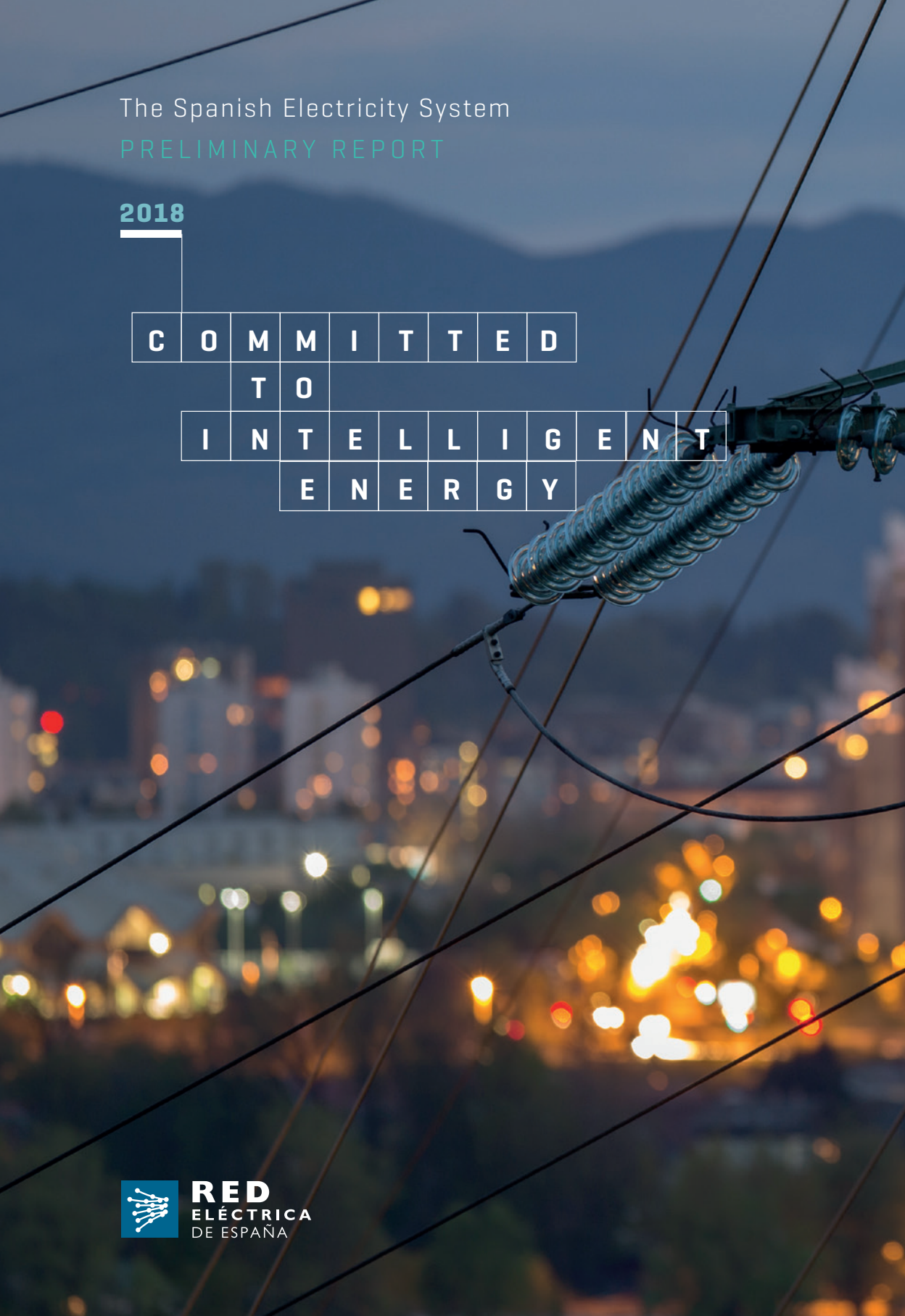


The Spanish Electricity System

PRELIMINARY REPORT

2018

COMMITTED TO INTELLIGENT ENERGY

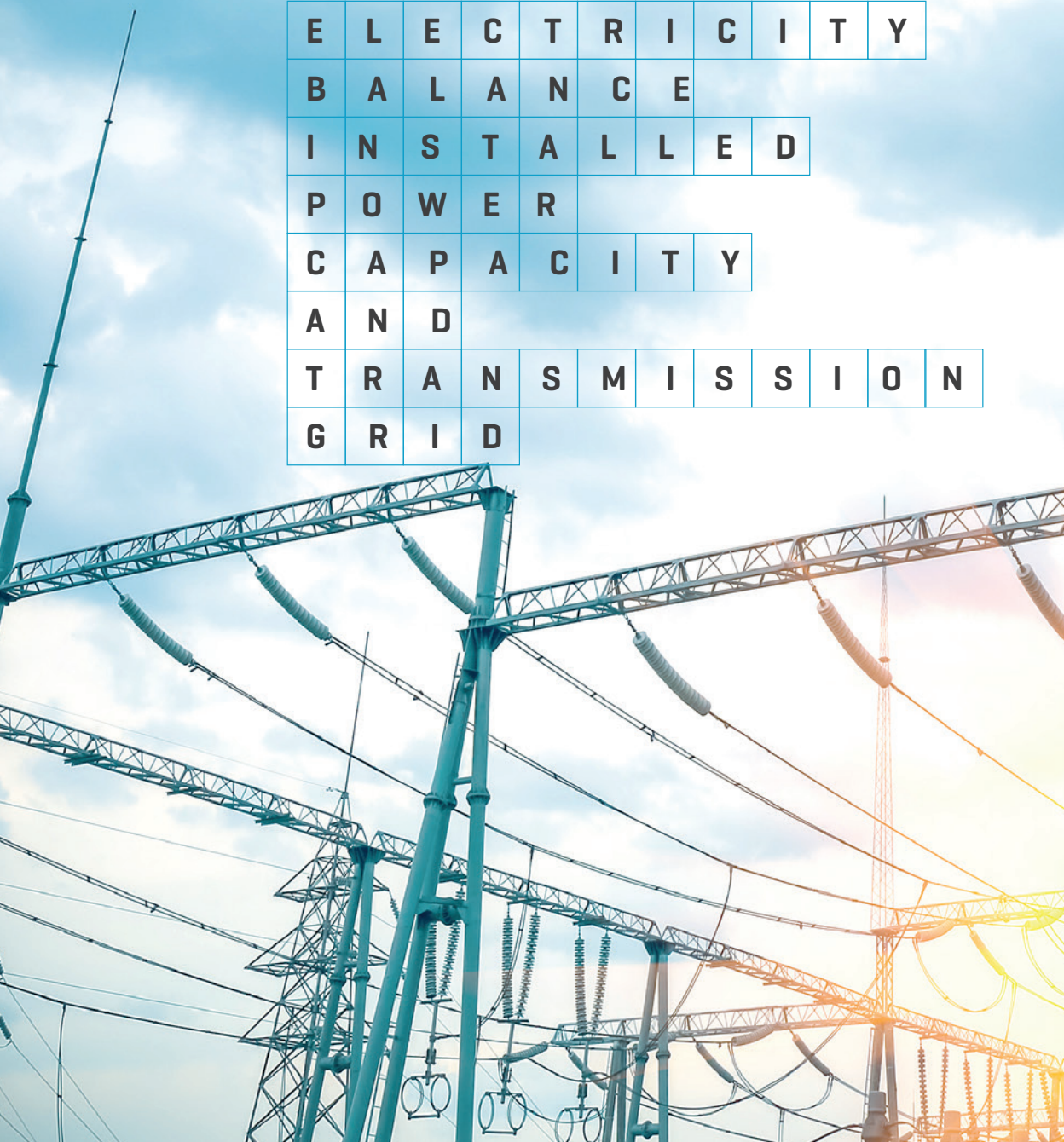
RED ELÉCTRICA DE ESPAÑA

TABLE OF CONTENTS

This preliminary report presents the **provisional** statistical data regarding the behaviour of the Spanish electricity system during 2018. Information prepared using data as at 16 January 2019.

