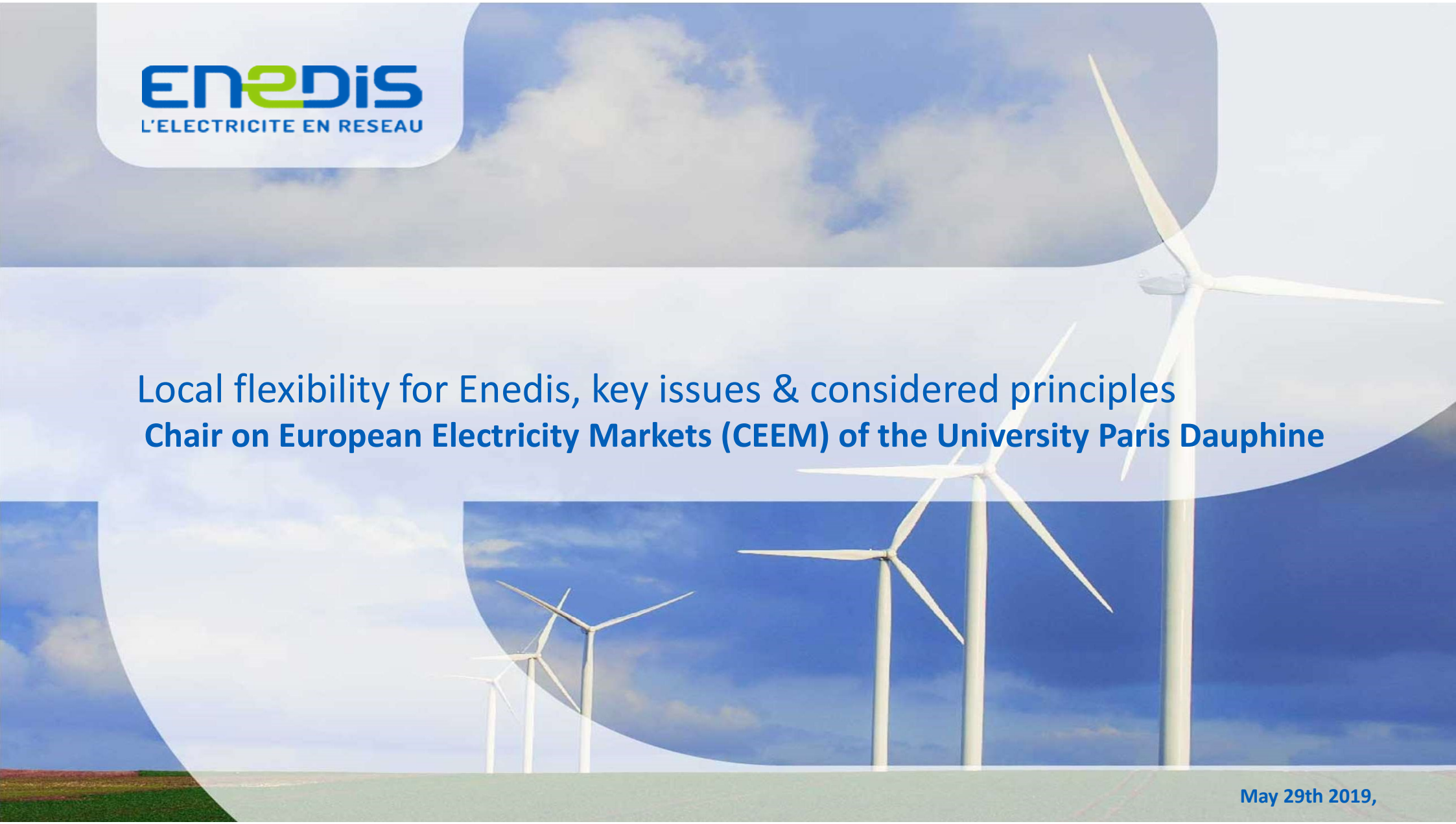


Local flexibility for Enedis, key issues & considered principles

Chair on European Electricity Markets (CEEM) of the University Paris Dauphine

May 29th 2019,

Enedis, fully involved in Energy and Digital Transitions

The energy transition induced a massive development of distributed Renewable Energy Sources (RES).

