

## EMPOWERING RESULTS



Empowering customers to save energy by informative billing

**Practical report on project results**



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Report developed by CIMNE - BEE Group on behalf of the project EMPOWERING with support from the Intelligent Energy Europe programme of the European Union.

# Presentation

The scope of the project was to achieve tangible results, including demonstration of measurable energy savings and customer satisfaction. In addition, a strategic objective was delivering open source software tools, guidelines, experience sharing and dissemination of information in order to convert the advanced billing information services into mainstream practices for European utilities by the year 2020.



**Jordi Cipriano**

PhD in Engineering and  
ICT and Director of  
CIMNE-BEE Group

*“Empowering was a very successful project where 4 European energy utility companies, with the support of an international consortium, were able to roll out a set of user feedback services to a large group of customers.*

*It was a real application of big data analytics and intelligent solutions to change the way people understand and manage their energy consumption”*

# Energy savings

The energy savings achieved within the Empowering project were evaluated using the Difference-in-Difference methodology which compares the performance of an experimental and control group of customers in each pilot.

The analysis covered a period of two years, from November 2013 to December 2015. The services started operating as pilot projects after October 2014, using the previous period as a baseline for evaluation.

The services in France and in Austria were offered through an online tool.

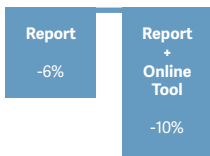
In Italy, a periodic home energy report was sent by email. In Spain, both online tool and paper report were offered, evaluating separately the effect on the users of receiving the different treatments.

In France, the availability of additional data allowed for separate evaluation per groups of customers with similar electricity end-uses: only for appliances, or also for heating and hot water.

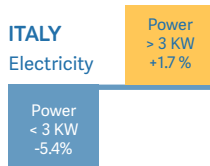
In Italy the evaluation was done over two groups of customers with different contracted power.

## Energy savings achieved in each pilot site

### SPAIN Electricity



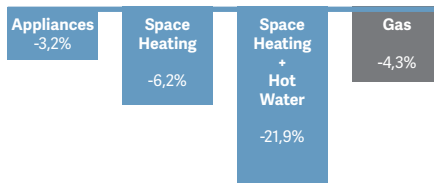
### ITALY Electricity



### AUSTRIA Electricity



### FRANCE Electricity



Higher level of electricity savings were achieved by:

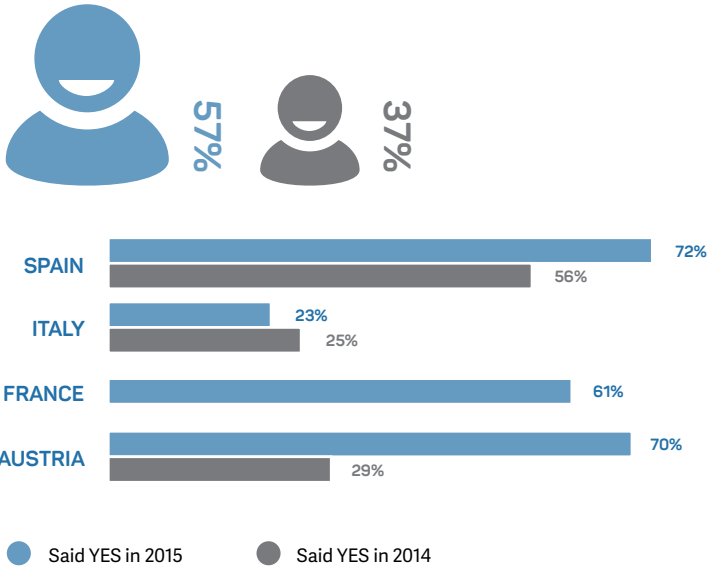
- ⊙ Customers from the high consumption segments
- ⊙ Customers using electricity for heating and hot water
- ⊙ Customers receiving energy report and accessing online tool

# Customer satisfaction

In 542 surveys collected in the four pilots, the customers were asked to evaluate their satisfaction with the billing information received from their energy provider.

The answers were collected from the users before and after the start of the services, in 2014 and 2015 respectively. The results show global satisfaction improvement due to Empowering.

