LIFE Project Number

LIFE12 ENV/FIN/000409

Carbon footprint report (first contributions)

Reporting Date

01/09/2015

LIFE+ PROJECT NAME or Acronym

Climate change indicators and vulnerability of boreal zone applying innovative observation and modelling techniques

Data Project

Project location	Helsinki
Project start date:	02/09/2013
Project end date:	01/09/2017
Total budget:	2755288 €
EC contribution:	1366952 €
(%) of eligible costs	49.61

Data Beneficiary

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1 Summary

All activity of our society consumes energy and natural resources. One way of quantifying the energy consumption and our impact on the surrounding climate and environment, is to calculate the carbon dioxide equivalent of our consumption. As consumers and participants in the modern society we are encouraged to make smart choices in order to reduce the carbon footprint of our activity and save the environment and resources for future generation, reduce the amount of energy consumed and counter the effects of warming climate. This report presents the choices made and actions done to reduce the carbon footprint in the MONIMET-project.

2 Introduction

Our daily activities in the modern society we use energy as commuters, workers and consumers. The emissions from energy production have an impact on our climate and environment. During the beginning of the 21st century, we've seen our knowledge of the impacts grow and this has led to awareness that the resources are limited and their utilization can have strong negative effects on our surroundings. The work of atmospheric and environmental scientists and experts has also been recognised as a source of carbon emissions, mainly due to travel to conferences and collaboration institutes (Stohl, 2008). Carbon emissions to the atmosphere and possible consequences are currently one of the most burning questions in natural sciences.

One way to assess the impact of the project activities to the environment and climate is to calculate the carbon dioxide emission equivalent for the actions, so called 'carbon footprint' and consumption in the project. During the course of the project we try to minimize our effect. The project relies heavily on existing infrastructure and existing services, which reduces the related carbon dioxide emissions. While planning the project, the following actions were indicated in the project proposal as activities in reducing the greenhouse gas emissions resulting directly from the project implementation:

1. The project strives for as minimal carbon footprint as possible by arranging only needed amount of meetings and avoiding unnecessary travelling.
2. Of project beneficiaries SYKE has an ISO 14001 certified environmental management system which encompasses e.g. travelling, acquisitions, real estate management (energy and water consumption, waste), and paper consumption.
3. Teleconferences and -meetings are used primarily for work meetings.
4. National travelling involving experts and stakeholders are carried out mainly by train.
5. The project will avoid the unnecessary use of paper by using mainly electronic documentation and extranet- and Internet-facilities. The project follows-up this decision regularly.
6. The project team assesses how successfully these efforts have been reached throughout the project (Actions related to the project monitoring).

From the above actions the main two activities for saving in the carbon dioxide emissions are the replacement of the travel to meetings with teleconferencing and the reduction hardcopies of the project documents, where ever possible. Additionally all institutions are strongly committed in promoting greener offices. The partner institutes of the project are involved in programs, which try to reduce the environmental impact of office functions. Finnish Meteorological Institute (FMI) is taking part in the 'Green Office' – program of the World Wildlife Foundation (WWF). Finnish Environment Institute (SYKE) has its own ISO-standardized environmental program called EkoSYKE.

A model has been developed at SYKE, which is used to assess the environmental and climatic impact of the any function in society in the perspective of a consumer. The ENVIMAT-model (Seppälä et al. 2009) detailed in chapter 5 is one of the methods for the calculations of the carbon footprint of the MONIMET project.

3 Green office WWF

WWF Green Office (http://wwf.fi/en/green-office/) is a practical environmental management system for offices. With its help, you can reduce the ecological footprint and greenhouse gas emissions of the office. Office premises hold a key position in energy consumption and in sustainable solutions. Green Office motivates office staff to act in an environmentally friendly way with regard to everyday tasks, and improves environmental awareness and brings cost savings. The scheme will benefit both the organisation and the environment.

Green Office network in Finland is comprised of 168 organisations and 447 offices. In addition to Finland there are Green Offices in 12 other countries around the world. (June 2015)

Green Office is developed by WWF Finland. Ten year anniversary of Green Office was celebrated in 2012.

The three main goals of the Green Office program are

- To reduce the consumption of natural resources by developing the eco-efficiency of offices.
- To promote sustainable way of life by increasing the environmental awareness of employees.
- To slow down the climate change by promoting energy saving and use of renewable energy sources.

The program is also beneficial for the participants, since the consumption of energy and paper also reduce the costs at the Green Offices. The main themes of the program are paper consumption, consumption of electricity in appliances, commuting, heating and sorting of waste. Based on these themes a Green Office needs to fulfil the following criteria, in order to be awarded the diploma from WWF:

- Select a Green Office co-ordinator and team.
- Plans a practical environmental programme.
- Improve energy efficiency continuously in order to mitigate greenhouse gas emissions.
- Reduce waste, and recycle and sort out waste according to local requirements.
- Pay attention to green issues in procurements.
- Inform and educate its personnel about Green Office practices.
- Aspire towards continuous improvement in environmental matters.
- Choose the indicators, set numeric objectives and monitor the fulfilment of the objectives.
- Report to WWF annually.

In 2014, Finnish WWF Green Offices saved a total of 13,130 tonnes of greenhouse gas emissions compared to the previous year. The same amount of emissions would be released by driving a car a hundred times to the Moon and back. Savings nearly doubled when compared to the previous year's results and reached an all-time high.

