

---

# Ancillary services and International exchanges

---

*Preliminary report*  
2020



**RED**  
ELÉCTRICA  
DE ESPAÑA

### **Glossary of terms**

<https://www.ree.es/en/glossary>

### **Published by**

RED ELÉCTRICA DE ESPAÑA  
Paseo del Conde de los Gaitanes, 177  
28109 Alcobendas [Madrid] - Spain  
Tel. +34 91 650 85 00  
[www.ree.es/en](http://www.ree.es/en)

### **Co-ordination of the publication**

Corporate Image and Brand Department

### **Technical co-ordination**

Department of Access to Information on  
the Electricity System

### **Design and layout**

EUROPUBLIC

### **Other data regarding this publication**

Publication date: February 2021

### **English translation by**

Wayman English International  
[www.waymanenglish.com](http://www.waymanenglish.com)

This English version is a translation of the original and authentic Spanish text found in the 'SERVICIOS DE AJUSTE E INTERCAMBIOS INTERNACIONALES – AVANCE 2020' report, originally issued in Spanish. In the event of any discrepancy, the Spanish-language version shall prevail.

## Components of the average final price of energy in the peninsular system

Reference supply and free contracting

[€/MWh]

Price [€/MWh] <sup>[1]</sup>	J	F	M	A	M	J	J
<b>Day-ahead market</b>	<b>42.06</b>	<b>36.54</b>	<b>28.28</b>	<b>17.81</b>	<b>21.70</b>	<b>31.00</b>	<b>35.20</b>
<b>Intraday market</b>	<b>-0.02</b>	<b>-0.03</b>	<b>-0.01</b>	<b>-0.02</b>	<b>-0.01</b>	<b>-0.01</b>	<b>-0.01</b>
<b>Ancillary Services</b>	<b>1.78</b>	<b>1.88</b>	<b>2.55</b>	<b>5.05</b>	<b>3.37</b>	<b>2.24</b>	<b>1.58</b>
Technical constraints PDBF <sup>[2]</sup>	1.32	1.44	2.03	4.54	2.96	1.68	1.07
Secondary control band	0.30	0.33	0.35	0.45	0.38	0.39	0.33
Real-time technical constraints	0.18	0.07	0.12	0.07	0.08	0.15	0.15
Unfulfillment of balancing energy	-0.02	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02
Deviation cost	0.16	0.14	0.23	0.21	0.10	0.15	0.16
Deviation balance	-0.09	-0.06	-0.11	-0.12	-0.06	-0.05	-0.05
Control of the power capacity factor	-0.06	-0.06	-0.07	-0.10	-0.09	-0.07	-0.06
Operating Procedure 14.6 balance	-0.01	0.03	0.01	0.01	0.01	0.01	0.00
<b>Capacity payments</b>	<b>3.11</b>	<b>2.98</b>	<b>2.39</b>	<b>2.42</b>	<b>2.24</b>	<b>2.76</b>	<b>3.22</b>
<b>Interruptibility service</b>	<b>0.03</b>	<b>0.03</b>	<b>0.03</b>	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	<b>—</b>
<b>Average final price 2020</b>	<b>46.96</b>	<b>41.40</b>	<b>33.24</b>	<b>25.30</b>	<b>27.34</b>	<b>36.03</b>	<b>39.99</b>
<b>Average final price 2019</b>	<b>67.97</b>	<b>59.87</b>	<b>54.16</b>	<b>56.63</b>	<b>53.77</b>	<b>52.14</b>	<b>56.71</b>
<b>Final energy <sup>[3]</sup> (GWh)</b>	<b>22,600</b>	<b>19,843</b>	<b>19,783</b>	<b>16,145</b>	<b>17,306</b>	<b>18,259</b>	<b>21,866</b>