1

ELECTRICITY BALANCE INSTALLED POWER CAPACITY AND TRANSMISSION GRID



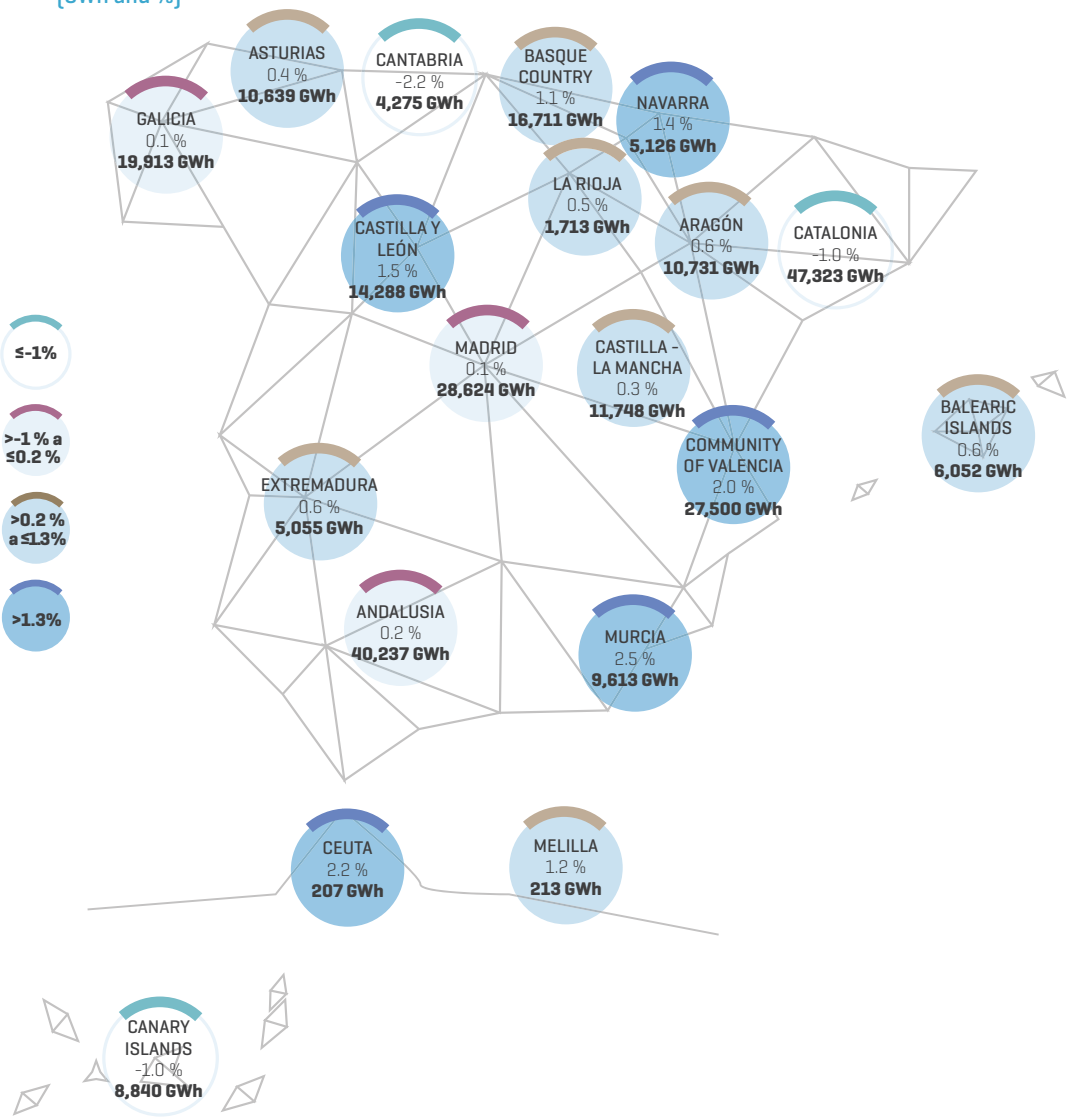
Electricity demand in Spain in 2018 grew for the fourth consecutive year, although showing a lower growth rate than that registered in the previous year.

268,808
GWh
NATIONAL DEMAND 2018

+0.4 %
COMPARED TO 2017

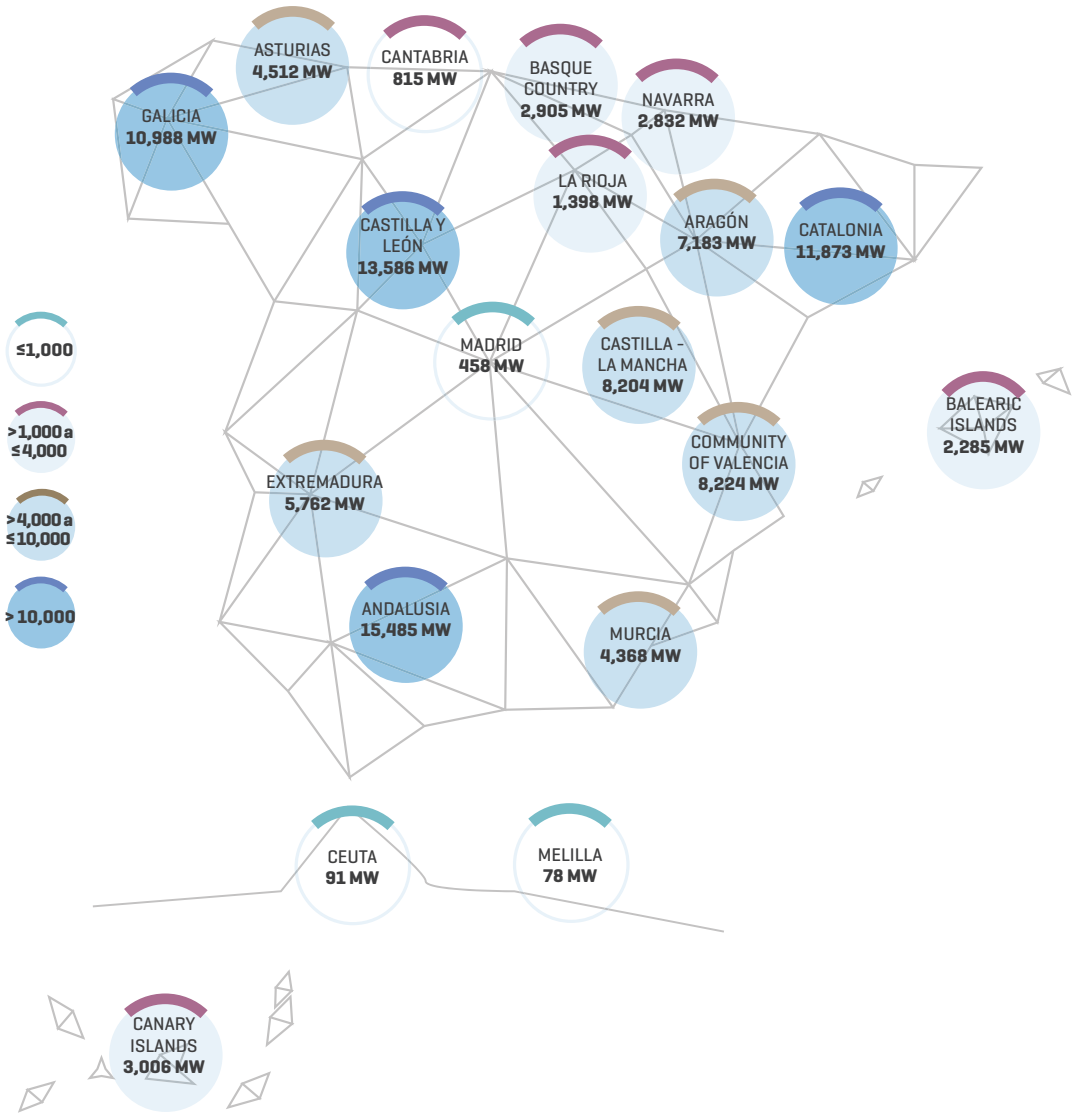
Demand for electricity in Spain has consolidated its positive trend begun in 2015, after registering falls in previous years due to the economic crisis. Specifically, demand in 2018 reached 268,808 GWh, 0.4% up on the previous year. On the other hand, generation registered a fall of 0.5% with respect to 2017, affecting mainly coal-fired and combined-cycle generating stations, whose production decreased by 17.2% and 18.9% respectively. In terms of international exchanges, imports exceeded exports by 11,102 GWh.

Electricity demand by autonomous communities and its variation with respect to the previous year (GWh and %)



In 2018, installed power capacity in **the complete set of generating facilities in Spain** fell for the third consecutive year, ending the year with 104,053 MW, 0.1% less than the previous year, mainly due to the definitive closure of the Tarragona Combined Cycle Power Station.
Wind power has increased by 1.5%. The rest of the electricity generation technologies showed minimal or insignificant variations.

Installed Power Capacity by Autonomous Communities (MW)



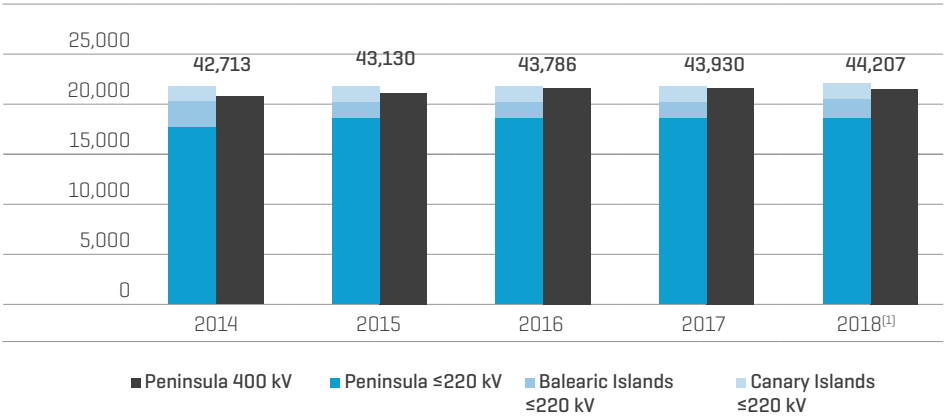
TRANSMISSION GRID

277

KM OF NEW CIRCUIT COMMISSIONED IN 2018

According to provisional data, the **development of the electricity transmission grid** in Spain during 2018 registered an increase of 277 km of new circuit and 2,592 MVA of new transformer capacity that bolsters the reliability of the transmission grid and the degree of grid meshing in order to guarantee security of supply.

