



9

EDUCATION, TRAINING AND PUBLIC AWARENESS

This chapter describes how climate change is included in the educational system of Finland from basic education to universities. That is followed by a portrayal of international training activities, including training of experts from developing countries. Finally, raising public awareness is discussed. The roles of ministries, local authorities, other public bodies as well as non-governmental organizations and other relevant stakeholders are explained. Several climate change or energy saving campaigns are presented, as well.

9 EDUCATION, TRAINING AND PUBLIC AWARENESS

9.1 General policy

Climate change is firmly anchored in the educational and public awareness policies and practices of the Government, and these policies and practices are under continuous development. Climate change issues are included in basic education and upper secondary level education as overarching values and part of education on sustainable development. Climate-change-related topics are also addressed by both universities and universities of applied sciences (Section 9.2).

The National Energy and Climate Strategy (2013) states that citizens should be provided with up-to-date information on all aspects of the Government's climate and energy policy. Information, guidance, best practices and tools are provided to help consumers make climate friendly choices in their everyday lives (see Section 9.4). International training activities are carried out, for example, by higher education institutions, and capacity building activities are also carried out as part of development cooperation (Section 9.3).

The national Medium-term Climate Change Policy Plan, in accordance with the Climate Change Act was approved by the Finnish Government in September 2017. It includes, e.g., an action plan presenting measures for mitigating greenhouse gas emissions resulting from human activity in sectors not included in the emissions trading scheme of the EU. It also mentions knowledge base and educational needs for furthering climate change policy.

Under the Doha Work Programme, launched at the 18th Conference of Parties to the UNFCCC (COP 18) in 2012, the Parties are encouraged to engage all stakeholders (e.g. local governments, non-governmental organisations (NGOs), intergovernmental organisations (IGOs), business and industry) in education, training, public awareness, public participation, public access to information and international cooperation, reflecting the elements of Article 6 of the Convention. The Doha Work Programme serves as a framework for country-driven actions, giving the Parties flexibility in implementing and taking into account national circumstances and priorities.

The activities described in this chapter include Finland's efforts at implementing the Doha Work Programme. In particular, the activities of local governments are described in Section 9.4.3 and the activities of NGOs in Section 9.4.4. At the end of this chapter, there are short descriptions and Internet links to the projects, networks and campaigns being carried out by various stakeholders.

ties, students can also study for scientific or artistic postgraduate degrees, which are the licentiate and the doctorate degrees.

It takes approximately three to four years of full-time study to complete a university of applied sciences degree. Degree studies provide a higher education qualification and practical professional skills. The annual enrolment in universities is about 20,000 students, almost one third of the age group. UASs admit some 33,000 students annually.

Educational institutions organise education and training intended for adults at all levels of education. Adult education comprises education and training leading to a degree or certificate, liberal adult education and staff-development, and other training provided or purchased by employers, as well as labour market training, which is mainly targeted at unemployed people. Efforts have been made to make the provision as flexible as possible in order to enable adults to study and work at the same time.

One of the basic principles of Finnish education is that citizens must have equal access to high-quality education and training. Education is free at all levels from pre-primary to higher education (degree education). Tuition fees are charged from citizens of non-EU/EEA countries in university and UAS programmes given in foreign language.

The Finnish school system has received high scores in the international PISA (Programme for International Student Assessment) comparison, which is an appraisal of 15-year-olds done every three years and organised by the OECD. In 2006, Finland was ranked at the top in scientific literacy, and in 2009, when the PISA comparison focused on reading literacy, a comparison of 65 countries put Finnish schoolchildren third. In 2015, with 73 countries participating, Finland was ranked fifth.

All schools in Finland are connected to the Internet. Around 90 per cent of 16 to 74-year-olds reported using the Internet on a daily basis in 2015.

All municipalities have at least one free public library and there are 790 public libraries (2014). About 70 per cent of Finns use libraries, which is the highest share among EU countries. The circulation of daily newspapers has decreased by 20 per cent during the last decade (355 per 1,000 adults in 2011). At the same time, the use of electronic media has grown rapidly.

9.2.2 Education on sustainable development and climate change in the national curricula

Climate change issues are included in the education given on sustainable development in Finland's compulsory basic education system. Many school subjects deal with sustainable development and climate change, and they are also dealt with as a cross-curricular theme. Teachers decide upon the context and the manner in which the issues are taught. The teaching should form a systematic learning path, one that progresses through the grades.

The National Core Curriculum for Basic Education entered into force in 2014. With this curriculum, sustainability is not only one cross-curricular theme supported by some of the values in the value basis. Instead, it is the overarching task of basic education and strongly embedded in all elements of the core curriculum. The new core curriculum, with its focus on promoting a sustainable lifestyle, represents a holistic approach to sustainability. This approach covers all dimensions of sustainability, as well as students' and the school community's developing competencies, and their safety and well-being. Sustainability is also one of the seven transversal competences in the curriculum. Climate change is especially involved in the subject level in geography and biology education.

The new National Core Curriculum for Upper Secondary Schools (2015) also highlights a number of sustainability and climate-related issues. Students (aged 16 to 19) should be familiar with the main aspects of the ecological, economic, social and cultural dimensions of sustainable development and be able and willing to act in support of

sustainable development in their own lives. Climate change is especially involved in the subject level in geography and biology education.

The National Core Curriculum for Upper Secondary Vocational Education defines sustainable development as one of its key skills. It is included in the qualification modules with a field-specific emphasis and is assessed as part of vocational skill demonstrations and/or other competence. Education providers are required to carry out measures to promote sustainable development. Sustainable development must also be visible in quality management issues.

The main aims of the Sustainable Development Certification of Educational Establishments (see links at the end of chapter) are

- To develop the quality of teaching, the learning environment and the operations of educational establishments,
- To implement education for sustainable development in teaching and the school culture via a comprehensive approach.

The Sustainable Development Certification scheme was started in March 2004 as an environmental certification. In 2010, the environmental criteria and certification system were updated to cover the environmental, economic, social and cultural aspects of sustainability. The criteria apply to basic education and to general and vocational upper secondary education. The new criteria and related self-evaluation tools are based on the principle of a quality circle (plan, do, check, act) and can be applied through quality systems. They provide a systematic tool for the planning of teaching and for constructing sustainable development programmes.

