

**Almada Workshop, Portugal  
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# Monitoring systems and smart meters (in Europe)

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# 1. Smart meter rollout

Some  
big  
data

**510** million  
Europeans

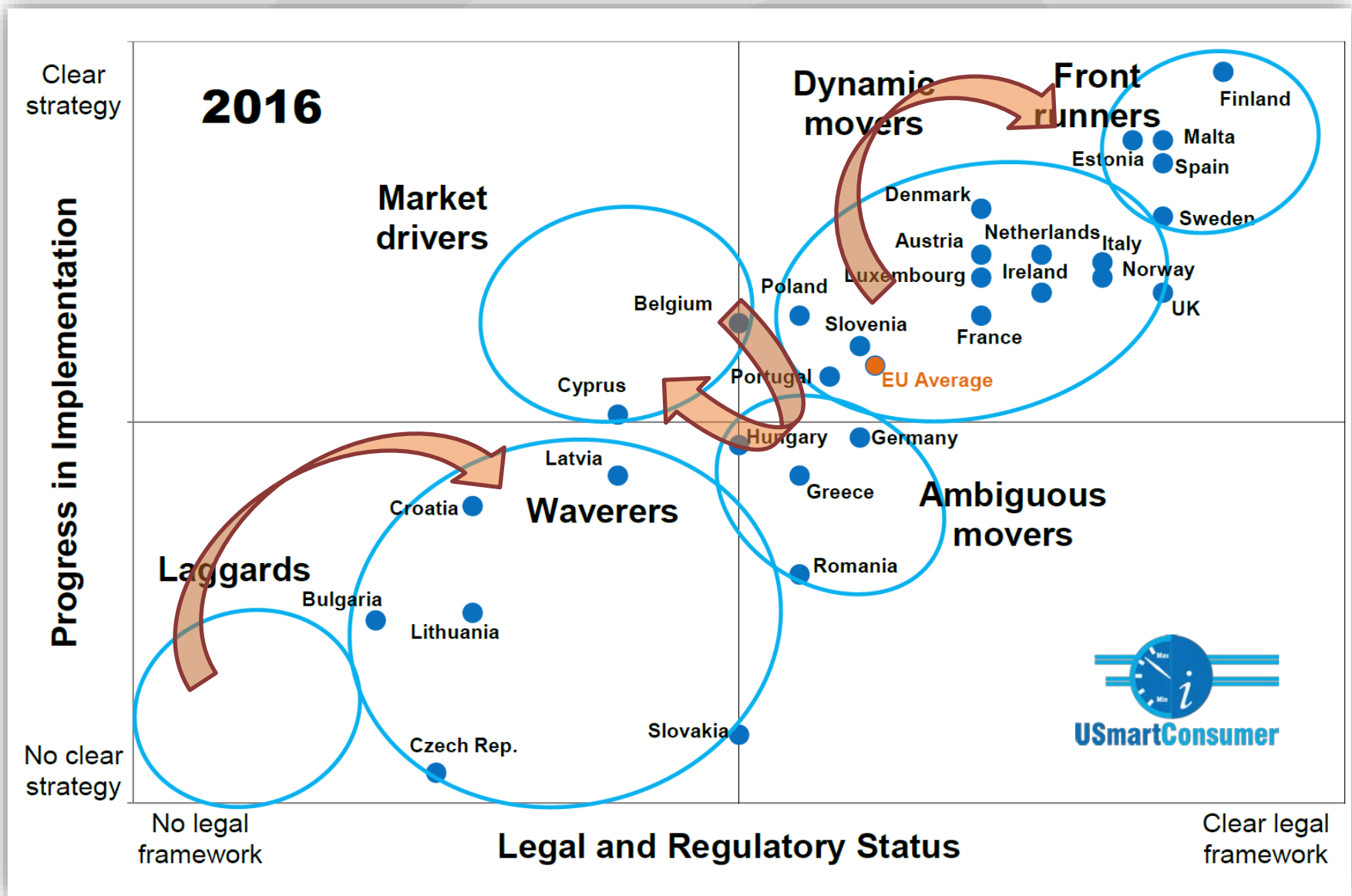
**300** million  
electricity  
customers

