Transmission for the energy transition

National regulatory frameworks must be revised to enable forward-looking and timely grid investments

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Introduction

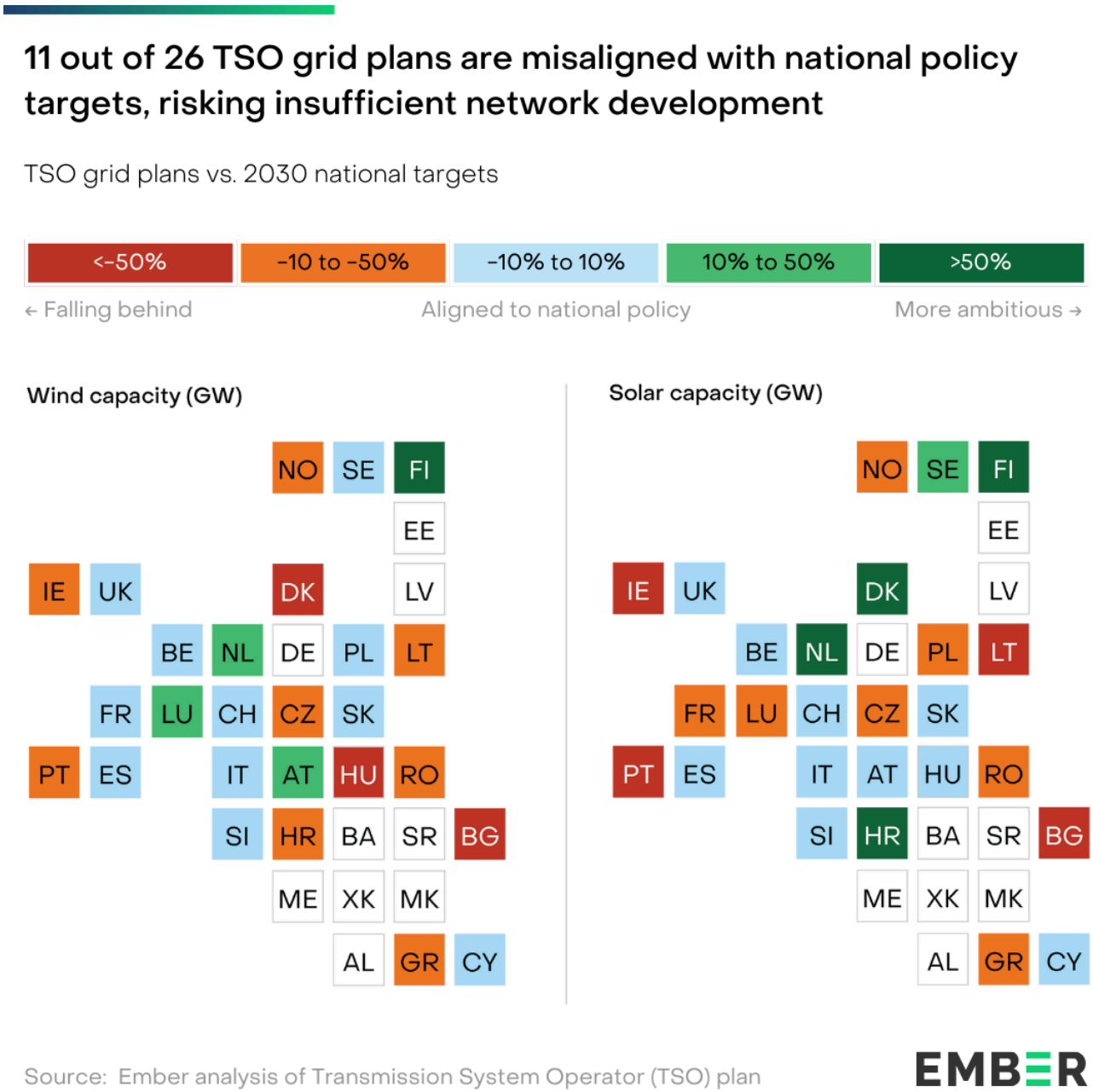
Grid infrastructure requires long timeframes for commissioning, making it crucial that grid planning anticipates the possible evolutions of the energy system with many faster moving pieces. Networks must be prepared to accommodate policy change and shocks from external factors, ensuring power system resilience and security.

