

A photograph showing three people walking on a dirt path through a forest of tall pine trees. In the background, a large metal power line tower stands prominently against a clear blue sky. The scene is brightly lit, suggesting a sunny day. The overall composition links nature and clean energy infrastructure.

**FINGRID**

**Towards a clean  
electricity system**



# Finland's transmission system operator

Fingrid Oyj is responsible for electricity transmission in Finland's main grid. The main grid is the backbone electricity transmission network, which is connected to large power plants, distribution networks, and major industrial plants.

Fingrid's main grid comprises more than 14,000 kilometres of transmission lines operating at 400, 220, and 110 kilovolts, numerous substations, and reserve power plants, which are used in the event of severe disturbances. Fingrid and the operators in Finland's neighbouring countries also own cross-border connections between their main grids.

The power system of Finland is part of a joint Nordic power system connected to the Central European system with HVDC transmission links. Finland has HVDC transmission links to its neighbouring countries.

A functioning electricity market benefits everyone, including consumers. Fingrid is tasked with promoting the electricity market's functionality, efficiency and reliability. Fingrid is also responsible for ensuring an uninterrupted power supply, now and in the future.

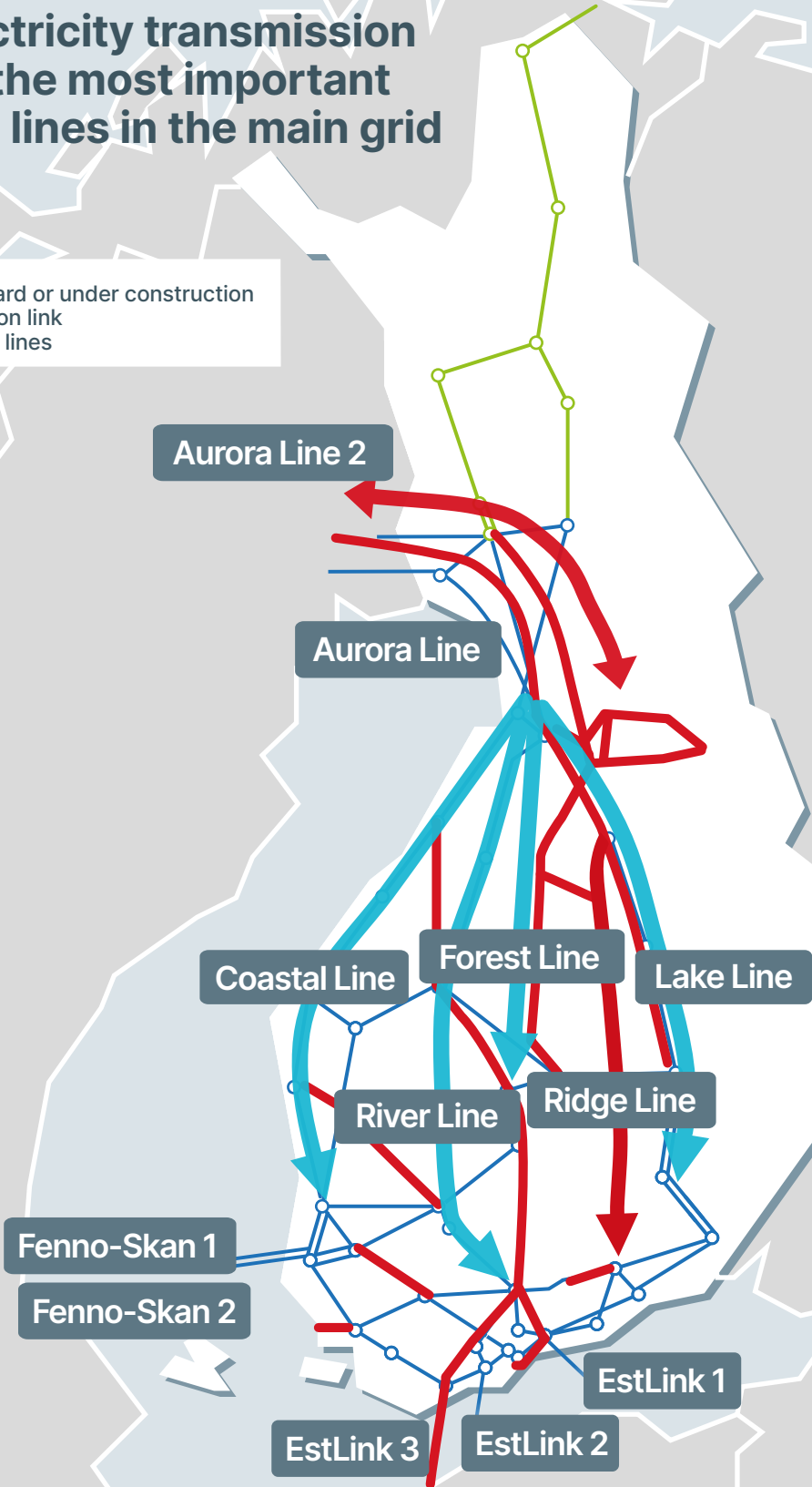
Transmission system operators play a special role in Finland and around the world. They have been assigned responsibility for the operation and development of the power system, which is vital for society. Transmission system operators are strictly regulated monopolies.

