The Environmental Report of the Estonian State Chancellery

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Background

Since our existence is linked to the Earth's ecosystems, any kind of human activity need to be in balance with processes taking place in these ecosystems.

During the last couple of thousand years due to modern culture's changed perception of the world and through the vast development of technology, human activities have become a great impact to ecological processes, to the extent where it endangers our own living environment. Due to global warming, soil erosion, accumulation of toxic substances and other human related harmful phenomena our current lifestyle may one day turn out to be impossible. Therefore during the last decades more and more eyes and minds have focused on understanding global environmental processes and consumptions and they try to adjust the existence of single persons, but also organizations and nations to the limits of ecological carrying capacity.

This Green Office Program in the State Chancellery is the first step towards acknowledging environmental impacts of an organization, drawing conclusions and taking steps towards becoming an ecologically balanced organization.

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Methods

There are many different methods used in the world to assess environmental impacts. While choosing a method it has to be kept in mind that this method should enable to describe organizations impacts broadly and adequately and that the results of this assessment should be expressed with as few indicators as possible. It is also important not to limit the analysis to direct impacts only, e.g. the amount of waste generated by the organization, instead also "invisible" impacts have to be considered, e.g. environmental contamination caused by the production of electricity. Therefore, to assess State Chancellery's environmental impacts, we chose the method called ecological footprint (Chambers, 2000) combined with material and primary energy indexes. These indexes are based on the input management of land, material and energy.

The ecological footprint

The ecological footprint assesses the total productive land usage linked to a service or a product and is measured in hectares per year (ha/y). It shows how much productive land and water are occupied to produce, use and absorb the resources we consume. This index includes for example the size of ground necessary to assimilate all emitted CO2.

According to calculations made in 1996 the footprint of an Estonians was found to be 7,1 ha per person. This is less than US (12, 2 ha/person) but higher than Germany (6,2 ha/person) and Latvia (3,7) (Chambers N, Simmons C, Wackernagel M, 2000).

The Ecological Footprints of Nations

Nations	Population (1995)	Nation's average ecological footprint (ha per cap)	Nation's available biocapacity (ha per cap)	Nation's ecological deficit (if negative) (ha per cap)
Finland	1 107 000	5.8	9.9	4.1
Sweden	8 788 000	6.1	7.9	1.8
Germany	81 594 000	4.6	1.9	-2.8
Hungary	10 454 000	3.1	2.6	-0.5
Russian Federation	148 460 000	4.6	4.3	-0.4
Canada	29 402 000	7.2	12.3	5.1
New Zealand	3 561 000	6.5	15.9	9.4
Bangladesh	118 229 000	0.6	0.2	-0.3
Netherlands	15 482 000	5.6	1.5	-4.1
Singapore	3 327 000	6.6	0.0	-6.5
United States	267 115 000	9.6	5.5	-4.1
World	5 687 114 000	2.2	1.9	-0.3

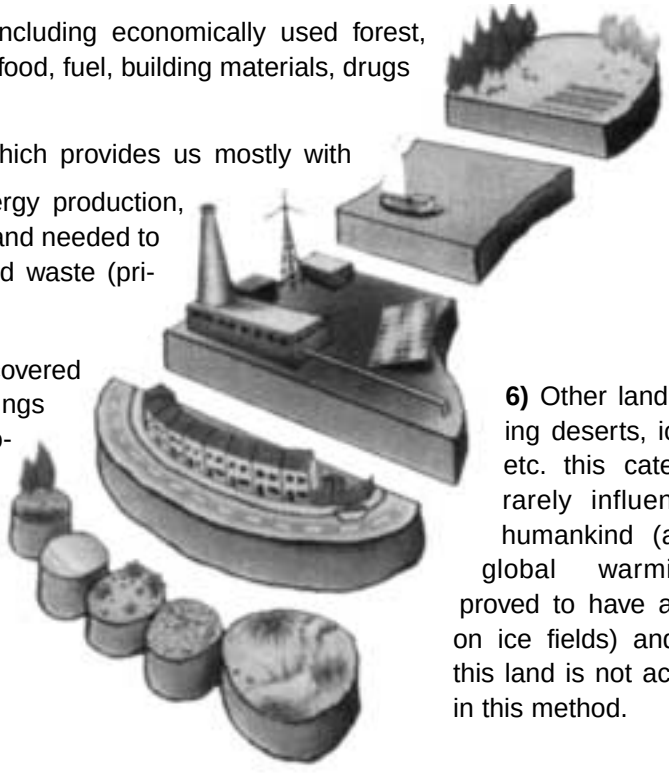
Chambers, N.; Simmons, C; Wackernagel, M. Sharing Nature's Interest. Ecological Footprints as an Indicator of Sustainability. Earthscan, 2000.

