SMART ELECTRIC LYON

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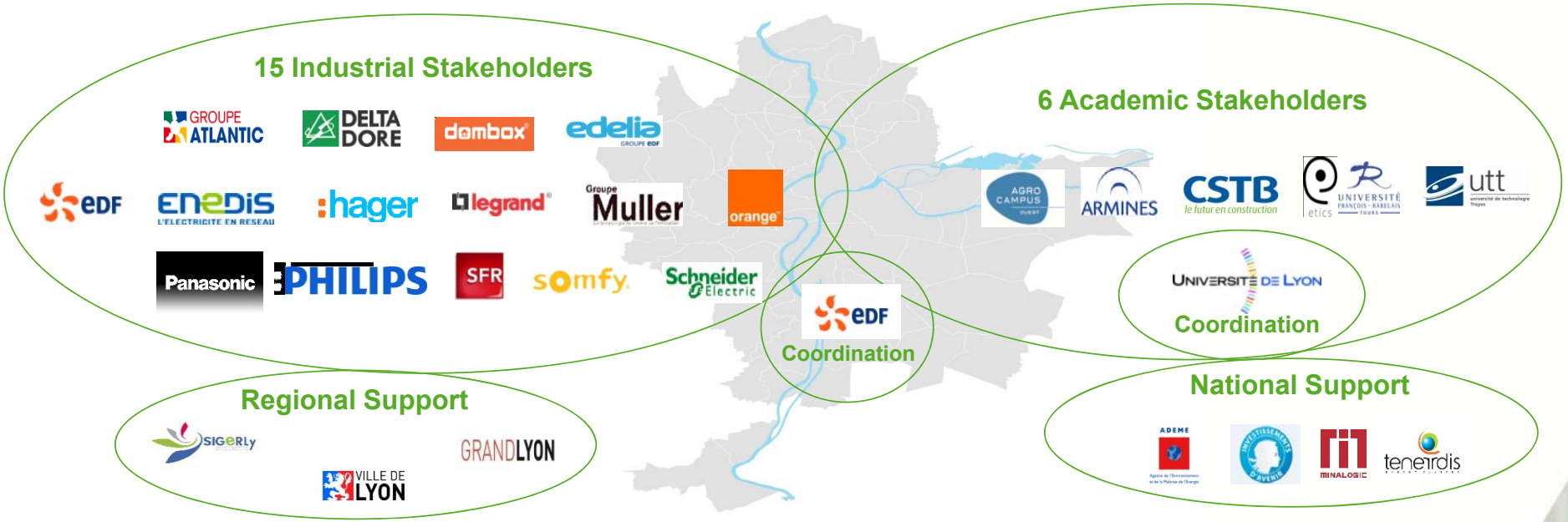
Smart Electric Lyon
> An « open » and « systematic » innovative mechanism combining industrial and research issues



… To develop

… To experiment

… To assess

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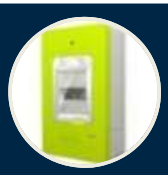
> Main results