The state and the National Emergency Supply Agency jointly own more than half of Fingrid. The other owners are pension and insurance companies and other institutional investors.

# Finland's electricity transmission in 2033 and the most important transmission lines in the main grid

- █ On the drawing board or under construction
- █ Existing transmission link
- █ Other transmission lines

The image does not show 110 kV connections.



# Distribution system operators transmit electricity to consumers

A reliable electricity supply is one of the cornerstones of a functioning society, guaranteeing the competitiveness of enterprises. Everyday life is powered by electricity.

Consumers can purchase the electricity they need from their chosen electricity suppliers. With an exchange electricity contract (also known as a spot price contract), the electricity price is determined according to supply and demand. Many consumers use Fingrid's Tuntihinta (Hourly Price) app to track the exchange price of electricity and optimise their consumption.

Electricity transmission is a regulated activity that is separate from electricity trading. It is handled by regulated companies – the transmission system operator (Fingrid) and distribution system operators. Distribution networks are regional and local networks that transmit electricity to consumers. Local electricity production plants are also connected to distribution networks. The main grid, cross-border connections, and distribution networks constitute the power system.

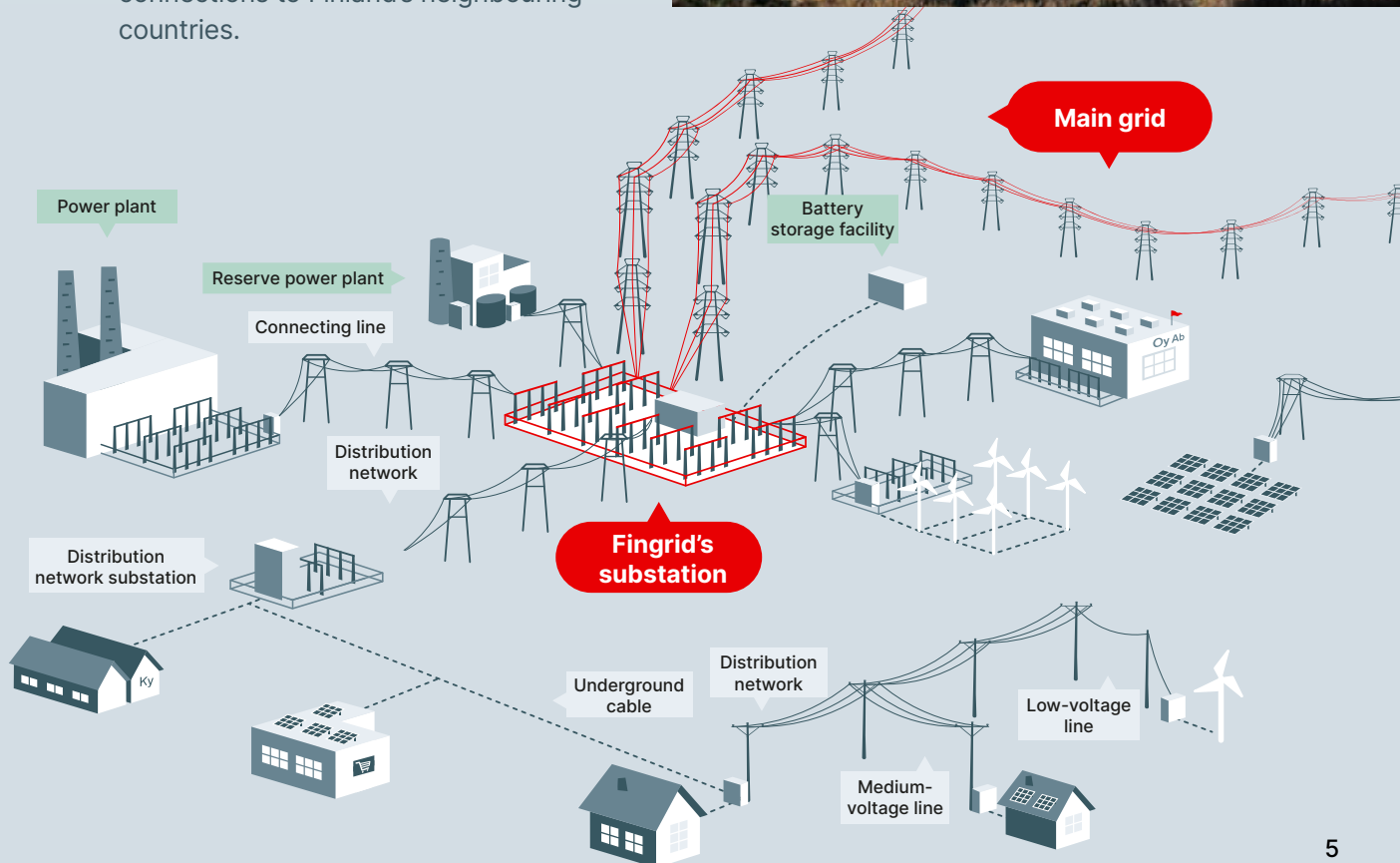


*The basic elements of the electricity transmission system are the main grid, distribution networks and cross-border connections.*

# How does electricity get from A to B?

Large power plants, factories and regional distribution networks connect to the main grid, which distributes electricity throughout Finland. The distribution networks receive most of their electricity from the main grid and transmit it to consumers, such as households.