	A	S	O	N	D	Total	% 20/19
<b>Day-ahead market</b>	<b>36.75</b>	<b>42.75</b>	<b>37.49</b>	<b>42.89</b>	<b>43.52</b>	<b>35.20</b>	<b>-27.5</b>
<b>Intraday market</b>	<b>-0.01</b>	<b>-0.02</b>	<b>-0.04</b>	<b>-0.03</b>	<b>-0.02</b>	<b>-0.02</b>	<b>0.0</b>
<b>Ancillary Services</b>	<b>2.18</b>	<b>2.32</b>	<b>2.94</b>	<b>2.89</b>	<b>2.60</b>	<b>2.54</b>	<b>72.8</b>
Technical constraints PDBF <sup>[2]</sup>	1.29	1.05	1.76	1.71	1.52	1.80	87.5
Secondary control band	0.35	0.41	0.53	0.49	0.54	0.40	8.1
Real-time technical constraints	0.48	0.84	0.62	0.61	0.53	0.33	725.0
Unfulfillment of balancing energy	-0.02	-0.02	-0.02	-0.03	-0.03	-0.02	0.0
Deviation cost	0.19	0.10	0.09	0.08	0.13	0.14	-22.2
Deviation balance	-0.06	0.01	0.02	0.02	-0.04	-0.05	-28.6
Control of the power capacity factor	-0.06	-0.06	-0.07	-0.05	-0.07	-0.07	16.7
Operating Procedure 14.6 balance	0.01	-0.01	0.01	0.06	0.02	0.01	0.0
<b>Capacity payments</b>	<b>2.12</b>	<b>2.35</b>	<b>2.26</b>	<b>2.43</b>	<b>3.10</b>	<b>2.63</b>	<b>-0.4</b>
<b>Interruptibility service</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>0.02</b>	<b>-97.3</b>
<b>Average final price 2020</b>	<b>41.04</b>	<b>47.40</b>	<b>42.65</b>	<b>48.18</b>	<b>49.20</b>	<b>40.37</b>	<b>-24.4</b>
<b>Average final price 2019</b>	<b>49.22</b>	<b>46.82</b>	<b>52.22</b>	<b>48.31</b>	<b>41.24</b>	<b>53.41</b>	
<b>Final energy <sup>[3]</sup> (GWh)</b>	<b>20,673</b>	<b>19,311</b>	<b>19,524</b>	<b>19,547</b>	<b>20,976</b>	<b>235,835</b>	<b>-5.3</b>

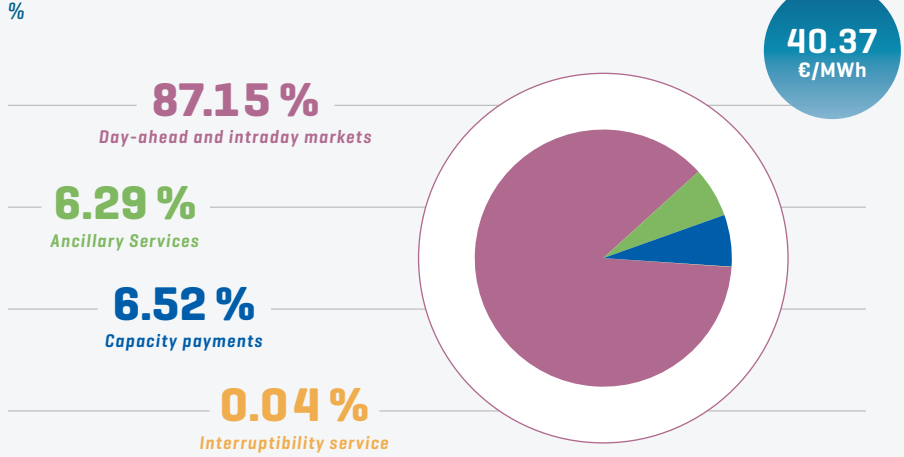
[1] Prices are calculated using the latest settlements available from the System Operator.

[2] PDBF: Daily base operating schedule.

[3] Includes closing of the energy market and own consumption of power generation ancillary services.

The interruptibility service was only active during the first half of 2020.