Teacher's Climate Guide (openilmasto-opas.fi) is a free and open climate education website for subject teachers working in secondary schools and high schools. It presents climate change separately from the perspective of each subject taught at school and also offers photo material, assignments and general information on climate change and climate education.

Box 9.1

SMART KALASATAMA – SMART CITY DISTRICT OF HELSINKI

Smart Kalasatama, a brownfield district in Helsinki, is a vivid Smart City experimental innovation platform to cocreate smart and clean urban infrastructure and services. Smart Kalasatama is developed flexibly and through piloting, in close cooperation with 200+ stakeholders including residents, companies, city officials and researchers. The Kalasatama district will offer a home for approximately 25,000 residents and jobs for 10,000 people by 2035. Currently, there are 3,000 people living in the area.

Kalasatama's energy services are built around the concept of a carbon-neutral future. Utilizing the latest smart grid technologies, the user of electricity can also be its producer. The grid enables real time smart metering for households, a network of electric vehicles and new storage solutions for electricity. A solar power plant already exists in the area and the whole neighbourhood is connected to the district heating and cooling grid.

The Smart Kalasatama program is running an ambitious innovation platform, where more than 25 innovative infrastructures and building projects are on-going. In addition to that, Smart Kalasatama is hosting innovative agile experimentation projects, where mainly start-ups codevelop their new smart solution prototypes with residents. For instance, several projects related to smart waste management, smart minigrids and mobility as a service (MaaS) are experimented.

During the spring of 2017, a set of climate positive pilots was tested in Kalasatama in the fields of green solutions, electric cars, parking, local solar power production and reducing consumer's carbon footprint using real-time calculator within households. ■

Box 9.2

SCIENCE EDUCATION CENTRE LUMA AND NATIONAL LUMA NETWORK

Finland's Science Education Centre LUMA is an umbrella organisation coordinated by the Faculty of Science of the University of Helsinki to bring schools, universities and industries together. LUMA coordinates cooperation between schools, universities, business and industry in Finland. It aims to promote meaningful and relevant learning and studying and teaching of natural sciences, mathematics, computer science and technology. A national LUMA network has also been established. LUMA celebrated its tenth anniversary in 2013. Supporting lifelong learning for children and young people is centred on activity clubs, summer camps and the virtual club Ksenonit, Science Day and the webzine Luova for young people. The activities aim to deliver positive experiences to children and young people in the LUMA subjects. At the same time, natural interaction with the scientific community at the university is fostered. The centre organises a great number of science clubs and camps each year. The international Millennium Youth Camp has been organised annually since 2010. Subject teachers' and primary education teachers' lifelong learning is supported via workshops, summer courses and an annual LUMA Science Fair. ■

Many projects, networks, campaigns or competitions in and between schools support the teaching of sustainable development and climate change; they give pupils a chance to make use of their knowledge and provide teachers with opportunities for in-service training. Environment Online – ENO, RCE Espoo (Regional Centre of Expertise on Education for Sustainable Development), and Finland's Science Education Centre LUMA are examples of such projects (see also Boxes 9.1 and 9.2). More information and examples can be found at the end of this chapter. Many different public service organisations have funded NGOs to visit schools as climate ambassadors and to discuss climate change and ways to curb it. This programme has been actively pursued in the present decade with good results.

9.2.3 Climate change in higher education and climate change training

Universities provide climate change education as part of different degree programmes, including environmental studies, environmental technology, chemistry, chemical technology and energy technology. Some universities also offer postgraduate studies in climate change. Teaching related to climate change is closely tied to the research in this field.

UASs also include education related to climate change in their degree requirements and master's degree programmes, such as environmental engineering, energy engineering and sustainable development.

Climate.now is a multidisciplinary study and teaching module on the basics of climate change. It contains written material, video lectures and interviews, assignments, tests and a guide for teachers that will help anyone familiarise themselves with the basics of climate change. Climate.now is located at the Massive Open Online Course (MOOC) platform of the University of Helsinki. It is freely accessible to everyone.

Climate issues are also included in the sustainable development teaching given as a part of teacher education, which in Finland is a university-level programme for all teachers throughout the education system. The Finnish National Agency for Education also funds and organises in-service training for teachers on sustainable development for EUR 700,000 (2014 to 2016). Nevertheless, only a fraction of the country's teachers outside the natural sciences have adequate pedagogical expertise in sustainable development and climate change. Various activities for advancing sustainable development exist (for example see Box 9.3).

Box 9.3

FINNISH UNIVERSITY PARTNERSHIP FOR INTERNATIONAL DEVELOPMENT (UNIPID)

The Finnish University Partnership for International Development (UniPID) is a partnership network between Finnish Universities. UniPID was established in response to the Johannesburg Summit on Sustainable Development in 2002, where institutional partnerships for development were encouraged. Following this Summit, in December 2002, representatives from eleven Finnish universities assembled at the University of Jyväskylä and decided to include and promote international development as a part of their international strategies.

UniPID was thereafter created to provide the strategic coordination required to build ties and increase cooperation between Finnish universities in the field of international development cooperation. The UniPID collaboration supports Finnish universities in the promotion and implementation of sustainable development in higher education. UniPID fosters the exchange of knowledge between Finnish universities and universities in developing and transition countries. Through international partnerships, UniPID links Finnish universities to European and global policy debates and development networks. The network works to strengthen institutional partnerships between scholars and institutions in Finland and in the South.

The network builds university capacities through the sharing of scientific knowledge, cooperation on common interests, understanding of development impacts, gathering and dissemination of information, and supporting long-term exchange and cooperation. These activities are essential in accomplishing true sustainable development and equal-footing partnerships both in the North and the South. ■

Universities, UASs and several training institutes provide continuing education programmes and vocational training in climate change and related issues, e.g. energy efficiency and environmental technology, for individuals and companies.

9.3 International training activities

Many higher education and research institutions in Finland provide international training and cooperate with research and higher education institutions, as well as governmental institutions in developing countries to support institutional development. Some examples are presented below.