**200** million  
SM in 2020 -  
**2023**

**80** million  
SM in 2016  
(**100** SM in  
**2018?**)

**45.000 million** Euro in smart  
metering infrastructures

# The European Map



# The European legal framework

## Energy Efficiency Directive Art. 9-10-11-12

### The Energy Efficiency Directive 2012 (and Guidance note 2013)

The Energy Efficiency Directive (the "EED") was published in the Official Journal on 14 November 2012, and entered into force on 4 December 2012. Member States will have to transpose it by 5 June 2014, with exceptions. The EED puts forward legally binding measures to step up Member States' efforts to use energy more efficiently at all stages of the energy chain – from the transformation of energy and its distribution to its final consumption. Related to metering and billing information, Articles 9-11 provide the rules on what devices, invoices and information should be provided to end-users.

*Article 9 requires that final customers for electricity, natural gas, district heating, district cooling and hot water should have a competitively priced individual meter that accurately reflects their energy consumption and provides information on the time of their energy use (with exceptions based on technical and financial grounds). This is mandatory for connections in a new building and in major renovations.*

The provisions of the EED on metering and billing information take over and make more effective some of the provisions of the earlier Directive 2006/32/EC on energy end-use



# The European legal framework

## The Third Energy Package (Directives: 2009/72/EC and 2009/73/EC)

### The Third Energy Package (Directives: 2009/72/EC and 2009/73/EC)

*Member States are required to ensure the implementation of smart metering under EU energy market legislation in the Third Energy Package. This implementation may be subject to a long-term cost-benefit analysis (CBA). In cases where the CBA is positive, there is a roll-out target of at least 80% market penetration for electricity by 2020.*

The Directives on the Internal Market for Electricity and Gas (Directives 2009/72/EC and 2009/73/EC) require Member States to ensure the implementation of intelligent metering systems to assist the active participation of consumers in the electricity and gas supply markets.

As regards electricity, where an economic assessment of the long-term costs and benefits has been made, at least 80% of those consumers who have been assessed positively have to be equipped with intelligent metering systems for electricity by 2020. Where no economic assessment of the long-term costs and benefits is made, at least 80 % of all consumers have to be equipped with intelligent metering systems by 2020 (Annex I(2) of the Electricity Directive).

As regards natural gas, no deadline is given but the preparation of a timetable is required,

# Smart metering services to end-users

## Frequent information to consumer and feedback

Awareness, continuous improvement, analytics



### Mi consumo - diario

La gráfica representa el consumo registrado en su suministro cada hora del día. Puede conocer el detalle de cada valor horario pulsando sobre cualquier punto de la gráfica o visualizar la gráfica de cualquier otro día pulsando en las flechas o en el icono del calendario.



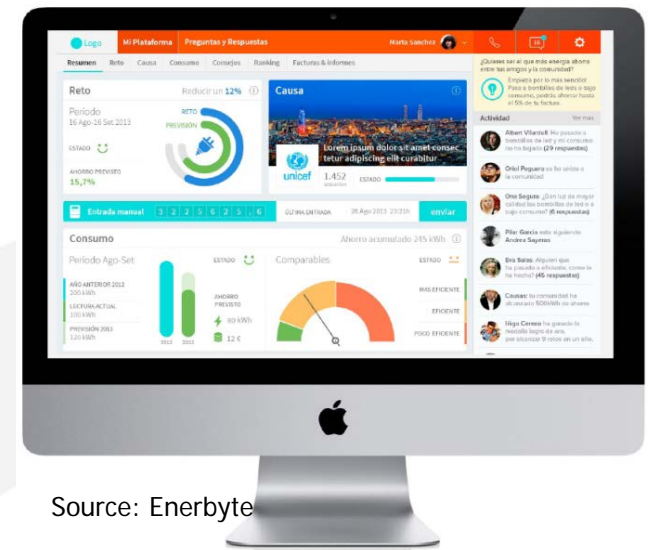
#### Consumo

Le mostramos su consumo comparado con el de otros usuarios con fines al agua. Si la aguja está en la zona verde significa que consume menos de la media, si está en la zona amarilla que consume más de la media y si está en la zona roja que consume más del doble de la media.



