Newsletter
[Volume 1]

SOCIALENERGY

A Gaming And Social Network Platform for Evolving Energy Markets' Operation and Educating Virtual Energy Communities

Getting Started

Dear readers,

Welcome to the 1st edition of the SOCIALENERGY's newsletter! SOCIALENERGY is an EU Innovation project focusing on the development, validation and demonstration of a gaming and social network platform for educating energy consumers and virtual energy communities towards evolving EU energy markets' operation. Each newsletter will highlight the recent achievements towards communicating the ongoing results to interested stakeholders and the public.

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Motivation

At the retail electricity market side, electric utility companies are gradually following the 'digitization' path towards providing more effective and attractive energy services to their clients. This digitization trend is expected to enhance the active participation of consumers along the energy value chain, thus changing the nature of consumer engagement across the customer life cycle. Thus, digitization should be considered as part of every progressive utility's initiative in order to reduce its OPEX (e.g. educate consumers, encourage self-service or create value with new services) and its CAPEX (e.g. exploit a variety of advanced energy efficiency services and products).

Conclusively, an holistic S/W infrastructure together with a multi-disciplinary business model is required in order to cope with all the afore-mentioned challenges. Therefore, we propose the SOCIALENERGY S/W platform, which consists of several systems and S/W modules from various disciplines such as ICT, energy efficiency, behavioral economics, socio-economic sciences, online social networks, competence based education, serious games and gamification sectors.

Objectives

The project's core objectives span various multi-disciplinary technology assets ranging from ICT and energy to gaming, behavioural economics and education sciences:

- **Objective 1:** Apply and evolve recent incentive technologies (localized social externalities) towards effective use of behavioral economics in energy efficiency and DR.
- **Objective 2:** Develop "SOCIALENERGY virtual world" by transferring gaming technologies into the energy efficiency sector, so as to educate and incentivize utility customers organized in energy communities (ECs) towards understanding and adopting modern demand response (DR) programs, such as price-based demand response (PB-DR).
- **Objective 3:** Develop "SOCIALENERGY real world" by engaging the users via advanced gamification techniques towards self-organization and management of ECs and efficient interaction with SOCIALENERGY's commercial activities.
- **Objective 4:** Provide a single point of hosting and advertisement services to energy consumers, energy communities, utilities and companies related to energy efficiency products and services via the development of context-aware recommendation algorithms.
- **Objective 5:** Perform small scale and diverse experiments that involve: i) real users, ii) electric utilities, iii) companies active in energy efficiency products and services in order to: a) validate the concept of SOCIALENERGY, b) evolve its technologies, c) trigger its adoption from these markets.
- **Objective 6:** Offer Energy Information Distribution as a Service (EIDaaS) to multiple stakeholders and commercialize information related with energy efficiency.

Expected Impacts

User engagement is the most challenging issue, which hinders the large-scale DR market growth and especially at the residential sector, which represents approximately 40% of the overall DR market share. Many DR programs are already in place harvesting considerable benefits in today's liberalized electricity markets, but it is obvious that DR markets will not be boosted, unless users comprehend their role and potential benefits as a result of changing their everyday energy behavior. By exploiting, integrating and advancing technologies such as gaming, gamification and social networking, SOCIALENERGY will fast bridge the gap between successful trials of DR programs and wide user adoption. We believe that the proposed platform is the most promising bottom-up learning and education way, which may lead to widespread user adoption.

SOCIALENERGY will facilitate and deepen the communication between stakeholders as: i) utilities and ESCOs, ii) companies related with manufacturing and marketing of energy efficiency products and services (e.g. electric appliances, building renovation companies, etc.), iii) public authorities (e.g. municipalities, ministries, etc.) that own a lot of buildings (e.g. schools, hospitals, government, etc.), iv) grassroots community organizations active to environmental and energy efficiency issues. In this way, SOCIALENERGY can be seen not only as a platform towards energy efficiency, but also as a tool towards social inclusion and even electronic democracy though interaction, bottom-up learning and education. Finally, as DR and generally liberalized energy markets involve quite complex processes, whose operation aspects and potential gains are difficult to be understood from the majority of the society and especially for "weak" social groups (e.g. low education, elder people, etc.), SOCIALENERGY paves the way towards familiarizing people with good practices on energy efficiency via the exploitation of widespread social networks.