Global responsibility is one of the main aims of the strategy for the Internationalisation of Higher Education Institutions in Finland 2009–2015. The higher education institutions are expected to utilise their research and expertise to solve global problems and to consolidate the knowledge base in developing countries. All eligible students, regardless of their nationality, can apply for the higher education degree programmes. Around 20 per cent of degree programmes in higher education institutions are international degree programmes with English as the teaching language. In 2011, the share of international students in UASs was 6.2 per cent and in universities 5.2 per cent.

Six out of 12 master's degree programmes at the University of Eastern Finland's (UEF) Faculty of Science and Forestry directly target the sustainable use of natural resources and climate change mitigation. During the past decade, these programmes, run in partnerships with European, North American, Russian, Chinese, Brazilian and Ghanaian universities, have trained more than 100 experts representing more than 50 nationalities. Furthermore, the UEF Faculty of Science and Forestry trains international climate change specialists in its doctoral programmes in forest sciences and in the biology of environmental change. Furthermore, post-graduate training in arctic biogeochemistry is part of the Nordic Center of Excellence's 'Impacts of a changing cryosphere: Depicting ecosystem-climate feedbacks from permafrost, snow and ice (DEFROST)' network.

The training of experts from developing countries in managing forests and other natural resources is an integral part of the agricultural and forest science programmes at the University of Helsinki. One example is the Viikki Tropical Resources Institute (VITRI), which is part of the Faculty of Agriculture and Forestry; the institute has maintained a strong focus on rehabilitating degraded natural and man-made production systems, including agroforestry systems, and on the various products and services provided by these systems across the different ecological zones in Asia, Africa and Latin America. More than half of the doctoral students come from developing countries, such as Sudan, Thailand, and China.

The Sustainable Global Technologies (SGT) programme is a multidisciplinary educational programme at the Aalto University School of Engineering. The SGT programme aims to increase awareness, education and research in the fields of sustainability, development and technology. It offers a special module in Sustainable Global Technologies at Aalto University. The SGT programme is an example of a UN Habitat Partner University Initiative; it is also collaborating with the United Nations Environmental Programme (UNEP). Aalto University is also one of the partnering universities in the Environmental Pathways for Sustainable Energy Services (SELECT) master's degree programme. SELECT is part of the Erasmus Mundus Programme, an EU-funded cooperation and mobility programme that aims to enhance the quality of European higher education, and to promote dialogue and understanding between people and cultures through cooperation with third countries. SELECT will be extended to include a doctoral programme as well.

The number of training activities related to development cooperation has increased in recent years. This is partly due to the newly initiated and nationally funded development cooperation programmes, such as the Higher Education Institutions Institutional Cooperation Instrument (HEI-ICI) and the North-South-South Higher Education Institution Network Programme (NSS) (see Internet links at the end of the chapter for more information). Both programmes include projects related to sustainable development and also specifically to climate change.

The University of Eastern Finland (UEF) currently coordinates NSS and HEI-ICI projects in, for example, West Africa, Ghana, Kenya, and Venezuela. The UEF Faculty of Science and Forestry coordinates and participates in various education and research projects that aim at capacity building in the areas of sustainable forest use and environmental studies. Currently, projects are being carried out in West Africa (Sierra Leone and Burkina Faso), Venezuela, Ghana, Uganda, India, and Kenya. These projects deal with bioenergy issues and carbon sequestration and concentrate on, for example, strengthening climatic know-how through curriculum development at local universities. VITRI is an active participant in the development of the forestry sector in Sudan, Kenya, Ethiopia, Thailand, Indonesia, and Laos.

Seven development research projects on climate change were jointly funded by the Ministry for Foreign Affairs and the Academy of Finland with total of EUR two million as part of FICCA, the Academy of Finland's Research Programme on Climate Change (2011–2014). The research projects resulted, as planned, in new cooperation networks, consolidated multidisciplinary scientific knowledge in developing countries and increased the mobility of doctoral students and researchers between Finland and developing countries.

The Finnish Meteorological Institute (FMI) has coordinated several development cooperation projects funded mainly by the Finnish Government. Most of these projects are funded using the Institutional Cooperation Instrument (ICI), which enables small-scale cooperation with partner institutes concentrating mainly on human capacity building. The projects coordinated by the FMI always include a strong training component and the subjects of the training typically include adaptation to climate change. For ex-

ample, the training has covered adapting to the changes in the intensity and frequency of extreme weather events that require wide-ranging development of early warning services. The sectors that benefit from the training include traffic, agriculture, health, and energy production. The FMI also trains researchers from other countries, either in their own countries (for instance, in Africa and Central Asia) or in Finland. More information on climate-change-related capacity building projects being carried out in developing countries is presented in Chapter 7 and Section 8.4.

The Nordic office of the Energy and Resources Institute (TERI, India) was established in 2012 at the UEF to promote collaborative activities between organisations in the Nordic region and India on issues related to sustainable forestry, bio-economy and renewable energy. The TERI Nordic office provides a platform where academic and business communities can interact with each other in joint research collaboration and transfer of technological know-how.

The Finnish University Partnership for International Development (UniPID) network is presented in Box 9.3. More information and examples can be found at the end of this chapter.

9.4 Public awareness

According to the Finnish Climate Barometer 2015 survey, Finns consider climate change to be a major global threat, and wish decision-makers would adopt more active climate policies and companies would develop new solutions for mitigating climate change.

A majority of Finns agree that Finland should reduce its emissions regardless of what other countries are doing. Citizens consider it important for Finland to be a pioneer in the adoption of emission reduction technologies and believe that developing new expertise and technical solutions can improve Finland's competitiveness and create new jobs. The respondents would also like Finland to increase the use of renewable energy, such as solar power, wind power and biofuels, even at the cost of making energy more expensive.

Conducted before the Paris climate negotiations in 2015, the survey concluded that over 80% of the respondents agreed that international negotiations should swiftly lead to a new global agreement on climate change for reducing global emissions. According to Finns, the most important decisions affecting climate change are made by large developing countries, such as China and India, and by the United States.

However, Finns have not significantly changed their own behaviour in order to mitigate climate change. Only just over one-third of the respondents considered climate impacts when deciding on purchases. On the other hand, the respondents felt that there is a great need for new low-emission services: over 80% considered them to be very or rather important in solving the problem of climate change.

