SMARTER TOGETHER

Smart and Inclusive Solutions for a Better Life in Urban Districts

Report on deployment of Linky smart power meters in the area

Deliverable D3.4.2

Version 2.0

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Versions

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V0.3	16/1/2017	Enedis	Final version
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Glossary

BEMS	Building Energy Management System
CNIL	National Commission for Informatics and Liberties (from French acronym)
EV	Electric Vehicle
PLC	Power Line Carrier
RMP	Reference Measurement Point
SPL	SPL Lyon Confluence
ST	Smarter Together
WP	Work Package
WWF	World Wildlife Foundation

SMARTER TOGETHER BENEFICIARIES

N°	Organization name	Short name	Country
1	Lyon Confluence	SPL	France
2	Lyon Metropolis	GLY	France
3	HESPUL Association	HES	France
4	Toshiba	TSF	France
5	Enedis	Enedis	France
6	Enertech	ETC	France
7	City of Munich	MUC	Germany
8	Bettervest	BET	Germany
9	G5-Partners	G5	Germany
10	Siemens Germany	SIDE	Germany
11	Spectrum Mobil	STA	Germany
12	Securitas	SCU	Germany
13	City of Vienna	VIE	Austria
14	BWS Gemeinnutzige	BWSG	Austria
15	Wiener Stadtwerke	WSTW	Austria
16	Kelag Wärme	KWG	Austria
17	Siemens Austria	SIAT	Austria
18	Sycube Informationstechnologie	SYC	Austria
19	Austrian Post	POST	Austria
20	Fraunhofer	FHG	Germany
21	Austrian Institute of Technology	AIT	Austria
22	Energy Cities	ENC	France
23	Gopa COM	GPC	Belgium
24	University of St Gallen	UNISG	Switzerland
25	Technical University of Munich	TUM	Germany
26	Deutsches Institut fuer Normung	DIN	Germany
27	Algoé	ALG	France
28	City of Santiago de Compostela	STC	Spain
29	City of Sofia	SOF	Bulgaria
30	City of Venice	VEN	Italy
31	Régionale d'HLM de Lyon	HLM	France
32	Wavestone	VWAV	France

1. Introduction

The present deliverable aims to present the roll-out of Linky smart power meters in the Confluence area in the Lighthouse city Lyon, within WP3 of Smarter Together.

This report reflects only the author's view, neither the European Commission nor INEA is responsible for any use that may be made of the information it contains.

1.1 Deliverable Objectives

This report presents an overview of the smart meter deployment in La Confluence demonstration area and the electricity data exchanged with Grand Lyon data platform. These issues will be addressed in three distinct chapters:

- Introducing the Linky Smart meter solution and deployment in La Confluence area.
- Presenting the feedback from the deployment effort.
- Present the data exchange between the Linky smart meters and the Data Grand Lyon platform.

1.2 Enedis Presentation

Enedis is the new name for ERDF (Électricité Réseau Distribution France), the distribution grid operator for electricity throughout the majority of France. The company was created in 2008 following the opening of the electricity market in France, when the activities of what was then EDF-GDF were broken up into separate companies, and is a 100% subsidiary of the French electric utility EDF (Électricité de France).

Though the company had recently launched a new logo in an attempt to differentiate itself from its parent company, the French regulatory agency la Commission de Régulation de l'Énergie (CRE) requested the name change in 2016. The CRE, which oversees the French electricity market and its liberalization, found that ERDF's name was too similar to EDF, leading to confusion and misinformation about the electricity market.

Figure 1: Enedis Brand identity Evolution

Enedis manages the public electricity distribution network covering 95% of continental France. Every day, its 39.033 employees oversee the operation, maintenance and development of a network of nearly 1.3 million km.

Enedis operates the public distribution network, which belongs to local authorities, hence it carries out two major public service duties :

- *Service continuity and quality:* managing nearly 1.3 million km of electric lines, Enedis is responsible for continuous public electricity service. To fulfill this role, the company operates, maintains and develops the network. Enedis also invests in modernizing and securing the network, particularly against extreme weather conditions.

- *Non-discriminatory access to the distribution network:* in compliance with regulations, Enedis ensures that users have transparent, objective and non-discriminatory access to the network. The company also guarantees the confidentiality of commercially sensitive information handled, having developed a code of conduct for this specific purpose. Adherence to this code is examined in an annual report submitted to the Energy Regulation Commission, France's regulatory authority on energy.

The quality of France's electricity supply is amongst the highest in Europe according to the 2016 Benchmark report on the quality of electricity and gas supply performed by the Council of European Energy Regulators[1]. To preserve this level of service, Enedis maintains and develops the network. The company also innovates to meet the needs of customers, electricity producers and electricity suppliers, particularly in the areas of information systems and metering.

2. Linky Smart meter solution

2.1 Linky Smart Meter program and key figures

A smart meter is an electronic device that records consumption of electric energy at preset intervals, and communicates that information back to the grid system operator for monitoring and transmission for billing purposes.

Smart meters enable two-way communication between the meter and the central system. Unlike current meters, which need human intervention to gather readings, or home energy monitors, smart meters can gather data for remote reporting.

Such an advanced metering infrastructure (AMI) differs from traditional automatic meter reading (AMR) in that it enables two-way communications with the meter. Communications from the meter to the network can be done via fixed wired connections (such as power line communications) or via wireless.

The smart meter is the answer to a need for modernization of the electric grid in France. In order to maintain an optimal service level, Enedis needs to replace the existing meters as some measuring devises have been installed almost 40 years ago.

[1] https://www.ceer.eu/documents/104400/-/-/0261ad33-6b06-f708-354b-5adf04683129

Enedis carries out the modernization of the distribution power grid by replacing the 35 million meters in France. The Linky smart meter is part of a wider energy transition strategy by the French government in order to attain the environmental goals established by the French Energy Transition law of 2014 which objectives include: optimizing and reducing energy consumption, increasing the share of renewable sources of energy in the energetic mix, amongst others.

This shift in paradigm will change the way of consuming (Demand Side Management) and producing electricity which will require a more "intelligent" electricity distribution grid (a smart grid), and Linky meter is a the key base element for this grid.

Modernization of electric meters complies with legal obligations (European directive 80% of smart meters deployed by 2020, French Energy Transition Law...)

The pilot phase demonstrated that Linky smart meter introduction leads to a reduction in management and operations errors as well as drastically reduce fraud, allowing an improved peak supply management, and significantly less billing complaints.

