The PI System™ as the Virtual Power Plant Platform

Presented by

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ConnectPoint

Presentation Agenda:

- Częstochowa Tech, ConnectPoint and OSIsoft
- Business challenge and benefits
- Current stage of the project
- Future

Częstochowa Technical University
Faculty of Electrical Engineering

- Optimization, modeling, intelligent management and forecasting methods in the power industry

- Modeling in operation and analysis of electromechanical systems, diagnostics of renewable energy sources

- Numerical and analytical methods in computer science and electrical engineering

Częstochowa Technical University cooperation with business and industry

Licensed software used in teaching and research (among others)

Cooperating agreements (teaching, research and development)

Using the PI System by Faculty of Electrical Engineering

- Monitoring & management of University assets:
    Smart meters, photovoltaic panels, wind turbines, weather stations

- Education:
    Student workshops, OSIsoft PI System science club, part of the curriculum

- Research and development
    Predictive Maintenance, forecasting of power generation, data validation, process optimization

About ConnectPoint

ConnectPoint mission is to deliver software solutions, that help the customers to boost the value of their businesses, thanks to the benefits hidden in operational data.

| Data Acquisition | Data Management | Data Analysis | Visualizing & Reporting |

- Partnership with OSIsoft
- Experience in analytics, modeling and real-time data handling
- Effective discovery of client needs

ConnectPoint Products & Applications

ΣEstimex ConnectPoint

Estimex product family

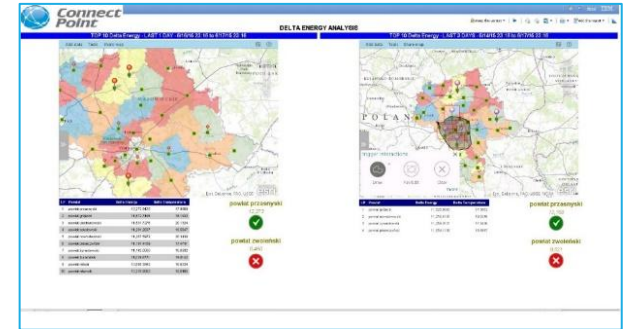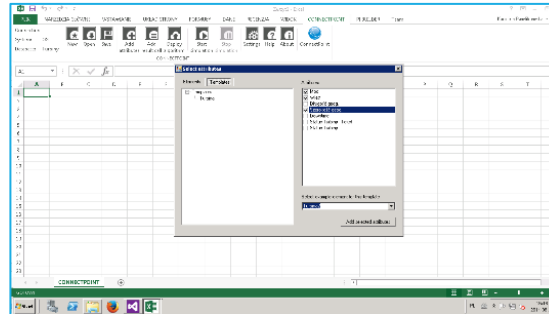- REMS Real-time and asset data visualization platform on top of the PI System

- Estimex CEP – PI System complex event processing made simple

Robust technology base for IGBS VPP project!

Integration product - reporting and data analysis portals (based on the PI System, ESRI, Microsoft BI and IBM Cognos products)

Our Cooperation: OSIsoft, Częstochowa Tech, ConnectPoint

- December 2014 – Educational & Research Software License Agreement
- February 2015 – first PI System Workshop in Częstochowa Tech
- March 2015 – PI System in the Students' Science Club
- March 2015 – present

  OSIsoft & ConnectPoint – Virtual Power Plant (pilot launched)

  OSIsoft & ConnectPoint – Internet Grid Balancing System – EU Grant (in evaluation by the European Commission)

  OSIsoft & ConnectPoint – internships program – EU grant (in the preparation)

OSIsoft involvement in the project

- Provide the ultimate real-time data infrastructure
- Provide the Connected Services commercial model which fits the needs of the project