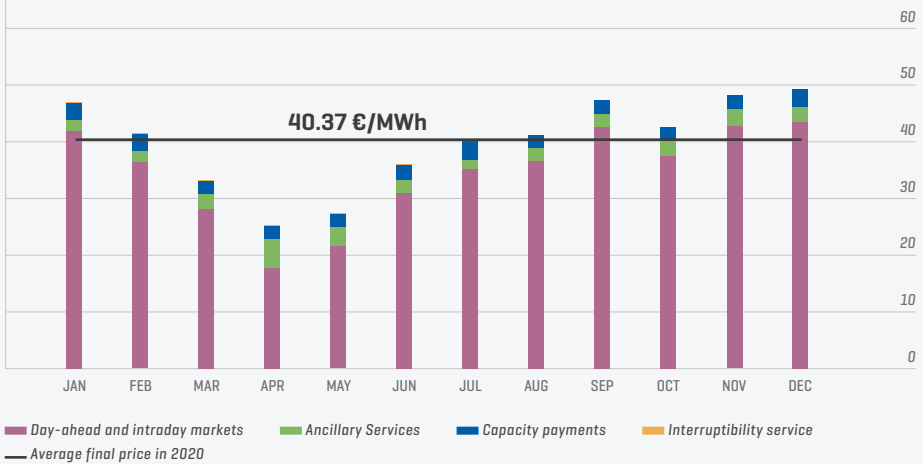
### Components of the average final price. 2020



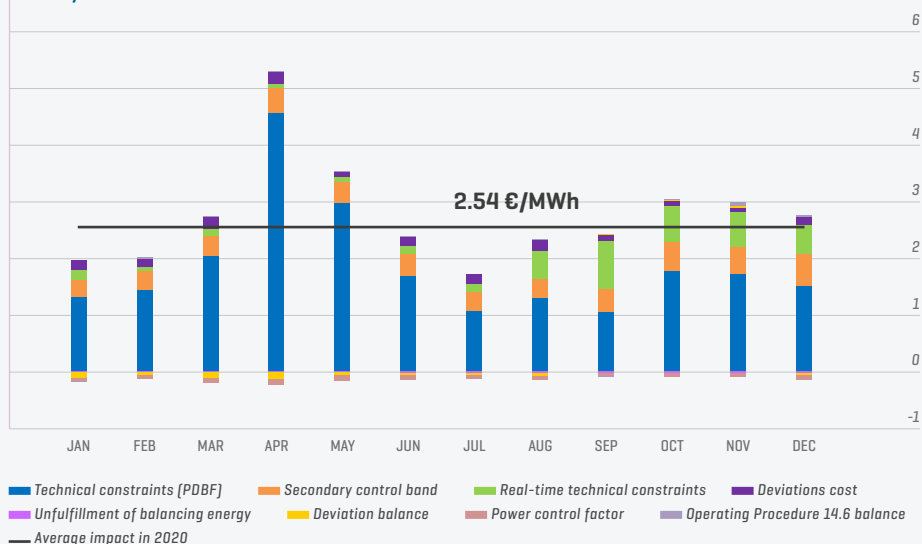
### Evolution of the components of the average final price

Reference supply and free contracting

€/MWh



## Impact of ancillary services on the average final price €/MWh



## Energy requirements covered through ancillary services GWh

	2019		2020		% 20/19	
	Upward	Downward	Upward	Downward	Upward	Downward
Technical constraints (PDBF) <sup>(1)</sup>	6,801	257	9,431	548	38.7	113.3
Secondary control	971	1,679	1,212	1,631	24.9	-2.8
Tertiary control	1,351	681	1,543	1,061	14.1	55.8
Replacement reserves (RR)/Deviation management <sup>(2)</sup>	2,225	866	2,107	872	-5.3	0.6
Real-time technical constraints	101	193	728	366	620.1	89.2
<b>Total energy</b>			<b>15.126</b>	<b>19.499</b>		<b>28,9</b>

Does not include energy managed through cross-border balancing services, nor the application of the interruptibility service due to economic criteria.

[1] Upward or Downward Energy in phase 1 of the resolution of technical constraints of the PDBF [Operating Procedure 3.2].

