



European
Workshops on
Demand Response
2023



DR4EU
DEMAND RESPONSE FOR EUROPE

Demand Response in Spain

State of play, evolutions and perspectives

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European
Commission



When?

12th June 2023

11:00 - 11:55 CET

On-line

*55 min to be
Fit for 55!*

How to register?

by e-mail to



info@dr4eu.org

Agenda

- Sabine CROME, DGENER, EC
 - Iolanda SAVIUC, JRC
 - Miriam BUENO
- Miguel RODRIGO
 - Josep SALAS
 - Laura MORENO
- Jose Pablo CHAVES
 - Alicia CARRASCO
 - Anna CASAS
 - Alvaro SANCHEZ



- Q&A + questions on-going => in the chat box please



Demand response – EMD proposal and the implementation of the Clean Energy Package

Sabine Crome
European Commission – DG Energy
Internal Energy Market

12 June 2022

COM proposal for a reform of the electricity market design - 14 March 2023

Provisions to enhance development of non-fossil flexibility sources, such as demand response and storage:

1. Flexibility needs assessment and requirement for MS to establish indicative objectives for DR and storage
2. Possibility of TSO peak shaving product and support schemes for non-fossil flexibility
3. Measures aiming at facilitating the use of DSF by SOs
4. Facilitating integration in ID market (such as shorter gate closure time)

Key provisions of Electricity Directive 2019/944

- Non-discriminatory access of demand response to all electricity markets, either directly or through aggregation (Art. 17)
- Full recognition of (independent) aggregators as market participants (Art. 17)
- Customer entitlement to contract with independent aggregator of their choice, without need for consent or prior agreement of their supplier (Art. 13)
- Strict limits to compensation payments (Art 17(4))

Transposition of Electricity Directive 2019/944

- Key that Member States transpose these provisions into the national laws swiftly
- Deadline for transposition: 1 January 2020
- Transposition very uneven among Member States
- While progress has been made, significant number of important provisions have not been transposed in several Member States

Network Code on demand side flexibility

- Article 59(1)(e) Electricity Regulation

The Commission is empowered to establish a **network code** on rules implementing Article 57 of the Regulation and Articles 17, 31, 32, 36, 40 and 54 of the Electricity Market Directive **in relation to demand response, including rules on aggregation, energy storage and demand curtailment.**

- Potential scope

- Load, distributed storage, distributed generation
- Products and services, in particular to solve physical congestions (and balancing)
- Market and processes, SO coordination, market access and aggregation, information and data exchange

- COM request to EU DSO entity in cooperation with ENTSO-E on 9 March 2023 to submit proposal withing 12 months



Explicit Demand Response for small end-users and independent aggregators

Status, context, enablers and barriers in Spain

A report by Saviuc, I., Zabala, C., Puskás-Tompos, A., Rollert, K. and Bertoldi, P.



Background

Spanish energy framework is focused on the rapid expansion of renewable energy, primarily solar and wind, as well as energy efficiency, electrification, and renewable hydrogen

- security of supply is important
- Spain envisages a total storage capacity of about 20 GW by 2030



Players and context

- Only 1 TSO : Red Eléctrica de España.
 - Part of the initiative of 8 EU TSOs aiming for a carbon neutral grid by 2050
- 336 DSOs
- Largest Spanish electricity aggregator is ASE group
 - Services are aimed at companies that consume high and low voltage electricity, whatever their sector of activity



Players and context

- Prosumers are primarily concerned with self-consumption and energy management. Their role has been improved since 2018
- Prosumers are able to supply balancing services to the electricity market through aggregation provided by suppliers (to reach the 1 MW threshold in the operating rules) since October 2020.
- Engagement of small end-consumers in explicit Demand Response driven by the availability of peak/off-peak tariffs and enabled by the rollout of smart meters that was completed in 2018



Players and context

- Independent aggregators are acknowledged since June 2020.
- Secondary legislation for aggregation is still being developed, and value stacking was not possible at the time of reporting (31 Dec 2021).
- Implicit use of flexibility available through supplier
- Retailers can participate in balancing services aggregating demand and self-generation.
- The Independent Aggregators are allowed to participate in the markets
- Suppliers are active in the balancing markets

Demand response in the ancillary services market

Flexibility services in Spain are delivered through three main modes:

- frequency containment reserve (FCR): mandatory and not remunerated;
- automatic frequency restoration reserve (aFRR): closed to independent aggregators;
- manual frequency restoration reserve (mFRR): recently opened the participation also for storage, DSF and aggregation