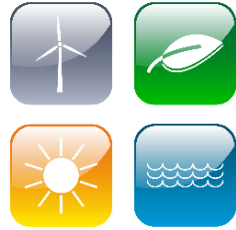**Target Customer**
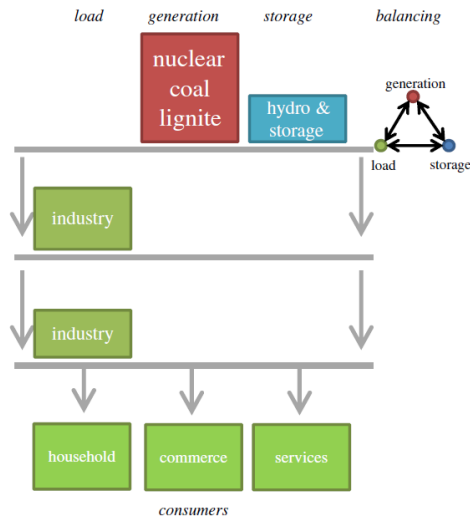Small-scale energy trading companies

IGBS
SaaS provider

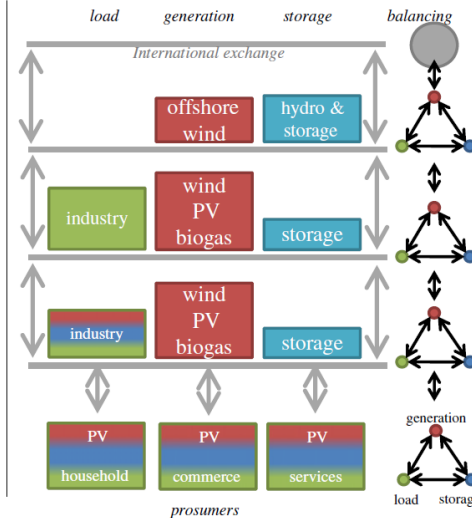PI System Platform
Connected Services model

Market challenges which lead to the project

Top-down supply system
(central control)

→ **Multi-level exchange system**
(subsidiarity, shared responsibility)

Transformation of the electricity system—schematic representation.

http://www.ourenergypolicy.org/

- Management of increasing volume the renewable Energy

- Newcomers into energy trading

- Integration of conventional and renewable energy sources

- No operational VPP within Poland

Why the IGBS (Intelligent Grid Balancing Solution) concept?

- Everyone wants to produce energy but do not know how to make a profit
- Key factor – balance production, consumption and storage

- Solution: Energy traders will create IGBS PI-centric communities, which will be then optimized by system from the perspective of demand and supply planning, market profit and risk limitation.
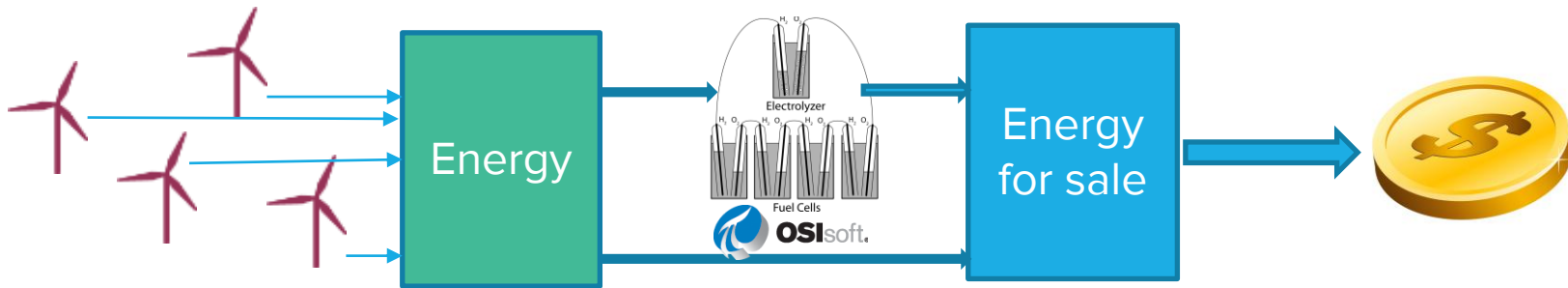
The Częstochowa Tech & ConnectPoint Solution

IGBS (Intelligent Grid Balancing Solution) combines virtual power plant approach with demand side management.

