



## THE BUSINESS APPLICATION – BUILDING VIRTUAL POWER PLANTS

E.ON Connecting Energies is a business unit of E.ON and an international provider of integrated energy solutions for commercial and industrial customers as well as public-sector institutions. E.ON is an international privately-owned energy supplier and will in future be focusing entirely on renewables, energy networks and customer solutions. In the 2014 financial year, more than 58,000 employees based in many countries in Europe as well as in Russia and North America generated sales of around EUR 112 billion. Around 33 million customers purchase gas and electricity from E.ON.

E.ON Connecting Energies is headquartered in Essen, Germany, and exploits innovative technology such as machine-to-machine communication and data analytics to provide integrated energy solutions with tangible cost benefits for customers. As a system integrator, E.ON Connecting Energies is technology agnostic and vendor-independent, allowing them to leverage cutting-edge technology to develop the best possible solution for customers. Three years ago the company entered the Virtual Power Plant (VPP) space, whereby they help companies offer and monetize their capacities beyond their own needs to contribute to the energy system.

E.ON Connecting Energies analyzes customer equipment resources including on-site power generation units (e.g. diesel generators, wind, PV, biomass, etc.) and transforms their capacities into VPPs, meaning they can control these sources by a central control system optimized to access data 24/7. Eventually, they sell the excess energy and capacity for the customer into the energy markets, such as wholesale markets (e.g. spot, intraday), reserve markets (primary, secondary, tertiary reserve) or local optimisation (e.g. peak charge, avoidance, imbalance optimisation).

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## THE INDUSTRIAL CONTROL SYSTEM - ECLIPSE SCADA

E.ON Connecting Energies found a solution in the Eclipse SCADA project, an open source supervisory control and data acquisition (SCADA) communication system that operates with coded signals over communication channels to provide control of remote equipment.

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SCADA systems historically distinguish themselves from other industrial control systems by being large scale processes that can include multiple sites, and large distances. Eclipse SCADA was attractive to E.ON Connecting Energies because they wanted to remain vendor-neutral and liked the flexibility of an open source project.

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E.ON Connecting Energies developed a VPP system to reach remote machines and pull data through a communication box that bridges a network and a secure gateway. The data is brought

through a cellular network to the data center, and goes through Eclipse SCADA to do the remote command and control of the units.

The VPP has two engines – one that virtualizes the unit in the field, and the VPP engine that takes the flexibility and optimizes it and presents it to grid operators. Eclipse SCADA abstracts the various power generation units so they can talk to the VPP. With Eclipse SCADA, E.ON Connecting Energies helps customers integrate their hardware with their VPP business application for data acquisition, monitoring, data and event archival, visualization and value processing.

The flexibility of Eclipse SCADA allows the E.ON Connecting Energies VPP to turn remote equipment on or off on demand. They take that control and calculate how much power can be made or consumed, and then sell extra power as a product pack to the grid. Instead of seeing hundreds of individual power units, the grid sees them as one very large unit.

E.ON Connecting Energies and the digital development team is growing fast, and for that reason they need a flexible and agile environment and infrastructure. The open source character of the system strongly contributed to this environment. IBH helped create the Eclipse SCADA project and actively participate in the ongoing open source development. IBH worked closely with E.ON Connecting Energies to install Eclipse SCADA and customize it to meet their needs.



**Eclipse IoT Project Scada**  
[www.eclipse.org/eclipsescada](http://www.eclipse.org/eclipsescada)