



# European Construction Sector Observatory

Policy measure fact sheet

## Finland

Carbon Neutral Municipalities

(Kohti hiilineutraalia kuntaa – HINKU)

Thematic Objectives 2, 3 & 4

February 2018



## In a nutshell

<b>Implementing body:</b>	Finnish Environment Institute
<b>Key features &amp; objectives:</b>	The Carbon Neutral Municipalities (Kohti hiilineutraalia kuntaa – HINKU) project brings municipalities, businesses, residents and experts together to devise and tailor new cost-effective solutions to reduce greenhouse gas emissions at municipal level.
<b>Implementation date:</b>	October 2008 - ongoing
<b>Targeted beneficiaries:</b>	Municipalities, businesses, citizens and experts.
<b>Targeted sub-sectors:</b>	Climate change; energy efficiency; emission reduction; renewable energy
<b>Budget (EUR):</b>	Not published

The construction industry is performing well in Finland. According to statistics compiled by the Confederation of Finnish Construction Industries, construction related investments amounted to approximately 12% of GDP in 2015. The construction and real estate sectors together employed 20% of the Finnish workforce, making it the largest sector of employment in Finland<sup>1</sup>.

Houses and apartments in Finland are generally of high quality. The most common type of buildings in Finland are detached houses (approximately 3/4 of the building stock), whereas apartment buildings and terraced houses are less common (1/10 of the building stock)<sup>2</sup>. They tend to be well insulated with double glazing as a minimum, with triple glazing, quadruple glazing and even quintuple glazing becoming more common. Homes are well heated in winter and there is no need for stand-alone heaters. Over 90% of Finnish apartment blocks, more than half of all terraced houses and the bulk of public buildings and business premises are connected to a district heating network<sup>3</sup>.

Nowadays, there is a common understanding that buildings should be energy efficient, operate with low emissions and use environmentally friendly building materials. Energy generation and consumption are the source of all carbon dioxide (CO<sub>2</sub>) emissions in Finland<sup>4</sup>.

District heating is a suitable form of heating in densely populated areas. In Finland, more than 75% of district heat is produced by combined heat and power generation<sup>5</sup>. In households, space heating is the most significant use of energy. Energy use for heating and water heating has been growing almost constantly in the last decade. Normalized energy consumption for heating in the residential sector has increased by 22,0% from 2000 to 2012, whereas heated floor area has grown by 21.2% over the same period<sup>6</sup>.

Sustainable development has been the emphasis of the construction industries in Finland at an increasing rate. National building legislation in Finland rarely takes a stance on the carbon footprints of buildings nor defines the maximum energy consumption permitted. To fulfil these needs, the Green Building Council Finland (GBC Finland) was founded on 19th April 2010<sup>7</sup>. GBC Finland has developed Building Performance Indicators to measure the environmental factors associated with buildings, their energy efficiency and lifecycle costs, and also the well-being of occupants.

The Finnish government aims to make the country carbon-neutral<sup>8</sup>. Several programmes and policy measures have been initiated to achieve that long-term goal.

Finnish municipalities have also decided to curb their greenhouse gas emissions beyond the requirements set by EU directives<sup>9</sup>. The Carbon Neutral Municipalities Project (Kohti hiilineutraalia kuntaa – HINKU), which was launched in 2008, is a prime example of the collaborative work being undertaken by local government in cooperation with a range of different stakeholders from industry and society. Adopting a collaborative and holistic approach, HINKU is developing and piloting innovative and cost-effective carbon neutral solutions that are tailored to the individual needs of specific municipalities with the common goal of reducing greenhouse gas emissions. The solutions target energy efficiencies in housing, transport and agricul-

ture in particular. The HINKU project and the HINKU forum that has been established through the project (2013) has already achieved considerable success. The number of municipalities involved in the initiative has risen from 5 in 2008 to 39 in 2017. Each has developed a range of good practices, and collectively, they have reduced their emissions by an average of 29%.

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## 1

# General description

The Carbon Neutral Municipalities (HINKU) Project brings municipalities, businesses, citizens and experts together to develop and pilot solutions to reduce greenhouse gas emissions.

The municipalities involved are committed to reducing greenhouse gas emissions more extensively and more rapidly than EU targets and schedules would require<sup>10</sup>. The main aim of the project is to develop solutions that deliver economic, social and environmental benefits.

At a high level, the HINKU partners are: Association of Local and Regional Authorities (Kunataliitto); Finnish Environment Institute; Finnish Funding Agency for Technology and Innovation (Tekes); Finnish Innovation Fund (Sitra); Ministry of the Environment; Ministry of the Economy and Employment; and several companies<sup>11</sup>.

