Strength in numbers: towards an integrated Central and Eastern European power grid

2024 PCI Energy Days set a pathway for TSO collaboration in CEE and beyond.

Published: 2 December 2024
Authors: Dr Paweł Czyżak, Tatiana Mindeková, Nolan Theisen, Maciej Jakubik

On November 4-5th, grid operators, government and European Commission representatives and industry leaders from Europe met in Brussels at the PCI Energy Days - one of EU's biggest events promoting electricity and gas interconnections.

30 stakeholders - including TSOs, DSOs and sector associations - signed the European Commission's Pact for Engagement, highlighting the importance of citizen and community engagement in energy infrastructure projects. Central and Eastern Europe was well represented at this year's event, largely in connection to the Baltic State synchronisation project which is critical for the energy security of NATO's eastern flank. New initiatives building upon this are already being discussed, with the three Baltic States tabling the Baltic Energy Hub, which could lay the foundations for North-South CEE grid integration.

Ember, the Renewables Grid Initiative, the Slovak Foreign Policy Association and Forum Energii hosted a high-level roundtable on the sidelines of the PCI Energy Days, bringing together electricity TSOs from seven countries. The discussion highlighted the following themes:

1. **Energy hubs are an emerging opportunity that require urgent joint action**
   A growing number of CEE countries are deploying wind and solar capacities that nearly match or exceed the peak electricity demand, a list that includes Lithuania, Poland and Hungary, soon to be joined by Estonia, and likely Czechia and Bulgaria by 2030.

   This is the motivation behind the Baltic Energy Hub concept, which combines the more than 80 GW of estimated wind and solar potential of the Baltic States with transmission, interconnection and hydrogen infrastructure. For example, **offshore and onshore infrastructure need to be planned in tandem** to determine cost-optimal solutions. Coordinated infrastructure planning would ensure that this clean power reaches local and more distant demand centres, capitalising on lower energy production costs. This has the potential to underpin long-term economic growth and competitiveness not only in the Baltic States but the wider Central Europe region, assuming it happens quickly enough.

   With multiple countries benefiting, governments must work towards a cost-sharing agreement. Such **decisions need to be made at a political level** in order to recognize non-financial security and macroeconomic benefits that projects like the CEE North-South corridor deliver. In this process, pan-European associations like ENTSO-E will remain a critical driving force for CEE interconnectivity through working formats like TYNDP, ERRA, PCIs, BEMIP and CESEC, which are useful for confidence building and developing cross-border projects.

2. **Connectivity is essential for landlocked countries**
   While the Baltic Sea region is poised to benefit from an electricity production surplus, Central Europe is facing the prospect of an electricity deficit over the next ten to fifteen years as power demand soars. The situation in Ukraine, with Russia attacking its energy infrastructure and Central Europe increasing exports, can further exacerbate this delicate situation. This presents an opportunity for the export of offshore wind energy to landlocked countries - Czechia, Slovakia, Hungary or Austria. However, **national grid investment for the management of internal congestion in the littoral countries like Germany and Poland is a prerequisite for successful** regional transit flows. Indeed, both national grid modernization and cross-border projects need to be achieved in tandem for offshore wind to provide an alternative for nuclear, coal and natural gas.

3. **Long-term regulatory uncertainty and financing remain key challenges**
   For companies in energy-intensive industries facing long investment cycles, electricity contracts proposed in the recent electricity market design revision can provide important price stability. Furthermore, EU-led **cross-border PPAs** could become key enablers for infrastructure megaprojects highlighted in points 1 and 2. However, long-term power purchase agreements (PPAs) often require guarantees that exceed the financial capacity of the suppliers, which is where **governments and EU financial institutions need to step in**. The public backing of PPAs could plug the gap and vastly increase the liquidity of the PPA market. Facilities such as the EIB guarantee program for wind projects, or joint purchases of equipment - especially HVDC cables and transformer stations - can also play an important role. As such, access to public financing should be streamlined through **one-stop-shops** that pool together multiple funding streams, with the European Commission acting as a facilitator of cross-government negotiations. With industrial investments like manufacturing plants at the heart of the EU Clean Industrial Deal agenda, low and stable electricity prices need to become the EU's priority.

4. **Short-term flexibility tools are lagging behind renewables**
   Interconnectivity is one of many flexibility tools that can facilitate the integration of the rising share of intermittent renewables. Several 'low hanging fruit' solutions are available to TSOs, including dynamic line rating, battery storage, and a more active approach to curtailment. Demand flexibility is emerging as a crucial resource, provided that smart metering is deployed fast enough. Furthermore, grid and system planning will need to account for the electrification of transport, buildings and industry, as well as innovative solutions such as compressed air storage, which can be coupled to increase grid efficiency and minimise costs.