

Media release

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Grid development projects up to 2040

Swissgrid presents the grid of the future

The transmission grid is the backbone of a secure supply of electricity in Switzerland. To ensure that the grid meets future requirements, Swissgrid has updated its long-term grid planning in the Strategic Grid 2040 project and identified 31 key grid projects. Swissgrid is preparing the grid for the energy future with investments totalling around CHF 5.5 billion by 2040.

The transformation of the energy and electricity system is in full swing in Switzerland and Europe. This process is being driven by decarbonisation, the decentralisation of electricity generation and digitalisation.

To enable decarbonisation, the Swiss population approved the Energy Strategy 2050 in a referendum. Electricity consumption is rising sharply, particularly in connection with the replacement of oil and gas heating systems by heat pumping technology, electromobility and the construction of large data centres.

Decentralised utility power generation is growing due to the construction of new photovoltaic and wind power plants in Switzerland and Europe. Electricity generation is becoming increasingly volatile. In addition, wind farms in the North Sea and large solar plants in southern Europe are leading to a rise in international electricity flows.

Digitalisation can reduce the need for grid expansion by opening up new possibilities to optimise the networking and coordination of energy consumption, generation and storage and the control of electricity flows.

By preparing the grid of the future, Swissgrid is making a decisive contribution to the successful transformation of the energy system. The Federal Electricity Commission (ElCom) has reviewed the plan and confirmed the need for additional grid development.

Grid development requirements until 2040

In its updated multi-year plan, the Strategic Grid 2040, Swissgrid has identified 31 major grid enhancement and grid expansion projects in the Swiss extra-high-voltage grid that need to be implemented by 2040 (25 existing grid projects that have not yet been carried out plus 6 further grid projects). Swissgrid will continue to ensure secure grid operation in the future by means of grid expansion and grid enhancement, additional adjustable transformers and the optimisation of the existing infrastructure.

Media release

30 April 2025

- **Grid enhancement and grid expansion:** the existing grid needs to be enhanced (voltage or power increase) over 400 kilometres, and new lines must be built over 790 kilometres to increase the grid's power transmission capacity.
- **Adjustable transformers:** 21 new phase-shifting transformers (PSTs) will be procured and installed to improve the controllability of electricity flows in the grid. PSTs function like a traffic guidance system. Electricity flows through the grid along the path with the least resistance. PSTs change the resistance of the lines so that the electricity is distributed more evenly across parallel lines, thereby increasing the transport capacity of the grid as a whole.
- **Optimising existing infrastructure:** as more than two-thirds of the existing grid is more than 60 years old, renovation measures are necessary on around 1,300 kilometres.

The total length of the Swiss transmission grid will remain the same as today at 6,700 km, as 790 km of old lines will be dismantled if they are no longer needed or replaced by new lines. Swissgrid will invest a total of around CHF 5.5 billion in the transmission grid by 2040 for the above measures.

«Economic growth, innovation, our everyday comfort – everything depends on a strong grid. Swissgrid is preparing the grid for the energy future to keep Switzerland moving,» says Nell Reimann, Head of Market at Swissgrid. «The updated grid plan confirms the grid projects we have already initiated and emphasises the importance of putting them into practice rapidly. It also shows what other projects are needed.»

Faster grid expansion required

Grid projects often take 15 years or more from project planning to implementation. This is hampering the transformation of the energy system and Switzerland's economic development.

«Grid expansion must be accelerated,» says Yves Zumwald, CEO of Swissgrid. «To implement the grid of the future by 2040, we need the necessary framework conditions and faster processes for grid infrastructure projects.» Swissgrid plays an important role by coordinating its projects with infrastructure operators (distribution system operators, SBB, etc.) and the cantons on a regional basis, bundling infrastructure, seeking environmentally friendly solutions and involving the population at an early stage.

Keeping grid expansion to a minimum

Swissgrid plans grid expansion in line with demand according to the NOVA principle: grid optimisation before grid enhancement before grid expansion. This enables Swissgrid to minimise the impact on the environment and landscape. Taking into account the economic impact, Swissgrid endeavours to keep the costs of further developing the transmission grid as low as possible.

Media release

30 April 2025

Closer connections to Europe

With the grid of the future, Swissgrid is also laying the foundations for connecting Switzerland even more effectively to the surrounding electricity system by 2040 – because the Swiss energy system is only robust if it is connected to the European grid. An electricity agreement with the EU is an important condition for this.

An additional direct current grid, the «supergrid», will be created over the next few decades to complement the current European extra-high-voltage grid. The supergrid will be used to transport large volumes of electricity over long distances with minimal losses at lower costs. Swissgrid and the responsible transmission system operators from Germany and Italy will conduct a joint study to examine how transfer capacity between the countries can best be increased.

The aim is to improve the organisation and control of cross-border electricity exchange on the north-south axis. This is essential in order to maximise the potential of offshore wind farms in the North Sea and solar farms in southern Europe in combination with storage services from the reservoirs in the Alps. This is essential in order to maximise the potential of offshore wind farms in the North Sea, solar farms in southern Europe and storage options in the Alps.

Further information on grid projects: www.swissgrid.ch/grid-projects

More details about the process for designing the grid of the future: www.swissgrid.ch/future-grid

Media release

30 April 2025

How the grid of the future is created

Swissgrid updates its multi-year plan for the expansion of the transmission grid every four years. Based on future scenarios for the development of generation and consumption, experts simulate where future grid congestion is likely to occur and where there is the greatest need for expansion. They then determine the necessary grid projects. To conduct this analysis, they coordinate with Swiss Federal Railways (SBB) and all the distribution system and power plant operators that are connected to the transmission grid. Of course, Swissgrid also carries out a cost-benefit analysis and only pursues grid projects whose benefits outweigh the costs. The scenario framework for Switzerland published by the Swiss Federal Office of Energy in 2022 forms the basis for the updated long-term grid plan. It sets out target values for the year 2040 indicating the installed capacity for each generation technology, electricity consumption per consumer group, and storage capacities.

For more information, visit media@swissgrid.ch or call +41 58 580 31 00.

Powering the future

Swissgrid is the national grid company. As the owner of Switzerland's extra-high-voltage grid, it is responsible for operating the grid safely and without discrimination and for maintaining, modernising and expanding the grid efficiently and with respect for the environment. Swissgrid has more than 900 highly qualified people from 40 countries at its sites in Aarau, Prilly, Castione, Landquart, Laufenburg, Ostermundigen and Uznach. As a member of the European Network of Transmission System Operators for Electricity (ENTSO-E), it is also responsible for grid planning, system management and market design in the European exchange of electricity. The majority of Swissgrid's share capital is jointly held by various Swiss electricity companies.