CO<sub>2</sub> in the burning of bio-fuel is calculated as 0 (zero) tons of CO<sub>2</sub> / kWh, because during its growth in nature, the biomass has accumulated the same amount of CO<sub>2</sub> that is released during the burning process.



## Transport

According to the calculation methods of the ecological footprint and CO<sub>2</sub> emissions, transport is divided into two categories: transport of people and transport of goods. The transport of goods covers goods transported with heavy goods vehicles; and the transport of people covers the business trips of employees by car, bus, train, boat or plane.

In case of Ecoprint, the tonne-kilometres of packages sent by courier have been included under the transportation of goods. Under the transport of people, the consumption of diesel fuel (by the company van) and the consumption of petrol (by the executive director's company car) have been calculated.

An estimated 4 370 tonne-kilometres<sup>5</sup> were covered for the transportation of goods, with the resulting ecological footprint being 0.35 ha-years. For the transport of goods, Ecoprint uses the delivery services provided through the public transport system and the regular transport network of the postal service operator.

The company's delivery van covered an estimated 22 850 kilometres, creating a 2.2 ha-year footprint. The executive director's company car travelled approx. 40 100 km in 2007, which corresponds to a 3.8 ha-year footprint.

## Water

1 150 m<sup>3</sup> of water were consumed in 2007, with a footprint of 0.09 ha-years. In order to maintain an optimum air humidity of 60% (required for the printing process) in the printing premises, two humidity systems have been installed in the print house premises (water vapour is sprayed). Thus, about 70% of the water is used without discharging it to the sewer system. Guaranteeing the appropriate air humidity allows considerable savings through the prevention of defective production.

In the new production and office building, Ecoprint collects rainwater from the roof to use in the damping system.

## Office Paper Used

In addition to the above-mentioned components, office paper consumption was also measured (but it has not been taken into account in the estimation of the ecological footprint and CO<sub>2</sub> emissions since there are no corresponding factors). During the year 2007, 143 packs or 358 kg of office paper were purchased. This means 7.8 kg of office paper per employee per year.

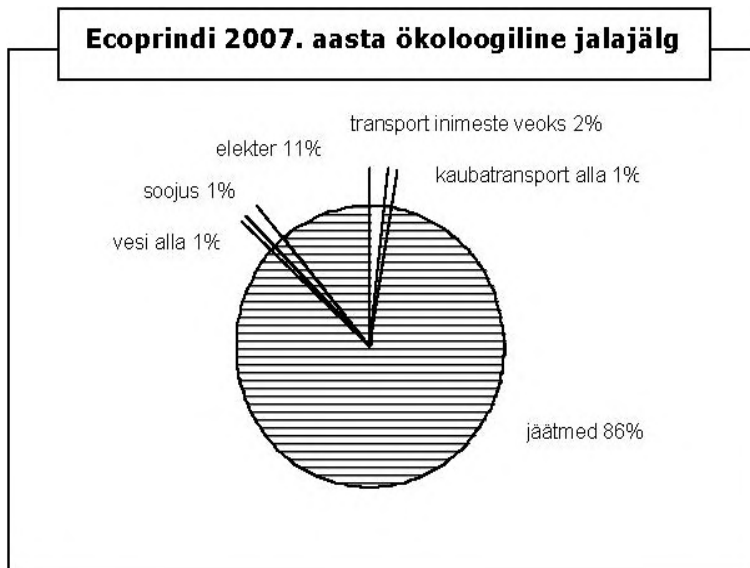
<sup>5</sup> The unit 1 tonne-kilometre equals the transport of 1 tonne of goods to a distance of 1 km; or the transport of 0.5 tonnes of goods to a distance of 2 km.

## Summary Table of the Ecological Footprint

The ecological footprint method was used to measure the environmental impact of 11 different components (there is no ecological footprint factor for converting the values of office paper consumption and hazardous waste; therefore, these have been left out of the estimation).

