

Halmstads Energi och Miljö – Artificial intelligence for validation of data

Participants: Halmstads Energi och Miljö
Category: Information and communications technology integration
Time plan: Started August 2018
Contact person: Alexander Örning, Halmstad Energi och Miljö Nät
Location: Halmstad
Possible to visit: No, no physical installation

Background

Today, the grid operator receives a significant number of notifications regarding incorrect values, that actually are not connected to any problem. To handle this, the technicians need to manually take care of many measurements that are indeed correct. To manage this manually is time-consuming and needs to be done once a month. The reason for that these values being flagged as deviations, is that the flagging is triggered by earlier behavior in the data collection point, and that there might be changes in this without there being any actual problem.

Implementation of the project

Halmstads Energi och Miljö has implemented artificial intelligence that analyzes the values that are flagged as inconsistent. The AI can do a deeper analysis of the values and also use other parameters than the value itself, such as weather data, to be able to detect values that have been flagged even if they are correct.

The AI was implemented to work with the existing system and to be able to extract and analyze data from that. Halmstads Energi och Miljö will also make an overhaul of the entire IT environment to make full scale implementation of AI more feasible.

Benefits

With artificial intelligence, the grid operator will obtain a significantly better accuracy regarding this type of faults and incorrect values. Better accuracy in turn gives them better possibilities to identify and focus on the faults that are actually in need of attention.

In one of the first tests, where weather was added as a parameter, the accuracy was improved with more of 60% of the faulty indications identified by the AI. Halmstad Energi counts on a further increase in accuracy when the AI learns and the parameters are fine-tuned, as well as more parameters added.

Scalability

More data is needed before the scalability can be evaluated. To add the AI to a larger grid is not likely to make much of a difference, but might instead be favorable, as more data is collected. The feasibility to add more parameters and to expand the AI for other uses as well, is however more uncertain.

Interoperability

The AI has been installed to work with the present system in the power grid. It will in the future also collect and use data from the district heating system in Halmstad and also use data from external sources.

Investment horizon

Halmstads Energi och Miljö calculates that the investment will pay itself in two or three years, because it eliminates the manual labor needed to identify and reset faulty measurements.

*Examples of smart grid solutions in Sweden,
compiled by Energiforsk for the Swedish Smart Grid Forum, 2019*

International potential

The system that is used by Halmstads Energi och Miljö is probably most useful in Sweden and the surrounding Nordic countries, as the power systems in these countries are similar.