The method of ecological footprint is based on the presumption that Earth as a surface is a limited resource which people use to satisfy their needs. Hence, Earth's surface can be divided into six categories:

1) bioproductive land, including economically used forest, that provides us with food, fuel, building materials, drugs etc;

2) bioproductive sea, which provides us mostly with

3) surface used for energy production, which also includes land needed to absorb energy related waste (primarily CO2);



4) Built land, i.e. land covered with all sorts of buildings and therefore not productive;

5) Biodiversity land, that enables to keep ecosystems balanced;

6) Other land, including deserts, ice fields etc. this category is rarely influenced by humankind (although global warming is proved to have an effect on ice fields) and hence this land is not accounted in this method.

Methods

Calculating the amount of surface used by an organization in a year enables us to compare organization's size and functions to its environmental impacts and draw conclusions about the importance of these impacts and possibilities to reduce them.

Material index

This index assesses the amount of total material moved including mining, harvesting linked to a given product or service. For example, to produce 1 kWh of energy in Estonia a certain amount of Earth material, oil shale, ashes and groundwater are moved. It is measured in tons of materials for the whole state office or per employee or m2. This index is based on the MIPS concept (Material Intensity Per unit Service) - to each product or service is associated the "ecological rucksack" which is the total amount of material moved for all the extractions and the processes required for a given service (Schmidt-Bleek, F. and Manstein, C, 1999).

Primary energy index

The primary energy index assesses the total amount of energy extracted from the environment during the life cycle of a service or a product. It is measured in GJp (Giga Joules of "primary" energy) (Benders, R.M.J., H.C. Wilting, K.J. Kramer and H.C. Moll, 2001).

These indexes have been selected because:

- They are able to deal with the State Chancellery's complex environmental impacts;
- They are preventive because linked to inputs
- They can be easily understood,
- They represent a rough but good approximation of the total impact;
- Data exists on many products and services index values.

To compare different organizations on the environmental level there has to be a common functional unit. For chancelleries these units could be use of the natural environment:

- per amount of Chancellery's expenses;
- per inhabitant of Estonia (knowing that the chancellery provides services for the whole country);
- per surface of Estonia (knowing that the chancellery provides services for the whole country);

To our knowledge no other state chancellery or similar institution has ever been assessed on the overall environmental level before, therefore we chose impact per employee and per square meter as functional units so we can compare results with other offices.

Reduction of organization's environmental pressure may take place in two stages:

1. Ecological purchasing. Purchasing ecological products instead of the regular ones is the easiest step to be taken, e.g. transition to certified and/or recycled paper, avoiding toxic cleaning products and products that contain chlorine or other ozone depleting substances. The advantage of ecological purchasing is its quick and easy realization.
2. Reduction of purchasing. At the time of utilizing products or services it is quite difficult to assess their exact environmental impact. For instance, consuming electricity is tightly related to mining, groundwater contamination etc. plus many concurring complex phenomena which are impossible to predict or calculate. Therefore the safe path to choose would be the reduction of the amount of products and services purchased by an organization while maintaining its current level of functioning.

Considered sectors

There are 144 employees in the State Chancellery and it has about 10 000 m2 of floor surface. These facts are the basis of our calculations. To assess State Chancellery's environmental impacts, we concentrated on the following sectors:

1. TRANSPORT - The use of different means of transport is considered (car for work purposes, taxi, boat, plane, bus, train, tram, foot and bicycle) taking into account work related travels and home-to-work travels.
2. PAPERWORK - this includes the use of office paper, and all activities linked, including printing, photocopying, and writing.
3. USE OF ELECTRICITY
4. INFORMATION TECHNOLOGY - the results reached in this sector are based on first estimates (use of electricity by different appliances and their lifespan was not studied).
5. CLEANING - this includes use of water and cleaning products.
6. WASTE MANAGEMENT

Due to limited time the influence of buildings and inventory was considered casually. Lighting, receptions, food and use of hotel services were not considered since there was not enough information available.

