

NEW SERVICE IDEAS FOR SMART ENERGY SYSTEMS

HANKEN School of Economics
Department of Marketing
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FORWORDS

This report is a result of the SESP (Smart Energy Systems Research Platform) project, funded by Regional council of Ostrobothnia, municipalities, University of Vaasa and HANKEN School of Economics.

The overall aim of the two-year SESP project (2017-2019) is to build up the new energy system research platform. The platform consists of physical laboratory environment for electricity distribution monitoring, protection, control and simulation, a Big Data collection and management system and business concepts that are based on the developed platform.

The SESP project consists of 9 work packages. Work package 8 is about *New Service Concepts and Business Models* and contributes to the smart energy systems research platform, and Vaasa's Smart Grid solutions by developing a *system for new service development and a framework for understanding, analyzing and developing new business models*.

WP 8 has listed five deliverables of which this report met up to the fourth one, *to present a number of new service concepts for the smart-grid energy system (D8.4)*.

This report is based on the discussion and findings presented at the "Open Innovation Station Hanken" workshop hosted by Hanken Executive Education, where faculty, students and business met for crafting new business, product and service ideas.

In this type of open innovation labs ideas for new businesses go in all directions. For this report ideas of relevance for smart energy grids are selected, presented and discussed.

Peter Björk
Work package 8 leader

HANKEN OPEN INNOVATION STATION - Ideas for smart micro grids

Open innovations and ideas for EaaS and TaaS

Open innovations have been described as a distributed innovation system, actor inclusion and free flow of information. The logic of open innovations is based on a paradigm of creative actors willing to share their ideas and thoughts in collaborative networks, with an embedded understanding that “together we perform better” (crowd sourcing). Out of a company perspective, open innovations can be seen as a platform for sourcing, absorbing ideas externally to be further developed internally by the companies.

In an approach to gear the innovation processes in Vasa, Hanken arranged in January 31, 2018 an open innovation happening called “Hanken open innovation station” with students, faculty and business representatives (appendix). The aim was to work on idea generation for further development and to pitch for new business opportunities. The innovation station was lead by the director for Hanken executive education in Vaasa André Österholm, associate professor Annika Ravald, Department of Marketing, Nina Ingves, Director of Hanken Business Lab, and the invited facilitator Terje Andersson from Sweden (attachment).

In Hanken open innovation station, 82 ideas were discussed in six groups. Based on a detailed analysis of the ideas, 25 can be linked to smart and micro grids structures in support of the SESP project. However, some of the ideas are overlapping. This paper will focus on the selected 25 ideas with an elaboration on how they could be put in practice after some further development and polishing (Table 1).

The 25 ideas linked to smart micro grids can be categorized into two dimensions; Smart houses and Smart living. Smart houses are high technology energy efficient houses, where communication is seamless and instant. Monitoring, information sharing, management and control systems function in a wireless environment. Robotics has become a home service for, for example, laundry washing and ironing, room service, and car washing. The refrigerator communicates with the grocery store and the recipe book, and based on the preferences of the family presents suggestion for the daily meal. The smart house automatically switches between three different grids, the house grid, the micro grid and the grid operated by Utilities depending on energy need and market prices. Energy on a house level can be produced by the means of renewable energy sources such as sun, wind, geothermal and garbage. Even a home gym can produce some electricity for immediate use, for sale or to be stored in batteries.

Smart living positions the house and the family in a context, within an area of daily use, including transportation to and back to work, and for other transportation means. In this, for private transportation, different type of tracking systems can be found, one for identifying where available cars and free bicycles are located, another for finding the best route to work and shops, for example. Interesting to notice is the potentials identified in drones for transportation, not necessarily people, but goods.