The Linky program is part of a wider initiative to adopt smart meters across Europe, and France has committed to 95% smart meter penetration by 2021. Each country participating in the EU smart meter roll-out plan has been able to choose its own infrastructure model, and France has chosen the Linky smart meter.

As shown in Figure 2, the whole industrial roll-out will be carried out during a period of 6 years between 2015 and 2021 where 35 million smart meters will be changed and 600 thousand concentrators will be installed. The program involve an investment of 5 Billion Euros creating more than 10000 direct or indirect jobs between technicians for installing and framework developing around the new smart meter, engaging more than 100 calls for tender for both installation and material recycling.

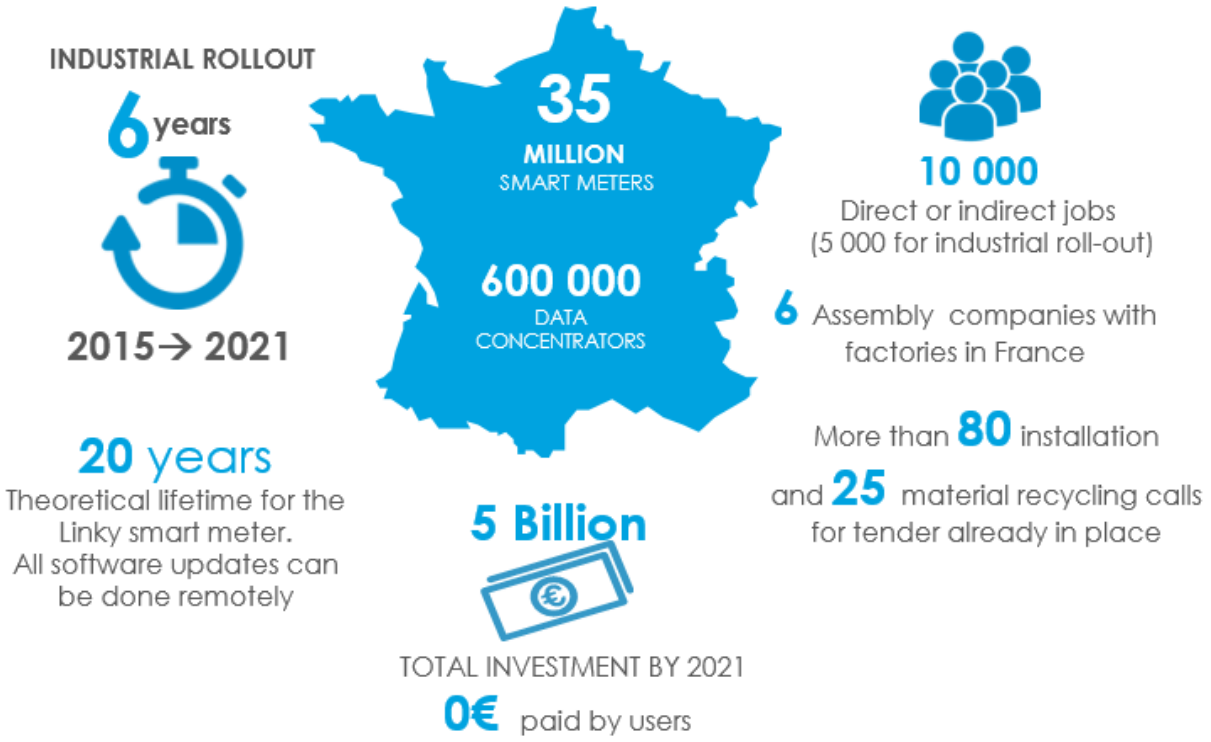


Figure 1: Linky program key figures

In an ever evolving electricity environment, the smart meter is set to become the building block of the future of power grids in France and worldwide.

In the past, power grids were l built to send electricity in a single way: from power generation plants toward consumers. The power grid that we know with electrical meters mostly installed from the 1960's to the 1990's allowed for simple and unidirectional usages for electricity such as heating, cooking, hot water and lighting.

The power grid evolves thanks to the smart meter and allows to better integrate renewable energies, the development of electric mobility and the evolution of consuming modes, while at the same time assuring the safety of the electrical system as well enhance continuity of service.

As shown in Figure 3, new types of consumers are connected to the power grid, so its evolution is key to better adopt new uses and better serve customers.

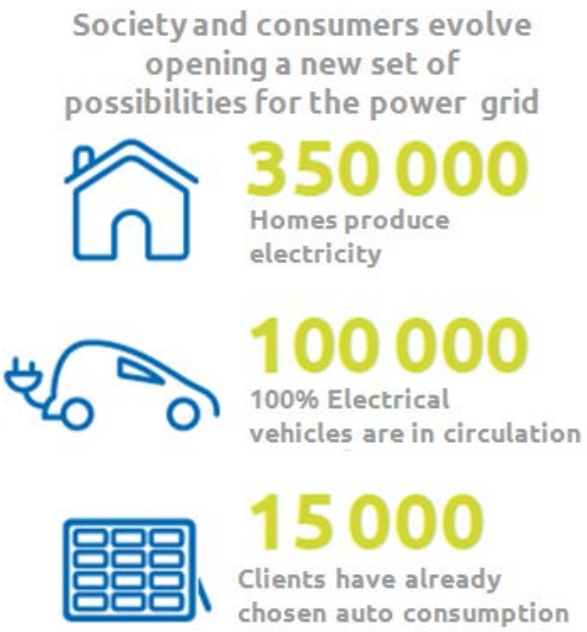


Figure 3: New types of consumers connected to the power grid

2.2 Linky, how does it work?

After electronic meters, the Linky smart meter is the latest generation of electricity meters installed by Enedis. As seen in Figure 4, previous generations of meters included the electromechanical disc meter in the 1960s, and the electronic meter with a digital display in the 1990s.

