



## SUMMARY

### Stedin

### Industry

Power & Utilities

### Business Value

- Business Intelligence
- Operational Insight
- Performance Optimization
- Process Controls
- Preventative Maintenance
- Visibility to Asset Conditions

### PI System™ Components

- PI Server™
  - Data Archive
  - Asset Framework (AF)
- PI Vision™<sup>1</sup>
- PI Connector for IEC 61850

## Modernizing Substation Architecture with the PI System

Stedin is a gas and electricity distribution system operator with over four million customers in three of the four biggest cities in the western part of the Netherlands. As part of its mission, Stedin began to adopt the IEC 61850 standard. In 2017, OSIsoft built a custom PI Connector for IEC 61850 to link Stedin's existing PI System to its 61850-compliant substations. PI System insights showed that tap changers were switching 30 times per day rather than the optimal 16, and allowed the team to attribute peaks in energy usage to trains accelerating at a nearby station. With this information, Stedin can now predict when assets may fail to optimize performance, take preventative action, and reduce outages.

### Implementing the 61850 Standard for Efficient Grid Operations

Stedin owns and operates 185 substations, the majority of which are made up of aging assets. However, in the coming years, Stedin anticipates an increase of electrical demand as more customers are moving from gas to electric heating and home energy. To prepare for this increase in demand, Stedin needed to modernize how it collected and consumed data, which required implementing the IEC 61850 standard across its substation network. The 61850 standard is an international communication protocol for substation automation, and currently 60 substations are 61850 compliant with an additional 15-20 stations added each year.

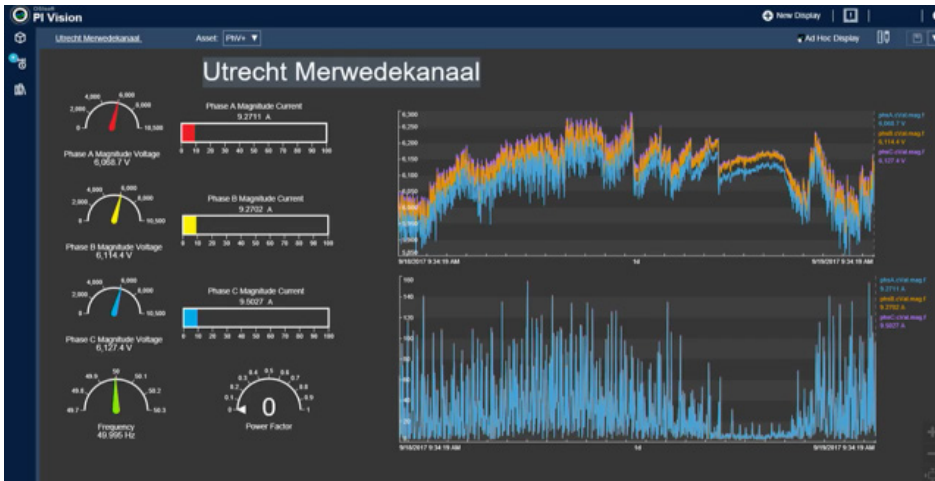
The IEC 61850 system is built around IED controllers that are collecting substation asset performance data and record events. With this information, Stedin can build smaller, more efficient substations and simplify the process for adding new devices and data sources. Overall, this would allow the team to perform remote inspections and diagnostics as well as predictive maintenance.

Implementing accurate strategies, however, required accurate performance data, and Stedin primarily relied on paper-based inspection records from field engineers and limited data from its SCADA environment. "You're only as good as the information you're getting from your SCADA historian," said Anne van der Molen, Grid Strategist at Stedin, during the 2017 OSIsoft EMEA Users Conference in London. "And, if you want to change that, you need to change... basically the interface from the substations or the equipment in the field to your SCADA."

## PI Connector for IEC 61850

To gain the real-time insights needed from its 61850-compliant substations and reach performance goals, Stedin needed to connect its substations directly to the PI System. To help Stedin capture the IED information, OSIsoft built a 61850 connector, which allowed Stedin to access substation asset information as well as real-time measurements, which it could now store in the PI System.

Now, using Asset Framework and PI Vision, Stedin can visualize data trends to better understand asset performance. “When you have the data, you can use PI Vision to visualize this data and actually get some value from it,” said Alex Meeuwisse, Solution Architect at Stedin.



**Train Station Acceleration:** Stedin immediately noticed peaks in energy usage, which were attributed to nearby trains accelerating away from the train station.

## Real-time Data Nets Immediate Results

With a steady stream of substation data and newfound flexibility with the PI System and 61850 connector, Stedin quickly gained insights that allowed the team to make important maintenance decisions and predict when an asset might fail. For example, PI Vision was showing tap changers were switching 30 times per day rather than 16. Maintenance is performed after 40,000, meaning these switches were on track to be serviced nearly twice as fast as ones that were working properly, allowing the team to perform maintenance before the switches failed.

Given the success of the PI System and 61850 connector, Stedin plans to hook up more sensors for greater substation insights. In addition, the team plans to use the data to perform remote inspections, which will allow them to achieve their risk-based maintenance goals. For more information about Stedin and the PI System, watch the full presentation [here](#).

<sup>1</sup>PI Coresight was renamed to PI Vision in 2017.

Van der Molen, Anne / Meeuwisse, Alex. *PI Connector for IEC 61850: Tapping into the Data Stored in 61850 Based Substations*. OSIsoft.com. 18 October. 2017. Web. 28 December 2017. <<https://www.osisoft.com/Presentations/PI-Connector-for-IEC-61850--Tapping-into-the-Data-Stored-in-61850-Based-Substations/>>

“Frankly, our opinion and our thoughts initially were that it would be a multiyear project and that we would see results in, well, 18–24 months. We found out that we had results in just a few months.”

– Anne van der Molen,  
Grid Strategist