ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

Sustainability report of the Finnish Meteorological Institute

Introduction

We will remember 2022 as an exceptional and historic year. Russia's attack in Ukraine changed the safety situation throughout Europe. The energy crisis and inflation affected both preparedness and the economic situation. The long-term recommendation for remote work in central government ended and the world around us gradually started to open up, even though the coronavirus pandemic continued.

Despite the challenging operating environment, the Finnish Meteorological Institute continued to strive to meet the expanding needs and expectations of stakeholders in both service production and the production of researched data during the past year. The Finnish Meteorological Institute has also increased its participation in projects directed at developing countries. We achieved our goals well. Our customers showed trust and satisfaction in our operations. The job satisfaction of our own personnel was also high.

In this report, we will discuss our projects that we use to promote the implementation of the UN Sustainable Development Goals. We also report on the negative impacts of our own activities, which we constantly strive to mitigate.

We always go hand in hand with responsibility and sustainability in our everyday work. We strive to provide safety and smoothness for society as a whole both in Finland and internationally. We produce information to support decision-making and help make sustainable decisions that rely on researched information. However, in terms of sustainability, we still have much to do.

In 2022, we launched a cooperation project with Aalto University to develop our sustainability operations. Our goal is to create a sustainability programme for the Finnish Meteorological Institute and clarify our goals and indicators. In the future, we aim to better identify the impacts of our own activities to promote the UN Sustainable Development Goals, but also the footprint of our activities. Students have given us plenty of tools for developing our own work. Our efforts to develop sustainability continue at the Finnish Meteorological Institute.

Jussi Kaurola

Director General

Description of the Finnish Meteorological Institute

The Finnish Meteorological Institute observes and studies the atmosphere, inner space and seas. It also produces services on the weather, sea, climate, air quality and inner space for the needs of public security, business life and citizens. The Finnish Meteorological Institute is an administrative branch of the Ministry of Transport and Communications.

The Finnish Meteorological Institute employs approximately 750 people (696 person-years in 2022). The headquarters of the Finnish Meteorological Institute is located in Helsinki. It also has other locations in Kuopio, Rovaniemi and Sodankylä. In addition, the Finnish Meteorological Institute carries out sounding activities in Jokioinen.

In addition to the Director General and its Office, the Finnish Meteorological Institute has six divisions: Administration; Observing and Information Systems Centre; Weather, Sea and Climate Service Centre; Meteorological and Marine Research Programme; Climate Research Programme; and Space and Earth Observation Centre.

The activities of the Finnish Meteorological Institute are governed by the Act on the Finnish Meteorological Institute 212/2018.

Strategy of the Finnish Meteorological Institute

International cooperation is an integral part of the meteorological sector. The strategic goal of the Finnish Meteorological Institute is to be an international pioneer within its field. We seek leadership in the international community so that we can contribute to the development of our sector and promote the impact of our activities.

Together with our partners, we produce increasingly versatile, the best Nordic data on weather conditions, so that the conditions will not surprise anyone now or in the future.

We anticipate the changing needs of our customers and other stakeholders in our operations to best serve our stakeholders.

The prerequisites for success will help us achieve our strategic goals and vision. Our values – collaboration, impact, pioneering – guide our everyday actions.

Responsibility at the Finnish Meteorological Institute

Sustainability and sustainability measures are woven into the Finnish Meteorological Institute's mission and everyday work. Our research and services provide safety, smoothness and economic efficiency for society as a whole and promote sustainable decision-making based on researched information. We promote economic, social, environmental and research responsibility in our activities.

In autumn 2022, the Finnish Meteorological Institute launched a collaboration project with Aalto University aimed at developing its sustainability activities. The project assessed the sustainability activities of the Finnish Meteorological Institute, interviewed the Finnish Meteorological Institute's stakeholders and mapped out the best practices.

As the result of the project, the Finnish Meteorological Institute received several proposals for developing its sustainability activities. This work will continue in 2023 in a sustainability working group. The most important measure is to create a sustainability programme for the Finnish Meteorological Institute, including targets, indicators and clarifying the management model.

Sustainability report 2022

Examples of the activities and results of action related to sustainability at the Finnish Meteorological Institute in 2022 have been compiled in this sustainability report.