#### CO<sub>2</sub>

Le mostramos la generación equivalente de dióxido de carbono que origina su consumo comparado con el de otros contratos similares al suyo. Si la aguja está en la zona verde significa que genera menos de la media, si está en la zona amarilla que genera más de la media y si está en la zona roja que genera más del doble de la media.



# Smart metering services to consumers

## Real time information to consumer and feedback

Watch and react immediately



Smile P1 – Plugwise



Enellogic P1 – Enellogic

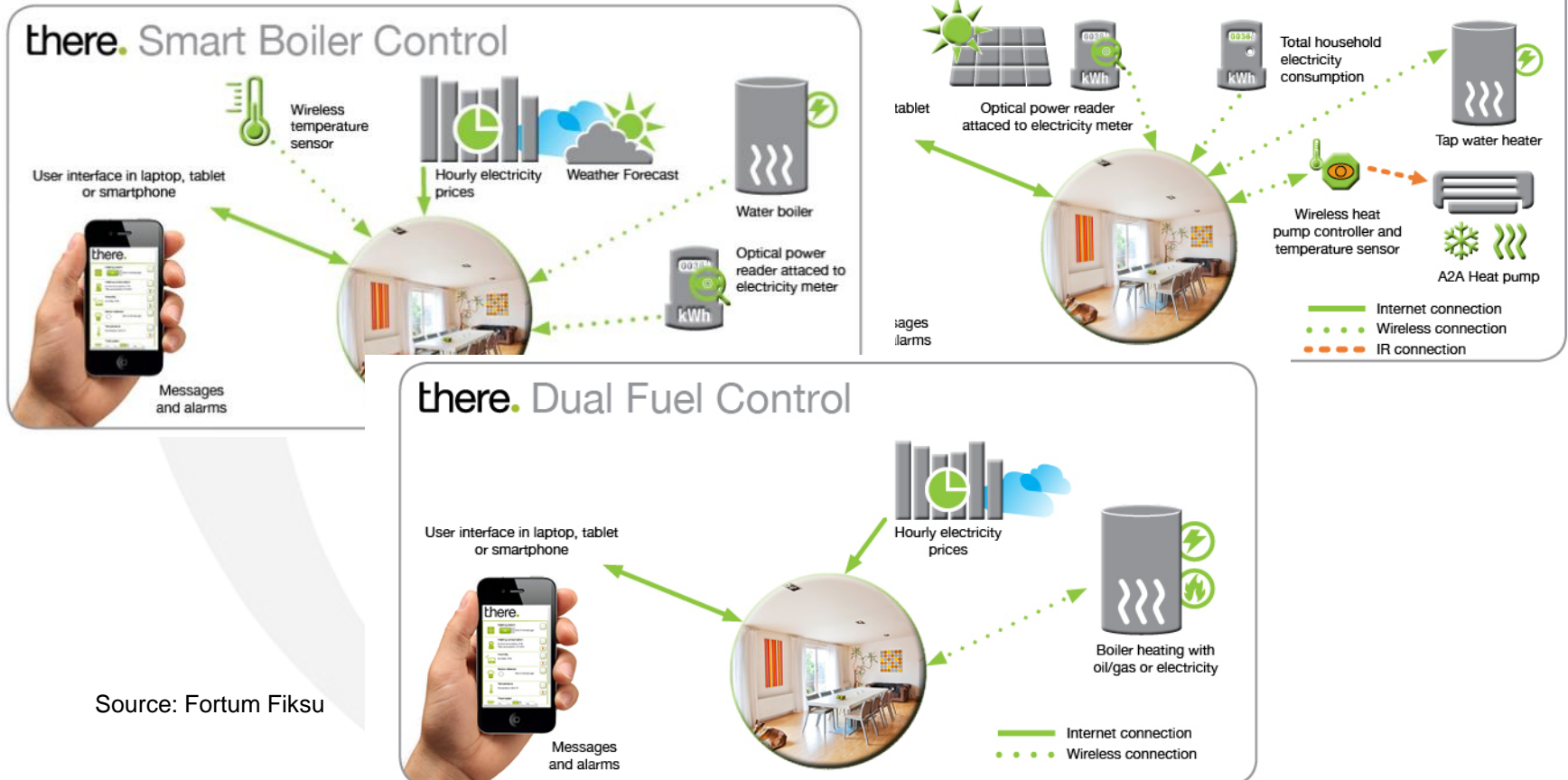




# Smart metering services to consumers

## Demand response

Change to non-peak times



Source: Fortum Fiksu



## 2. Examples of information for end-user based on smart meters

# information for end-user based on smart meters

## Nuon E-manager







### Description of the service

**The E-manager** is basically a meter reader connected to the P1-port of the smart meter. The E-manager sends the metering data to a gateway, connected with the internet router. After creating an account on the E-manager website, users can view their energy consumption information in real time through a personal computer, mobile phone and tablet. Additionally, it is possible to switch on/ off individual appliances by installing controlling smart plugs. The E-manager also provides comparisons of energy usage with previous periods as well as with similar households and information details such as outside temperature.



# information for end-user based on smart meters

## The main services provided by E-manager:

-  E-manager offers information regarding the users total energy consumption each hour, day, week, month and year. The system shows the energy consumption in realtime: every 10 seconds for electricity and every hour for gas.
-  In combination with an E-manager subscription users will also be able to analyse historic consumption patterns and energy saving results.
-  Benchmarking with normalised consumption of similar households in order to apply peer-pressure strategies is possible, based on the selection of profile settings offered by Nuon.
-  Energy saving targets and tips to engage and support consumers to compare their actual energy use with previous consumption periods and reduce future energy usage.
