

# Advances in Energy Storage Regulation: Perspective and Next Steps

Avances en la regulación del Almacenamiento: Perspectiva y próximos pasos



Yann Dumont  
[presidencia@asealen.es](mailto:presidencia@asealen.es)

23 November 2021





# The Association

**ASEALEN** is a non-profit association of companies **involved in energy storage with all available technologies**, aimed at accelerating the decarbonization of the electricity sector and in thermal uses.



# Members

Currently, they are part of  
ASEALEN

## 22 companies

very different sizes and with  
very diverse activities:  
manufacturers, engineers,  
producers, technologists,  
consultants, suppliers, investors  
and asset managers



Storage, the key to the energy transition



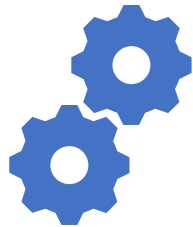


# Technologies

Storage is (Ley 24/2013 – Art. 6.h):

- 1) Conserve energy to be used at a different time (use of electricity is deferred) than its production
- 2) Perform the conversion of electrical energy into a form of energy that can be stored for the subsequent conversion of such energy in electrical energy

There are currently 3 main technologies in addition to many others in the research phase



Pumped hydropower



Molten salt tanks



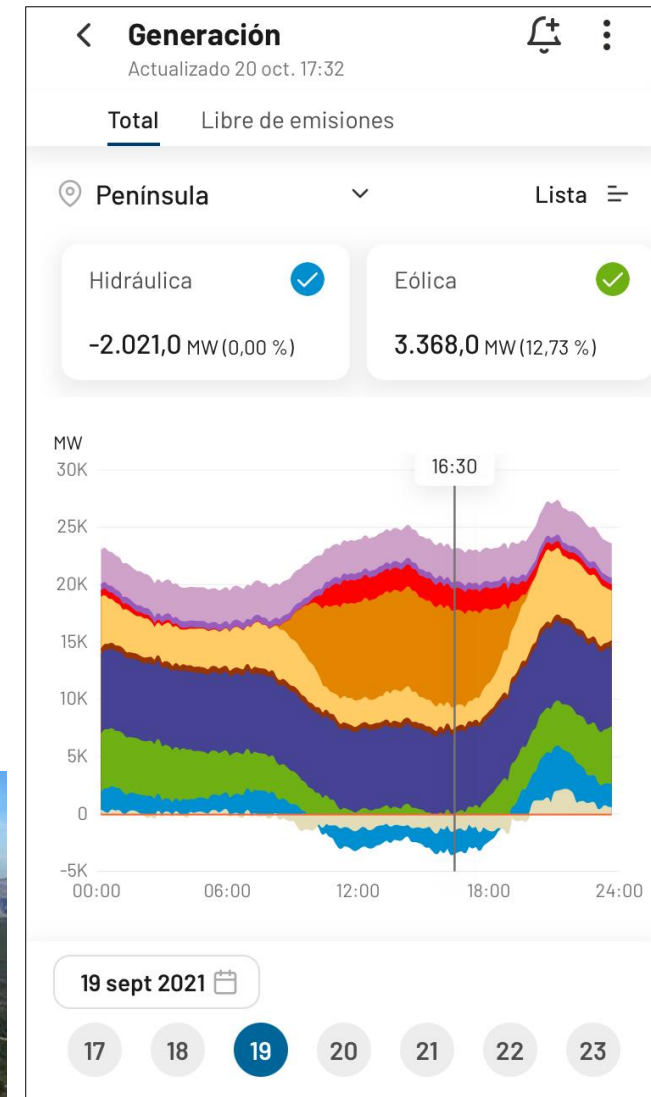
Conventional  
electrochemical batteries



# Technologies

## Pumped hydropower

- ✓ It is the technology that offers the maximum guarantee of operation of the system
- ✓ Spain is the European country with the largest number of reservoirs and the 10th in the world, with a capacity of more than 6 GW of pumping power (> 85 GWh).
- ✓ Pumped hydropower and “only” hydropower → >14.000 GWh