Evolution of the electricity transmission grid in Spain (km de circuito)



Provisional data pending audit (currently in progress).

(1) Cumulative figures regarding kilometres of circuit as at 31 December of each year. Includes the transmission grid assets of those utility companies whose electricity distribution facilities are considered as an integral part of the overall transmission grid infrastructure nationwide.

Electricity transmission grid facilities in Spain

	400 kV	≤ 220 kV			
	Peninsula	**Peninsula**	**Balearic Islands**	**Canariy Islands**	**Total**
Total circuit (km)	**21,730**	**19,133**	**1,854**	**1,491**	**44,207**
Overhead lines (km)	21,613	18,343	1,133	1,187	42,276
Submarine cable (km)	29	236	540	30	835
Underground cable (km)	88	553	181	273	1,096
Transformer capacity (MVA)	**81,490**	**613**	**3,433**	**3,310**	**88,846**

Provisional data pending audit (currently in progress).

Cumulative figures regarding kilometres of circuit and transformer capacity as at 31 December 2018. Includes the transmission grid assets of those utility companies whose electricity distribution facilities are considered as an integral part of the overall transmission grid infrastructure nationwide.

2

PENINSULAR SYSTEM

Electricity demand on the Spanish Peninsula maintains the positive trend shown over the last four years. Noteworthy is that in 2018 over 40% of total generation has been obtained using renewable energy technologies.

253,495
GWh
PENINSULAR DEMAND 2018

+40 %
OF DEMAND COVERED BY RENEWABLE GENERATION

Evolution of electricity demand on the spanish peninsula

	Demand (measured at power station busbars)		Components (%)		
	GWh	Δ Annual (%)	Working days	Temperature	Adjusted
2014	243,174	-1.1	0.0	-1.0	-0.1
2015	247,970	2.0	-0.1	0.4	1.7
2016	249,680	0.7	0.6	0.1	0.0
2017	252,506	1.1	-0.3	-0.2	1.6
2018	**253,495**	**0.4**	**-0.1**	**0.2**	**0.3**

Monthly variation in peninsular electricity demand. 2018 (%)

	J	F	M	A	M	J	J	A	S	O	N	D
Monthly	-2.1	6.6	4.6	5.1	-0.6	-6.3	-1.1	1.0	2.9	0.6	0.1	-4.4
Cumulative	-2.1	1.9	2.8	3.3	2.5	1.0	0.7	0.7	1.0	0.9	0.9	0.4

Variation with respect to the same month the previous year.

Annual variation in peninsular electricity demand. Rolling year (%)

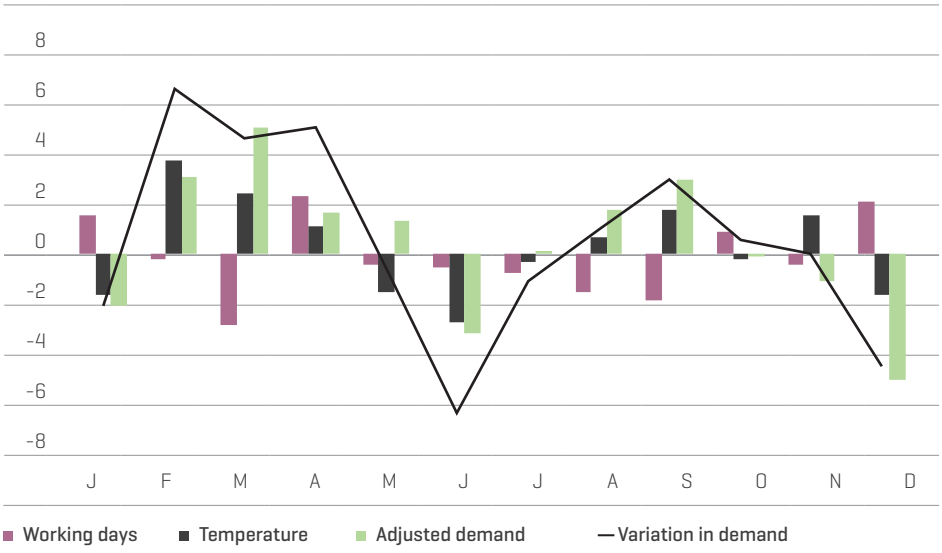
Peninsular electricity demand, according to provisional data, closed 2018 at 253,495 GWh, up 0.4% on the previous year. After factoring in the influence of seasonal patterns and working days, the annual variation rate of the demand is estimated at 0.3%.

253,495 GWh
PENINSULAR DEMAND 2018

+0.4 %
COMPARED TO 2017

Temperatures have had an impact of 0.2% on the evolution of consumption

Components of the monthly variation in peninsular electricity demand. 2018 (%)



The **Red Eléctrica Index** (IRE) is an electricity consumption indicator that includes preliminary data that shows the evolution of the monthly demand of large power consumers. In 2018, the composition of the working calendar had a positive impact of 0.1 percentage points on the evolution of the IRE. Temperature levels, on the contrary, higher than those of the previous year, reduced the evolution of the IRE by 0.6%. After having factored in both effects, the general index decreased by 1.3% year-on-year, a figure which represents the first negative variation of the index since 2013.

By sector, the industrial sector has shown a downward trend month-on-month, closing the year with a percentage of -2.5%, compared to the adjusted growth of 2.2% in 2017, while the services sector showed an/a adjusted variation of 0.6%, compared to -0.7% in 2017.

-1.3 %
IRE
(demand of large power consumers)

IRE: VARIATION BREAKDOWN IN 2018 (%)

	Gross	Working days	Temperature	Adjusted
General	**-1.8**	**0.1**	**-0.6**	**-1.3**
Industrial	-2.6	0.0	-0.1	-2.5
Services	-0.8	0.0	-1.4	0.6
Other	0.9	0.1	-2.3	3.1

Monthly evolution of the adjusted IRE. Rolling year (%)

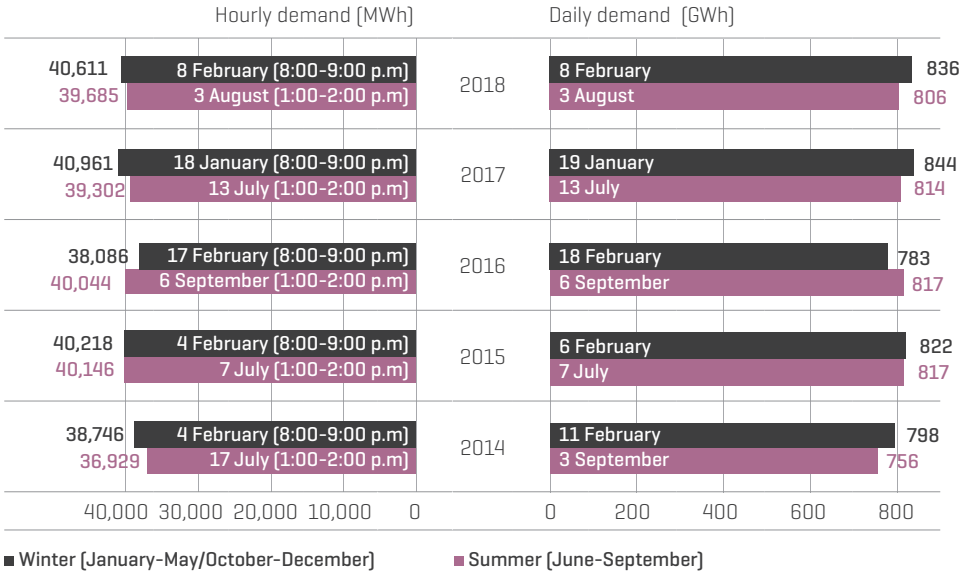
The **maximum instantaneous** power, at the time of drafting this report, was recorded on 8 February at 8:24 p.m. when it reached 40,947 MW, a value 1% lower than the previous year's maximum recorded in January, but still far from the all-time record of 45,450 MW set in December 2007. The maximum hourly demand was also registered on 8 February between 8:00 and 9:00 p.m., when it reached 40,611 MWh, a value 0.9% lower than the maximum for 2017.

40,947 MW
MAXIMUM INSTANTANEOUS POWER

8 FEBRUARY
8:24 P.M.

-9.9 %
COMPARED TO THE ALL-TIME HIGH SET IN 2007

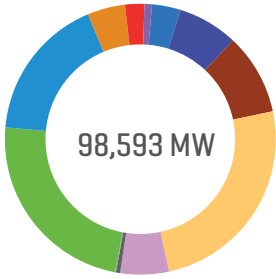
MAXIMUM ANNUAL PENINSULAR DEMAND VALUES



Regarding **demand coverage**, noteworthy was the increase in the contribution of hydro (13.2% compared to 7.2% the previous year), which has led to a decrease in the contribution of coal (13.5% compared to 16.5% in 2017). As for the technologies that have contributed most to demand coverage, nuclear has again ranked first with a contribution of 20.6%, followed by wind with 19%. It should also be noted that close to 4.3% of the demand was covered by energy imported from other countries.