control

decision
support
information
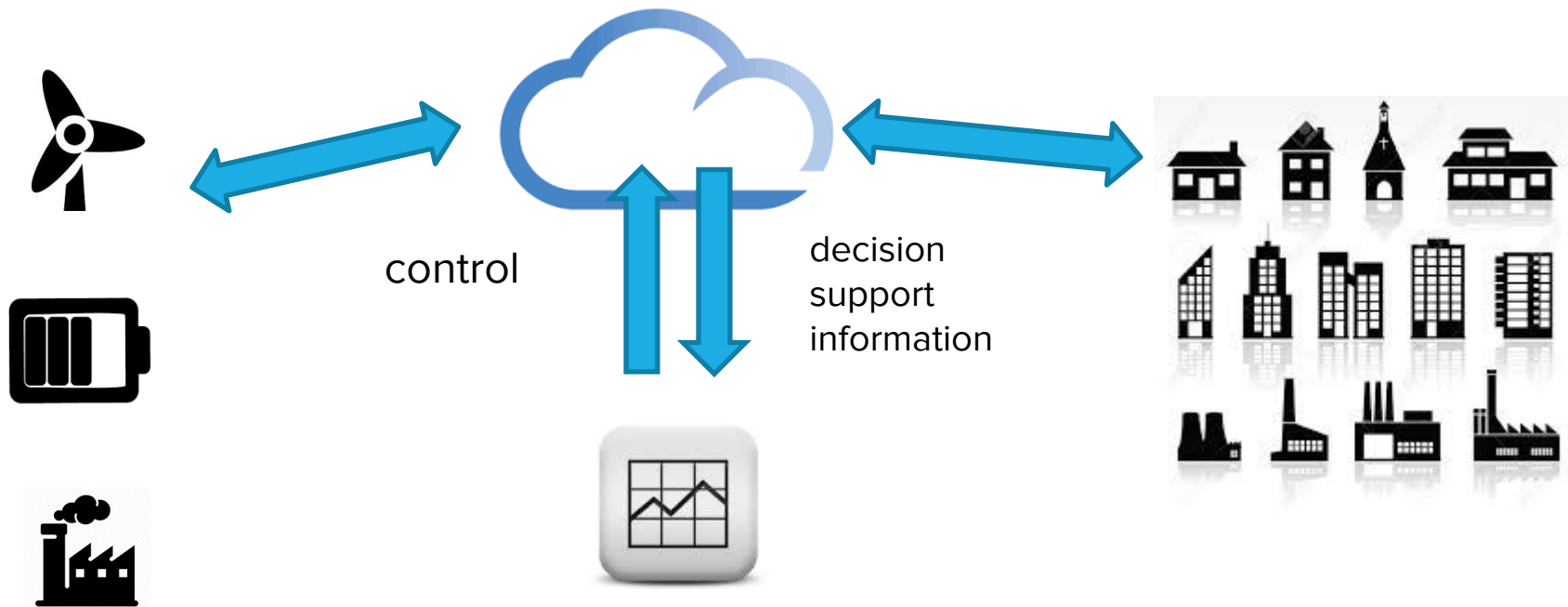
User Benefits

Software-as-a-service business model, the target customer group are energy trading companies that, thanks to IGBS, will be able to achieve following benefits:

- Lowering the cost of green energy acquisition by buying it directly from suppliers connected to IGBS (not just buying green certificates)

- CAPEX-free potential of expanding installed capacity (by connecting new energy manufacturers in the IGBS community)

- Increase in price of energy sold, thanks to multiple options (selling directly to the market, selling to the consumers inside IGBS group, storing the energy in low-price times)

- New sources of revenues thanks to offering additional benefits to energy consumers connected to the system- lowering their energy bills by exact profiling and connecting into consumer groups organized by energy traders.