Besides, the digital and technological evolutions allow the development and use of **local flexibility**, in particular demand- side response, and allow the System Operators to:

⇒ Have **new flexibility resources** at disposal

⇒ **Adjust both Supply and Demand** and not only Supply to Demand

⇒ Consider more **local approaches** in addition to European and nationwide methods.

These new approaches contribute to the RES integration and satisfy the citizen' expectations **wishing to be more actively involved in energy matters.**

Today, Enedis already enables distributed flexibility development

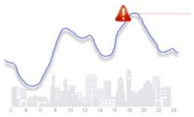
Enedis is fully committed along the other French DSOs to :

- **Enable market access**

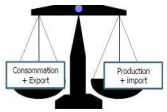
  Capacity mechanism, balancing mechanism, Demand Side Response market

- **Ensure the security and safety of the public distribution network**
- **Anticipate the next step of the electric system evolution** where every customer is potentially acting in the electric system.

Capacity Mechanism



Balancing Mechanism/ Demand Side Response Market



Enable distributed capacities to access markets

Enedis takes part in the conception and evolution of market mechanisms.

Daily, Enedis is involved in every step of these mechanisms operation:

- Upstream, to certify capacities and manage market players' perimeters
- Near real-time, to prevent network constraints
- After the activation, to control and supply the TSO with added value data

TSO/DSO Coordination

Build rules in coordination with TSOs and DSOs

Submit proposals at French and European levels to build a TSO-DSO coordination capable to face the incoming challenges

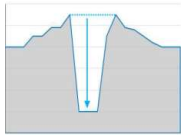
DSO Collaboration

AGENCE ORE
OPÉRATEURS DE RÉSEAUX D'ÉNERGIE

Put forward simplified procedures for market players

Facilitate procedures for market players with DSO common desks, tools and file formats.

Achievement control



Estimate the actual demand side response

Development of new methods (k nearest neighbours, Panels) that are based on statistical approach and appropriate for small sites.

Linky

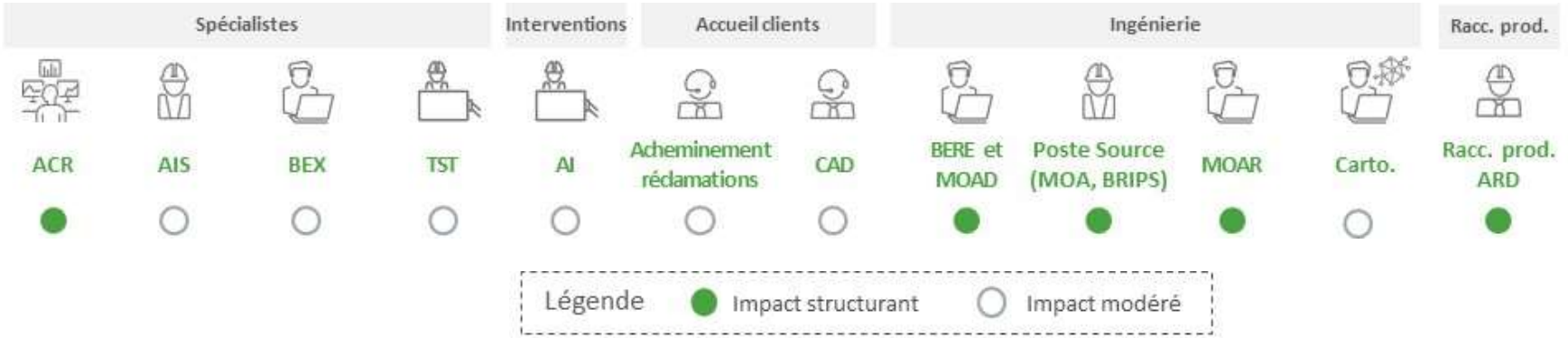
Support the development of the demand side response

Linky functionalities enable the customer to steer its consumption (load curve telemetering, mobile peak, etc.)