-  E-manager also offers monitoring and control of individual appliances via smartphone or tablet by using 'smart plugs' in a socket to connect the devices to the energy management system. Via the gateway, the smart plugs are wirelessly connected to the system and via the household WiFi-network to the consumers smartphone or tablet.
-  E-manager will shortly offer functionality for monitoring of own generation of electricity via solar panels in the energy management system.



# information for end-user based on smart meters

## Oxxio Energy Monitor

### Description of the service

**Energy Monitor** is an online self-service portal provided by Oxxio (a subsidiary of Eneco) where household customers can view, compare and set goals for their electricity and gas consumption. The energy management system also provides customers with personal contact services such as tariff and billing information, cash advance payments and removal. The objective of the service is to help utility customers to save energy through better understanding of their consumption. For energy retailer Oxxio, the online tool provides the opportunity to reduce service costs, call centre costs and costs of regular direct mailing.





# information for end-user based on smart meters

## The main services provided by Energy Monitor:

- 👤 A personal webpage on a laptop, PC, smartphone or tablet, showing consumption history and costs from electricity as well as gas on a monthly, daily and hourly basis.
- 👤 Automatic remote recording of smart metering data by Oxxio for analysis and colourful presentation on the personal webpage of the consumer.
- 👤 Accessible and appealing design of the personal webpage for a broad target group.
- 👤 Energy saving targets and tips to engage and support consumers to compare their energy consumption with previous periods and further reduce future energy usage.
- 📄 With Energiescore, the consumer is able to compare his energy consumption with other households.
- 📄 With Voorschotcheck, the consumer is able to check the risk of additional charges regarding the next annual energy bill.
- 📄 Automatic recording of outside temperature to help explain eventual abnormalities in historic energy consumption.
- 👤 Monitoring of electricity production of solar panels is not yet possible with Energy Monitor.

