BOOTCAMP INSIGHTS

KEY TAKEAWAYS FROM THE ROUNDTABLE:
HOW DIGITALIZATION, DATA VALORIZATION, AND NEW TOOLS IMPROVE NETWORK PLANNING, MODELING, AND SECURITY?

This roundtable, moderated by **Jérôme Gaonach (AETS)**, brought together **Florent Cadoux (Roseau Technologies)**, **Cyril Perret (IED)**, and **Ngor Sene (Senelec)**.

1. DIGITAL TWINS: FROM PROMISE TO REALITY

Digital twins are gradually becoming key tools for planning, simulating, and increasing the reliability of power grids. They make it possible to better represent the real operation of the network by taking into account both its structure and day-to-day operations.

📌 Feedback and lessons learned

Thanks to smart meters, smart sensors, and improved system interconnection, power networks are now more observable. Digital twins help improve alignment between theoretical models and real-world operations.

In this context, data quality is a prerequisite.

Models are only reliable if use cases are clearly defined: integration of renewable energy sources, loss reduction, incident management, and connection prioritization.

The main challenge is no longer technical, but organizational and methodological. The success of a digital twin requires:

→ clear governance (roles, responsibilities, decision-making)

→ stronger coordination between planning, operations, and information systems

→ upskilling teams to embed these tools into existing business processes

🔑 Key message

Digital twins do not fail because of the software, but because objectives are poorly defined and data is incomplete or poorly structured.

2. DATA VALORIZATION: GUIDING INVESTMENT DECISIONS AND ACCELERATING ACCESS TO ENERGY

The growing number of data sources in power networks — GIS, AMI, remote metering, SCADA, asset databases, and open data — makes it possible to turn data into faster and more rational investment decisions.

🚀 Feedback and lessons learned

The discussions highlighted a situation widely shared by operators: data exists, but its use is often limited by:

- strong heterogeneity of data sources
- varying levels of data completeness across regions
- misalignment of needs between different teams

Operators that succeed are those that implement a structured data governance framework based on:

- shared data models and standards
- improved interoperability between systems
- clearly defined roles and responsibilities

Once organized, data enables high-value use cases, including:

- identifying areas with low connection costs
- more targeted planning of network extensions and reinforcements
- comparison of investment scenarios

- simulation of medium- and long-term needs (2030–2050), integrating renewable energy, demand evolution, flexibility, and CAPEX/OPEX impacts

🔑 Key message

Power networks already have enough data to make better decisions.

The challenge is no longer to multiply tools or data sources, but to structure existing data and use it effectively.

3. CYBERSECURITY & INTEROPERABILITY: A DEMANDING BALANCE

The digitalization of power grids increasingly relies on system interconnection (SCADA, AMI, GIS, web applications, and API interfaces). While this openness is essential to improve operators' operational efficiency, it mechanically increases the attack surface. In this context, cybersecurity can no longer be treated as a secondary issue and must be addressed from the system design phase onward.

🛡️ Feedback and lessons learned

The discussions highlighted a shared observation: system openness is now unavoidable, but it must be controlled by design. The principles emphasized are based on a security-by-design approach, including in particular:

- systematic encryption of data exchanges
- network segmentation
- application of the principle of least privilege
- regular testing (audits, penetration tests, configuration reviews)

Continuous monitoring emerged as a key lever. Implementing logging, detection tools (SIEM), and rapid incident identification capabilities is becoming essential.

The growing use of AI, which enables more targeted attacks, further reinforces the need for containment mechanisms, incident response plans, and impact-reduction strategies.

Hosting choices also remain a structuring issue:

- cloud solutions offer agility, scalability, and rapid updates, but raise sovereignty concerns (e.g. US-based servers)

- on-premise solutions can provide greater control, but often come with higher costs and reduced flexibility

🔑 Key message

As systems become more open and interconnected, cybersecurity becomes an operational prerequisite. The only viable approach is cybersecurity by design, combined with continuous monitoring and architectural choices aligned with sovereignty and service continuity requirements.

OVERALL CONCLUSION

The discussions highlighted that the digital transformation of power grids is not limited to deploying new tools. It relies on a structured approach that combines strategic vision, valorization of existing resources, and control of the risks associated with system openness.

Vision before solutions

There is no effective digitalization without clearly expressed needs and well-defined operational processes. The success of digital projects primarily depends on operators' ability to formalize their objectives, align internal stakeholders, and embed tools into existing business practices. Strategic vision must come before the selection of technological solutions.

Data as a strategic asset

Data is becoming a central lever to reduce uncertainty and guide decision-making. When properly structured and consistently used, it helps make investment choices more objective, improves network planning, and more effectively contributes to expanding access to energy—while keeping costs and risks under control.

End-to-end integrated cybersecurity

The increasing interconnection of systems makes cybersecurity non-optional. It must be integrated from the design of architectures, from field sensors and equipment to central systems and cloud solutions. Network resilience and service continuity now directly depend on it.


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