PRESS KIT

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think SMARTGRIDS

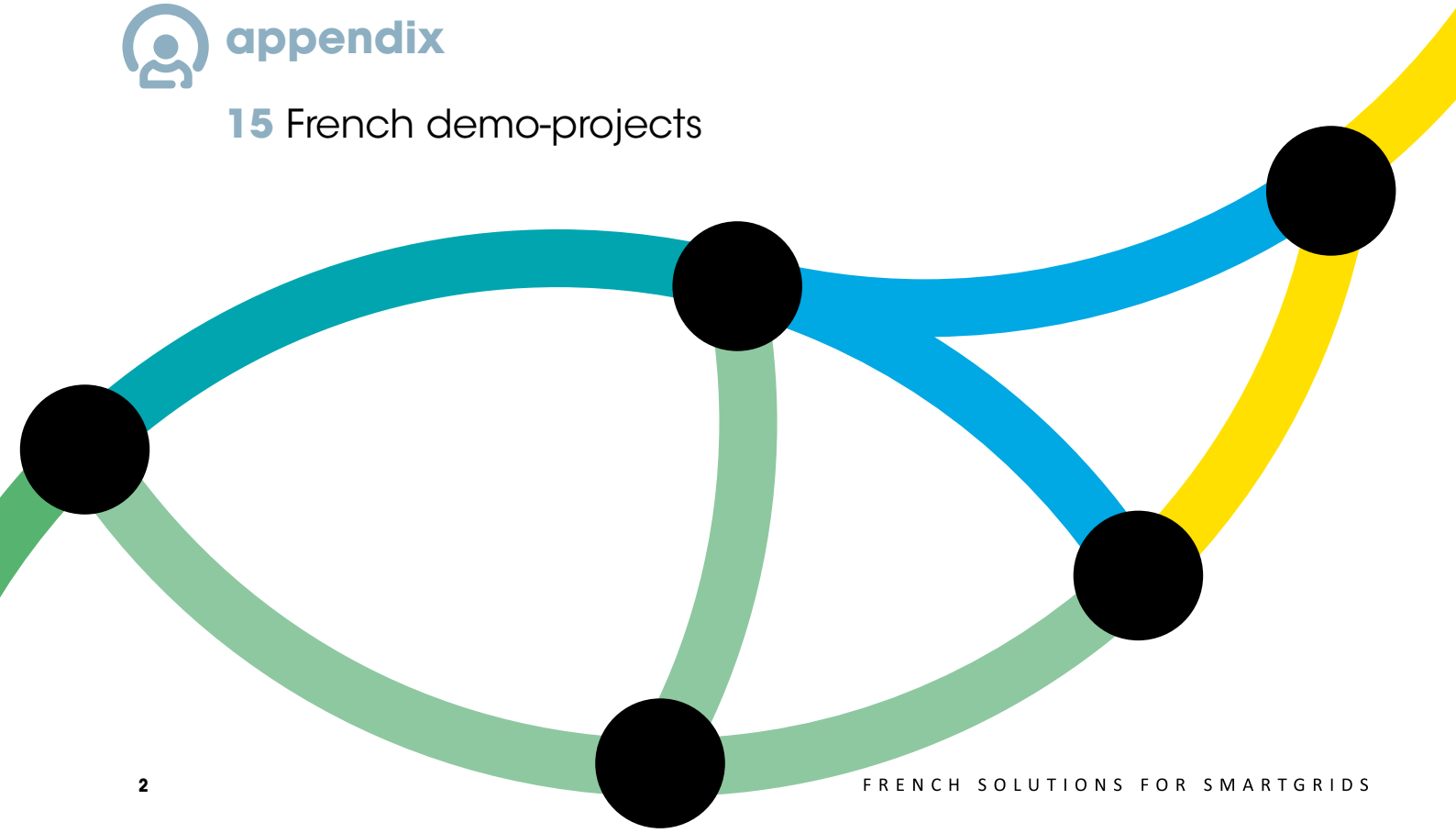
FRENCH SOLUTIONS FOR SMARTGRIDS

contents

about Think Smartgrids

achievements

appendix



Presentation / Think Smartgrids

France has a well-structured and equipped smart grid ecosystem allying industrial groups, SMEs and startups with universities, schools, research centers and labs. Over 120 demo-projects have been launched across the country since 2008 and France is one of Europe's top investors in smart grid R&D, with more than 120 million euros in investment.