Figure 4: Three generations of meters

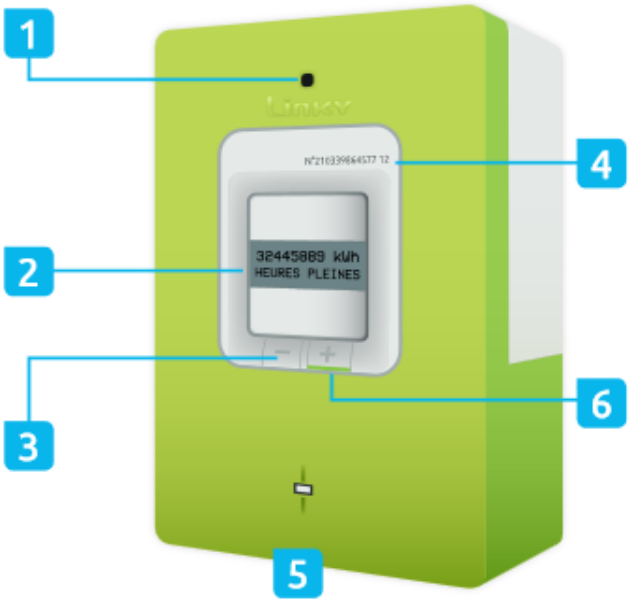
Figure 5 explains in detail the different components of the Linky smart meter both inside and outside the cover. For instance by using the display screen it is possible to navigate through the different informations available on the display.

It is possible to connect to the meter via the dry contact and offer different services to the customer to improve the electric consumption and have a better understanding of consumption patterns.

Consumption indicator light
The consumption indicator light flashes according to the amount of electricity being used (the more electricity is being used, the faster the light flashes).

Display screen
The display screen allows you to see most of the meter's parameters whenever you want.

Scrolling buttons
By pressing the + and – buttons, you can scroll through various information on the display screen.



Your meter number
You can check that the meter number is the same as the number on your invoice.

Indicator light
The indicator lights up when the meter is turned off and you are permitted to switch it back on.To do so, press and hold the + button for at least 2 seconds.

Screw for opening the cover
By opening the cover, you can access the dry contact, the fuse and the remote customer information.

Remote customer information
Various information from the meter (current consumption, apparent power and tariff period) is supplied via this remote information link.

Dry contact
The meter enables you to automatically switch on and off some of your electrical appliances (e.g hot water tank) thanks to the dry contact. To do so, get in touch with your installer.

IMPORTANT SAFETY INFORMATION

- The meter remains connected to the electricity network at all times, even when you switch off the power supply. Do not try to dismantle or move it.
- The meter is connected to visible and hidden wires. Never drill close to it unless you are sure that you can do so without damaging the wires (otherwise there is a serious risk of electrocution or fire).
- If you carry out electrical work, always switch off the electricity at the circuit breaker, even if the Linky meter is switched off.
- Should you need a power increase, you remain responsible for checking the capacity of your installation dowstream of the circuit breaker.

Figure 5: Linky in details

Each Linky meter is connected to a concentrator (an electronic device that is placed most of the times in the distribution substation that gathers all the information sent by the meter 1 concentrator can cover up to 1000 smart meters) using Power Line Carrier technology (PLC). The PLC uses existing power grid cables from the low voltage grid in order to transmit data. This tested and reliable technology uses existing infrastructure and does not require extra telecommunication cable installation.

This system consists of five key elements:

- ***Linky smart meter***
- ***Local communication network***, via which the smart meters communicate with the concentrators. It implements Power Line Carrier (PLC) technology, using the low-voltage electric network to exchange data and orders between meters and concentrators.
- ***Concentrator***, located in the substation, which consults the meters, processes and stores the data it receives and transmits it to the central information system.
- ***Extended communication network***, which allows concentrators to communicate with the central information system. This network uses the telecommunications network, via its related technologies (e.g.: GPRS)
- ***Central information system***, receives requests from Enedis' internal information systems and processes them with an automated system.

This tested and reliable technology uses existing infrastructure and does not require extra telecommunication cable installation.

Data flow with Linky is a simple process as illustrated in Figure 6:

- Data with Linky will be transmitted once per day to the concentrator via PLC.
- The concentrator will rely it via GPRS to the supervisory agency that will gather all the data and transmit it to the electricity supplier for invoicing purposes.

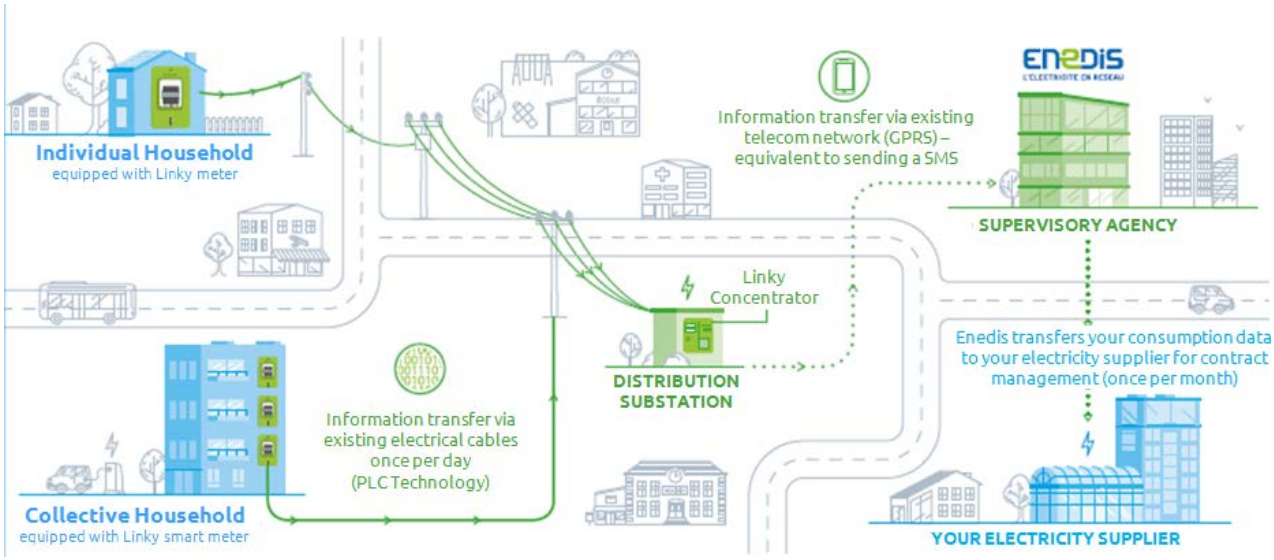


Figure 6: Linky data flux

Power Line Carrier Technology

The PLC (Power Line Carrier) is a mode of communication that is able to flow through the electrical grid cables. It can send information in the form of an electrical signal towards Enedis. Data is collected once per day. The system verifies periodically if the electric grid is correctly powered by sending a signal with emission duration of only milliseconds.

