



Smart Simulator

– Future in Energy Sector Has Arrived

Contemporary Issues

The energy production has started to be **more and more decentralized and atomized** with the increasing number of photovoltaic and wind power plants. Changes in energy production generate many modern benefits like carbon footprint reduction through renewable energies usage. On the other hand, these changes place high demands on current distribution networks.

Hardly predictive energy production from renewable sources brings about inconveniences in the network like overloads, failures and blackouts at worst.



Who contributes to solving the issue?

Smart Simulator is brought by the unique partnership of:



NESS Czech
International SmartNESS projects integrator



MycroftMind
Complex Event processing specialists



Cerit Scientific Cloud
Supercomputing centre at Masaryk University in Brno

Error-free implementation

Protection of network against failures or blackouts is connected with the ability of effective metering, management and optimization of the network, called **Smart Grid**. The ability of effective network management starts with obtaining and processing the distribution network data that are / will be present in the network. This is addressed in the first step – definition and processing of distribution network data analyses. Based on the defined data analysis, the project of optimal concept continues with the appropriately selected simulation of future events.

Professionals responsible for minimization of the risk connected with the implementation and integration of New Technologies need to choose a suitable concept in order to ensure error-free implementation.

How to get sources for incident-free implementation?

- Trust in **references & pilots** of another utilities
 - In standalone example Low-cost but also Very-High-risk variant
- Launch **pilot projects**
 - High-cost variant and the output is based just on information from limited area
- **Simulate** the behavior of Smart Grid with Smart Simulator
 - Way of **effective proportion between the costs and applicability of outputs**
 - Simulation of the behavior of almost any component at the whole network

Utilities and their professionals can use simulation to test and tune a large scale of Smart Metering and Smart Grid components. Smart Simulator is able to generate network topology with the same characteristic as your real network. It generates **scenarios of behavior of individual points** of delivery (PoD) including energy consumption, accumulation capabilities, energy production, measurement frequency, communication failures, latency, impact of weather, customer behavior, etc.

The simulated grid is connected to real tested system in the next step. Simulation environment **is operated at a super-speed computing center at Masaryk University and offers highly flexible computation power**. The center provides specialized monitoring tools for monitoring the tests in real-time as well as for behavior analysis of the tested system.

Smart Simulator Offers

- **Minimization of risk** connected with the launching of Smart Metering / Smart Grid projects
- Information on the **real behavior of the components** in the network without the necessity of buying expensive infrastructure and hiring full-time professionals
- Possibility to run a **wide scale of follow-up simulations** and thus save future costs
- Gain **relevant data** on “What exactly do we need / require” in the following project steps (e.g. RFP)

Take advantage of our experience

IT as a Service
Energy Management
Prediction & Simulation
Automated Meter Management
Security
Prediction of Customer Behaviour
Testing
Application Integration
ERP
Portals/eCommerce
eProcurement
Risk Management
Mobile
Big Data
Outsourcing
Dispatch Control System
CRM & Campaign Management
Business Intelligence & DWH
Infrastructure
Smart Energy
Application Development
Digitization
Billing

Solving the issue

With the experience from implemented projects we honestly recommend to combine all of the sources with strong emphasis on simulations, because:

Smart Simulator brings answers to the questions like:

How many meters can your data collection and control system handle?

How often can you get the outputs /measurements?

What kind of data protocols are the most reliable for your case?

Where are potential imperfections of your smart metering / smart grid infrastructure?

How will tested system handle any extreme situations like communication system failure?

What are the relevant information for following steps of the project?

What will happen if the number of photovoltaic panels increases up to 30%?

WHO SOLVED ISSUE with us ALREADY?

Smart Simulator is successfully used by ČEZ Group, who is Czech dominant energy and utility company with headquarter in Prague and subsidiaries in Central and Southeastern Europe.



ČEZ Group used smart simulator for testing their **meter data management system processing 3.5M PoDs with 15min sample readings**. Now the simulator is used for testing consequent projects (e.g. algorithms for utilization of accumulation capacity of PoDs).

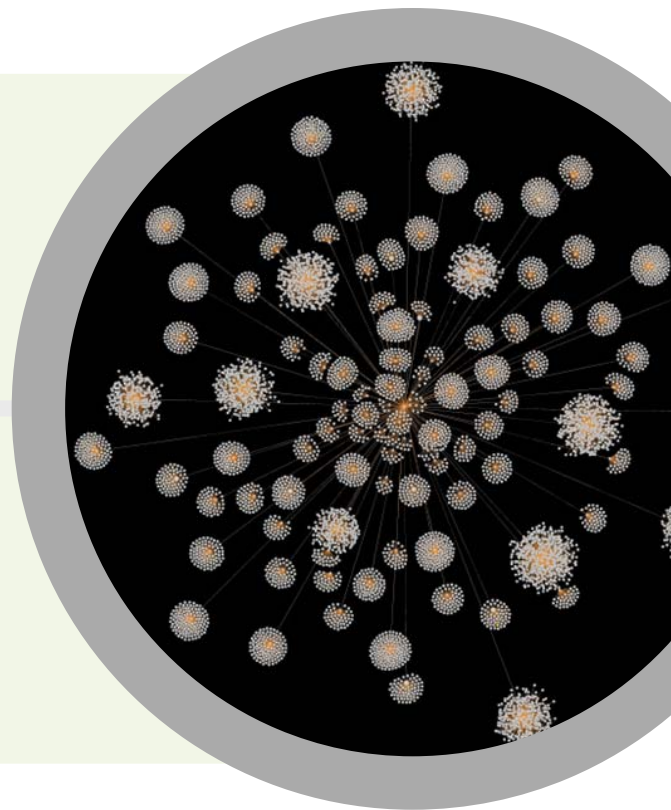
Examples of Simulation Tests

Duration of the standard simulation project lasts approx. three months, depending on the test complexity.

We are able to launch the following simulations immediately:

- Communication between the Distribution Management System & Distributed Transformation Station (DTS)
- Dynamic consumption management using local accumulation appliances
- Effective balancing of local production and consumption within the Smart Island (simulation for compensation of local balance)
- Impact of fragmentation / atomization of local resources (photovoltaic boom, etc.)
- Optimal amount of supporting services or mandatory accumulation for regional photovoltaic power stations

We are also ready to provide tailored simulation tests.



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