Created in April 2015, Think Smartgrids federates and represents the French smart grid ecosystem, with a hundred members from the entire smart grids value chain: electronic engineering, utilities, automation, telecommunication equipment and information systems, business models, training, and regulation.

The association federates the French smart grid sector in France and develops international partnerships through MoUs and its participation in exhibitions and events. Think Smartgrids is a member of the Global Smart Grid Federation.

Think Smartgrids is chaired by Olivier Grabette, member of the Executive Board of RTE (France's TSO). Its first Vice-President is Philippe Monloubou, Chairman of the executive board of Enedis (DSO) and its second Vice-President is Hugues de Bantel, co-founder and CEO of Cosmo Tech.

Ecosystem expertise / Think Smartgrids

ASSOCIATED MEMBERS

ABB, Accenture, Atos, Capgemini, CEA Tech, EDF, Enedis, EY, GE Grid solutions, Gimélec, INP Grenoble, Mines ParisTech, Nokia, Omexom (Vinci), RTE, Sagemcom, Schneider Electric, Siemens.

OBSERVING MEMBERS

DGE (Direction Générale des Entreprises),
CRE (Commission de Régulation de l'Énergie).

PARTNER MEMBERS

Actia, Altana, Amiens Cluster, Arc Informatique (PC Vue Solutions), Artelys, B2020, Bearing Point, Blue Solutions, Groupe Cahors, CIAC International Technologies, Colombus Consulting, CosmoTech, DCBrain, Efficacity, Elum Embix, Enea, Ensto Novexia, EPI, I.C.E, IDEX Services, Itron, Keynergie, Landis+Gyr, Metal Deploye Resistor, Michaud, Nexans, Odit-e, OFATE, Orange Business Services, Promotelec, PWC, Saft Batteries, Senseor, SenX, Setec, Sia partners, Sicame Group, Smartside, SMILE, SNG Consulting, Socomec, Total, Trialog, Union Française de l'Électricité (UFE), Voltalis, Wavestone, Yélé Consulting, 3M.

ELD : ES Réseaux.

Schools, Research centers and labs: Centrale Supélec, École des Ponts ParisTech, École Polytechnique, L2EP, Laboratoire National de métrologie et d'Essais (LNE), SEE, SNCF Cluster Innovation & Recherche, Université de Montpellier.

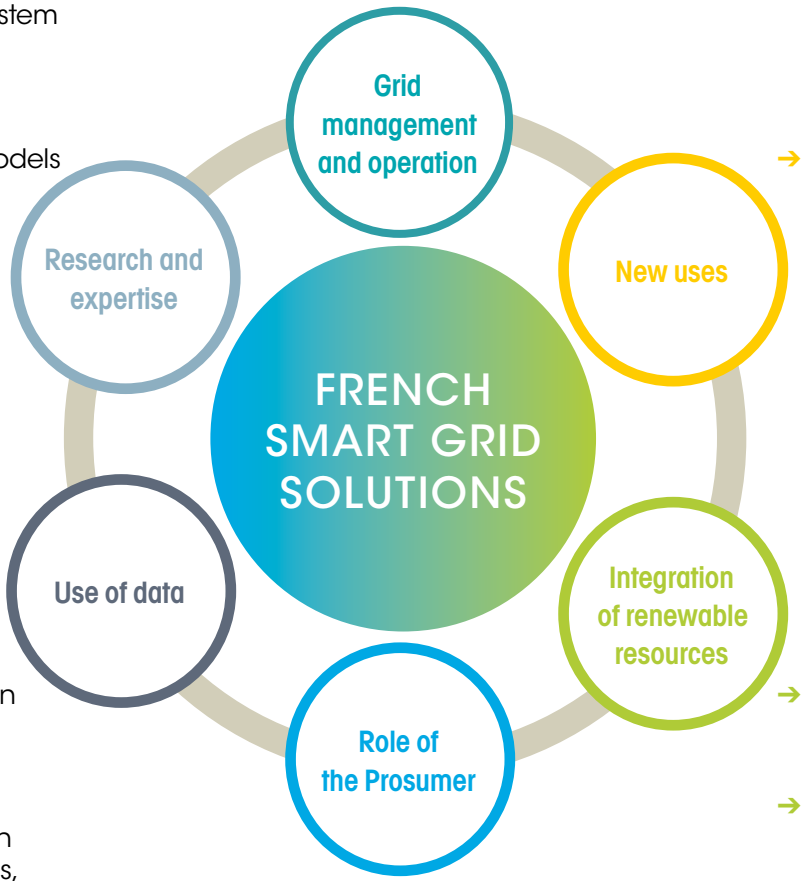
Innovation centers: CapEnergies, Derbi, Fibres Energivie, Images & Réseaux, Médée, Minalogic, S2e2, Tenerrdis.