At a lower (local) level, the HINKU project involves a growing number of sub-projects that are independent in nature and are focused on meeting local needs and objectives, but which all subscribe to a common commitment to meet an 80% emission reduction target by 2030, compared to 2007. Each sub-project involves the participation of local (municipal) government and a range of stakeholders from local business, experts and society<sup>12</sup>.

HINKU municipal projects are diverse and unique and are based on locally developed roadmaps towards energy efficiency.

They are broad in scope and they involve, for example, measures that target: energy saving improvements in buildings, districts (urban and rural), industry and agriculture; sustainable mobility/transport infrastructure and vehicles; and waste management; among many others. Examples of some of the common types of activities that many projects are delivering, from a broad construction sector perspective, include:

- Information and promotional campaigns to help residents to find ways to reduce emissions in their home;
- Investment and support for the installation of energy efficient solutions in buildings (residential and non-residential) and districts, covering a wide range of solutions (e.g. for

heating, insulation, use of renewable energy sources, etc.);

- Promotion of the use of wood as a sustainable and energy efficient construction material and fuel source (e.g. wood chips for eco-friendly heating systems).

HINKU is unique in that it also encourages municipalities to work together to achieve individualised goals around carbon neutrality. At the local level, the purpose of HINKU is to strengthen local cooperation and improve wellbeing through energy efficiency and new business opportunities<sup>13</sup>. The project began with five forerunner municipalities, under the coordination of the Finnish Environment Institute (SYKE), which is a national environmental research centre under the Ministry of the Environment<sup>14</sup>.

The HINKU Project aims to spread best practices in climate change mitigation at national and international level.

To ensure strong communication between municipalities, the HINKU Forum was established in 2013. The forum is a network that brings together HINKU municipalities, a large group of cleantech companies and experts involved as partners to reduce greenhouse gas emission at municipal level<sup>15</sup>. HINKU collates best practices about climate friendly solutions and shares the information to those that are interested. Collating is done by the HINKU municipalities, other municipalities and even outside Finland. Information is shared through the HINKU forum and map. Using the map, municipalities present and share their own climate friendly solution<sup>16</sup>.

The HINKU project has 3 main phases:

- Phase 1: October 2008 – June 2010
- Phase 2: June 2010 – December 2012
- Phase 3: HINKU forum 2013 – ongoing<sup>17</sup>.

The HINKU forum provides a range of collaborative services:

- Networking;
- Information sharing;
- Preparation support for projects and initiatives;
- Emission calculation services and tools;
- Communication cooperation;
- Company product and service visibility.

To join the HINKU forum, municipalities must fulfil a set of criteria drawn up by the Finnish Environment Institute (SYKE).

These criteria include municipalities' measures and alignments to reduce emissions. These requirements refer to climate change mitigation and policies for reducing the gas emissions at municipality level and to have an effect on different actors in the municipality area. These actors can be: inhabitants, companies and entrepreneurs<sup>18</sup>.

The HINKU municipalities must meet a number of targets:

- Commitment to achieve an 80% reduction in greenhouse gas emissions by 2030, compared to 2007;
- Join the energy efficiency agreement which is between the Ministry of Employment and the Economy, the Energy Authority and the Association of Finnish Local and Regional Authorities;

- Select a HINKU contact person;
- Establish a HINKU-group – a working group at municipal level that comprises the relevant project partners in the municipality and is responsible for designing a Carbon Neutral Municipality (HINKU) Roadmap and a set of activities that are specific to that municipality, and which meet its particular needs and objectives. The working group then links into the wider HINKU community (multi-municipalities) and the HINKU forum in order to share ideas and best practices;
- Presentation of a yearly emission reduction action plan.

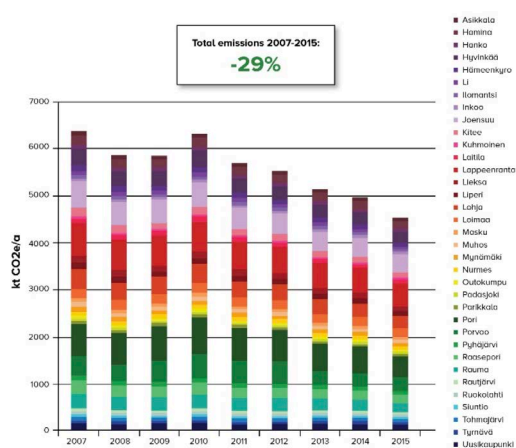
## 2

# Achieved or expected results

The HINKU project is an important initiative in Finland that is significantly reducing greenhouse gas emissions. In 2008, the HINKU involved 5 small municipalities and 36,000 inhabitants. By 2017, there were 39 municipalities and 678,000 residents participating, which equates to 11% of all municipalities and 12% of the Finnish population<sup>19</sup>.