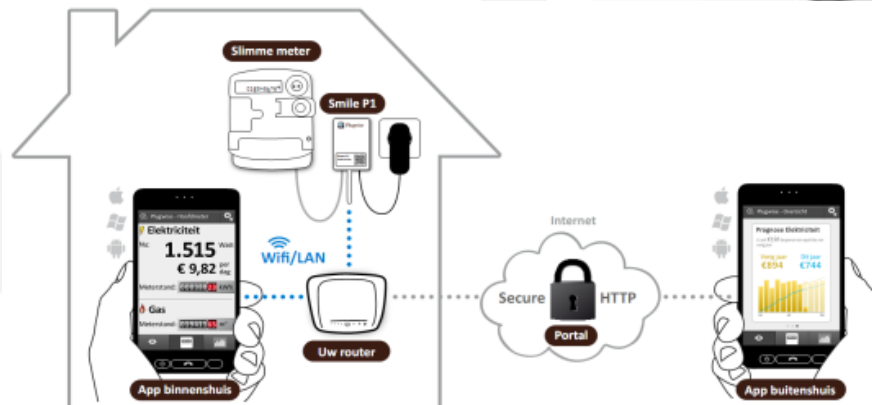


# information for end-user based on smart meters

## Plugwise Smile P1







### Description of the service

Plugwise P1 can be connected to the P1 port on the users smart meter. The Smile P1 sends the energy usage data wireless to the app on the users smartphone or tablet. The users total energy usage is shown in clear graphs and overviews. This makes it possible to check if measures to save energy really work. To be able to use the Smile P1, a smart meter with a P1 port is required. If you do not have a smart meter with P1, please contact your grid operator.



# information for end-user based on smart meters

## The main services provided by Plugwise Smile P1:

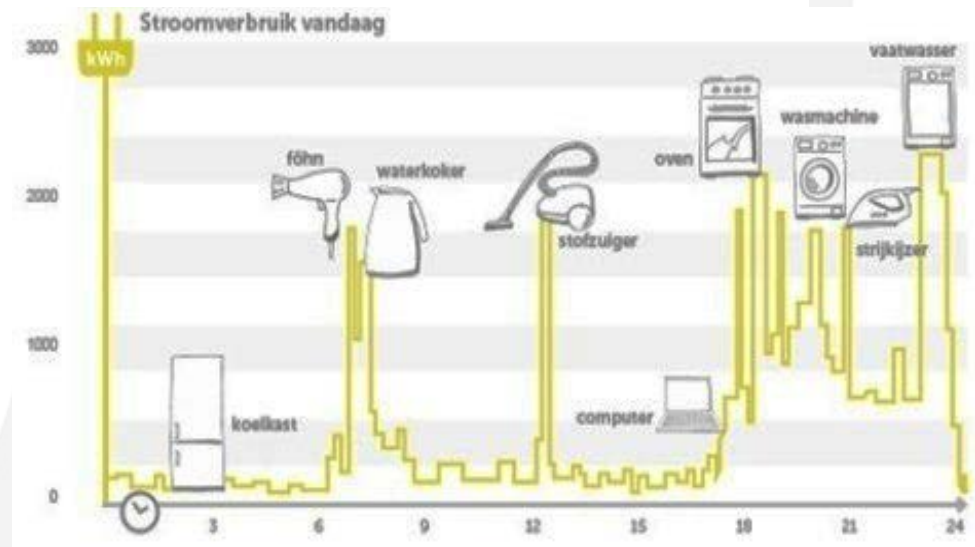
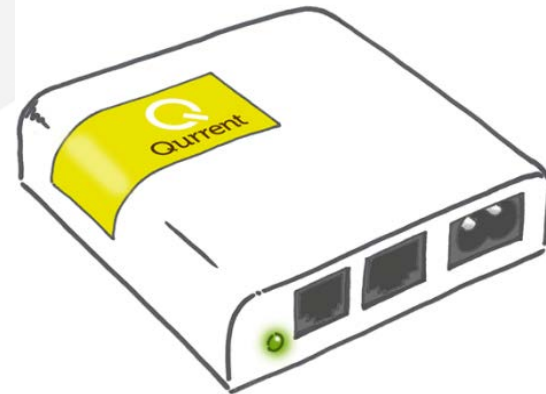
-  Smile P1 offers realtime information regarding the users total energy consumption each hour, day, week, month and year. The system shows the energy consumption in realtime: every 10 seconds for electricity and every hour for gas. The system also estimates the annual energy use, based on the actual registered consumption.
-  In combination with a Plugwise Smile subscription the user will also be able to analyse historic consumption patterns and energy saving results.
-  Benchmarking with normalised consumption of similar households in order to apply peer-pressure strategies is possible, based on the selection of profile settings offered by Plugwise.
-  Plugwise optionally offers disaggregated monitoring and appliance control via smartphone or tablet by using smart plugs (Circle and Circle+) in a socket to connect one or more devices to the energy management system. This feature also requires a Stretch 2.0 gateway to connect the smart plugs wirelessly to the system and send the data via the household WiFi-network to the consumers smartphone or tablet.
-  Another optional Smile P1 feature is the integration of own generation of electricity via solar panels in the energy management system, by using internet gateway Stretch Solar and a separate metering device, called Stealth M+. Apart from getting insight in the energy production of your solar panels (up to 16A) on your smartphone or tablet, the Stretch Solar also provides insight in the financial pay-back development of the consumer's investment in solar panels.
-  The Smile P1 app on smartphone and tablet also provides the consumer with energy saving tips for additional savings on the consumption of electricity and gas.