SOCIALENERGY bridges the gap between each emerging progressive electric utility and its customers by providing a Gamified Social Marketing as a Service (GSMaaS) solution that focuses in the easy and deep communication among them towards the widespread adoption from the latter of advanced DR energy programs that the former provides. Moreover, through its intelligent and advanced recommendation and advertisement services, SOCIALENERGY facilitates its ECs to select the utility that best fits to their needs, interests and habits. We can call this process Utility Selection as a Service (USaaS) and we believe that USaaS will highly motivate utilities towards more advanced and personalized EPs. From the customers' perspective, USaaS will act as a "tutor" that will help them to lower their energy bills and live in a more environmental friendly way.

SOCIALENERGY architecture overview

The figure below presents a high-level architecture design of SOCIALENERGY system, which comprises of six S/W components (subsystems), namely: 1) **Meter Data Management System (MDMS)**, 2) the **core GSRN S/W platform** or else SOCIALENERGY's real world, 3) **Energy Efficiency GAME** or else SOCIALENERGY's virtual world, 4) **Research Algorithms' Toolkit (RAT)**, 5) **Learning Content Management System (LCMS)**, 6) **Energy Information Distribution as a Service (EIDaaS)** or else virtual marketplace.

In **MDMS**, all energy consumption related data is collected. MDMS actually serves as SOCIALENERGY's database, where all energy-related data models are also available (e.g. electric appliance consumption models).

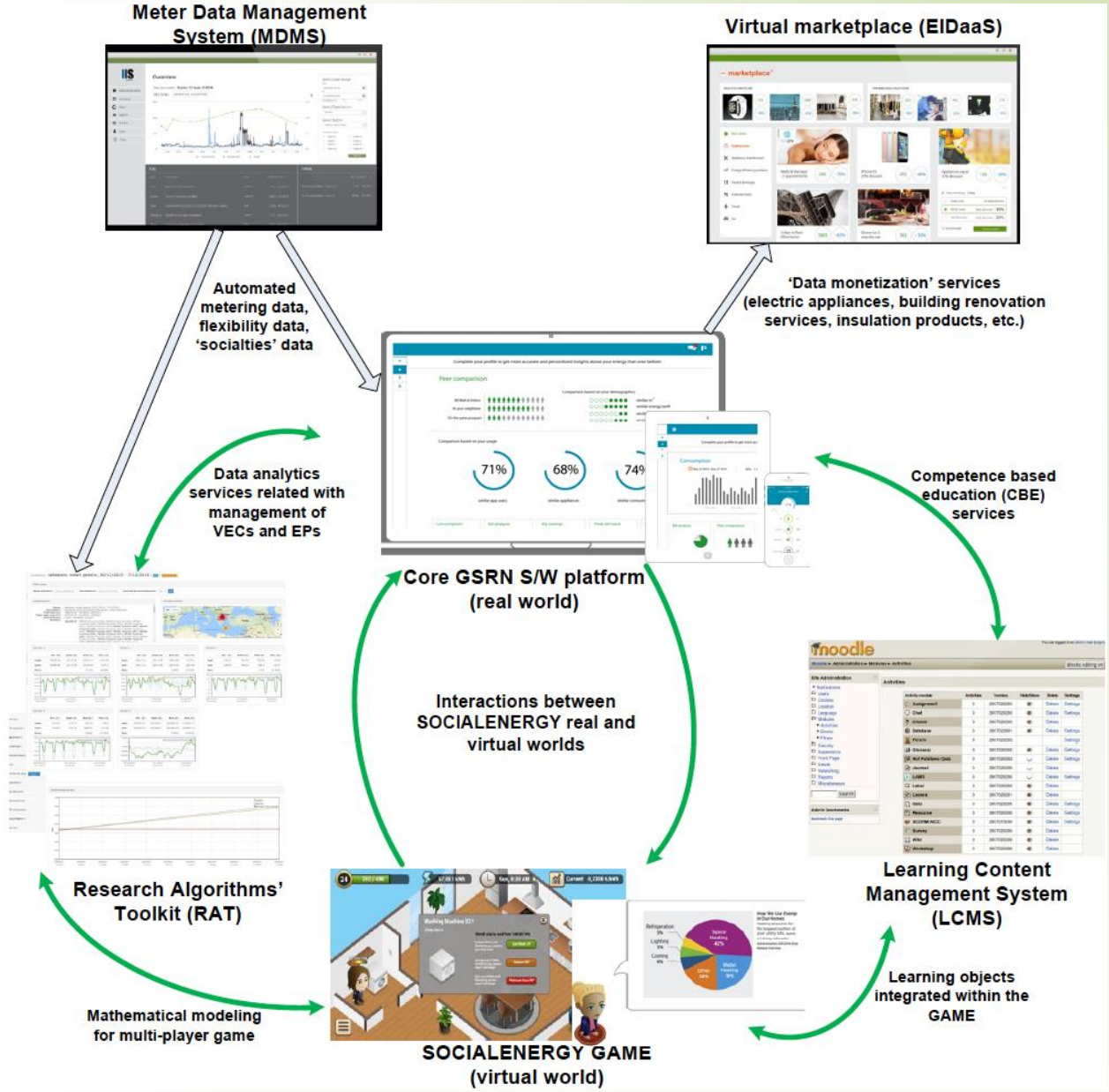
The **GSRN** is the core S/W platform of the SOCIALENERGY system, in which all types of SOCIALENERGY users (e.g. individual consumers, VEC leaders/managers, electric utility/retailer user, ESCO user, etc.) are able to log in and visualize/experience many innovative functionalities. GSRN has technical interfaces with all other five (5) subsystems integrating several multi-disciplinary functionalities ranging from the scientific/research sector (cf. RAT) to the gaming/gamification sector (cf. GAME) and the educational sector (cf. LCMS).