The media coverage of climate change has been extensive in Finland. Partly as a result of the media debate, some issues are considered serious environmental problems by the general public; some risks are amplified while others are attenuated. The peaks of climate coverage have been caused particularly by international policy negotiations, such as the Paris COP21, and mild winters. Other contributing factors have included the releases of EU and government policies on emissions reductions, releases of major scientific reviews, expressions of concern by key actors and the related debate on energy policy.

9.4.1 Climate change communication

Communication on climate change is handled by several different ministries, government research organisations, as well as communities and civil society actors, each with-

in the sphere of their own tasks and responsibilities. Most communication activities are carried out independently by the various bodies and the range of communication actions vary, for example, from stakeholder meetings and seminars to social media campaigns, press releases and visual communication.

With climate change communication being handled by different organisations, there has been a need for cooperation to ensure that the actions are coordinated. Officially since 2010, the Ministry of the Environment has been coordinating cooperation on climate communications. At the moment, the Steering group for Climate Communications consists of all relevant ministries (the Ministry of Agriculture and Forestry, the Ministry of the Environment, the Ministry of Economic Affairs and Employment, the Ministry for Foreign Affairs, the Prime Minister's Office Finland), research organisations (the Finnish Environment Institute (SYKE), the Finnish Meteorological Institute (FMI), VTT Technical Research Centre of Finland Ltd, Natural Resources Institute of Finland (Luke)), regionally operating organisations (Centre for Economic Development, Transport and the Environment and the Association of Finnish Local and Regional Authorities), Tekes – the Finnish Funding Agency for Innovation, Sitra the Finnish Innovation Fund, Motiva Ltd (see Section 9.4.2), and the think tank Demos Helsinki.

The aim of the cooperation is not only to coordinate climate and energy related communication, but also to accomplish common communication projects and share best practices and expertise. The cooperation makes it possible to consider climate change communication from a wider perspective than that of each individual organisation.

The steering group publishes an online magazine 'Klimaatti' focusing on analytical feature articles providing concrete solutions for climate change mitigation and adaptation. Also featured are themes of eco-efficiency, energy consumption, biodiversity and international negotiations.

The group has also produced an extensive package of infographics and visual statistics to raise awareness about the IPCC's fifth assessment report (<http://climateguide.fi/ipcc>) and Finland's climate policy (<http://climateguide.fi/climate-policy-infographics>). The material has been widely thanked and used by the media, universities and researchers alike. In early 2016, the campaign was also rewarded by the Institute of the Languages of Finland as an exemplary work making climate change and related government policies more understandable, and interesting, for the general public.

Encouraging the public to participate in the planning of Finland's climate policies continued in 2016 with an open online platform energiajailmasto.fi on which anyone regardless of their background could comment on the planned climate strategies and measures of emissions reduction.

Nominated by the Finnish Ministry of the Environment at the end of 2011, the interdisciplinary and independent Climate Change Panel of researchers and academicians aims to enhance communication between science and politics in issues related to climate change (see Section 4.2.2 for the role of the panel in policy making and Box 8.2 for its research activities). The Finnish Climate Change Panel has actively participated in public debate by releasing statements, organizing discussions and interacting with the media, decision-makers and other stakeholders.

Many of the Government organisations provide training for various stakeholders both independently and through the Steering Group for Climate Communications. The FMI has, for example, organised a climate change course for journalists since March 2006. To date, the course has been attended by more than 200 journalists specialising in the economy, science and the environment.

One result of the cooperation between various organisations is the national web portal on climate change, Climateguide.fi, which was launched in 2011. Most of the information in the portal is available in three languages (Finnish, Swedish and English) and

it provides scientific background information on different aspects of climate change, as well as tangible means for mitigation and adaptation. Climateguide.fi features approximately 250 web articles, checklists, adaptation and mitigation solutions, learning modules, observational and modelled data, mapping tools, interactive visualizations, videos, and learning exercises. It also provides current information on ongoing news, processes, research, and events. The purpose of the website is to raise awareness about climate change and its implications for Finland, as well as to support society and citizens in mitigating climate change and in adapting to it. It also serves as a platform through which key Finnish research institutions and projects can disseminate their information in a user-friendly way. Climateguide.fi is especially targeted at the general public and decision-makers and actors, especially in Finnish municipalities. The FMI and SYKE share responsibility for the contents of the web portal, as well as for updating and further developing it. There are also plans for more research institutions to join in. Climateguide.fi is also the home for the infographics produced by Finnish research institutions and ministries in 2013 to 2015 (Figure 9.2).

The national IPCC working group coordinates and presents Finnish standpoints in the IPCC reports. It aims to raise awareness about the IPCC's work in Finland and the Finnish contribution to it. The communications department of the FMI is responsible for communication related to the IPCC's activities and works in close cooperation with the communications department of the Ministry of the Environment. The most important channels are press releases and conferences, seminars for decision-makers and training programmes for journalists. These are put together in cooperation with the Finnish scientific community.

Figure 9.2

Observed changes in the climate system – an example of the infographics made on the basis of the results of the IPCC's Fifth Assessment Report and published in the Finnish climate portal Climateguide.fi.



SINCE 1950, CHANGES HAVE BEEN OBSERVED THROUGHOUT THE CLIMATE SYSTEM.

The atmosphere and ocean have warmed, the extent and volume of snow and ice have diminished, and sea level has risen. Many of the observed changes are unusual or unprecedented on time scales of decades to millennia.

Based on IPCC Assessment Report 5, Working Group 1.

9.4.2 Raising awareness about energy efficiency

Communication on energy efficiency is handled mainly by two ministries, the Ministry of Economic Affairs and Employment and the Ministry of the Environment, and by other government bodies, research organisations and state-owned organisations, e.g. Motiva Ltd. Motiva Ltd is a fully state-owned company working closely with government bodies, that promotes the efficient and sustainable use of energy and materials by providing information, training and expert services. It furthers energy education through specific

projects and campaigns at schools, and it supports energy competence development for professionals in different sectors through training and information dissemination and by providing them with adaptable materials. Motiva also coordinates several communication and awareness raising activities (see below).

