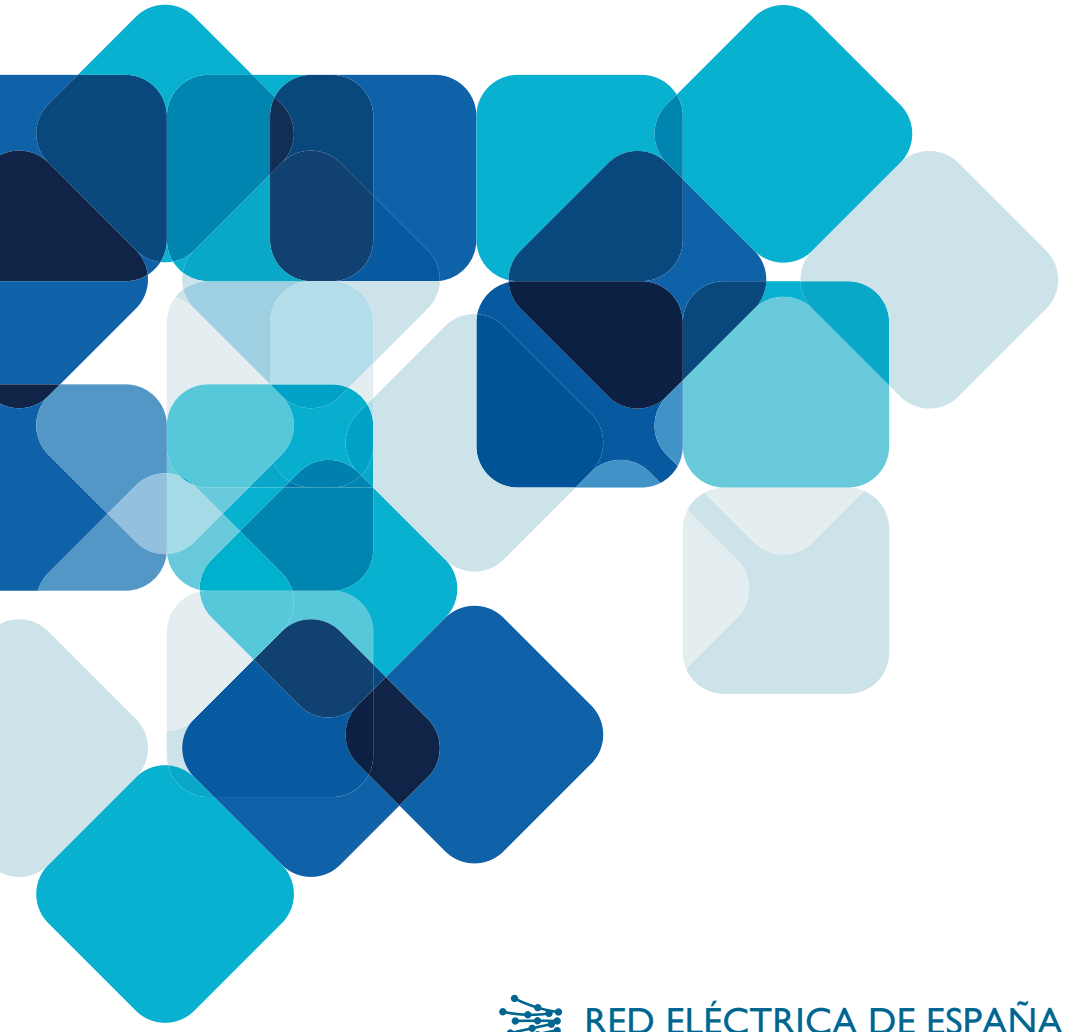
The **Spanish Electricity** System

PRELIMINARY REPORT

2013



RED ELÉCTRICA DE ESPAÑA

Drafting date:
19 December 2013

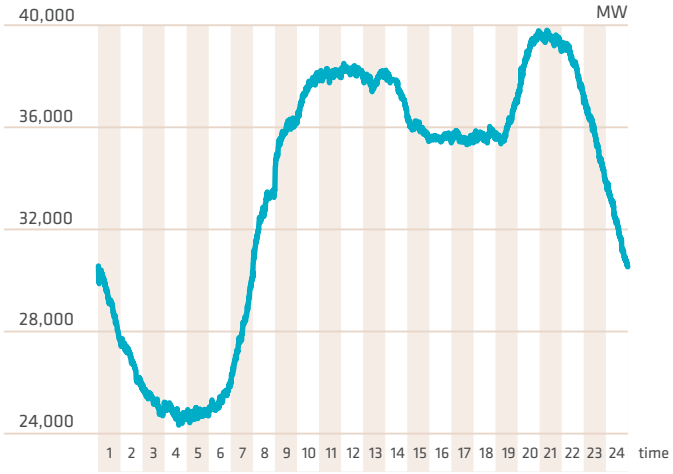
Provisional data:
Year end based on data estimated as at 17 December

The **Spanish Electricity** System

PRELIMINARY REPORT

2013

Load curve for the 27th of February 2013
maximum hourly power demand



RED ELÉCTRICA DE ESPAÑA

Index


RED
ELÉCTRICA
DE ESPAÑA

Introduction

This preliminary report presents **provisional** statistical data regarding the behaviour of the Spanish electricity system in 2013.

Peninsular System

Demand for **electrical energy** on the Spanish peninsula registered its third consecutive annual decline, falling to 246,166 GWh, 2.3% lower than 2012. After factoring in the effects of seasonal and working patterns, a drop of 2.0% was registered.

The maximum **instantaneous power** was registered at 40,277 MW on 27 February at 8:42 pm, 7.5% less than the maximum of 43,527 MW recorded in 2012 and 11.4% below the record of 45,450 MW reached 17 December 2007.

Installed power capacity on the Spanish peninsula closed 2013 at 102,281 MW (556 MW greater than 2012). The greatest increase was recorded by solar thermal (15% or 300 MW) and solar photovoltaic (3.3% or 140 MW). Other technologies have not experienced power variations or have been insignificant.

Producible hydroelectric stood at 32,205 GWh, 16% higher than the all-time average and 2.5 times greater than that registered in 2012. Hydroelectric reserves for the complete set of reservoirs ended 2013 with a fill level close to 52% of its total capacity, compared to 38% last year.

Regarding the **balance in the generation mix**, the high rainfall recorded in 2013 has resulted in a significant growth in hydroelectric generation over the previous year (+75.8% in hydroelectric under ordinary regime). Also, renewable generation included in the special regime grew 14.2% compared to 2012. In contrast, significant decreases were recorded in production from combined cycle (-34.2%), coal-fired (-27.3%) and nuclear (-8.3%) power stations.