Barriers for Demand Response and Independent Aggregators

- Failure to define the perimeters of action of independent aggregators
- Insufficiently outlined methods of calculating the imbalances that aggregation would generate for distribution companies
- No dedicated legislation at the residential level. Aggregation of loads can participate in the balancing services under specific conditions
- The market is dominated by incumbents.
- The TSO requests real-time telemetry to participate in balancing services, making aggregation of medium and small loads difficult.
- The DSOs are not incentivized to rely on demand-side flexibility

Thank you



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red eléctrica

Una empresa de Redeia



European Workshop on Demand Response in Spain

Red Eléctrica

June, 2023

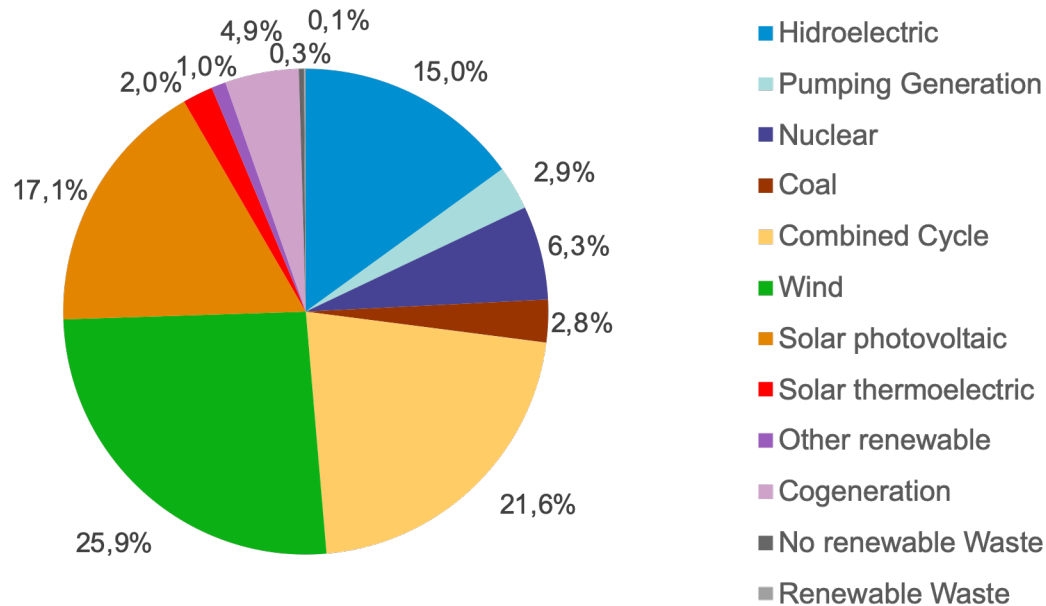
Introduction

1



Installed capacity

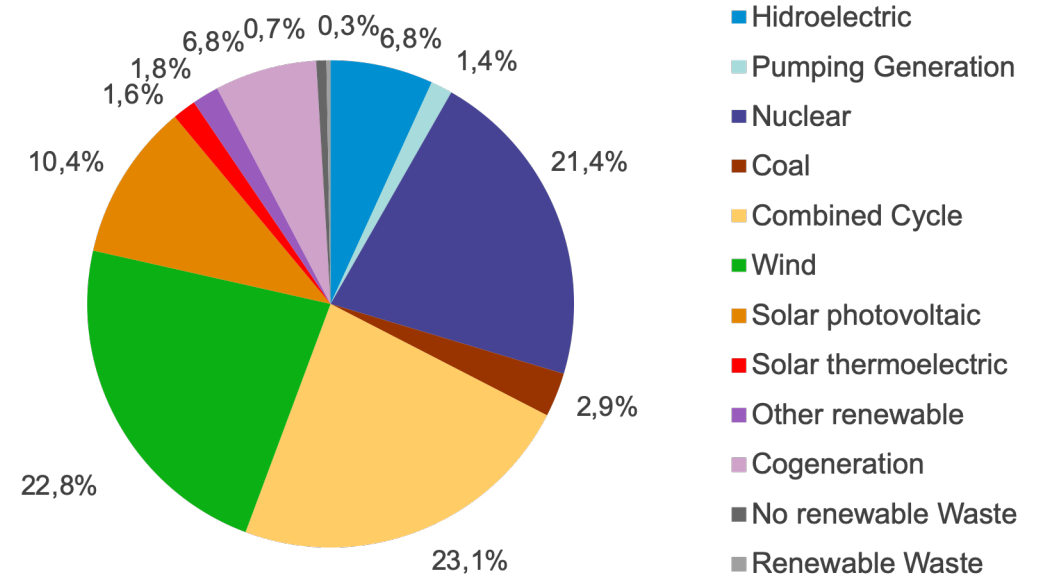
114 GW



- 61,1 % Renewable
- 67,4 % CO₂ free

Generation mix

262 TWh



- 43,7 % Renewable
- 65,1 % CO₂ free

Key element for a secure decarbonization

- For a decarbonized system, with low capacity of interconnection, the flexible resources such as demand side response represent a key element for ensuring the security of supply.
 - » **The principal aim of TSOs, safeguarding security of supply, is not possible without enough flexible assets in the system.**
- The more flexible assets in the system, the greater the possibility to incorporate further volumes of renewables.