The ERA17 – for an Energy-Smart Built Environment 2017

The aim of the ERA17 – for an Energy-Smart Built Environment 2017 action plan is to make Finland a leader in energy smartness and to have an energy-efficient, low-emission built environment. The action plan is based on five key factors: energy-efficient land use, distributed methods of energy production, steering of construction, ownership and use of real estate, and taking know-how further. ERA17 has put strong emphasis on raising public awareness and sharing best practices and expertise. Numerous projects have been launched and implemented throughout Finland, seminars and events have been organised, and reports and newsletters published on the results of the actions toward a more energy-efficient built environment. The ERA17 period will come to an end in the end of 2017.

Energy Awareness Week

Motiva has successfully run the National Energy Awareness Week and the more specific energy awareness week for primary schools since 1996. The week has become an established annual event in October, during which time companies, schools and other organisations and households concentrate on promoting sustainable use of energy. The week is a means of getting people to think about, and voluntarily act in favour of, a sensible use of energy and an environmentally conscious way of life.

About half of Finland's school children aged around eight (close to 25,000 pupils) take part in the week by studying energy from its production and consumption phases, and how to save energy. They learn to engage in energy saving actions both at home and in school. Every year, more than 300 companies and organisations participate in the week. Most of them have incorporated the week into their own environmental programmes and implement voluntary energy saving measures. The campaign reaches tens of thousands of Finns. In recent years, the Energy Awareness Week has also been expanded abroad through several globally operating Finnish companies.

Motiva provides Energy Awareness Week participants with tools, tips, informative materials and support for distributing information, and it acts as the national media contact point. It also organises seminars to activate different organisations to exchange ideas, collaborate with one another and arrange events together. The Energy Awareness Week is supported by the Finnish Energy Authority.

Advice and guidance to consumers on sustainable choices

Finnish consumers are provided with advice to support their choices on energy use at home, on renovation and building work, and on mobility issues by networks of experts throughout the country. Regional advisers give consumer energy advice on household energy use, heating and cooling systems, building and the renovation of houses and energy efficient transport and mobility. The network of thirteen regional advisers reaches about 75% of Finnish consumers. The core of the activity is to provide consumers with high-quality and reliable information and tools to support their energy decisions. Consumers are provided also with on-line energy advice on Facebook @Asiaaenergiasta. The coordinated activity started in 2012 after a two-year piloting period.

Motiva coordinates the consumer energy advice efforts by providing advisers with supportive services, such as a website and Facebook page, training, tools, marketing, promotional and networking support. The network of regional advisers meets annually to exchange experiences and best practices, and for training.

The work is supported by a broad-based advisory steering group chaired by the Finnish Energy Authority, and it includes members from the Ministry of Economic Affairs and Employment, the Ministry of the Environment, the Ministry of Transport and Communications, the Ministry of Agriculture and Forestry, the Association of Finnish Local and Regional Authorities, and the Energy Industry.

Mobility management

The Finnish Mobility Management R&D programme is coordinated by Motiva on behalf of the Finnish Transport Agency. The Agency is also the main funder of local mobility projects. The state subsidy for Mobility Management was introduced in 2012 and has been used to establish mobility management work in various regions. The regional projects and established activities provide advice and services to municipalities, companies and consumers. In the end of 2016, the national Network of Mobility Management had over 600 members covering municipalities, national authorities, private sector and NGOs. In addition to the environmental aspects of Mobility Management (MM), the health benefits have gained strong recognition lately and more focus has been put on the workplace MM on a national level. This has meant that other benefits such as company responsibility, well-being and image have also been recognized more strongly as the key benefits of MM. In the end of 2016, the first R&D funding for workplace MM was launched, the funding coming from Finnish Transport Agency, Finnish Transport Safety Agency, Fit for Life Program and The Finnish Innovation Fund Sitra.

Advice on renovation

The advice network on the renovation of buildings, managed by the Ministry of the Environment, gives advice to home owners, tenants, housing associations and real estate managers. The network provides advice and online tools, for example, for finding professional service providers and for proper recycling of construction materials. A key focus of the advice is to improve the energy efficiency of the building when it is renovated. Each of the networks arrange networking events one to two times per year to exchange experiences, best practices and common challenges, and for training. To multiply their efforts to provide better service to consumers, the regional energy advisers and renovation advisers also have joint annual networking events to learn about each other's work and experiences and to accumulate collaboration on a regional level.

9.4.3 Local activities

More than one-third of Finland's municipalities have a climate strategy or are in the process of preparing one. Those municipalities have incorporated climate change mitigation into their practices (see Section 4.2.5).

The municipalities play a decisive role as intermediators of information regarding attitudes towards climate issues and effecting changes in people's lifestyles. Some of the municipalities have already initiated campaigns to encourage citizens to contribute to combating climate change.

In the Carbon Neutral Municipalities (HINKU) project (see Section 4.2.5), the local mitigation measures are gathered together in a publicly available database, which can be browsed using an interactive map. To this day, HINKU constitutes a group of 36 pioneering municipalities. They have volunteered to greening their economies and acting as laboratories for sustainable development. These municipalities have brought together mayors, businesses, citizens and experts to create and carry out solutions to reduce greenhouse gas emissions. The involved municipalities are committed to an 80 per cent emission reduction target by 2030 from the level of 2007. The preliminary results

are encouraging: new businesses and jobs have been established while emissions have already reduced by 29%. At the same time, new energy solutions and procurement policies have led to considerable cost savings.

Another indication of the determination at the local level is the FISU network – Finnish Sustainable Communities. FISU municipalities form a group of forerunner communities committed to becoming carbon-neutral and waste-free, as well as curbing overconsumption by 2050, or earlier. The network shares best practices and knowledge about new opportunities in the field. The FISU communities develop their policies and procedures together in peer support, thereby enabling a quicker transition than if doing it alone. The largest cities in Finland are also active in promoting awareness among their citizens about climate change and in providing energy and climate-change-related advice (see also Section 4.2.5). For example, in the city of Oulu in northern Finland, proactive quality control of buildings has been successfully carried out for several years now and the practice is being extended to other cities as well. As part of the proactive quality control, families who are planning to build a single-family house, designers, work supervisors in charge of the project, suppliers and contractors are all provided with information on the technical and architectural quality of the house, including energy efficiency guidelines. Quality control is mainly implemented as instructions for large groups, where experts lead the discussion, and it also involves neighbourhood meetings in small groups.

