High-potential EU tools for a green future

It's time to use the RRF for the promotion of energy storage in the CEE region

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Energy storage has become one of the hottest topics in the global economy in the last few years, as it is now clear that it will be one of the key areas in the global transition to renewable energy. The spread of electric vehicles has also gained momentum, further increasing investment in energy storage. These investments can be facilitated by the European Union's Recovery and Resilience Facility (RRF), for which, despite initial difficulties, there are already positive examples in Central and Eastern Europe.

Key takeaways:

- Energy storage and renewable energy sources go hand in hand. The green transition targets, with a view to their security of supply, system balance and e-mobility aspects, cannot be met without appropriate energy storage technologies.
- The **EU's Recovery and Resilience Facility** will contribute a total of EUR 723.8 billion to achieve the green and digital transition and the REPowerEU's targets to reach independence from unpredictable external energy supplies.
- The opportunities provided by the RRF are **of particular importance for Central and Eastern Europe** (the CEE region) to achieve their own goals and in their relations with neighbouring EU countries.
- In the field of energy storage, Hungary can be an example for other countries to follow, given that serious efforts are being made to use the RRF with the intended purpose of disseminating storage technologies.
- More than EUR 250 million of EU funding will be available to support the integration of photovoltaic systems into the Hungarian grid, with the development of at least 500 MW storage capacity by 2030.
- Comprehensive legislative measures are also being taken to promote energy storage in Hungary, as the installation of balancing capacity, such as storage, is becoming a general requirement for new weather-dependent power plants.

1 Security of supply, system balance, e-mobility – why is energy storage important?

Energy storage has always been a key issue for renewables. There are at least three main reasons for this. On the one hand, **to ensure security of supply,** i.e., to ensure that there is always enough electricity available in the system to meet consumption demand. If, for example, wind farms can only produce a smaller amount of energy than usual, it is important to be able to store some of the energy produced earlier for more demanding times.

The importance of security of supply is **further enhanced by the gradual development of electric vehicles and infrastructure,** where it is now a fundamental requirement that the electricity needed to power vehicles must come from green sources and not from polluting power plants, otherwise the rise of electric technologies will not reduce

emissions. **In addition, the vehicle itself needs a battery**, which is also one of, if not the most prominent area of energy storage and the second main reason for the spread of energy storage.

The third reason is that if there are no satisfactory solutions for storing the large quantities of alternating current that determine the electricity supply through the grid, then the same amount of electricity must be produced at any moment as is consumed, otherwise the stability of the system could not be maintained. *This is a virtually impossible*, as it would require accurate predictability of the consumption and production and sufficient non-weather-dependent balancing capacity to cover any difference, which, although practically commonplace a few years ago, is now unthinkable with the spread of weather-dependent technologies such as solar and wind. **Today, balancing service providers are not available in sufficient numbers, and the electricity system as a whole**, including these suppliers, **is not tailored to weather-dependent power generation technologies**, but instead to conventional generators (e.g., gas, nuclear).

> "Green power generation is therefore a common expectation, which poses a number of problems if too much weather-dependent generation is suddenly connected to the grid. In addition, e-mobility will inevitably become part of our daily lives. There are many ways to respond to these challenges, including building new non-weather-dependent power plants and other innovative technologies, such as energy storage, to provide alternative energy sources and balancing capacity. The RRF can play a prominent role in this."

2 Significant financial resources for recovery and resilience building in the European Union

The RRF entered into force on 19 February 2021 to finance reforms and investments in member states from February 2020 (the start of the pandemic) until 31 December 2026. **Its aim is to mitigate the social and economic impact of the pandemic, make European economies and societies more sustainable and resilient, and prepare them for the green and digital transition**. The RRF *is also at the heart of the implementation of the REPowerEU plan*, the Commission's response to the socio-economic difficulties and global energy market disruptions caused by the Russian invasion of Ukraine. The Facility has a budget of EUR 723.8 billion, of which EUR 385.8 billion are in the form of loans and EUR 338 billion are in grants.

Member states have to submit national recovery and resilience building plans to the European Commission in order to benefit from the support provided by the RRF. In the plans, they must describe the reforms and investments they intend to implement by the end of 2026. The Commission has so far approved 22 national recovery and resilience building plans. The plans show that member states are earmarking nearly 40% of their planned spending for climate action and more than 26% for the digital transition.

This is also in line with other EU plans. For example, under an earlier proposal by the European Commission, from 2026 it will no longer be possible to build public buildings and commercial properties (offices, shops and the like) in member states without solar panels on their roofs. More importantly, however, residential buildings would also be subject to this requirement from 2029, less than seven years from now. While dates and rates may vary, the direction and impact is clear: *the amount of energy from renewable sources will soar, and a significant proportion of it will come from equipment (mainly solar and wind) that is weather-dependent, i.e., seasonal and intermittent*.