Clean Energy Package

Framework Guideline on Demand Response

Reform of the EU Market Design

- Consumer in the center
- Participating in all markets
- Independent aggregator

- Harmonized rules
- Network Code on Demand Respond in cooperation TSO-DSO

- Evaluation of the flexibility system needs
- Peak-shaving product

2 main objectives: European Markets and increasing of flexible resources

Red Eléctrica works closely with Markets Participants through the “[Roadmap for the electrical System](#)” addressing new challenges towards an energy transition

Actualización Hoja de Ruta MIE a fecha 23 de marzo de 2023

	2020				2021				2022				2023				2024				
	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	
TERRE – Plataforma RR	mar		sept (RFC)																		
IGCC – Plataforma IN				oct																	
Demanda en balance					ene																
F&kar						jun															
Sistema reduc. autom. potencia									26 ene												
Armonización desvío	2 posic								APROB	1 abr											
Programación QH										24 may											
Previsores QH																					
Redespachos por RRTT (1)																			oct		
Hibridación tecnologías (1)																			oct		
Proyecto SRS																				mar	
MARI – Plataforma mFRR (2)																				may jul	
PICASSO–Plataforma aFRR (2)																					jul
ISP 15 min (3)																					dic
Agregador independiente (4)																					sep
Calidad telemedidas (5)																					dic
Mercado control tensión (6)																					dic

- **2020:** Connection to TERRE and IGCC European platforms
- **2021:** Demand and Storage to participate in balancing markets
- **October 2022:** New specific balancing product: Active Response Demand-Side Service
- **February 2023:** Voltage Control Pilot Project
- **Ongoing projects:**
 - MARI/PICASSO connections
 - ISP 15 min
 - Participation in markets of hybrid installations
 - Independent Aggregator

Active Response Demand-Side Service (SRAD)

2



Context

- **26 January 2021** → Entry into force of Operational Procedures (BOE 24/12/2020) allowing demand resources to participate in energy balancing services (RR, mFRR and aFRR)
- **Until 31 March 2023** → Only one UP qualified with 7MW for RR and mFRR services.
Provision of energy: 2 MWh

21st September 2022:

*Publication of **RDL 17/2022** for the approval of the active demand-side response service*

1

Not enough demand participation on balancing markets via standard products.
Allowed for RR, mFRR and aFRR energy since January 2021

2

Flexibility need for the system to guarantee generation-demand balance (security of supply Winter 22/23)

- Active Response Demand-Side Service
- Specific balancing service, according to established in Regulation EB
- Start of the service: 1st November 2022

Service providers

- Suppliers and Consumers, acting as demand aggregators to offer flexibility to the system

Specific balancing product

- Contract holders are required to be able to reduce demand for three-hour blocks following a minimum 15-minute warning.
 - » Variation of **upwards active power** in ≤ 15 min
 - » Delivery period **up to 3 consecutive hours** per day
 - » Activation within the **predefined periods**

Provision

- » **Capacity [MW]:** awarded through yearly auctions
- » **Activated energy (consumption decrease) [MWh]:** paid at mFRR price.
- » **Real time verifications:** penalization for non-fulfilment in capacity or energy activation

Yearly horizon of the service

From 1st November 2022 to 31st October 2023

Delivery Service Period

January, February, September October, November and December

Week days 08:00 – 00:00

From March to August

Week days 18:00-00:00

Results of yearly auction

Capacity allocated: 497 MW

Price: 69,97 €/MW

Number of assigned BSPs: 11

redeia

El valor de lo esencial

red eléctrica

reintel

hispasat

redinter

elewit



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European workshop on Demand Response in Spain

