FÓRUM LATINO-AMERICANO DE SMART GRID

SMART GRID

15ª EDIÇÃO

CENTRO DE CONVENÇÕES FREICANECA | 11 E 12 DE SETEMBRO DE 2023
SÃO PAULO - SP

Utilising Smart grids solutions to ensure Renewable Energy Sources integration into the French Grid

Régis Le Drézen
Managing Director of Think Smartgrids

think SMARTGRIDS

think SMARTGRIDS

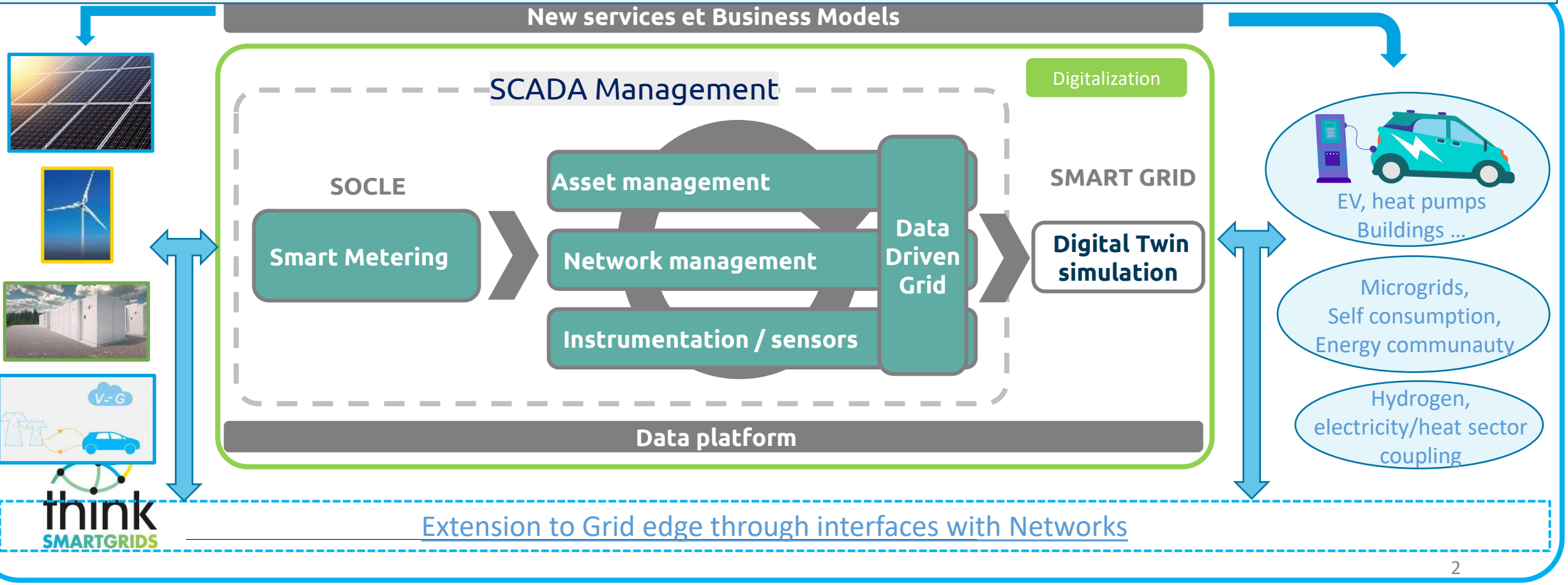
SCOPE OF OUR WORK ON SMART GRIDS

SMART GRID 15ª EDIÇÃO

Think Smartgrids represents and develops the French Smart Grids ecosystem, for the benefit of ***consumers***, the development of ***territorial economic activity***, and the ***energy transition***. It federates a hundred members from IT startups and electro-technical SMEs to grid operators, equipment manufacturers, digital services compagnies, universities and research laboratories.

The association develops international collaborations on behalf of its members and promotes solutions that contribute to ***energy efficiency*** and the ***reduction of energy consumption***, as well as to the ***security of supply*** and ***competitiveness of the electricity system***.

Think Smartgrids also advises the industry on the innovative solutions to be tested as a priority to prepare for the future.