The RRF can therefore be a useful tool for EU member states, including the CEE countries, to achieve their climate targets. The opportunities offered by the RRF *is important for the CEE region in its relations with neighbouring Western European countries as well*. The Austrian economy, for example, is expected to benefit from the positive demand spill-over effects of the RRF given its extensive production and trade links with the CEE region. As the CEE countries gradually move towards the implementation phase of the RRF package, a number of policy implications for Austria are emerging. These include the promotion of cross-border cooperation in projects, especially in the area of the green transition, and the active involvement of regional stakeholders.

3 Comprehensive funding schemes and legislative reforms in order to succeed at the national level

While the RRF seems to be an excellent way of promoting the green transition, concerns have been raised from the very beginning that the recovery and post-pandemic resilience plans put forward by the member states do not pay proper attention to and do not provide sufficient funding for energy storage. A review of the plans shows that they either omit energy storage altogether or promise to fund specific projects, which means that the approach is not technology-neutral and storage is not promoted systemically but through single projects. This cannot bring about structural changes, as it would require complex support schemes and comprehensive legislative reforms. **A welcome exception in this respect is Hungary, where serious efforts are being made to use the RRF with the intended purpose of disseminating energy storage technologies**.

In Hungary, government announcements made last year suggest that **more than HUF 100 billion (ca. EUR 250 million) of EU funding will be available to support the integration of photovoltaic systems into the Hungarian grid**. The tenders, mainly financed by the RRF, aim to increase the flexibility and security of the electricity system through investments in the distribution and transmission networks. This is understandable given that the National Energy Strategy and the National Energy and Climate Plan of Hungary focus on solar energy as a weather-dependent renewable energy source, with a target of around 6,500 MW of solar capacity by 2030 and well over 10,000 MW by 2040.

Eligible activities under the tenders include, among others, the construction of new grid lines, increasing the transmission capacity of the existing grid, new substation installations, substation transformer replacements and upgrades, various digital upgrades and, most importantly, **energy storage solutions**. For example, it was announced in June 2022 that as part of the RRF, the state-owned TSO (MAVIR), with more than HUF 15.4 billion (ca. EUR 39 million) of government and EU funding, will upgrade 20 substations and 7 transmission lines by 2026. Also, the government will support the development of nearly 500 MWs of electricity storage capacity with at least HUF 23 billion (ca. EUR 58 million). **In the longer term, a total of HUF 1,600 billion (ca. EUR 4 billion) is expected to be provided for these purposes up to 2030**.

It is noteworthy that the RRF is not the only EU source for increasing energy storage. A total of HUF 33 billion (ca. EUR 83 million) in state support will be available for network operators, co-financed by the government and the EU's Modernization Fund for climate investment. As a result, at least 33 MWs of electricity storage capacity will be installed nationwide by 2025, covering the monthly consumption of 313 households.

In addition to financing structures, **comprehensive legislative measures are also being taken to promote energy storage in Hungary**. Nowadays, in order for new weather-dependent power plants to be connected to the grid, the following two conditions are particularly important: (i) automatic frequency restoration reserve (aFRR) accreditation has to be obtained for the power plant to provide balancing services (mostly downside regulation), and (ii) a non-weather-dependent aFRR service capability (e.g., gas engine, battery) equivalent to 30% of the nominal capacity of the power plant must be installed. If the investor chooses to install a battery, it must have a

capacity of at least 0,6 MWh/MW compared to the nominal capacity of the power plant. A temporary derogation from these rules has been granted by the government during the state of emergency declared due to the armed conflict in Ukraine. Thus, during the state of emergency, the installation of non-weather-dependent aFRR service capabilities is not required (but also not prohibited). At the same time, mandatory storage capacities for residential solar power plants are also on the agenda.

> "Therefore, the installation of balancing capacities, such as storage, has now become a general requirement for new weather-dependent power plants, which, although temporarily exempted by the government, is a stable long-term objective. In addition to central grid developments, the government expects contributions also from the private sector to increase storage capacity and makes connection to the grid conditional on the provision of adequate balancing capacity."

Batteries and related industry investments have been growing strongly in Hungary in recent years. **The country is already a leader in battery production, and this will continue to grow**. Hungary could therefore be an attractive area for those interested in energy storage technologies and the legislative and support measures introduced could serve as a model for other countries in the CEE region.

However, storage will soon be of a volume and duration that cannot be covered by lithium-ion or other battery technologies that are already known but still far from production. It is therefore expected that large amounts of energy will be stored in hydrogen. Hydrogen will be one of the world's most important energy carriers alongside natural gas and oil for the foreseeable future, with thousands of billions of euros now being poured into the sector in the developed world, and national regulators are beginning to look at how to promote it effectively from a regulatory perspective.

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