TSO/DSO coordination: a necessary step to unlock Demand Response

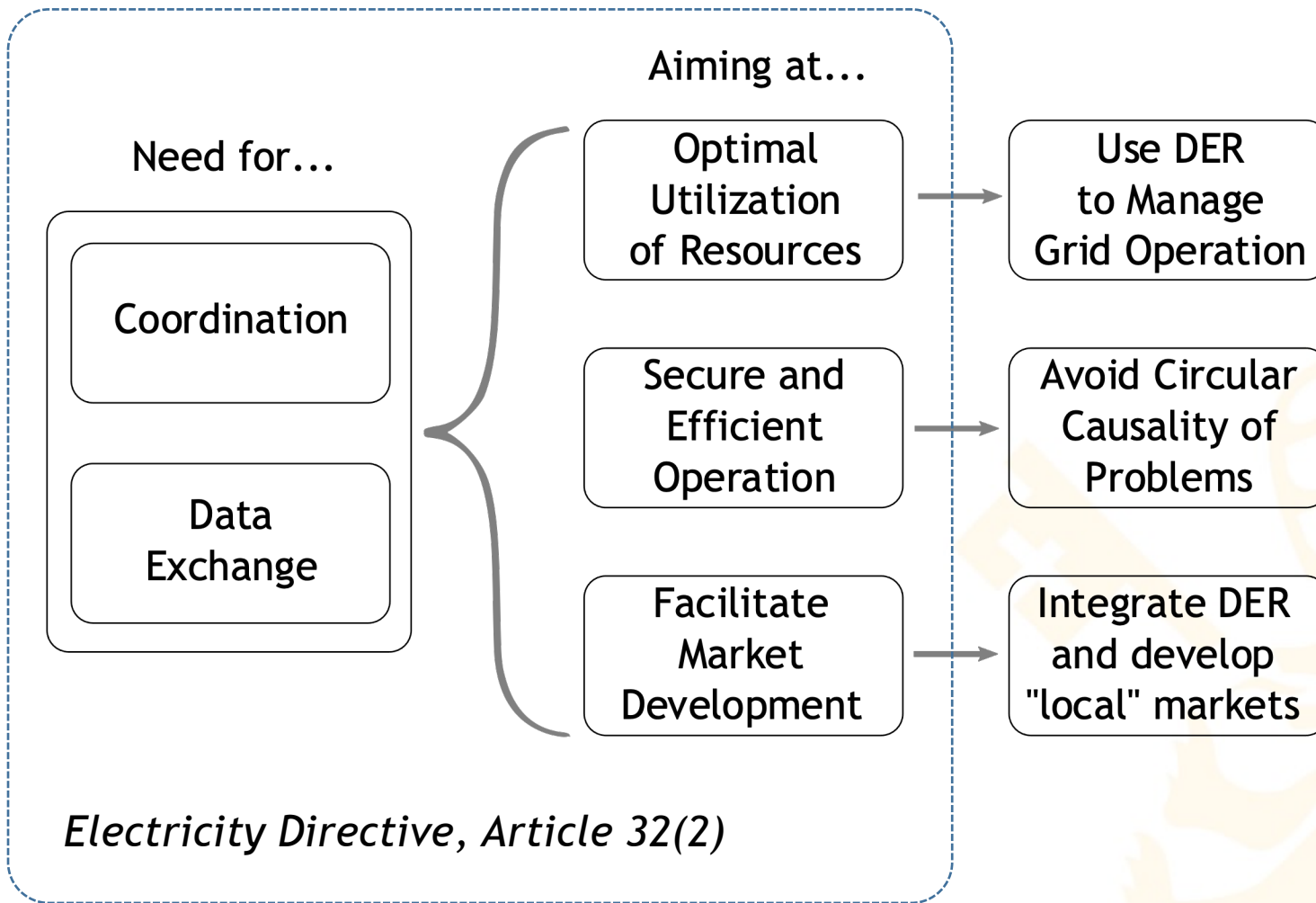
José Pablo Chaves Ávila
(jose.chaves@comillas.edu)