FRENCH SMART GRID SOLUTIONS

- Grid operation: observability, remote operations, dispatching, supervision, flexibility, quality of supply, and safety
- Asset management: economic performance, maintenance and modernization of infrastructures
- Comprehensive microgrid solutions
- Reduction of technical losses

- Multi-criteria cost–benefit analysis: environmental, societal and economic
- Audit and expertise of the electric system
- Advice on the implementation of new markets and business models
- Training of users and decision -makers

- Solutions for Smart Buildings / Smart Factories
- Electric mobility: charging stations, V2G, smart charging, batteries...
- Design and construction of Smart city networks



- System operation (data and open data)
- Management and optimization of public policies, predictive and prescriptive analysis…
- Smart meter data value-creation
- Cyber security

- Integration of renewable energies into the grid
- Implementation of smart connections: grid code, load shedding…
- Contribution to cost-effective energy transition

- Role of the prosumer in flexibility, demand response, auto-consumption, storage…
- Deployment of smart metering and multi-metering systems
- Reduction of non-technical losses

10%
of the Global market share

Over 100 members

+20,000 jobs

in France in 2020

€200 million
invested in large scale deployment
(Smile, Flexgrid, You & Grid)

> 120
demo-projects
in France

Turnover x2
between 2014 and 2020

€130 million
in **R&D**/year

€75 billion
global revenue in 2020

€6 billion
in revenue

in France
incl. **50%** in export

Board

Olivier GRABETTE
Président, Chairman of Think Smartgrids and Member of the Executive Board of RTE.

Valérie-Anne LENCZNAR
Managing Director of Think Smartgrids.

Philippe MONLOUBOU
Vice-président of Think Smartgrids and Chairman of the Board of ENEDIS.

Hugues de BANTEL
Vice-président of Think Smartgrids, co-founder and CEO of Cosmo Tech.

Antoine de FLEURIEU
Treasurer of Think Smartgrids, Managing Director of Gimelec.

A Scientific council and four committees

In order to meet the needs of the French smart grid sector as closely as possible, Think Smartgrids relies on a Scientific Council and four Commissions, chaired by recognized personalities and made up of industry representatives.

Nouredine HADJSAID
President of the scientific council, professor at Institut polytechnique of Grenoble.

He is in charge of educating the association on his technological choices and participates in the definition of priorities for R&D in the French smart grids sector.

Andrea MICHIORRI
President of the training committee, professor and research laboratory director at Mines Paris Tech.

He works with members on the development of continuing education and certification training in the field of smart grids.

Philippe VIÉ
President of the Territories and Innovation committee. Deputy director of the chemicals, utilities and energy sector at Capgemini.

The Territories and Innovation Commission is in charge of benchmarking the best solutions adopted by smart territories on energy, and proposing innovative business models.

Julien PELCOT
President of the International Committee, Sales Director for Ge Grid Solutions.

The International Commission coordinates interaction with foreign delegations interested in French know-how in the smart grid industry. It organizes the representation of the French smart grids industry in the context of international events and exhibitions.

Yves BARLIER
head of the *Institutional relations* working group, Director of the Enedis "Smart Solutions Industrialization" program.

This group establishes the topics on which the association will express itself and proposes position papers.

Achievements / 3 industrial projects

The large-scale deployment of smart grids is a major challenge. FLEXGRID, SMILE and YOU & GRID are three French projects deployed on a regional scale, initiated as part of the government's smart grid plan in 2014, with several sources of both private and public funding and investments. They bring together all French smart grid stakeholders around a common aim: to build a technological showcase to facilitate regional development.