Enedis uses the power line carrier technology since the 1960's mainly as part of a current service to about 11 million households, to send a signal for peak or flat-rate hours in order to start the electric water heater.

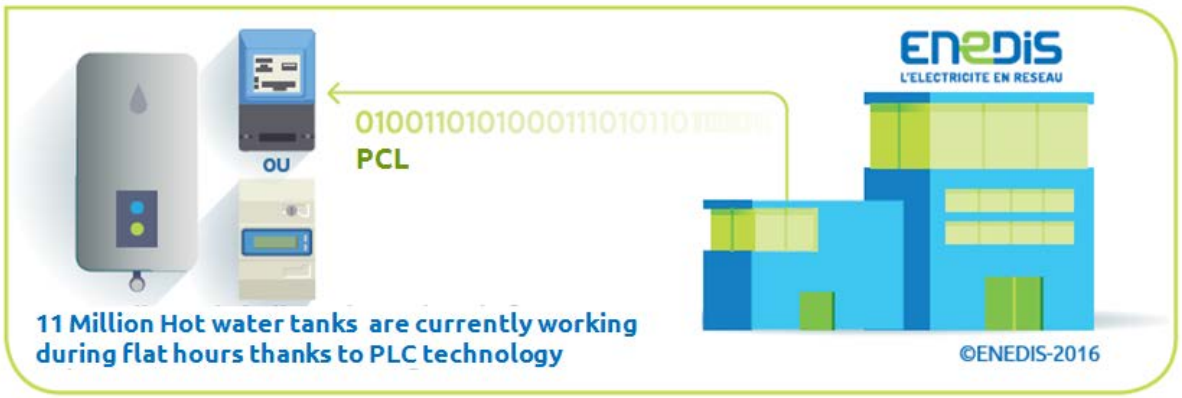


Figure 7: Current use of PLC

PLC technology is also used in many common day to day use appliances such as baby phones, alarms and electric window shutters.

Two PLC technologies are currently employed by Enedis: G1 and G3. Even though the two technologies carry the same kind of data, the technologies don't exactly speak the same "telecommunications" language. Both of them perform digital modulations but while G1 works on the principal of frequency modulation G3 is based on electrical signal phase modulation.

PCL G3 is an evolution on PCL G1. G3 being more robust, less sensitive to noise, allowing for a better data collection rates. Its data flow is also higher increasing speed of data collection. Finally and most importantly, unlike the G1 which only transmits metering information, the G3 protocol is a pure communication protocol independent of the application rendering it more versatile regarding possible usages. Thus with the Linky program, each new G3 meter will allow to extend a communication infrastructure that the distributor will be able to leverage for a multitude of usages.

2.3 Benefits

The Linky smart meter system provides several benefits for each of the stakeholders of the public distribution network. These are detailed in the following:

End-consumers will:

- Have simple access to information on their electric energy consumption, and be able to manage it better, via a dedicated web portal and smartphone application with the possibility of viewing their power consumption with a 30 minute pace.
- Receive bills based on their real consumption, rather than estimated consumption as carried out in the past.
- Have the cost of the services currently in offer reduced thanks to the advantages of the new technology as can be seen in Figure 8.

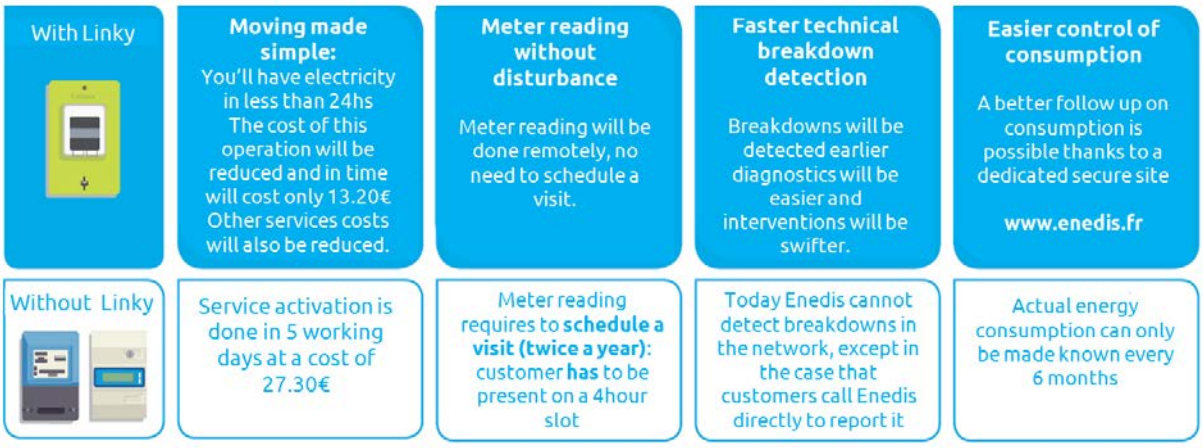


Figure 8: Benefits of Linky meter for customers

Electricity suppliers will:

- Be able to determine the duration of their billing periods, based on actual consumption.
- Be able to diversify their price offers and adapt them more precisely to their customers' needs.

Electricity producers will:

- Have better visibility on periods when they have produced electricity,
- Be able to use simplified electrical equipment, given that Linky allows the measuring of both their production and their consumption

Distribution Network Operators will:

- Follow up electricity supply quality in real time,
- Reduce intervention time during outages,
- Carry out remote operations (connections, power adjustments, etc.),
- Develop services to allow sustainable use of electricity for all people in France.

2.4 Data Protection

Protecting customer data that flows through the Linky system constitutes one of the key priorities, along with network protection of the cyber security initiative set in place by Enedis. Multiple Security measures are in place and are set all along the chain of data transmission.