Instituto de Investigación Tecnológica - IIT

Madrid. June 12th, 2023

comillas.edu

The TSO-DSO coordination in the Clean Energy Package



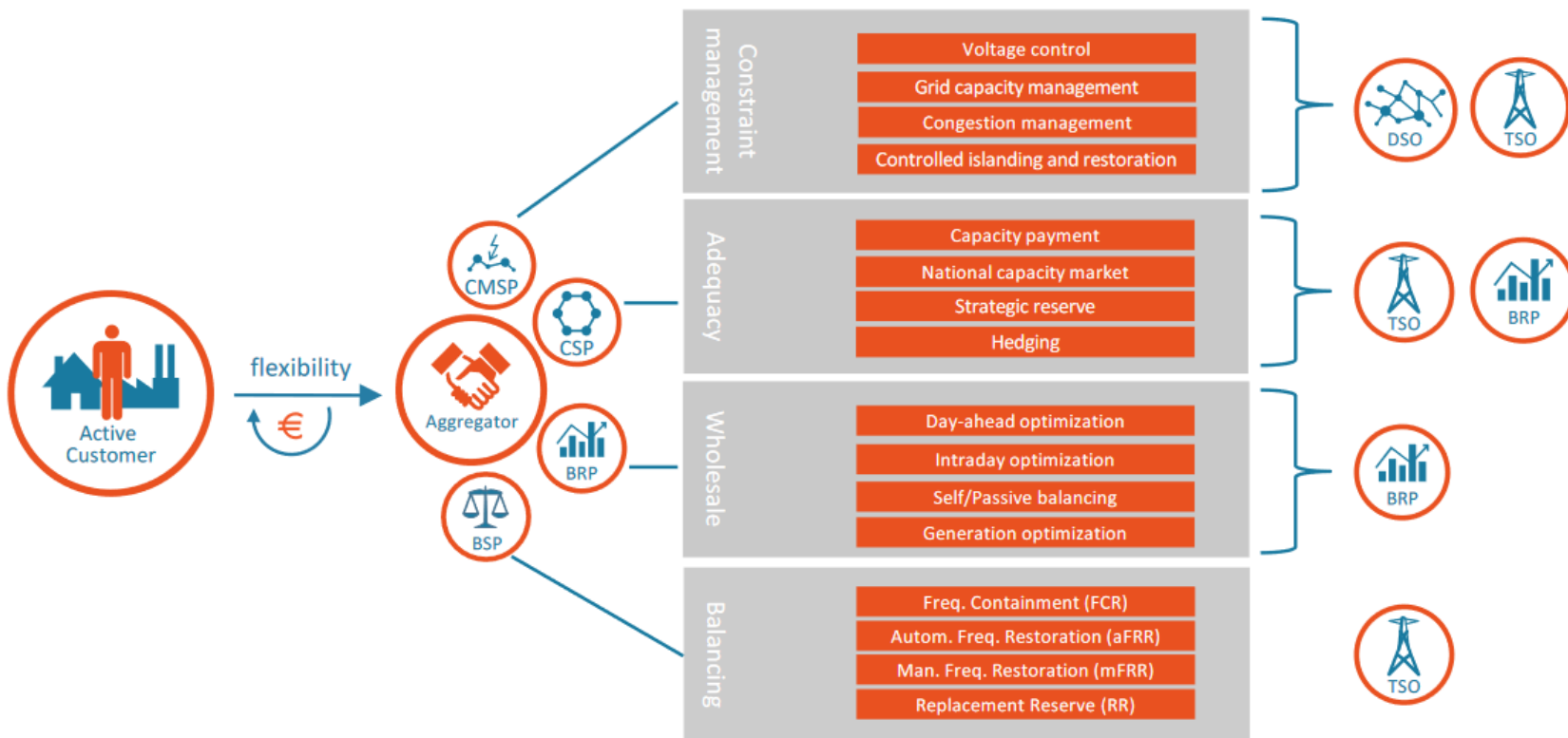
The value of “locational services” vary depending on the location of service provision

The ability of Distributed Energy Resources to provide locational benefits puts them in competition with traditional network investments.

	Locational	Non-locational
Power system benefits	<ul style="list-style-type: none"> • Network capacity • Constraint mitigation • Loss reduction • Voltage control • Power quality • Reliability and resiliency 	<ul style="list-style-type: none"> • Energy • Firm capacity • Frequency control • Price hedging
Other public benefits	<ul style="list-style-type: none"> • Land use • Employment 	<ul style="list-style-type: none"> • Emissions mitigation • Energy security

