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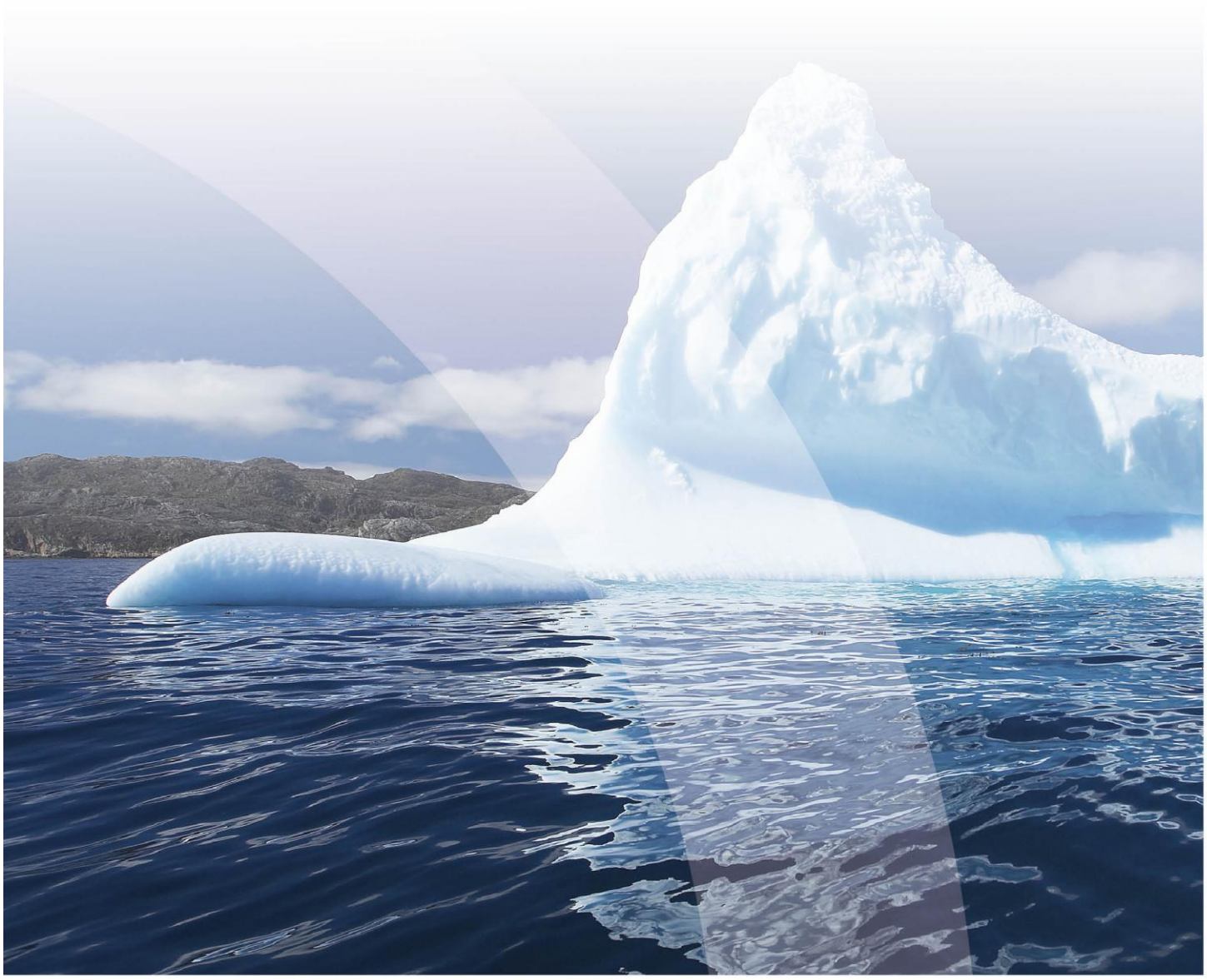
Norsk institutt for luftforskning
Norwegian Institute for Air Research

Environmental Management Report

2010



Contents

Environmental Management Report 2010

1 NILU's Environmental Policy

A portion of the NILU Objectives states that: "NILU shall investigate and assess technical, economic, hygienic and other environmental questions related to air pollution and the cleaning of polluted air."

The environmental policy of NILU is thus both to reduce, as far as possible, the direct environmental impact of the institute's activities and to contribute to better management of the environment by providing fundamental knowledge for authorities and other decision-makers.

Integral parts of NILU's environmental management system are an assessment of the environmental impacts and an implementation plan with actions to reduce the prioritized impacts as best as possible.

It is NILU's clear intention to always comply with relevant laws and regulations. NILU will continuously work to prevent pollution and to improve the institute's environmental impact.