# information for end-user based on smart meters

## Q-box








### Description of the service

**Q-box** is a small device that can be connected to the P1 port on your smart meter. The Q-box sends the metering data via the users internet router to the Current internet server for analysis and presentation on the users smartphone or tablet. For additional analysis, the households energy usage is shown in clear graphs and overviews. To be able to use the Q-box, a smart meter with a P1 port is required. The system is "plug and play" en works independent from the energy retailer.



# information for end-user based on smart meters

## The main services provided by the Qbox:

-  Q-box offers realtime information regarding the total household energy consumption each hour, day, week and month. The system shows the energy consumption in (near) realtime: every minute for electricity and every hour for gas. The system also estimates the annual energy use, based on the actual registered consumption.
-  Current offers an online social media platform for exchange of experiences and organising of 'energy battles'.
-  In combination with a free Q-box subscription a consumer will be able to analyse historic consumption patterns and energy saving results.
-  Benchmarking with normalised consumption of similar households in order to apply peer-pressure strategies is possible, based on the of profile settings offered by Current.
-  The Q-box also offers the possibility to set personal saving targets. Additionally, Q-box sends alerts as well as energy saving tips to help achieve the saving targets.
-  An optional Q-box feature is the integration of own generation of electricity via solar panels in the energy management system, by using the internet Q-box gateway and a separate metering device.
-  Q-box also provides the consumer with energy saving tips for additional savings on the consumption of electricity and gas.

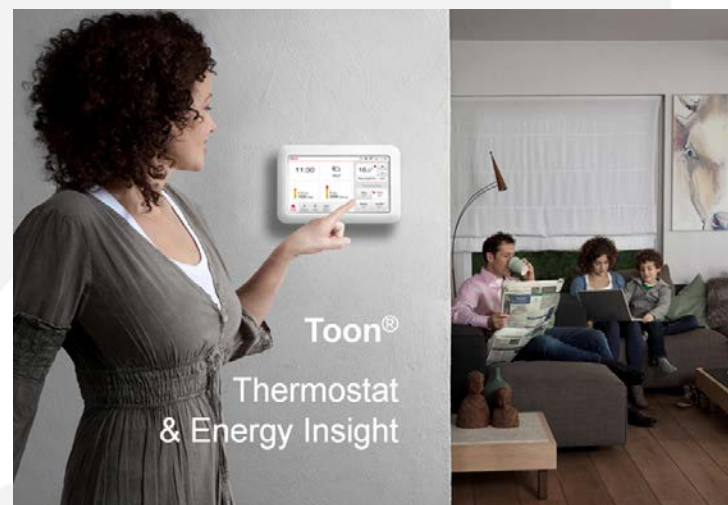


# information for end-user based on smart meters

## Toon®









### Description of the service

**Toon®** is a revolutionary programmable thermostat display in combination with a set of energy consumption and tariff information functions for electricity as well as for gas. The basis of the system is a small unit connected to the P1 port of the smart meter which transmits the metering data wirelessly to the touchscreen display. Via the household internet router, the smart display is connected with the energy provider for instant updates of actual tariff and consumption cost information.