3 industrial projects on a regional scale: FLEXGRID, SMILE, YOU & GRID

The large-scale deployment of technological solutions close to industrial maturity aims to perpetuate the dynamic initiated by the numerous experiments carried out on the French territory, and in particular the demonstrators supported by ADEME's Future Investments Program to the tune of 50 million euro.

The objective of this large-scale deployment is to organize a coherent set of smart grids solutions, in the most adapted areas, so as to efficiently mobilize the public funds and investments of grid operators. These three projects make it possible to accelerate the deployment of smart grids and to demonstrate the viability of the solutions provided by the French industrial sector.

Flexgrid

Flexgrid is a project supported by the Provence Alpes Côte d'Azur region, and brings together a dozen partners: the Nice-Côte d'Azur ~~and Marseille Provence~~ metropolises, the Alpes de Haute Provence region, the Pays "Serre-Ponçon Ubaye Durance", Provence-Verdon County Council, ~~eDF, CeA,~~ General Electric, STMicroelectronics, Orange, Caisse des Dépôts and two competitiveness clusters, Capenergies and Solutions Communicantes Sécurisées.

It includes ~~27~~ territorial projects and 6 transversal projects for a budget estimated at over 150 million euro, shared between public and private investments. The ~~project focuses on~~ self-production and selfconsumption of photovoltaic energy, synergies between renewable energies, ~~management of the charging of electric vehicles,~~ territorial projects of energy optimization, with in particular, the implementation of the Nice Smart Valley project, as well as cooperation projects between photovoltaic, wind and hydroelectric power plants to smooth out intermittent production.

Smile

By 2020, Smile must make western France the pioneer territory for the large-scale development of smart grids.

Smile, deployed in the west of France, covers two regions (Brittany and Pays-de-la-Loire), 3.4 million inhabitants, several islands, two large cities (Nantes and Rennes), a growing EnR production and the highest potential for marine renewable energy in France.

At the crossroads between energy and digital transitions, smart grids will provide solutions to this pioneering territory, representative of different energy situations. The aim is to massively integrate and store renewable energies, to improve flexibility and demand management, to develop electric mobility, and to secure networks and the supply of electricity.

44 projects, nearly 200 stakeholders and 100 companies are involved. This new dynamic already foreshadows the emergence of a real industrial sector, with investments totaling €240 million. The SMILE smart grids showroom opened in 2019, in Rennes and Nantes.

You & Grid

You & Grid aims to develop piloting tools and to experiment with new uses in 15 municipalities of the European metropolis of Lille.

You & Grid will experiment with viable models for communities, retailers and end users from solutions based on already proven digital techniques.

One of the pilots will focus on the self-consumption of photovoltaic energy in areas that include businesses, administrations and communities such as the port of Lille. In this territory with a population of 200,000, it will be necessary to study the feasibility of consuming locally produced energy, on the spot.

You & Grid will also work on the control of electrical terminals and the optimization of flexibility management by adjusting consumption depending on the network.

You & Grid will particularly rely on the implementation of the Lille metropolis So Mel So Connected project.

International Partnerships

In 2018, a partnership was signed with the **India Smart Grid Forum (ISGF**) in India, during the presidential trip of March 2018, in the presence, in particular, of the Minister of Foreign Affairs and the Secretary of State for Energy Transition and Solidarity.

The experience of the French smart grid sector, through its 120 demo-projects and the large-scale deployment of the Flexgrid, SMILE and You & Grid programs, are all assets in this partnership.

Focusing on the state of Karnataka and the Kolkata region, the partnership was implemented in September 2018 through technical workshops, held in Bengalore and Kolkata, to develop a business flow between Indian and French companies.

At the same time, Think Smartgrids Training Commission will be supporting the implementation of exchanges between Indian and French students in the field of smart grids.

On October 31, 2018 **MASERA** (Microgrid for Affordable Sustainable Electricity in Remote Areas) was inaugurated in Singapore by the EDF-ENEDIS consortium, in which 3 other members of the association also participated: SAGEMCOM, SOCOMEC and ZINIUM.

This project follows a letter of intent signed by Think Smartgrids in March 2017 with Singapore's Nanyang Technological University (NTU), ranked among the top 15 higher education institutions in the world.

The micro-grid has a total production capacity of 200 KW and is one of the showcases of French technology in the world, but also one of the first concrete examples of micro-grid that could be duplicable in several regions of the world, and especially in areas without power grids, or in electrified areas that aim for a low-carbon transition.

