

## Finland microgrid design

The project has been singled out by the Finnish government as a key project that will help meet Finland's national energy "decarbonization" targets. Finnish utility Lempäälä Energia Oy recently awarded Siemens the contract to design and engineer the medium-voltage microgrid and associated grid automation and energy storage systems

According to the project plan, two solar power fields consisting of more than 15,000 PV panels will produce an estimated 3,600 megawatt-hours of clean, emissions-free electrical energy. The project design also calls for six gas-fueled motors and fuel cells that will provide both heat and power for businesses in the industrial district. "The project uses the latest microgrid technology solutions to balance and secure energy production in the area," explained Thomas Zimmermann, CEO Digital Grids at Siemens Energy Management.

"This key renewable energy project will serve as an exceptional opportunity to explore how a larger scale smart grid functions in conjunction with the current electricity market, while generating 100 per cent renewable power from solar and biogas sources," said Elcogen CEO Enn Vunpuu. Elcogen manufactures the "next generation," solid-oxide fuel cells that will be used in the project. More than 100 businesses are up and running on the 300 hectare (741 acre) Marjamäki industrial district project site at present. That number is expected to increase as 30 hectares are up for sale and development.

Finland Prime Minister Juha Sipilä's government is calling on Finland's businesses and citizens to increase use of renewable energy to more than 50 percent of electricity demand during the 2020s, as well as raise energy self-sufficiency to more than 55 percent.

"[R]enewables for mines is now firmly established as a critical market segment for the global renewable energy industry. Industry experts predict continued growth for this sector as mines face increasing carbon exposure and energy cost pressures," the program managers say.

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Siemens will design and engineer a smart medium-voltage micro grid, corresponding grid automation system and electrical storage system. After completion, the project LEMENE will enable businesses in the Marjamäki area to connect to the distributed energy system and flexibly participate in different energy markets. The project will also be capable of independent off-grid operations by disconnecting from the national grid.

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"Our goal is to create an energy community with decentralised generation of renewable energy" said Toni Laakso, CEO of Lempäälä Energia Oy. "This involves ensuring security of supply for the energy community and ensuring it functions at all times. Automation plays an important role in order to ensure the system's performance".

The project is located in the Marjamäki industry area in the municipality of Lempäälä, near Tampere in Finland. Energy will be generated by two solar farms with an annual electricity output of 3,600 MWh and featuring more than 15,000 panels, six gas motors and fuel cells. The facilities will also use combined heat and power (CHP) production to maximise efficiency. Any surplus energy will be offered to the national grid operator Fingrid.

Thomas Zimmermann, CEO Digital Grids at Siemens Energy Management, added that the project uses the latest microgrid technology solutions to balance and secure energy production in the area. The combination of advanced control, distributed grid architecture and assets in the form of micro grids will ensure the grid operates as reliably, resiliently and efficiently as possible.

Siemens will implement state-of-the-art technology including a SICAM microgrid controller. This ensures reliable monitoring and control as well as blackout protection. EnergyIP DEMS allows aggregation of decentralised energy to provide ancillary services for utilities or to trade energy.

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