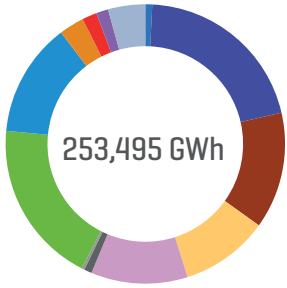
Installed power capacity on the peninsula as at 31 december 2018 (%)

Nuclear	7.2%	Wind	23.4%
Coal	9.7%	Hydro	17.3%
Combined cycle	24.9%	Solar photovoltaic	4.5%
Cogeneration	5.8%	Solar thermal	2.3%
Non-renewable waste	0.5%	Other renewables	0.9%
Pumped-storage	3.4%	Renewable waste	0.1%



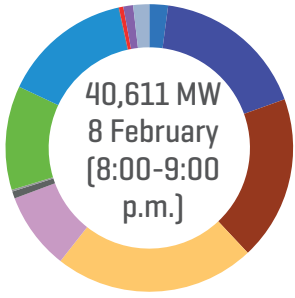
Electricity demand coverage on the peninsula. 2018 (%)

Nuclear	20.6%	Wind	19.0%
Coal	13.5%	Hydro	13.2%
Combined cycle	10.2%	Solar photovoltaic	2.9%
Cogeneration	11.2%	Solar thermal	1.7%
Non-renewable waste	0.9%	Other renewables	1.4%
Pumped-storage [1]	0.8%	Renewable waste	0.3%
		Import balance of international exchanges	4.3%



Electricity demand coverage. Maximum hourly demand coverage on the Peninsula. 2018 (%)

Nuclear	17.4%	Wind	11.7%
Coal	18.5%	Hydro	14.6%
Combined cycle	22.6%	Solar thermal	0.5%
Cogeneration	8.7%	Other renewables	1.1%
Non-renewable waste	0.8%	Renewable waste	0.2%
Pumped-storage [1]	2.1%	Import balance of international exchanges	1.8%



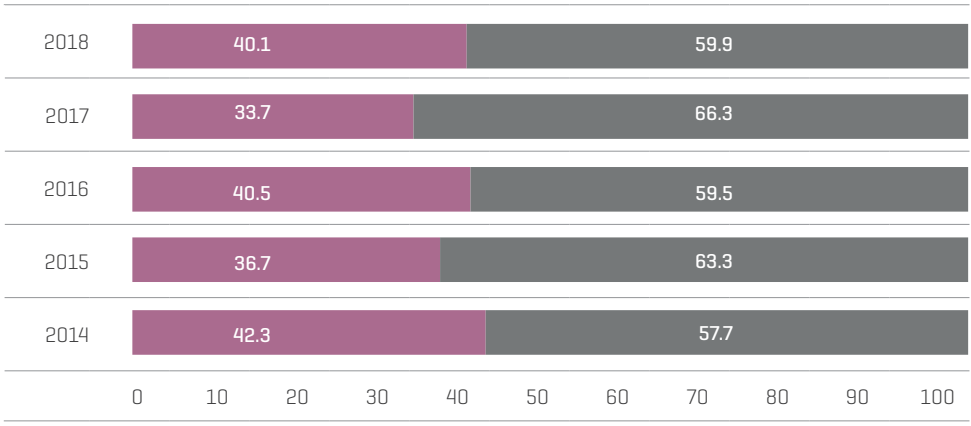
(1) Pure pumped storage + estimated mixed pumped storage.

40.1 %

SHARE OF RENEWABLES IN THE TOTAL ELECTRICITY GENERATION

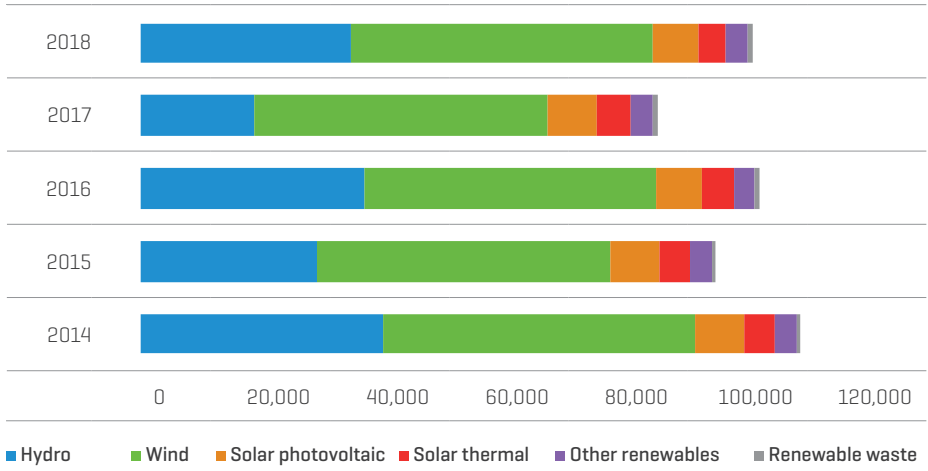
Renewable energy increased its share to 40.1% in the overall annual electricity generation, compared to 33.7% the previous year, this was helped mainly by an increase of 84.8% in hydroelectric generation compared to 2017. Similarly, wind energy grew 2.9%, maintaining its ranking as the second source of electricity generation in 2018.

Evolution of renewable and non-renewable peninsular electricity generation (%)

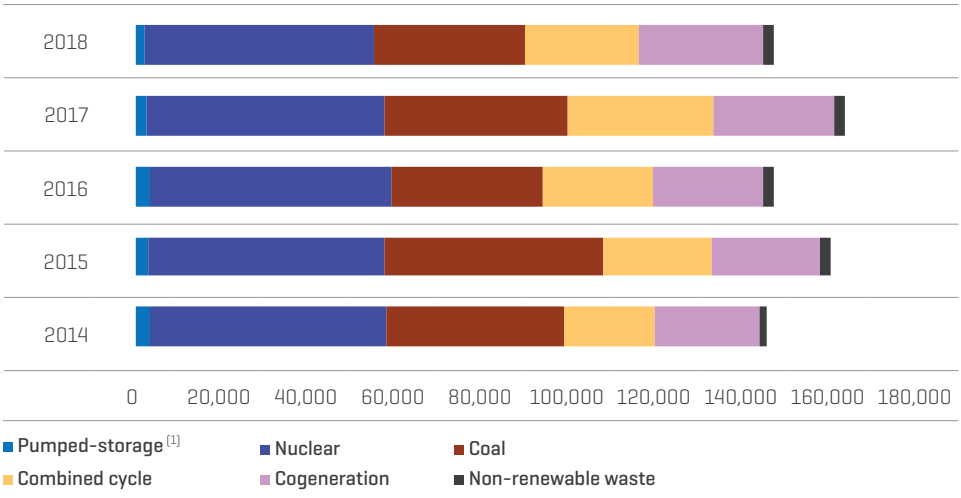


■ Renewable: hydro, wind, solar photovoltaic, solar thermal, other renewables and renewable waste.
■ Non-renewable: pumped storage, nuclear, coal, fuel/gas, combined cycle, cogeneration and non-renewable waste.

Evolution of renewable electricity generation on the peninsula (GWh)



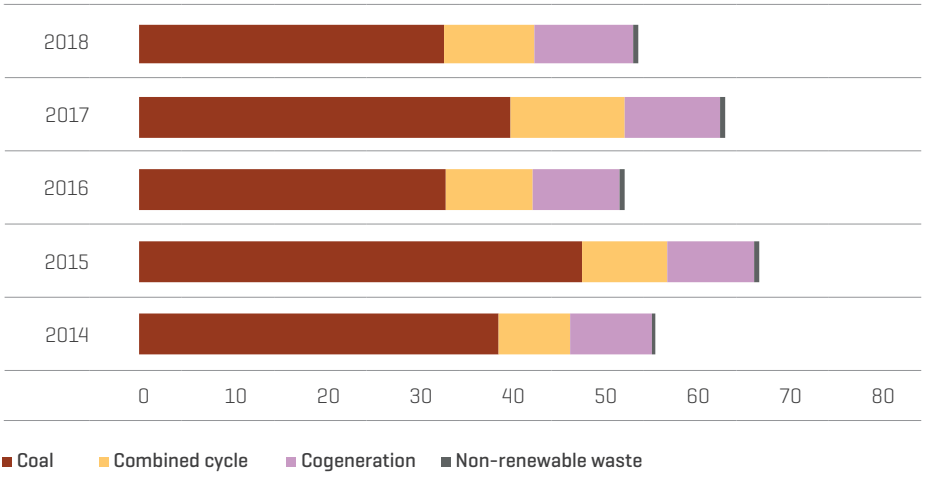
Evolution of non-renewable electricity generation on the peninsula (GWh)



(1) Pure pumped storage + estimated mixed pumped storage,

Decrease in CO_2 emissions from electricity generation thanks to the greater contribution of renewable energy

Evolution of CO_2 emissions associated with electricity generation on the peninsula (Million, tCO_2)



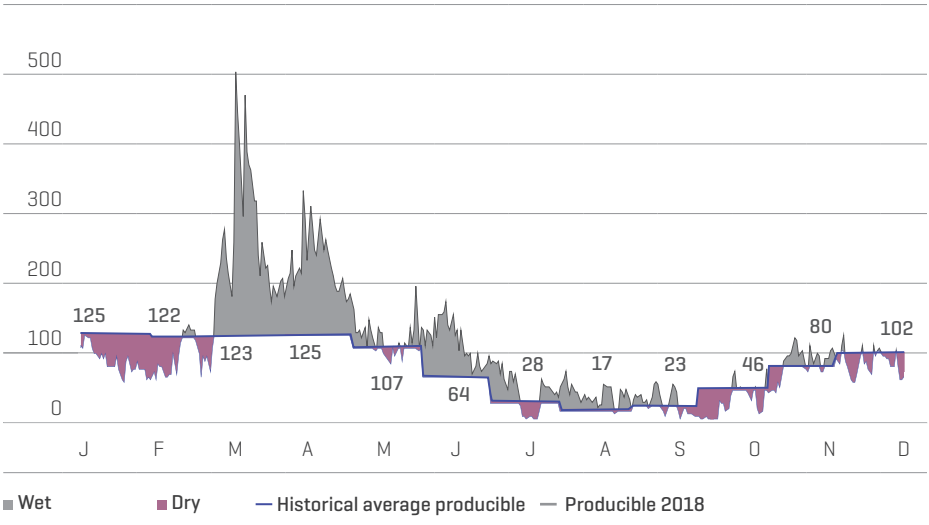
According to provisional data, **producible hydroelectric** registered the highest value of the last four years, 37,386 GWh, a value 28% higher than the historical average value and 134% higher than that registered in 2017. **Hydroelectric reserves** of the complete set of reservoirs closed 2018 with a fill level of 44.1% of their total capacity.