20 500 households have participated in a customer's engagement program

4 GWh saved



150 households have been testing
18 different technical solutions

104 hours per year have been cut off

50 tertiary buildings in experiment and
2 public lithening zones

4 GWh saved

- 30% in average for energy consumption

The Local Radio Transmitter

12 partners,
Licencing process

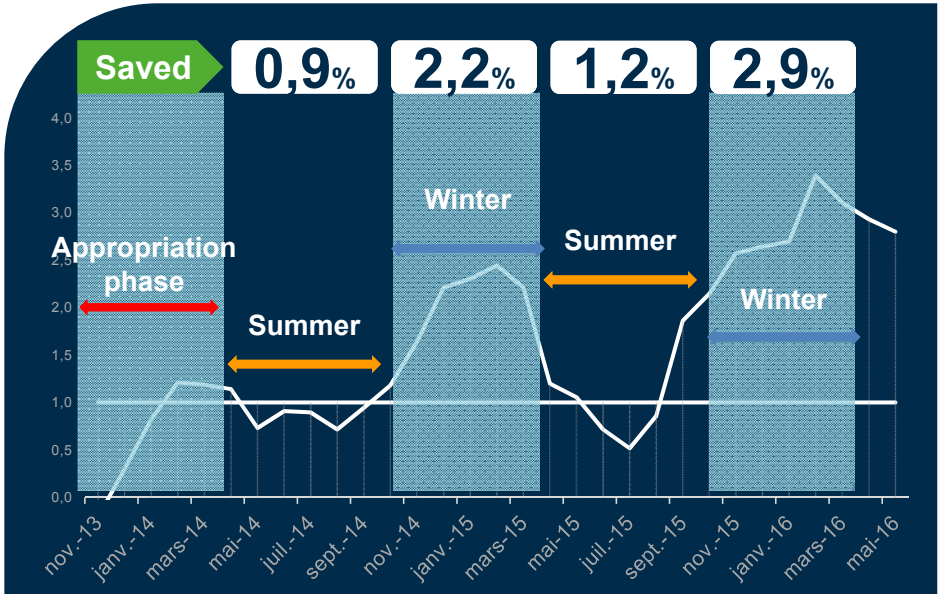
350 households have been testing
10 different tariffs

PENALTIES are more efficient than **REWARDS**
(but less attractive…)

5 Simulation tools

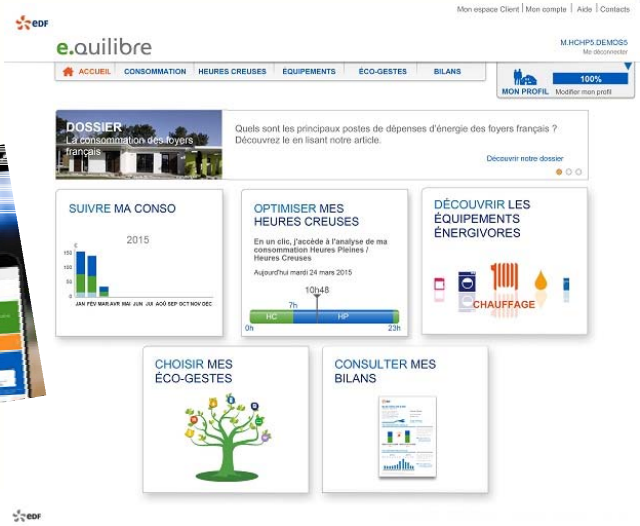
EDF SMACH
UdL / EDF diffusion of innovations
CSTB simulation of households cut-offs with and without tariff signals according to the price of electricity ont the spot market
ARMINES modelisation of 10 000 hourseholds and buildings of a distric of Lyon

Customer's engagement program
> An experimentation on 20500 households



4 GWh saved in **3** years

On the basis of this experimentation, EDF developped a service for residential customer

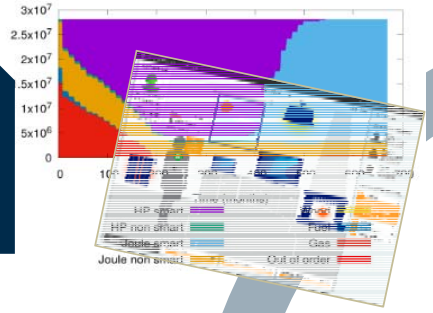


You can :

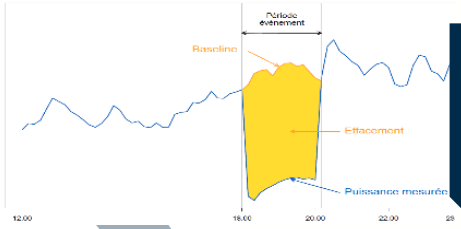
- ✓ **Follow your consumption and access monthly assessments**
- ✓ **Optimize your tariff**
- ✓ **Learn about the consumption of your appliances**
- ✓ **Learn about eco-friendly gesture**

Example of collaborative scientific analysis
> Customers'appropriation of technical systems

Simulation
models allowing the analysis of the diffusion of innovations or human behavior

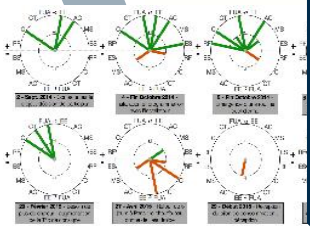


Statistics
Validation of the way the customer consumed and used his technical system



