

EnergyIP DEMS

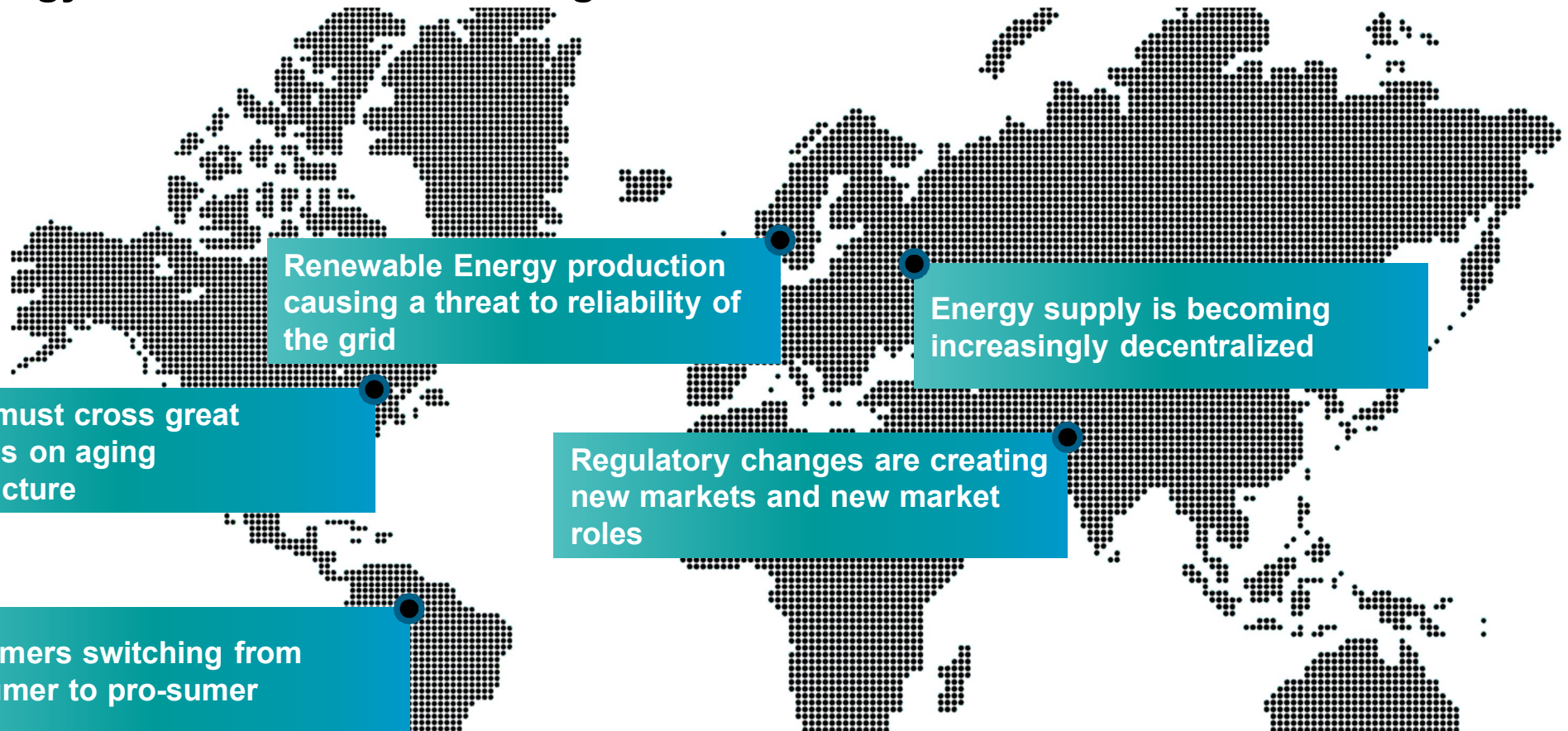
Demand Response and Virtual Power Plant
Overview

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[siemens.com/energyip](https://www.siemens.com/energyip)

New challenges – new opportunities

Energy decentralization is rising.

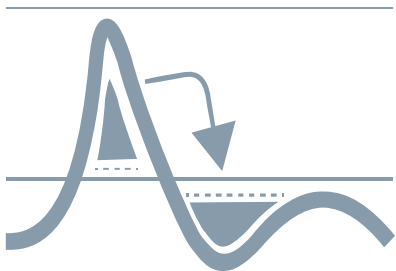


The Grid Evolution from uni-directional and top-down to bi-directional and distributed triggers two major goals

Demand-side Management

- Traditionally event-based management of demand and generation with distributed grid assets
- Load balancing/grid stability as overarching goal

“How can we manage loads and ensure grid reliability with distributed grid assets?”