Tomorrow, local flexibility implies a real challenge for Enedis

Impact on planning and operations process…

Need of a new approach for operational teams…



⇒ **Integrate flexibility levers into the different stages of network management while ensuring quality of service (continuity / quality)**

Enedis explores the local solution feasibility and enables innovative schemes

Enedis, **committed in many demonstrators** or part of local projects to support innovative schemes :

- ⇒ *Smart Grid Vendée* : flexibilities for DSO uses, TSO-DSO coordination
- ⇒ *Interflex / Nice Smart Valley* : aggregators web interface, open platform for third parties
- ⇒ *Rennes Grid* : local production value
- ⇒ *DIVD Bordeaux* : Local multi-fluid managers
- ⇒ Collective self-consumption

Local flexibilities for the DSO Use

Visualizing local energy flows

Building a TSO/DSO coordination

Sharing Data

Unveiling local values

Involving communities

Managing a micro-grid

Houat et Hoëdic

Collective self-consumption

PÉNESTIN

Network optimisation

aVEnir

2019: assessment of the network impacts of large-scale EV development, refueling management solutions to facilitate the integration of EVs, and to shed light on the potential uses of EV flexibility (in recharge and V2G) for local network interface, open platform for third parties

A step by step preparation on local flexibility

2020 First calls for tender

End 2019 First calls for interests

Working group with market players on flexibility model before end 2019

Consultation synthesis June 2019

Public consultation on Enedis local flexibility Model **Nov 2018**

First and single contract (up to now) on local flexibility (2015 Energy Transition Law, art 199)

Oct 2018

Start of the 1er demonstrator on flexibility

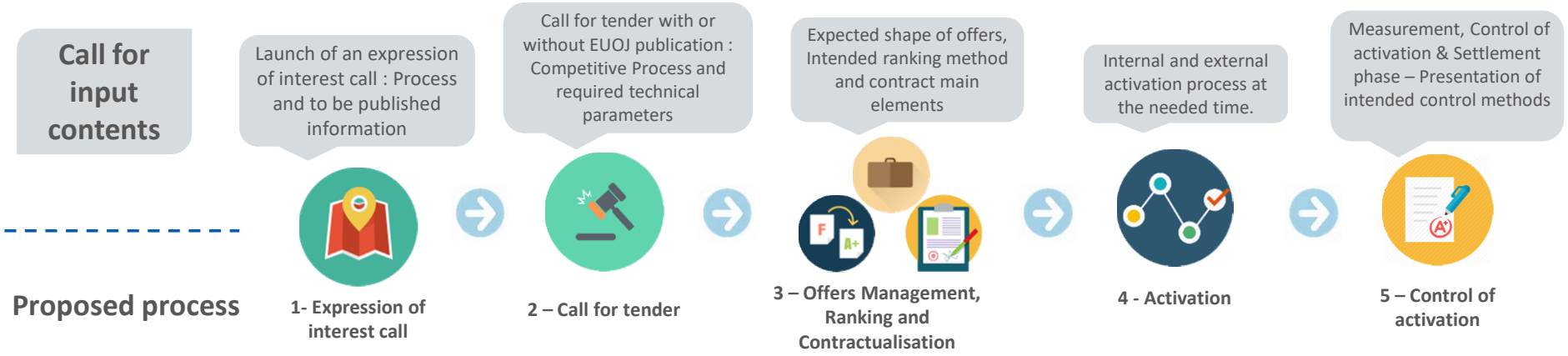
June 2017

2011

1. **Contribution to eCube Report (on French NRA request)**
2. **Report on the economic value of smart grids**

Local flexibility markets : an ongoing co-construction with the stakeholders

November 30th 2018, **consultation on local flexibility for the use of Enedis**



26 stakeholders, including the French TSO and local communities, contributed and submitted an input

An extensive **summary** will be issued **in June** and will state the **stakeholders main inputs** but will also present **Enedis first proposals** on the flexibility use process.

Pragmatic approach to start with local flexibility

Firstly, Call for interest to assess the flexibility fields and the market players appetite in the areas where flexibility could be used (either for an investment deferral or for incident management). **In case they are successful, Calls for Tenders,** contracts with market players.