Producible hydroelectric has registered levels 28% above the historical average value

Producible hydroelectric energy on the peninsula

	GWh	Index	Probability of being exceeded (%)
2014	40,271	1.3	14.6
2015	25,141	0.8	79.0
2016	34,667	1.1	37.3
2017	15,972	0.5	99.3
2018	**37,386**	**1.3**	**17.2**

Daily producible hydroelectric energy on the peninsula in 2018 compared with the historical average producible (GWh)



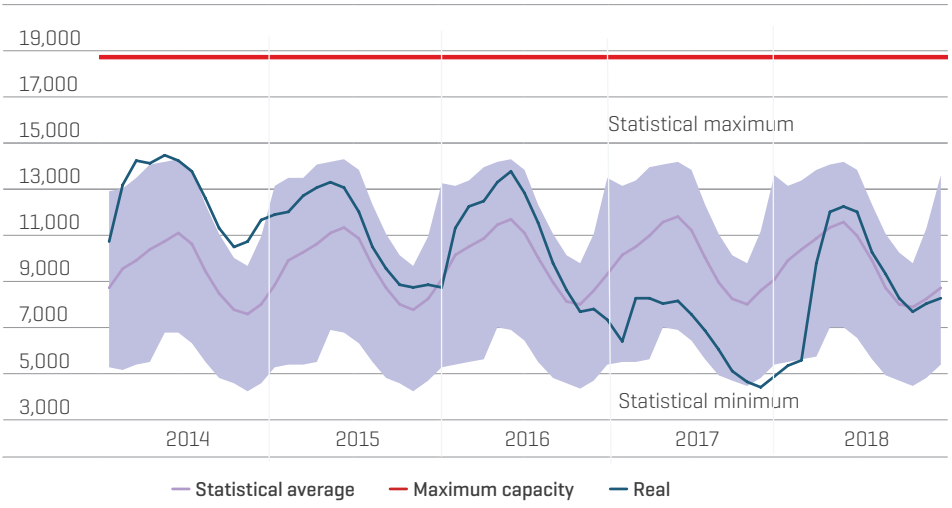
44.1 %

HYDROELECTRIC RESERVES

Peninsular hydroelectric reserves as at 31 december 2018

		2017		2018	
	Capacity	**GWh**	**% Fill level**	**GWh**	**% Fill level**
Annual management regime	8,967	2,617	29.2	4,717	52.6
Hyper-annual management regime	9,571	2,267	23.7	3,456	36.1
Total	**18,538**	**4,883**	**26.3**	**8,172**	**44.1**

Evolution of peninsular hydroelectric reserves (GWh)

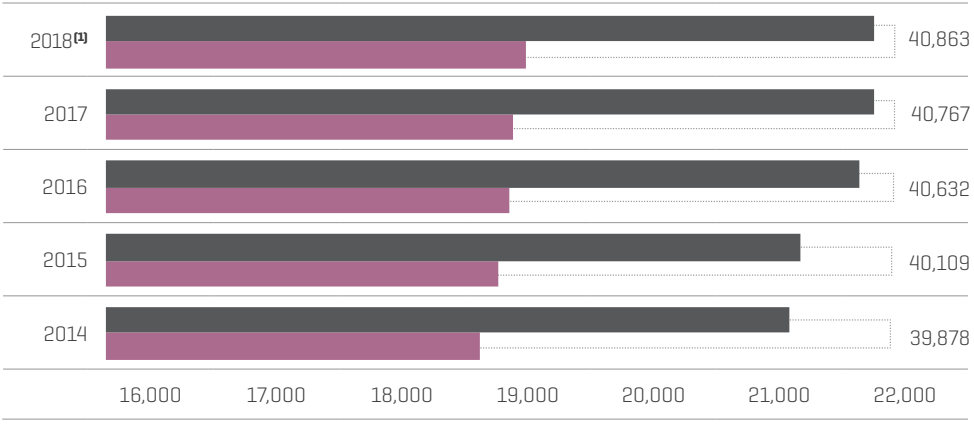


Statistical maximum and minimum: average of the maximum and minimum values of the last 20 years.,

Strengthening of the transmission grid with the commissioning of new kilometres of electricity line to ensure a safe and efficient supply

According to provisional data, the peninsular electricity transmission grid registered an increase of 96 km of circuit during 2018 (2 km of 400 kV and 94 km of 220 kV), bringing the total km of circuit in the peninsular transmission grid at year-end to 40,863 km.

Evolution of the peninsular transmission grid (km of circuit)



(1) Provisional data pending audit (currently in progress).
Cumulative figures regarding kilometres of circuit as at 31 December of each year. Includes the transmission grid assets of those utility companies whose electricity distribution facilities are considered as an integral part of the overall transmission grid infrastructure nationwide,

Evolution of the electricity transmission grid on the peninsula

	2014	2015	2016	2017	2018 (1)
Circuit 400 kV (km)	21,094	21,184	21,619	21,728	**21,730**
Circuit ≤ 220 kV (km)	18,785	18,925	19,013	19,039	**19,133**
Transformer capacity (MVA)	79,271	79,271	79,871	80,421	**82,103**

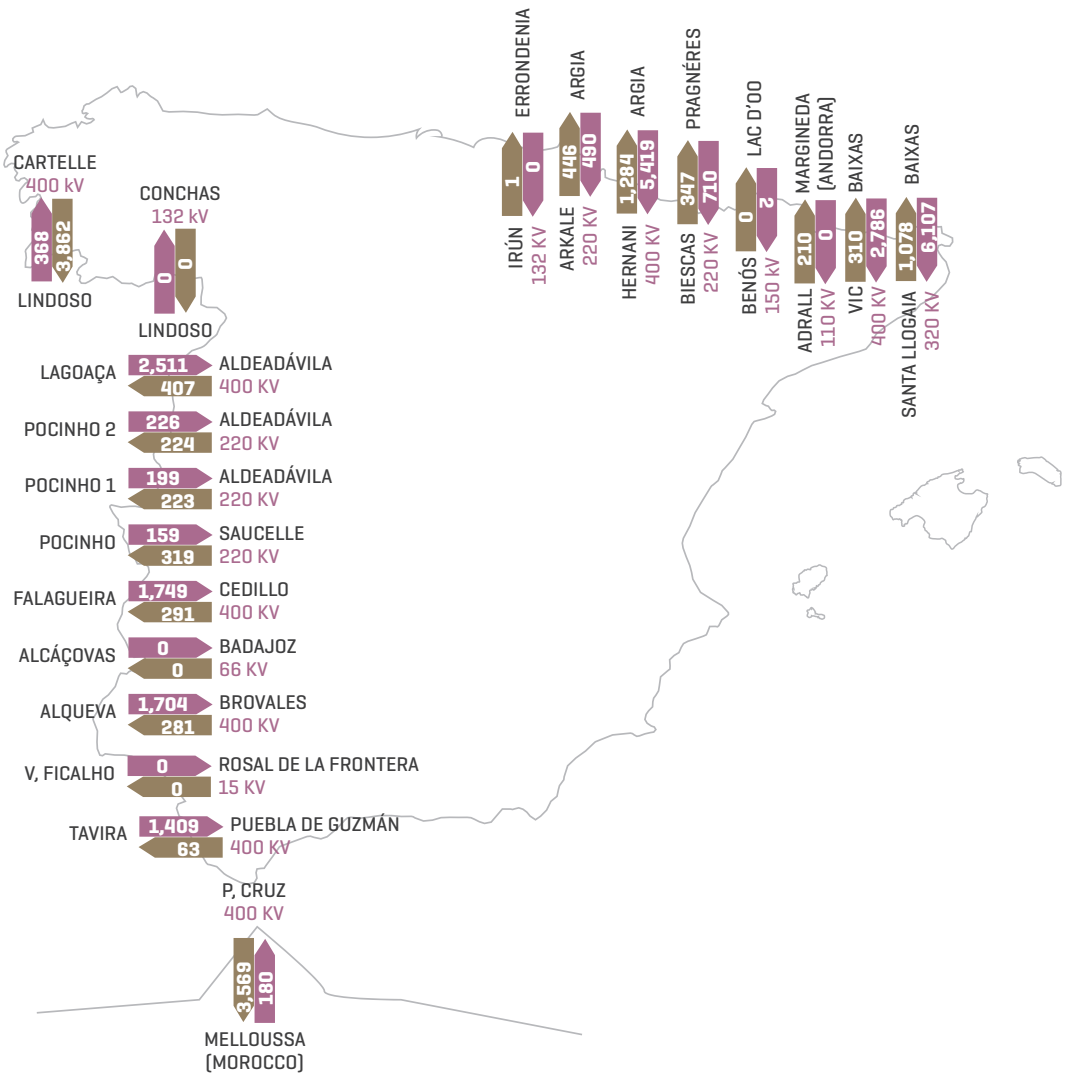
(1) Provisional data pending audit (currently in progress).
Cumulative figures regarding kilometres of circuit and transformer capacity as at 31 December of each year. Includes the transmission grid assets of those utility companies whose electricity distribution facilities are considered as an integral part of the overall transmission grid infrastructure nationwide.