# information for end-user based on smart meters

## The main services provided by TOON:

-  Providing insight is central to Toon®. The smart thermostat shows graphics and diagrams about the current energy consumption in comparison with previous days, weeks, months and even years. Consequently, people become more aware of their household energy use.
-  The design is accessible, appeals to a broad target group and fits into every home.
-  The smartphone can be used as a remote control of the heating thermostat.
-  The thermostat also offers traffic and weather information, such as a rain radar.
-  The consumer is able to compare his energy consumption with previous periods as well as with other households.
-  Another feature is that the system also warns for the risk of additional charges regarding the next annual energy bill.
-  By means of Live Updates, received via the household internet router, the consumers gets an instant insight into the actual costs of the energy consumption.
-  From 2015, Toon® is expected also to monitor the electricity production of solar panels.

# information for end-user based on smart meters

## There Corporation Demand Response System

### Description of the service

**There Corporation solution delivers easy and automated demand response, real-time consumption information and heating system optimisation.**

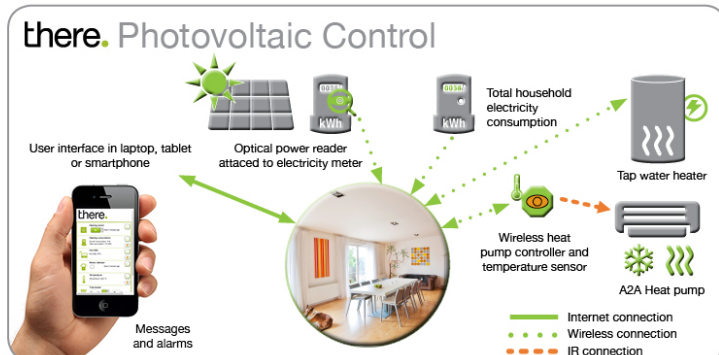
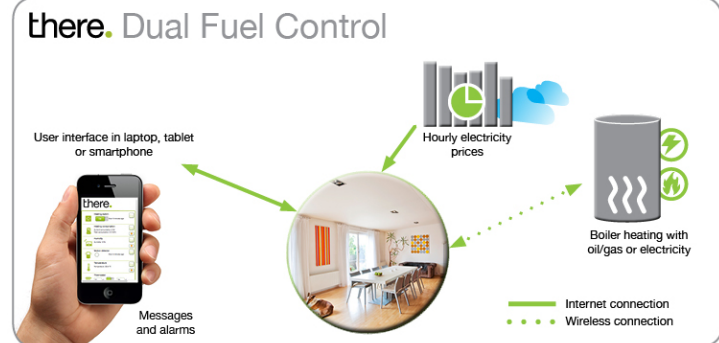
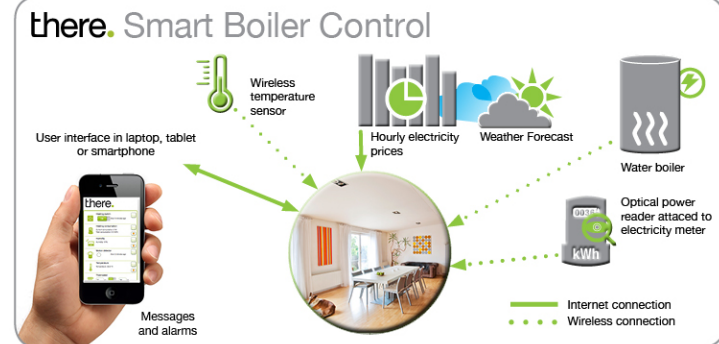
In principle, the system is totally automatic and no user interaction is necessary. The system also includes a web interface that enables monitoring and controlling heating system, real-time electricity consumption, accumulated savings, Nord Pool Spot prices and receiving price alerts. The interface can be accessed anywhere through computer or smart phone.

Our services are  
**easy to use!**

You will have user interface  
in laptop, tablet or smartphone.











We are there to  
make it happen.



