Energy Storage and Smart Grid Solutions

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Innovation At Every Level

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We have an opportunity to co-create the future

More ELECTRIC

2X faster growth of electricity demand compared to energy demand by 2040

Source : IEA WEO 2014

More DIGITIZED

10X more incremental connected devices than connected people by 2020

Source : Cisco, Internet World Statistics

More DECARBONIZED

82% of the economic potential of energy efficiency in buildings and more than half in industry, remains untapped

Source : World Energy Outlook 2012, Internal Analysis

More DECENTRALIZED

70% of new capacity additions will be in Renewables by 2040

Source : BNEF

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MORE DECENTRALIZED
Integrating intermittent generation & leveraging microgrid flexibility

Distributed
Generation

Energy
Storage

Micro Grid

...What are the key drivers…

Flexibilization	Data	Big Demanders	Economical case
Balancing demand/production	Which kind of data	Connected on LV/MV Level	It has to be worth to invest
Bidirectional prediction	Big Data or small Data	What is the application/need	It has to be sustainable (financial)
Short term reaction & Autonomy	Where to store the data	Are there other needs	It has not be dependent on subsidies

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Industrial Customer in Germany

Plant as a Microgrid

The Customer
- Chemical site from a industrial customer in Germany
- 3MW Rooftop PV Installation (3 football fields)
- 8MWh Redox Flow Battery
- Steam Generation

Customer Challenge
- Reduce CO_2 costs and becoming a Prosumer
- Bringing the ecological challenge to e real Business Case

The Solution
- Fully Integrated Microgrid Solution with PV, Battery, Management System
- Peak-Shaving & Peak Shifting
- UPS
- Participating at the "energy balancing" market (negative) – increasing
- Possibility to influence 50% of the price/kWh of energy (EEG, taxes, etc.)

The Results
- Significant energy and cost savings through the optimisation of the entire electrical distribution solution from plant to plug
- The Investment of 30m€ will have a payback around 5 years

EcoStruxure Innovation At Every Level **Grid**

Apps, analytics, and services

EcoStruxure Microgrid Advisor

Edge control

Power Management System & Conext Advisor

Connected products

PV Box RT & Batt RM6 + Easergy T300

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Substation as power plant

The Project
- TSO in the northern part of Germany
- Several wind turbines and solar plants
- Connected to the transportation grid at 110kV level
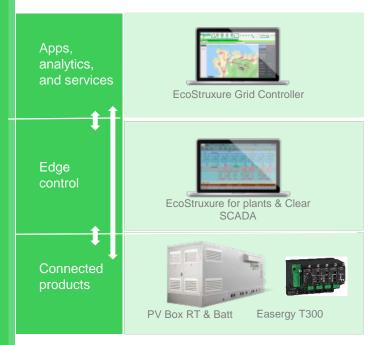- To comply with the grid code for the TSO

The Solution
- Put them together in a virtual power plant
- Control them through a algorithm to respect the grid code
- Include battery storage system on the level of a PV power plant to shift peak production
- Provide reactive power through a fully automatic plant controlling
- Effective maintenance by comprehensive measurements and data collecting

The Results
- Still in project phase
- First test results are OK

EcoStruxure™ Grid
Innovation At Every Level

Apps, analytics, and services	EcoStruxure Grid Controller
Edge control	EcoStruxure for plants & Clear SCADA
Connected products	PV Box RT & Batt Easergy T300

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