Target System Functionalities

- Real-time data collection
  - Energy is delivered to the market (SCADA systems connected to IGBS)
  - Demand for the energy (by application for demand planning for consumers and eventually by connecting smart meters into IGBS)
  - Generation forecasts based on forecasting models based on particular generation assets characteristics as well as on accurate weather forecasts
  - Market data for trading optimization module
  - Real-time operational data, that allows to provide condition-based maintenance service for the energy producers, that will be additional benefit encouraging them to connect to IGBS

- Algorithms that calculate proper size of energy storage and take it into account when doing optimization
- Decision-support module, that based on forecasts and actual data prepares a plan that can be then implemented by the system operator
- Ability to control assets (for example to curtail unprofitable generation or excessive consumption)

Market Potential

- New legislation in Poland (January 2016) will allow prosumers to sell energy to the grid – VPP helps entities to accomodate inflow of such new energy generation sources.
- Local municipalities investing into distributed generation sources – but they do not have trading potential

Current Design and Infrastructure

Renewable sources
connected to the grid
via
two smart metres

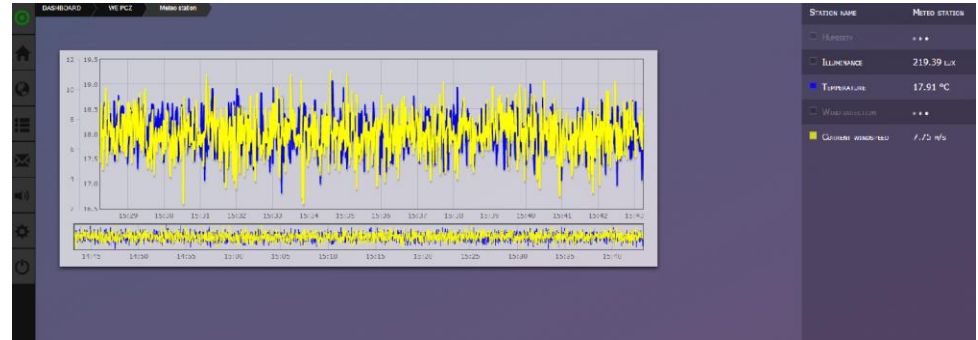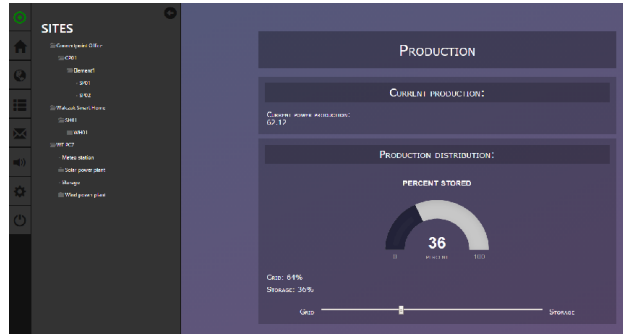180 photovoltaic panels (250W)
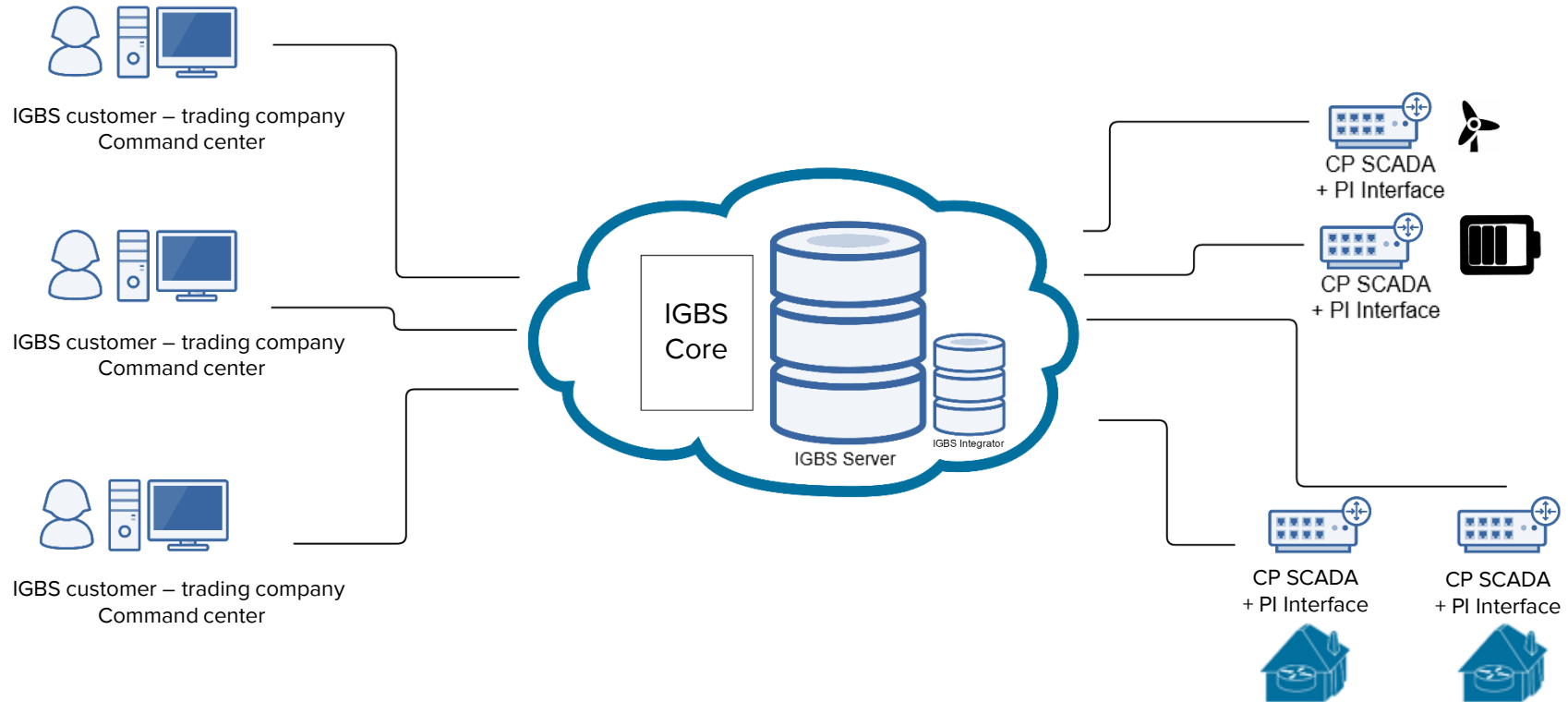divided into three sections