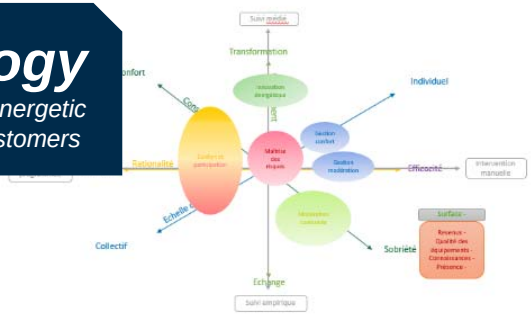
Behavioural Economy
Analysis of the customers'dispositions to pay for services

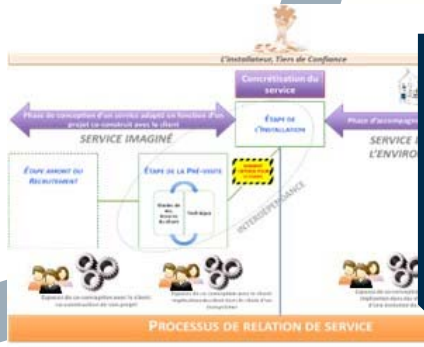
Each scientific discipline analyses the customer's ownership of the technical solution



Ergonomics of clients
Analysis over a long lapse of time of the interactions of the cutomer with his technical solution

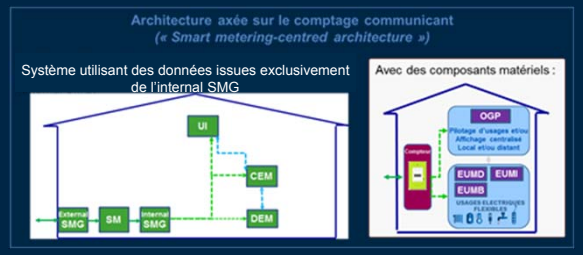
Sociology
Analysis of the energetic project of the customers





Ergonomics of service
Analysis of the link between the customer, the installer and the technical system in order to have a personnalized and efficiant service

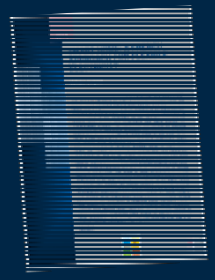
Normalisation and standardisation



4 functional architectures

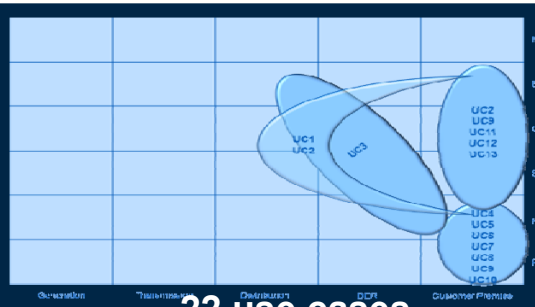
3 functional architectures for Smart Home

1 functional architecture for Smart building



1 COSEI/EDF white paper on the use cases

Description of the **8 B2C use cases**



22 use cases

IEC

8 B2C

14 B2B

2 white papers about French meters

Linky PME-PMI

ZigBee® Alliance

Local Radio Transmitter

Standardisation of the data of the Linky meter, can be used with other radio protocols