Figure 2 shows that HINKU municipalities managed to lower their emissions by an average of 29% compared to the level of emissions in 2007. Since 2011, overall emissions by the participating municipalities have decreased continuously.

Figure 1: Greenhouse gas emissions in HINKU municipalities 2007-2015



Source: HINKU Forum, Emissions trend<sup>20</sup>

The HINKU project can showcase 39 good examples (municipalities) of the HINKU work done at local and regional level. One of the best practices is the Municipality of Ii, which has accelerated significant CO<sub>2</sub> emissions cuts of almost 70% within just a few years.

The HINKU project is an important initiative in Finland that is significantly reducing greenhouse gas emissions. In 2008, the HINKU involved 5 small municipalities and 36,000 inhabitants. By 2017, there were 39 municipalities and 678,000 residents participating, which equates to 11% of all municipalities and 12% of the Finnish population<sup>21</sup>.

The Municipality of Ii joined the HINKU project in 2011, and since then, it has saved a total of 4,818 MWh of energy which is equivalent to the energy consumption of 241 electrically-heated single-family houses. The Municipality of Ii has also reduced its use of oil by 310,000 litres (-85%). The resulting cost saving is equivalent to EUR 240,000. Key construction sector-related measures that the municipality is implementing include:

- Analysis of the energy consumed in all municipally-owned buildings and replacement of oil heating systems with local and renewable sources such as biomass (wood chips) and geothermal heating;
- Organisation of Energy Days with the assistance of energy experts to inform residents and teachers/students (in schools) about energy saving methods and behaviour;
- Accelerated adaptation of renewable energy solutions in the community by organizing a joint procurement/tendering programme to acquire solar energy and thermal panels. About 80 local residents, companies and leisure apartment owners have been participating the programme. Benefits are lower prices / economies of scale and sharing expertise on sustainable energy solutions<sup>22</sup>.

Another example of the success being achieved by HINKU municipalities is presented in Table 1, which shows how the municipality of North Karelia is already outstripping national and European efficiency targets. North Karelia is implementing a wide range of measures based on two main local strategies: the Climate and Energy Programme of North Karelia 2020<sup>23</sup> and North Karelia's Choices for Smart Specialisation 2021<sup>24</sup>.

The construction sector-related measures that North Karelia is implementing are<sup>25</sup>:

- Promotion of and support for building insulation, controlled ventilation, the recovery of heat, the utilization of passive solar energy and ventilation and other ecologically sustainable solutions – in both new construction and building renovations;
- Promotion of the use of water circulation heating;
- Promotion of energy efficiency in new and old buildings and in public sector facilities;
- Support for training in wood construction for construction professionals, and promotional activities to increase the interest of local builders in wood construction;
- Building wooden apartment buildings is established as a normal practice in construction;
- Provision of information on alternative heating solutions based on renewable energy sources;

- Promotion of and support for the use of residential energy saving solutions that use renewable energy sources;
- Review of local building codes to remove barriers for the installation of solar collectors, solar panels and wind turbines.
- Awareness raising about the potential uses of passive solar energy;
- Promotion of centralised heating systems that use renewable energy in new residential areas;
- Implementation of an energy advice project aimed at construction and renovation;
- Establishment of a region-specific model for providing construction and energy advice.

Table 1: North Karelia exceeding national and European efficiency targets

Target	Finland/Europe	North Karelia
Reduction of greenhouse gases	-20% by 2030 -30% by 2050	-30% by 2030 -80% by 2050
Share of renewable energy	>50% by 2030	66% already achieved
Self-sufficiency of renewable energy	>55% (incl. peat) by 2030	100% by 2025
Reduction of oil usage	-50% by 2030	Heating – 100% by 2020 Transportation – 100% by 2030
Increasing the use of wood energy for heating	15 mil. m <sup>3</sup> /year	1 mil. m <sup>3</sup> /year

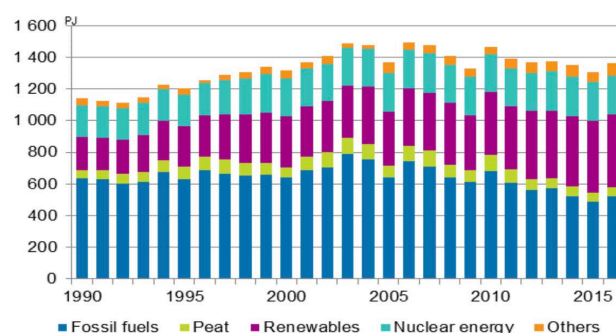
Source: Jukka Nykanen, Regional Council of North Karelia<sup>26</sup>

The most important measures that are being delivered through HINKU projects at municipal level are focused on the replacement of fossil fuels with renewable energy sources, improvements in the energy efficiency of buildings and reductions in energy consumption.