With regard to **demand coverage**, it is worth noting that wind power has been, for the first time ever, the technology that contributed most to the annual electricity demand coverage (with a share of 21.1% compared to 18.1% in 2012), reaching the same level as nuclear which contributed 21% (22.1% in 2012). Hydroelectric energy doubled its contribution (a share of 14.4% in 2013, compared to 7.7% in 2012), whilst the contribution of coal-fired and combined cycle power stations were down 14.6% and 9.6% respectively (19.3% and 14.1 % in 2012). Other technologies maintained a similar share or experienced little variation over the previous year.

The progressively increasing weight of **renewable energy** in demand coverage has been favoured by the high rainfall recorded this year, increasing the share of renewable energy in the coverage of demand to 42.4%, 10.5 percentage points higher than the previous year.

Throughout 2013, the all-time highs of wind power production were exceeded. On February 6, wind power recorded a new maximum of instantaneous power with 17,056 MW at 3:49 pm (2.5% up on the previous record registered in April 2012), and that same day the all-time maximum for hourly energy was also exceeded reaching 16,918 MWh. Similarly, in January, February, March and November wind power generation was the technology that made the largest contribution towards the total energy production of the system.

On the other hand, also worth noting are the special circumstances under which the system was operated during Holy Week 2013, during which values of extremely low demand, high hydroelectric production (with actual discharges in many basins) and a forecasted high wind power production were recorded. Thus, to ensure the safety of the system it was necessary to issue orders to reduce production, by an amount never before seen, in order to maintain the balance between generation and demand. These reductions affected, amongst others, nuclear power stations; an exceptional event that has been unprecedented since 1997.

Introduction

The increased weight of renewable energy in the generation mix structure of 2013 compared to the previous year has reduced **CO_2 emissions** of the electricity sector on the Spanish peninsula to 61.4 million tonnes, 23.1% lower than in 2012.

Electricity exchanges through the **Spanish peninsula-Balearic Islands' interconnection** have had an export balance of 1,266 GWh towards the Balearic Islands, which allowed 22.3% of the Balearic Islands' electricity system demand to be covered by the peninsular system.

For the tenth consecutive year, the balance of **international electricity exchanges** has been as an exporter registering 6,958 GWh in 2013, 37.9% lower than 2012. Exports stood at 16,913 GWh (18,986 GWh en 2012) and imports at 9,955 GWh (7,786 en 2012).

Extra-peninsular systems

Annual demand for electricity in the **extra-peninsular systems** as a whole closed 2013 with a decrease of 2.9% compared to the previous year. By electricity system, the registered falls were 2.5% in the Balearic Islands, 3% in the Canary Islands, 4.8% in Ceuta and 3.4% in Melilla.

Transmission grid facilities

Regarding **transmission grid facilities**, during 2013 were 747 km of new lines were put in service, meaning that at the end of the year the national transmission grid totalled 42,116 km of circuit. In addition, transformer capacity rose by 2,125 MVA, increasing the total national transformer capacity to 80,295 MVA.

Electricity balance, installed power capacity and transmission grid

1

Annual balance of electrical energy

	Peninsular system		Extra-peninsular system		National total	
	GWh	% 13/12	GWh	% 13/12	GWh	% 13/12
Hydro	34,205	75.8	0	-	34,205	75.8
Nuclear	56,378	-8.3	-	-	56,378	-8.3
Coal(1)	39,792	-27.3	2,591	-11.9	42,384	-26.5
Fuel/gas(2)	-	-	6,981	-7.4	6,981	-7.4
Combined cycle	25,409	-34.2	3,574	-8.8	28,983	-31.8
Gross production	**155,785**	**-10.6**	**13,147**	**-8.7**	**168,932**	**-10.4**
Self-consumption	-6,241	-20.9	-771	-9.3	-7,012	-19.8
Hydro	7,095	52.8	3	-	7,098	52.8
Wind	53,926	12.0	375	1.8	54,301	12.0
Solar photovoltaic	7,982	1.9	415	12.6	8,397	2.4
Solar thermoelectric	4,554	32.2	-	-	4,554	32.2
Renewable thermal	5,011	5.6	9	11.4	5,020	5.6
Non-renewable thermal	32,048	-4.3	260	-5.1	32,309	-4.3
Special regime	**110,616**	**8.1**	**1,062**	**4.1**	**111,679**	**8.1**
Net production	**260,160**	**-3.2**	**13,438**	**-7.8**	**273,598**	**-3.4**
Pumped storage consumption	-5,769	14.9	-	-	-5,769	14.9
Peninsula-Balearics interc.(3)(4)	-1,266	-	1,266	-	0	-
International exchanges(4)	-6,958	-37.9	-	-	-6,958	-37.9
Demand (b.c.- at power station busbars)	**246,166**	**-2.3**	**14,704**	**-2.9**	**260,870**	**-2.3**

(1) As of 1 January 2011 includes GICC (Elcogás). **(2)** Generation from auxiliary generation units is included in the Balearic Islands' electrcity system. **(3)** Peninsula-Balearic Islands' interconnection operating at the technical minimum level of security until 13 August 2012. **(4)** Positive value: importer balance; negative value: exporter balance.

