



Grid Modernization & Smart Infrastructure

Navigating challenges and opportunities

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KPMG in Romania | 2026

Growing Pressures on Europe's Energy Grids

Europe's energy grids face urgent demands, calling for sustained investment. This funding is critical for integrating distributed energy resources (DERs), managing increasing electrification loads, and facilitating cross-border energy flows. Without targeted modernization and improved operations, numerous renewable assets remain stuck in connection queues, delaying efforts to decarbonize and reducing the financial viability of these initiatives.

Client Challenges in Grid Modernization

Grid operators and DSOs are under pressure to:

- **Balance CAPEX Constraints:** There is growing pressure to navigate the balancing act between CAPEX and regulatory expectations for consistent reliability and affordability. Clients are looking for ways to control costs while meeting their obligations.
- **Clearing Interconnection Backlogs:** With increasing demand for solar, wind, and storage solutions, clients face significant delays in clearing interconnection requests, with an impact on project timelines and revenue generation.
- **Improving Hosting Capacity:** As demand for electric vehicles (EVs), heat pumps, and data centers increases, clients must find ways to enhance hosting capacity and flexibility in these rapidly growing areas.

Client Actions to Address Grid Needs

1. **Investment Prioritization:** Clients are prioritizing their investment strategies by evaluating portfolio-level cost-benefit analyses, regulatory recoverability, and system reliability scoring to make informed decisions.
2. **Grid Readiness Assessments:** Using geospatial analytics, clients identify congestion hotspots, assess DER hosting capacity, and determine the most cost-effective reinforcement paths.
3. **Smart Grid Upgrades:** Investment in advanced metering infrastructure (AMI), distribution automation, and real-time monitoring systems is essential for enabling predictive maintenance and enhancing grid resilience.
4. **Non-Wires Alternatives (NWA):** Clients are increasingly contracting demand response solutions and flexible DERs to defer or reduce the need for physical reinforcement actions.
5. **Connection Process Re-Design:** To streamline operations, clients are developing standardized, digital interconnection portals, complete with transparent milestones and key performance indicators (KPIs) relating to time-to-connect.

Common Risks and Oversights to Avoid

- **Overlooking System-Wide Transformation:** It is crucial not to view smart grid initiatives solely as IT projects but rather as comprehensive, operational transformations that touch all aspects of the grid.
- **Underestimating Data Quality:** Ensuring data quality and establishing robust model governance are critical for effective real-time operations. Neglecting this can lead to misguided decisions and inefficiencies.
- **Focusing Solely on CAPEX:** Failing to contract for flexibility through Non-Wires Alternatives (NWA) and DER aggregators could lead to missed opportunities.

Enabling a Resilient and Future Ready Grid

Modernizing energy grids is not a straightforward task, and most organizations are dealing with a mix of operational pressures, regulatory expectations, and rapidly changing demand patterns. Still, many clients are already taking practical steps that strengthen resilience and prepare their networks for the growth of renewables and electrification. KPMG in Romania continues to support these efforts by helping clients focus on where investment and process improvements will have the greatest impact. As grid operators move forward, the emphasis will be on making informed decisions, improving day to day operations, and ensuring that modernization efforts translate into real, measurable benefits for the energy system.



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