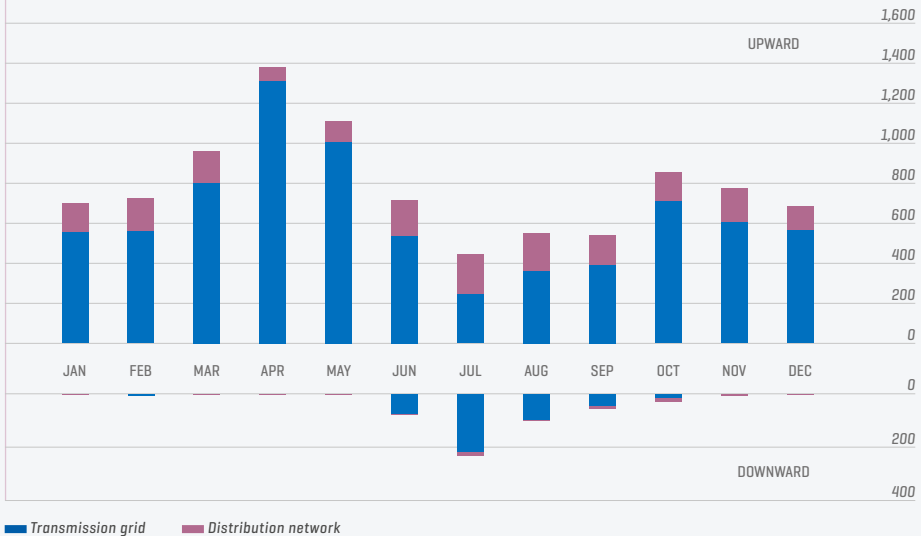
[2] Energy requirements of the Spanish System allocated via Deviation management until 2 March, and as of that date, allocated through the European platform for the exchange of balancing energy from replacement reserves (RR).

### Average weighted energy prices in the peninsular system's ancillary services €/MWh

	2019		2020		% 20/19	
	Upward	Downward	Upward	Downward	Upward	Downward
Technical constraints (PDBF)	81.4	46.1	75.3	30.7	-7.5	-33.3
Secondary control	54.7	39.4	35.9	29.2	-34.3	-26.0
Tertiary control	57.3	31.9	42.6	19.3	-25.7	-39.5
Replacement reserves (RR)/Deviation management <sup>[1]</sup>	56.2	32.6	36.9			
Real-time technical constraints	105.9	16.0	144.2	7.4	36.1	-53.5

[1] Prices resulting from Deviation management until 2 March, and as of that date, a per the activation of the RR balancing energy bid through the European platform for the exchange of balancing energy from replacement reserves [RR].

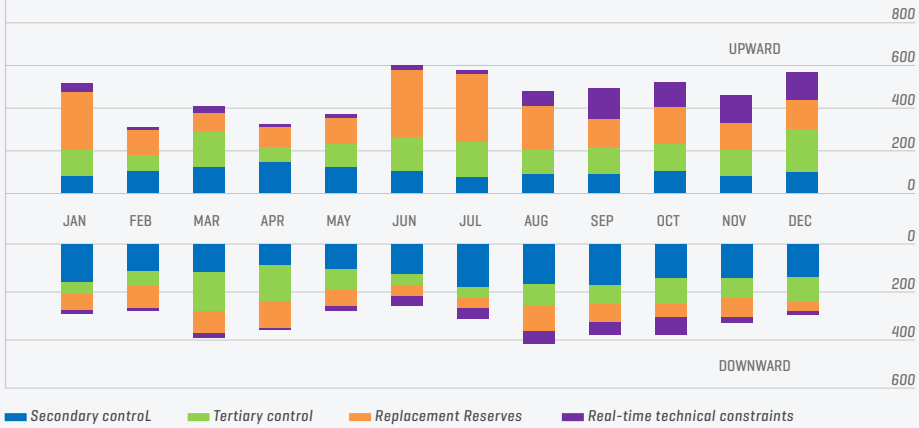
### Resolution of technical constraints (PDBF). Scheduled energy broken down by type of constraint GWh