Objectives : 11 SMART GRID USE CASES covered

Generation

- Integration and management of renewable energy
- Storage
- Flexibility of the means of generation (smart connection …)

Transmission

- Flexible transmission network management and operation

Distribution

- Flexible distribution network management and operation
- Demand – side management (smartmeter)

Consumption

- Smartcity lighting
- Electromobility (smartcharging points)
- Smart home
- Smart factory
- Smart building

THINK SMARTGRIDS, A FRENCH ASSOCIATION THAT BRINGS TOGETHER A FULL ECOSYSTEM

Observing members

COMMISSION DE RÉGULATION DE L'ÉNERGIE

DGE DIRECTION GÉNÉRALE DES ENTREPRISES

MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET DE LA COHÉSION DES TERRITOIRES

Associete members

RTE Réseau de transport d'électricité

ENEDIS L'ELECTRICITE EN RESEAU

ABB

accenture

CEA tech

Capgemini

EDF

EY Building a better working world

GE Grid Solutions

OMEXOM

GIMELEC

MINES ParisTech

Sagemcom

UGA Université Grenoble Alpes

sopra steria

Schneider Electric

partners members

3M

Aets apave

algorus CONSULTING ENERGY, STRATEGY & PROJECTS

ALTANA

APLINES

BCM Energy

Colombus Consulting

COSMOTECH

DATATEGY

efficacity

EIFFAGE

Energy Pool Smart energy management

ENSTO

Entech smart energies

Envision digital

EPI

FRACTAL ENERGY

GROLLEAU

homeys.io Lite

idex CARING FOR ENERGIES

institut smart grids

Itron

Landis+Gyr

Mobileese

naelis

Keynergie

Nexans BRINGS ENERGY TO LIFE

OFATE DFBEW

orange Business Services

PcVue Solutions

Quantmetry

Odit-e

STRASBOURG ELECTRICITE RESEAUX

STREiNN

SenX

setec

smartside smart metering and smart grid solutions

smile

Synapse Grid

SICAME Group

Voltalis

stations-e

roseau TECHNOLOGIES

SEED ENERGY

siapartners

Trialog

WAVESTONE

Clusters

Capenergies

UFE Union Française de l'Electricité

MEDEE Maîtrise Energétique des Entraînements Electriques

S2E2 SMART ELECTRICITY CLUSTER

School, research centers and labs

L2EP

CentraleSupélec

ifp SCHOOL

LNE

Université di Corsica Pasquale Paoli

École des Ponts ParisTech

École Polytechnique Université Paris-Saclay

LAAS CNRS

Xavier Piechaczyk

President of
Think Smartgrids,
CEO RTE

International Partnerships

APUA ASEA

SMART OTANIEMI

PLN

NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

GSEF Global Smart Energy Federation

think SMARTGRIDS

THE DECARBONATION OF OUR ELECTRICITY SYSTEMS REQUIRES MORE RENEWABLE ENERGY AND AN ELECTRIFICATION OF ENERGY USES

SMART GRID 15ª EDIÇÃO

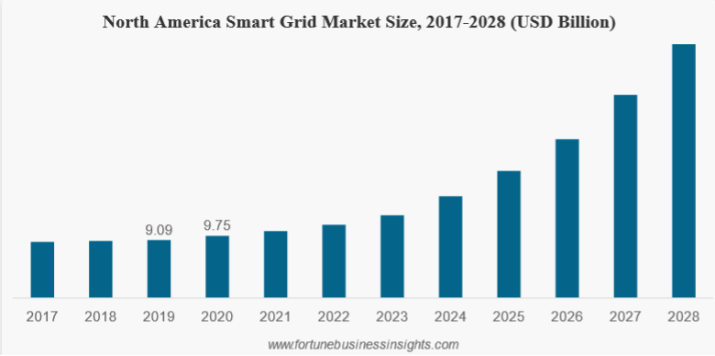
The Smart grid market (France) is expected to grow fivefold over the decade to reach around €6 billion in 2030, driven by the electricity generation and consumption segments:

The two main drivers of this growth :

- The increased share of ***renewable energy*** in the energy mix

- The electrification of uses, particularly in the ***automotive sector***

Worldwide, the smart grid market is expected to exceed US$100 billion in 2026 (North America being the largest market)



DSOs and TSOs will lead this growth:

- The use of the ***flexibility*** offered by the networks will be fundamental
- The exchange of ***data*** will be essential for the development of new uses

The fast deployment of intermittent RE and of new uses of electricity (EVs, heat pumps…) make **digital technologies** essential to optimize grid management and power flows (“flexibility”).

