

Report presentation "Storage & Grids on November 17th, 2020



Ambitious climate targets and the expansion of renewable energy sources are pushing the current grid infrastructure to its limits and require adaptation to the new conditions. The Storage & Grids working group of the second Young Energy Professional (YEP) cycle has intensively dealt with the question of what the energy infrastructure of the future should look like and what role storage technologies can play in this system.

On November 17th, 2020 **AFRY Austria** invited the Young Energy Professionals to present their insights to a broad public at an online event and to present the final report of the Storage & Grids Working Group. In two keynote speeches and a panel discussion, top-class experts from the Austrian energy scene shed light on this hot topic from all sides.

Dr. Michael Strugl, President of the World Energy Council Austria, opened the event and underlined the essential role of energy storage and infrastructure for the transformation of the energy sector. Above all, the intelligent management of the energy system and its components is an important success factor.

DI Ernst Zeller, Director Hydropower for Europe, Middle East and Africa, AFRY, pointed out how important it will be for the future to have enough young experts available for the transformation of the energy system and that the YEP programme is an ideal platform for this. AFRY contributes its expertise to a large number of international pumped storage projects and can therefore only underline the importance of storage technologies.

The report of the working group was presented by **Dr. Wolfgang Richter**, **MMag. Verena Gartner** and **DI Franz Georg Piki** presented. Climate change is forcing us to transform the energy system in the direction of decarbonization and renewable energy sources. Fluctuations in the generation capacity of renewable energy sources lead to an increasing need for storage. There are currently several technologies available in various stages of development, such as pumped storage power plants, battery storage and power-to-X solutions. A survey among the visitors of the event showed that almost half of the participants regard Power-to-X solutions

as the most important storage technology. About one third of the participants regard pumped storage power plants as the most important storage option. Furthermore, specific cost comparisons for battery and pump storage projects as well as power-to-gas applications were presented.

Storage technologies must be assessed holistically in interaction with renewable generation over the entire value-added and life cycle. This assessment must take into account technological and economic criteria as well as social and environmental aspects.

Hydrogen can only make a contribution if it is produced from renewable energy sources. In order to reduce the currently still very high costs, massive expansion is necessary to generate economies of scale. For this breakthrough, however, political course-setting and financial support are necessary.

To ensure the stability of the energy system, the expansion of renewable energy producers is only possible in harmony with the expansion of the necessary infrastructure. The necessary social acceptance is one of the greatest challenges in this respect, as often lengthy approval procedures have shown. In future, it will become increasingly important to show how energy transition can benefit society.

In the keynote speeches, **DI Herfried Harreiter**, Head of Asset Management at Verbund Hydro Power, and **DI Sven Kaiser**, Deputy Head of the Electricity Division, E-Control, explained the hot topic from the perspective of a generator and regulator. For a generator, regulatory intervention is a major economic risk factor. Long approval procedures lead to legal uncertainties and prevent projects. A faster transition to renewable technologies is encouraged by a technology-independent market design. Harmonisation of financial support is a key issue here. An overall view of the market system is important for a regulator. In order to design a functioning and efficient market, a large number of levels must be analysed and coordinated. Regulations must be as neutral as possible and should not involve any preliminary decision for specific technologies or organisational structures.

In addition to the two keynote speakers, **DI Theresia Vogel**, Managing Director of the Climate and Energy Fund, **DI Kurt Misak**, Head of Supply Security at APG, **Dr. Stephan Schwarzer**, Head of the Department for Environmental and Energy Policy at the Austrian Federal Economic Chamber and **Dr. Franz Strempl**, Managing Director of Energy Grids Styria, could be won for the subsequent panel discussion.

For energy infrastructure to be sustainable in the long term, both networks and storage capacities need to be expanded. At present, storage facilities are mainly located in Western Austria, which is why grid expansions are needed here, especially in the West-East direction. Due to these grid bottlenecks, the use of gas-fired power plants in eastern Austria will probably be necessary until 2030. A challenge for grid operation is the fact that the connected generation units are increasing significantly, but becoming smaller and smaller. In order to be able to integrate this additional feed-in of wind, photovoltaic and small hydropower into the grid, an expansion at all grid levels is necessary. In the meantime, the greatest challenge is no longer to cover peak loads, but to cover supply peaks. This shows how important the expansion of the grid and storage infrastructure is. In addition, further automation and digitalisation of the network can help. In the discussion, it was pointed out emphatically that Austria will no longer be able to rely on electricity imports from abroad in the future, should there also be an exit from thermal generation capacities in order to compensate for deficits in domestic production. This requires local storage facilities.

The discussion has shown that the question of who may operate storage facilities is not an uncontroversial issue. According to European directives, grid operators are also entitled to operate storage facilities for grid-related purposes.

However, the future energy system must not be viewed only from the perspective of electricity. The integration of gas infrastructure with electricity infrastructure should also be pursued. Thermal storage can play a major role in this respect in the future.

For industry and consumers, it is important that the conversion of the energy infrastructure is carried out in a cost-efficient manner and with a long-term perspective in order to avoid unnecessary burdens. The current targets seem very ambitious and often the use of renewable energy is not yet a question of cost but of availability. For example, Austrian industry currently has no access to hydrogen. This raises the question of how industry can replace fossil fuels under these circumstances.

Above all, the long approval periods for new projects represent a major challenge. A clear and stable regulatory framework is necessary for investment decisions, which was unanimously demanded by the panelists. However, this creates a conflict of objectives with regard to the necessary flexibility that a regulator needs to be able to react to future developments.

Innovation *Made in Austria* is, however, a good option to meet future challenges.

A recording of the event can be found under this link

<https://youtu.be/ozDD6HKAfwk>

Dr. Christian Diendorfer, YEP and Austrian representative in the FEL-100 programme led through the event.