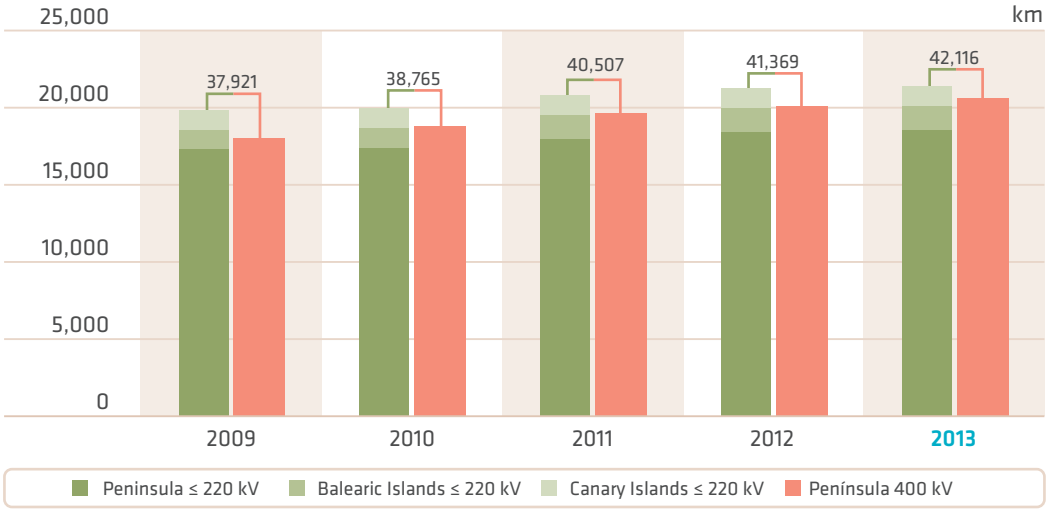
Installed capacity as at 31 December

	Peninsular system		Extra-peninsular system		National total	
	MW	% 13/12	MW	% 13/12	MW	% 13/12
Hydro	17,765	0.0	1	0.0	17,766	0.0
Nuclear	7,866	0.0	-	-	7,866	0.0
Coal(1)	11,131	0.2	510	0.0	11,641	0.2
Fuel/gas	520	0.0	2,979	2.4	3,498	2.0
Combined cycle	25,353	0.0	1,854	0.0	27,206	0.0
Ordinary regime	**62,635**	**0.0**	**5,343**	**1.3**	**67,978**	**0.1**
Hydro	2,057	0.7	0.5	0.0	2,058	0.7
Wind	22,746	0.8	153	3.1	22,900	0.8
Solar photovoltaic	4,438	3.3	244	1.5	4,681	3.2
Solar thermoelectric	2,300	15.0	-	-	2,300	15.0
Renewable thermal	979	2.7	5	61.6	984	2.9
Non-renewable thermal	7,127	-1.6	121	0.0	7,248	-1.5
Special regime	**39,646**	**1.4**	**524**	**2.0**	**40.170**	**1.4**
Total	**102,281**	**0.5**	**5,867**	**1.4**	**108.148**	**0.6**

(1) As of 1 January 2011 includes GICC (Elcogás).

1 Electricity balance, installed power capacity and transmission grid

Evolution of the transmission grid in Spain



Transmission grid installations in Spain

	400 kV Peninsula	≤ 220 kV Peninsula	≤ 220 kV Balearic Isl.	≤ 220 kV Canary Isl.	Total
Total lines (km)	**20,641**	**18,639**	**1,544**	**1,293**	**42,116**
Overhead lines (km)	20,586	17,939	1,089	1,023	40,637
Submarine cable (km)	29	236	306	30	601
Underground cable (km)	26	463	149	240	878
Transformer capacity (MVA)	75,859	63	2,748	1,625	80,295

Data relating to km of circuit and transformer capacity as at 31 December 2013.

Peninsular system
2.1 Demand

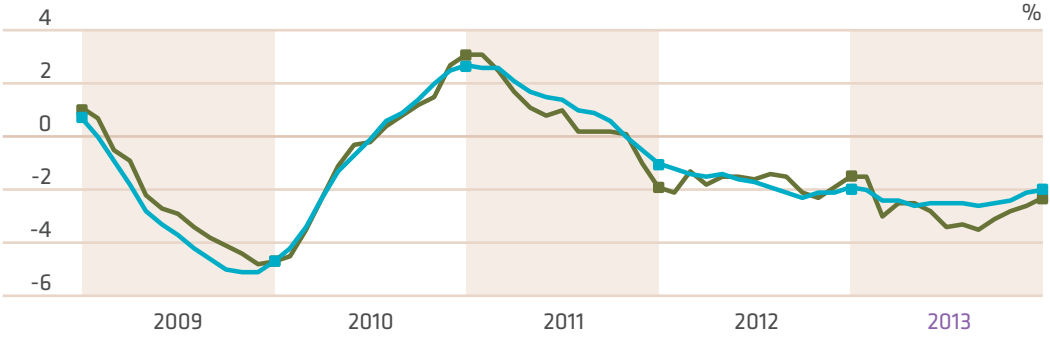
2

Demand evolution

Año	GWh	Δ Annual (%)	Δ Adjusted annual (*) (%)
2009	252,660	-4.7	-4.7
2010	260,530	3.1	2.7
2011	255,631	-1.9	-1.0
2012	251,850	-1.5	-1.9
2013	**246,166**	**-2.3**	**-2.1**

(*) Adjusted as a result of factoring in the effect of seasonal and working patterns.

Annual demand growth (rolling year)



Monthly demand growth (%)

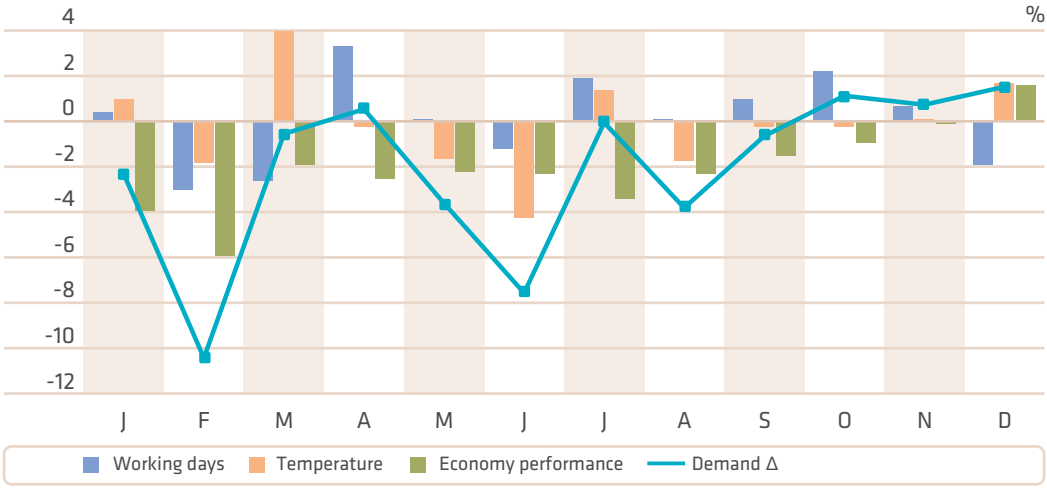
	J	F	M	A	M	J	J	A	S	O	N	D
Monthly	-2.4	-10.6	-0.6	0.5	-3.7	-7.7	-0.1	-3.9	-0.7	1.1	0.7	1.5
Cummulative	-2.4	-6.5	-4.6	-3.5	-3.5	-4.2	-3.6	-3.6	-3.3	-2.9	-2.6	-2.3

Variations as compared to same month of previous year.