### Other ancillary services markets

Energy requirements covered

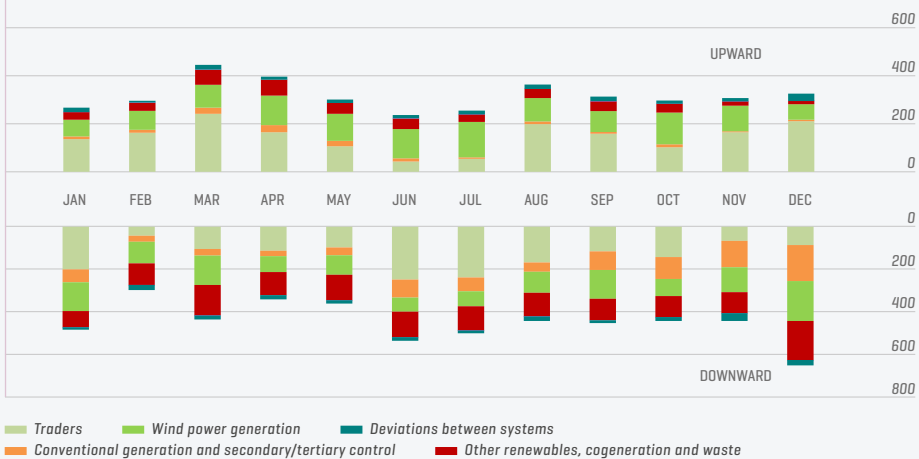
GWh



Does not include technical constraints of the PDBF

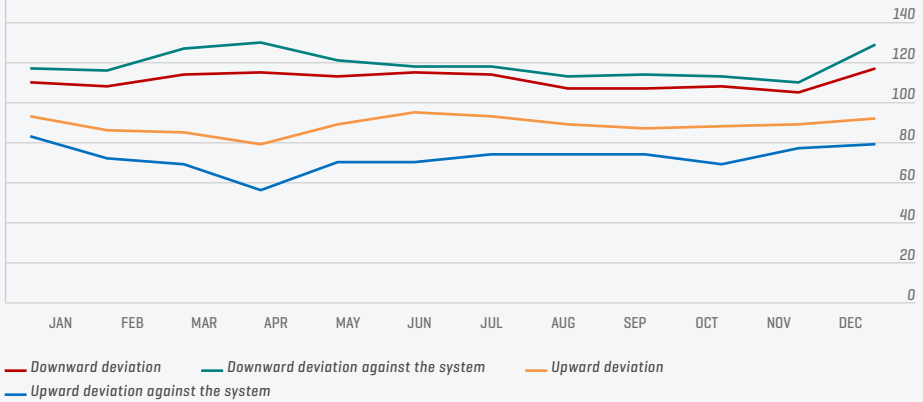
### Measured net deviations

GWh



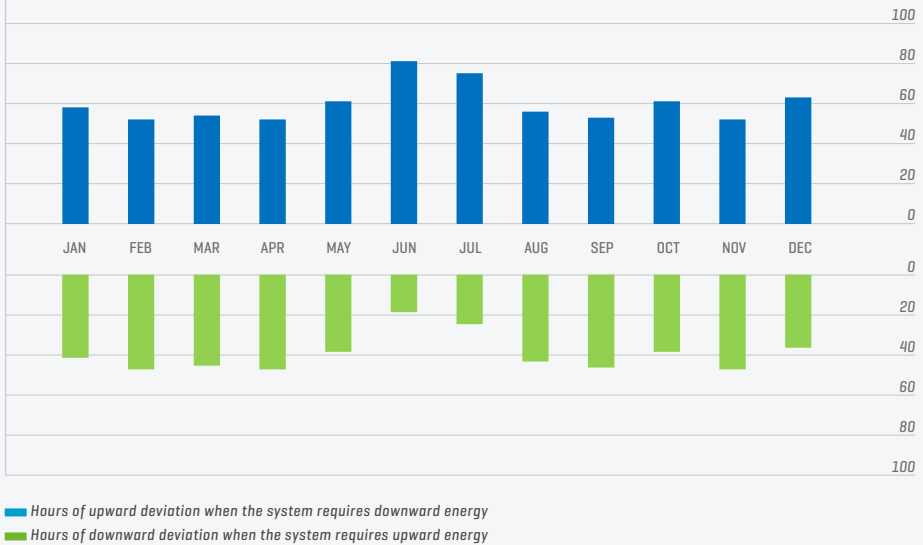
### Price deviation in relation to the day-ahead market