## 'Are you satisfied with the billing information you receive?'



*The evaluation surveys demonstrated that customer satisfaction from the information received after the Empowering project increased by 20% on the average.*

## Perceived quality of the Empowering services

The specific aspects of the services scored by the users on a scale 0-10



7,3

**Presence of additional information on energy consumption**

**20% improvement**  
Versus 2014



7,2

**Provision of help and suggestions on how to save energy**

**29% improvement**  
Versus 2014



6,7

**Provision of handy tools to understand the energy consumption**

**25% improvement**  
Versus 2014



7,2

**Information available at any time**

**17% improvement**  
Versus 2014

# Customer preferences

Customers' preferences were analysed during the first phase of the project, from August 2013 to May 2014.

The analysis consisted in local surveys based on precursor services asking the customers to rank their preferences about the information they would like to receive in addition to their bills. The options included different type of comparatives, tips and predictions. The study was complemented with 2 Focus Groups organised in Italy and in France.

The study, based on results from 964 respondents, provided valuable information to the utilities for the development of service features which were of most interest to the customers in each pilot.

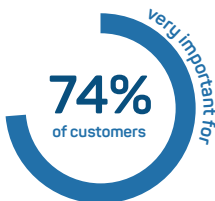
Amongst the variety of services, the customers ranked as most useful the reception of personalised tips suggesting energy saving actions, followed by comparisons with the consumption from previous periods and with that of similar households.



*Customer preferences for information were gathered from 964 utility customers in Austria, France, Italy, Spain and Denmark.*

## What is the most valuable information for the customers?

PERSONALISED  
ENERGY SAVING TIPS



COMPARISONS WITH  
PREVIOUS PERIODS



SIMILAR HOUSEHOLDS  
COMPARISONS



# External experts feedback

Since the project beginning Empowering set up an Advisory Board of utility experts, energy associations and governmental institutions so that it could provide an external point of view over the development of the services. The experts participated in meetings and interviews at different stages of the project.

The Advisory Board experts provided practical guidance and state-of-the-art information about the billing services actually offered by utilities.

The following ideas for the Empowering design are their key contribution:

- With billing information sometimes “more” is “less”.
- To save energy, customers need actionable advice for specific moments.
- Customers are not always motivated only by saving money, ecological reasons and social norms are sometimes more important.

*“Users are not always aware of how to save energy. They need education and actionable advice.”*

External experts participated also in 2 Focus Groups which provided additional insight into the mechanisms of visual perception of the information and suggested service design hints.

The experts stressed the importance of: i) the coherence between service information and billing; ii) the use of multiple communication channels to reach customers; and iii) the necessity for the services to match the users’ educational level.



## What do the experts think?

When the Empowering service design was completed, 53 energy experts and utility representatives were asked for their opinion. See what they think about the Empowering services.



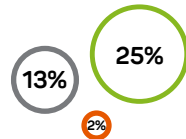
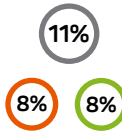
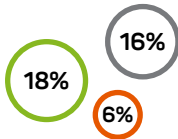
“Thanks to the service customers will understand how to save energy”



“The service meets the information and awareness needs of customers”



“The service improves the image of the quality ”



Agree
  Strongly Agree
  No opinion
  Disagree



# The Empowering set of services

Empowering developed a comprehensive set of 42 service modules offering additional billing information for the consumers of electricity, gas and thermal energy.

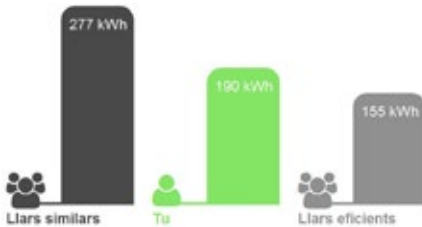
- The services are mainly based on metering data, but can use also weather data, location and customer-provided data, and allow high level of personalisation.



The refrigerator is the appliance that consumes the most at home, set the thermostat at 5°C. A difference of 1° can save 32€ per year

*Example of energy saving tip*

- The comparisons with similar households enable customers to easily understand whether their consumption is low or high.



*Example of comparison with similar households*

- Benchmarking makes it possible to rank energy performance in a way similar to that of the efficiency of home appliances.