ACCELERATING THE DEPLOYMENT OF DECENTRALISED RENEWABLE ENERGY

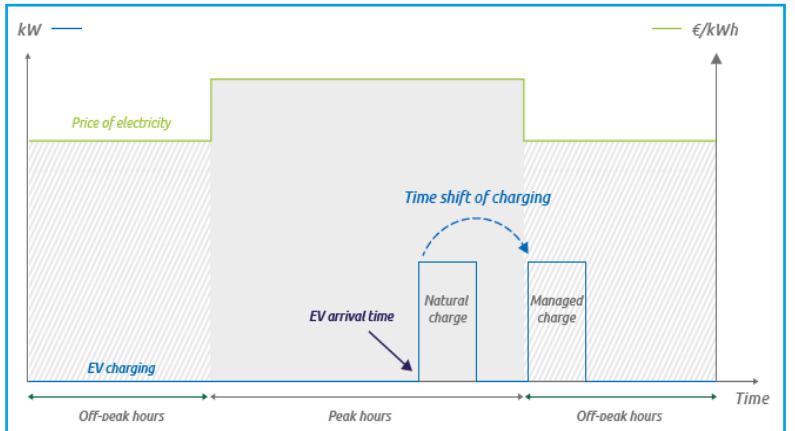
Accelerate grid connection:

1. **« Smart connections »**. The connection to the distribution or transmission network is made to the "nearest existing network", without "electrical reinforcement".
   - Benefit on CAPEX (reducing investment)
   - Time saving because there is less civil engineering work (faster start of injection)
   - Less disturbance caused by the possible opening of the roadway
   - In exchange, producers accept a contract to modulate their production if constraints appear on the network => **very fast Return of investment**

In addition:

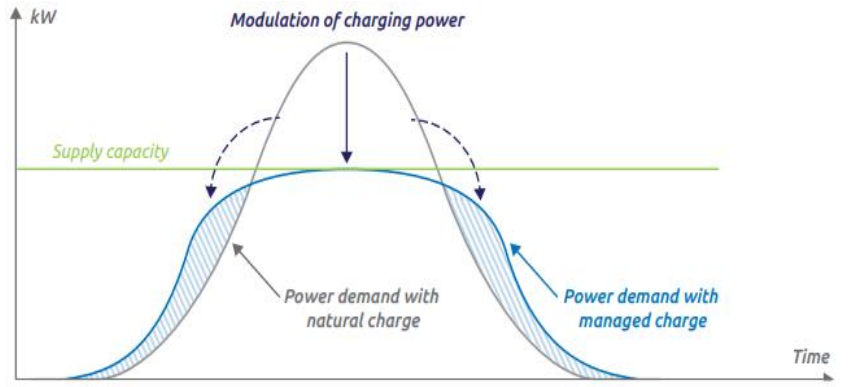
2. Participation of producers in the regulation of electrical voltage (inject or absorb reactive power)
3. Maximisation of collective self-consumption, by matching local consumption with high production.
4. Development of forecasting tools

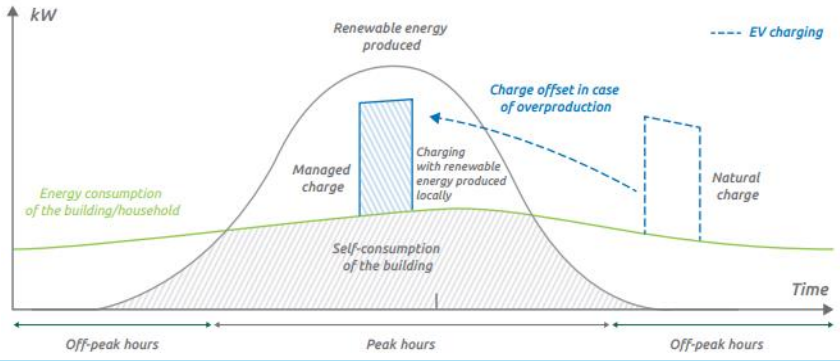
USING THE POTENTIAL OF ELECTRIC VEHICLES THROUGH SMART CHARGING : *3 LEVERS FOR SAVINGS: ENERGY, POWER & SELF CONSUMPTION*



Load charging consists in choosing to charge your car when the price of the electricity consumed is the lowest (use peak / off-peak hours)

Controlling **the power** of the charge means controlling the power demand of the charge (in kW) in coordination with the total power demand of the house/office/building (oven, hot water tank, heating…)





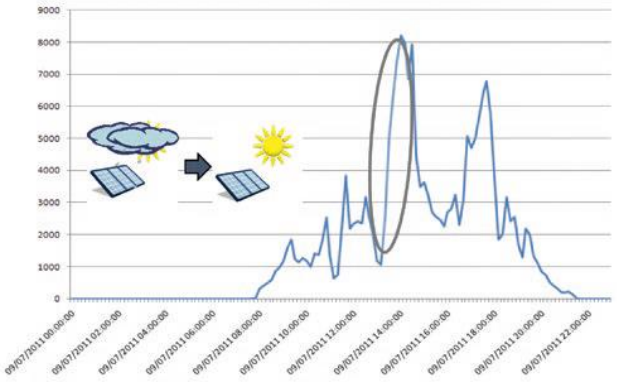
Steering to maximise self-consumption means capturing the surplus solar production of your own photovoltaic panels to charge your electric car.