By participating in the Green Office- program, FMI wants to reduce the environmental burden and participate in slowing down the climate change. In addition to conducting research on climate change, FMI wants to be part in the mitigation measures. FMI was granted the 'Green Office'- diploma in June 2008.

4 EkoSYKE

As the governmental institute for environmental research and expertise in Finland the Finnish Environment Institute also needs to set example on measures in protecting the nature and reducing the environmental burden from the activities in and outside the office.

The EkoSYKE- environmental management system was certified according to ISO 14001-standard in October 2006. The certificate was evaluated by DNV GL, a foundation for providing classifications, certifications and verifications for large range of functions in society and industry. The certification was renewed in 2009, 2012 and 2015. The ISO 14001 is the most recognized and used framework for environmental management systems. The core concept for the standard is that the organization is continually improving their environmental friendliness.

EkoSYKE- program has the following overall goals:

- To become a carbon neutral organization by 2017
- To reduce harmful effects of SYKE's purchases on nature and water systems

- To increase SYKE's employees' awareness and positive attitude towards environmental issues and also to encourage them to take environmental issues into consideration in their everyday life

The Finnish Environment Institute SYKE has made three society's commitments to sustainable development. The commitments are a response to the campaign by the Finnish National Commission on Sustainable Development, which challenges a variety of organisations to take practical measures. SYKE's commitments promote the goals of a carbon neutral society, reduce the harmful effects of food on nature and water systems, and support development towards a more multicultural society.

Two of the commitments are incorporated to the EkoSYKE-management system.

The environmental impact of the SYKE offices and laboratories is annually evaluated. The main indicator used by monitoring the progress is the carbon footprint of SYKE. The carbon footprint calculation includes:

- Research vessel Aranda
- Travelling (business travelling, not commuting)
- Energy consumption
- Waste management

In addition to carbon footprint calculation, the amount of procurements and paper consumption is also monitored and reported.

There is also a systematic evaluation process for all projects at SYKE for the environmental impact through the project lifespan. An evaluation document is filled out and archived together with the project documentation. Depending on the nature of the project, at least the following themes are covered.

- Chemicals and substances, used in the project, causing environmental risks: Risk assessment and precautionary measures.
- Travel during the project: Means of transportation; routes; replacing meetings in far locations with tele-/videoconferences.
- New procurements: Common procurements with other institutes; leasing; renting; environmental friendliness of the procurements etc.

The above list is not exhaustive, but shows that the impacts of the projects are considered in depth. If the implementation of the project mainly includes the office work at the institution, which is already covered in EkoSYKe, the evaluation is not performed, but the reason for this is written down on the form and archived.

5 ENVIMAT

A research project was established in 2002 in SYKE to assess the impacts of production and consumption in the Finnish Economy. The project used the years 2002-2005. This resulted in the ENVIMAT model (Seppälä et. al 2009), which can be used to analyze the relationship between material flows, environmental impacts and economic impacts. The model is based on monetary and physical input-output tables and an environmental life cycle impact assessment, which is one of the central areas of research and development at SYKE.

The input-output tables, based on commodity groups of COIOP (Classification of Individual consumption by purpose) classification, established by the United Nations have been constructed based on life span analysis of commodities and services (work done at SYKE). They give the greenhouse gas emissions and energy consumption per spent euro. The model is currently indicating the commodities and services for households, but it is considered here to give a good estimate also for the same services in large institute.

The greenhouse gas emissions that can be seen as a direct result of the implementation of the project will be calculated using the ENVIMAT- model. We will only consider the additional emissions due to direct purchases for the project. This will exclude the regular use of electricity, heating and regular office functions, since all institutes are committed in greener offices. The main commodity categories and related greenhouse gas (GHG) emissions and energy consumption, applicable in the MONIMET- project, given in **Error! Reference source not found.**.

Table 1.The main categories and assumptions for Greenhouse gase emissions, energy consumption

COICOP-class	Commodity group		GHG kg/€	Energy consumption MJ/€
C072	Utilization of personal vehicles		1,4	16,5
C0733	Travel – aeroplane		1,2	12,3
C0731	Travel - train, metro, tram		0,5	9,5
C0732	Travel - bus and taxi		0,7	8,8
C081	Telecommunication		0,2	1,6
C091	Audiovisual, photographic and IT- equipment		0,4	2,6
C094	Recreational- and cultural services (including conferences and exhibitions)		0,2	2,7
C111	Catering services	0,4	0,4	2,2
C112	Accommodation services	0,5	0,5	2,8
C127	Other un-categorized services	0,3	0,3	3,0

6 References

Stohl, A. 2008. The travel-related carbon dioxide emissions of atmospheric researchers. *Atmospheric Chemistry and Physics Discussion, 8, 2008.*

Seppälä, J., I. Mäenpää, S. Koskela, T. Mattila, A. Nissinen, J.-M. Katajajuuri, T. Härmä, M.-R. Korhonen, M. Saarinen and Y. Virtanen. 2009. Suomen kansantalouden materiaalivirtojen ympäristövaikutusten arviointi ENVIMAT-mallilla. *Suomen ympäristö, 20, 2009.*