

AN INVITATION TO COOPERATION. SUMMARY

PROPOSAL

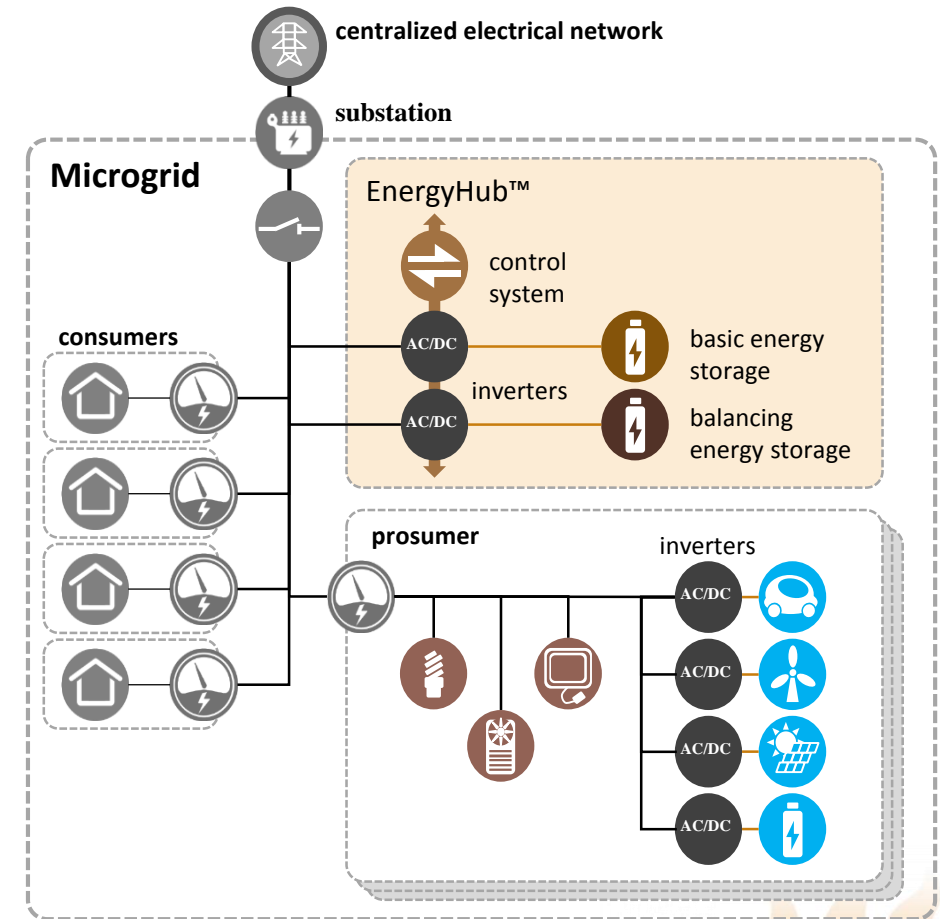
Design and develop innovative solutions to optimize energy consumption through demand-side management. The proposed solutions will ensure a stable and reliable energy supply of consumers in the presence of various kinds of distributed generators and energy storage systems connected to one microgrid. Possibility of autonomous power supply, maintaining an independent internal energy balance, static and dynamic stability and the work of all production and household equipment in optimal for them conditions is provided. This is achieved by intelligently process of the primary power balance adjustment to different kinds of generators (both based on renewable energy sources and traditional generation) and storage devices that provide power to consumers. The result is an increase of capacity utilization index not less than 20%, reducing the cost of electricity generation by at least 1.5 times, as well as reducing the maximum transient voltage and frequency deviations in local networks, which is especially important for the stable operation of high-tech and digital equipment.

CONSORTIUM TARGET SCHEME

Search Singapore Institutes of higher learning (IHLs) / research institutes (RIs) / small-medium enterprises (SMEs), who can become as a consortium leader and a developer of software for the final solution .