The sustainability report of the Finnish Meteorological Institute has been prepared by a cross-organisational working group, which included representatives from the sectors of Administration, Weather, Marine and Climate Services, Climate Research and Communications. In addition, several experts from the Finnish Meteorological Institute have produced information for the report. The Management Group of the Finnish Meteorological Institute has approved the sustainability report.

We publish the sustainability report annually according to the State Treasury's guidelines.

The activities of the Finnish Meteorological Institute and the UN Sustainable Development Goals

The activities of the Finnish Meteorological Institute are related to several UN Sustainable Development Goals. In the sustainability report, we discuss our activities related to four of the UN Sustainable Development Goals.

These objectives are:

- Ensuring a healthy life and well-being for people of all ages (SDG 3)
- Ensuring safe and sustainable cities and human settlements (SDG 11)
- Taking urgent action to combat climate change and its impacts (SDG 13)
- Strengthening the means of implementation and revitalize the global partnership for sustainable development (SDG 17)

Handprint 1: Good health and well-being (SDG 3)

***Goal 3.9**. Significantly reduce the number of deaths and diseases caused by hazardous chemicals and, the pollution and contamination of air, water and soil by 2030.*

The aim of the Finnish Meteorological Institute is to guarantee a healthy life and well-being for people of all ages by acting as an expert in air quality, thus helping reduce the harm caused by outdoor air pollution. The Institute produces information and services for citizens and different sectors of society.

The Finnish Meteorological Institute is responsible for numerous statutory tasks related to air quality and related services for authorities, different sectors of society and citizens in Finland. For example, we produce national air quality forecasts and air quality measurement services and assessments for cities and industry in Finland. In addition, we are responsible for the operations of the national air quality reference laboratory and the air chemistry laboratory.

The Finnish Meteorological Institute's strong international expertise in air quality is also exported. The aim is to strengthen the ability of developing countries to produce better air quality services for their citizens.

The Finnish Meteorological Institute has carried out various projects aimed at improving air quality globally in more than 30 countries. Many projects have developed comprehensive monitoring and management of air quality in the target country, from legislation to improving air quality.

In 2022, air quality projects were carried out in the following countries: Tajikistan, Kyrgyzstan, Uzbekistan, Chile, Vietnam, Iran, Rwanda, Kenya, Tanzania, Ethiopia and Ukraine.

The Finnish Meteorological Institute is involved in work that affects the development of air quality monitoring. The RI-URBANS project (2021–2025) develops new innovative service tools based on research for the use of air quality measurement networks. The project evaluates new measurable air quality variables, the real-time contribution of emission sources and the related health impacts. Service tools are piloted in 9 European cities. In cooperation with other European research institutes, the project will help to find solutions to air quality problems and to produce forecasts and information for citizens and decision-makers. Ultimately, this work supports the reform of air quality directives and the reduction of emissions relevant to health.

Demand for air quality measurement services in industry and cities has increased. As a result, the number of air quality measurement stations of the Finnish Meteorological Institute has clearly become the largest in Finland, including a total of 26 measurement stations at the beginning of 2023

Handprint 2: Sustainable cities and communities (SDG 11)

Goal SDG 11.b *By 2020, substantially increase the number of cities and human settlements by adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation of and adaptation to climate change, resilience to disasters, and develop and implement holistic disaster risk management at all levels in line with the Sendai Framework for Disaster Risk Reduction 2015–2030.*

The Finnish Meteorological Institute strives to improve the safety of cities and residential communities by producing information on weather, seas, climate and its change, and natural disasters. Information is produced, for example, as an operational 24/7 warning service for different actors in society, including those maintaining critical infrastructures. The purpose of the services is to provide operators with time to prepare and to describe the impacts of harmful and dangerous conditions on their activities. The preparedness data produced by the Finnish Meteorological Institute and European sister institutions will also be utilised by the Emergency Response Centre of the European Commission when preparing to send humanitarian aid to various locations.

The Finnish Meteorological Institute's research activities continuously produce new information to support local and regional adaptation in a changing climate. Among other things, the projects develop climate economic preparedness and prepare sector-specific climate risk management reports for such purposes as construction and urban planning, so that changing climate risks are taken into account in a way that considers the special features of the area in question.

In addition, the Finnish Meteorological Institute participates in the development of weather and climate models in order to produce better forecasts for constantly changing conditions.