Tens associada una classe energètica:



Els teus hàbits de consum són molt eficients

*Example of benchmarking*



*Online platforms offered by the utilities of Empowering*

# The software platform

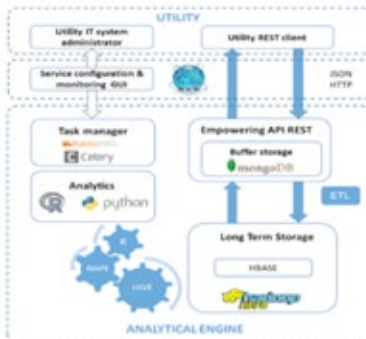
The EMPOWERING ICT system architecture has been implemented as a central engine providing analytic services to multiple utilities by exchanging data with them through a standard Application Programming Interface (API). The Analytical Engine is an open source solution based on the Apache Hadoop's "ecosystem" of tools. The end-user interfaces (informative billing reports generators, online tools) are integrated in the utility IT systems and existing web portals.

This approach has been considered to have several advantages: First, the analytical part is concentrated in one place, avoiding high

implementation and maintenance costs. Second, the Analytical Engine is easily interconnected with the utilities through a standard API with minimum effort on their side. Third, the integration of the end-user interfaces within the utility shows a unique presentation style for the services, reinforcing the corporate image to the customer, facilitating also the integration with customer services.



*"The Empowering software is open source and available for free through EUPL v1.3 license."*



- Big Data architecture
- Modular & configurable
- Secure data exchange
- Privacy by design
- Outstanding analytic capabilities
- 100% open source solution

# Communication and dissemination

Within the Empowering project, extensive communication and dissemination activities for promoting the ideas, concepts and results of the project were performed.

The activities had two main objectives:

- Distribute the results to external organisations aiming to promote a wider use of the Empowering services at local, national and international level.
- Engage the customers with the services offered by the utilities in the project.

Energy utility companies were the principal target audience of the external communication. Encouraging them to implement the Empowering services was the main objective.

Energy associations, consumer organisations and public institutions were the other selected target groups, all with the capacity for major societal impact. The main objective targeted was raising their awareness about the benefits of improved billing information.

## Activities:

- 10 workshops or round tables
- 8 international utility events
- 20+ international conferences
- 10+ conference papers
- 6 poster exhibitions
- 5 newsletters
- 5 press releases
- 4 promotional videos
- Winner of the SMAU Smart City Award 2014



## DURING THE PROJECT LIFETIME



WordPress / 9.500 visitors  
[www.iee-empowering.eu](http://www.iee-empowering.eu)



Twitter / 112 followers  
[@empowering\\_IEE](https://twitter.com/empowering_IEE)



# Utility engagement

The workshops and events organised for the benefit of Empowering partners made it possible to create numerous contacts with energy utilities. In more than 50 follow-up meetings, the Empowering solution was presented personally to utility executives.

This activity bore fruits in the form of 2 utilities external to the project signing a collaboration agreement and adopting the services within the project timeline: Som Energia and Factor Energia.

At present, another five European and one Latin American utilities have access to the Analytics Engine and are currently testing the services and considering their contracting options.

Som Energia is a Spanish energy retail cooperative with rapidly increasing market share and about 25,000 customers. Its main activities are production and retail of energy from renewable sources. They are committed to promote a change in the current energy model based on transparency, fair costs and renewable energy sources.

Factor Energia is an energy retailer operating in Spain since 1999 with more than 50,000 customers. It is a dynamic company aiming to provide quality services to its customers with maximum transparency. It is highly dedicated to helping the users manage their electricity consumption and save electricity at home.



*Som Energia participated in Empowering initially as an Advisory Board member. In 2014, after analysing different solutions, they adopted the Empowering services, choosing them as the best option on the market.*



*Factor Energia joined early in 2015 by signing a collaboration agreement with the project. They integrated the Empowering services in their Smart Home engagement program.*

The infographic is divided into two main sections. The left section, titled 'SMART HOME - SMART PEOPLE', features a central icon of a house with a family silhouette. To the left of the icon, it lists: 'Potencia contratada: 4.4 kW', 'Consumo: 3.000 kWh/año', and 'Coste: 708 €/año'. To the right of the icon, it lists: 'Potencia del sistema: 211 €/año' and 'Reducción de factura: -30%'. Below the icon, it says 'FACTOR SMARTHOME' and 'el lugar donde empieza el ahorro'. The right section is a solid blue box with the text 'FACTOR SMART HOME' in white, where 'SMART' is inside a yellow speech bubble.



# empowering

energy counts

[www.iee-empowering.eu](http://www.iee-empowering.eu)

## Coordination and technological development



## Utilities

LINZ AG



## Technological partners



## Social agents



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