GREEN E-VALUE: SMART METERING AT THE SERVICE OF ENERGY EFFICIENCY

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ABSTRACT

For the first time ever, a Smart Metering project has been initiated and advocated by a customer. Swiss real estate assets owners would like to have an energy dashboard at the entrance of all their buildings which proposes educational and interactive tools helping their tenants to decrease their energy consumptions.
As we know, smart meters are to be deployed in Switzerland for the next 10 years. Furthermore, we have decided to develop a multi energy sources Smart Metering pilot in Lausanne, linked to 3 web products (resident, screen building and building). With this kind of solution we can create services for every participant in the chain (grid operator, suppliers, resident and real estate assets owners) to optimize the business case of the whole infrastructure.
The solution is up and running since February 2011, the first results in terms of energy efficiency will be released in 8 months.

INTRODUCTION

In September 2011, the public services of Lausanne will launch a multi-energy (electric, water, gaz and heat) and interoperable Smart Metering pilot project integrated with an energy consumption follow-up solution.

A English video (3 min) introduces the project: http://www.neo-technologies.ch/index.php/fr/metering/green-value.html

This project deployed on 7 buildings will be lead by four partners. These are the Services Industriels de Lausanne as a multi-energy grid operator. The company Signaterre as an energy audit specialist. The company Realstone as a building owner responsible for listing relevant indicators and alarms. The IT- Expert, neo technologies, who is specialised in the utilities sector, functioning here as the smart metering platform integrator and project coordinator within the framework of Green E-value.

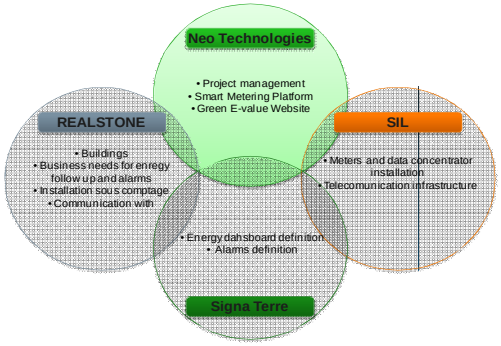


Figure 1: Green E-value partners

OBJECTIVES

With this project we intend to respond to 3 kinds of business needs. One is to allow the Grid operator to run remote network operations and receive alarm detections. The second is to enable the building owner to have a tool to track energy consumption and manage alarm settings for his properties. The third is to supply the residents with a tool to follow their energy consumption and make their invoices more understandable to them

GREEN E-VALUE

We defined a number of technical specifications to propose a general and harmonized solution for grid operators (700 in Switzerland) as well as a simple solution to set up for the distributors. It also covers the dematerialization service needs of grid operators and allows the creation of new products. Furthermore it follows the recommendations of the Swiss Electricity Association (interoperability, direct and indirect feedback to the consumer) and manages all kind of energy sources: electricity, water, gas and heat.

Technical infrastructure

The described solution will consist of 5 types of components, which are the meters, the data concentrator, the telecommunication, the Saturne platform and the IT application “Green E-value products and ERP – SAP”.

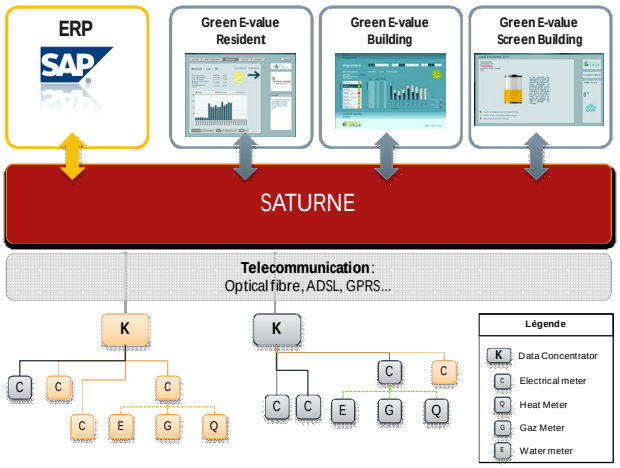


Figure 2: technical infrastructure

Meters and Data Concentrator

For the pilot project we intend to use 2 interoperable metering suppliers: Itron and Landis+Gyr with "pre"-IDIS protocol.

The electrical meter is the master unit for heat, water and gas. It is accessed by M-bus protocol and is linked to the data concentrator by PLC.

The Data Concentrator is connected by Ethernet to the Saturne system.

Saturne

Saturne is a smart metering application developed by the company Asais. It is an interoperable, multi energy and distributor platform.