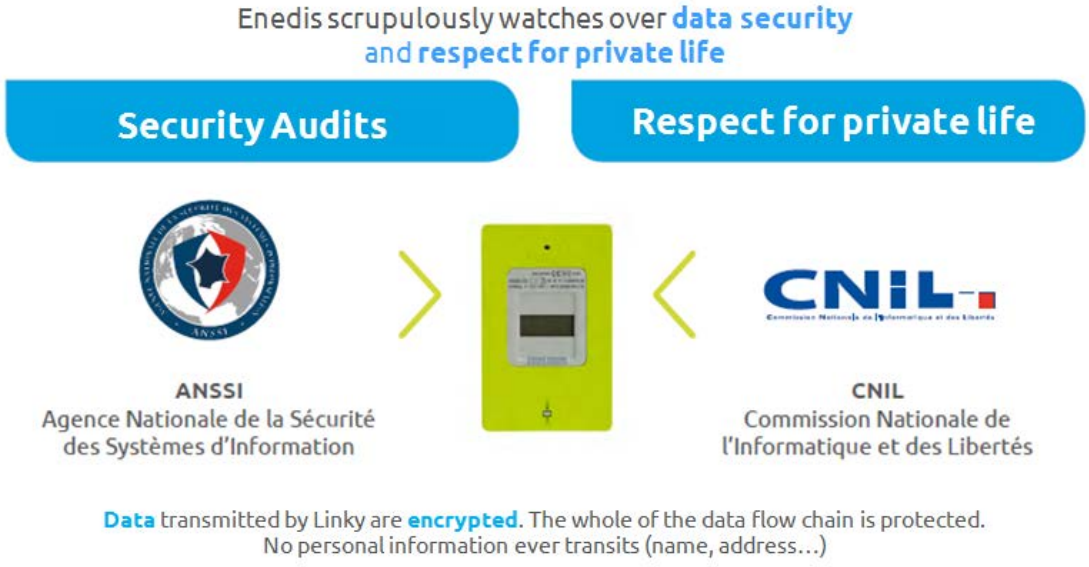


Figure 9: Data security commitments

Secure data that belongs to the customer
Electricity consumption data belongs to the customer. None of this data can be transferred to a third party without an explicit agreement from the customer.

Like previous meters, Linky measures global electricity consumption for a household in kilowatts per hour. It cannot identify which appliance is being used nor the frequency of usage. It doesn't collect personal information from the users either.

Enedis respects all of the recommendations from the National Commission for Information and Freedom (CNIL from the French name)

End to end data protection

Data encryption is performed from end to end with Linky. Encryption keys are specific to each material and the algorithms are continually optimized. Enedis scrupulously watches over data security and the respect of private life.

Regular data Audits

Regular audits are performed by the National Agency for the Security of Information Systems (ANSSI from its name in French), the agency allows Enedis to test the strength and effectiveness of the Linky meter security system. The objective is to avoid intrusions and potential cyber-attacks. All together the set of protection levels and tools that have been developed allow guaranteeing the best protection possible.

3. Linky Smart Meter deployment

3.1 Deployment goals and timeline

Enedis is responsible for installing the Linky smart meters. During the pilot phase, nearly 300,000 Linky meters have deployed from 2009 to 2011 on a rural area (Indre-et-Loire) and an urban area (Lyon). This experimentation helped answer to the fixed goals: Enedis was able to test on the field, its capacity to manage an industrial deployment, to build the final information system and finally to validate economic hypotheses.

As the pilot phase was successfully finished a national roll-out campaign started in December 2015. Today over 7 million Linky smart meters have been installed in France. The end of the massive Linky roll-out is set in 2021.

Deployment plans are built with the objective of optimizing operational and economic performance of the project as well as giving visibility and autonomy to the enterprises working with Enedis.

An important part of deployment is that it is progressive and evenly distributed throughout the different regions of France. This helps engaging each of Enedis' local implementations,

widespread all over the French territory, to meet time and budget restrictions. The massive roll-out is also an opportunity to provide local labor to skilled jobseekers.

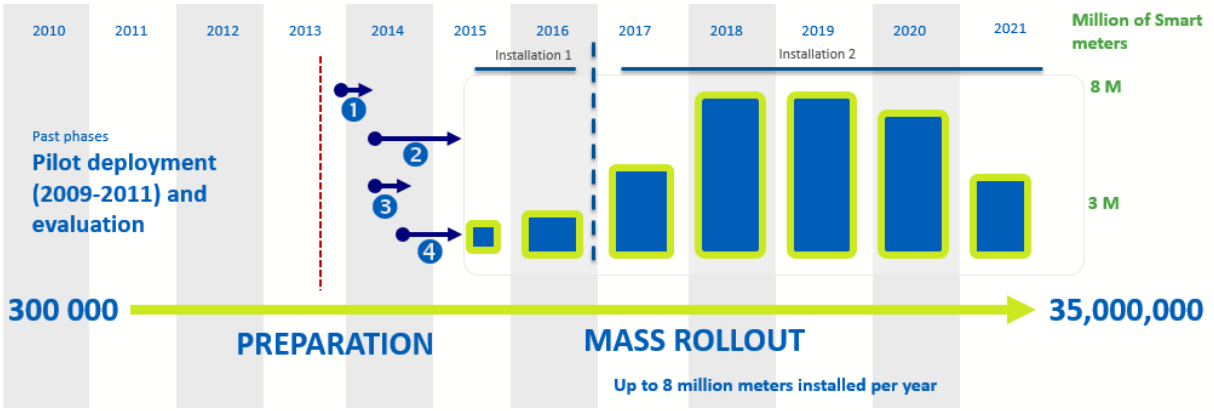


Figure 10: Linky deployment timeline

3.2 Deployment procedure

The procedure to replace the existing meter with a Linky smart meter contains several steps. First, Enedis notifies each customer identified for a Linky installation by letter 45 days before the scheduled meter replacement. Customers are then contacted by the Linky installation service provider (subcontracted partner company) commissioned by Enedis to set a date for installing the Linky meter.

If the meter is placed outside the household, the partner company will inform the customer of the new meter installation scheduled date.

If the meter is placed within the household, an installation date will be proposed to the customer by the partner company by phone call. Customers can change the date directly the day of the call or on the internet by connecting to the www.enedis.fr website.

Figure 21 : Linky deployment and installation

During installation whether it is outside or inside the household, customer's presence is not required, however it might be desirable for the technician to have access to the circuit breaker. When located inside, the technician must be provided access to the existing meter.

The installation process takes 35 minutes on average and the power supply needs to be cut off for about 15 minutes. The installation is free of charge and in no way modifies the existing contract.

Smart meter activation will be performed by the technician who carried out the installation, the customer will be provided with a user manual or will leave it in the mailbox in case the customer isn't present.

A toll -free number is at the disposal of Linky users to answer any questions they may have on using the meter, as well as a free web portal enabling customers to consult and compare their electricity consumption with customers of the same geographic region with the same power subscription level.