3 wind turbines (10 kW)
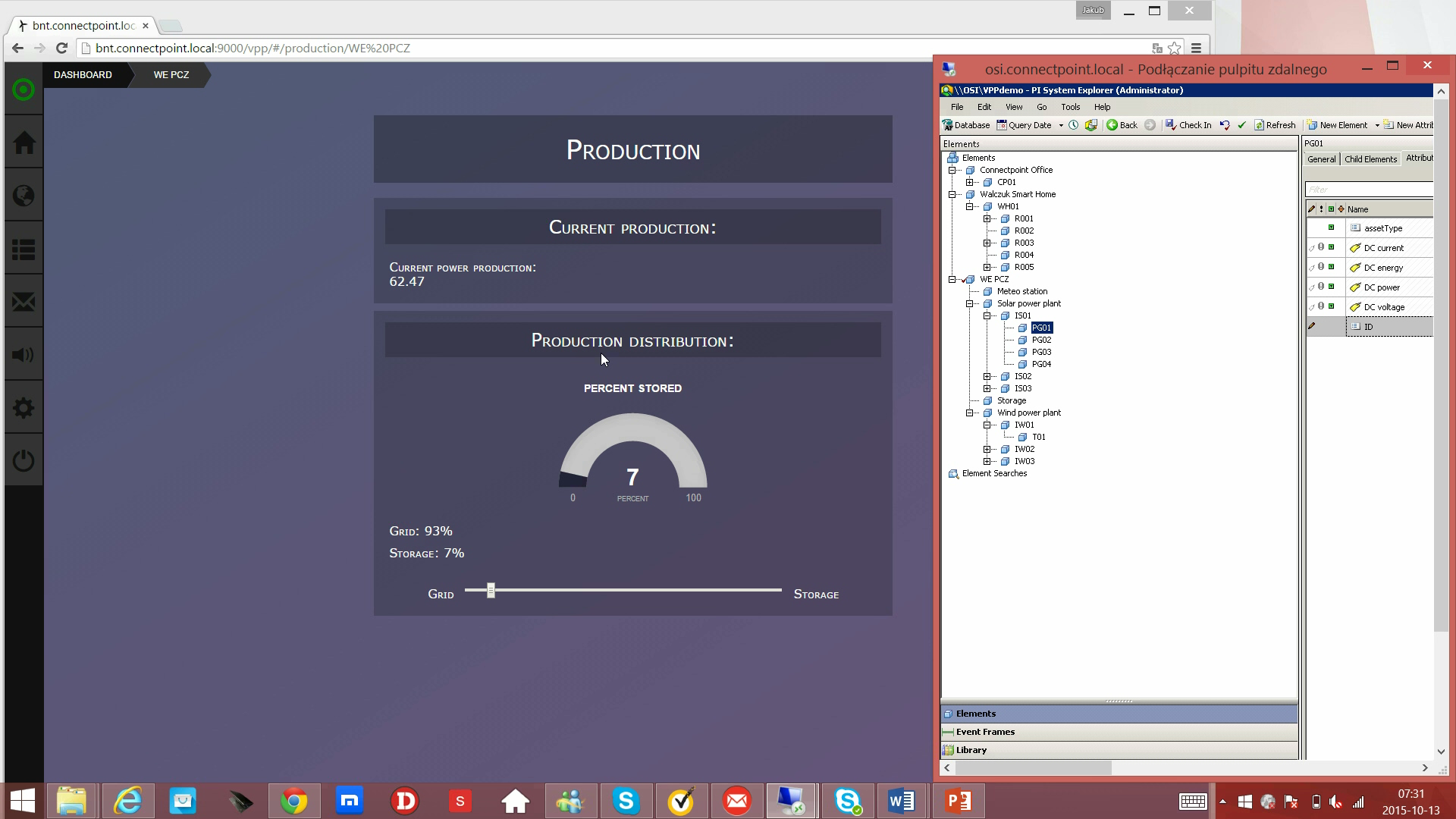
Current Stage - Software