%



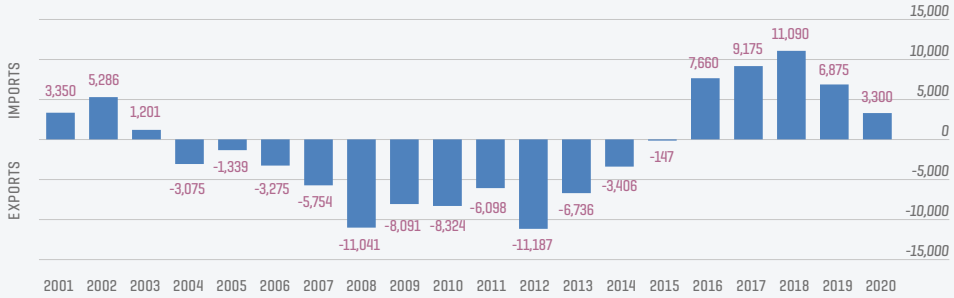
### Hours with deviations contrary to system requirements

%

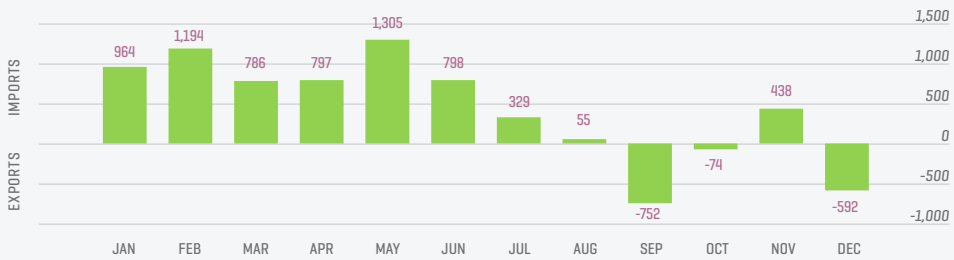




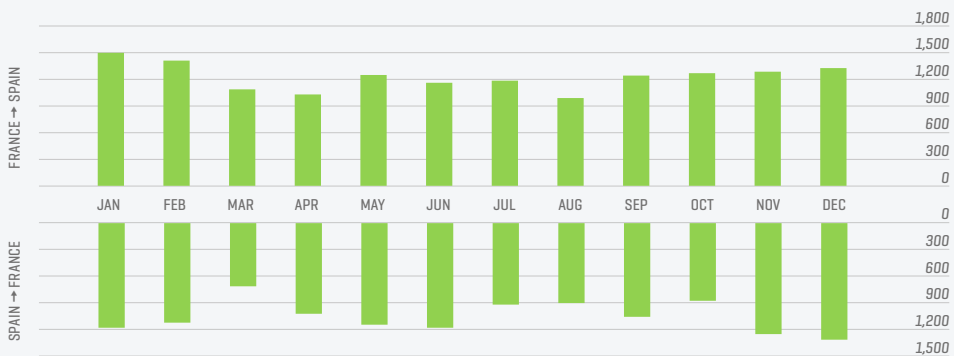
### Annual net balance of scheduled energy exchanges via Spain's interconnections GWh