Finland is one of the few European countries where voluntary means, such as the voluntary Energy Efficiency Agreement scheme, have proven to work and yield profits. Energy savings and energy efficiency have been improved through agreements drawn between the Government and industrial/municipal associations since the 1990s. The Energy Efficiency Agreement for the Municipal Sector is an agreement between the Ministry of Economic Affairs and Employment, the Energy Authority, and the Association of Finnish Local and Regional Authorities on increasing the efficient use of energy in the municipal sector. Municipalities, cities and joint municipal authorities sign their own Energy Efficiency Agreement, in which they commit themselves to the actions and targets specified in the Energy Efficiency Agreement for the Municipal Sector. At the end of 2016, the coverage of Finnish municipalities within the agreement scheme was 77% of the total Finnish population, 70% of the building volume and 47% of the Finnish area. In 2015, in the whole energy efficiency agreement scheme (covering also industry, energy and the property sector), the savings generated from energy efficiency measures equal 3.9 percent of Finland's total energy consumption in 2015. The scheme reduced annual carbon dioxide emissions (CO₂) by approx. 4.3 million tonnes and energy costs by a total of approx. EUR 500 million (www.energyefficiencyagreements2017-2025.fi). As another example, Climateinfo (Ilmastoinfo) was founded in autumn 2010 as a joint initiative of the cities in the Helsinki Metropolitan Area and it has been integrated as part of the Helsinki Region Environmental Services Authority (HSY) since the beginning of 2013. Climateinfo aims to familiarise residents and small and medium enterprises (SMEs) with the climate strategy of the cities of the Helsinki Metropolitan Area and provide support and guidance with practical measures. The four themes of the activity are energy-efficiency and renewable energy, food, transportation and consumption. Through practical trials and campaigns, Climateinfo promotes solutions that can change people's behaviour and decrease their impact on the climate. Trials are carried out, for example, in restaurants, shops and places for leisure activities. They are used to find solutions that could be spread cost-efficiently across the entire Helsinki Metropolitan Area.

The Helsinki Metropolitan Smart & Clean Foundation started operation in June 2016 by Helsinki Metropolitan Area cities and Sitra, in partnership with the Finnish state and the Helsinki–Uusimaa Regional Council, several companies and research or-

organisations and major Finnish companies aiming to turn the Helsinki capital region into a test bed for smart and clean solutions. The foundation has an operating period of five years. The foundation develops new forms of collaboration and innovation activities between the public sector, cities, companies, residents and the scientific world. New technologies and services are tested in different areas of the city and the best ones will be exported and will create thriving businesses. For example, new services in mobility and living will increase the quality of life and mitigate climate change, they will boost the circular economy and smart solutions will reduce food waste. Small and large actions build permanent changes, and the doers, as well as the beneficiaries, are both citizens, cities and businesses (<https://smartclean.fi/en/smart-clean/>).

Motiva assists municipalities and other public entities as a Focal Point for Sustainable and Innovative Public Procurement giving advice and consultancy to public procurers around sustainable and cleantech procurements covering all stages of the procurement process. The service is based on provision of product group specific procurement guidance and advice according to the knowledge base and ambition level of the procuring entity. Motiva offers tools and guidelines, suggests criteria to be used in procurements and gives advice for market dialogue, and collects and disseminates best practices and success stories, and coordinates the national network on Green Public Procurements (http://www.motivanhankintapalvelu.fi/in_english).

9.4.4 Activities and campaigns of the NGOs

NGOs also conduct climate-change or energy-related campaigns, some of which have received broad publicity. For example, the Finnish Friends of the Earth (Maan ystävät) ran a campaign called ‘The Big Ask’ (Polttava Kysymys) to push the Finnish Climate Act. In addition, other NGO’s like the World Wide Fund for Nature (WWF Finland), the Finnish Association for Nature Conservation (Suomen Luonnonsuojeluliitto), Finn Church Aid (Kirkon ulkomaanapu) and the Guides and Scouts of Finland (Suomen Partiolaiset) run their own climate campaigns.

At the climate awareness website, ilmasto.org, Dodo ry offers schools the possibility to invite a guest speaker to the class to talk about climate change. The umbrella organisation for Finnish civil society organisations who work with development cooperation, Kepa ry, had its own campaign on climate change called ‘Expecting Instability’ (Luvassa epävakautta). There is also a NGO called Climate Parents (Ilmastovanhemmat ry) that is active in insisting that decision-makers consider the coming generation when deciding on climate issues. Finnish Greenpeace runs a campaign called ‘Energy [r]evolution’ (Energiavallankumous), which aims for an overall change in the energy sector.

In 2013, ‘EKOenergy’, an Ecolabel for electricity originally developed by the Finnish Association for Nature Conservation, became the first Europe-wide label for sustainable renewable electricity. The label aims to provide guidance to consumers on making energy choices that are climate friendly and environmentally sustainable. The criteria of the label look at both greenhouse gas emissions and other environmental impacts of renewable energy. Part of the generated profits is used for different climate and environment projects. The EKOenergy network consists of European environmental organizations from 20 countries, which together promote climate-friendly development in the European energy sector.

Coal-free Finland is a campaign at a municipality and city level to shut down coal plants in municipalities across Finland in which citizens have decided to take action against the use of coal. The campaign is working in collaboration with the Finnish Friends of the Earth and the Finnish Nature League and is run by volunteers from a variety of backgrounds. The campaign’s methods include lobbying and advocacy, participating in public debate, and awareness-raising among citizens and stakeholders.

WWF Finland developed an environment management system for offices. Office premises hold a key position in energy consumption and in sustainable solutions. The Green Office network is suited to offices – both large and small – in private companies, the public sector and other organisations. The network includes 433 offices from 156 organisations with a total of nearly 62,000 employees.

Earth Hour is a worldwide movement for the planet organized by the World Wide Fund for Nature (WWF). The event is held worldwide annually encouraging individuals, communities, households and businesses to turn off their non-essential electric lights for one hour, from 8:30 to 9:30 p.m. towards the end of March, as a symbol of their commitment to the planet. WWF Finland has participated in the movement since 2007.

In 2013, WWF Finland started a campaign, which is part of the organization's global 'Seize your Power' campaign. The campaign's goals in Finland are to promote the use of solar power by challenging cities and companies to take action, and to empower the youth to take action for the environment.