2 Background

One of NILU's main goals is to study the impact of pollution. It is thus very important for the institute to have control of the impact the institute's own activities may have on the environment and to reduce the impact as far as possible.

NILU has for many years been working to reduce the impact. In order to take this one step further, it was decided that the institute should restructure the work according to a relevant environmental standard and to seek certification according to the same standard.

The chosen standard is ISO 14001:2004 (Environmental management systems—Requirements with guidance for use) and NILU achieved certification according to this standard in October 2010.

3 Overview of the status of the indicators

Each indicator is described in detail in chapter 4

Indicator	Parameter	2010	2009	Evaluation/Comments
Assessment of environmental impacts	Action plan	Yes	-	☺
Heating and cooling systems	-	-	-	Changing to district heating and cooling in 2011
Energy efficiency	-	-	-	To be addressed in 2011
Travels and meetings	CO_2-emissions due to air travel (kg)	32 880	-	?
	Distance travelled by car (km)	96 131	100 633	☺
Travels to and from the place of work	-	-	-	Not addressed in 2010
General waste	-	-	-	Not addressed in 2010
Chemical waste	-	-	-	Not addressed in 2010
Water consumption	Consumption of water (m^3)	7 229	7 832	☺
Consumption of paper and other cellulose based products	-	-	-	Not addressed in 2010
Emissions to air	-	-	-	Not addressed in 2010
Emissions to water	-	-	-	Not addressed in 2010
Requirements for suppliers	-	-	-	Not addressed in 2010
Environmentally friendly products	-	-	-	Not addressed in 2010
NILU's research	Good examples	Yes	-	☺
NILU's research based services and products	Good examples	Yes	-	☺
Energy classification of the building at Kjeller	Energy Certificate	-	-	To be addressed in 2012
Handling of dangerous materials	Compliance	Yes	-	Next evaluation in 2013

4 NILU's Environmental Indicators

4.1 Assessment of NILU's environmental impacts

4.1.1 Assessment of environmental impacts

In 2010, NILU carried out an assessment of the main environmental impacts of the institute's activities and established an action plan for the coming years ("Miljøprogram").

4.2 Energy consumption

4.2.1 Heating and cooling systems

NILU's main building is located at Kjeller and has, since it was built in 1993/1994, been heated and cooled by electric power. In 2010 it was decided to substitute electric power with a centralized heating and cooling operation for the local district. This will require major changes in the technical installations serving the building and will have to be carried out in such a way that it does not interfere with NILU's daily routines.

The first step is removal of the existing cooling compressors and installation of the necessary heat exchangers. This was started at the end of 2010 and must be finished before cooling may be necessary in March 2011. During the summer of 2011, the new heating equipment will be installed.

All in all, district heating and cooling should be in use in NILU's building at Kjeller in the fall of 2011.

4.2.2 Energy efficiency

After NILU's building at Kjeller has fully switched to district heating and cooling, energy consumption will be substantially reduced and at that time we will carefully go through the remaining use of electric power in order to reduce consumption.

4.2.3 Travels and meetings

In 2010, NILU has installed equipment for video conferences both at Kjeller and Tromsø. This has significantly reduced the need for travel and has improved communication.

When ordering a travel, the employee must describe why it was not possible to use the equipment for video conference.

In order to monitor the environmental impact, NILU has established two parameters:

- CO_2-emissions due to air travel
- Distance travelled by car (km)

4.2.4 Travels to and from the place of work

This has not been addressed in 2010.

4.3 Waste

4.3.1 General waste

NILU has for several years separated the waste into the following categories:

- Paper and other cellulose-based products
- Glass
- Plastics
- Food waste
- Chemical waste
- Electronic equipment
- Batteries
- General waste

In 2010 we started to evaluate the waste handling and the process of finding one company that could receive all our waste in order to establish an overview of the total amount of each category. The set main goal is to reduce the amount of "General waste". This will be finalized in 2011.

4.3.2 Chemical waste

NILU has, for many years, delivered chemical waste to a certified receiver and will continue to do so.

4.4 Raw materials and resources

4.4.1 Water consumption

In order to monitor the environmental impact, NILU has established the following parameter:

- Consumption of water (m^3)

4.4.2 Consumption of paper and other cellulose-based products

This has not been addressed in 2010.

4.5 Emissions

4.5.1 Emissions to air

This has not been addressed in 2010.

4.5.2 Emissions to water

This has not been addressed in 2010.

4.6 Procurements

4.6.1 Requirements for suppliers

This has not been addressed in 2010.

4.7 Products

4.7.1 Environmentally friendly products

This has not been addressed in 2010.

4.8 Environmental impacts of NILU's activities

4.8.1 NILU's research

The positive environmental impacts of NILU's research are illustrated by describing a few good examples (Chapter 5).