In March 2018, a MoU was signed with the Senelec (Senegal) to facilitate the implementation of a smart grid association covering Senegal and its region.

A Think Smartgrids delegation met with key smart grid stakeholders in Senegal in June 2018.

Invest in Smartgrids

Think Smartgrids, in partnership with France Invest, has set up a yearly program of meetings between investment funds and startups / SMEs of the French smartgrids sector.

Invest in Smartgrids introduces SMEs and startups from the smart grid sector to interested investment funds during one-to-one 30-minute meetings.

This meeting enabled investment funds and stakeholders in the financial world to participate in the development of the smart grid market in France. They enabled about fifteen SMEs and smart grid startups to create first exchanges or to further fundraising projects.

In two years, the funding requirement envelope totaled 50 million euro to support projects such as energy demand management solutions, modeling and simulation platforms, industrial process energy performance analyses, or a solar production forecasting service.

R&D roadmap

Under the chairmanship of Nouredine Hadjsaid, professor at the Grenoble Institute of Technology, the Think Smartgrids Scientific Advisory Board drafted an R&D roadmap in 2017 for the French smart grid sector. It involves placing the following challenges at the heart of the industry's priorities:

- ➔ Energy transition
- ➔ Digital revolution
- ➔ Consumer expectations and societal challenges
- ➔ Climate change
- ➔ Export requirements

Economic and environmental analysis of smart grids

By 2030, the study estimates that the implementation of smart grids nationwide would provide benefits of up to 400 million euro per year for the country.

The *Socio-Economic Valorization of Smart Grids*, was published in July 2017 and draws on the experiences and expertise of Transmission and Distribution System Operators.

It was written by four contributors:

- ADEME, the Environment and Energy Management Agency, which led the study
- ADEeF, Association of Electricity Distributors in France
- Enedis, a public company that manages the electricity distribution network, responsible for connections, repairs, meter readings and interventions on the entire French electricity grid
- RTE, Electricity Transmission Network, is the French manager of the transmission network, at high and very high voltage

They analyzed and summarized the lessons learned from the many experimenters located throughout metropolitan France and overseas, as well as years of theoretical research, on the subject of smart grids.

This analysis is based on national data or on the extrapolation to a national scale of data collected on a local scale. The first conclusions relate to the economic aspect.

The study divides the application of smart grids on different sectors of electricity management in France and, for each case, analyzes the costs of installation and maintenance of a smart environment for this sector, reduced to one year, and the potential savings with this equipment. This makes it possible to determine the real advantage of this implementation on this specific sector.

As the study underlines, "these methodological approaches, relating to the perimeters of each of the grid operators, bring new answers that existing studies in France or Europe do not currently provide". An unprecedented approach and results which confirm the choices made in favor of smart grids.

Complete study downloadable on the ADEME website

Digital transformation of utilities

This first study, initiated by the Data and Digital Transformation working group of Think Smartgrids, aims to describe the progress of digitization projects for European utilities, use cases, obstacles and solutions to their deployment, by combining the viewpoints of transmission and distribution system operators, solution providers, and institutions.

In 2017 Think Smartgrids created a working group that focused on the **digital transformation of utilities**, with an emphasis on successfully identifying the keys to achieving this transformation.

The group brought together seventeen members of the association: Benjamin de Buttet (DC Brain) and Thomas Lacroix (Cosmo Tech), who led the study, as well as Acccenture, Atos, SenX (ex Cityzen Data), Colombus consulting, the CRE, Ecole des Ponts Paristech, GE Grid Solutions, Gimelec, Images & Networks, Nokia, RTE, Siemens, Strasbourg Electricité Réseaux, Trialog and Yélé.

The study's authors relied on a series of interviews conducted with approximately twenty key players (network operators, suppliers, associations, regulatory authorities). These interviews were cross-referenced with public data dating from July 2018.