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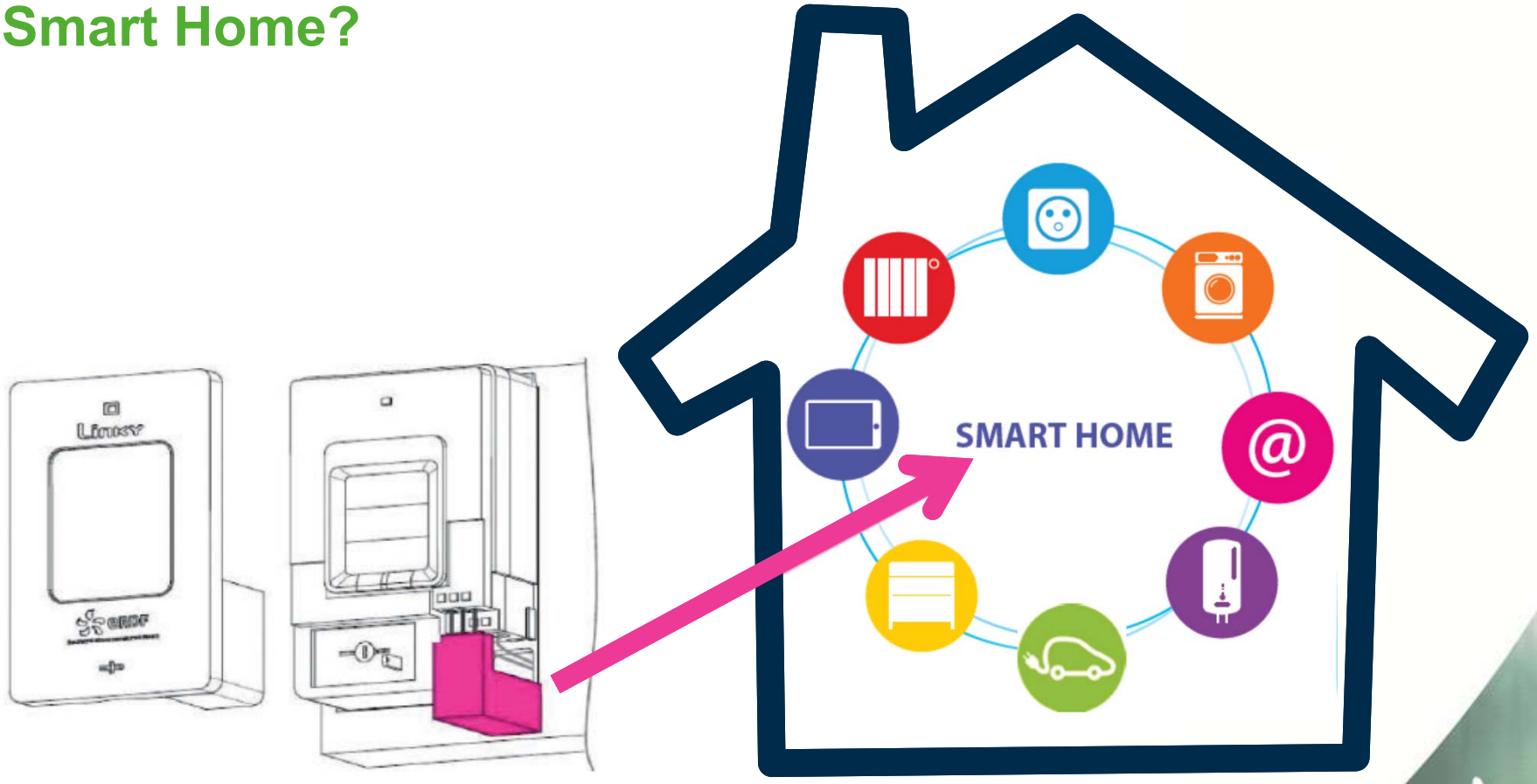
The Local Radio Transmitter
> How to enable the smart meter to communicate in real time with the Smart Home?