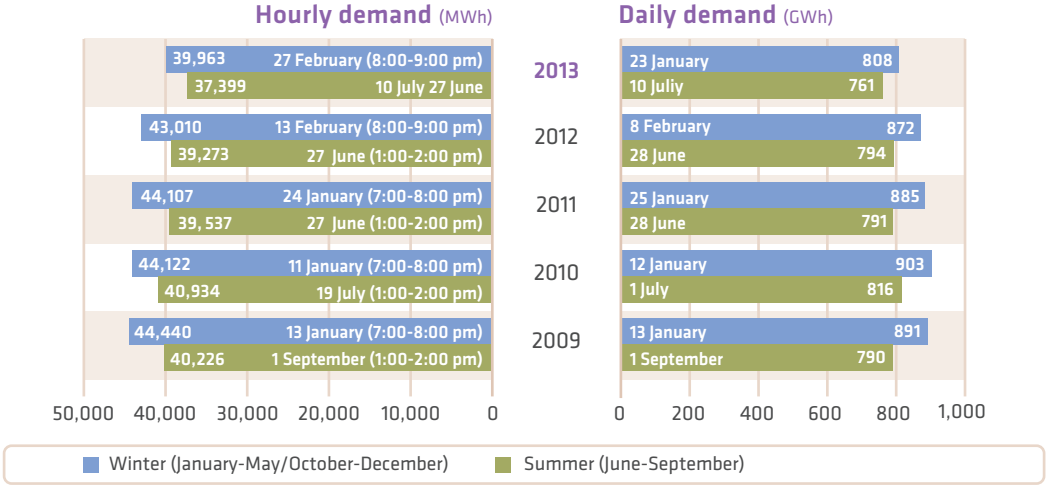
2 Peninsular system

2.1 Demand

Components of the monthly growth in demand



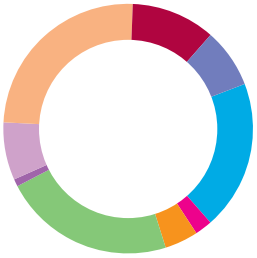
Maximum hourly and daily demand



Peninsular system
2.1 Demand

2

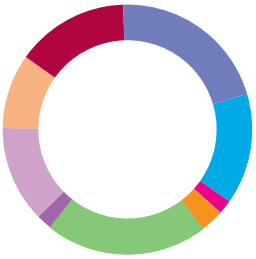
Installed capacity as at 31 December (102,281 MW)



- Combined cycle 24.8%
- Coal 10.9%
- Nuclear 7.7%
- Hydro(1) 19.4%
- Solar thermoelectric 2.2%
- Solar photovoltaic 4.3%
- Wind 22.2%
- Renewable thermal 1.0%
- Cogeneration and the rest of the technologies(2) 7.5%

(1) Includes pure pumped storage (2,747 MW). **(2)** Includes non-renewable thermal and fuel / gas.

Spanish peninsula electricity demand coverage 2013(1)



- Combined cycle 9.6%
- Coal 14.6%
- Nuclear 21.0%
- Hydro(1) 14.4%
- Solar thermoelectric 1.8%
- Solar photovoltaic 3.1%
- Wind 21.1%
- Renewable thermal 2.0%
- Cogeneration and the rest of the technologies(2) 12.4%

(1) Pumped storage not included. **(2)** Includes non-renewable thermal and fuel / gas.

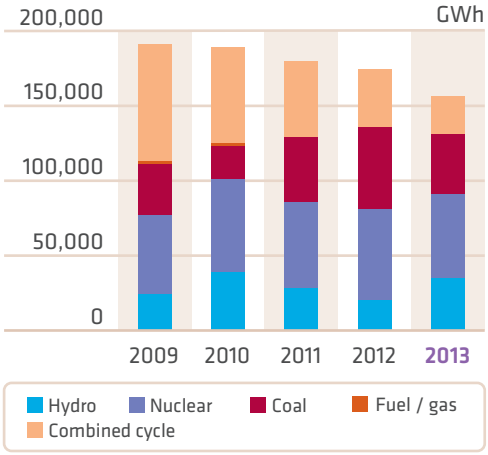
Maximum peak power demand coverage 39,963 MW(1)
27 February 2013 (8:00-9:00 pm)

- Combined cycle 9.3%
- Coal 20.0%
- Nuclear 17.7%
- Hydro(1) 17.3%
- Solar thermoelectric 0.1%
- Solar photovoltaic 0.2%
- Wind 21.9%
- Renewable thermal 1.7%
- Cogeneration and the rest of the technologies(2) 11.8%

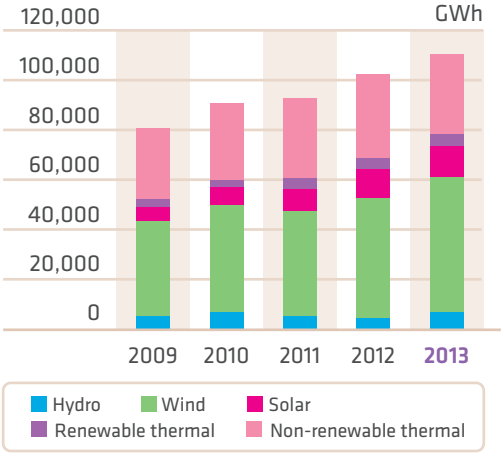
(1) Pumped storage not included. **(2)** Includes non-renewable thermal and fuel / gas.

2 Peninsular system
2.1 Demand

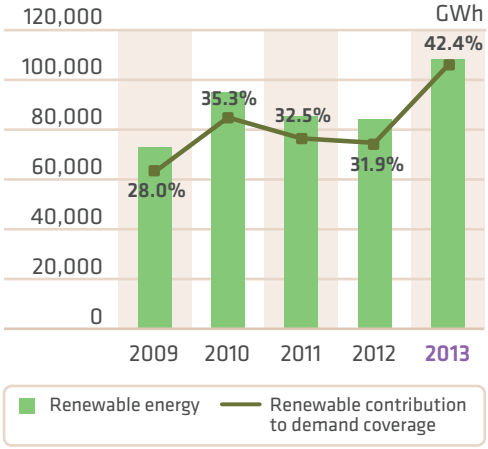
Evolution of gross production from ordinary regime