The work of the Data and Digital Transformation working group has made it possible to draw up an inventory of the problematic expressed by network operators, by observing their response to changes in consumption patterns, the challenges of integrating renewable energies and the aging of their network infrastructure. Different use cases have been studied with the most pressing, including:

- **Flexibility management** uses information and communication technologies to better integrate new forms of decentralized production (renewable energies) and consumption (electric vehicles in particular), but also to optimize the use of storage energy tools (batteries, etc.) and network operation;
- **Asset Management,** to improve strategic and operational maintenance and investments on infrastructure, handle a growing amount of data of different types and models encapsulating human expertise, and develop condition-based maintenance strategies;

This first study has identified several essential questions for future research. How can the quality of the data gathered by utilities be improved? Where can the Chief Digital Officer be positioned in the new organization and what are the new skills that need to be integrated? How best to accompany the evolution of organizations to encourage agile approaches? How best to develop a roadmap around use cases with a high operational impact in relation to the energy transition?

The study concludes that all European operators surveyed have initiated at least one data-related project and are beginning to digitize their networks. In the future, new challenges remain, such as a more specific assessment of the return on investment of their projects and the integration of new skills into their organization.

Complete study downloadable on Think Smartgrids website

FRENCH DEMO-PROJECTS

Today, many "smart grid" experiments are being conducted in France, in particular through the projects supported by ADEME's Investments for the Future Program. The objectives of these projects are to test life-size features and services such as the contribution to local management of intermittent production, the variation in demand and any associated network constraints, as well as help to better control energy consumption.

A3M
Development of smart meters for local distribution companies.

Affícheco
Determine the impact of the display of energy consumption on savings.

BienVEnu
Experimentation of new solutions to connect charging stations in multi-family residences.

Concept Grid
A unique experimental platform to anticipate and accompany the transformation of electrical systems to smart grids.

Crome
Creation of a European interoperable platform on electromobility.
A Franco-German cross-border experience.

Eguise
Development of an ecosystem for global vehicle energy management from a given fleet of vehicles.

EPIT 2.0
Development of an open information system for the energy management of eco-neighborhoods and the cities of tomorrow.

Flexiciency
Experiment with services to meet energy demands.

IGREEBGRID
Massive integration of ENR on the distribution network.

Islet Amédée Saint-Germain
Experimentation of multi-energy smart grids.

Issygrid
Scaled energy optimization of a neighborhood.

Jupiter 1,000
Power to gas demo project to absorb surplus electricity produced on-site by four wind turbines (10 MW).

Millener
Improve the insertion of intermittent renewable energies in island areas.

Modelec
A project that tests several models of load shedding for consumers.

Nice Smart Valley (Interflex)
New solutions on the network to improve the reliability of a local electrical system.

Smart station
Optimization and digitization of an RTE transport substation in the presence of massive wind energy production.

Reflexe
Optimization of network management to facilitate the integration of photovoltaic and wind power.

Rider
Develop an innovative solution, combining ICT and energy challenges, in order to optimize the energy efficiency of a building or group of buildings.

Ringo
By 2020, 100 MW capacity storage at five sites, in order to absorb wind farm production peaks, instead of limiting their production.

Saint-Nicolas des Glénans
Local electrical system with 100% renewable energies.

Appendix

SMAC
Incentive for charging electric vehicles based on wind energy production forecasts and the state of the network.

SMAP
Facilitating the development of renewable energies in rural areas.

Smart Border Initiative (SBI)
1st cross-border Franco-German smart grid, with optimized integration of renewables, thanks to flexibilities and intelligent charging.

Smart Electricity
Test and improvement of a smart switchboard.

Smart Occitania
New solutions to accompany the energy transition in rural areas.

Smart ZAE
Demonstrate that an Economic Activity Zone can be an essential element of the smart grid.

Smarter Together
Community support solutions in an eco-district.

SoMel SoConnected
Models of activities relating to smart grid solutions in urban areas.

Watt and me
Providing the customer with power consumption data on a website.

COMPLETED PROJECTS

Ecolink
Analyze the behavior of electricity users and remotely control the equipment installed.

Greenlys
Upstream / downstream integration around the Linky smart meter in urban areas.

Houat and Hoëdic
Securing the power supply of two islands with optimized energy distribution.

InfiniDrive
Piloting charging infrastructures for electric vehicles.

Nice Grid
Contribution of a smart solar district. Manage consumption peaks and get the most of photovoltaics.

Premio
Optimization of real-time production and distribution by means of load management, electricity storage and called power management.