Balance of international physical electrical energy exchanges (GWh)

	France	Portugal	Andorra	Morocco	Total
2014	3,567	-903	-235	-5,836	-3,406
2015	7,324	-2,266	-264	-4,927	-133
2016	7,802	5,086	-278	-4,951	7,658
2017	12,465	2,685	-233	-5,748	9,169
2018	**12,047**	**2,655**	**-210**	**-3,389**	**11,102**

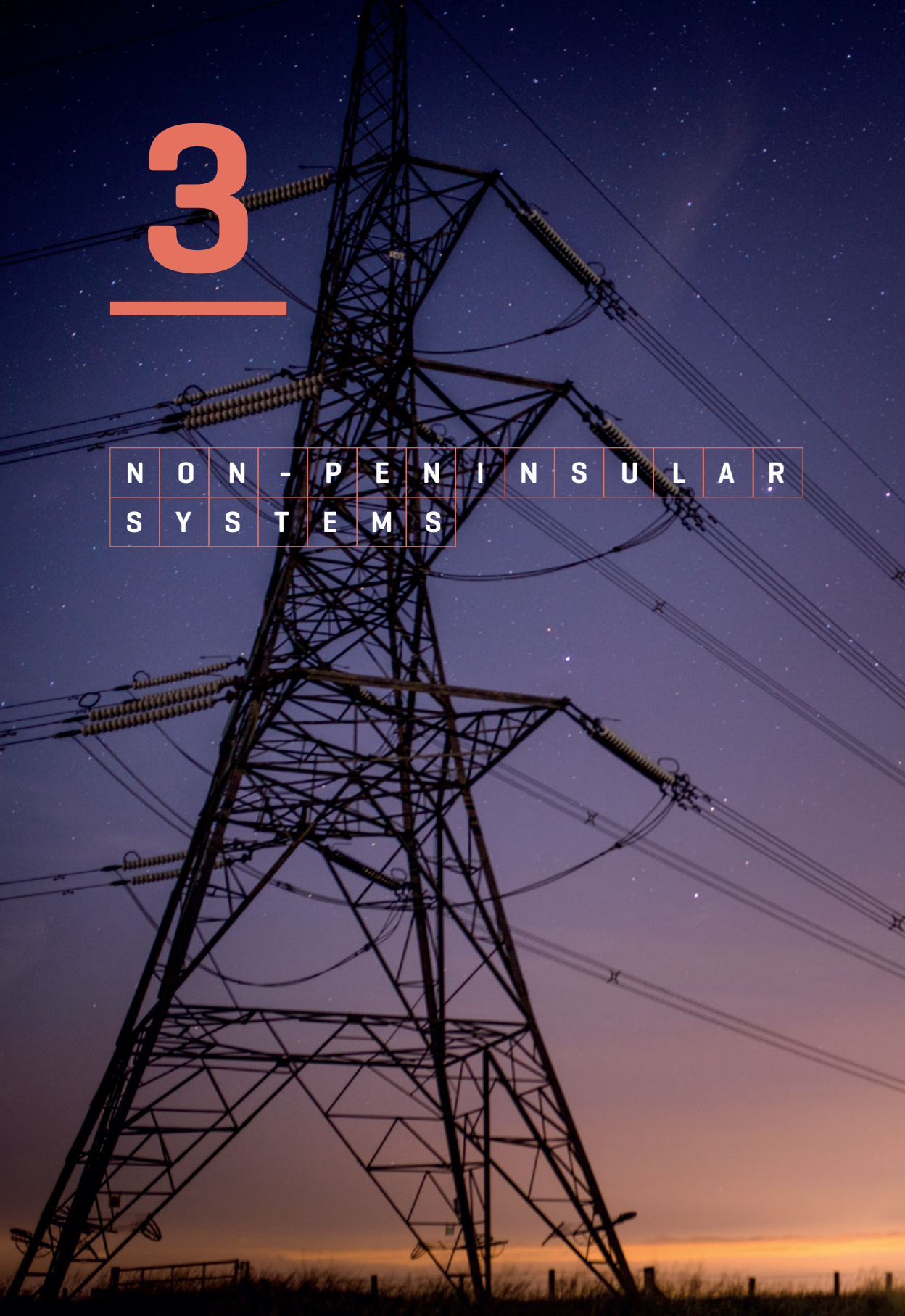
Positive value: importer balance; Negative value: exporter balance

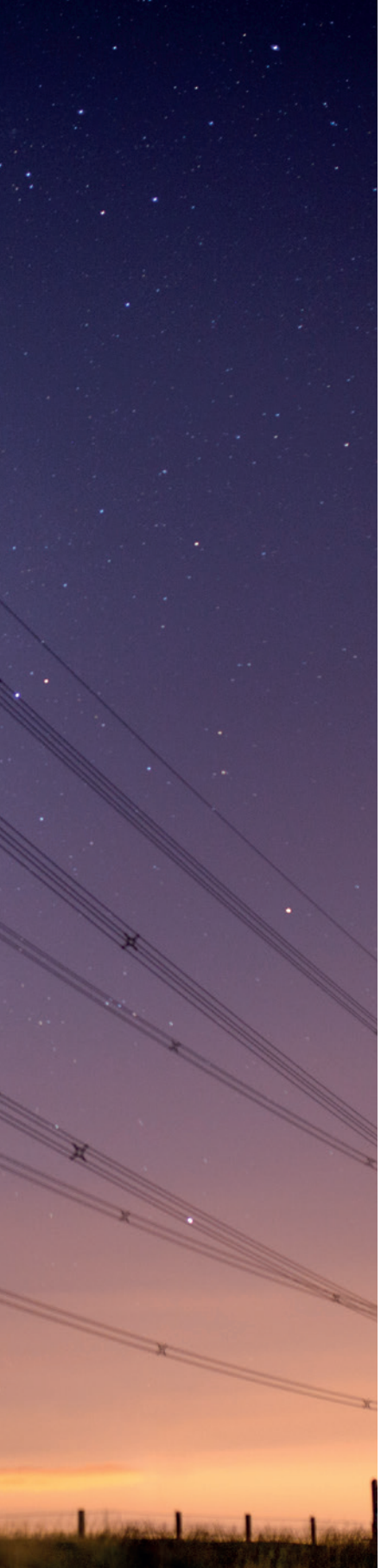
International physical electrical energy exchanges. 2018 (GWh)



3

NON-PENINSULAR SYSTEMS





Electricity demand grew in most non-peninsular systems, except in the Canary Islands. Of note is that renewable energy covered more than 10% of demand in the Canary Islands, a significant value for an isolated electricity system.