Nature League (Luonto-Liitto in Finnish) is a nation-wide non-governmental nature and environmental protection organization for children and the youth. The Nature League arranges environmental education for children and the youth in the form of afternoon clubs and nature camps.

FEE Finland (Finnish Foundation for Environmental Education) enhances a sustainable way of life by the means of environmental education. FEE Finland is a part of an international FEE (Foundation for Environmental Education) network, which consist of 73 member countries. FEE Finland coordinates the Green Key programme in Finland and enhances environmental education collaboration.

9.5 Short descriptions and Internet links of some projects, networks and campaigns

Climate Guide

The website [Climateguide.fi](http://climateguide.fi) pools practical, studied and reliable information on climate change into one address and in a uniform format. The purpose of the website is to support society and citizens in mitigating climate change, and in adapting to it. The website helps understand phenomena related to climate change, and structure information. The aim is to allow anyone needing information on climate change to find it rapidly and easily. Another aim is to enable Finnish research institutions, authorities and expert organisations to make their climate change information and services more easily available to society.

<http://climateguide.fi>

Climate Now

Climate.now is a multidisciplinary study and teaching module on the basics of climate change. It contains written material, video lectures and interviews, assignments, tests and a guide for teachers that will help anyone familiarise themselves with the basics of the climate change. You can complete the study module independently or as part of your higher education studies. The scope of the whole module is five credits. In addition to teachers and students, the material can also be used by companies, other organisations and media.

<http://www.climatenow.fi/>

Teacher's Climate Guide

The Teacher's Climate Guide is a free and open climate education website for subject teachers working in secondary schools and high schools. It presents climate change separately from the perspective of each subject taught at school and also offers photo material, assignments and general information on climate change and climate education. At the moment, the material exists only in Finnish, but hopefully it will get translated into other languages in the near future.

According to research, teachers are lacking skills in climate education and knowledge on climate change. In addition, existing teaching materials have been insufficient and teachers have had a hard time seeing how climate change is connected to the educational content in their subject. The project was funded by the Maj and Tor Nessling foundation. Dozens of educational and climate professionals contributed to the work in workshops and online.

<http://openilmasto-opas.fi/english/>

Writing competition for upper level of comprehensive school students on Climate Change.

The writing competition is arranged by Finnish Energy, which is a branch organisation for the industrial and labour market policy of the energy sector and Motiva Ltd – a Finnish state-owned company that provides a wide range of expertise and services designated to improve resource efficiency throughout society.

The subject matter for the essays should be the mitigation measures that will be used during the coming 100 years and what Finland looks like after the hundred years. Have the mitigation measures been effective enough and what does it mean for everyday life in Finland?

<http://www.vuodenilmastoteko.fi/kirjoituskilpailu.html>

Youth Climate Summit

The Finland Youth Climate Summit 2016 gathered 66 middle school students from all over Finland to create a climate action plan for their schools. The themes were energy efficiency, renewable energy and food. While the students were creating the plans, teachers and principals learned how to support the students with their projects and how to include the projects in the curriculum. In addition, the students sent a video message to COP21 to encourage them to make a strong Climate Agreement.

The Youth Climate Summit was created in Adirondacks, USA. The aim is to give an opportunity to young people to make an impact on their own future by offering tools to make change and a channel to create environmental awareness. This was the 4th Youth Climate Summit arranged in Finland, and it was carried out in cooperation with Nuorten Akatemia (Youth Academy), WWF, Schneider Electric and Heureka.

<http://ilmasto.org/ilmari-hanke-vie-ilmastokeskustelun-kouluihin/nuorten-ilmasto-huippukokous>

University of Eastern Finland (UEF) – United Nations Environment Programme (UNEP) Course on Multilateral Environmental Agreements

The UEF-UNEP Course on Multilateral Environmental Agreements (MEAs) is a high profile two-week course on MEAs, international environmental law-making and diplomacy. It is organised annually in cooperation between the University of Eastern Finland and UNEP, with a changing course venue and theme each year.

The aim of the course is to equip present and future negotiators of multilateral environmental agreements with the information and experiences of others in the area of

international environmental law-making in order to improve the impact and implementation of these key treaties.

The course is intended for experienced government officials engaged in international environmental negotiations. Other stakeholders, such as representatives of NGOs and the private sector, researchers and academics in the field of international environmental law are also eligible. Starting from 2004, the course has had a total of 399 participants from 121 different countries.

<https://www.uef.fi/web/unep>

Teachers' Climate Change Forum

Teachers from all corners of the world met at the first ever Teachers' Climate Change Forum on 26 November 2016 to share their good practices and innovative approaches on climate change education via inspiring video presentations and to learn from each other.

The Teachers' Climate Change Forum is a virtual forum organized by LUMA Centre Finland. At the forum, teachers interested in climate change education have the opportunity to share their practical experience and learn from each other. The Director of the LUMA Centre Finland acts as the chair for the forum.

<http://www.luma.fi/en/news/2016/12/01/some-great-practices-on-climate-change-education/>

EURONET 50/50 MAX

EURONET 50/50 MAX mobilized energy savings in public buildings through the implementation of the 50/50 methodology in 525 schools and over 50 other public buildings in 13 EU countries. The nine-step methodology increased energy awareness of the building users (close to 100,000 pupils and 7,000 teachers) and actively involved them in energy saving actions. Achieved financial savings are shared equally between the building users and the local authority which covers the energy bills. The project was supported by the European Commission through the Intelligent Energy Europe (IEE) programme.

<http://euronet50-50max.eu/en/>

The Carbon Neutral Municipalities project (HINKU)

The Carbon Neutral Municipalities project brings municipalities, businesses, citizens and experts together to create and carry out solutions to reduce greenhouse gas emissions. The municipalities involved are committed to reduce greenhouse gas emissions more extensively and rapidly than EU targets and schedules would require. The project aims to create solutions that have economic and social benefits as well as environmental advantages.