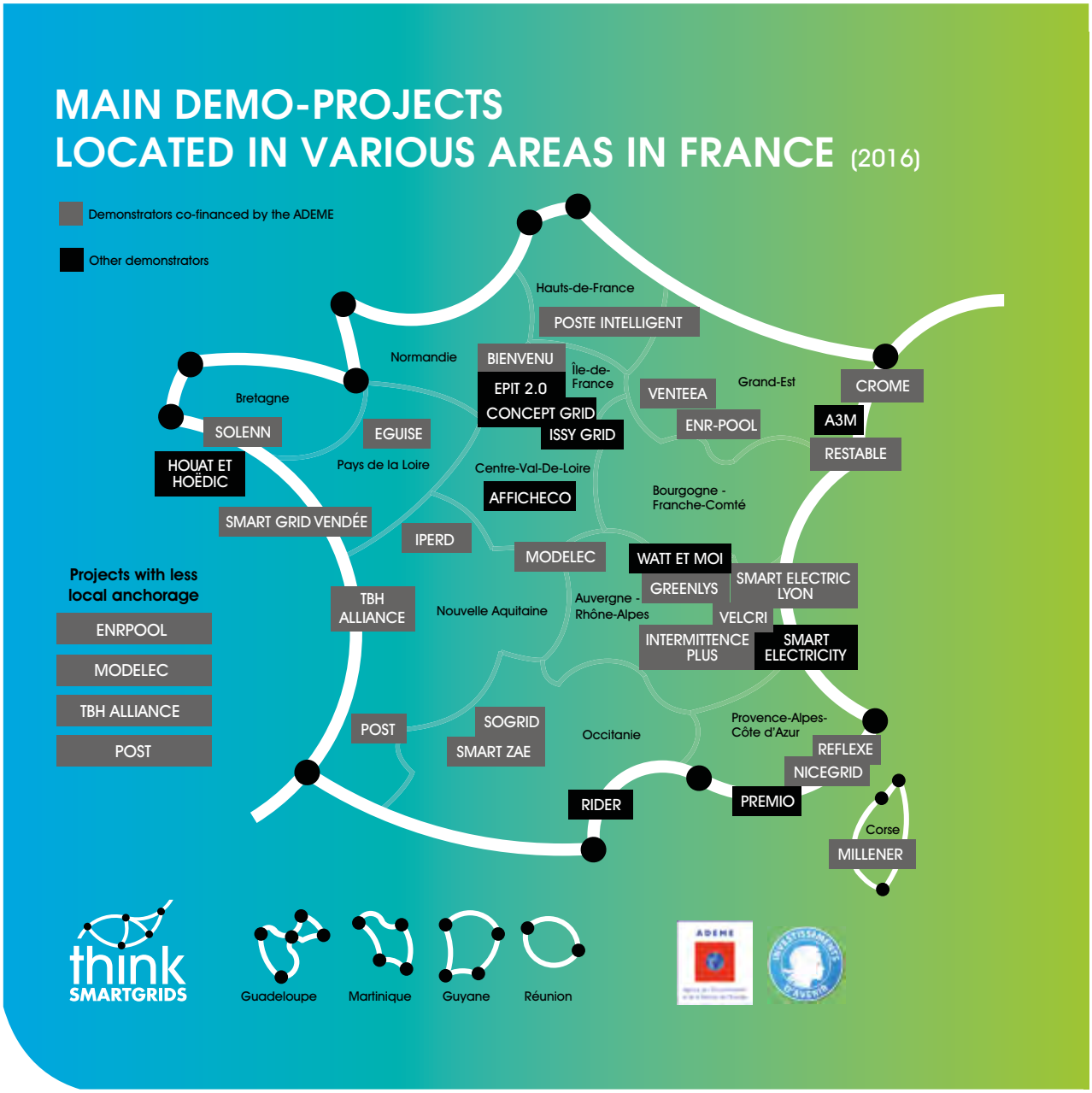
Smart Electric Lyon
Raising consumer awareness on the challenges of Demand side management.

So Grid
Development of a CPL (line carrier) communication chain for controlling the distribution network.

SOLENN
Demand side management actions across a territory and alternatives to load shedding.

Venteea
Integration of strong wind power generation capacities on a rural network.

SINCE 2008, MORE THAN 120 SMART GRID DEMO-PROJECTS HAVE BEEN BUILT/INSTALLED IN FRANCE.



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