Exposure to heat increases morbidity and mortality, especially in vulnerable populations and especially in urban areas where the heat island phenomenon further increases temperatures. The Finnish Meteorological Institute is involved in the HEATCLIM project (2020–2023), which produces new scientific information on the health hazards of high temperatures and social and societal factors related to heat sensitivity. It aims to provide cost-effective and socially acceptable solutions for climate change adaptation. In the project, the Finnish Meteorological Institute examines how often heat waves will occur in the future and how harsh they will become as a result of climate change. We are also studying how heat could be forecast over a period of a few weeks.

Handprint 3: Climate action (SDG 13)

***Goal SDG 13.1**: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.*

***Goal SDG 13.2**: Integrate climate change measures into national policies, strategies and planning.*

***Goal SDG 13.3**: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.*

The Finnish Meteorological Institute promotes climate change mitigation and adaptation by conducting climate research and developing tools to support the implementation and impact assessment of mitigation and adaptation measures. The Institute's research data supports decision-making internationally, nationally and locally.

Our climate research focuses on understanding and predicting the functioning of the climate system and its changes. Our research supports climate change mitigation measures, for example, by producing information on the possibilities of carbon sequestration in terrestrial ecosystems. In addition, we promote adaptation to climate change in different sectors of society with the aim of developing an understanding of the urgency, significance and prioritisation of the measures together with operators.

We support the planning of Finland's climate policy and strategies by participating in the activities of the national scientific panels in the field, i.e., the Climate Change Panel, the Nature Panel and the Forest

Bioeconomy Panel. We are also involved in numerous ministry-funded and Government projects developing climate risk management together with Finnish operators. The Director General of the Finnish Meteorological Institute chairs the national IPCC working group, and its experts have participated in writing the IPCC evaluation reports.

We actively communicate about climate change to citizens, decision-makers and the private sector. Among other things, the Finnish Meteorological Institute maintains the Climateguide.fi website. The Institute has a long history in different levels of educational and teaching cooperation and various stakeholder events. Additionally, the institute has provided Finnish journalists with climate change training involving hundreds of journalists since 2007.

Satellite observations of greenhouse gases provide independent information to verify the realisation of emission reductions with the goal of mitigating climate change but using them requires investments in research and mathematical method development. In 2022, the Finnish Meteorological Institute developed computational methods for assessing emissions from concentration observations made with satellites. Research has been carried out especially as part of the Centre of Excellence of Inversion Modelling and Imaging funded by the Academy of Finland and an EU-funded project that has developed a pre-operative system for verifying carbon dioxide emissions. International collaboration has played an important role in developing methods for assessing emissions, either from individual satellite overflights or over a longer period of time. Collaboration has been emphasised, for example, when comparing different technologies and assessing their strengths and weaknesses, especially with regard to satellites under construction.

In autumn 2022, the Finnish Meteorological Institute invested in new energy weather services, responding to society's demand for information on the impact of the weather on electricity production and consumption. Before winter 2022–2023, the Finnish Meteorological Institute started producing an energy weather forecast for the general public on its Twitter account and website. The purpose of this was to help households take into account and anticipate the potential impact of wind on electricity production and price and the effect of temperature on electricity consumption.

Handprint 4: Partnerships to achieve the goal (SDG 17)

Goal 17.6 *Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism.*

International collaboration is integrated to all aspects of the Finnish Meteorological Institute's activities: observation, research and service production. Exchange of observations, joint weather model development, international research cooperation and joint weather service production with sister institutions are examples of everyday cooperation with international partners.

The Finnish Meteorological Institute represents Finland in the World Meteorological Organisation (WMO), the aim of which is to ensure that its 193 member states have access to the best technical and material opportunities to manage statutory weather services and the associated warnings. To achieve this, the WMO promotes the free exchange of weather observation data and products between member states.

Other important international cooperation bodies include the European Centre for Medium-Range Weather Forecasts ECMWF, the European Organisation for the Exploitation of Meteorological Satellites EUMETSAT and the European Meteorology Networks EUMETNET as well as the Nordic Meteorology Network NORDMET. In addition, the Institute's research activities are closely linked to many international collaboration networks and also serve scientific cooperation on the North-South axis.

