Key challenges for hydropower in Spain

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THE WAY FORWARD FOR HYDROPOWER RESEARCH
EERA JP Hydropower Kick-Off Event

Current situation of hydropower in Spain

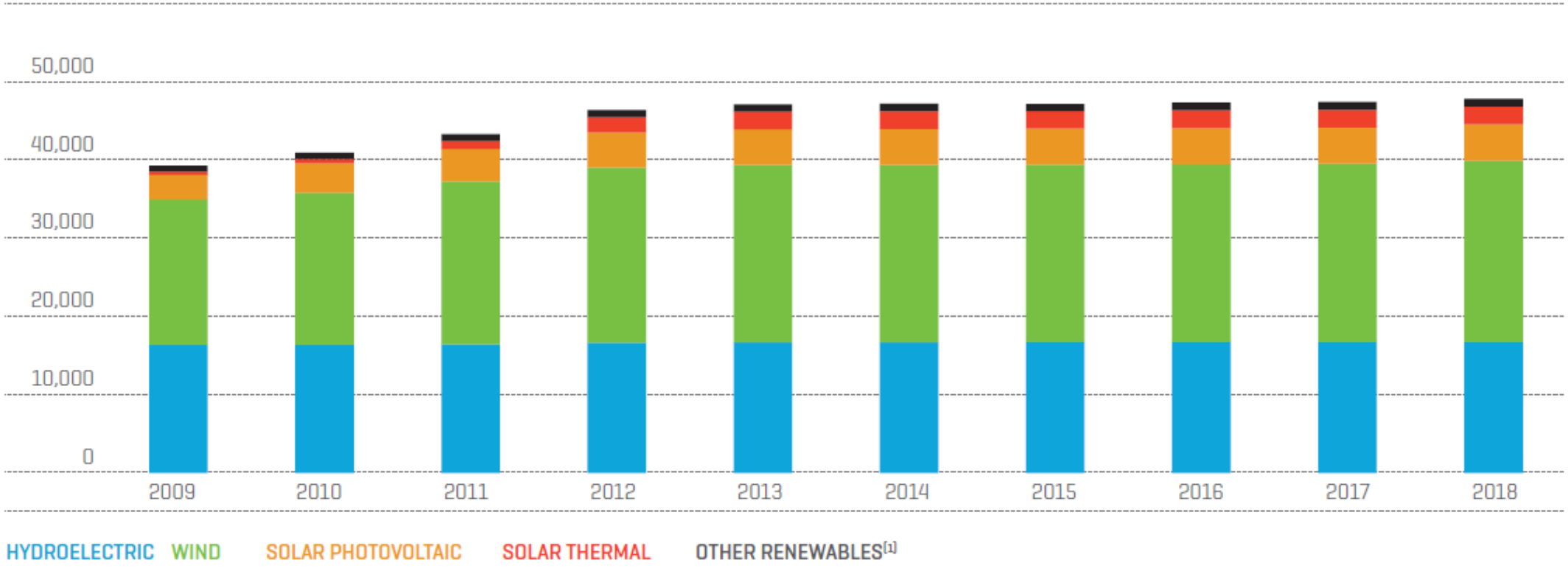
Breakdown of installed power capacity as at 31.12.2018. National Electricity System

	Peninsular system		Non-peninsular systems		National total	
	MW	%18/17	MW	%18/17	MW	%18/17
Hydro	17,047	0.1	2	0.0	17,049	0.1
Bombeo puro	3,329	0.0	-	-	3,329	0.0
Nuclear	7,117	0.0	-	-	7,117	0.0
COAL	9,562	0.3	468	0.0	10,030	0.3
Fuel/gas	0	-	2,490	0.0	2,490	0.0
Combined cycle	24,562	-1.5	1,722	0.0	26,284	-1.4
Hydro-wind	-	-	11	0.0	11	0.0
Wind	23,091	0.7	416	97.7	23,507	1.6
Solar photovoltaic	4,466	0.6	248	0.2	4,714	0.5
Solar thermal	2,304	0.0	-	-	2,304	0.0
Other renewables [1]	859	0.6	6	0.0	865	0.6
Cogeneration	5,730	-1.3	10	0.0	5,741	-1.3
Non-renewable waste	452	-1.4	38	0.0	491	-1.3
Renewable waste	123	0.0	38	0.0	162	0.0
Total	**98,643**	**-0.2**	**5,452**	**3.9**	**104,094**	**0.0**

Taken from REE, The Spanish Power System 2018.

Current situation of hydropower in Spain

Evolution of installed renewable power capacity. National electricity system (MW)



(1) Includes biogas, biomass, geothermal, marine hydro, wind-hydro and renewable waste.
Source: National Commission of Markets and Competition (CNMC) until 2014.

Taken from REE, Renewable Energy in the Spanish Electricity System 2018.

Current situation of hydropower in Spain

- 3 generation companies own 88.7 % of the installed hydropower capacity: Iberdrola (8,415 MW), Enel Green Power (4,753 MW) and Naturgy (1,954 MW)
- GE, Voith and Andritz have manufacturing workshops in Spain (in the Basque Country in Madrid)
- In the current century, only 3 large hydropower upgrading projects have been undertaken in Spain
- Since 2010, only 5 large hydropower projects have received a positive Environmental Assessment from the Ministry

Year	Project type	Comments	Power capacity (MW)
2012	Open-loop pumped-storage	Existing upper and lower reservoirs	225
2013	Hydropower plant	Existing upper reservoir	158
2014	Closed-loop pumped-storage	Abandoned and polluting mines (included on the 3rd EC PCI list)	552
2014	Closed-loop pumped-storage	Abandoned and polluting mines (candidate to be included on the 4th EC PCI list)	235
2017	Open-loop pumped-storage	Existing upper and lower reservoirs	380

Main barriers (B) and associated challenges (C) to the further development of hydropower in Spain

B: In Spain it can take 10-15 years from the first draft of a hydropower project to the hydropower plant's commissioning.

C: Public authorities must make some changes in the regulations so as to shorten and increase the efficiency of the permitting process

B: The Environmental Impact Assessment process is very demanding

C: A real participatory process should be carried out so as to prepare the Environmental Impact Study the Project's promoter must submit for the Ministry to perform the Environmental Impact Assessment

B: Most people in the Spanish hydropower sector agree that the potential for new large hydropower projects will hardly be tapped

C: It's necessary to promote the use of existing wáter infrastructures (water supply, irrigation) for hydroelectric power generation

Opportunities for hydropower development in Spain

- 7 % of hydropower concessions have already expired and an additional 8 % will expire by 2030

  Once the concession period of a hydropower plant has ended the competent authority must issue a call for tenders to take over the plant's operation

  Several upgrading and refurbishment works are usually required in the tender especification

  Expired concessions might be used in a centralized manner so as to guarantee a low price electricity for vulnerable consumers and certain energy storage capacity

- 3.5 additional GW of installed capacity in closed-loop pumped-storage plants is foreseen in the draft Integrated National Energy and Climate Plan (NECP) 2021-2030

  The NECP states that the operation of pumped-storage might be reformulated so as to guarantee electric power system's stability and the integration of renewable energy

Thank you very much for your attention!