Control Energy Market

Overview and development

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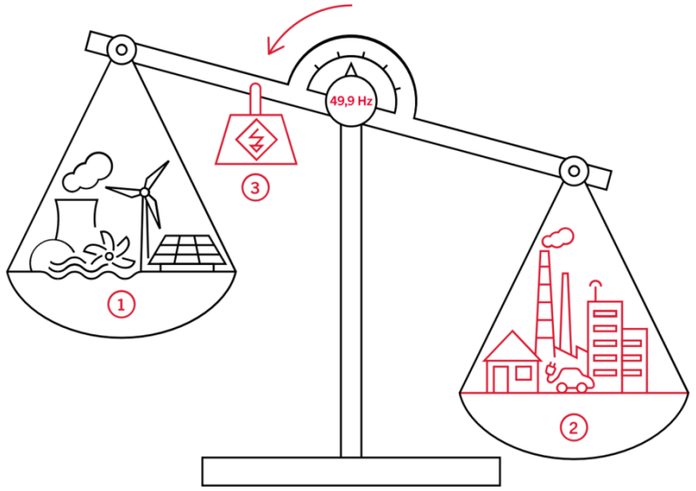
Use of control energy for a stable grid in Switzerland and Europe

1 Generators/power plants

2 Consumers: private households and industry



1 Generators/power plants

2 Consumers: private households and industry

3 Control energy

- The transmission grid only works if the production and consumption of electricity are in equilibrium. A frequency of 50 Hertz must be ensured every second.
- The grid control rooms monitor the grid around the clock and ensure that this equilibrium is maintained at all times.
- In the event of an imbalance between production and consumption, Swissgrid draws on control energy.
- This is a reserve that power plants keep available on Swissgrid's behalf and which it can access at short notice.
- If electricity consumption increases or a power plant fails, Swissgrid allows generators to feed more energy into the grid. If it drops, less energy is fed in.

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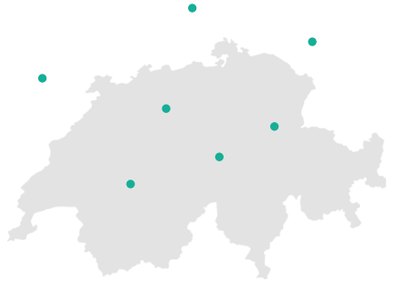
Swissgrid takes a three-stage approach to control energy

Primary control:
0.5 min. after outage

- **Automatically** generated within seconds by the generators
- Rapid response due to frequency measurement in the power plants
- **Across Europe**

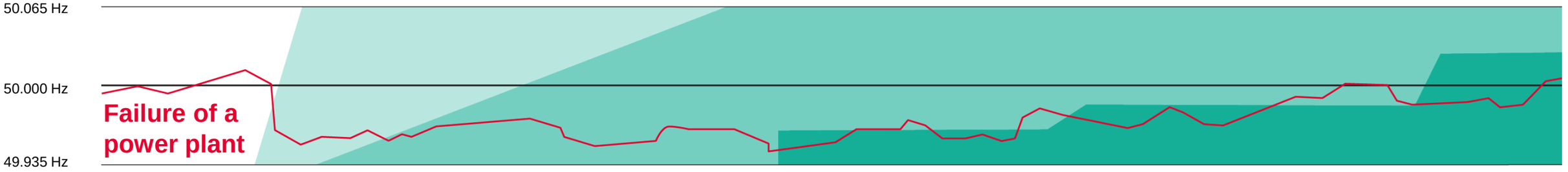
Secondary control:
5 min. after outage

- **Automatically** activated by the central load frequency controller at Swissgrid
- Measurements taken on Switzerland's cross-border lines
- **Across Switzerland**



Tertiary control:
15 min. after outage

- **Activated by the operator**
- In case of larger and longer deviations
- Contracts with **individual international providers**



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The procurement of control reserves – the control energy market

- Swissgrid procures the control energy on an internet platform using tenders.
- The power plants offer a certain power at a certain price.
- The best offers are selected using an algorithm.
- If a contract is awarded, the power plants are obliged to keep their offered power available for a certain period.
- Swissgrid pays the power plants for keeping this power available.

