Customer Story

Helen Electricity Network

The Strategies of Readying Helsinki's Power Grid for 2030 with envelio

www.envelio.com

Customer Profile

Helen Electricity Network, part of Helen Group, serves ~410,000 customers in Finland's Helsinki region.

As a municipal utility, it is tasked with enabling the city's ambitious target to become CO2 neutral by 2030, requiring major shifts in electrification, heating, and mobility infrastructure. For this, the company is relying on a combination of cutting-edge technology and a consistent increase in the share of renewable energies in its portfolio.

Challenge

Finland aspires to achieve CO2 neutrality by 2035, while Helsinki has established the ambitious target of attaining zero emissions by 2030. As the principal energy supplier in the area, Helen Electricity Network plays a vital role in facilitating this transformation.

Specific challenges they face:

- Rapid urbanization: 6,000–8,000 new residents and up to 800,000 m² of new construction annually
- Surge in electric heating systems, EV charging, and rooftop PV
- Shutdown of coal plants by 2025, replaced by electric boilers
- Need for proactive planning to prevent future grid bottlenecks and identify reinforcements early

Solution

To address this challenge effectively, comprehensive studies will be necessary to assess the implications of increased connection points and be future-ready. Helen Electricity Network leveraged the envelio Intelligent Grid Platform (IGP) to model long-term grid scenarios and identify critical reinforcement needs.

Specifically, Helen Electricity Network used the envelio IGP to conduct scenario-based evaluations of the power grid over 5-, 10-, and 15-year time horizons. These studies incorporated a wide range of data inputs-- including socio-economic trends, detailed building information, and smart meter insights-- to ensure a comprehensive understanding of future demands.

The modeling was based on the existing Trimble NIS grid topology and enhanced with open geo-spatial data from the City of Helsinki to capture precise infrastructure characteristics. Simulations across both medium- and low-voltage levels were driven by annual load patterns and synthetic profiles, capturing projected growth in heat pump installations, EV charging infrastructure, and rooftop solar generation.

Intelligent Grid Platform

The envelio Intelligent Grid Platform (IGP) empowers utilities to stay ahead and support digital transformation, optimization of grid management, and planning while ensuring cost-effective and scalable operations. The envelio IGP is trusted by over 70 utilities worldwide, helping utilities optimize Network Model Management, Interconnection, and Grid Planning.

The envelio IGP is modular and flexible. For this project two key applications were identified to best solve the challenges faced by Helen Electricity Network: Grid Transparency and Grid Study.

Grid Transparency

The application delivers robust grid analysis, ensuring transparency regarding the grid's condition.

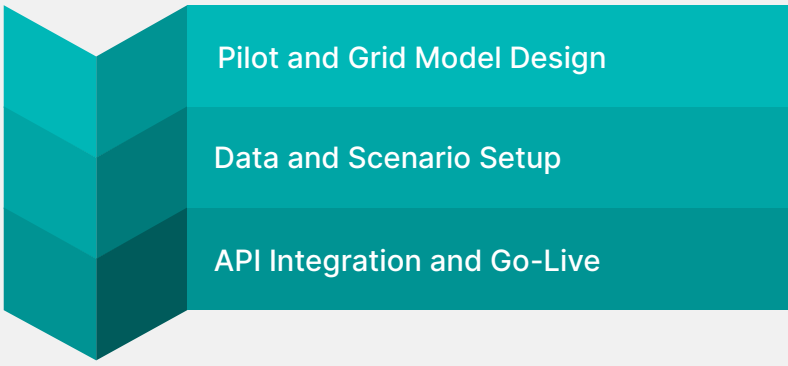
Grid Study

The application allows for the creation and evaluation of trend scenarios for future supply tasks. The modeling can be done by specifying general penetration rates for one or more grids or by providing node-specific parameters, which allows for highly customized studies.

Implementation Journey

Helen Electricity Network adopted envelio's IGP with the Grid Study application to simulate future demand scenarios, identify reinforcement needs, and enable proactive, data-driven infrastructure planning.

To achieve the goals the implementation teams worked collaboratively through a phased rollout:



Pilot and Grid Model Design

Establish collaborative project management frameworks

Pilot Phase – Modeled two Medium Voltage networks including associated Low Voltage networks

Grid Twin Creation – Built a complete Medium Voltage/Low Voltage digital model with updated syncs

Data and Scenario Setup

Extensive team training

Data Pipeline Setup – Merged asset, topology, and metering data with new simulation tools

Scenario Modeling – Defined 3 key scenarios (peak loads, high generation, realistic blend)

API Integration and Go-Live

API Integration – Enabled scenario definition, calculation, and export at granular levels

Continuous feedback loop with regular release cycles

Data quality enhancements benefiting all internal planning process

Results and Benefits

By leveraging the Intelligent Grid Platform, Helen Electricity Network is able to make data-informed decisions regarding grid reinforcement needs, ensuring investments are both timely and targeted. The use of detailed annual simulations—built on a combination of historical consumption data and synthetic load profiles—provides a robust foundation for accurately forecasting future grid demands. This approach enables real-time alignment between the city's rapid growth and the capacity of the power grid, supporting more resilient and proactive infrastructure planning.

Strategic	Future grid violations identified years in advance
Technical	Automated scenario modeling via APIs
Operational	Investment planning aligned with real demand forecasts
Scalable	Full Medium Volt/Low Volt model with flexible update structure
Customer Impact	More efficient operations to help achieve CO2 goals

Conclusion

Looking ahead, Helen Electricity Network is leveraging the full value of envelio's Intelligent Grid Platform to turn scenario insights into targeted, strategic action. The powerful simulation capabilities and high-resolution data integration enable the utility to accurately evaluate future grid bottlenecks and prioritize reinforcement measures with confidence.

By integrating these results directly into Trimble NIS, Helen can streamline construction planning and align investment decisions with actual system needs. The platform's flexibility also supports the launch of customer-facing hosting capacity overviews, improving transparency and engagement.

Crucially, as Helen prepares to scale its modeling efforts to higher voltage levels, the IGP provides a robust and scalable foundation for comprehensive, system-wide grid planning—ensuring that infrastructure development remains aligned with Helsinki's climate-neutral 2030 vision.

"Customers' solutions like heat pumps and EVs push the grid's limits-the envelio IGP helps us plan better, faster."

Juhani Lepistö
Network Analyst
Helen Electricity Network