3.3 Linky deployment in France

To this date, industrial deployment of Linky in France has achieved over 7 million installed meters, in addition to this according to a technical and economic analysis performed by the CRE (National Commission on Energy Regulation for France) the Linky deployment project is well within budget and schedule.

8 million of Linky meters installed means that over 15 million people are already enjoying the advantages and services offered by the smart meter in near 4600 municipalities in France.

Linky responds to a current and very important future challenge: that of guaranteeing the safety of the electrical system and thus a continuity of supply for all while accompanying these new ways of consuming electricity.

Success factors of the project:

Behind the key figures of the Linky project (35 million meters are to be manufactured and installed over 6 years) there are more than 10,000 women and men mobilized and involved in everyday life for the manufacturing and installation of Linky meters and the recycling of old ones. Not to mention the employees of Enedis invested in the field and in the monitoring of the project.

For this, 6 factories throughout the country are running at full capacity to manufacture these meters, while nearly 3,000 installation technicians are working for the 80 companies mandated by Enedis.

At the peak of the deployment, nearly 175,000 meters will be installed each week, the equivalent of a city like Saint-Etienne. At the same time, the "deposited" meters will be

recycled: this mission has been entrusted to recycling companies, more than 60% of which are STPA (protected and adapted work sector) companies.

A project of such magnitude requires the preparation of a "deployment plan" involving consultation with all stakeholders: the public authorities (Ministries), the CRE, consumer associations, electricity suppliers, etc. Linky is actually the result of a real collective enterprise.

Every day, about 3,000 installation technicians from companies engaged by Enedis install Linky meters throughout the territory.

These women and men have been trained for 4 weeks where the essential themes to their mission are addressed: safety prevention, and in particular electrical hazards, customer support, meter installation, the Linky system and equipment, mobility tool provided for the delivery.

Very regular controls are carried out by Enedis whose employees remain present on a daily basis in the field to assist the installation technicians.

3.4 Linky deployment in La Confluence

The Linky deployment in La Confluence area was initially scheduled at the regional level for the fourth quarter of 2017. However the exact date during the year 2017 wasn't still determined when the ST contract was signed by Enedis in 2015.

As explained before, a project this large would require an important planning in order to install 35 million smart meters on a five year timeline. For deployment purposes, the national planning for the year can only be defined with precision at the end of the year previous to deployment. Thus, it was only at the end of 2016 that it was confirmed that deployment for La Confluence area would be planned by the end of 2017

In order to meet with the Smarter Together project planning and deliverables, Enedis has been able to adapt the deployment phase by beginning the roll-out in July 2017.

Taking this into account, Enedis requested a delay for the submission of the present deliverable in February 2017. It was initially scheduled to be presented in June 2017 but as the deployment schedule started in July it was necessary to ask for this delay.

The deployment has been scheduled during the period of July 2017 to February 2018, and consists of two phases:

- Phase 1: Massive roll-out from July to October 2017 (90% of the neighborhood)
- Phase2: Saturation from November to February 2018 (10% of the neighborhood)

The objective for the deployment of La Confluence neighborhood was to install 7692 Smart meters. As explained in section 2.2 the deployment of smart meters requires the installation of concentrators in order to be able to communicate data to the central system. Usually concentrators are deployed one to six month before smart meters are installed.

Taking this into account for concentrator deployment, a retro planning strategy was set in place in order for all the concentrators to be in place at the time the smart meters were to be deployed. See Figure 12 for an example of an installed concentrator.

In La Confluence, concentrator deployment has been adapted to achieve a total of 61 concentrators covering the whole span of the neighborhood.

Figure 32: Installed Concentrator

At the end of November 2017, the company installing the meters in La Confluence has managed to install 5 255 Smart meters which represents 75% of the deployment objective for the first phase in the area.

Taking in account that most of the buildings in the area are recently built, this means that the meter is located on the majority of cases inside the household. Customers have to be reached and agreed upon a scheduled visit because it is necessary for the customer to be present.

This procedure, renders the access to the meter more complex and adds time to the deployment process. In buildings in other areas, meters are located outside the household which reduces the need for the customer to be present during the installation process and greatly facilitates the installation pace.

That is s why the second phase of saturation to achieve the goal is needed. Saturation and final deployment fulfillment for La Confluence area is expected to be completed by the end of February 2018 once all of the Linky meters are installed as planned.

Once the smart meters are installed, a process of synchronization and communication called "reconciliation" takes place between the smart meter and the concentrator.

This process involves establishing communication between the meters and the central system and test the quality of data received. This process can last up to one month. Currently in La Confluence area the reconciliation rate is 88.8% and evolving as new meters are installed and reconciled, and the roll-out phases are developed.

The deployment in La Confluence area was performed in normal operating conditions, described in section 3.2. Regarding work related incidents during the deployment, no incidents have occurred up to date.

First feedbacks from the installation show that the user acceptance of meter changing in the area is high and refusal index is well within the national average. The results from the confluence area are comparable to other densely populated urban areas currently under deployment.

4. Data exchanges between the Linky system and the Grand Lyon Data platform

4.1 Data Platform background

The Grand Lyon Data platform aims to answer the challenges of an "intelligent metropolis". By giving a large access to public data, this platform contributes to the dynamism of the territory by promoting the creation of services and fostering citizen participation.

The process of making public data available in Lyon Metropolis is an answer to several objectives:

- To facilitate the exchange of data between the actors of the same territory (Inspire European directive). The data platform is a tool at the service of the municipalities and partners of Lyon Metropolis area which allows them to have reliable information to design, implement and evaluate their actions on the territory.

- Leverage the economic potential of public data at the heart of the digital economy. By providing their data, Lyon Metropolis and its partners are looking forward to encourage experimentation, innovation and the creation of services in the area. The goal: to improve the daily life of the inhabitants.

- Encourage citizen participation and enable them to better interact with the public authorities. The dissemination of data responds to a concern for transparency and allows citizens to better understand public action.

By making its data available, Lyon Metropolis wants to both reinforce its public policies and improve the quality of services offered to citizens. In this context, Lyon Metropolis has built a dissemination strategy allowing broad ownership of data, while ensuring favorable conditions of innovation for entrepreneurship and service creation projects to the benefits of new lifestyles in the area.

Enedis will provide electricity consumption information to the Grand Lyon Data platform on a daily basis. Data will be about the electricity consumption in buildings, individual households (for customers who wish to participate), electric mobility stations, and at district level.

