Q&A with Yves Zumwald, CEO Swissgrid

1) What policies is Switzerland pursuing in the electric utilities industry to tackle climate change?
Switzerland has taken a wide range of policy measures to counteract climate change. For example, it introduced laws committing it to the short- and medium-term climate targets agreed under the Kyoto Protocol and the nationally determined contributions set out in the Paris Agreement.

As part of these nationally determined contributions, Switzerland is committed to reducing its greenhouse gas emissions by 20% by 2020 and by 50% by 2030 compared to the 1990 levels. It has also set indicative targets for the period to 2050 in line with its commitment to gradually shift away from fossil fuels and contribute to maintaining the increase in global temperature to well below 2°C.

In 2016, Switzerland emitted 48 million tons of carbon dioxide equivalent, excluding emissions and abatements of greenhouse gases from land use, land-use change and forestry. Energy-related emissions, including those from the transport sector, accounted for 78% of total greenhouse gas emissions – a reduction of 10% compared to 1990. It's also worth noting that Switzerland's carbon intensity is the lowest among International Energy Agency member countries.

Despite the progress achieved, more stringent measures are required to ensure that the country stays on track to achieve its targets towards 2020 and its medium to long-term targets under the nationally determined contributions and the Energy Strategy 2050, especially in the transport sector.

2) What technologies is Swissgrid developing to support the energy transformation – and what role will automation and distributed resources play?
We've introduced a number of innovations to support our activities in different areas. For example, since taking over Switzerland's transmission grid assets in 2013, we've been working on digitalizing the system to ensure we have accurate and up-to-date records and standardized documentation processes. We've made an initial digital recording of the 200-metre-wide route corridor of our 3,700 km routes using helicopter flights, and this data is being transferred into a three-dimensional line model that we'll be able to use to model transmission lines and perform status analyses and simulations.

We've also optimized our procurement of control reserves by introducing a system of combined auctions, whereby we look for synergies between both the products and between the weekly and daily auctions. This market clearing system, the first of its kind based on stochastic optimization, enables us to select the bids with the lowest procurement costs while upholding the technical requirements for the control reserves.

Elsewhere, we've introduced fully automated network security forecasts for the next four hours, which are updated every 15 minutes. These forecasts increase the security of the network by enabling operators to perform preventative interventions or prepare curative interventions.

Moreover, as Switzerland's demand for electricity and generation of renewable energies increases, we need to reconstruct and expand the transmission grid. However, it can be difficult to gain consensus among the affected citizens and other stakeholders on where to construct the new power lines. With this in mind, we've launched a new 3D Decision Support System, which uses geographical data and mathematical optimization to find the most consensual solution for all of the stakeholders involved.

One of the crucial factors in ensuring the success of these projects is to involve business from the outset. It's incredibly satisfying when we can address business challenges directly and help iron out operational problems.

3) What's your vision for the power system by the middle of this century – and what disruptions lie in store for the industry?
The energy system of the future will be much more consumer-centric, with end users such as households and industry playing much more active and central role.

Real-time communication platforms and digital innovations will be used to encourage these end users to exploit technologies such as solar panels, heat pumps, boilers and electric cars to optimize their electricity bills. This will result in a greater share of decentralized and variable energy generation as well as increasingly international electricity flows.

To keep the system in balance, we will have a growing need for flexible capacity that can be deployed in real time. Prosumers can play an

important role in this by actively participating in market events.

4) What impact will the changes to the power system by the mid-century have on the workforce?
The combination of digitalization, new technologies and increasing customer demands will require new business models and the integration of services and technologies that accommodate changing consumer behaviors. Employees will have to be able to constantly adapt to change, embrace life-long learning and remain engaged during this period of change.

The electricity system of the future will be highly automated, with a lot more data available, therefore the future workforce needs to be digitally enabled. We will need a workforce that can handle this data – with data specialists, cyber security specialists and software application programmers playing a critical role. Routine work will increasingly be automated so that employees can devote more of their time to their core activities.

Understanding these skill needs is of a high importance for the electricity industry and executive management will play a crucial role in managing this transformation carefully.

Description of Swissgrid
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 employs about 470 highly qualified people from 20 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.

Biography Yves Zumwald
Yves Zumwald, an electrical engineer, launched his long career in the energy industry in 1993 at Energie Ouest Suisse (EOS). After a spell as National Electrical Design Manager at Orange Communications, he returned to EOS Holding in 2002 to head up the company's Grid Usage and Access operations. In 2005, he took over as Head of the Infrastructure department as a member of the Executive Board at EOS Réseau. In 2009, he took charge of the Sales department and joined the Executive Board of the Romande Energie group. He made a significant contribution in this role to the development and optimisation of the department while guaranteeing outstanding quality of supply. In 2014, he joined Swissgrid as a member of the Executive Board and Head of Grid, before being appointed CEO of Swissgrid in 2016.