4.8.2 NILU's research-based services and products

The positive environmental impacts of NILU's research-based services and products are illustrated by describing a few good examples (Chapter 5).

4.9 Energy classification

4.9.1 Energy classification of the building at Kjeller

It is a requirement that all corporate buildings in Norway, with an area of more than 1000 m^2, shall be classified according to the energy consumption. Since NILU in 2011 is changing to district heating and cooling, it has been decided that the energy classification will be carried out in the first half of 2012.

4.10 Dangerous materials

4.10.1 Handling of dangerous materials

In 2009, a new regulation on handling of dangerous materials was published in Norway (FOR-2009-06-08-602). NILU has gone carefully through this regulation and concluded that we are in compliance (see Chapter 6).

5 Good Examples

European super-site

The upgrading of Birkenes observatory will turn it into one of the main observatories in Europe when it comes to understanding trends in emissions of greenhouse gases and pollution. This will strengthen the field of particle research. A better understanding of the composition and mechanisms associated with particles is essential in order to make climate modelling more accurate.

Soot in the Arctic

With an analysis combining measurement data of Equivalent Black Carbon (EBC) from several Arctic stations, together with calculations from the Lagrangian particle dispersion model FLEXPART, NILU has identified the most important source regions of black carbon that are transported into the Arctic troposphere and how this changes with the seasons.

Mercury in the Environment

Mercury (Hg) poses a serious threat to our global ecosystem. According to the United Nations Environment Programme (UNEP), coal-fired power plants and garbage incinerators emit thousands of tons of mercury into the atmosphere every year. Supported by research from NILU, UNEP is now working on a global, legally binding treaty to control mercury pollution. According to plan the treaty will be implemented by 2013.

Environmental Toxins

NILU´s research is of high quality, and its work in the field of environmental chemistry is widely recognized. Samples are scaled down until they are pure, before being analysed by using advanced instruments. Scientists recover the environmental toxins, both known and unknown, in the so-called chromatograms.

Searching for Tomorrows Toxins

Thousands of individual chemical compounds are produced in large scale over the entire planet. However, the effect these new substances have on humans and on the environment remains largely unknown. It is a major challenge to identify new pollutants and foresee where problems may occur. NILU in collaboration with a team of international experts, has developed a mechanistic multimedia model to give more precise information.

CO_2 Capture and Amine Emissions

Amines are chemical components derived from ammonia, where the hydrogen atoms are replaced by organic groups. While amines are the most efficient and effective technology currently available to capture CO_2, the effects of amine emissions to the environment are relatively unknown. NILU has been performing ground-breaking research to analyze these compounds and their associated effects, and strongly encouraging industry to take these issues into consideration.

Quality Control and Traceability

NILU is working to ensure the quality of the measuring data from various measuring networks by using a comprehensive quality control system. The system states procedures for the operators of the instruments in their daily work. As of 2009, this system is in active use with 14 different network owner/operators in the city surveillance networks in Norway. The system ensures the comparability of the collected data by using measuring instruments calibrated with reference standards that are traceable to common national reference standards.

Health Effect Laboratory

With the new health effect laboratory, NILU will investigate the direct health impact of pollution, climate change and new materials on humans and animals. Its establishment completes the "circle" of monitoring, modelling, analysing, evaluation and effects implemented at NILU.

6 Laws and regulations

NILU's clear policy is to be in compliance with all relevant laws and regulations. We have done a thorough evaluation and concluded that we are in compliance with the following:

LOV-1976-06-11-79: *Lov om kontroll med produkter og forbrukertjenester (Produktkontrolloven)*

LOV-1981-03-13-6: *Lov om vern mot forurensninger og om avfall (Forurensningsloven)*

FOR-2001-06-08-602: *Forskrift om håndtering av brannfarlig, reaksjonsfarlig og trykksatt stoff samt utstyr og anlegg som benyttes ved håndteringen*

FOR-2004-06-01-930: *Forskrift om gjenvinning og behandling av avfall (Avfallsforskriften)*

7 Actions in 2011

In 2011, NILU's environmental management system will mainly focus on the following tasks:

- Maintaining and improving the Environmental Management System (EMS)
- Finalizing the transition from heating and cooling by electric power to district heating and cooling at Kjeller
- Analysing the remaining use of electric energy
- Further development of indicators and parameters
- Establish a total overview of the amounts of waste in the various fractions

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ABSTRACT (in Norwegian)

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A Unclassified (can be ordered from NILU)
B Restricted distribution
C Classified (not to be distributed)

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NILU is an independent, nonprofit institution established in 1969. Through its research NILU increases the understanding of climate change, of the composition of the atmosphere, of air quality and of hazardous substances. Based on its research, NILU markets integrated services and products within analyzing, monitoring and consulting. NILU is concerned with increasing public awareness about climate change and environmental pollution.