The Finnish Meteorological Institute has exported expertise and Finnish technology to support developing regions since the 1970s. The aim of the cooperation is to help developing countries to safeguard human lives and property. Over the years, the Finnish Meteorological Institute has strengthened its position in international development projects.

According to the Development Policy Results Report published by the Ministry for Foreign Affairs in 2022, weather and climate services developed with the support of the Finnish Meteorological Institute in target countries help up to 500,000,000 people prepare for climate change and extreme weather phenomena.

In 2022, the Finnish Meteorological Institute had around 30 international development projects in approximately 20 different countries.

In January 2022, the Finnish Meteorological Institute launched a development project funded by the Finnish Ministry for Foreign Affairs with the Ukrainian Hydrometeorological Institute. The aim of the project is to update Ukrainian weather and warning services together and to develop personnel competence. The new and improved weather service in Ukraine helps society and citizens adapt to dangerous weather conditions brought about by the changing climate.

Due to the Russian war of aggression, the project was on hold for three months in spring 2022. In autumn 2022, some meteorologists from the Ukrainian weather service worked at the Helsinki office of the Finnish Meteorological Institute for two months. During their visit, the meteorologists familiarised themselves with the use of new tools and programs with the guidance of their colleagues at the Finnish Meteorological Institute and promoted the cooperation project in Finland. With the project, the Finnish Meteorological Institute played a key role in integrating Ukraine's national weather service into the European Meteorological Society. A key achievement was the integration of the Ukrainian Hydrometeorological Institute into the European Meteoalarm warning service.

Footprint, i.e., negative impacts of activities on the operating environment

Environmental sustainability

The Finnish Meteorological Institute is involved in the WWF Green Office environmental programme. The Finnish Meteorological Institute monitors the negative impacts of its own activities on the environment. Regularly monitored issues include the energy consumption, waste volumes and paper consumption of the Finnish Meteorological Institute's office building.

Due to the nature of the Finnish Meteorological Institute's international activities, the largest single source of carbon dioxide emissions comes from flight kilometres. The next two largest emission sources have been electricity and district heating. As part of Senate Properties' carbon neutrality targets, the premises of the Finnish Meteorological Institute in Kumpula, Helsinki, have also started using zero-emission electricity and district heating. In 2015, solar panels were installed on the roof of the Finnish Meteorological Institute's office building. The electricity production of the panels has been approximately 18,500 kWh per year. In 2022, the solar energy plant was inoperative – even though the year was sunny, electricity production remained very low.

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Since the travel restrictions because of the pandemic were partly dismantled in 2022, air travel has returned close to the pre-pandemic travel volumes. Presumably, remote meeting practices that were established during the pandemic may keep the number of flight kilometres slightly lower than in the years preceding the pandemic in the future. In the future, increased hybrid work will also reduce the emissions and air quality impacts caused by commuting between home and workplace. On the other hand, the

hybrid work model shifts electricity consumption to households, and not all households have access to zero-emission energy contracts.

The Finnish Meteorological Institute has versatile recycling opportunities. According to the waste records for 2022, 77.35% of waste ended up in recycling and reuse.

Environmental impacts are also taken into consideration in the housekeeping services of the Finnish Meteorological Institute and in procurements. Thanks to secure printing and electronic documents, office paper consumption has decreased significantly.

In everyday work at offices, environmentally sustainable choices are promoted with campaigns. The Finnish Meteorological Institute participates in the annual energy saving week, the Earth Hour campaign and the Kilometrikisa cycling competition, among other events. In 2022, the Finnish Meteorological Institute signed up for the Down a degree campaign. The temperature in the Kumpula premises was lowered by one degree, and the personnel's sauna services were temporarily out of use. Personnel were encouraged to save energy even with small actions: by turning devices off when not in use, by turning off the lights in empty spaces and using stairs instead of the elevator.

