

## A) General Information



Acronym:	ITEH
Title of the User-Project:	IT solutions for optimal strategy of energy technology choices
TA Call:	
Host Research Infrastructure:	RSE DSM-EH
Starting Date:	14 Jan 2013
End Date:	1 Feb 2013
Lead User :	Irina Oleinikova
Organization:	IPE Institute of Physical Energetics
Additional Users:	Mario Turcik, Anna Mutule, Artjoms Obusevs

## B) Summary of the User-Project

The primary motivation of the work is required revision of operational and long-term management of distribution networks due to the substantial changes compare to the conventional pattern. Increase of variable generation, introduction of DSM programs through controllable loads and market sensitive customer participation requires the setting up advanced strategies for network operation and energy management, prospectively with consequences to the network planning and dimensioning.

In frame work of project *IT solutions for optimal strategy of energy technology choices* are elaborated by the Institute of Physical Energetics (IPE) methodology and network management algorithms and methodology applicable for the optimal sustainable development of the MV and LV networks with final implementation into new designed software instrument.

Current research related to the modeling of DER and Smart grid elements impact to the grid and focuses on DER decision making approach and implementation such as the DER design process, technology integration (ERA NET project SMARTGEN) and interconnection issues.

The focus on the energy management in distribution network via DER and load control in an energy and market perspectives, taking advantage of DERri (*Demand side Management Experimental House (DSM-EH) in RSE*) research facility with practical measurements and technology testing will considerably contribute to the quality and veracity of Lab research results in ongoing and forthcoming tasks. The results and new knowledge from the modeling and simulation are applied for development and evaluation of design methods including phase of decision making and investments planning for grids with active DER.

## C) Main Achievements (Expected/Achieved Results)

1. Principles of the formulation and composition of load priority lists. Estimation of possible impacts caused by seasonal changes in composition.
2. Testing of ability to cover demanded energy load profiles (thermal & electricity- biofuel) of DSM-EH in various energy management strategies by  $\mu$ CHP unit.
3. Assessment of start up time impacts and available power(s) from other power recourses to the formulation of optimal energy strategy (i.e. scheduling & loading of  $\mu$ CHP + storage, PV power availability).
4. Simulation of impact of various electricity market price development scenarios and DSO (utility) signals to the DSM-EH operation including its aggregated behavior (Virtus).
5. Evaluation of complex DSM-EH functionality according to the available optionality, i.e. scenarios in operation, with/without  $\mu$ CHP unit, with/without storage device or combination.

## D) Dissemination of the Results (Planned/Done)

Acquired results and knowledge will be implemented at the Riga Technical University lectures and conferences as well as Theses elaboration where IPE Researchers closely cooperates in students' education processes.

***E) Use of the Resources (Expected/Done)***

Applied methodology and simulation results will be applicable for network management algorithms for the optimal sustainable development of the MV and LV networks into new designed software instrument. Obtained results also will be published in two scientific papers in scientific journals including conference proceedings, according planned exploitation of results.

**Nr. of Users involved:** 4  
**Access Days:** 10 working days  
**Stay Days:** 10 working days