### Monthly net balance of scheduled energy exchanges in 2020 via the interconnection with France (IFE) GWh

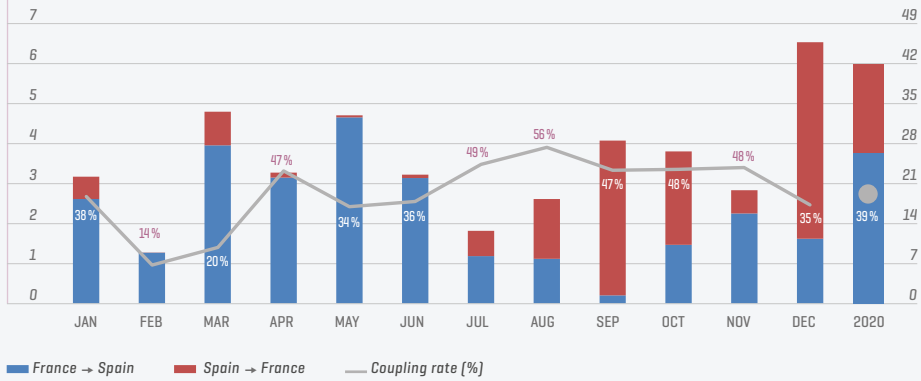


### Capacity rights allocated via explicit long-term auctions in the interconnection with France (IFE) GW



Annual and monthly capacity rights

### Congestion rents and coupling rates in the interconnection with France derived from the coupling of the European day-ahead markets € Million



Does not include counter-trading costs nor other costs.  
Coupling Rate: % of hours without congestion in the day-ahead horizon.

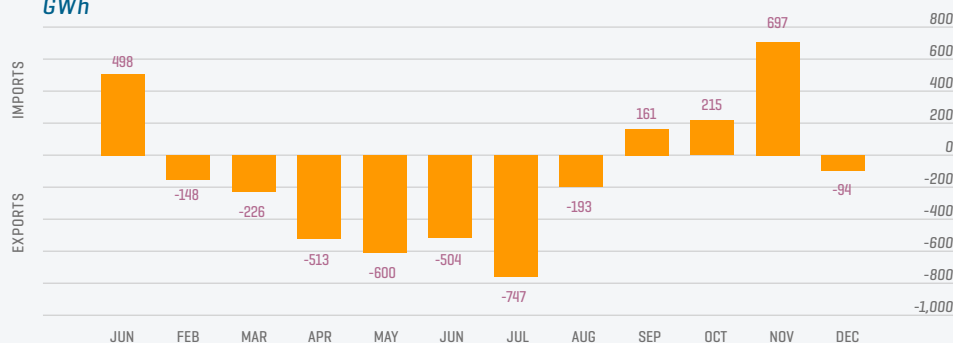
### Congestion rents in the interconnection with France derived from the exchange capacity management mechanisms € Thousand and %

	France → Spain		Spain → France		Total	
	€ Thousand	%	€ Thousand	%	€ Thousand	%
Annual Auction	32,281.2	23.8	20,905.9	15.4	53,187.1	39.2
Monthly Auction	25,180.7	18.6	15,104.0	11.1	40,284.7	29.7
Day-ahead Horizon	26,584.0	19.6	15,478.8	11.4	42,062.8	31.0
Replacement Reserves	1.8	0.0	26.3	0.0	28.1	0.0
<b>Total</b>	<b>84,047.7</b>	<b>62.0</b>	<b>51,515.0</b>	<b>38.0</b>	<b>135,562.7</b>	<b>100.0</b>

Does not include counter-trading costs nor other costs.

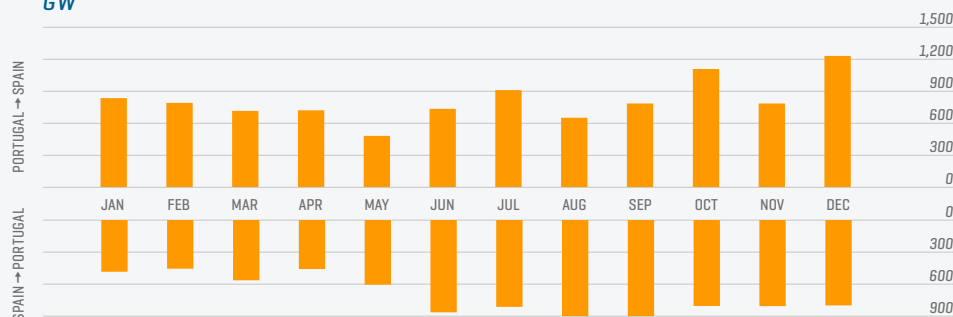
## Monthly net balance of scheduled energy exchanges in 2020 via the interconnection with Portugal (IPE)

