



**INTEGRATED SMART GRID CROSS-FUNCTIONAL SOLUTIONS
FOR OPTIMIZED SYNERGETIC ENERGY DISTRIBUTION,
UTILIZATION STORAGE TECHNOLOGIES**

www.inteGRIDy.eu

Enhancement of the smart grid infrastructure in Romania by implementing the innovative solution EIS (Energy Integrated Information System)

Mihail Tudor, Emil Constantinescu

ELECTRICA SA Romania

Mrs. Otilia Bularca

SIVECO Romania SA

ARTICLE INFORMATION	ABSTRACT
<p>Published 31th December, 2019.</p> <p>Keywords: demand-response, smart grid, algorithms,</p>	<p>Pilot Ploiesti is implemented in relation to the 'InteGRIDy' project's Demand Response pillar. The purpose of implementing the EIS (Energy Integrated Information System) within the Ploiesti Pilot is to ensure a Demand Response (DR) Smart Grid for a residential area, where buildings' energy management and control systems will operate based on critical peak pricing and intelligent DR programs/algorithms.</p>
<p>LEGAL NOTICE</p> <p>© All rights reserved.</p> <p>Copying and distribution is permitted by any means provided that the recognition of its authors is maintained, commercial use of the works is not made and no modification of them is made</p>	

Introduction

The challenge of implementing the Ploiesti Pilot is to deliver an innovative

solution which provides specific functionalities such as monitoring and control of the operation of DR programmes in order to decrease the peak of power consumption, engaging

consumers in DR, testing and validating the concept of a DSO (Distribution System Operator) as user of demand-side flexibility. Moreover, the consumer behaviour has to be analyzed to increase flexibility of energy consumption using specific DR intelligent algorithms with the final goal of providing trade flexibility solutions.

ELECTRICA SA, as a large Romanian DSO, will use the results of Ploiesti Pilot implementation to improve the offered services and to provide innovative energy distribution services packages.

Solution implementation

The Ploiesti Pilot is based on electric energy consumption data for residential users. Particularly for the Romanian Pilot, the energy demand and supply are matched by means of an intelligent solution, the EIS (Energy Integrated Information System), aiming at delivering a direct impact on overall energy consumption. The Ploiesti Pilot is a solution developed from the scratch. The economical objective of the Pilot is to analyse the effect of the proposed automated DR solution, based on smart meters infrastructure, on the energy consumption in targeted/specific areas and the positive outcomes of implementing this type of solutions for the DSO and consumers.

ELECTRICA SA will develop within the Pilot an innovative infrastructure with energy consumers and energy providers whose demand and supply of energy will be monitored. Dedicated smart meters installed on site (smart metering infrastructure) provide data about

consumption (using specific communication lines and software) which are used together with historical data to implement and validate DR algorithms.

The core integration platform of EIS developed by SIVECO will handle several DR profiles, which could then be tested. The resulted web-based solution will provide relevant information about the power demand and evolution of consumption and also easy-to-interpret data visual representations and reports.

Such an implementation could then serve as a main starting point for latter more complex DR profiles, like Demand Side Management (DSM) and bring elements of automated decision-making, based on various profiles or criteria.

Ploiesti Pilot is based on four major data exchange flows:

- Data collection / simulation (Load measurements, Environmental measurements)
- Data analysis (based on facility & user consumption profiles)
- Data processing based on DR programs and algorithms (modelling, optimization, forecasting)
- Outputs: Alerts and notifications.

Conclusions

The Ploiesti Pilot is a complex system developed from the scratch, being the first implementation of this type of DR solution in Romania, offering a good opportunity not only for implementing a such innovative DR solution in the energy domain, but also the opportunity of implementing and validating domain

specific smart algorithms and intelligent domain specific business models.

The EIS (Energy Integrated Information System) solution will provide both consumers and Distribution System Operators the relevant data necessary to identify opportunities for consumption optimization and increased energy efficiency, ensuring the following benefits:

- Optimizing the energy consumption
- Costs reduction, energy savings
- Consumers can track and manage their consumption
- Consumers can make informed decisions

- Empowering the staff of the DSOs, Public Utility companies, electricity suppliers
- Ensuring a better forecast of the energy consumption and energy losses
- Ensuring the process transparency and the clarity of roles and responsibilities (DSO)
- Validating various business models, compliant with the specific of the targeted market.

About **ELECTRICA SA** and **SIVECO**

Electrica (SDFEE Electrica S.A) is a Romanian joint stock company focused on power distribution (DSO) and supply, providing communications infrastructure / information and energy services. In inteGRIDy, Electrica develop san innovative infrastructure with energy consumers and energy providers whose demand and supply of energy is being monitored.

SIVECO (SIVECO Romania S.A) is a private shareholder company located in Bucharest, Romania, that participates in all inteGRIDy stages of the solution development, starting with the analysis of use case requirements, the definition of the conceptual architecture, functional & technical specifications, and is the main technical partner leading the integration of the sub-components, and will also take part in the Back-end Platform demonstration and evaluation activities.

Acknowledgement



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731268.