Secondly, once the first experiments bore their fruits, Enedis will work with the stakeholders to define **the relevant features of local flexibility platforms.**

costs-benefits analyses + well-targeted features

Principles for first call of tender:

Technologically neutral

No exclusivity: Possibility to offer flexibility for different purposes (e.g portfolio optimisation, congestion management, system balancing)

minimum threshold (500kVA)

only complete offer accepted

In consideration: product features, success criteria, penalties, test on connection point, control method…

Analysis of national flexibility mecanisms to see if possible convergence with DSO mecanism (eg on test principles…)

Demonstrators still investigating features in parallel:

Demo. **AVEnir**: Start in 2019, assessment of the network impacts of large-scale EV development, refueling management solutions to facilitate the integration of EVs, and to shed light **on the potential use of EV flexibility (in recharge and V2G) for local network interface, open platform for third parties**

Theoretical Platform features

Connection Point Registration	Flex Registration	Bid Registration
Connection Point Register	Unit Unit Groups	✓ Balancing ✓ Ancillary Services ✓ Energy Markets ✓ TSO Cong.Manag ✓ DSO Cong. Manag
Including locational info. (single grid identification reference) *« Connection Point register identity card »*	Each Unit / Group is pre-qualified for the service(s) *« Bid identity card »*	Different Congestion Management (CM) Groups for different needs

Establish links between bids

Links are drawn up at the Flex registration phase

The activation of a bid leads to the unavailabilty of the linked bids

Share activation data

Impacts of activated bid on networks and balancing can be anticipated by SOs, ensuring system security

Limit activations near real time

Impacts of activated bid can be controlled by proposing adapted activation conditions to Flex Services Provider (FSP)

Coordination functions

Several levels of coordination, from light to consolidated, may be put in place depending on the activation time, independently of any IT infrastructure

Possible options of organization

The possible models can be segmented into four categories according to :

Coordination methods between mechanisms for access to flexibilities	**Contractual arrangements** between DSOs, TSOs and Flexibilities Service Provider (FSP)
Coordination may be (i) left to the flexibility operators or (ii) centrally managed by the network operators	FSP offer their flexibility (i) directly on each mechanism (ii) To the connection network operator, who has the possibility of reprocessing them

The best solution to be implemented will be a trade-off between these options

To conclude on local flexibility markets : nothing is set yet and everything is on going!

There is **no set market design** for local flexibility, we are working on it with all stakeholders…

All options must then be left opened on platform design (organization and technologies).

Enedis takes part and manages demonstrators to assess the pros and cons of each solution.

Enedis carefully follows all platform projects (ENERA, GOPACS…).

Enedis at a glance

Enedis operates ~95% of the French distribution network

35 million customers

4,3 million professional customers

365 000 producers

39 000 employees

2 250
(U)HV/MV substations
4 400
(U)HV/MV transformers

600 000 km
MV network

750 000 MV/LV
transformers

700 000 km
LV network

35 million
meters

French DSOs operate only Low Voltage and Medium Voltage networks

Appendix

Smart Grids Economic Assessment Report

Working as team, RTE, the ADEME agency and Enedis published a **large scale report on the economic value of smart grids**. In particular, **Costs-benefits analyses** were carried out on flexibility potentially used by the DSO to lift network constraints.

	Flexibility to lift consumption constraints	Costs and benefits for HV/MV substation	
Local roll out	Implementation costs	*Floating*	Depending on offered flexibility services
	Gain on investment postponement	*From 0 to 24k€/MW/year*	Depending on local circumstances
	Gain on operations	*From 0 to 24k€/MW/year*	Depending on local circumstances

Costs: instrumentation, information systems, equipment, etc.

Benefits: decrease of non distributed/injected energy, network losses, postponed investments, etc.

The report on the economic value concluded that **the use of flexibility has potentially a real value as long as it is implemented locally.**

Energy Transition Law : Article 199 – Local Flexibilities

2015 Energy Transition Law provided the local flexibility with **an experimental legal framework. Enedis** engaged in a **proactive and educational approach towards the to-be projects leader :**

- Publishing a contractual Corpus describing technical and economic conditions
- Active research of cases to manage network constraints

Enedis requires reliable flexibility service.

That's a **paradigm shift**. Enedis needs indeed to change everything from its tools, its planning methods to the very relation with the stakeholders or the operation of the distribution network.

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