Gathering information

Majority of the data necessary for this report was collected from bookkeeping documents; these provided us with information about types and amounts of products and services used. A questionnaire was also worked out and spread, which received about 40 responses. Some employees of the chancellery were interviewed. In addition, a seminar took place where employees were familiarized with the concept of sustainable development and work environment was discussed. References and contacts are brought at the end of this report.

Results of this analysis:

- Estimates of the consumption of the State Chancellery.
- Assessment of these consumptions with material, primary energy and ecological footprint indexes.
- Identification of relevant indicators to survey environmental impacts and their values in 2000.
- Identification of most important measures of improvement.

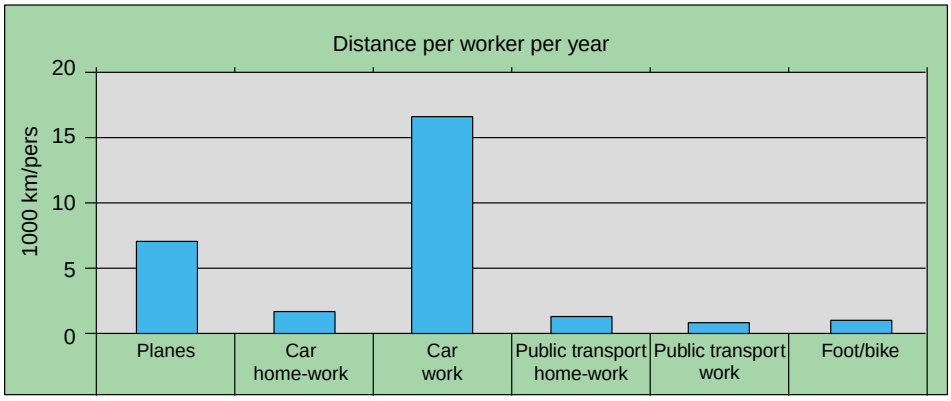
In every sector some important indicators have been educed, which allow us to compare results of different years. It has to be kept in mind, though, that these results are preliminary, since data for some sectors (both in the State Chancellery and in the world) are incomplete.

Majority of basic data concerning environmental performance of products and services needed for consumption analysis originate from outside Estonia (a database should be created that is suitable for Estonia). Analysis of environmentally less important sectors was limited due to lack of time and resources.

Results per sectors

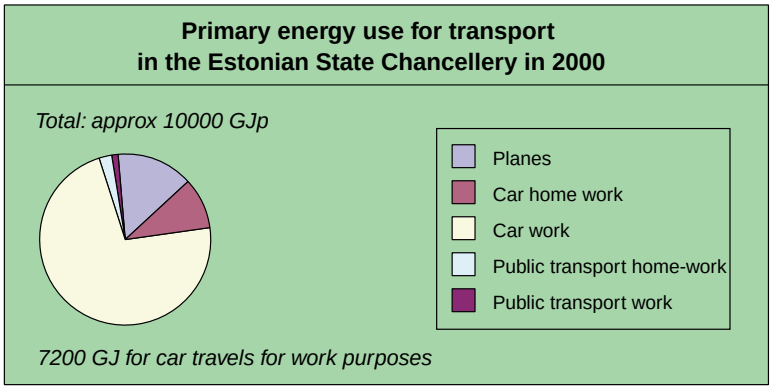
1. Transport

According to the first estimates the employees of the State Chancellery seem to strongly favor the ecological means of transport (public transport and foot) for home-to-work travels. 7 km of car usage per person per day for the home to work route is quite low compared to available data. This is certainly made possible through central positions of the State Chancellery's offices. According to results of the questionnaire each employee travels 1,8 km by foot and 0,6 km by bike per work day for home-to-work purposes. Concerning travels for work purposes, the situation is totally opposite, with a total of 160 000 liters of gasoline per year (or 4 liters per employee per working day). 74 km are traveled per person per working day by car. The second problem is traveling by plane, which is as high as 3000 km per year per employee. Per day, per employee, 5 km are traveled by public transport and 1, 5 km by foot for work purposes. In total 25 000 km per employee were traveled in the year 2000.



