IoT End to End solution for Smart Grid

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Intel’s Vision

This decade we will create and extend computing technology to connect and enrich the lives of every person on earth.
Internet of Things x Big Data = Unprecedented Value

50 Billion x 35 ZB = Value

Sources: AMS Research, Gartner, IDC, McKinsey Global Institute, and various other industry analysts and commentators.
E2E IoT architecture
ON JUNE 16th something very peculiar happened in Germany’s electricity market. The wholesale price of electricity fell to minus €100 per megawatt hour (MWh). That is, generating companies were having to pay the managers of the grid to take their electricity. It was a bright, breezy Sunday. Demand was low. Between 2pm and 3pm, solar and wind generators produced 28.9 gigawatts (GW) of power, more than half the total. The grid at that time could not cope with more than 45GW without becoming unstable. At the peak, total generation was over 51GW; so prices went negative to encourage cutbacks and protect the grid from overloading.
The Biggest Machine –
The power grid

+ US grid delivers electricity worth $400 billion a year
+ German Grid is 1.78 Million Km long
+ Bavarian Grid has 43,961 secondary sub stations
THE CHALLENGE OF THE SMART GRID

+ alternative energy sources
+ Insufficient visibility
+ 10-15 % over production for ~4 h / year
+ resulting High CAPEX and OPEX
INTEL PARTNERS TO BRING TRANSPARENCY TO THE GRID

What if we could predict how much energy is needed where 24h from now?
VISION - Demand Response Aggregation and Smart Buildings

Balancing Supply and demand At local level
Benefits

For e.on:
- Reduce high voltage powerlines needed
- Reduce CAPEX
- Reduce overproduction

For Endusers (Industry, Building Management, private households)
- Stabilize power quality and prices
- Optimize building management (cooling, ventilation)
- Safe money in energy intensive industries
Analytics Example 1

The same two week’s “sun hours” data as Bar Chart below.

**Insights:**
- The sun hours data is strongly related to the energy production!
- We can use this information to make better predictions!

* Created by SHS Viveon for Intel
Analytics Example

Maximum Power per transformer and month

The values can be read via tool tips!

Insights:
• About 6 Transformers have a high load (red or orange)
• No. 379 had a very high load in winter 2012-2013!

* Created by SHS Viveon for Intel
...so the question is:

or
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