Requesting control energy:

- If fluctuations occur in the grid, the control energy is automatically or manually activated by the Swissgrid grid control room.
- The power plants receive additional compensation for requests for secondary and tertiary control energy, but not for primary control energy.

Control energy market: Swissgrid product overview

Control power	Procurement
Primary control power	• Daily product (power plants must be able to ensure availability of the power for 24 hours) • Always procured two days before real-time operation (d-2) • Positive and negative power is jointly tendered (providers must be able to feed in more or less power during this period)
Secondary control power	• Weekly product (power plants must be able to ensure availability of the power for one week) • Always procured on the Tuesday of the preceding week • Positive and negative power are tendered separately
Tertiary control power	• Weekly product, four-hourly product (power plants must be able to ensure availability of the power for either one week or four hours) • Part of the power on the Tuesday of the preceding week (weekly product), the rest two days before real-time operation (four-hourly product) • Positive and negative power are tendered separately

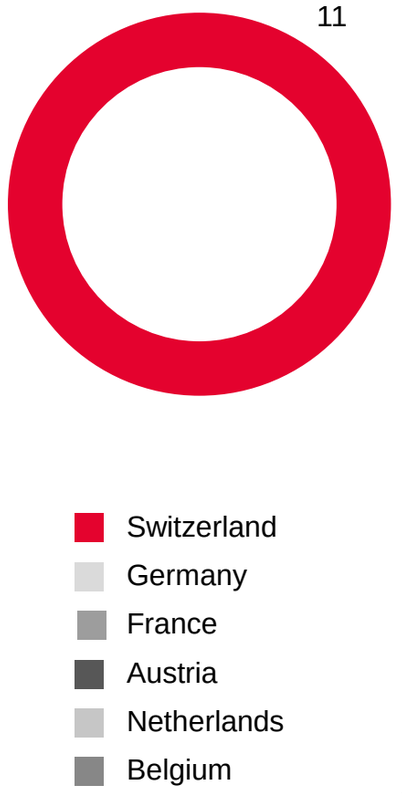
Continued development of the control energy market

- Swissgrid is constantly refining the control energy market in cooperation with international transmission system operators.
- Use of synergies between the products and combined tendering processes for secondary and tertiary control power.
- Establishment of integrated markets: integrated market for tertiary control power and redispatch.
- Further development of the product range, such as separate tendering of positive and negative power, daily auctions instead of weekly auctions.
- Introduction of new price mechanisms and cross-product harmonisation of prices
- Introduction of control pooling