The data provided by Enedis will be aggregated and anonymized based on a series of criteria, further discussed in section 4.2 of the present document. And it's public diffusion or not will be determined subject to each use case defined for this project.

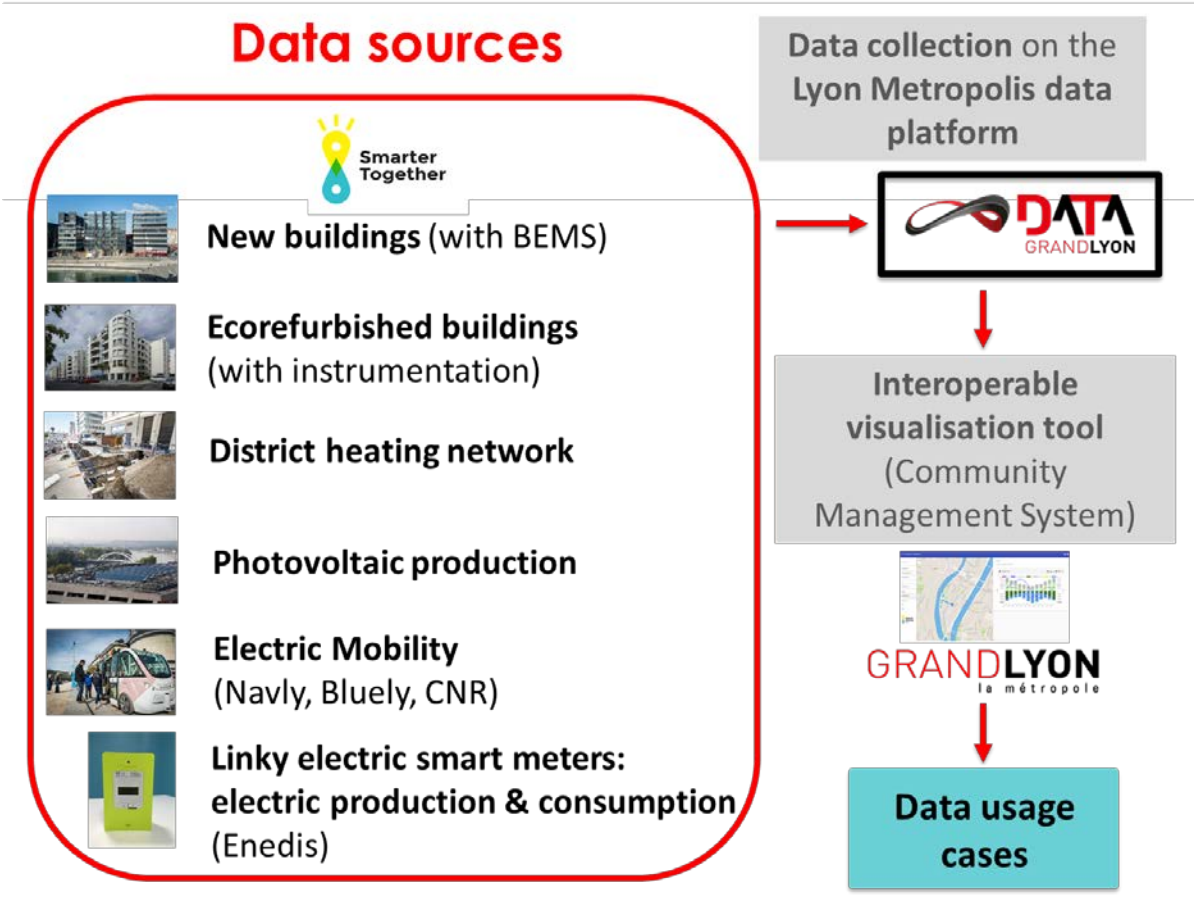


Figure 43: Data Grand Lyon data flows

4.2 Data Use Cases

In WP3, several use cases have been defined with partners for the electricity consumption, they are presented hereafter:

Use case 1: Monitoring of consumption for a new building

- Purpose is to compare real data to the objectives that were fixed by the new regulations.
- Data will be provided directly by the properties including electrical data with the BMS (Building Management Systems) and some of the data pertaining to Linky will be provided by Enedis.
- Data will be provided on a monthly basis

Use case 2: Monitoring of consumption for a renovated building

- Purpose is to evaluate the overall performance of the building in addition to the operating tool of the communal property
- Users (owners and tenants) will grant their consent to participate as instated on the European Program framework

PARAMETER	CASE DESCRIPTION		
Geographical Scope	5 to 7 buildings of 25 households + 200 households (building set - cité)		
Customer Scope	Building *Households + common areas*	Common area meters 1 or several	Common area meters *1 or several*
Data Nature	Aggregated consumption (gross sum of consumptions) or Anonymized Consumptions (median...) or calculated indicators (gradient...)	Charge Curve *individual or aggregated*	Consumption *individual or aggregated*
Time step	day	10 min	day
Periodicity of data sharing	D+2	D+2	D+2
Client consent	according to the calculation method	required	required
Data Sharing	private	Private	Private

Building ID	Hexaline		
Data Sharing Duration	Project	Project	Project

Table 1: Use case 2 Specifications

Use case 3: Monitoring of consumption for individual households upon consent agreement

- Objective is to encourage and develop a more conscious and virtuous energy consumption behavior in eco-renovated buildings

PARAMETER	CASE DESCRIPTION
Geographical Scope	Potentially 125 households maximum *5 to 7 buildings*
Customer Scope	Individual Linky Meter
Data Nature	Consumption
Time step	Day
Periodicity of data sharing	D+2
Client consent	Required
Data Sharing	Private
Building ID	RMP
Data Sharing Duration	Project

Table 2: Use case 3 Specifications

Use Case 4: Monitoring of consumption for a Neighborhood

- Purpose is to evaluate the achievement of goals in the World Wildlife Fund's (WWF) action plan
- Monitoring on neighborhood via development of a performance dashboard
- Obtain data sets for R&D purposes

PARAMETER	CASE DESCRIPTION		
Geographical Scope	Confluence Neighborhood 8000 habitants	30 clusters	Confluence Neighborhood 18 LV producers
Customer Scope	Residential + Business	Residential + Business	Producers

Data Nature	Consumption	Consumption	Production injected and self-consumed (PV + cogeneration)
Time step	Day	Day	Day
Periodicity of data sharing	D+2	D+2	D+2
Client consent	Not Required	Not Required	Not Required
Data Sharing	Public	Public	Public
Data Sharing Duration	Project	Project	Project