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> Planning

2011 2012 2013 2014 2015 2016 2017

ADEME

Submission of an application

Main steps

End of the demonstrator

Meetings with clients

Technical releases

COSEI use case white paper

First LRT prototype

Final release of the LRT specifications

Use Cases IEC standardisation

150 households have been testing

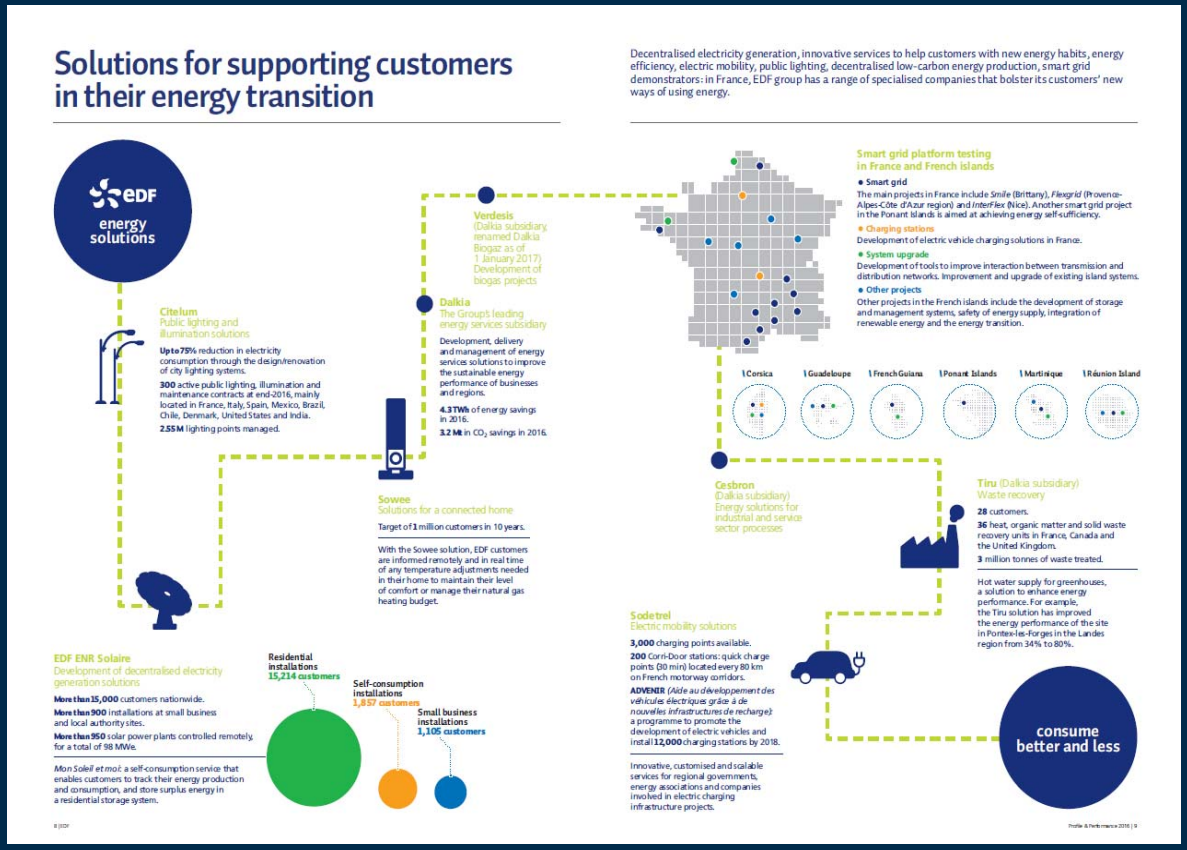
18 different technical solutions

Tariffs

350 households have been testing

10 different tariffs

> Why EDF as a coordinator for such a demonstrator and an active member of the demonstrator?



Solutions for supporting customers in their energy transition

Decentralised electricity generation, innovative services to help customers with new energy habits, energy efficiency, electric mobility, public lighting, decentralised low-carbon energy production, smart grid demonstrators: in France, EDF group has a range of specialised companies that bolster its customers' new ways of using energy.

EDF energy solutions

Citelum
Public lighting and illumination solutions

Up to 75% reduction in electricity consumption through the design/renovation of city lighting systems.

300 active public lighting, illumination and maintenance contracts at end-2016, mainly located in France, Italy, Spain, Mexico, Brazil, Chile, Denmark, United States and India.

2.55 M lighting points managed.

Verdesis
(Dalkia subsidiary renamed Dalkia Biogaz as of 1 January 2017)
Development of biogas projects

Dalkia
The Group's leading energy services subsidiary

Development, delivery and management of energy services solutions to improve the sustainable energy performance of businesses and regions.

4.37 TWh of energy savings in 2016.

3.2 Mt in CO_2 savings in 2016.

Sowee
Solutions for a connected home

Target of **1** million customers in 10 years.

With the Sowee solution, EDF customers are informed remotely and in real time of any temperature adjustments needed in their home to maintain their level of comfort or manage their natural gas heating budget.

EDF ENR Solaire
Development of decentralised electricity generation solutions

More than 15,000 customers nationwide.

More than 900 installations at small business and local authority sites.

More than 950 solar power plants controlled remotely, for a total of 98 MWe.

Mon Soleil et moi: a self-consumption service that enables customers to track their energy production and consumption, and store surplus energy in a residential storage system.

