



Invited Speaker

Jacob Tran

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AI in the driver's seat: How Swissgrid automates grid stability with massive economic impact (G1101)

| Talk Title

AI in the driver's seat: How Swissgrid automates grid stability with massive economic impact

| Biography

As the Head of Development and Optimization at Swissgrid, Jacob Tran is dedicated to bringing artificial intelligence out of the lab and into system-critical operations. He and his team develop and operationalize the automation tools that keep the Swiss power grid both stable and highly cost-efficient. An Electrical Engineer by training, his lifelong passion for computer science has been particularly energized by the rise of agentic AI. Today, he focuses on leveraging these autonomous technologies to redefine how European grid operators manage the complexities of the energy transition.

| Abstract

For decades, maintaining the power grid's 50 Hz frequency through manual balancing energy activation was a task driven by human intuition. However, as Europe's energy landscape shifted toward volatile solar power and escalating market prices, this manual approach became an expensive liability. By 2024, as balancing costs in Switzerland surged, it became clear that human operators alone could no longer optimize a complex portfolio of European and national balancing markets in real time. Our answer was decisive: stop merely assisting the operator and start automating the process with the Optimizer Balancing Energy Autopilot.

The Optimizer isn't just another AI tool. It represents a fundamental shift in how our energy system must evolve to meet modern challenges and leverage digital opportunities. As the first transmission system operator worldwide to operationalize a fully cost-optimized automation approach, Swissgrid has integrated advanced AI models directly into the core of its energy procurement process.

Since going live in May 2025, the Autopilot has evolved from a bold vision into an operational reality, autonomously executing approximately 99% of all balancing energy activations. This isn't just about replacing manual labor. It's about achieving superior performance. The system delivered a 27% reduction in balancing energy forecast errors compared to traditional manual operations. Additionally, by strategically shifting the procurement mix away from expensive, last-resort balancing energy toward cheaper – albeit more uncertain – products, the Autopilot has unlocked massive economic savings. This financial impact is undeniable: the introduction of the Autopilot has slashed the gap between actual operational costs and the theoretical cost optimum. For the Swiss electricity system, this translates to measurable annual savings of €30 to €50 million.

This presentation will demonstrate how Swissgrid successfully navigated the technical and cultural “digital maturity” gap to put AI in charge of a system-critical process. From digitalizing our data ecosystem to redefining the human operator as a strategic supervisor, the Optimizer Autopilot serves as a compelling blueprint for the future of grid automation.