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SMART ENERGY

Photo: Thomas Kast / Visit Finland



Finland - a leading country in smart energy

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- A combination of groundbreaking renewable energy technology, smart networks and automation has made Finnish smart energy solutions among the most advanced in the world.
- Finland's expertise in smart energy is based upon a variety of complimentary factors: **a history of using renewable energy, strong support from society and public officials, rare natural resources, world-class research and an innovative private sector.**



Developing smart energy

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- Finland has no usable old fossil energy deposits such as oil and coal. Because of this Finland has for decades focused on developing the energy it does have, such as renewable hydroelectric and wood-based bioenergy.
- The harsh climate has forced Finland to develop efficiency solutions, such as district heating and smart grids. District heating takes “waste” heat from industry and uses it to heat homes.
- The Finnish state has pledged €100 million to the Smart Energy Finland Program, while energy is key for the Finnish Innovation Fund Sitra.



Facts and stats:

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- Finland is a forerunner in the quest for carbon neutrality and smart energy. Already **40%** of Finnish energy is produced from renewables. Finland has a goal of being coal-free in 2029.
- The smart energy sector is an important export industry, with one estimate placing it at **25-35%** of total exports.
- Eurostat says Finnish energy prices for non-households, including taxes, are the third lowest in the EU.



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Finland has focused on human resources and education, leading it to have one of the most highly-skilled workforces on the planet.





Renewable energy

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- According to the Finnish Ministry of Economic Affairs and Employment, **40%** of Finnish energy comes from renewables.
- Traditionally wood has been a major source of renewable energy in Finland, but currently the fastest growing energy source is wind power.
- Wind power production is growing at a **24%** annual rate, the fastest-growing energy source, according to Statistics Finland.



Finland's energy grid is among the best in the world.

In 2015, the transmission reliability of the national grid was as high as **99.9998%**, and the average forced interruption was a little more than 1 minute.



Mobile communications and software skills

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- In the modern age of sustainability and renewability Finland has found its old skills in high demand. Finnish mobile communications and software skills are now required for Internet of Things (IoT) solutions and smart energy grids.
- In the IoT, sensors are placed on equipment and relay information wirelessly. This information can warn operators if equipment is about to fail or help decide which power generation assets should be used in a flexible system, for example. This increases efficiency and reliability.



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In 2020 the Environmental
Performance Index ranked Finland **the
seventh cleanest country in the
world and the first in air quality.**



Power-to-X solutions

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- Power-to-X solutions, a way to convert and store energy, have drawn considerable attention. The problem with renewable solar and wind energy is that they do not produce power on demand, but only when the sun shines or wind blows.
- Power-to-X seeks to solve this challenge by taking excess power and converting it to a fuel which can be accessed later on demand, such as methane or hydrogen. This technology is a main focus in the Smart Technology Hub in Vaasa.



Renewable biofuels

- The centuries-old forestry industry is rapidly developing renewable biofuels. The forestry industry is also innovative in circular solutions, such as using waste and side streams as sources of energy.
- Renewable wood represents 28% of Finnish energy consumption, according to the National Resources Institute Finland.





Learn more:

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Business Finland Smart

Energy Finland: The Smart Energy Finland Program brings together the services for technical development and exports.

VTT Smart City: A smart city is related to the smart energy sector, focusing on data, services, energy, housing and transport in urban environments.

Sitra: Energy: The Finnish Innovation Fund Sitra is a “think and do tank” which aims to improve Finland’s future.

VTT Smart Grids and Energy Systems:

VTT puts together a wide range of solutions addressing the whole energy value chain, taking into account electricity, heating, cooling and fuels.



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Thank you!