Residential installations **15,214 customers**

Self-consumption installations **1,857 customers**

Small business installations **1,105 customers**

Smart grid platform testing in France and French islands

- **Smart grid**
The main projects in France include *Smile* (Brittany), *Flexgrid* (Provence-Alpes-Côte d'Azur region) and *InterFlex* (Nice). Another smart grid project in the Ponant Islands is aimed at achieving energy self-sufficiency.
- **Charging stations**
Development of electric vehicle charging solutions in France.
- **System upgrade**
Development of tools to improve interaction between transmission and distribution networks. Improvement and upgrade of existing island systems.
- **Other projects**
Other projects in the French islands include the development of storage and management systems, safety of energy supply, integration of renewable energy and the energy transition.

Corsica | Guadeloupe | French Guiana | Ponant Islands | Martinique | Réunion Island

Cesbron
(Dalkia subsidiary)
Energy solutions for industrial and service sector processes

Tiru (Dalkia subsidiary)
Waste recovery

28 customers.

36 heat, organic matter and solid waste recovery units in France, Canada and the United Kingdom.

3 million tonnes of waste treated.

Hot water supply for greenhouses, a solution to enhance energy performance. For example, the Tiru solution has improved the energy performance of the site in Pontenx-les-Forges in the Landes region from 34% to 80%.

Sodetrel
Electric mobility solutions

3,000 charging points available.

200 Corri-Door stations: quick charge points (30 min) located every 80 km on French motorway corridors.

ADVENIR (*Aide au développement des véhicules électriques grâce à de nouvelles infrastructures de recharge*): a programme to promote the development of electric vehicles and install **12,000** charging stations by 2018.

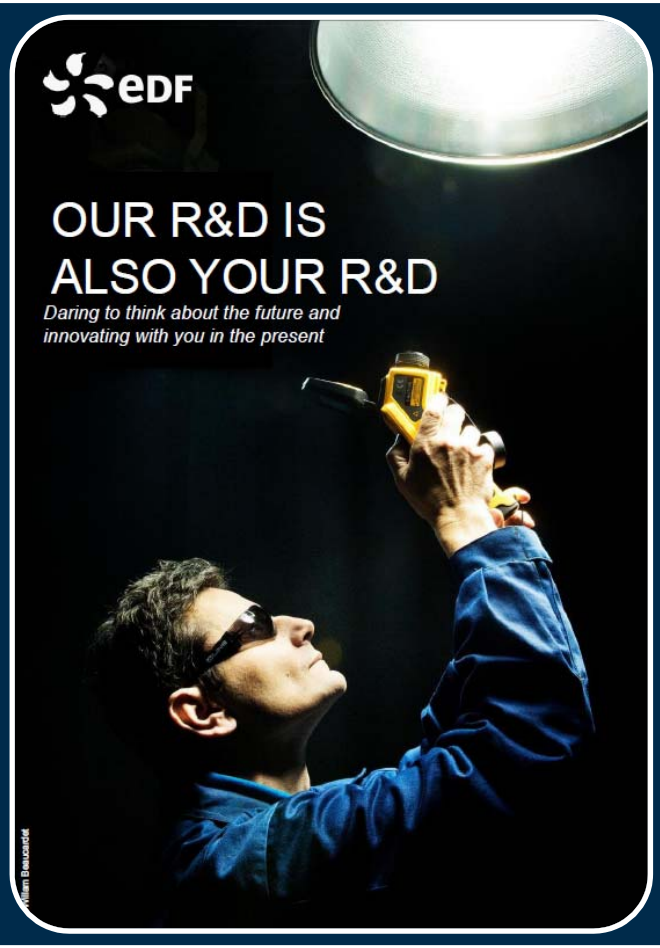
Innovative, customised and scalable services for regional governments, energy associations and companies involved in electric charging infrastructure projects.

consume better and less

EDF was involved in more than 20 demonstrators for the past 5 years dealing with Energy Transition and Digital Transition

A large variety of topics were approached such as network management questions, inserting renewable energies on the network, smart meter, customer engagement, new design of tariffs,… dealing with a lot of data

Do you want to know more about EDF R&D or Smart Electric Lyon?
> We have the answer!



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BILAN DU DÉMONSTRATEUR
SMART ELECTRIC LYON

SMART ELECTRIC LYON
Pour vivre l'énergie simplement

Les auteurs : Nicolas PHILIBERT, Alain MARTI et Philippe GOUY

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Coordination
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Investissement d'avenir *Soutiens*

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THANK YOU FOR YOUR ATTENTION

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