The material index could not be calculated for transport because of lack of information concerning the material input associated with transport infrastructure, information for primary energy and ecological footprint indexes were available (the latter is brought under chapter Results).

Energiaindeks



Indicator	In 2000
Number of cars at use (including rented cars):	43
Kilometers by plane per year:	more than 470 000
Kilometers by car per year:	1 800 000
Share of public transport in work travels:	about 6 %
Share of public transport in home-work travels:	about 40 %
Share of foot or bicycle in home-work travels:	20 %

Objectives

=> Reduce the number of cars per employee used in the State Chancellery.
=> Reduce kilometers traveled by plane and car.
=> Increase the share of public transport, foot and bike in travels.

Means

1. Support the use of alternative transport modes (foot, bike and public transport). Practicing this kind of transport should be supported and favored.
2. Change the system for travel reimbursement, with e.g. a fixed amount of travel expenses reimbursed (whatever the mean of transport).
3. Use information technology (video conferences, for instance) to reduce travels.

2. Paper

In year 2000 37 tons of paper in total or 250 kg per employee was utilized in the State Chancellery. Compared to western countries this is quite a lot (for example recent studies indicate 175 kg per office worker in Holland, (Hallenga R)) . On the other hand, since chancellery's duty is to prepare for the government's sittings, this kind of paper use can, to some extent, be understood.
Used paper is collected and handed over to an enterprise that arranges its recycling (AS Sekto).

Indicator	In 2000
Amount of paper used (tons):	37
Share of recycled paper:	0 %
Percentage of paper collected for recycling:	about 90 %

Objectives

=> Replace virgin paper with recycled and/or FSC certified paper.
=> Avoid printing unnecessary papers.
=> Print an limited amount of Riigi Teataja´s and other publications.
=> Use information technology to reduce paper use.

Heat and electricity

In Rahukohtu 1 and Rahukohtu 3 houses 922 MWh of electricity in total or 10 MWh per employee was used in the year 2000. Most of it was spent on heating. Electricity consumption per square meter was 0, 11 MWh, which compared to other offices in the western world, is not so much anymore. Other offices of the State Chancellery and guest houses used up about 700 MWh of electricity.
However, considering that the electricity used is produced from oil shale, the amount of energy extracted from the environment is actually much higher. According to our calculations, producing 1 MWh of electricity requires 4, 6 MWh of primary energy and moves 7, 6 tons of material from its natural location.

Indicator	In the year 2000
Consumption of energy per sq meter in the Rahukohtu 1 and 3 houses:	0, 11 MWh
Consumption of energy per employee in the Rahukohtu 1 and 3 houses:	about 10 MWh

Results per sectors

Objectives

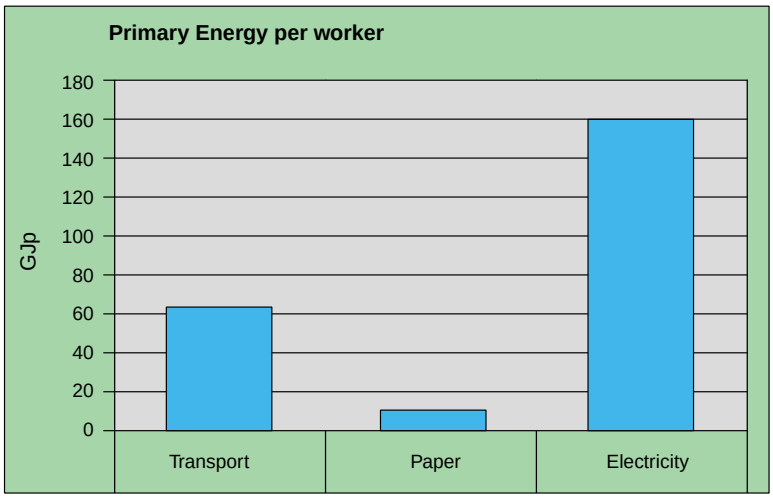
=> Replace electrical heating system with central heating.