This picture still lacks one important part of the power transmission system: connections to Finland's neighbouring countries.





*The main grid and the power system covering the entire country represent Finland's most extensive infrastructure.*



# Keeping the lights on throughout the country

Fingrid monitors the power system 24/7 so that Finland receives power without disruptions. It is our job to ensure that electricity production and consumption are always in balance. If domestic electricity production, imports and demand-side management are not enough to cover electricity consumption, an electricity shortage could arise, and consumption would need to be restricted momentarily.

In recent years, the main grid has caused an average of just three minutes without electricity annually. The system is designed to withstand the worst possible individual fault at any given moment without a large-scale power cut.

The line structures and vegetation clearing in transmission line areas ensure trees do not fall onto the lines. The aim is that even severe storms cannot cause disturbances in main grid electricity transmissions.

Fingrid manages reserve power plants that can be started up quickly. Their capacity is approximately equivalent to that of a nuclear power plant unit. Reserve power plants are kept ready to safeguard the power supply in the event of a disturbance. They are rarely called upon to operate.

*Fingrid is actively working to develop the Nordic and European electricity markets.*





# On the European electricity market

As the electricity market has expanded, Finland has become increasingly involved in the pan-European development of the sector. Fingrid promotes the functioning of the electricity market to ensure that everyone in Finland continues to receive the most affordable electricity.

Fingrid works closely with the other Nordic transmission system operators. We work tirelessly to improve the operating conditions in Nordic markets and develop European electricity markets while safeguarding national interests.

We ensure that Finland's cross-border connections have enough transmission capacity for the market's needs. Sufficient transmission capacity is vital for an efficient market and contributes to levelling out price disparities between countries. Finland has four submarine cables to other countries: Fenno-Skan 1 and 2 to Sweden and EstLink 1 and 2 to Estonia. The Aurora Line, a new connection under construction between Finland and Sweden in the north, will increase the electricity transmission capacity between the countries and

support investments in the green transition of industry. A third submarine cable connection to Estonia is on the drawing board. This will further integrate the Baltic Sea region's electricity markets, boost the security of the energy supply, and support the achievement of climate and renewable energy targets. The construction of Aurora Line 2, a fourth connection to Sweden, is planned for the early 2030s.





# Combating climate change

Fingrid plays an active role in the energy transition and climate change mitigation. We are laying the foundations for a clean electricity system by designing, building and maintaining the main grid. In a clean electricity system, electricity production is based on CO<sub>2</sub>-free energy sources, such as wind, solar, bio, hydro and nuclear power. We are developing the electricity market and power system solutions around the needs of an emission-free power system. We work closely with customers, technology partners, authorities and policymakers.

Finland aims to become a carbon-neutral society by 2035. Electricity consumption is increasing in the industrial, heating, and transport sectors in terms of direct electricity consumption and indirect electrification via conduits such as hydrogen.

Fingrid considers the long-term effects on the environment and land use when

building and maintaining transmission lines, substations and reserve power plants. Transmission line projects primarily use existing transmission line rights-of-way. If an entirely new route is necessary, settlements and other important sites are avoided whenever possible. We always prepare an Environmental Impact Assessment (EIA) or environmental study for transmission line projects. We aim to place the lines as well as possible while considering the viewpoints of landowners and other stakeholders.

We develop our operations over the long term by training our personnel and participating actively in sectoral development projects. The operating environment for Fingrid's personnel has changed substantially in recent years. The energy transition, a main grid construction programme of record proportions, and the demands on electricity market development have increased the workload.

## Services for consumers:

- Monitor the state of Finland's power system: [fingrid.fi/en/electricity-market/power-system/](https://fingrid.fi/en/electricity-market/power-system/)
- Check the electricity consumption of your home: [palvelut.datahub.fi/en](https://palvelut.datahub.fi/en)
- Track the exchange price of electricity with the Tuntihinta mobile app: [fingrid.fi/tuntihinta](https://fingrid.fi/tuntihinta) (in Finnish)
- Information and news about Fingrid: [fingrid.fi/en](https://fingrid.fi/en)
- Blogs and articles: [fingridlehti.fi/en](https://fingridlehti.fi/en)
- Open data on the electricity market and power system: [data.fingrid.fi/en/](https://data.fingrid.fi/en/)

# FINGRID

**Delivers. Responsibly.**

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