Silo AI Uses Data Analysis to Reduce Water Loss and Improve Energy Efficiency for a Finland Piping Network

iTwin Platform Unified Data and Visualized It in an Intuitive User Interface

Keeping Finland Warm with Piped Heat

Most cities in Finland, a country not far from the Arctic circle, rely on district heating systems to keep residents warm during frigid winters. These systems transmit heat from a central source through a network of insulated pipes to individual buildings. But as heating systems and water systems age, they can start to deteriorate. Even with regular care, Finland's heating and water systems now experience one leakage event per year for every 10 kilometers of network. Not only can leaks cause service outages, but they can also lead to energy inefficiencies and water insecurity. Suur-Savon Sähkö Oy, one of the largest grid operators in Finland, wanted to solve the problem and before having to undergo costly repairs.

Preventing Leaks with Artificial Intelligence

Suur-Savon Sähkö Oy decided to address the problems in their Helsinki piping network by partnering with Silo AI, an artificial intelligence laboratory that has delivered solutions for smart vehicles, smart cities, and smart devices and networks. The organization wanted to develop a data-driven asset optimization service for the city-wide pipe networks, enabling operators to address and prevent leaks as well as improve energy efficiency with intelligently targeted repairs and maintenance. However, Silo AI needed a way to unify data from numerous systems into a single view to provide a holistic view of overall pipeline health.

Unifying Detailed Network Information

Silo AI determined the iTwin Platform could help them develop a federated source of pipeline network data owner-operators could use to improve operations and eliminate water leakages. Within iTwin, Silo AI brought together all data, including information on heating and water supply, as well as detailed data on pipeline age, type, and condition. The organization then developed a method to analyze the data and visualize it in an intuitive user interface.

Preventing Leaks by Prioritizing Maintenance

By visualizing and analyzing all pipeline data within Silo AI's solution, the owner-operator determined how to prioritize maintenance activities where leaks are likely to occur, lowering water loss and preventing blockages and outages while reducing maintenance costs. Additionally, undertaking AI-driven cooling performance analysis allows the network to lower its heating network temperature by 3 degrees Celsius, significantly improving energy efficiency and decreasing fuel consumption while supplying the same level of heat to customers. Silo AI estimated their use of iTwin reduced the amount of effort needed for visualization by 50%.

Project Playbook: iTwin Platform

Outcome/Facts:

- By determining how to prioritize maintenance activities where leaks are likely to occur, the pipeline owner-operator can lower water loss and prevent blockages and outages while reducing maintenance costs.
- AI-driven cooling performance analysis allows the network to lower its heating network temperature by 3 degrees Celsius, significantly improving energy efficiency and decreasing fuel consumption.
- Silo AI estimated their use of iTwin reduced the amount of effort needed for visualization by 50%.

Quote: "The iTwin-based solution ensures pipeline maintenance needs are predictable to ensure customer satisfaction by avoiding unwanted shutdowns of the grid assets." – Harri Kaukovalta, Business Development Executive, Silo AI

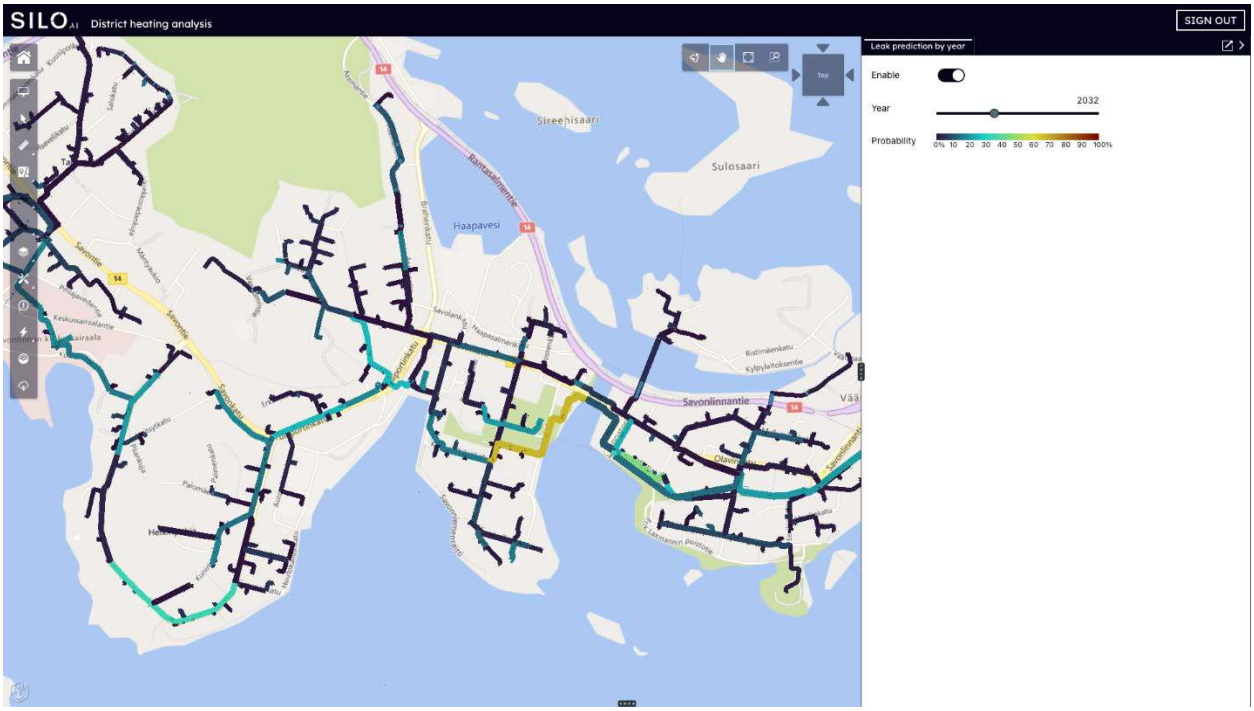

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Image Caption: By determining how to prioritize maintenance activities where leaks are likely to occur, the pipeline owner-operator can lower water loss and prevent blockages and outages while reducing maintenance costs. *Image courtesy of Silo AI.*

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