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El almacenamiento en la gestión de las redes eléctricas

*El rol del almacenamiento de energía en la
descarbonización del sector energético español*

15 septiembre 2020

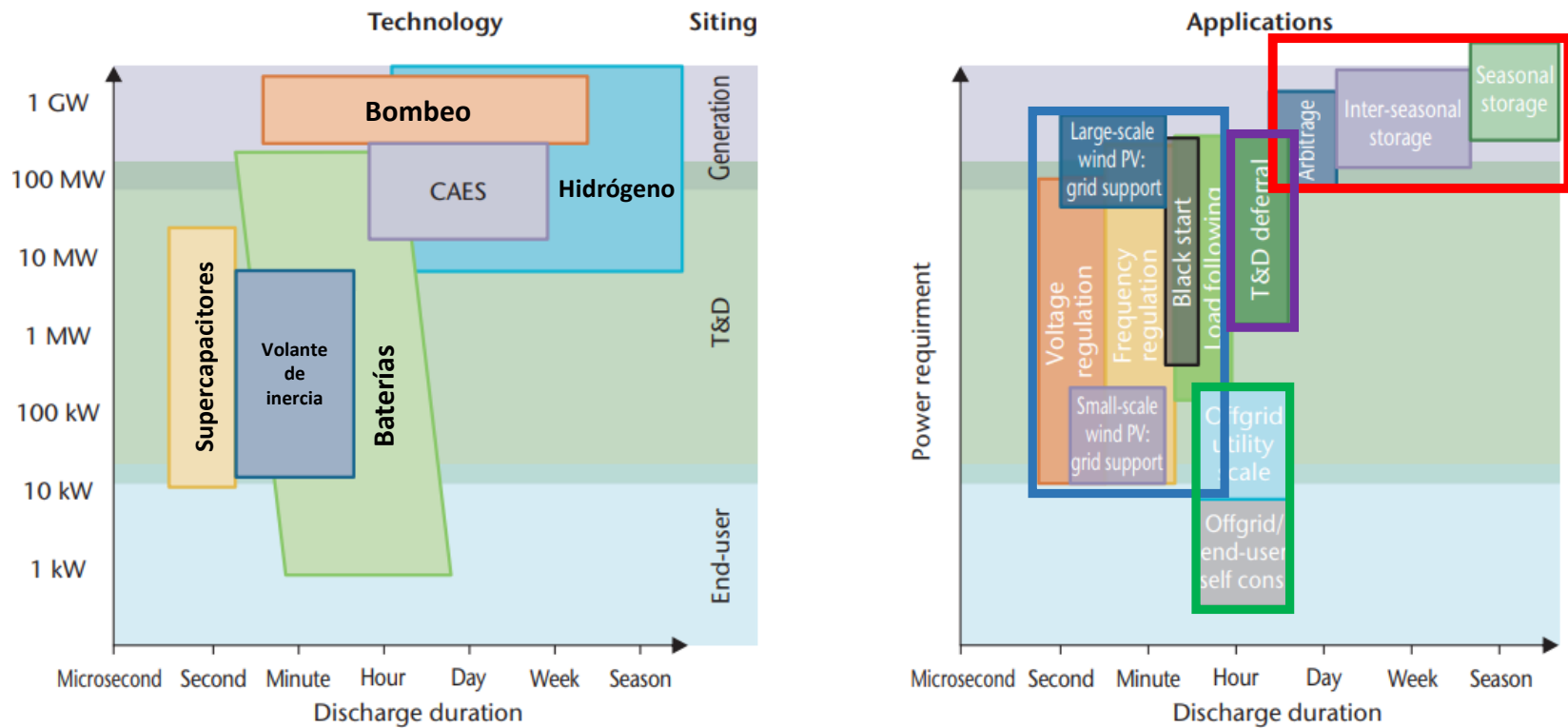


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El almacenamiento: clave para gestionar las redes eléctricas del futuro



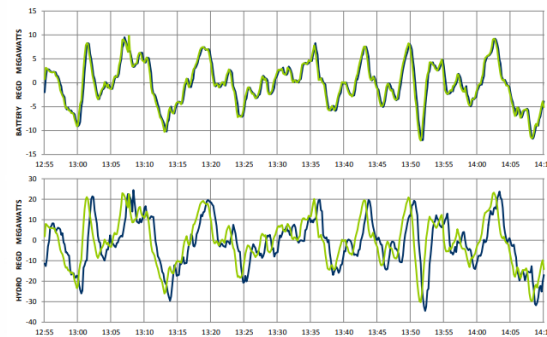
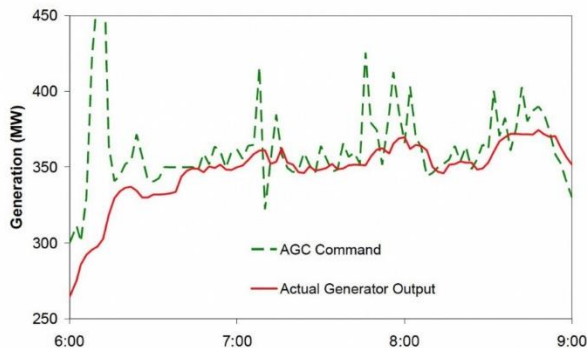
Fuente: (IEA, 2015)

¿Qué hace falta para desplegar este potencial?

