

# A Utility Company enhances efficiency by automating operations deploying Azure IoT Hub

## The Customer:

A Norwegian utility company, which transmits energy to 190,000 customers in the Agder area, making it country's fourth largest distribution company.

## The Challenge:

The customer wanted a solution to collect data from different devices in the electrical substation that generate energy, gather the load forecast for the devices, and automate the generation of power from the devices in the most efficient manner.

The need was to have a plan to run the load forecast data for all connected devices through an optimization engine that would generate results to efficiently run the electrical substation. One of the challenges in the project was to provide the load forecast data to the optimization engine that needed the input in the form of a csv file. The other challenge was that the output from the optimization engine was also in the form of a csv file, which needed to be parsed and the respective commands to be dispatched to the devices.

## WinWire Solution:

WinWire created a solution by building various components for integration of this solution with the optimization engine.

## Optimization Web API

A Web API was built that could be invoked by passing different input parameters to generate a csv file that can be provided as input. The parameters included the duration which is the start and end date/time for the optimization run, and an interval of time to divide data for the entire duration in different time points.

## Optimization Integration Tool

The optimization engine was made running on an Azure VM and was written using C++, in order to avoid making any changes to this code, a separate tool was built to enable communication of optimization with Azure. The optimization integration tool was a console application running simultaneously on the same VM.

## Optimization Output Processor

Optimization output processor, a web job that was deployed for listening for the messages on the output queue. Once it receives a message, it automatically downloads the results csv file, parses the contents and copies the output in three different sets of Azure tables that are used by command dispatcher and Power BI reports to show the results from optimization.

## Optimization Dispatcher

Optimization dispatcher, a web job scheduled to run every hour, it reads the optimization results from Azure table storage for the current hour and constructs the respective commands to be dispatched to the devices. It sends these command to the respective devices through Azure IoT Hub.

Device	Substation	Quantity	OfferPrice	Cleared	ClearedCost	DispatchTime
Berger Gård - Demand Response		0.069	3240.000	0	0	
Fevik Skole - Demand Response		0.000	3220.000	0	0	
Frivoll sykeheim - Demand Response		0.082	3230.000	0	0	
Hiseyhallen - Demand Response		0.003	10000.000	0	0	
Nedenehallen - Demand Response		0.006	1000.000	0	0	
The Testbox nummer0 ono - Demand Response		0.120	10000.000	0	0	

## The Benefits:

- Streamlined Operations
- Performance Optimization
- Increased Efficiency
- Reduced overall cost

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