A novel element of HINKU is the joint procurement of solar power systems. This began as a pilot project in four small communities and it proved to be successful. As a result, the project coordinator SYKE subsequently launched a joint procurement initiative for solar power systems, inviting all municipalities and municipal enterprises in Finland to increase their use of solar power <sup>27</sup>.

The use of renewable energy sources grew by 2%, rising to a new record level in 2016, as shown in Figure 2. Renewables covered 34% of total energy consumption and according to Statistics Finland, this is barely 39% of end use.

Figure 2: Total energy consumption 1990-2016



Source: Statistics Finland, Use of renewable energy at record level in 2016<sup>28</sup>

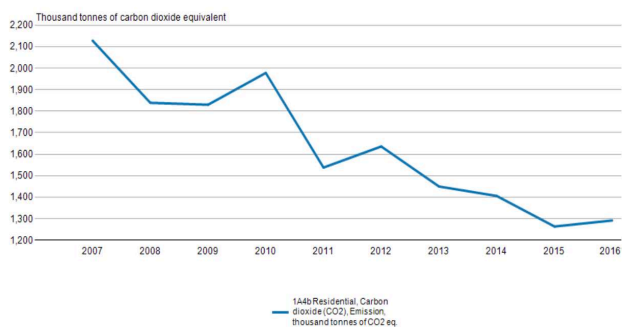
Another important result of the HINKU project is related to climate change education at all levels. More than one-third of Finland’s municipalities have a climate strategy or are in the process of preparing one. Those municipalities have incorporated climate change mitigation into their practices. The municipalities play a decisive role as intermediators of information regarding attitudes towards climate issues and effecting changes in peoples’ lifestyles.

Some of the municipalities have already initiated campaigns to encourage citizens to contribute to combating climate change<sup>29</sup>. As a result, the HINKU project offers a publicly available database in which all necessary measures to combat climate change are gathered, which users can browse using an interactive map. In addition, the municipalities involved in HINKU are voluntarily working to green their economies and are acting as laboratories for sustainable development. HINKU municipalities have brought together mayors, businesses, citizens and experts to create and carry out solutions to reduce greenhouse gas emissions.

As Figure 3 shows, 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<sup>30</sup>.



Figure 3: Greenhouse gas emissions in Finland by residential sector



Source: Statistics Finland, Greenhouse gas inventory unit<sup>31</sup>

Due to the HINKU project, municipal authorities, business representatives, local residents, research institutes and experts are continuing to work together to devise new cost-effective solutions to reduce emissions, especially in housing, transport and agriculture. Apart from environmental advantages, the municipalities have created new jobs and gained economic benefits.

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## 3

## Perspectives and lessons learned

From a **government perspective** the HINKU project should help Finland to reach its Paris Climate Agreement goals well ahead of schedule and be carbon-neutral by 2045, meaning that the country would have a quarter of a century to achieve its goal<sup>33</sup>.

According to the Director of the Carbon Neutral Municipalities (HINKU) Project, the initiative is a good example of effective collaboration between the local authorities, private enterprises and citizens<sup>34</sup>. This is a best practice model for reducing emissions that should be adopted elsewhere, in order to build a green economy. The projects are also having a positive social and economic impact by creating new employment and developing new business ideas; however, it is important to communicate the project and its concept both nationally and internationally<sup>35</sup>.

From an **industry perspective**, investment in renewable energy production is becoming more and more popular as a means of reducing or compensating the emissions caused by production.

In many industries, large amounts of greenhouse gas emissions are created in the use phase of products. Therefore, to truly achieve carbon neutrality, there is a need to place more emphasis on products and their usage, instead of just focusing on the production processes<sup>36</sup>.

75% of Finnish companies believe that carbon neutrality is a valuable opportunity to achieve a significant competitive advantage. This is according to a survey of 500 Finnish companies that was conducted by the Finnish Innovation Fund Sitra. Research work that Sitra has commissioned also estimates that carbon neutrality will create a market worth up to EUR 6,000 billion for intelligent green solutions by 2050. Important opportunities for Finnish companies exist in many areas within this context, including for example, the application and enhancement of the Finnish Smart Building Concept in multiple Finnish regions, cities and localities. HINKU is an ideal platform for Finnish companies to get involved, experiment and trial new ideas with an eye to the future<sup>37</sup>.

# Endnotes

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- 16 Secure, Smarter energy communities, HINKU Best practice in Finland: <http://secure.interreg-npa.eu/news/show/hinku-best-practice-in-finland/>
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