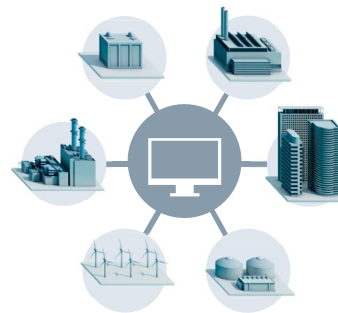


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Supply-side Management

- Dynamic management of generation for participation in energy and ancillary service markets
- Coordinating groups of DERs into Virtual Power Plants that can be managed together with a commercialization goal

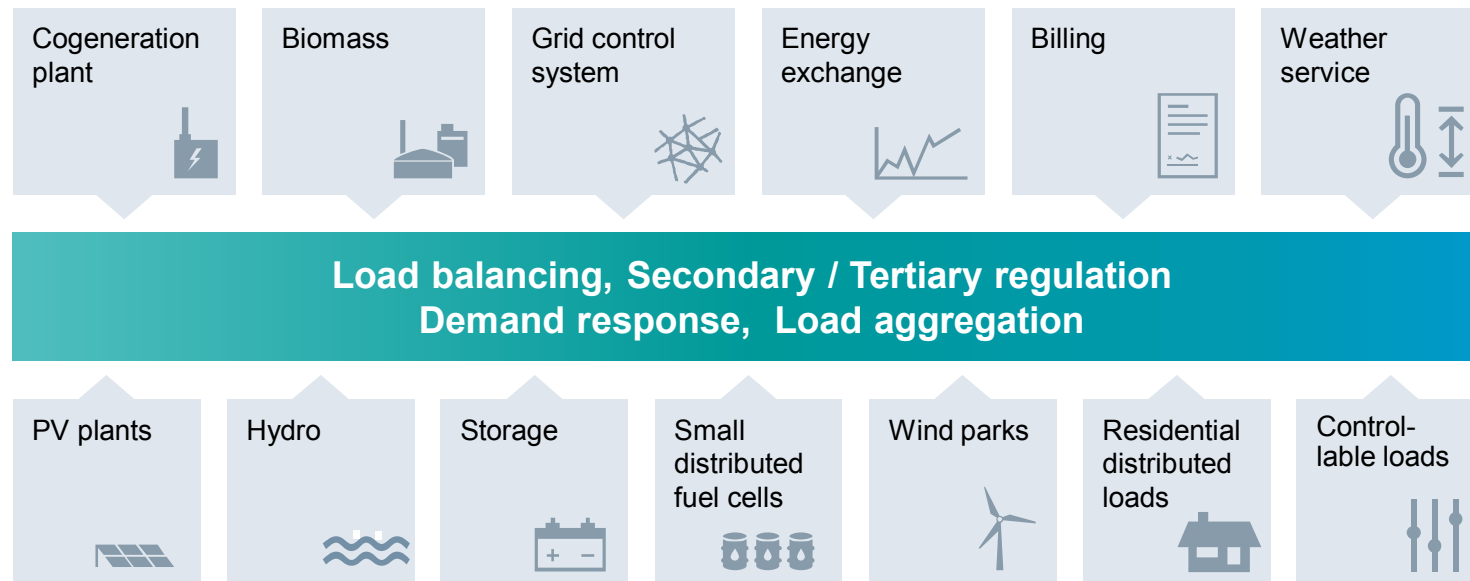
“How can we bundle distributed generation and optimize it?”



2

EnergyIP DEMS – Demand Response and Virtual Power Plant

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The Distributed Energy Resource Management System EnergyIP DEMS is one single system to manage demand and supply of distributed energy resources for a wide variety of use cases

Demand Response

Aggregation management system for DER

- Administering loads and participants
- Contract management
- Multiple and flexible aggregations
- Scheduling and dispatching events
- Preparing settlement data