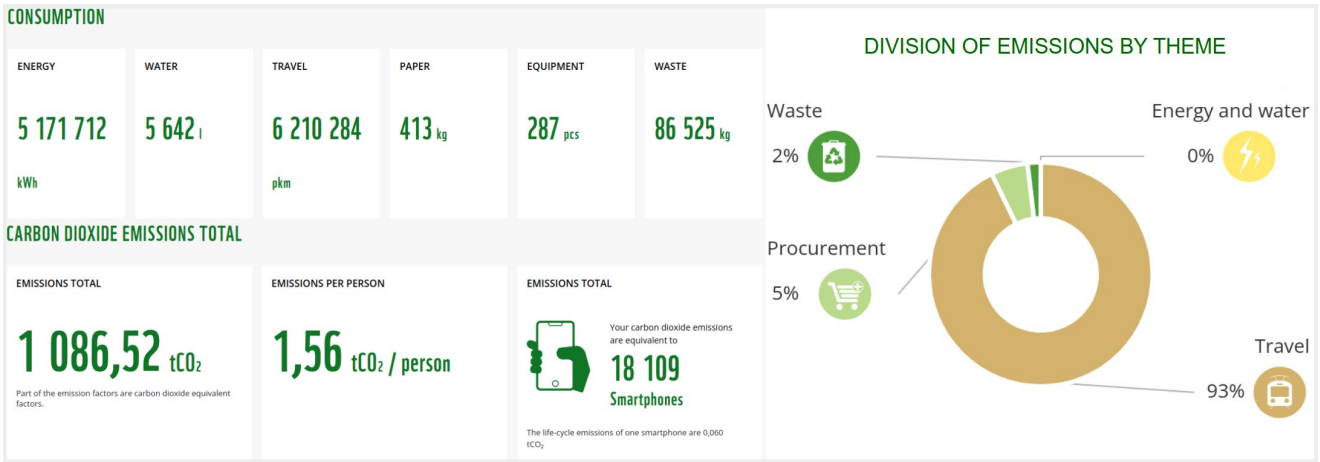
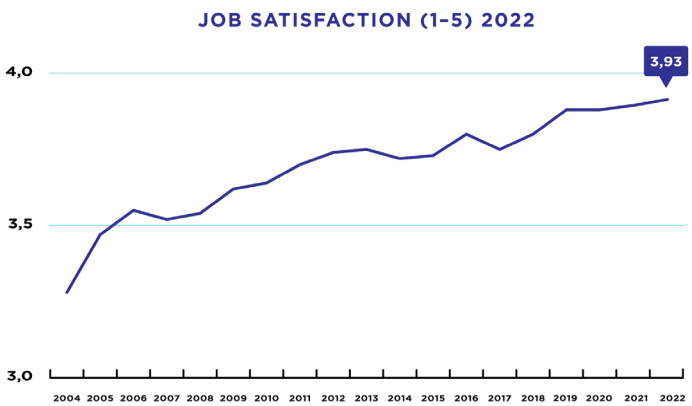


Figure 1. A compilation of the Finnish Meteorological Institute's consumption and carbon dioxide emissions in 2022. The data is from the Green Office counter.

Social sustainability

In accordance with its strategy, the Finnish Meteorological Institute is a healthy and developing workplace. The annual job satisfaction survey conducted in 2022 yielded excellent results, as the personnel's overall job satisfaction index rose to 3.93 (scale 1–5). Themes related to job satisfaction development in 2022 included hybrid and remote work, collaboration and interaction as well as the organisation of work and management.



In 2022, we invested in personnel's well-being and skill development in many different ways. A lecture series on well-being at work was organised for the personnel during the year. We cooperated with the Institute's supervisors on everyday human resources issues. Support was provided especially in themes related to remote management, such as maintaining interaction and the sense of community, performance management and other topical issues.

A great number of recruitments were carried out in 2022. Vacancies in the Institute are filled either through the internal registration procedure or as a public call for applications. In order to support the career development of personnel, information on vacancies is also communicated internally, and personnel are encouraged to develop their skills also by applying for new positions. Recruitments comply with the central government's joint recruitment process and investments are made in applicant communications. Each year, the Finnish Meteorological Institute offers internships to Finnish and international students as well as TET work practice opportunities, non-military service placements and other positions supporting employment as agreed with the TE Employment Centre.

The Finnish Meteorological Institute prepares an annual equality and non-discrimination plan. The measures of the plan promote equal pay, equal recruitment practices, equal opportunities for career development and professional development, the creation of equal and non-discriminating working opportunities, the reconciliation of work and private life, and management at different stages of a career. In the 2022 job satisfaction survey, the result of the question "Gender equality is realised in my work community" was 4.4 and the result of the question "Equality of people is realised in my work community" was 4.29 (scale 1–5).

