

Timelines and Delays in European Grid Expansion

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Extended Abstract

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Abstract Summary

Despite the consensus that rapid power grid expansion is essential for Europe's decarbonization and industrial competitiveness, empirical evidence on actual deployment timelines has remained scarce. This study addresses this gap by quantifying deployment durations, identifying factors that influence advancement, and analyzing the drivers behind project delays and cancellations. Utilizing a novel dataset that harmonizes ENTSO-E TYNDP editions from 2010 to 2026, the research tracks over 900 unique investments across 43 countries.

The analysis reveals that grid investments take an average of more than 13 years from proposal to full commissioning, contrasting with the commonly expected 10-year implementation cycle. A multi-stage Cox proportional hazards model demonstrates that higher capacity, domestic, Alternating Current (AC), and new greenfield projects deploy significantly faster than infrastructure upgrades.

Furthermore, nearly one-third of investments suffer significant delays, with a median of 4 years. Technical characteristics explain less than 6% of this variance. Instead, Natural Language Processing (NLP) identifies prolonged permitting (30%) and asynchronous generation coordination (30%) as the primary drivers of delay. Alarming, nearly 50% of investments exit the tracking process before commissioning; excluding technical re-clustering, cancellations are primarily caused by administrative failures (30%), political barriers (25%), and financial constraints (20%).

These findings indicate that the current 13-year implementation cycle is fundamentally misaligned with European energy targets. Because bottlenecks are concentrated in pre-construction stages, institutional reform offers high leverage for acceleration. The regulatory framework must transition toward a model of mutual guarantees, providing predictable, high-speed administrative processing in exchange for firm project commitments.

Presenting Author Biography

Damiano Alessi is a PhD Candidate at the Vienna University of Economics and Business (WU), within the Institute for Data, Energy, and Sustainability. His research focuses on the intersection of electricity markets, infrastructure investment, and regulatory policy, with a specific emphasis on European grid expansion. Previously, he served as a Research Fellow at the University of Padova and was a trainee at the European Central Bank.