<http://www.hinku-foorumi.fi/en-US>

MONIMET

MONIMET is a project about Climate Change Indicators and Vulnerability of Boreal Zone Applying Innovative Observation and Modeling Techniques (2013 to 2017). The coordinating beneficiary of the project is the Finnish Meteorological Institute (FMI). Other associated beneficiaries are the Natural Resources Institute Finland (Luke), the Finnish Environment Institute (SYKE) and the University of Helsinki (UHEL).

<http://monimet.fmi.fi/index.php?style=warm>

YLE Oppiminen (YLE Learning)

In 2015, the Finnish broadcasting company (Yle) produced learning material to teachers about climate change.

<http://yle.fi/aihe/artikkeli/2015/12/15/ilmastonmuutos>

Training projects 'Our Safe Village' and '72 Hours'

The Finnish National Rescue Association (SPEK) has trained approximately 150 villages during 2014 to 2016 in preparedness for different disruptions caused by, among others, abrupt weather events. The 'Our Safe Village' instructors organise regional safety training events together with the regional rescue and village associations. The villagers receive support and instruments, such as training materials, for local contingency planning. The 'Our Safe Village' training concept was developed through the projects financed by the Fire Protection Fund.

The 72 Hours concept steers people to set up a 72h preparedness kit: self-preparedness for three days can dramatically assist the authorities' relief efforts. As of spring 2017, SPEK has trained 72h preparedness instructors to organise training events in urban communities. In addition to the training, SPEK is responsible for providing materials as well as social media and network services. The 72h training concept was developed by the Committee for Home Emergency Preparedness and financed by the National Emergency Supply Agency.

<http://www.spek.fi/In-English/Safety-Information/Preparedness/Self-preparedness>

Projects KUJA and KUJA2 on continuity management of municipalities, local and regional authorities

The objective of the project KUJA 'The continuity management of municipalities' (2014 to 2016) was to develop the capacity of the local actors to ensure the disruption-free functioning in all situations, including during weather and climate change related disruptions. The tools produced during the project support the development of preparedness and continuity management, as well as the protection of citizens' well-being. With the project KUJA2 'The continuity management of local and regional authorities' (2017 to 2019) the scope was widened to include provinces. Provinces will have an important role in the coordination of regional preparedness after the major health, social services and regional government reform in 2019. KUJA2 aims to strengthen the interconnectedness of municipalities, regional authorities and their key stakeholders and to promote common understanding related to preparedness. Both projects have been implemented in cooperation between the Association of Finnish Local and Regional Authorities and the Finnish National Emergency Supply Agency.

Climate resilience tools by Tapio

Climate resilience tools for the public and private sectors were released at the end of 2016, compiled by the Tapio Consulting Services and funded by the Ministry of Agriculture and Forestry. These tools include a variety of good practices, guides and measures used by public and private sector actors to implement measures in the different aspects of climate resilience. The concept also presents good examples on how to secure climate resilience and how to assess it.

Citizens Climate Pledge

Citizens Climate Pledge is an NGO-led initiative that encourages individual citizens to announce their personal commitment to cut half their carbon footprint within ten years. Launched in 2015 in Finland, Citizens Climate Pledge aims to bring the citizens into the center of the societal transition to low-carbon development. Today the initiative has more than 2500 signatories, the present and two former Presidents of Finland, leaders of Finland's largest corporations, musicians, artists and top athletes amongst them. Citizens Climate Pledge grew global in 2016, when the Finnish initiators launched the international version together with UNFCCC. Now it is possible for any global citizen to commit to join a global movement of action on climate change.

<https://climatepledge.global/>

Literature

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<http://unfccc.int/resource/docs/2012/sbi/eng/147.pdf>
- Government report on the National Energy and Climate Strategy for 2030 (2017) Publications of the Ministry of Economic Affairs and Employment of Finland 12/2017.
<http://urn.fi/URN:ISBN:978-952-327-199-9>
- Finnish National Commission on Sustainable Development, Sub-committee for Education (2006) Strategy for Education and Training for Sustainable Development and Implementation Plan 2006–2014, Helsinki, Finland.
http://www.oph.fi/download/47693_engnetKekekajako.pdf
- National Core Curriculum for General Upper Secondary Schools 2015, Finnish National Board of Education 2016, Publications 2016/8.
- National Core Curriculum for Basic Education 2014, Finnish National Board of Education 2014, Publications 2016/5.
- Strategy for the Internationalisation of Higher Education Institutions in Finland 2009–2015 (2009) Publications of the Ministry of Education, Finland 2009:23.
<https://julkaisut.valtioneuvosto.fi/handle/10024/77779>
- The Climate Barometer 2015 survey, Ministry of the Environment Press release 16-04-2016.
[http://www.ymp.fi/en-US/Finns_want_more_effective_measures_for_m\(33191\)](http://www.ymp.fi/en-US/Finns_want_more_effective_measures_for_m(33191))

Internet links

- Climate awareness web portal,
<http://ilmasto.org/>
- Climateguide web portal,
<http://Climateguide.fi>
- Climateinfo, <http://ilmastoinfo.fi/en/climateinfo-2/>
- Energy Awareness Week,
https://www.motiva.fi/en/public_sector/training_and_communication_in_the_improvement_of_energy_efficiency
- ERA 17 – for an energy-smart built environment (2016) <http://era17.fi/en/>
- Finnish University Partnership for International Development (UniPID),
<http://www.unipid.fi/en/home/>
- The Higher Education Institutions Institutional Cooperation Instrument Programme (HEI ICI), http://www.cimo.fi/programmes/hei_ici
- HINKU project, <http://www.hinku-foorumi.fi/en-US>
- Motiva, a state-owned company promoting the sustainable use of energy and materials, <https://www.motiva.fi/en>
- National IPCC working group (in Finnish),
<http://ilmatieteenlaitos.fi/suomen-ipcc-tyoryhma>
- The North-South-South Higher Education Institution Network Programme (NSS),
<http://www.cimo.fi/programmes/north-south-south>
- RCE Espoo,
<http://www.rcenetwork.org/portal/espoo> (in Finnish)
- Science Education Centre LUMA,
<http://www.luma.fi/en/>
- Sustainable development certification of educational establishments,
<http://www.koulujaymparisto.fi/sivu.php?id=1820>
- Teacher's Climate Guide
<http://openilmasto-opas.fi/english/>
- The Association of Finnish Local and Regional Authorities
<https://www.localfinland.fi/>