Table 3: Use case 4 Specifications

Use case 5: Monitoring of consumption for electric mobility (Electric Vehicles)

- Purpose is to follow up on the level of use and the environmental impact of the different electric vehicle systems (shuttle and charging stations)

PARAMETER	CASE DESCRIPTION		
Geographical Scope	Public Electric mobility on Confluence		
Customer Scope	1 CNR station	3 Bluely stations	1 Navya station
Data Nature	Charge Curve	Charge Curve	Charge Curve
Time step	30 min	30 min	30 min
Periodicity of data sharing	D+2	D+2	D+2
Client consent	Required	Required	Required
Identification	RMP	RMP	RMP
Data Sharing	For neighborhood evaluation	For neighborhood evaluation	For neighborhood evaluation
Data Sharing Duration	Project	Project	Project

Table 4: Use case 5 Specifications

4.3 Enedis daily data provision service

In order to help achieve the objectives of WP3, Enedis has developed a data providing service to feed the necessary consumption data to the Data Grand Lyon platform. This service is called "Provision of daily measurement data of consumption or production sites connected to the public distribution network managed by Enedis" as the periodicity of the data required for most is daily.

Enedis is able to provide consumption information gathered via the smart Linky meter 48 hours after it was measured. Enedis requires this time to make sure that the data provided is sufficiently aggregated, verified and that it complies with data confidentiality rules.

The provision of daily measurement data of consumption or production service allows communities to have different types of energy data measurements available.

Enedis in coordination with the CNIL (National Commission for Informatics and Liberties) has implemented several protection mechanisms in order to guarantee data protection against a possible risk of data reconstitution.

More specifically, the level of data protection depends on the following criteria:

Nature of requested data:

- Extraction or Injection
- Consumption / production issued from indexes or Charge curves

Size of the sets of RMP for which the data is requested and the final usage of the data by the customer and accessibility of the data:

- Public Usage
- Restricted usage (sharing of data restricted to the utmost strict needs of the project which excludes all public sharing of the targeted data by any means and excluding all diffusion to a third party or public diffusion)

Data available subject to previous gathering of consent by the customer

Consumption Data → public or restricted usage:

Nature of requested data	Required number of RMP	Form of publication of data available to the customer
Daily consumption issued from indexes	Any Set size	Sum of individual consumption all of the RMP in the set Consumption of the set of RMP in rounded up quartiles (including median) Simple individual data
Daily Extraction measurement curve 30' step	Any Set size	Synchronous extraction Charge curve for the complete set of RMP

Production data → public or restricted usage:

Nature of requested data	Required number of RMP	Form of publication of data available to the customer
Daily consumption issued from indexes	Any Set size	Sum of individual production of all the RMP in the set Simple individual data
Daily Production measurement curve 30' step	Any Set size	Synchronous production Charge curve for the complete set of RMP

Data available without need of consent by the customer

Extraction Data → public usage:

Nature of requested data	Required number of RMP	Form of publication of data available to the customer
Daily consumption	≥ 101 RMP	Sum of individual consumption of the RMP in the set Consumption of the set of RMP in rounded up quartiles (including median)
	≥ 101 RMP	Consumption of the set of RMP in rounded up quartiles to KWh (including median)

Extraction data → restricted usage:

Nature of requested data	Required number of RMP	Form of publication of data available to the customer
Daily consumption	≥ 11 RMP	Sum of individual consumption of the RMP in the set Consumption of the set of RMP in rounded up quartiles (including median)
	≥ 11 RMP	Consumption of the set of RMP in rounded up quartiles (including median)

Production data → public or restricted usage:

Nature of requested data	Required number of RMP	Form of publication of data available to the customer
Daily production	≥ 11 RMP	Sum of individual injection of the RMP in the set Production of the set of RMP in rounded up quartiles (including median)
	≥ 11 RMP	Production of the set of RMP in rounded up quartiles (including median)

Thanks to the Linky smart meter, the data aggregates of electricity consumption fulfilling the previously described use –cases will be periodically sent to the Grand Lyon Data platform and viewed with the Community Management System of La Confluence district.

5. Conclusions

The deployment of the smart meters is part of the cross-cutting ICT solutions implemented as part of the goals of the WP3.

The Linky smart meter, designed by Enedis, uses PLC technology to communicate electricity production and/or consumption data to the distribution network operator. Several benefits for all stakeholders have been exposed, for instance in the case of residential customers these include billing based on real electricity consumption, access to a free web portal and smartphone application to monitor and compare the energy consumed at various time periods. The deployment of Linky meters in France will involve 35 million customers by 2021, today over 7 million Linky meters are installed in France.

The deployment in La Confluence area today exceeds 5 000 meters and is planned to be fully equipped by February 2018. The complexities of such a big industrial deployment made it complex to adapt to the needs of the Smarter Together project. However the effort to adapt deployment plans has been carried out within acceptable parameters and minimal impact to the project as a whole.

The national massive roll-out of the Linky smart meters in La Confluence area were initially planned for the fourth quarter of 2017. Given the complexity of adapting a 35 million meter deployment plan, Enedis has been able to advance the deployment in La Confluence area to begin in July 2017 and should end by February 2018. This deployment plan achieved has nevertheless required a delivery delay for the present report

Currently 75% of the deployment objective is achieved. The deployment is well on track, and expected to be completed by the end of February.

The electricity data that will be transmitted to the Data Grand Lyon platform includes five use-cases:

- Monitoring of consumption for a new building
- Monitoring of consumption for a renovated building
- Monitoring of consumption for individual households upon consent agreement
- Monitoring of consumption for a Neighborhood

Enedis has developed a solution to provide information to the platform, called daily data provision service, which transmits daily measurements which respect data privacy and security issues.

Thanks to the Linky smart meter, this information available through the portal will contribute to establish the energy profile of La Confluence district.

The activation will allow for the daily data provision service set up by Enedis to provide data to the Community Management System in order to monitor the actual effects and benefits of measures implemented in La Confluence area to reach the zero carbon goal.

It will enable the citizens to engage on a more responsible and well informed electric consumption.

One of the key element for the success of the current deployment has been the commitment of the local authorities, the project has been supported thoroughly by the political and public stakeholders and this has been a very important factor in keeping with the projects goals.