The **SOCIALENERGY GAME** will be played by the user in a range of platforms starting from a basic web-based implementation and possibly being extended to a mobile application, too. After the SOCIALENERGY user (i.e. individual consumer) is logged in the GSRN, s/he uses the same credentials to download the game and start the gameplay. The GAME is an applied game on energy efficiency, combining characteristics by both serious games and classic entertainment industries. The player creates/enters a virtual world (i.e. virtual house) with all electric appliances and tries to maximize the energy efficiency KPIs by striking to find an optimal trade-off between the energy cost and the discomfort incurred through the load shedding and shifting. Via the gameplay, the user is seamlessly educated in best practices about energy efficiency and this is done in an enjoying manner.

The **RAT** subsystem is very important for SOCIALENERGY's operation because it provides all the intelligence that is required towards making SOCIALENERGY S/W platform competitive enough and commercially successful in a sustainable manner. It provides all the EPs' modeling and "data analytics" services mainly to GSRN and to the GAME (by integrating the sophisticated mathematical modeling in the energy pricing and game score calculations). Various research algorithms are executed regarding: i) the dynamic pricing models that are adopted in the various innovative EPs and ii) the VECs' creation and dynamic adaptation algorithms (required for the online management of VECs).

LCMS is the subsystem, where the user/player educates himself both online (e.g. via the gameplay or by taking various learning courses) and offline (e.g. by consuming CBE-based material) to consolidate the new knowledge about good practices on energy efficiency. LCMS interacts with GSRN. Thus, the latter can provide recommendation services to the user according to the educational content that is mostly keen on watching next based on user's current educational profile and actions in SOCIALENERGY's real and virtual worlds. The role of the LCMS is important, because it provides to the user the opportunity to better comprehend the new concepts in the liberalized smart grid markets and inter-relate the "lessons learned" from the GAME with the real-life conditions.

SOCIALENERGY Architecture



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