15,313 GWh

ELECTRICITY DEMAND IN NON-PENINSULAR SYSTEMS 2018

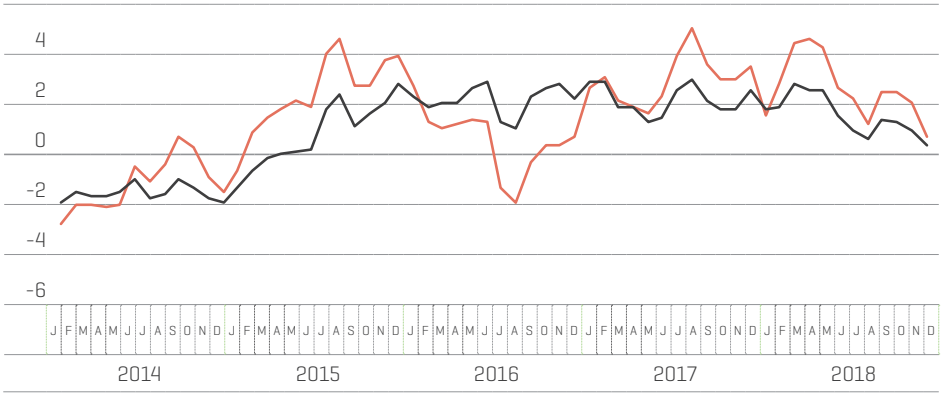
-0.3 %

COMPARED TO 2017

Evolution of non-peninsular electricity demand

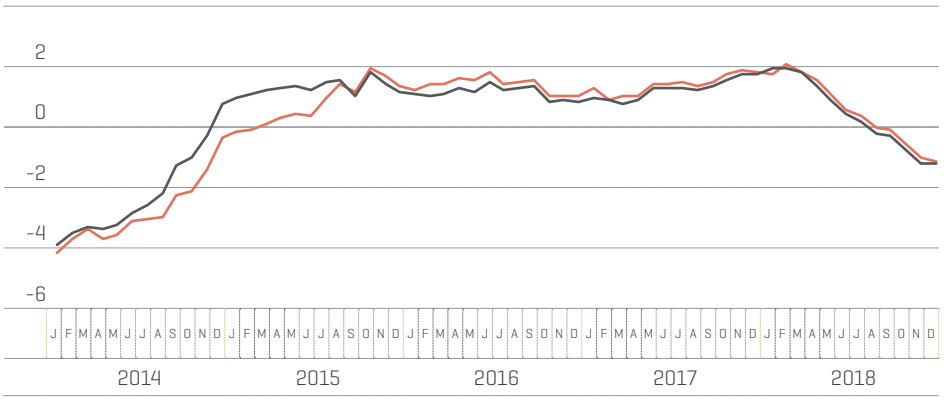
	Balearic Islands		Canariy Islands		Ceuta		Melilla	
	GWh	Δ Anual (%)	GWh	Δ Anual (%)	GWh	Δ Anual (%)	GWh	Δ Anual (%)
2014	5,577	-1.6	8,495	-0.1	212	5.1	210	0.1
2015	5,788	3.8	8,633	1.6	204	-3.9	213	1.6
2016	5,823	0.6	8,744	1.3	211	3.3	208	-2.3
2017	6,016	3.3	8,931	2.1	203	-3.7	210	1.0
2018	**6,052**	**0.6**	**8,840**	**-1.0**	**207**	**2.2**	**213**	**1.2**

Annual variation of electricity demand. Balearic islands. Rolling year [%]



■ Adjusted ■ Non-adjusted

Annual variation of electricity demand. Canary islands. Rolling year [%]



■ Adjusted ■ Non-adjusted

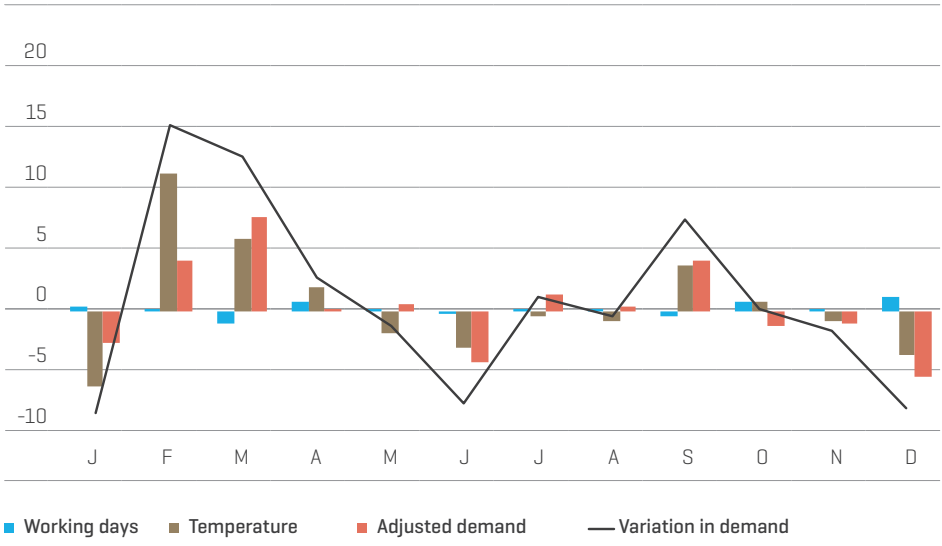
More than 20% of the demand of the Balearic Islands was covered by energy transferred from the Spanish Peninsula

Electricity demand on the Balearic Islands closed 2018 at 6,052 GWh, representing a growth of 0.6% compared to 2017. After factoring in the influence of seasonal patterns and working days, the demand growth was 0.2%.

6,052 GWh
DEMAND ON THE BALEARIC ISLANDS 2018

+0.6 %
COMPARED TO 2017

Components of the variation in monthly electricity demand. Balearic islands (%)

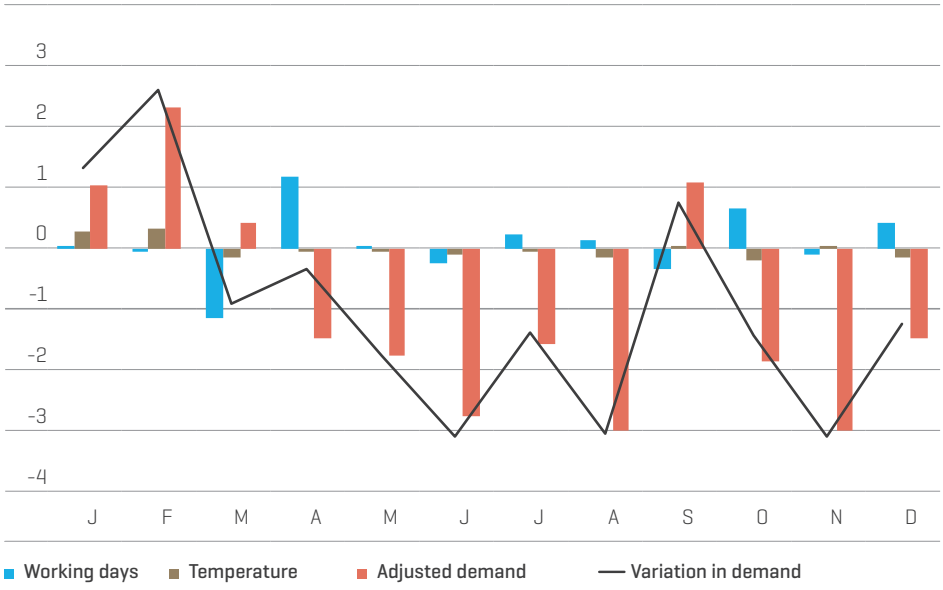


Electricity demand on the Canary Islands closed 2018 at 8,840 GWh, representing a decrease of 1% with respect to 2017. After factoring in the influence of seasonal patterns and working days, a negative 1% variation in demand is also estimated.

8,840 GWh
DEMAND ON THE CANARY ISLANDS 2018

-1.0 %
COMPARED TO 2017

Components of the variation in monthly electricity demand. Canary islands. 2018 (%)



The **maximum hourly demand on the Balearic Islands** occurred on 6 August, between 1:00 and 2:00 p.m., when it reached 1,315 MWh, a value 2.2% lower than the 2017 maximum recorded on 3 August, between 1:00 and 2:00 p.m. The maximum hourly demand in the Canary Islands was recorded on 8 February, between 8:00 and 9:00 p.m., with 1,404 MWh, a value 0.2% higher than the maximum of 2017 registered on 17 October, between 8:00 and 9:00 p.m.

Monthly variation of non-peninsular electricity demand. 2018 (%)

	Balearic Islands	Canariy Islands	Ceuta	Melilla
January	-8.6	1.3	0.0	-2.1
February	15.7	2.6	8.7	9.1
March	12.9	-0.9	7.5	1.4
April	2.8	-0.3	9.2	5.1
May	-1.3	-1.8	-1.0	0.3
June	-7.7	-3.1	-6.9	-5.5
July	1.1	-1.4	-2.4	-2.9
August	-0.4	-3.1	-5.1	3.1
September	7.6	0.8	5.2	9.0
October	0.1	-1.4	11.8	1.1
November	-1.8	-3.1	6.2	1.3
December	-8.2	-1.2	-3.2	-3.5

Variation with respect to the same period of the previous year,

Maximum annual demand values (non-peninsular systems)

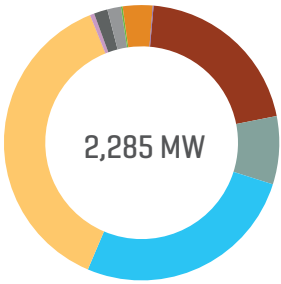
	Hourly demand (MWh)		Daily demand (MWh)	
1,049	27 February (8:00-9:00 p.m.)	Balearic Islands	27 February	18,780
1,315	6 August (13-14h)		6 August	26,412
1,404	8 February (8:00-9:00 p.m.)	Canariy Islands	10 February	26,703
1,375	24 September (1:00-2:00 p.m.)		13 September	27,224
38	7 February (8:00-9:00 p.m.)	Ceuta	8 febrero	693
35	25 September (1:00-2:00 p.m.)		25 September	657
41	6 February (8:00-9:00 p.m.)	Melilla	6 February	715
40	8 August (1:00-2:00 p.m.)		8 August	763

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

Installed power capacity of non-peninsular systems remained stable in all systems, except in the Canary Islands, which registered an increase of 7.7%, due to an increase of 103.8% in installed wind power capacity. In terms of demand coverage, the most significant difference compared to the previous year is the lower share of coal-fired generation in the Balearic Islands (nearly four percentage points less than in 2017). Of note is that renewable energy covered more than 10% of the demand in the Canary Islands, a significant value for an isolated electricity system.