GWh



## Capacity rights allocated via explicit long-term auctions in the interconnection with Portugal (IPE)

GW



Annual, quarterly and monthly capacity rights

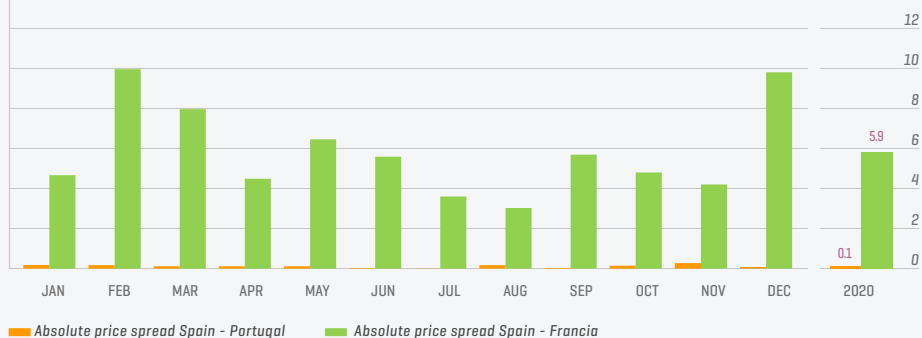
## Congestion rents in the interconnection with Portugal derived from the exchange capacity management mechanisms

€ Thousand and %

	Portugal → Spain		Spain → Portugal		Total	
	€ Thousand	%	€ Thousand	%	€ Thousand	%
Annual Auction	235.6	7.9	489.1	16.5	724.7	24.4
Monthly Auction	117.0	3.9	246.8	8.3	363.8	12.3
Quarterly Auction	216.9	7.3	112.0	3.8	329.0	11.1
Day-ahead coupling	609.2	20.5	855.7	28.8	1,464.9	49.4
Intraday Market	45.2	1.5	33.0	1.1	78.2	2.6
Replacement Reserves	4.7	0.2	1.2	0.0	5.9	0.2
<b>Total</b>	<b>1,228.6</b>	<b>41.4</b>	<b>1,737.8</b>	<b>58.6</b>	<b>2,966.4</b>	<b>100.0</b>

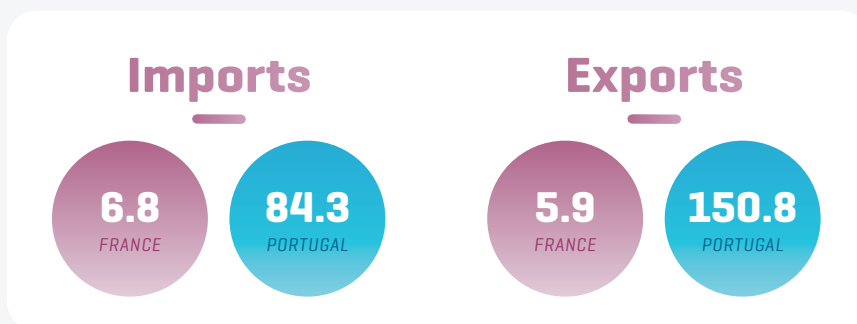
Does not include counter-trading costs nor other costs.

### Absolute price spread of the coupling rates of the European day-ahead markets in the interconnections with France and Portugal €/MWh



Average arithmetic value of the absolute values of the hourly price differentials resulting from the coupling of European day-ahead markets.

### Replacement reserve (RR) energy exchanged through the Spanish cross-border connections GWh



Interconnection with Portugal as of 29 September and as of 8 October for the interconnection with France.



**RED**  
ELÉCTRICA  
DE ESPAÑA

Paseo del Conde de los Gaitanes, 177  
28109 Alcobendas [Madrid]

[www.ree.es/en](http://www.ree.es/en)



*For a renewed future,  
a renewable present.*