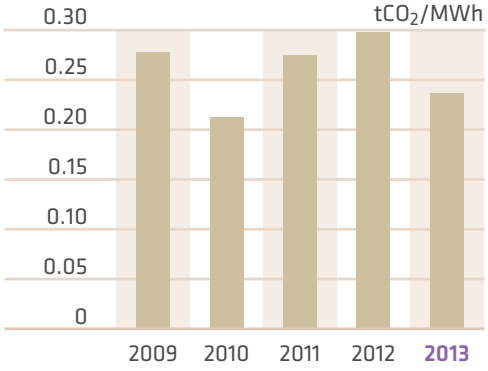
Evolution of net production from special regime



Evolution of renewable energies



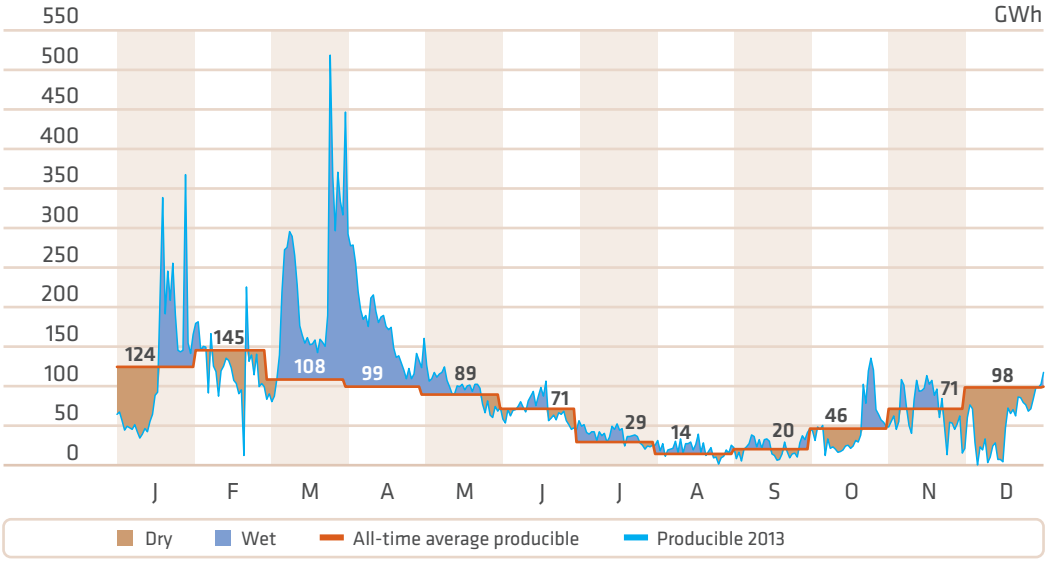
Evolution of the emission factor associated to electricity generation



Peninsular system
2.2 Hydroelectric energy

2

Daily producible hydroelectric energy compared with the all-time average producible

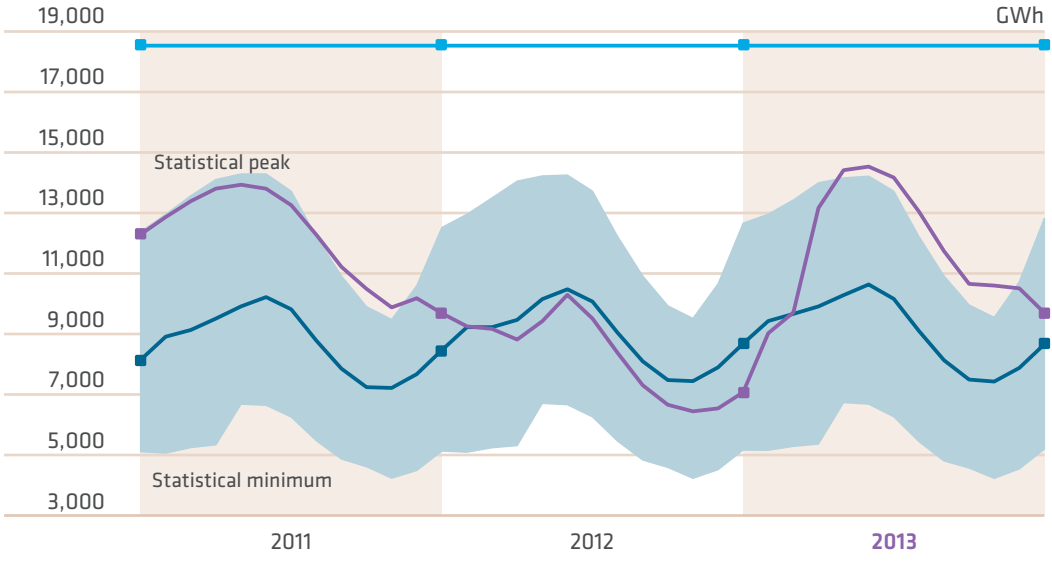


Annual producible hydroelectric energy

Year	GWh	Index	Probability of being exceeded (%)
2009	22,262	0.79	76
2010	36,174	1.29	16
2011	22,506	0.81	74
2012	12,640	0.46	100
2013	**32,205**	**1.16**	**27**

2 Peninsular system
2.2 Hydroelectric energy

Evolution of hydroelectric reserves



Statistical maximum and minimum: average of the maximum and minimum values of the last 20 years.

Hydroelectric reserves as at 31 December

	Capacity	2012		2013	
		GWh	% of maximum capacity	GWh	% of maximum capacity
Annual regime	8,967	3,672	41.0	4,176	46.6
Hyper-annual regime	9,571	3,407	35.6	5,582	57.8
Global	**18,538**	**7,079**	**38.2**	**9,704**	**52.3**

Peninsular system
2.3 Facilities. Generation and transmission

2

Variations in ordinary regime generator equipment

	Commissioned		Decommissioned	
	Type	MW	Type	MW
Meirama	Coal	17		
San Esteban II			Hydroelectric	2
TOTAL		17		2

New 400/220 kV switchyards

	Voltage kV		Voltage kV
Grado	400	Brovales	220
Ludrio	400	Eiris	220
Muniesa	400	El Fargue	220
Puebla de Guzmán	400	Gandía	220
San Serván	400	Gavarrot	220
Alcobendas	220	Polígono C	220
Aldaia	220	San Serván	220
Algete	220	Torrellano (Nueva Saladas)	220
Balsicas	220	Villaverde GIS	220

New 400 kV transmission lines

	N.º of circuits	Km of circuits
I/O Grado L/Soto-Tabiella (*)	2	13.46
I/O Muniesa L/Fuendetodos-Mezquita	1	0.64
L/Abanto-L/Penagos-Güeñes	4	40.26
L/Almaraz-San Serván (*)	2	285.38
L/Penagos-Güeñes	2	5.13
L/Salas-Grado (*)	2	54.70
L/San Serván-Brovales	2	132.48
TOTAL		532.05

I/O= input/output. L= Line
(*) Pending reception of the commissioning certificate.