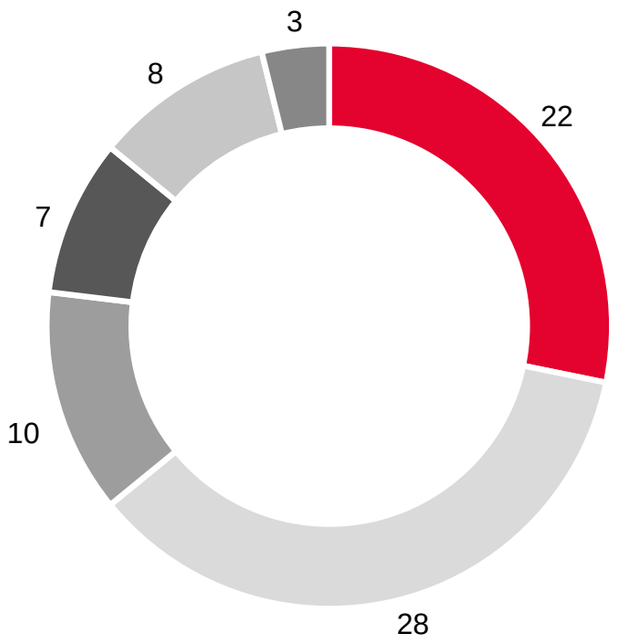
→ **Increase in providers**

→ **Significant decrease in procurement costs**

2009
11 providers



2019
78 providers*



*The number of providers participating in the market can vary

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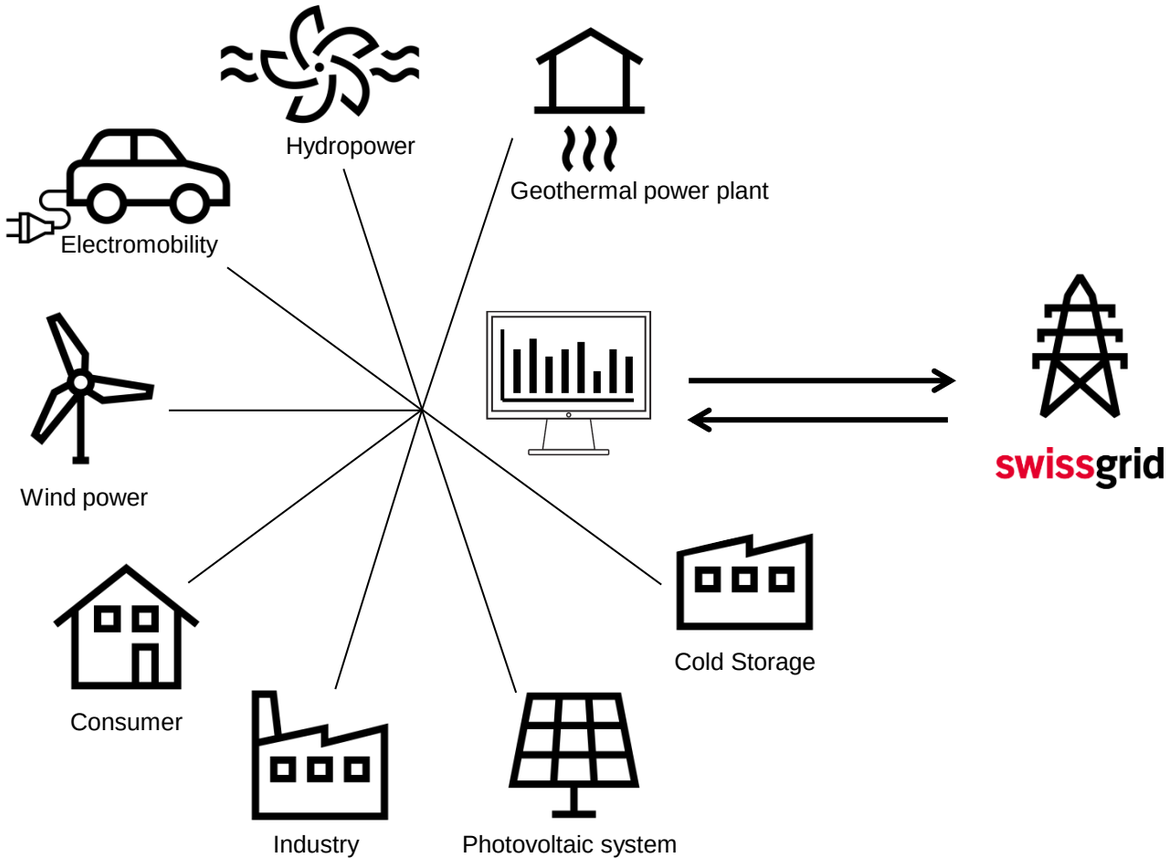
Control pooling – Swissgrid as a pioneer in Europe



- Different energy generators or consumers can merge to form a "virtual power plant" and offer their combined power as part of the tendering process.
- Examples: small power plants, refrigerated warehouses, waste incineration plants.
- Swissgrid has been offering prequalification for owners of photovoltaic, biomass, wind and smaller hydro power plants since 2015. They can join forces to offer their power.
- In doing so, Swissgrid plays a pioneering role in Europe.

Outlook – Equigy crowd balancing platform

- Swissgrid is launching the Equigy – Crowd Balancing Platform as part of an international consortium. This platform is another step towards the development of complementary control energy products that ensure grid stability.
- The consortium is establishing European, standardised and open access to the control energy market for manufacturers of electric cars and other storage technologies.
- The successful implementation of the Energy Strategy 2050 requires innovations such as the Equigy – Crowd Balancing Platform. The approach has proven to be successful in other countries and interested parties in Switzerland now have the opportunity to get involved in the pilot project.

Thank you
for your attention

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