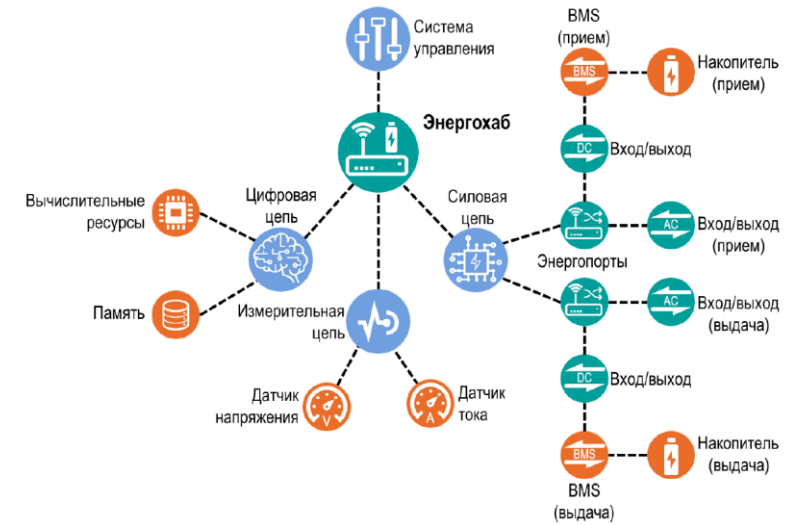
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ABOUT ENERGYHUB™

Problem to be solved: generation and accumulation devices on the market have different electrical output parameters and characteristics today. In addition, renewable energy generators have generation profiles that depend on various factors related to the primary energy sources in the region where they are located. Therefore, the dynamics of consumption and generation requires coordination at different time intervals.



Solution: *EnergyHub™* device allows for an intelligent process of primary power balance control for various kinds of generators and storage devices. Device is developed as a part of road map of EnergyNet NTI (Russian government grant program). Technology Readiness Level (TRL) - Validation of Integrated System (Component and/or validation in a relevant environment).

BRIEF SPECIFICATION ENERGYHUB™

Consumer appeal of the *EnergyHub™*:

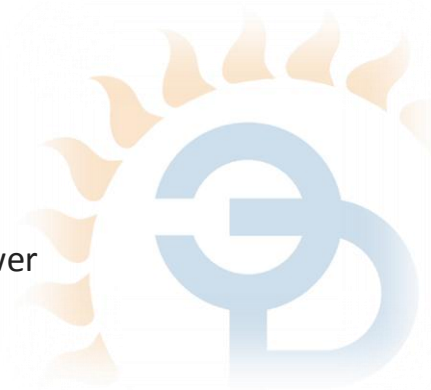
- Long service life time – not less than 10 years
- high reliability (due to built-in protection against unstable network operation)
- unified connection of various generation and accumulation devices
- no need for preliminary design of small systems
- easy connection and setup of equipment
- the possibility of parallel operation of several devices on a common load in the autonomous mode
- high integration, provided the ability to interact with the upper-level control systems by MODBUS RTU

Effects of the *EnergyHub™* implementation:

- increasing the capacity factor not less than 20%
- reducing the cost of electricity generation by at least 1.5 times
- reduction of installed capacity for typical consumers with pronounced consumption peaks of at least 40%
- reduction of harmful emissions up to 80% (the maximum reduction of emissions is achieved in operating modes due to the replacement of energy produced by a diesel generator with renewable energy)
- reduction of maximum voltage transient deviations in local networks up to 5%
- reduction of maximum frequency transients in local networks up to 1%

Potential consumers of *EnergyHub™* are:

- Domestic consumers with their own sources of generation and accumulation (cottage villages, urban areas, rural settlements, etc.)
- Manufacturers that are selling devices for generating renewable energy
- Integrator companies offering complete solutions of the power supply system (including autonomous) on a turnkey basis
- Companies offering solutions for the implementation of power supply systems with increased requirements for the reliability of power supply equipment
- Organizations engaged in the implementation of projects miCrogrid technologies



ABOUT LLC ENGINEERING CENTER "ENERGY DEVELOPMENT"



ЭнергоРазвитие
ИНЖЕНЕРНЫЙ ЦЕНТР

Company speciality:

- ✓ Complex engineering audit of energy providers and manufacturing plants using power engineering equipment
- ✓ Development of investment programs, installation and result control on behalf of the owner

Company works in the entire territory of Russian Federation

The company employs over 100 people, of which 80% are highly qualified engineers

Experience of staff and managers - more than 25 years in the market of engineering services

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