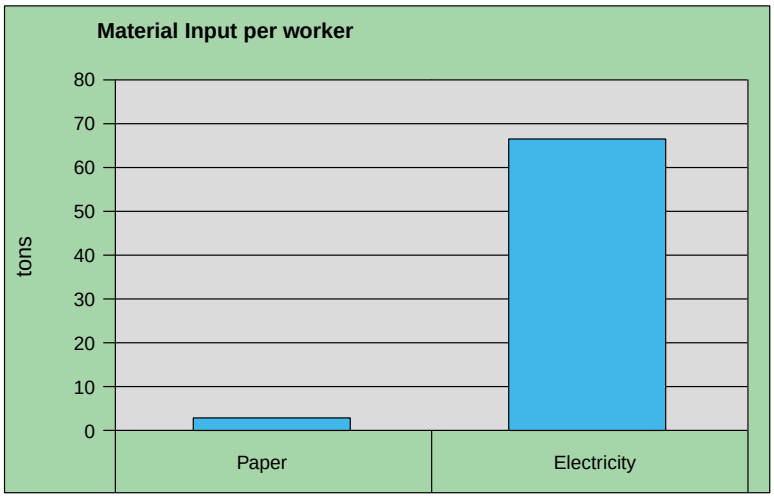
=> Co-operate for the development and use of renewable energy resources (wind generators).

In the next stage of this study the reasons for high electricity use should be identified by disaggregating electricity consumption by different sectors (lighting, heat, apparatus etc). An ecological analysis of the district heating and comparison to electrical heating is also necessary.

Results

We present here the results of the analyses according to the different indexes. Material input for transport was not available.





This analysis shows that electricity and transport are the most urgent aspects to consider for reduction of environmental impacts, third important aspect is paper.

4. Information Technology

140 computers are used in the State Chancellery, almost one per employee. In total there are 511 electronic apparatus in use at different offices. According to first estimates this kind of amount of apparatus could use up as much electricity as there is energy embodied in all the paper used in the chancellery in one year.

Indicator	In the year 2000
Number of computers per employee	0, 97
Number of other apparatus per employee	2, 6

Objectives

=> Reduce the amount of electric appliances (i.e. one apparatus should be used by more employees).

=> Use energy efficient appliances efficiently (by switching them off or to stand-by when not in use)

=> Electronic waste (waste from computers and other apparatus, including phone batteries and disks) should be disposed of in environmentally acceptable way (e.g. returned to manufacturer).

5. Buildings and furniture

The embodied energy and material in different furniture and in the building should be assessed as well as the work environment and toxicities. In case of new buildings these aspects should be paid attention to. Furthermore, for building and renovation, local and less toxic materials should be used.

6. Cleaning

In terms of energy consumption, cleaning products seem to be relatively negligible. Yet, majority of these products is of foreign origin which means unnecessary transportation, therefore additional consumption of energy and material has taken place. Conventional cleaning products should be replaced by alternative (simple ingredients, environmentally acceptable) substances.

Objectives

=> Purchase toxicant-free locally produced cleaning products.

=> Prefer alternative (simple contents, possibly self-made) products. For example, for general use: ½ glass of borax (or vinegar) mixed with 3,5 liters of water or ½ glass of soda and one glass of vinegar mixed in 2 liters of warm water. Soda or borax could be used as cleaning paste.

7. Waste management

Waste management system in the State Chancellery is not complete. Separation of paper is implemented well (about 90 % of all paper is collected for recycling). Other kinds of waste are not separated, toxic waste like batteries are not always collected separately either. There is a battery-box in the Rahukohtu 1 house; in other houses its either not installed (Rahukohtu 3) or information was not available.

Objectives

=> Keep in mind easy disposal of products while purchasing them.

=> Start collecting different types of wastes separately (metals, plastics, glass, organic waste, dangerous waste) and make sure that separated wastes are accordingly disposed of (reused or recycled).