Components for the calculation of the ecological footprint	Consumption (rounded)	Ecological footprint per employee (ha-years per employee)	Ecological footprint (ha-years)
<b>Transport of people (km)</b>			
1. Car	62 950	0.130	5.980
<b>Electricity (kWh)</b>			
2. Electrical energy produced from oil shale	264 210	0.925	42.537
3. Green Energy	7 140	0.004	0.173
<b>Heat (kWh)</b>			
4. Thermal energy produced from biomass (peat, wood, rape waste)	59 730	0.039	1.805
5. Thermal energy produced from natural gas	32 430	0.066	3.048
6. Thermal energy produced from coal	20	0.0001	0.003
<b>Water (m<sup>3</sup>)</b>			
7. Water consumed	1 150	0.002	0.092
<b>Waste (kg)</b>			
8. Paper collected for recycling	51 760	2.757	126.806
9. Metal collected for recycling	10 040	0.142	6.528
10. Domestic waste (to a landfill)	49 500	4.345	199.856
<b>Transport of goods (tonne-kilometres)</b>			
11. Road transport	4 370	0.007	0.306
<b>TOTAL:</b>		<b>8.4</b>	<b>387.1</b>

Ecoprint has the biggest environmental impact in the area of waste generation (86%), followed by electrical energy (11%), thermal energy (1%) and transport of people (2%). The share of the transport of goods (less than 1%) and of water and sewage (less than 1%) in the ecological footprint is the smallest.



**387.1 ha-  
years or 8.4  
ha-years per  
employee**

**Ecoprint's ecological footprint in 2007** - (waste 86%, electricity 11%, thermal energy 1%, transport of people 2%, transport of goods <1%, water <1%)

**The ecological footprint of Ecoprint is 387.1 ha-years, or, 8.4 ha-years per employee.**

According to the comparison of the ecological footprints of different countries, published in 1997, the area available for humans to use is 1.7 ha per person<sup>6</sup>. This is the average of the current ecological reality.

On the other hand, the report of the World Wide Fund for Nature for the year 2000 estimated that the limit of sustainability is 2.2 ha per person, considering that 10% is required for the preservation of biological diversity.

The length of a normal working day is only one third of the whole day, and during this time, about three times as much biological resources are used than is available/allowed per one person.

**Thus, no matter which sustainability guideline we use as the basis, it is obvious that the use of resources far exceeds the optimum level, that is to say, people live at the expense of the future.**

<sup>6</sup> Considering the world population in 1993, there were 2.07 hectares of biologically productive land per person. Based on the world population in 1997 and the optimistic assumption that the amount of biologically productive land has not decreased, there is today just 1.94 hectares per person. After allocating 12% of the amount for the preservation of biological diversity, the result is  $((1-0.12) \times 1.94 = 1.71)$  1.71 hectares of land per person.

## CO<sub>2</sub> Emission

In order to achieve sustainable development, it is necessary to restore a situation where human activity does not exceed the dynamic balance of the basic material cycles - CO<sub>2</sub> and water - or the buffering capacity of natural systems. In order to ensure sustainability, it is important to know how big this buffering capacity is, and to be able to estimate the quantitative impact of human activity.

CO<sub>2</sub> emissions were measured for 6 components. The UNEP Guidelines for Calculating Greenhouse Gas Emissions were used for the conversion of the measuring results into CO<sub>2</sub> emission<sup>7</sup>.

Measured component	CO <sub>2</sub> emission, CO <sub>2</sub> in tonnes
<b>Electrical energy</b>	
1. Electrical energy produced from oil shale	197.4
<b>Thermal energy</b>	
2. Heat energy produced from natural gas and coal	6.6
3. Heat energy produced from biomass	0
<b>Transport of people</b>	
4. Car (diesel)	6.1
5. Car (petrol)	8.9
<b>Transport of goods</b>	
6. Road transport	3.4
<b>TOTAL</b>	<b>222.4</b>

The Intergovernmental Panel on Climate Change (IPCC) has suggested that the size of the environmental space is 1.7 tonnes of CO<sub>2</sub> per person per year, which is 4.66 kg of CO<sub>2</sub> per person in a day<sup>8</sup>. The threshold quantity of CO<sub>2</sub> emitted per person during working time is calculated as 70% of what IPCC has suggested. Thus, the tolerated environmental space per person is 1.19 tonnes of CO<sub>2</sub> a year or 3.3 kg of CO<sub>2</sub> a day.