Combining smart charging and solar & wind generation

Due to the growing interest in correlating local renewable energy generation with electric vehicle charging.

More and more self-consumption at the site level

- The ability to schedule vehicle charging will allow “market” stakeholders to encourage consumers to charge their vehicles during local generation peaks, thereby reducing local demand peaks, as well as the backflow of local generation onto the power transmission network (RTE)
- Maximizing self-consumption with smart charging thus means: **anticipate renewable energy production, transmit the information to the customer’s charging system, encourage the customer to charge when local renewable generation is higher.**



THE FLEXIBILITY OF BUILDINGS MADE POSSIBLE BY NEW TECHNOLOGIES

Energy efficiency thanks to data and usage management solutions :

1. **Data** to improve and reduce energy bills
   - Visualising your consumption
   - Use cases management (hot water tank, EVs …)
   - Existing Industrial solutions

Moreover, flexibility is an additional oportunity to save money:

2. **Agree to reduce consumption** at a specific time (load shedding) when there are constraints on the network, in exchange for additional remuneration

Developing flexibility will be key for the resilience of the electricity system

Exemple : **Cartoline**,The new predictive maintenance tool for Enedis based on the french Linky Smart metering infrastructure : identifying non technical losses, detecting incidents in real-time, improving the reliability of the grid, optimize capacity network and so on …

TO CONCLUDE : THE MORE WE WILL HAVE RENEWABLE ENERGY SOURCES CONNECTED TO THE GRID, THE MORE WE WILL NEED TO USE FLEXIBILITY

In 2050, need of ~16 to 18 Gw of flexibility of consumption (RTE Energy pathways), only 3 GW today
In France, thanks to peak / off peak tarrifs, → switch more than 5 Gw of consumption with water tank

1. Most flexibilities → on a regular basis, so it can be anticipated a long time before the real time.
   - The main need will be to place shiftable consumption when RES are available and affordable, to smooth out peaks.
   - The best solution to the use of these needs is the tariff of the electricity. Smart meters make it possible to transmit the signal, or even to activate the use

2. A need for flexibilities for less regular needs, for example to compensate for a sharp increase in consumption due to a period of very cold weather correlated for example with a total absence of wind.

3. OUR MAIN WORKS FOR 2023-2024

1. Accompany all territories
2. To publish a white paper to develop the use of flexibility
3. To publish a white paper to develop the local an renewable energy community (self and collective consumption)

For the Second consecutive year, Enedis has topped the Smartgrids index of Singapore Power Group

SPgroup
Empowering the Future of Energy

SG

Smart Grid Index

2022 Benchmarking Results | About Smart Grid Index

2022 Benchmarking Results

The 2022 SGI benchmarks a total of 94 utilities across 39 countries/markets

Utility	Country/Market	Score	+ / - (%)	Best Practices
Enedis	FRA	98.2	1.8	
TaiPower	TWN	94.6	0.0	
UKPN	GBR	94.6	0.0	
ConEd	USA	92.9	-1.8	
WPD	GBR	92.9	0.0	
CitiPower	AUS	91.1	-1.8	
DEWA	ARE	89.3	0.0	
SP Energy Networks	GBR	89.3	1.8	
SDGE	USA	87.5	0.0	
FPL	USA	85.7	0.0	
Northern Powergrid	GBR	85.7	1.8	
SCE	USA	85.7	0.0	
Stedin	NLD	85.7	0.0	

94 utilities evaluated
Across 39 countries

Smartgrid index measures the smartness of electricity grids globally, in 7 key dimensions :

01.	MONITORING & CONTROL	. SCADA . DMS / ADMS
02.	DATA ANAYTICS	. Smart Meter Coverage . Data Analytics Application
03.	SUPPLY RELIABILITY	. SAIDI . SAIFI
04.	DER INTEGRATION	. Management of DER Integration . Grid Scale Energy Storage
05.	GREEN ENERGY	. Renewable Energy Penetration . EV Facilitation
06.	SECURITY	. IT Cyber Security . OT Cyber Security
07.	CUSTOMER EMPOWERMENT & SATISFACTION	. Real-time data to Customers . Customer Satisfaction Feedback