It offers various services such as meter reading in 2 hourly intervals (15 min load profiles), disconnection/reconnection, tariff modification, intensity power control, automatic meter detection, automatic data concentrator detection, M Bus Customizing, alarms for meter communication lost, fraud and upgrading meter firmware.

Green E-value products

The 3 kind of products we developed (Green E-value Resident, Green E-value Screen Building, Green E-value Building) use the previously described infrastructure.

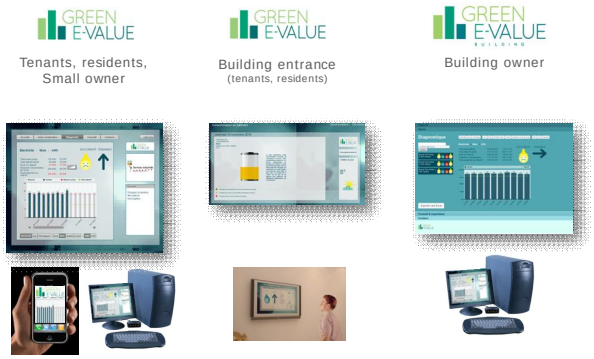
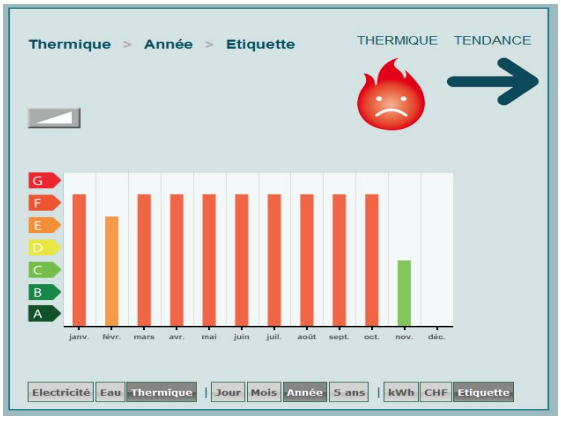


Figure 4: Green E-value products

It is also important to know that all energy efficiency indicators are certified (CEB, Display...).

Green E-value Resident

This product is meant for appartement tenants, house tenants or owners and displays energy consumption on an hourly basis.
Each resident can define his own characteristics and objectives of energy consumption.
Furthermore he can track his consumption on different energy types in Swiss Francs, kWh or energy labels.



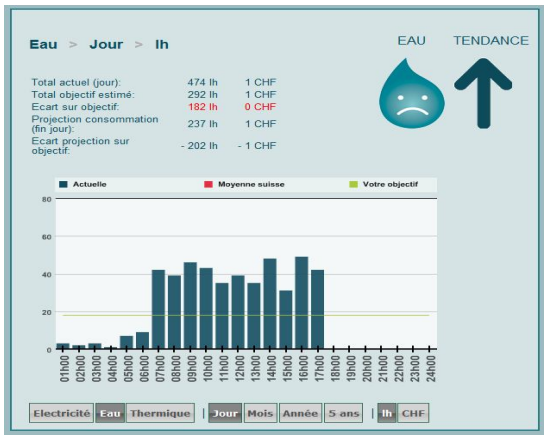


Figure 5: Screen shot of Green e-value Resident

A forecast allows him to estimate the consumption at the end of a period, a day, a month or a year.
The application also advises residents on how to improve consumption behaviour and show usage trends.

Green E-value Screen Building
This product displays energy indicators for a building and is intended for tenants or owners.

Figure 6: Screen shot of Green E-value Screen Building

The aim is to inform all people who live in the building about the total consumption of that building.

Green E-value Building
This product is intended for building owners who would like to track energy consumption for their property.

Figure 7: Screen shot of Green E-value Building

The owner can define his own objectives (percent reduction in comparison of the previous year) for each building and can activate different alarms in order to be informed of, for example, an abnormal consumption (heat, water, electrical). Another alarm informs about important consumption of heating while external temperature increases. The overrun of energy efficiency indicator thresholds can also be reported.

All indicators available for residents are also available for owners and in addition they can receive thermal signature readings.

Future outlook ?

Current version of Green E-value is just able to inform customers about their consumption (follow up, alarms). In the future we plan to improve these products in different areas in order to increase interactivity with the customer, add functionality of home automation, add a real time application (laptop, Smartphone iPhone) by using output signals directly from the meters and develop smart grid functionalities.

CONCLUSION

This project and its success were possible by the joint work of 4 companies with complementary fields of expertise. The technological (interoperability, multi-energy) and strategic choices make possible an expansion to other grid operators. Moreover all webproducts will become more and more interactive and intuitive to achieve maximum energy efficiency.