- Desarrollo tecnológico
- Adaptar los mercados eléctricos (todos los horizontes de tiempo)
 - Permitir su participación
 - Reconocer sus características particulares y su valor
- Crear un marco regulatorio apropiado
 - Que defina claramente la actividad y quién puede realizarla
 - Que incentive a los gestores de la red a considerarlo como una alternativa en la planificación
 - Diseñar mecanismos de apoyo

Ejemplos de buenas prácticas (i)

- Orden FERC 755 (pay for performance) y FERC 841 (participation in markets)



Battery
REGD
97.7%

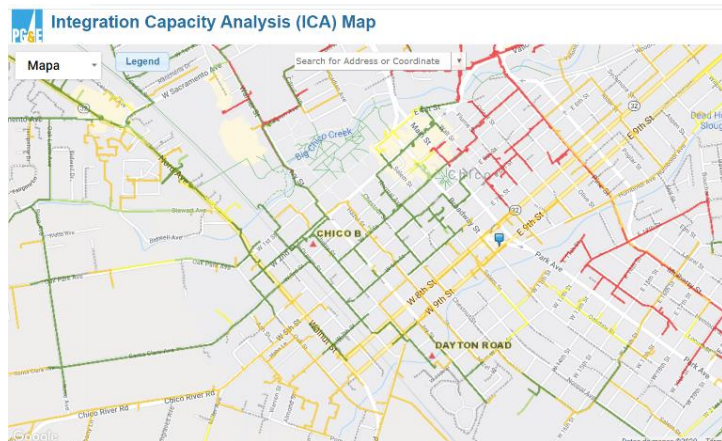
Hydro
REGD
74.7%

Physical or Operational Characteristic	Definition
State of Charge	State of Charge represents the amount of energy stored in proportion to the limit on the amount of energy that can be stored, typically expressed as a percentage. It represents the forecasted starting State of Charge for the market interval being offered into.
Maximum State of Charge	Maximum State of Charge represents a State of Charge value that should not be exceeded (i.e., gone above) when a resource using the participation model for electric storage resources is receiving electric energy from the grid (e.g., 95% State of Charge).
Minimum State of Charge	Minimum State of Charge represents a State of Charge value that should not be exceeded (i.e., gone below) when a resource using the participation model for electric storage resources is injecting electric energy to the grid (e.g., 5% State of Charge).
Maximum Charge Limit	Maximum Charge Limit represents the maximum MW quantity of electric energy that a resource using the participation model for electric storage resources can receive from the grid.

Ejemplos de buenas prácticas (ii)

- Regulación de la planificación de las redes

Pacific maps



Planned Investment

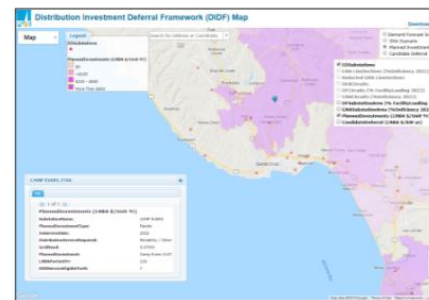
The planned investment layer provides information on projects that meet identified grid needs and can be viewed by selecting the "Planned Investment" radio button in the top right corner of the map. The map is colored by the locational net benefit analysis (LNBA) value of the planned investment in \$/unit-yr (where unit is either kW or V). The legend can be accessed by clicking "Legend" in the top left corner of the map. Additional information is available on the pop-up that appears when clicking on a shaded section of the map:

Substation Name	Name of substation
Planned Investment	Name of planned investment facility
Planned Investment Type	Type of planned investment facility
In Service Date	Date project is needed
Distribution Service Required	Type of service required
Estimated LNBA (\$/unit-yr)	Estimated LNBA value in kW or V
Grid Need	Value of grid need in MW or V
DER Service Eligible (Y or N)	Identifier if the project is eligible for DER service

Candidate Deferral

The candidate deferral level provides information on projects that have been identified as potential candidates for deferral by DERs and can be viewed by selecting the "Candidate Deferral" radio button in the top right corner of the map. The map is colored by the LNBA value of the candidate deferral in \$/kW-yr. The map legend can be accessed by clicking "Legend" in the top left corner of the map. Additional information is available on the pop-up that appears when clicking on a shaded section of the map:

Substation Name	Name of substation
Candidate Deferral	Name of candidate deferral facility
Candidate Deferral Type	Type of candidate deferral facility
In Service Date	Date project is needed
GNA Facility Name	Name of facility identified in GNA
Distribution Service Required	Type of service required
Estimated LNBA (\$/MWh-yr)	Estimated LNBA value in MWh
Estimated LNBA (\$/kW-yr)	Estimated LNBA value in kW
Unit Cost of Traditional Mitigation (\$K)	Unit cost of traditional mitigation in thousand dollars
Real Time or Day Ahead (RT or DA)	Identifier if the need is real time or day ahead
Grid Need (MW)	Value of grid need in MW
Months	Time of year during which the need exists
Calls Per Year	Number of potential calls per year
Hours	Time of day during which the need exists
Duration (hours)	Duration of call in number of hours



Situación en Europa - España

- Clean Energy Package y el PNIEC alineados con estas buenas prácticas
- Clean Energy Package
 - el futuro sistema eléctrico debe hacer uso de todas las fuentes disponibles de flexibilidad, en particular [...] el almacenamiento de energía [...]
 - [...] el almacenamiento de energía [...] participarán en condiciones de igualdad en el mercado;
- PNIEC (129 menciones, 6 GW)
 - Medida 1.2. Gestión de la demanda, almacenamiento y flexibilidad
- Están las directrices, aunque ahora falta el diseño y la regulación de detalle



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