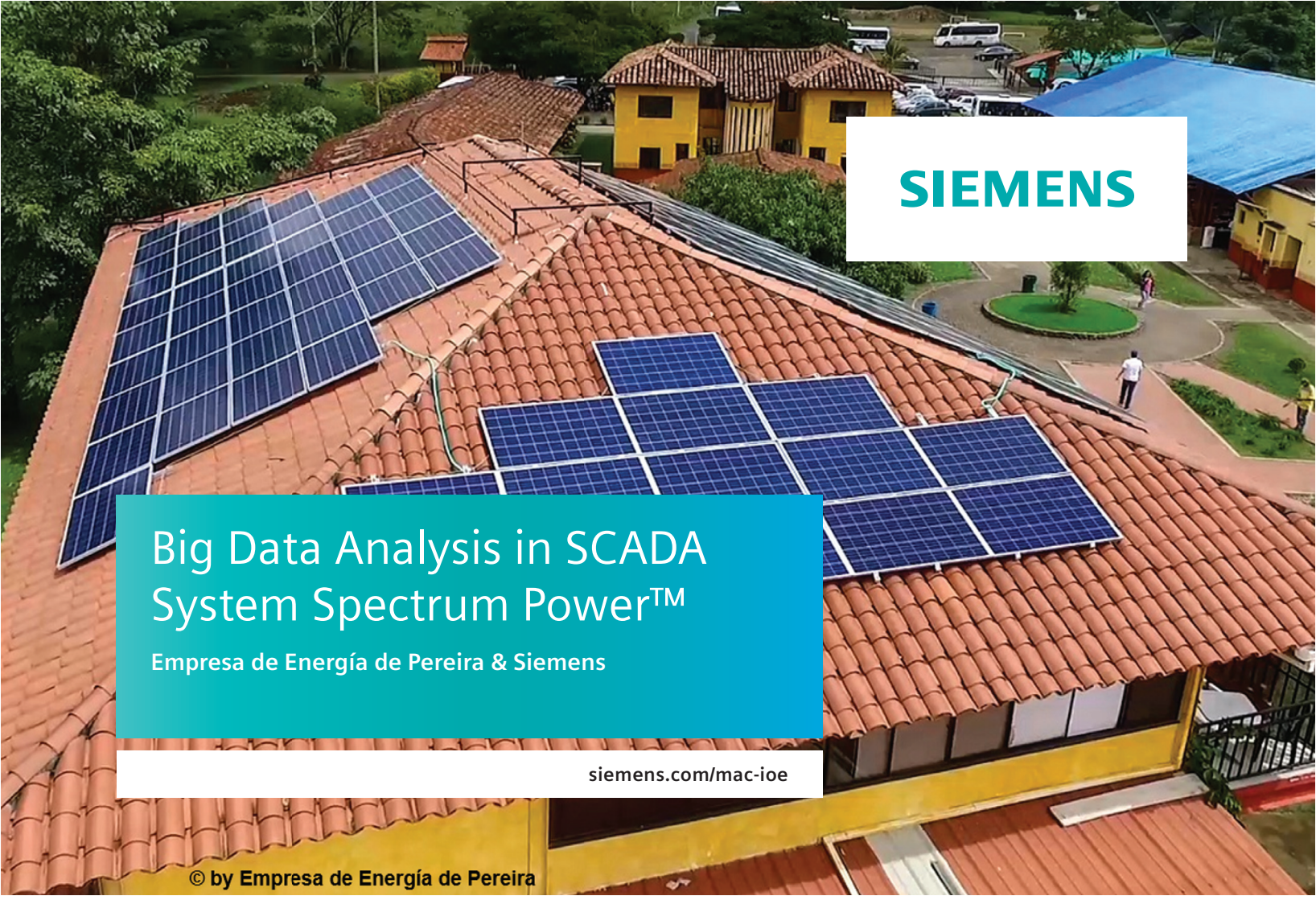


Big Data Analysis in SCADA System Spectrum Power™

Empresa de Energía de Pereira & Siemens

siemens.com/mac-ioe

Our systems create so much data and yet we only use a part of it. How is it possible to optimize our processes using this data? Empresa de Energía de Pereira (EEP) and Siemens joined forces to answer this question with the help of data analytics!