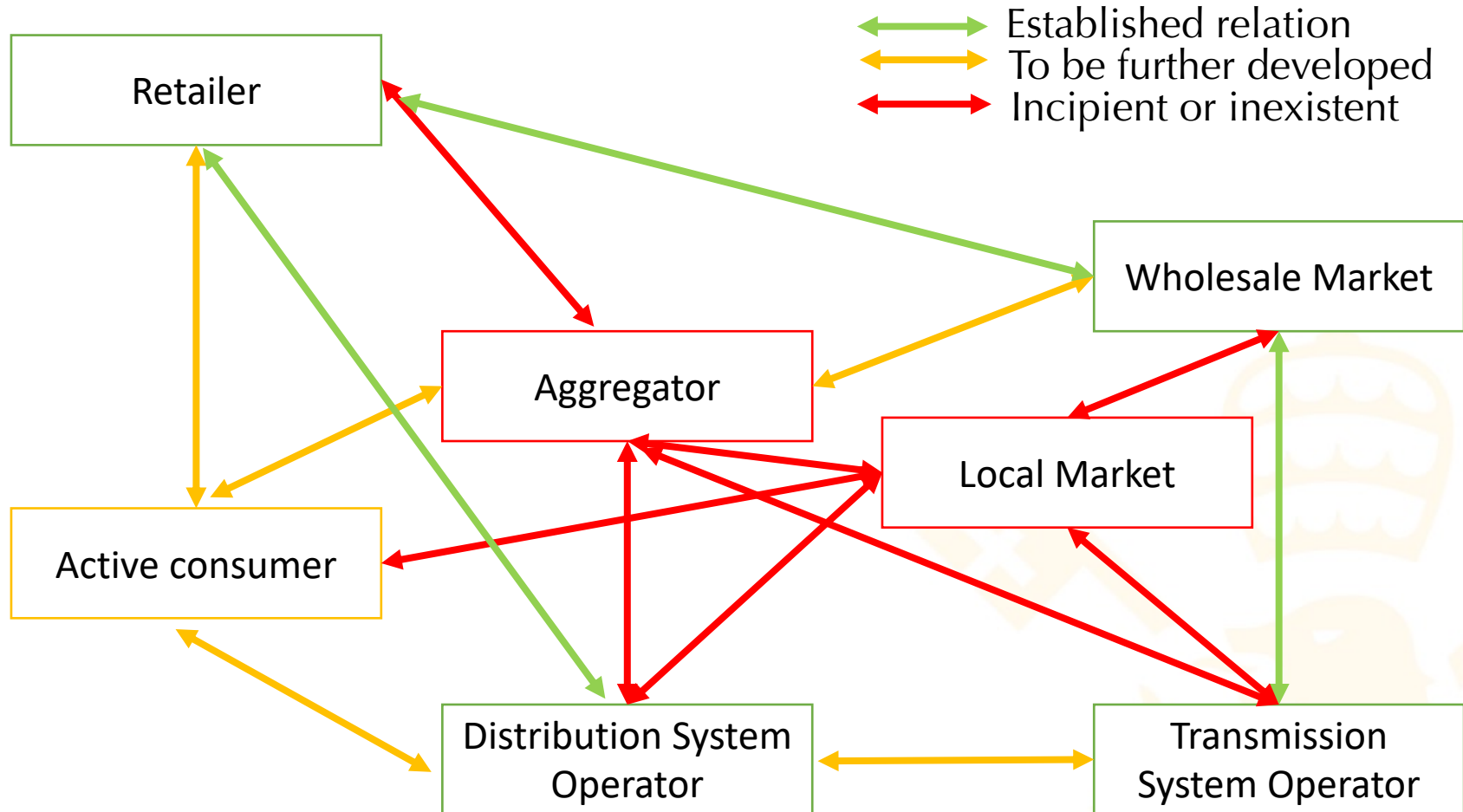
Source: Utility of the Future Study

DERs create new options for the provision of a wide range of electricity services