2 Peninsular system
2.3 Facilities. Generation and transmission

New 220 kV transmission lines

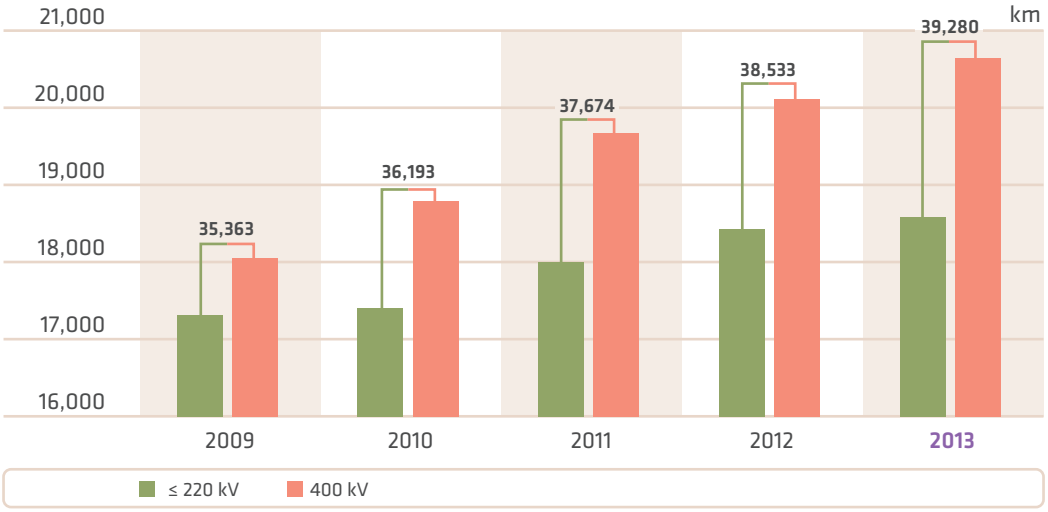
	N.º of circuits	km of circuits
I/O Alcobendas L/Fuencarral-S.S.Reyes (*)	2	0.10
I/O Alcobendas L/Fuencarral-S.S.Reyes (underground) (*)	1	1.34
I/O Alcobendas-L/Fuencarral-S.S.Reyes (underground) (*)	2	0.77
I/O Aldaia L/La Eliana-Torrente (underground)	2	1.30
I/O Eiris L/Mesón-Puerto (underground) (*)	1	4.87
I/O Eiris L/Mesón-Puerto (underground) (*)	2	0.77
I/O Eiris L/Mesón-Puerto (*)	1	0.16
I/O Novelda L/Benejama-Petrel (underground)	2	1.54
I/O Novelda L/Benejama-Petrel	2	0.51
I/O S.S. Reyes (underground) (*)	1	0.87
I/O S.S. Reyes (*)	2	2.34
I/O Villaviciosa L/Boadilla-Lucero	2	0.08
L/Aljarafe-Rocío (*)	2	116.00
L/Andújar-Guadame 2 (*)	1	23.00
L/Brovales-Balboa	1	0.97
L/Gandía-Valle del Cárcer (antes Vilanova) con I/O Valldigna	2	40.90
L/Gandía-Valle del Cárcer (antes Vilanova) con I/O Valldigna (underground)	2	9.43
L/Maragall-Trinitat (underground) (*)	2	7.48
L/Maragall-Trinitat (underground) (*)	1	1.23
Reconfiguration of S.S. Reyes switchyard (underground)	1	0.45
Tres Cantos GIS 220: feeding TR5 (underground)	1	0.16
Tres Cantos GIS 220: connection to I/O de S.S. Reyes (underground)	1	0.22
Tres Cantos GIS 220: connection to hybrid bay (underground)	1	0.19
TOTAL		**214.68**

I/O= input/output. L= Line
(*) Pending reception of the commissioning certificate.

Peninsular system
2.3 Facilities. Generation and transmission

2

Evolution of the transmission grid

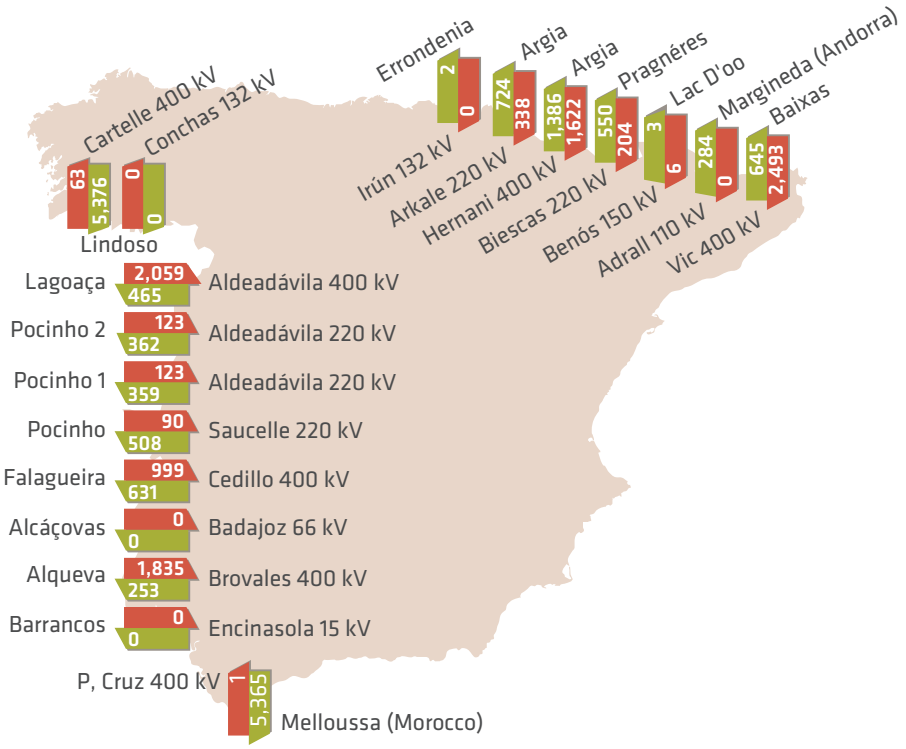


Evolution of the transmission system and transformer capacity

	2009	2010	2011	2012	2013
Circuits 400 kV (km)	18,056	18,792	19,671	20,109	**20,641**
Circuits ≤ 220 kV (km)	17,307	17,401	18,002	18,424	**18,639**
Transformer capacity (MVA)	66,347	67,547	69,347	74,047	**75,922**

2 Peninsular system
2.4 International exchanges

Map of international physical energy exchanges (GWh)



Balance of international physical energy exchanges (GWh)

	France	Portugal	Andorra	Morocco	Total
2009	1,590	-4,789	-299	-4,588	-8,086
2010	-1,531	-2,634	-264	-3,903	-8,333
2011	1,524	-2,814	-306	-4,495	-6,090
2012	1,883	-7,897	-286	-4,900	-11,200
2013	**1,353**	**-2,663**	**-284**	**-5,364**	**-6,958**

Positive value: import balance; negative value: export balance.