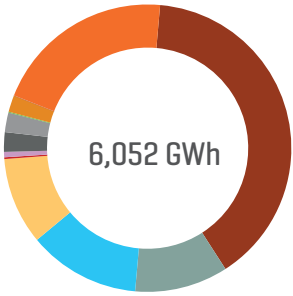
Installed power capacity as at 31 december 2018. Balearic islands (%)

Coal	20.5%	Non-renewable waste	1.6%
Diesel generators	8.0%	Renewable waste	1.6%
Gas turbine	26.5%	Wind	0.2%
Combined cycle	37.5%	Solar photovoltaic	3.5%
Cogeneration	0.5%	Other renewables	0.1%



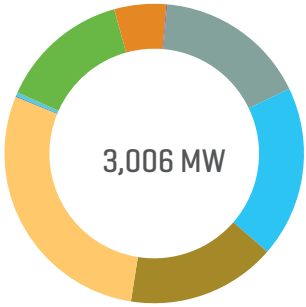
Electricity demand coverage. Balearic Islands. 2018 (%)

Coal	39.5%	Non-renewable waste	2.2%
Diesel generators	10.5%	Renewable waste	2.2%
Gas turbine	12.6%	Wind	0.1%
Combined cycle	9.8%	Solar photovoltaic	1.9%
Auxiliary generation	0.2%	Spanish Peninsula-Balearic Islands link	20.4%
Cogeneration	0.6%		



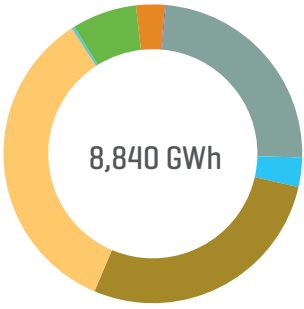
Installed power capacity as at 31 december 2018. Canary Islands [%]

Diesel generators	16.5%	HidroWind	0.4%
Gas turbine	18.5%	Wind	14.0%
Steam turbine	16.1%	Solar photovoltaic	5.6%
Combined cycle	28.7%	Other renewables	0.1%
		Hydro	0.1%



Electricity demand coverage. Canary islands. 2018 [%]

Diesel generators	24.0%	HidroWind	0.3%
Gas turbine	3.2%	Wind	7.0%
Turbina de vapor	27.8%	Solar photovoltaic	3.1%
Combined cycle	34.5%	Other renewables	0.1%



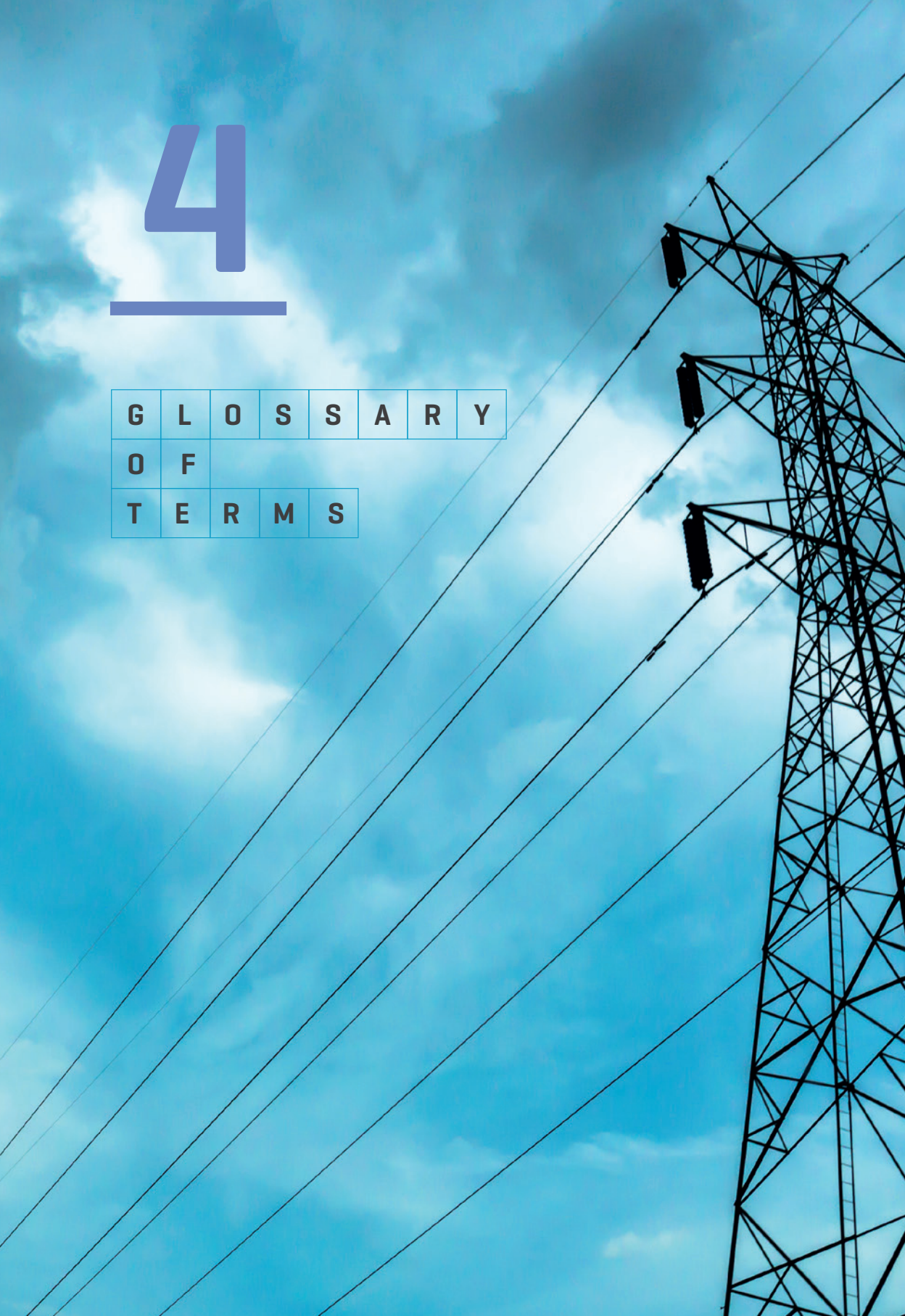
Evolution of the non-peninsular electricity transmission grid

		2014	2015	2016	2017	2018 (1)
Circuit 220 kV (km)	Balearic Islands	431	431	432	432	432
	Canariy Islands	163	216	220	220	238
	Total	**594**	**647**	**652**	**652**	**670**
Circuit 132 kV (km)	Balearic Islands	220	346	472	472	517
	Canariy Islands	-	-	-	-	69
	Total	**220**	**346**	**472**	**472**	**586**
Circuit ≤ 132 kV (km)	Balearic Islands	894	896	896	905	905
	Canariy Islands	1,126	1,131	1,134	1,135	1,184
	Total	**2,019**	**2,027**	**2,030**	**2,039**	**2,088**
Transformer capacity (MVA)	Balearic Islands	2,793	3,273	3,273	3,273	3,433
	Canariy Islands	1,875	2,000	2,000	2,560	3,310
	Total	**4,668**	**5,273**	**5,273**	**5,833**	**6,743**

(1) Provisional data pending audit (currently in progress).
Cumulative figures regarding kilometres of circuit and transformer capacity as at 31 December 2018. Includes the transmission grid assets assets of those utility companies whose electricity distribution facilities are considered as an integral part of the overall transmission grid infrastructure nationwide.

4

GLOSSARY OF TERMS



PUMPED STORAGE CONSUMPTION

Energy that pumped storage hydroelectric power stations use to elevate water from a lower reservoir to the upper one in order to be subsequently used to generate hydroelectric energy.

RENEWABLE ENERGY

Includes hydro, hydro-wind, wind, solar photovoltaic, solar thermal, biogas, biomass, marine energy, geothermal and renewable waste.

NON-RENEWABLE ENERGIES

Includes pumped-storage, nuclear, coal, fuel/gas, combined cycle, cogeneration and non-renewable waste.

PRODUCIBLE HYDROELECTRIC ENERGY

Maximum quantity of electricity 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 generation of electricity have been subtracted.

PRODUCIBLE HYDROELECTRIC INDEX

Quotient between the producible energy and the average producible energy, both related to the same period and to the same hydroelectric system.

INTERNATIONAL PHYSICAL ELECTRICITY EXCHANGES

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.

INSTANTANEOUS POWER

Instantaneous power is the energy absorbed by the demand at any given moment of time.

TRANSMISSION GRID

The complete set of lines, switchyards/facilities, transformers and other electrical elements with voltages greater than or equal to 220 kV, and those other facilities, regardless of their power, which fulfil power transmission functions, international/cross- border interconnections and the interconnections with the Spanish non-peninsular electricity systems.

HYDROELECTRIC RESERVES OF A RESERVOIR

The hydroelectric reserve of a reservoir is the quantity of electricity that could be produced in its own power station and in all the power stations situated downstream, with the total drainage of its current useable water reserves and providing that drainage occurs without natural contributions.

The annual management regime reservoirs are those in which complete drainage would take place in less than one year. Hyper-annual management regime reservoirs are those in which the total drainage time takes more than one year.

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Tel, 91 650 85 00
Fax, 91 640 45 42
www,ree,es

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Paseo del Conde
de los Gaitanes. 177
28109 Alcobendas (Madrid)
www,ree,es