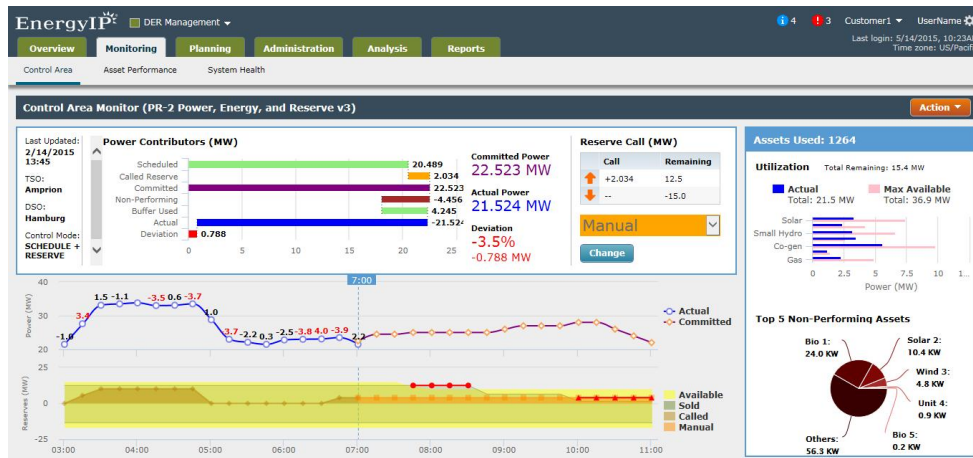
Virtual Power Plant

Energy management system for DER

- Forecasting generation and load
- Scheduling
- Monitoring and supervising
- Real-time optimization

EnergyIP DEMS

EnergyIP DEMS – Demand Response and Virtual Power Plant



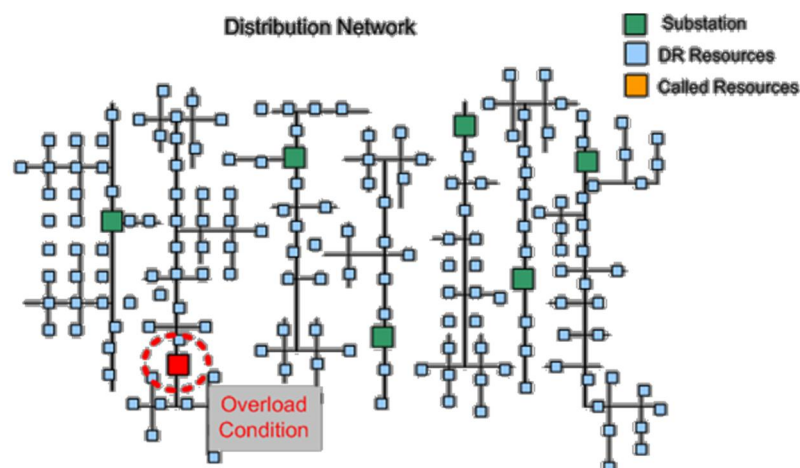
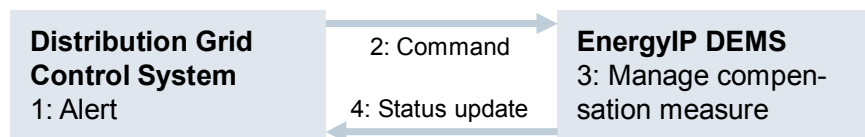
- Cost efficient integration of more and more renewables avoiding grid extension
- Higher profitability with energy trading
- Increased customer loyalty
- High scalability to integrate/administrate a very high number of assets and customers

- Event-based demand response – utilities or aggregators can use the rule-based event wizard to manually dispatch DER assets based on the program
- Market-centric DER management – Operators can accurately plan the quantity of resource available to be offered in a given market, according to each market's specific constraints
- Online optimization and control – online control can be used to ensure market commitments are fulfilled, scheduled balance is achieved, and event-based dispatch targets are realized
- DER asset management – A flexible data model that can model the engineering characteristics of asset as well as the applicable business constraints

Grid stabilization with distributed assets

Customer challenge

Avoid overload situations in distribution grid by shedding load or increasing generation



Application logic/value proposition

- Chose from different control philosophies to integrate all customers and assets
- Classical demand response programs for residential and industrial customers
- Continuous online control and optimization for e.g. renewable generation, industrial load, CHP, smart buildings, and batteries
- Relieve Grid Control System from data acquisition from large number of small assets by providing pre-aggregation following grid topology

