




**THE**  
**LIVING ENERGY**  
**BOOK**

by *edp*

IBERIAN DATA  
2017











# PRICES AND SPREADS

FUEL, CO <sub>2</sub> AND EXCHANGE RATES		2013	2014	2015	2016	2017	'17-'16
Brent	\$/bbl	108.7	99.0	52.5	43.7	54.3	24%
Coal API#2	\$/ton	81.7	75.3	56.8	59.8	84.5	41%
Gas (NBP)	\$/MBtu	10.7	8.2	6.5	4.6	5.8	25%
Gas (WACOG) <sup>(1)</sup>	\$/MBtu	10.3	10.3	7.2	5.4	6.0	10%
Gas (Mibgas)	€/MWh	-	-	-	17.0	20.9	23%
CO <sub>2</sub> (USA)	€/ton	4.5	6.0	7.7	5.3	5.8	9%
EUR/USD		1.33	1.33	1.11	1.11	1.13	2%
EUR/GBP		0.85	0.81	0.73	0.82	0.88	7%

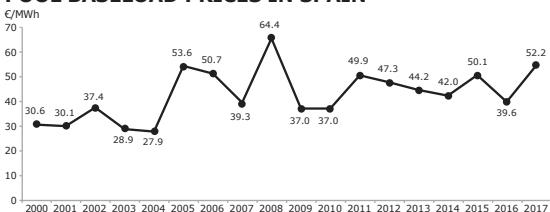
## PORTUGAL

## SPAIN

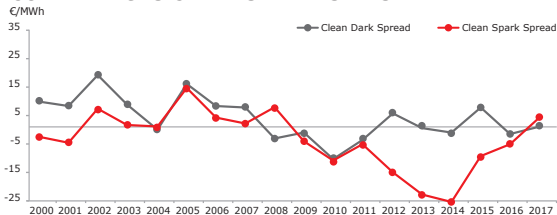
€/MWh	2016	2017	2016	2017		
Pool Baseload	39.4	52.5	33%	39.6	52.2	32%
- Pool Peak	44.8	57.0	27%	44.9	57.1	27%
- Pool Offpeak	36.6	50.0	36%	36.8	49.5	35%
Clean Spark Spread	2.3	12.3	444%	-5.0	4.4	-187%
Clean Dark Spread	7.7	11.6	51%	-1.6	1.2	-178%

<sup>(1)</sup> Weighted Average Cost of Gas (Iberian Peninsula)

## POOL BASELOAD PRICES IN SPAIN



## COAL AND GAS CLEAN SPREADS IN SPAIN



Assuming average efficiency of 48% for CCGT and 34% for Coal plants in the Iberian Peninsula

# ELECTRICITY BALANCE

## PORTUGAL

## SPAIN

GWh	PORTUGAL			SPAIN		
	2016	2017	%	2016	2017	%
Ordinary Regime	34 484	32 623	-5%	150 688	149 799	-1%
Nuclear	0	0	0%	56 099	55 609	-1%
Hydro	15 413	5 536	-64%	33 715	17 743	-47%
Thermal	19 071	27 087	42%	60 874	76 447	26%
- CCGT	7 373	13 479	83%	25 686	33 855	32%
- Coal	11 698	13 608	16%	35 188	42 593	21%
Special Regime	21 510	20 733	-4%	97 848	98 644	1%
Hydro	1 332	614	-54%	5 450	2 867	-47%
Wind	12 188	11 974	-2%	47 298	47 498	0%
Solar	786	852	8%	12 650	13 336	5%
Thermal	7 204	7 293	1%	32 450	34 943	8%
- Cogeneration	5 763	5 805	1%	24 144	25 677	6%
- Biomass and Waste	1 441	1 488	3%	8 306	9 266	12%
Import Balance	-5 082	-2 684	-	7 667	9 171	-
Imports	1 973	3 072	-	21 845	23 759	-
Exports	-7 055	-5 756	-	-14 178	-14 588	-
Hydro Pumping	-1 519	-2 223	46%	-4 819	-3 675	-24%
Total Consumption	49 393	47 835	-3.2%	251 384	253 939	1.0%
Hydro Capability Factor	1.33	0.47	-65%	1.12	0.53	-53%
Gross Production + Net Imp.	54 007	54 916	2%	256 203	257 614	1%
Renewable Gen. (real)	33 348	24 108	-28%	105 860	90 710	-14%
- % Renewables (real)	61.7%	43.9%	-	41.3%	35.2%	-
Renewable Gen. (Directive) <sup>(1)</sup>	29 205	29 507	1%	93 786	-	-
- % Renewables (Directive)	54.1%	53.7%	-	36.6%	-	-

Electricity data includes T&D losses

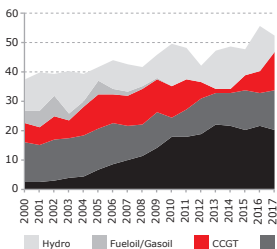
Portugal: Gross Production and Renewable Generation include islands; Spain: values refer to mainland only

<sup>(1)</sup> Directive 2009/28/EC

# ELECTRICITY GENERATION MIX

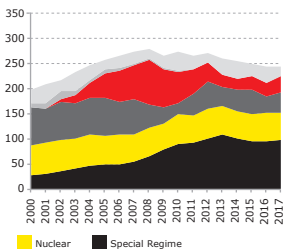
## PORTUGAL

TWh



## SPAIN

TWh



# GHG EMISSIONS

## PORTUGAL

## SPAIN

kton CO <sub>2</sub> eq.	2015	2016	2017	2015	2016	2017
Total Emissions	69 577	67 776	n.a.	335 809	324 707	n.a.
CO <sub>2</sub> Emissions	52 370	50 440	n.a.	271 727	260 986	n.a.
Other Gas Emissions	17 207	17 336	n.a.	64 082	63 721	n.a.
CO <sub>2</sub> ETS Emissions	27 947	25 745	30 116	137 270	123 556	136 319
ETS Free Allowances	11 479	11 217	10 958	60 373	60 019	58 571
ETS Auctions	12 634	14 116	17 281	62 066	69 346	84 876
ETS Balance	-3 835	-412	-1 877	-14 831	5 809	7 128
CO <sub>2</sub> Emissions (Power Sec.)	14 248	13 226	13 226	59 018	44 173	54 884
CCGT	1 886	2 652	2 652	9 249	9 390	12 535
Coal	12 362	10 574	10 574	49 769	34 783	42 349
SEF Power Sector (g/kWh)	298	236	251	221	178	221

GHG - Greenhouse Gas

n.a. - Values not available at the date of publication

ETS - Emissions Trading System

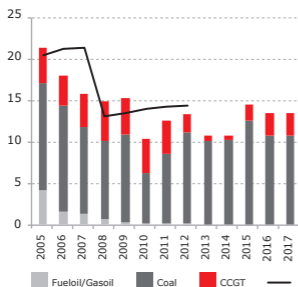
SEF - Specific Emission Factor

Estimated values according to the sector's average emission factors

## CO<sub>2</sub> EMISSIONS AND FREE ALLOWANCES IN THE IBERIAN PENINSULA (POWER SECTOR)

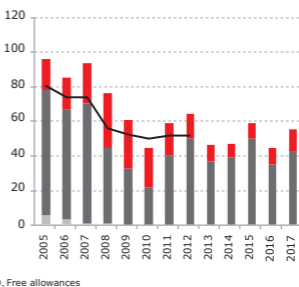
### PORTUGAL

Mton CO<sub>2</sub>



### SPAIN

Mton CO<sub>2</sub>



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