# information for end-user based on smart meters

## The main features of There Corporation demand response solution:

-  Automatic demand response based on Spot market price, no user interaction necessary
-  A web-based user interface can be accessed anywhere through computer or smart phone
-  Real-time information on electricity consumption and accumulated savings
-  Monitoring and controlling heating system in real-time
-  Information on Nord Pool Spot prices and receiving price alerts
-  1 The service offers cost savings in the range of 15 - 20 % of heating costs. The system can also bring energy savings by more accurately optimizing the heating to the heating need of the house.
-  The basic demand response solution package consists of the central control system and a spot-priced electricity contract from the electricity supplier.
-  The control system automatically fetches the current Nord Pool Spot and network tariff prices for electricity and a local weather forecast. Based on this data and other site specific parameters, the system calculates the optimal hours and controls the heating accordingly.

# information for end-user based on smart meters

## British Gas smart meter service

### Resources provided

All British Gas customers receive a free IHD, and can opt to receive a Smart Energy Report online or by post.

The IHD includes an energy traffic light system which makes it easy for the customer to see how much energy they are using. This is always visible even if the device is in sleep mode. British Gas can also send messages to the IHD about usage or bills.





# information for end-user based on smart meters

## Main services provided



Energy efficiency advice as general tips. Personalised advice is offered in the online Smart Energy Reports.



Historic energy

information (comparison with energy consumption with earlier periods).



Benchmarking of the customer's consumption against the consumption of households with similar characteristics.



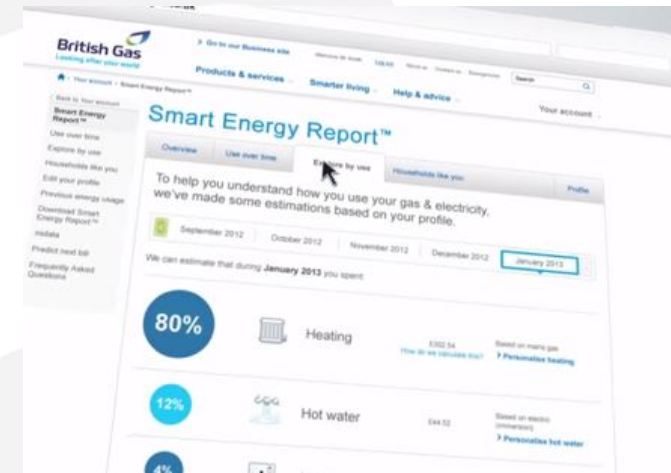
Division of energy usage into different energy services e.g. heating, hot water, and appliances so consumers can make informed decisions about their energy-using behaviours.



Customer engagement using daily energy target budgets in either kWh or money to reduce electricity usage. A red pointer shows where the customer is relative to their target.



Videos to explain smart metering and its benefits.



# information for end-user based on smart meters








## 3. EU Communication

06 Nov 2018

07 Nov 2018

08 Nov 2018

## Digitalisation - theatre 1

06 Nov 2018	07 Nov 2018	08 Nov 2018	09 Nov 2018	10 Nov 2018
<p>Smart Metering</p> <p>14:00 - 14:10</p> <p><b>Chairperson's Introduction</b></p> <p>📍 Hub Theatre 1</p> <p>Chairperson</p> <p> Francisco Puente, Manager - Escan</p>	<p>Smart Metering</p> <p>14:10 - 14:30</p> <p><b>(presentation title announced soon)</b></p> <p>📍 Hub Theatre 1</p> <p>Speakers</p> <p> Representative of ENEL</p>	<p>Smart Metering</p> <p>14:30 - 14:50</p> <p><b>Zero-touch commissioning of Smart Metering</b></p> <p>📍 Hub Theatre 1</p> <p>Speakers</p> <p> Marc Gebert, Senior Director, IoT Business Development - NXP</p>	<p>Smart Metering</p> <p>14:50 - 15:10</p> <p><b>(presentation title announced soon)</b></p> <p>📍 Hub Theatre 1</p> <p>Speakers</p> <p> Ifigo Larumbe Cabanas, Global Smart Metering Coordinator - Iberdrola</p>	<p>Smart Metering</p> <p>15:10 - 15:30</p> <p><b>(presentation title announced soon)</b></p> <p>📍 Hub Theatre 1</p> <p>Speakers</p> <p></p>

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Escan energy consulting

*Thank you!*