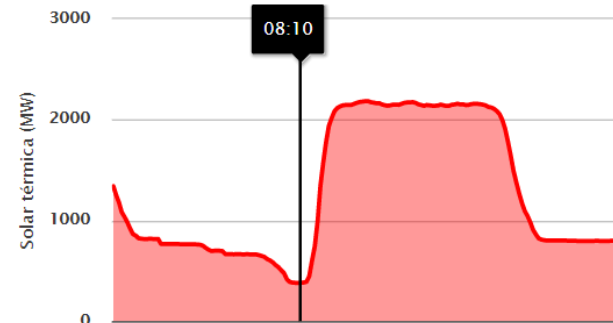
# Technologies

## Molten salt tanks

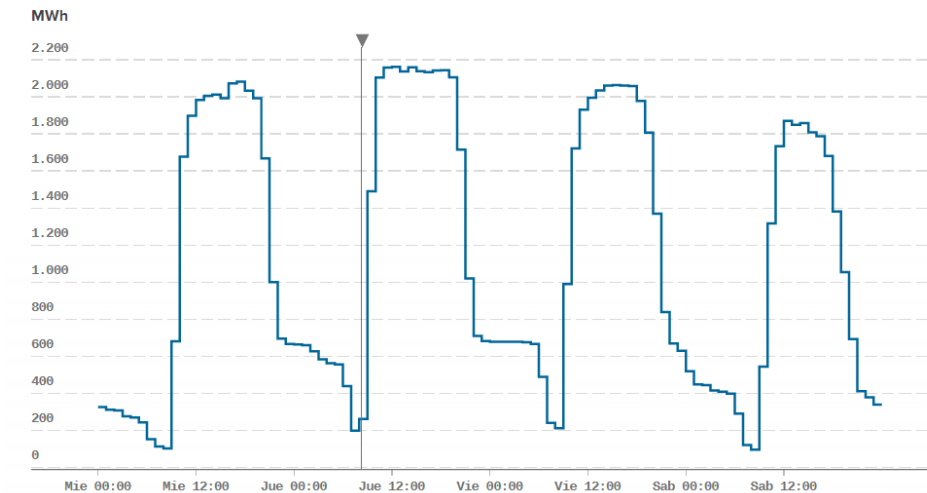
- ✓ These tanks function as small reservoirs accumulating the sun during the day and producing on demand later at night.
- ✓ Current range of operation is daily, but they can incorporate electric heaters.
- ✓ Operating 870 MW (CSP+MS storage) with energy capacity of 6,5 GWh. They could be increase x2 approx.
- ✓ Stand alone technologies



Solar térmica 381



DESDE EL 07-07-2021 A LAS 00:00 HASTA EL 10-07-2021 A LAS 23:50 AGRUPADOS POR HORA





# Technologies

## Conventional electrochemical batteries

- ✓ This technology already allows applications in the field of seasonal storage:
  - 1) Behind The Meter (BTH): linked to small and medium-sized self-consumption applications
  - 2) Front The Meter (FTH): linked to power generation and grid support applications – or “Stand Alone”
- ✓ The wide range of powers and duration configurations is an advantage over previous systems, along with the lower technical and administrative difficulties.







# Storage at the PNIEC

(Spanish NECP)

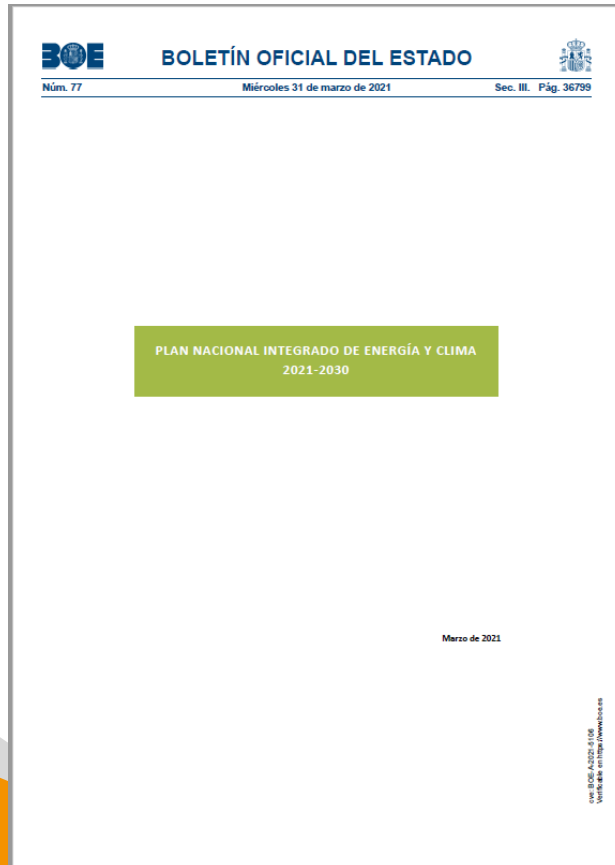


Tabla 2.3. Evolución de la potencia instalada de energía eléctrica (MW)