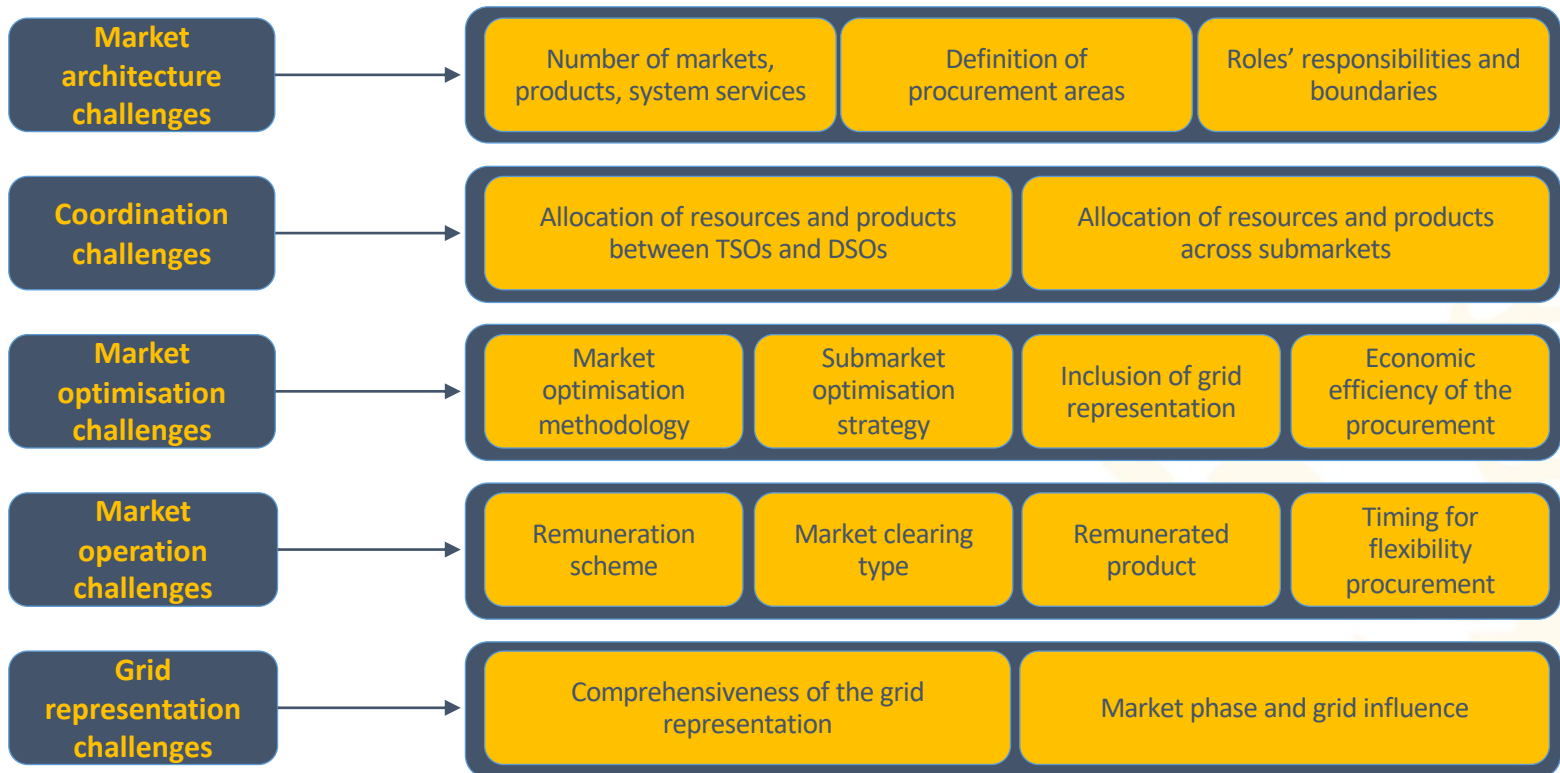


Source: USEF (2021)

Coordination is required between different actors



Challenges to improve the European electricity markets identified in OneNet: how to define the main design aspects?



Thank you for your attention

Dr. José Pablo Chaves
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ENTRA Agregación y Flexibilidad

DR4EU
DEMAND RESPONSE FOR EUROPE

Demand Response in Spain *State of play, evolutions and perspectives*

When?

12th June 2023

11:00 - 11:55 CET

On-line

*55 min to be
Fit for 55!*

Cuerva*

endesa

 **PEUSA**


sonnen
energy is yours

 **Ielectra**

SIEMENS

 **factorenergia**

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Gdinor
Energía Distribuida

agrrenergía
Group AE

Energy
Pool
Smart Energy Management

axpo

 **CENER**
CENTRO NACIONAL DE
ENERGÍAS RENOVABLES

 **bassols**

 **plenitude**

 **sympower**

Life Is On | **Schneider**
Electric

bamboo
energy

Q: aduriz
energía



¡Gracias!

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Challenges for Demand Side Flexibility in Spain

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Sympower Flexibility Service Provider

Founded in 2015
as an **independent**
aggregator

Always working
with a **local team**

With more than

1 GW

of flexible distributed energy
resources under management.