Extra-peninsular systems
3.1 Demand

3

Balance of electrical energy

	Balearic Islands		Canary Islands		Ceuta		Melilla	
	GWh	% 13/12	GWh	% 13/12	GWh	% 13/12	GWh	% 13/12
Hydro	-	-	0	-	-	-	-	-
Coal	2,591	-11.9	-	-	-	-	-	-
Fuel/gas	1,296	-1.4	5,243	-8.9	220	-5.4	216	-6.1
Internal combustion engines(1)	769	-20.4	2,182	-2.3	220	-5.3	216	-6.0
Gas turbines	527	51.5	382	-36.4	0.2	-57.3	0.1	-45.1
Steam turbines	-	-	2,679	-8.4	-	-	-	-
Combined cycle	427	-54.7	3,147	5.8	-	-	-	-
Auxiliary generation(2)	7	-14.9	0	-	-	-	-	-
Régimen ordinario	**4,322**	**-17.0**	**8,390**	**-3.9**	**220**	**-5.4**	**216**	**-6.1**
Self-consumption	-302	-13.4	-437	-6.3	-18	-11.7	-14	-4.5
Hydro	-	-	3	67.4	-	-	-	-
Wind	6	-4.5	369	2.0	-	-	-	-
Solar photovoltaic	127	12.6	288	12.6	-	-	0.04	-50.0
Renewable thermal	1	14.1	9	11.2	-	-	-	-
Non-renewable thermal	252	-7.3	0	-	-	-	8	258.2
Special regime	**386**	**-1.5**	**668**	**6.6**	**-**	**-**	**8**	**247.4**
Net production	**4,405**	**-16.1**	**8,621**	**-3.0**	**202**	**-4.8**	**210**	**-3.4**
Penins.-Balearics interc.(3)	1,266	-	-	-	-	-	-	-
Demand (b.c.- at power station busbars)	**5,671**	**-2.5**	**8,621**	**-3.0**	**202**	**-4.8**	**210**	**-3.4**

(1) Includes generators whose main fuel is fuel oil, gasoil and/or natural gas. **(2)** Emergency generator units which are installed temporarily in specific areas to cover deficits in generation. **(3)** Peninsula-Balearic Islands'interconnection operating at the technical minimum level of security until 13 August 2012. Positive value: import balance; negative value: export balance.

Installed capacity as at 31 December

	Balearic Islands		Canary Islands		Ceuta		Melilla	
	MW	% 13/12	MW	% 13/12	MW	% 13/12	MW	% 13/12
Hydro	-	-	1	0.0	-	-	-	-
Coal	510	0.0	-	-	-	-	-	-
Fuel/gas	877	6.0	1.918	1.0	99	0.0	85	0.0
Internal combustion engines(1)	199	0.0	566	3.6	83	0.0	70	0.0
Gas turbines	678	8.0	639	0.0	16	0.0	15	0.0
Steam turbines	-	-	713	0.0	-	-	-	-
Combined cycle	934	0.0	920	0.0	-	-	-	-
Auxiliary generation	-	-	-	-	-	-	-	-
Ordinary regime	**2,321**	**2.2**	**2,839**	**0.7**	**99**	**0.0**	**85**	**0.0**
Hydro	-	-	0.5	0.0	-	-	-	-
Wind	4	0.0	150	3.2	-	-	-	-
Solar photovoltaic	78	0.3	166	2.2	-	-	0.1	0.0
Renewable thermal	2	0.0	3	164.8	-	-	-	-
Non-renewable thermal	86	0.0	33	0.0	-	-	2	0.0
Special regime	**169**	**0.1**	**353**	**3.0**	**-**	**-**	**2**	**0.0**
Total	**2,490**	**2.1**	**3,192**	**0.9**	**99**	**0.0**	**87**	**0.0**

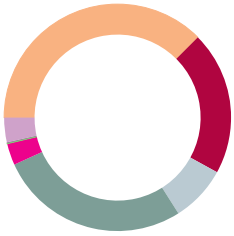
(1) Includes generators whose main fuel is fuel oil, gasoil and/or natural gas.

3 Extra-peninsular systems

3.1 Demand

Balearic Islands

Installed capacity as at 31 December 2013 (2,490 MW)



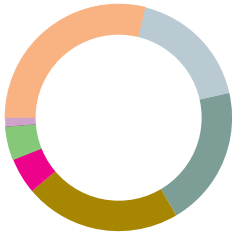
- Combined cycle 37.5%
- Coal 20.5%
- Internal combustion engines 8.0%
- Gas turbines 27.2%
- Solar photovoltaic 3.1%
- Wind 0.1%
- Renewable thermal 0.1%
- Cogeneración y resto 3.5%

Demand coverage

- Combined cycle 7.0%
- Coal 42.5%
- Internal combustion engines 12.6%
- Gas turbines 8.6%
- Auxiliary generation 0.1%
- Solar photovoltaic 2.2%
- Wind 0.1%
- Cogeneration and the rest of the technologies 4.6%
- Peninsula-Balearic Islands'interconnection 22.3%

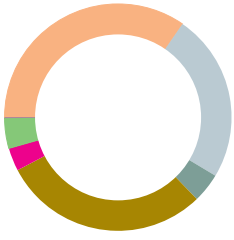
Canary Islands

Installed capacity as at 31 December 2013 (3,192 MW)



- Combined cycle 28.8%
- Internal combustion engines 17.7%
- Gas turbines 20.0%
- Steam turbines 22.3 %
- Solar photovoltaic 5.2%
- Wind 4.7%
- Renewable thermal 0.1%
- Cogeneration and the rest of the technologies 1.2%

Demand coverage



- Combined cycle 34.6%
- Internal combustion engines 24.0%
- Gas turbines 4.2%
- Steam turbines 29.5%
- Solar photovoltaic 3.3%
- Wind 4.3%
- Renewable thermal 0.1%

Extra-peninsular systems
3.1 Demand

3

Monthly demand growth (%)

	J	F	M	A	M	J	J	A	S	O	N	D
Balearic Islands	-2.8	-16.0	-2.3	-0.8	-0.8	-10.0	1.7	-6.3	0.1	2.5	6.7	2.8
Canary Islands	-3.5	-6.8	-4.0	1.1	-2.4	-5.6	-2.5	-3.2	-5.2	-2.2	-2.3	0.5
Ceuta	-3.3	-13.8	-12.6	-12.6	-10.3	-9.9	0.6	2.1	1.2	-4.2	2.4	2.2
Melilla	-5.7	-12.3	-6.7	-1.3	-2.4	-9.5	-5.4	-3.0	0.5	1.1	6.1	-0.2

Variation as compared to the same month of the previous year.