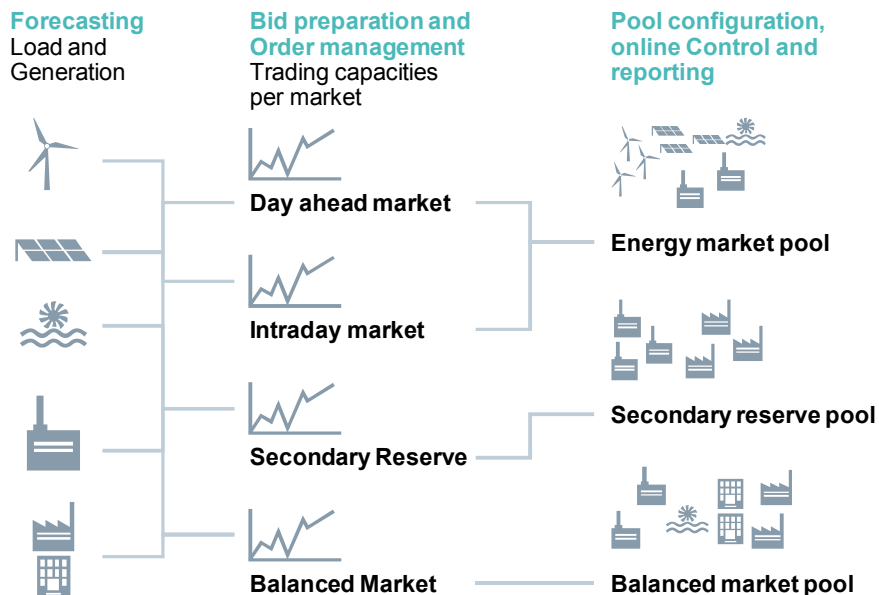
Highlights

- One EnergyIP DEMS implementation can serve unbundled operations (e.g. DSO and Retail) with multi-tenancy
- Different control philosophies in one application from manual messaging to full online control

Trading of energy or flexibility from distributed assets

Customer challenge

Trade mixed pool of distributed generation on intraday and day ahead markets – optimize among different market options



Application logic/value proposition

- Forecast capacities and merit order for each market with high frequency for continuous trading
- Use assets on all markets that they qualify for
 - Energy markets
 - Day ahead and intraday
 - Ancillary markets
- simultaneously
- Easily re-assign assets to the market with highest profit based on your optimized trading strategy
- Automatically create reports and settlement data

Highlights

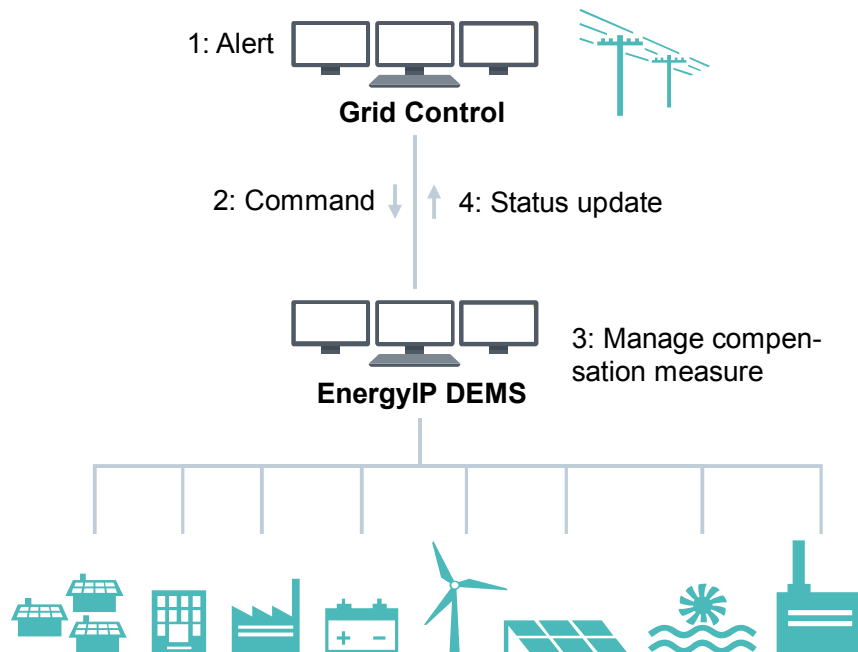
Maximum flexibility

- Flexible data model to react to new market rules and market designs
- Flexible assignment of assets to different trading strategies – reconfigure several times per day if needed

Ancillary service with distributed assets for Transmission System Operators or Distribution System Operators

Customer challenge

Provide ancillary services (primary, secondary, tertiary reserve) with pools of large number of distributed assets



Application logic/value proposition

- Participate with large pools of distributed assets in ancillary service programs and markets for TSO & DSO as additional revenue stream for distributed assets
- Effectively forecast the pool's availabilities for the different ancillary services and support tender process
- Interface to grid control systems to execute dispatch signals within pool
- Measure performance of each participant and prepare settlement towards TSO/DSO and participants

Highlights

- Highly scalable platform to build large pools
- Maximize value of assets by flexibly trading them on all eligible markets
- Market rules can be easily adjusted to regulatory changes or to new markets

10 good reasons to choose EnergyIP DEMS



Integrated Generation Optimization and Demand Response Management

Intelligent forecasting and planning

Integrative view of all resources

Open interfaces enables seamless integration in IT environment

Optimized work processes

**EnergyIP™
DEMS**

Flexible Aggregation of Grid Assets

Real-time operation and optimization

Scalable systems

Modern technology stack

Leveraging the power of EnergyIP