Real-time data collection

- Demand for the energy by application for demand planning for consumers and smart home solutions
- Real-time operational data, generation, state of devices, forecasts and meteorological information
- Smart plugs control

Target Design

IGBS customer – trading company
Command center

IGBS customer – trading company
Command center

IGBS customer – trading company
Command center

IGBS
Core

IGBS Server

IGBS Integrator

CP SCADA
+ PI Interface

CP SCADA
+ PI Interface

CP SCADA
+ PI Interface

CP SCADA
+ PI Interface

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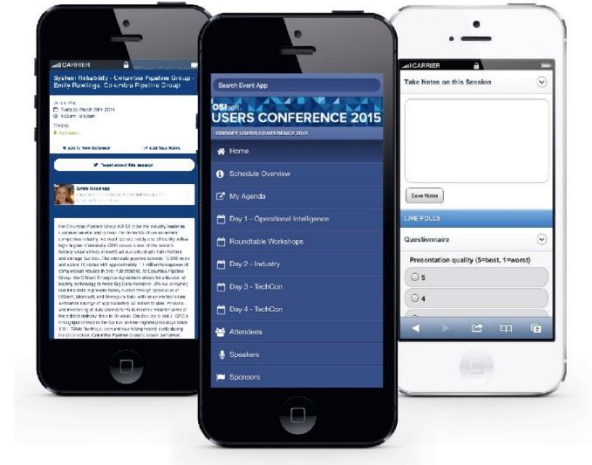Chief Technology Officer

ConnectPoint

Questions

Please wait for the **microphone** before asking your questions

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name & company

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http://eventmobi.com/emeauc15