EEP and Siemens – the perfect match

Empresa de Energía de Pereira (EEP) is a network operator located in the city of Pereira in Colombia with more than 230.000 customers and more than 20 years of experience in the electrical sector. EEP is responsible for transmission, distribution, and generation of electricity in the entire zone of Risaralda (so called Colombian Coffee Zone). Siemens and EPP have been working successfully together for more than 12 years in network operations now and plan on continuing so e.g., using Spectrum Power™ today. EEP wants to understand the value of leveraging SCADA data to improve its processes and decision-making without a major IT integration project. And with the help of data analytics this wanting could be realized.

"It was very impressive to get unknown perspectives on our existing processes within network operations and new insights into the usage of our assets. Based on the successful collaboration with Siemens we will continue to expand our use of SCADA data to inform decisions beyond network control."

Juan Guillermo Gutierrez, Empresa de Energía de Pereira

EEP is responsible for electricity transmission, distribution and generation for the Risaralda zone (Colombia).

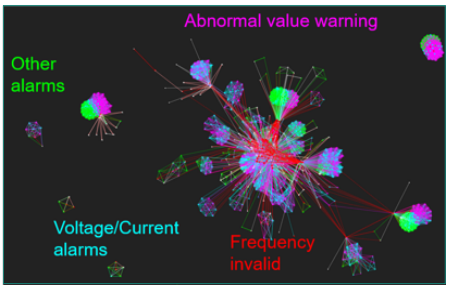
Future-oriented with data analytics: EEP and Siemens

The future lies in data analytics

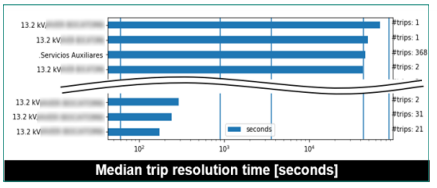
Data scientists and grid experts from Siemens teamed up with a cross functional team with local network know-how from EEP to tackle EEP's current challenges and optimize their network operation. With success! Together the colleagues from the MAC4IoE (MindSphere Application Center for Internet of Energy) and EEP managed to add new value to already existing data! About 33 million messages over 18 months from EEP's Spectrum Power SCADA archive have been analyzed and evaluated with the help of an advanced analytics workbench and leveraging among other things advanced text mining techniques to clean up and categorize data.
Spanning across process, asset and grid analytics, the analysis helped identifying different event patterns in EEP's day-to-day network operations, unusual asset usages and different patterns in the grid behavior. By using data analytics on network and SCADA data, it was possible to create additional value with already existing data and paving the way for further optimizations in EEP's asset management, network planning & maintenance and for a future IoT Roll-out.

Unique achievements of Siemens and EEP

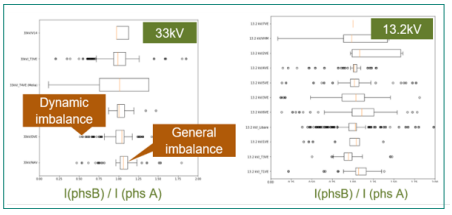
- First time ever: data analytics with a customer big data set out of Spectrum Power™
- Peace of mind through transparency and overview about the status of auxiliary subsystems; future re-parametrization of respective alarms to relieve system capacity
- Identification of imbalanced feeders in the network to improve network stability and prevent reduced lifetime of assets
- Identification of sensors with anomalies that indicate misconfigurations or suboptimal condition of ventilator and SF6 systems
- Detection of assets (e.g., field reclosers) prone to communication errors, base for mitigation measure to secure connectivity



Event analytics showing the correlations of different alarms between substations



Comparison of trips of different substations including auxiliary services



Exemplary result of the imbalance analysis for a 33kV-13.2kV substation

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