Parque de generación del Escenario Objetivo (MW)				
Año	2015	2020*	2025*	2030*
Eólica (terrestre y marítima)	22.925	28.033	40.633	50.333
Solar fotovoltaica	4.854	9.071	21.713	39.181
Solar termoeléctrica	2.300	2.303	4.803	7.303
Hidráulica	14.104	14.109	14.359	14.609
Bombeo Mixto	2.687	2.687	2.687	2.687
Bombeo Puro	3.337	3.337	4.212	6.837
Biogás	223	211	241	241
Otras renovables	0	0	40	80
Biomasa	677	613	815	1.408
Carbón	11.311	7.897	2.165	0
Ciclo combinado	26.612	26.612	26.612	26.612
Cogeneración	6.143	5.239	4.373	3.670
Fuel y Fuel/Gas (Territorios No Peninsulares)	3.708	3.708	2.781	1.854
Residuos y otros	893	610	470	341
Nuclear	7.399	7.399	7.399	3.181
Almacenamiento	0	0	500	2.500
Total	107.173	111.829	133.802	160.837

\*Los datos de 2020, 2025 y 2030 son estimaciones del Escenario Objetivo del PNIEC.

Fuente: Ministerio para la Transición Ecológica y el Reto Demográfico, 2019

New capacity	2025	2030
CSP (w/ 10h MS tanks)	2.500 MW	5.000 MW
Pumped Hydro	875 MW	3.500 MW
Storage FTM (2 H)	500 MW	2.500 MW
Distirbuted Systems(BTM – SC)	nd	> 400 MW
Only Hydro (WO/ pumped)	250 M	500 MW





# Regulation

## Main Instruments already accommodated (I)

- ✓ Real Decreto Ley 23/2020: "miscellaneous"
  - 1) Storage definition (Ley 24/2013 – Art. 6.h)
  - 2) Criteria for considering "the same installation" → door to hybridization
  - 3) Storage addition is "hybridization" (Ley 24/2013 – Art. 33.12)
  
- ✓ Real Decreto 1183/2020: "Grid Access & Connection"
  - 1) Storage "as electricity production" (Art. 6.3)
  - 2) Hybridization and Stand Alone
  - 3) Guarantee non-principal technology → 1/2 → 20 €/kW
  - 4) Access & Connection Capacity Tenders



# Regulation

## Main Instruments already accommodated (II)

- ✓ Real Decreto 477/2021: “granting self-consumption & storage (BTH)”
  - 1) Direct grants to BTH storage linked to self-consumption
  - 2) New and existing self-consumption
  - 3) Limit →  $\leq 2 \text{ kWh}$  (energy) / **kW** production (power)
  - 4) 254.7 MWh storage target (777,7 MW self-consumption)
  
- ✓ Orden TED/1182/2021: “Tender for Access Capacity – Just Transition Mudéjar 400 kV”
  - 1) 1.302 MW
  - 2) Storage ( $\geq 2$  hours) → up to 6 points of 100
  - 3) Synchronous machine → up to 7 points of 100
  - 4) Automatic power reduction → 1.5 points of 100

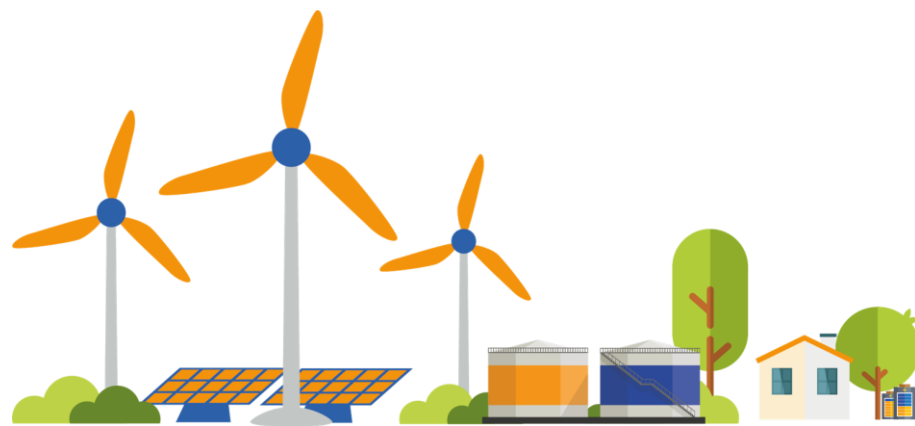


# Regulation

## Main Instruments to be accommodated

- ✓ Proyecto de Orden “Capacity Market”
- ✓ REE Operation Procedures
  - 1) \*\* PO 12.2 → Minimum design, equipment, operation and safety requirements
  - 2) PO 7.4 → Complementary transmission network voltage control service
  - 3) Others POs to include storage in ancillary services markets (MARI, PICASSO...)
- ✓ \*\* Propuesta de Orden Ministerial “Grants R&D Storage” → 2023  
(European Recovery [...] Plan – end 2026)
- ✓ Storage-specific auction

\*\* Currently under Public Consultation



# ASEALEN

Asociación española de almacenamiento de energía

[www.asealen.es](http://www.asealen.es)