

# EMPURON VIRTUAL POWER PLANT

## Centralized Supervision of Decentralized Plants

With **EMPURON VIRTUAL POWER PLANT** all controllable local units are networked into a virtual power plant that allows them to be monitored, evaluated, and controlled from one central control room. So, energy service companies, municipal, regional, industrial and private operators of renewable energy plants as well as energy provider with a variety of small plants are able to participate in the electricity market and take responsibility for the grid through the provision of reserve energy. Out of the status information of facilities, such as the operating state, the amount of electricity produced, the weather forecast and the local load quantities a road-map is created at the central control room which ensures an optimum use of the virtual power plant.

### Supervising and controlling of distributed plants with EMPURON SCADA and EMPURON ATLAS RTU

Programmable SCADA systems provide local and remote monitoring as well as control of geographically distributed renewable energy plants and electrical transmission and distribution networks.

The solution also includes all types of RTU (Remote Terminal Units) and SOE (Sequence of Events) for chronological data logging and presentation as well as for sending control commands.

### Standard - Performance Core Functions:

Standard functions of System and data bases enable:

- Remote supervision and control of the distributed Renewable Power Generators
- Statistics
- Data and event analysis
- Data archiving
- Comprehensive state and trouble information of the plant available via internet





Use Cases:

- Feed-in management for Renewable Energy Plants:**  
 Integrated, location independent operating of a generation system
- Limitation of energy consumption:**  
 Operating of energy plants in consideration of reserve power to avoid load peaks
- Energy management for companies:**  
 Integrated operating of heterogeneous Energy Systems with optimization of internal consumption / avoiding of load peaks

Provision of Tertiary Energy for Minutes Reserve

EMPURON Virtual Power Plant is perfectly suited for tertiary control (minutes reserve) and is primarily used for economical optimization. The minutes reserve is ordered over the phone by the transmission provider and has to be provided completely within 15 minutes.

Grid components can be integrated into the system as positive or negative control energy. The provision of negative control energy is also achieved with distributed power generators of the virtual power plant by collective reduction of the feed-in power.

Monitoring and Reporting

As central control system EMPURON Virtual Power Plant collects runtime and message data of the single power producer, power consumer and forecast modules in a unified structure in the EMPURON Data Warehouse.

Using EMPURON CE and a powerful Reporting module, the key data are evaluated in a user defined and time controlled way.

Via Internet all relevant data, evaluations and disturbances are visualizable and inspectable. In case of errors or violations of limit values, an alarm via "SMS" or "Email" is issued by the alarm centers EMPURON AC. Thus the energy provision of the virtual power plant is documented and traceable at any time and trouble shooting is facilitated.

Figure: Online Recording of the Production Progress