Maximum hourly and daily demand

Hourly demand (MWh)			Daily demand (MWh)	
976	26 February (8:00-9:00 pm)	Balearic Islands	4 October	18,279
1,187	7 August (9:00-10:00 pm)		7 August	23,373
1.352	2 October (8:00-9:00 pm)	Canary Islands	1 October	25,567
1,336	30 September (8:00-9:00 pm)		23 August	26,853
36	28 February (8:00-9:00 pm)	Ceuta	24 January	642
35	5 September (1:00-2:00 pm)		21 August	657
36	12 February (8:00-9:00 pm)	Melilla	3 October	644
37	26 August (1:00-2:00 pm)		6 August	714

Winter (January-May/October-December) Summer (June-September)

Demand evolution

	Balearic Islands		Canary Islands		Ceuta		Melilla	
	GWh	Δ annual (%)	GWh	Δ annual (%)	GWh	Δ annual (%)	GWh	Δ annual (%)
2009	5,993	-2.1	9,107	-2.4	212	0.9	206	2.4
2010	5,840	-2.5	8,895	-2.3	218	2.8	213	3.6
2011	5,743	-1.7	8,870	-0.3	203	-6.7	215	0.7
2012	5,820	1.3	8,891	0.2	212	4.5	217	1.1
2013	**5,671**	**-2.5**	**8,621**	**-3.0**	**202**	**-4.8**	**210**	**-3.4**

3 Extra-peninsular systems
3.2 Facilities. Generation and transmission

Variations in ordinary regime generator equipment

	Commissioned		Decommissioned	
	Type	MW	Type	MW
Balearic Islands				
Formentera AUX	Electrogen generator	10	Electrogen generator	10
Ibiza TG7 (A y B)	Gas turbine	50		
Canary Islands				
Llanos Blancos group 16	Internal combustion engines	2		
Punta Grande group 11	Internal combustion engines	18		
Total		**80**		**10**

Evolution of the transmission system and transformer capacity

		2009	2010	2011	2012	2013
220 kV (km)	Balearic Islands	185	185	430	430	**430**
	Canary Islands	163	163	163	163	**163**
	Total	**348**	**348**	**594**	**594**	**594**
132 kV (km)	Balearic Islands	199	206	220	220	**220**
	Canary Islands	-	-	-	-	**-**
	Total	**199**	**206**	**220**	**220**	**220**
< 132 kV (km)	Balearic Islands	884	890	890	893	**893**
	Canary Islands	1.127	1.129	1.129	1.129	**1.129**
	Total	**2.011**	**2.018**	**2.019**	**2.022**	**2.022**
Transformer Capacity (MVA)	Balearic Islands	1.998	1.998	2.248	2.498	**2.748**
	Canary Islands	1.375	1.625	1.625	1.625	**1.625**
	Total	**3.373**	**3.623**	**3.873**	**4.123**	**4.373**

Terminology index

Combined cycle. Technology for the generation of electrical energy in which two thermodynamic cycles coexist within one system: one involves the use of steam, and the other one involves the use of gas. In a power station, the gas cycle generates electrical energy by means of a gas turbine and the steam cycle involves the use of one or more steam turbines. The heat generated by combustion in the gas turbine is passed to a conventional boiler or to a heat-recovery element which is then used to move one or more steam turbines, increasing the yield of the process. Electricity generators are coupled to both the gas and steam turbines.

Closed-cycle pumped storage. Production of electrical energy carried out by the hydroelectric power stations whose higher elevation reservoir does not receive any type of natural contributions of water, but uses water solely from the lower elevation reservoir.

Generation consumption. Energy used by the auxiliary elements of power stations, necessary for the everyday functioning of the production facilities.

Hydroelectric reserves. The hydroelectric reserve of a reservoir is the quantity of electrical energy that could be produced in its own power plant and in all the power plants situated downstream, with the total drainage of its current useable water reserves and providing that drainage occurs without natural contributions. The annual regime reservoirs are those in which complete drainage would take place in less than one year. Hyper-annual regime reservoirs are those in which the total drainage time takes more than one year.

Ordinary regime. The production of electrical energy from all those facilities which are not included under the special regime.

Physical electricity exchanges (Intl.) The movements of energy which have taken place via international interconnection lines during a given period of time. It includes the loop flow of energy as a consequence of the grid design.

Producible hydroelectric energy. Maximum quantity of electrical energy that theoretically could be produced considering the water supplies registered during a specific period of time and once the supplies used for irrigation or uses other than the production of electrical energy have been deducted.

Producible hydroelectric index. This is the quotient between the producible energy and the average producible energy, both related to the same period and to the same hydroelectric equipment.

Special regime. Production of electrical energy which falls under a unique economic regime, originating from facilities with installed power not exceeding 50 MW whose production originates from cogeneration or other forms of electricity generation associated with non-electrical activities, if and when, they entail a high energy yield: Generation units that use renewable non-consumable energies, biomass or any type of biofuel as a primary energy source: Groups which use non-renewable or agricultural waste, livestock and service sector waste as primary energy sources, with an installed power lower than or equal to 25 MW, when they entail a high energy yield.

Published by
Red Eléctrica de España, S.A.U.

Co-ordination of the publication
Department of Communication and Corporate Image
of Red Eléctrica.

Technical co-ordination:
Department of Statistics and Information

English translation by
Wayman English International, S.L.

Red Eléctrica works on selecting the most legible typographical font for their publications.
The typographical font Fedra has been used for the texts and graphics in this report.

RED ELÉCTRICA
DE ESPAÑA

www.ree.es

Follow us on:

Paseo del Conde de los Gaitanes, 177
28109 Alcobendas (Madrid) · Spain