Considering that Ecoprint generates 222.4 tonnes of CO<sub>2</sub> whereas the environmental space only allows 54.7 tonnes of CO<sub>2</sub>, Ecoprint has to compensate for the generation of the excess 158.7 tonnes of CO<sub>2</sub> emission in year 2007. It is known that, on average, 1 sq. km of forest binds 97 tonnes of pure carbon a year, which corresponds to 356 tonnes of CO<sub>2</sub> per year.

**This means that 0.45 sq. km or 45 ha of forest is required to bind the excessive 158.7 tonnes of CO<sub>2</sub>.**

<sup>7</sup> The GHG Indicator: UNEP Guidelines for Calculating Greenhouse Gas Emissions for Businesses and Non-Commercial Organisations

<sup>8</sup> Viilu, R. Randla, T. *Kuidas mõõta keskkonna jätkusuutlikkust*. Unpublished, Tallinn, 2002

## Summary

This environmental statement is the first for the company Ecoprint, but essentially it is a continuation of the environmental statements which Ecoprint's predecessor Triip had prepared for 5 years already. As far as we know, this is the longest period among Estonian companies who prepare environmental statements using the ecological footprint and CO<sub>2</sub> emission methods. Over these years, many environmental events have been organised – which today is also reflected in the company's new name, Ecoprint.

The creation of Ecoprint's "own" fir tree forest and its maintenance is something that no other company, as far as we know, has managed to do in the Republic of Estonia. The tree-planting has now become a tradition and both our customers and business partners take part in this initiative.

Ecoprint's environmental statement is based on 13 measurable components (electricity, heating, etc.) which also form the basis for calculations. The company's ecological footprint in 2007 was 387.1 ha-years, or 8.4 ha-years per employee. This is more than the biological resources allow. Similarly to the ecological footprint, CO<sub>2</sub> emissions were also measured. In 2007, 224.2 tonnes of CO<sub>2</sub> were produced which is 158.7 tonnes of CO<sub>2</sub> more than a balanced environmental space can accommodate. 45 ha of forest are needed to bind the excess CO<sub>2</sub>.

In order not to compare apples and oranges and not to make any long-term forecasts based on such a comparison, the environmental statement for the year 2007 does not compare Ecoprint's results with the previous years (with AS Triip). But looking ahead, we are happy to say that the sustainable solutions used in the new production and office building will significantly improve the results of 2008 compared to the results of 2007 outlined in this environmental statement.

Throughout the years, waste generation has made up the biggest share of the printing house's ecological footprint, primarily due to the amount of domestic waste. The company has worked hard all these years to decrease the generation of such waste by collecting it into different categories and has achieved great results. Although the sum spent on waste handling is only 0.3% of the turnover and thus waste handling might not be a priority, Ecoprint must, above all, reduce the generation of domestic waste. This is also one of the targets Ecoprint has established for itself (see below).

Ecoprint has set itself the following specific targets:

- Reduce the ecological footprint by 5% each year;
- Reduce the consumption of thermal energy, by starting to use energy-efficient production facilities and recycling the residual heat;
- Reduce the amount of domestic waste generated per employee by 10% each year;
- Purchase the Green Energy certificate each year;
- Increase the share of materials printed on FSC-certified paper to 10% of total turnover;
- Once a year, organise a hike for customers, to visit the Alam-Pedja nature reserve
- Plant at least 1 000 new trees each year with the help of employees and customers

The environmental activities of Ecoprint continue to receive plenty of recognition. In 2007, AS Triip was declared the most environmental company of the year (in the area of environmental management) in the award competition organised by the Ministry of the Environment for all Estonian companies.