Table 1. Innovations for smart micro grids

IDEA	Specification	Category
Team 1		
Wireless charging stations	Charging via WiFi technology	Smart home
Smart cars	Identify traffic jams, smart routes	Smart living
Water recycling	Water cleaning in home/ micro systems	Smart home
Control of kitchen ware	Smart kitchen	Smart home
Team 2		
Bicycles free of charge	QR-code tracking	Smart living
A ride sharing app	"Local Uber" logic	Smart living
Gym machines as energy producers	Distributed energy sources	Smart home
Team 3		
Home robotics	Home services	Smart home
Green/efficient transportation/ app	Goods transportation / shared transp.	Smart living
Washing/ ironing service	Home services	Smart home
Free internet globally	Information / measures / control	Smart home
Home heating monitoring	Sell surplus energy	Smart home
Team 4		
Parcel transportation	Using Drones / "Uber style"	Smart living
Heated roads / pavements	Using solar power	Smart living
Monitoring energy consumption	On individual level	Smart home
Team 5		
Energy from garbage	Composting	Smart home
Sharing economy	Sharing of energy supply/costs	Smart living
Package sending	Using drones	Smart living
Household waste management	Information /techniques / tools	Smart home
Car cleaning robots	Energy efficient robot	Smart home
Smart homes	IoT based monitoring and management	Smart home
Car pools	Share economy	Smart living
Team 6		
Smart refrigerator / grocery delivery	Information & communication systems	Smart home
IoT and smart houses	Information & management systems	Smart home
Grocery delivery / smart food trucks	Information & communication systems	Smart living

The ideas presented, and the two categories of service domains identified do not reflect on the users - end user and their smartness (Table 1). Implicitly it is assumed that people are willing to change and adopt the new solutions. From previous research it is known that people are of different type when it comes to adaptation of technologies, some are eager to test new services (innovators), and some are more resistant.

For business, and the two domains identified, four interlinked areas of development can be portrayed, summed up in two business platforms; Energy-as-a-Service, and Transportation-as-a-Service (Table 2).

Table 2. Energy efficiency, communication and smart homes and smart living

	Smart home	Smart living
Energy efficiency	Based on the IoT, home appliances, sensors and services energy efficiency can be improved by automatic and/or manual monitoring and control	Sharing economy including coordinated, joint, and more environmental friendly transportation add to energy efficient smart living
Communication	Smart home systems are based on IoT connection management platforms for cable and wireless real time communication	Systems and apps for assembling and communicating real time information
Business platforms	Energy-as-a-Service	Transportation-as-a-Service

A Smart home denotes a house or an apartment, and in case of a house also the adjoining garden, places where “smart home systems and devices operate together, share consumer usage data among themselves and automatically take actions based on the homeowners’ preferences”. Smart living involves improved standard in several aspects of life, whilst striving for efficiency, economy and reduction of the carbon footprint. Smart home is one dimension of smart living to which transportation, flow of people and goods from the domicile of the home to “outside” places, comes naturally.

Smart house and smart living are only two dimensions of a broader context, as for example a smart city (Figure 1).

Figure 1. Smart living in a smart city

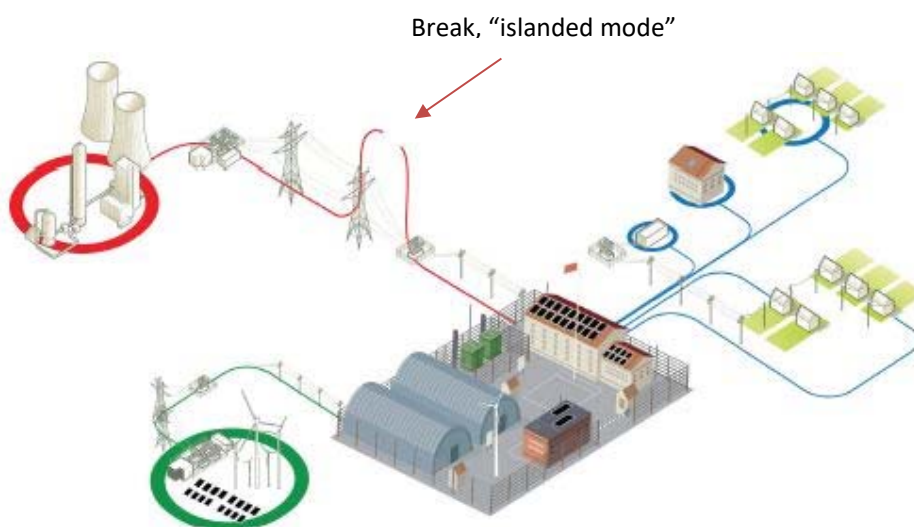


<https://smartcitiesworld.net/news/news/smart-cities-services-worth-225bn-by-2026-1618>