Ecological Footprint of the State Chancellery

References

Based on the results of this analysis it is evident that State Chancellery's footprint is at least 720 ha/years in total or at least 5 ha/years per employee. Naturally, these numbers are preliminary but by exploiting same methods in the future, changes could be assessed in the chancellery's environmental impact.

Is 5 ha per year per employee too much or too little? Calculation shows that there are little over 3 ha of land per person in Estonia. In State Chancellery's analysis only work related activities were included. Therefore we may say, that 5 ha per year per employees exceed Estonia's ecological capacity. Considering the equal share to all persons in the world the footprint shouln't exceed 2 ha/years. An overall objective for the State Chancellery should be achieving a footprint of 1,5 - 2 ha per year per employee.

Summary

This report contains a rough assessment to State Chancellery's environmental impacts.

Greatest impacts are brought on by electricity consumption, followed by transport. Impacts of paper usage are also significant. We believe that State Chancellery is able to reduce its impacts many times. For that, State Chancellery needs to deal with its environmental issues continuously. This includes developing an environmental policy. Employing an environmental manager is highly recommended.

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Review of the Green Office Report 2000 of the Estonian State Chancellery

As the carrying capacity of the Earth is being exhausted, more and more attention is drawn to problems related to practicing sustainable development. In addition to conventional economical bookkeeping new spheres of accounting - energetic and material balance - are arising in order to keep count of and bring to public consciousness the effect of routine daily life and the necessity to change it.

Estonian State Chancellery's activities environmental impacts were analyzed in this report and as a result its ecological footprint was presented. This footprint was found to be at least 5 ha per employee, which is surprisingly big, especially since the chancellery is so called paper-productive office and this analysis does not include indirect consumptions related to repairs of buildings, offices etc. Assessment of transport, paper use, electricity consumption, information technology, cleaning and waste management reflects only impacts caused by daily activities. Prerequisites to these activities were not taken into account.

Majority of the ecological footprint is composed of consumption of transport and electricity, but also paper. Every employee of the chancellery uses approximately four liters of fuel per day. Please allow me to remind you of what calculations so far indicate: two liters per day is the amount of fossil fuel that can be, if equally shared, utilized by one person on the Earth without causing risk of global climate change. Electricity consumption is three times bigger than fuel consumption if calculated in energy units. By adding up these two, it becomes evident that the chancellery needs to seriously consider reduction of its ecological footprint by first of all lessening travels and energy use of the buildings. And here, perhaps, is the biggest shortcoming of this report - it contains no assessment of how big a difference in the size of the footprint could be accomplished by concrete measures and which investments should therefore be made. The attempt to compare ecological footprint of management based on information technology with zero paper use and that of current paper-based management is rather constitution of a problem than its analysis.

This report clearly shows how unusual, strange and undeveloped "green accounting" today is. The laconic language and rough analysis in the report indicate best that this sort of reporting is yet raw and needs to be supported. The State Chancellery's initiative to assess its environmental performance must be acknowledged and analysis done so far should be continued and broadened. In the future, though, these assessments should include active participation of all employees because initial targets of this undertaking were to develop a different understanding of calculating and implementation of "green accounting" not only in the State Chancellery but also all over Estonia.

Continuing this work makes it possible to develop necessary methods of database-creation and data processing with management mechanisms, that would force not only organizations but also people and the whole country to "fit" in between the limits of environmental carrying capacity and to live and breathe in balance with the Earth, instead of overburdening the planet.

While reading this report, questions like "Do we really need to count kilograms of paper and liters of fuel used by 144 employees?" might arise, since these amounts seem microscopic compared to those causing global climate change. Of course, it is not about the State Chancellery with its 144 employees. There are six billion people in this world and counting. If every single one of them used the amount of energy equal to 16 liters of fuel with fossil origin in a day and 250 kg of paper in a year, then this would certainly cause a catastrophe. Human race, every one of us must learn "green accounting" and live his/her life accordingly.
Again, State Chancellery's initiative should definitely be continued and every firm, organization and family ought to be familiarized with "green accounting". This would prove that the Republic of Estonia has an alternative to "oil-shale-nihilism" - energy policy of the state in denial of reality.

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