Research sustainability

The Finnish Meteorological Institute complies with national and European principles of open science in its activities and has invested heavily in the implementation of these principles in recent years. Open science promotes the efficiency and good quality of research and enables its more extensive use in society.

In the monitoring of open science in research institutes, universities and universities of applied sciences, the Finnish Meteorological Institute was ranked at the top of research institutes in 2022. The monitoring examined the share of open publications in all publications, the operating culture of open research and services in the organisation. In 2022, more than 80% of the Institute's research publications were open publications.

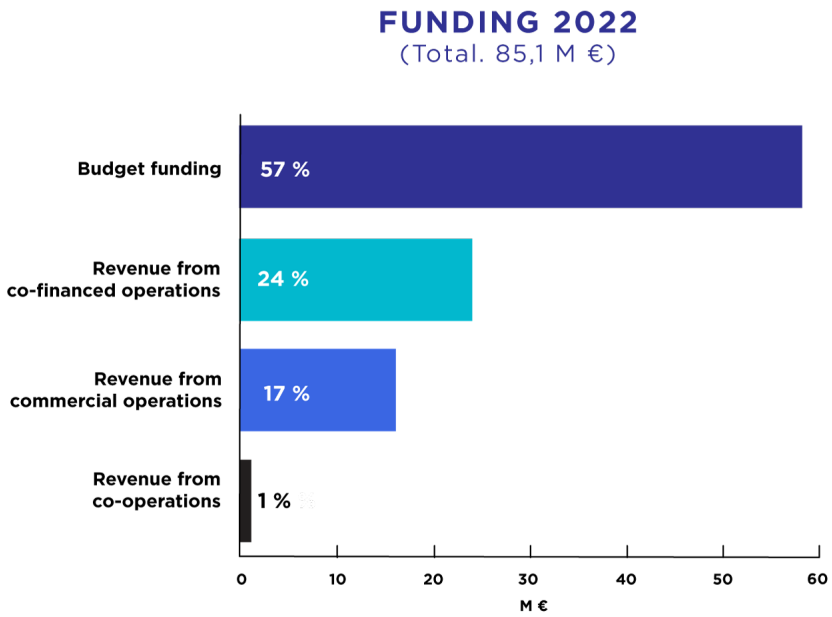
The Finnish Meteorological Institute also sought to promote open science at the European level. The Institute participated in three international projects that develop and implement the European Open Science Cloud (EOSC) environment. The EOSC initiative aims to provide a multidisciplinary environment open to European researchers and other operators, allowing them to publish and use research data and tools for research and education.

Financial sustainability

The financial operations of the Finnish Meteorological Institute are governed by the State Budget Act and Decree and the regulations and instructions based on them. In 2022, there were no misconducts concerning the funds or assets of the Finnish Meteorological Institute.

The total expenditure of the Finnish Meteorological Institute was EUR 85.1 million in 2022. The expenditure level increased by around EUR 7 million from 2021. The majority of the increase was due to increased operating costs. The increase in revenue was approximately EUR 3.5 million, most of which consisted of the increase in jointly funded research activities.

The Finnish Meteorological Institute's financial information is available in more detail in the financial statements https://www.ilmatieteenlaitos.fi/netra-asiakirjat



Procurements are an important part of an organisation's responsibility.

In addition to the Act on Public Procurement and Concession Contracts, our procurements are guided by the Finnish Meteorological Institute's procurement strategy and procurement rules, which contain guidelines on matters and requirements related to responsibility.

During the planning and the initial phase of the procurement, we consider the potential risks related to the goods and services to be procured. This way we can determine for which product groups requirements must primarily be set. We take into consideration the environmental, social and economic aspects related to responsibility both in our competitive tendering and during the contract period. We also examine the life cycle impacts of procurements according to the principles of sustainable development.

The perspective of innovation is also part of our responsibility-oriented thinking in procurement. Cost targets for public procurement and the need to improve the quality of service and to act more sensibly encourage the Finnish Meteorological Institute to make innovative procurements.

The Finnish Meteorological Institute strives to achieve 10% of the target for innovative procurements and evaluates the achievement of the target. The Finnish Meteorological Institute has achieved the target in 2021 and 2022.

More information about the Finnish Meteorological

en.ilmatieteenlaitos.fi

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