However, there are already clear indications that **grid planning is not up to scratch**. Record clean technology investment, turbocharged by the energy crisis and Russia's invasion of Ukraine, is coming up against the barrier of grid capacity. Long grid connection queues are developing, slowing deployment and impacting investor confidence. More renewable power is being curtailed and the costs of congestion management are rising, as grid operators struggle to keep pace with the new reality.

Additionally, regulatory frameworks in many European countries are **holding back forward-looking grid planning**. The Grids Action Plan, while not directly addressing this issue, constitutes a crucial opportunity to correct existing regulatory obstacles.

Grid plans lag behind energy policy

Ember's analysis compared grid plans from 26 transmission system operators (TSOs) in Europe to energy policy targets for wind and solar in their respective countries. Of these, 11 grid plans were found to be based on energy scenarios which **significantly undershot existing policy targets**. This risks that new grid investments necessary to support policy targets will be overlooked and their development delayed, aggravating grid congestion problems and slowing the energy transition.



Regulatory frameworks are preventing "anticipatory" planning

TSOs are typically required to abide by targets established in national legislation when planning their grid. While logical in principle, this is **preventing grid planners** from pursuing more forward looking approaches. Furthermore, it causes grid plans to **persistently lag**

behind the latest level of ambition. Transposing political targets into national legislation takes about two years, and grid plans require another two years to be developed - meaning a grid plan published in 2023 is likely based on political targets set in 2019.

Grid plans out of step with industry outlooks

Energy targets themselves often lag behind external conditions, making it difficult for grid plans to keep up with rapid changes in the energy landscape. This is evident in the case for solar, as highlighted by Ember's analysis which compared TSO grid plans to market outlooks from SolarPower Europe. Out of the 23 grid plans which could be assessed, 19 use significantly lower solar capacities to plan their grid, with a total difference of **205 GW less capacity in 2030** - a staggering figure close to the entirety of solar installed in the EU today (263GW). This disconnect from real-world trends implies that grid congestion may worsen, unless remedial actions are taken, discouraging investors and disrupting markets.

Recommendations

1. **Regulatory frameworks must be revised to enable forward-looking grid planning**

Action 4 under the Grids Action Plan requires the Commission to propose guiding principles for anticipatory investments. The Commission should provide accompanying guidance on "anticipatory planning", ensuring that national regulations enable grid planners to use forward-looking energy scenarios that reflect ongoing policy discussions and technology trends. This is key to enabling anticipatory grid investments: it is clearly impossible to build proactively unless you plan proactively.

2. **Regulators to have increased oversight and scrutiny of network plans**

Regulator oversight of grid plans is largely limited to assessing cost implications. Given the central role of grids in providing energy security and facilitating the energy transition, the scope of scrutiny should be extended to assessing grid plan adequacy. The reform of the electricity market provides impetus for national regulators to provide such scrutiny, stating they "will play a central role in ensuring that sufficient investment is provided for the necessary grid development, expansion and reinforcement".

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Ember is an independent, not-for-profit energy think tank that aims to shift the world to clean electricity using data. It gathers, curates and analyses data on the global power sector and its impact on the climate, using cutting edge technologies and making data and research as open as possible. It uses data-driven insights to shift the conversation towards high impact policies and empower other advocates to do the same. Founded in 2008 as Sandbag, it formerly focused on analysing, monitoring and reforming the EU carbon market, before rebranding as Ember in 2020. Its team of electricity analysts and other support staff are based around the world in the EU, UK, Turkey, India, China and Indonesia.