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BALTIC POWER SYSTEM AND ELECTRICITY MARKET EVOLUTION: CHALLENGES AND SOLUTIONS

During the last decades, the evolution of power systems in Europe has been primarily driven by decarbonisation. The recent energy crisis has added additional challenges, raising concerns about the electricity market design and the viability of the current energy generation mix. However, for the Baltic states there is a further increased complexity related to the power system security, stability and reliability as the system is being prepared for synchronisation with the Continental European grid.

The synchronisation project will enable further integration of the Baltic power system in the European electricity market, but it also brings forth a requirement for new market types and products for system balancing to be provided locally, as for now these are being procured from the Russian power system. Moreover, the foreseen synchronisation approach mandates the Baltic power system to be able to also withstand operation in an isolated mode in case the synchronous connection line fails.

Therefore, we overview the techno-economic challenges faced by the Baltic electricity sector in light of pursuing its two main development goals – climate change mitigation through decarbonisation and energy independence reinforcement through the synchronisation project. We outline the measures planned by the power system operators to tackle these challenges. Additionally, we provide insights into the value of interfacing the industry with research institutions while addressing these major issues, also providing some specific examples of innovative solutions arising from such collaborations. Finally, we take a brief look into the ongoing energy crisis-driven debate on potential electricity market reforms in Europe.

Key words: electricity market, decarbonisation, power system, renewable energy, synchronisation.



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