Already working with more than
**150 commercial and
industrial**



ARCTIC PAPER



ALFEN

VATTENFALL



GETEC
PARK.EMMEN



Metsä

SOLARIGO

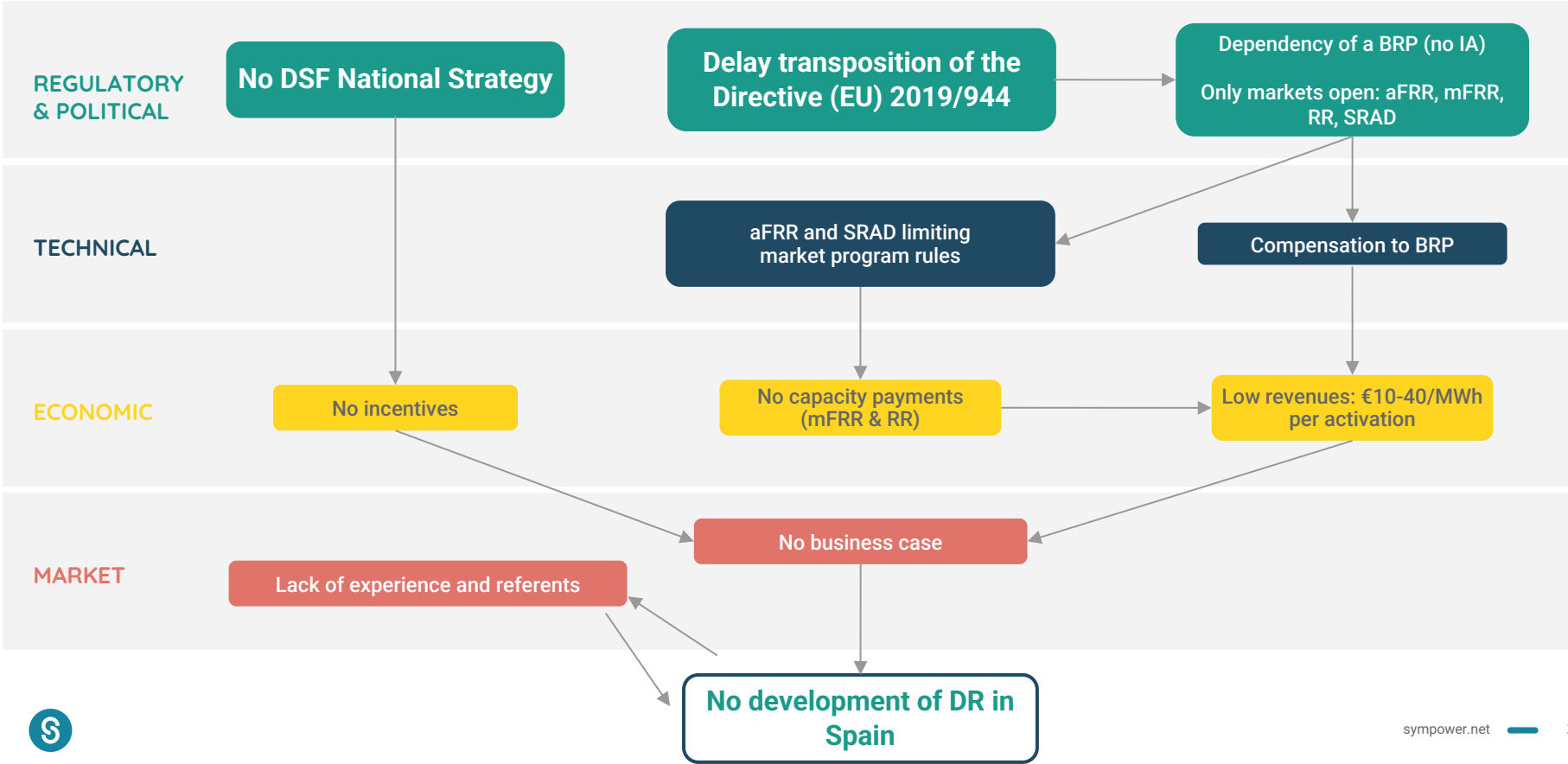
● Active
● Activating



In **Spain**, we are currently working
in **several pilots** to enable flexible
assets to participate in REE's
balancing markets.



What are the challenges for DSF in Spain?



A large participation of DSF can be fostered by adopting rules and processes fit for independent aggregators



Market programs rules*

- Markets open (FCR)
- Low bid thresholds (SRAD, aFRR)
- Small bidding periods (SRAD)
- Availability payments (RR, mFRR)
- Allow use of submetering



Deployment of Indep. aggregator

- No need for BRP agreement
- TSO handles compensation
- Net Benefit
- Different Baseline methodologies allowed

*In brackets examples of markets that are not design according to the listed recommendation



Together, towards a smarter energy future.



Anna Casas
Business Developer Manager Spain
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Impact of Demand Response together with Energy Efficiency.

Álvaro Sánchez Miralles – CEO Stemy

Impact of DR



DR reduces the need of gas, losses of the grid, grid reinforcement and **RES** needs.

DR reduces the need of investment in **batteries**, generation and grid.

Take care, if consumers are **optimized**, any DR activation will increase the Bill.

DR reduces **electricity market** prices



A real example

Case in numbers



65
residential



2
commercial/
industrial

1st Jan 2022



15th Nov 2022



Understanding
of
consumption



Reduce the
bill



Reduce CO2
emissions



Help electric
system

1,48 MW
of flexible power

0,795 MW
average flexible power used



Resultados obtenidos



Bill reduction

Month avg

15,2%
of the bill

Accumulated
(9 months)

64k€



Revenues of DR

9,2%
of the bill

39k€



CO2 emission reduction

5.492 kg CO2
2072 of diesel
litres

50 t de CO2
18700 diesel litres





Thank you for your attention