Energy-as-a-Service (EaaS) platform

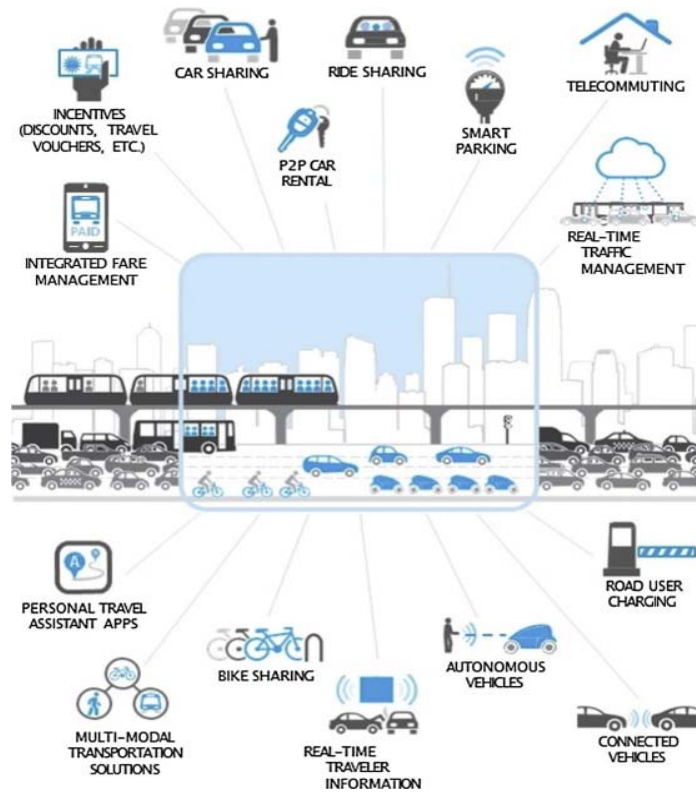
Micro grids are self-contained electrical generation and distributions grids that can be connected to the national electric grid or disconnected to the “island mode” (Figure 2). Micro grids are local, emerging, and small in scale electric power systems programmed for sustainability.

Figure 2. Micro grid



<https://www.engineering.com/ElectronicsDesign/ElectronicsDesignArticles/ArticleID/6112/The-Perfect-Power-Microgrid-at-IIT.aspx>

Figure 4. Smart transportation



The interest in TaaS, for both people and goods, has been uplifted by improvements in the integration of multiple mode of transportation into seamless trip chains with the help of advanced travel planning, booking and payment systems. Car-, bike-, and ride-sharing are popping up and self-driving electric cars are in the test phase. Drones for transportation of packages and parcels, and for home delivery are also being tested. Multirotor, for example, a German company offers multicopter drones and flight planning software for commercial and professional use.

Appendix. Open innovation station Hanken

Program for the Workshop



WORKSHOP-PROGRAM

OPEN INNOVATION STATION HANKEN

Time: 30.1.2018 kl. 12:30–16.00

Place: Hanken Svenska handelshögskolan, Biblioteksgatan 16, Vasa

12:30-13:45	<p>Introduction to Innovation</p> <ul style="list-style-type: none"> - What is Innovation and what kind of Innovations are there? - Why does some companies succeed and others don't? <p>Idea Management Process</p> <ul style="list-style-type: none"> - Idea Generation with creative methods
13:45-14:00	Coffee
14:00-16:00	<p>Workshop on Development of high tech products, services and concepts with the help of "16 windows of opportunity" and the "5-3-6" -model</p> <ul style="list-style-type: none"> - Focus on different business and society trends and new promising technologies and business models

This open innovation workshop is a co-operation between the Department of Marketing at Hanken, Hanken Business lab and Hanken Executive Education

Up to 10 company representatives are invited to take part in the workshop with students from Hanken Business Lab and the Department of Marketing.

Open Innovation in this context means that every Business Idea, Product or Service Idea presented in the workshop can be used by everyone taking part in the workshop.

WELCOME TO AN AFTERNOON OF PROFESSIONAL DEVELOPMENT AND IDEA CREATION !

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Companies and organisations involved in the “Open innovation station”

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OPEN INNOVATION STATION HANKEN 30.1.2018

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Dahl Johanna	Specialplanerare	Österbottens förbund	Vasa
Hamidi Mahdi	Project Researcher	Vaasan yliopisto	Vasa
Jansson Kristoffer	Teknologi	UpCode Ltd	Vasa
Pått Magnus	VD	Pool Digital Ab	Närpes
Rönnlund Kaj	Ägare	There Corporation Oy	Vasa
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