



## **Decisions that matter**

Impact of renewable electricity generation on consumer prices in 2021

March 2022



# EXECUTIVE SUMMARY



## Goal of the analysis and Main Impacts

The study aims to assess the impact of renewable electricity generation on electricity consumption prices in 2021

The purpose of this study is to determine the impact the renewable electricity generation had on the electricity consumption prices in 2021 and to update the previously executed analysis in 2020.

This analysis took into consideration the current context of the Iberian wholesale market, which was punctuated by a significant increase in the electricity price, due to unrelated reasons to the renewable electricity generation.

Thus, it was determined that in 2021, if there were no renewable electricity generation, the price of the MWh of electricity in the Iberian wholesale market would have been, on average, 88€ higher than that verified.

In 2021, the differential cost of renewable SRP and its impact on the daily electricity market price recorded a positive net effect for the system of more than 2.6 billion euros, the highest value in the last 10 years.



# THE ELECTRICITY MARKET IN PORTUGAL



## Price structure for the consumer

The price of electricity borne by companies and private consumers results from the costs related to production and sale of electric energy, transmission and distribution networks, and the commercialization of electricity

The **Regulated activities for electricity supply** are the following:

- System global management;
- Electricity transmission;
- Electricity distribution;
- Retailer Change Logistics Operator;
- Purchase and sale of electric energy;
- Commercialization of electric energy.

*Only for the last resort supplier*

Usually, the electricity supply price, paid by the end consumer, can be divided into three components:

- Networks;
- Power;
- Fees and taxes.

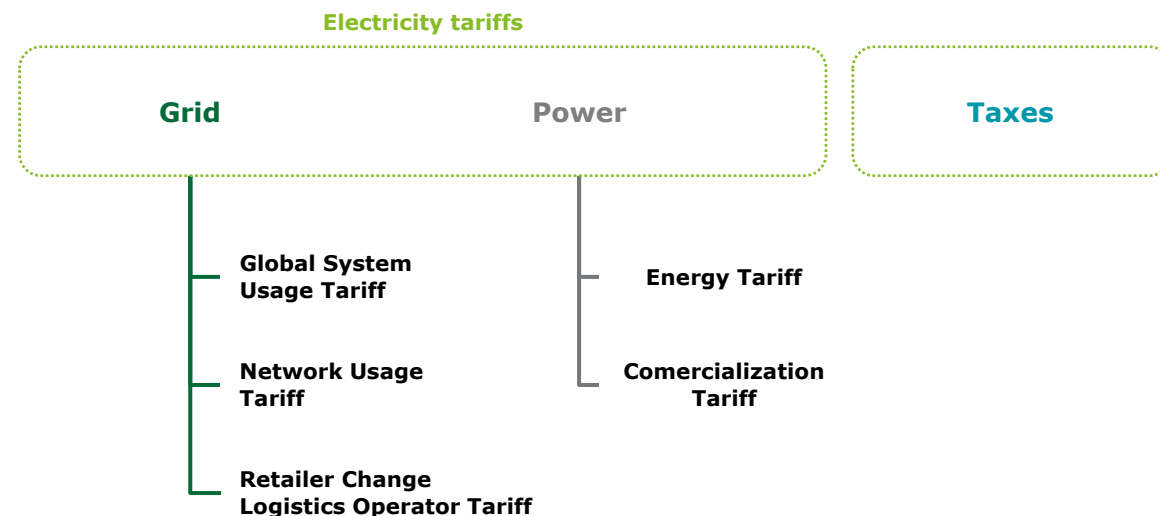


Figure 1. Electricity charges in Portugal

Source: ERSE, Deloitte Analysis

The **grid value** represents the amount related to the infrastructure that transports electricity from its production to its consumption point. The **power value** represents the electricity generation cost and its commercialization costs. Finally, **fees and taxes** include the several types of taxation, namely VAT (Value-Added Tax), IECE (*Imposto Especial de Consumo de Eletricidade*) and CAV (Audiovisual Contribution).

The sum of regulated tariffs for networks and power is the **End-User Sale Tariff**.

# SPECIAL REGIME PRODUCTION



## Impact of the SRP on the tariff

The main impact of the usage of RES on the electricity tariff are reflected on the global system usage tariff through both the CIEG and the purchase and commercialization of electricity in the Iberian Market

In order to promote and attract investment in the renewable energy sector, Portugal has created a regulatory remuneration framework based on feed-in-tariffs (FIT) as a stability mechanism to promote the transition into endogenous energies from an early stage. The differential cost of these tariffs against the market price is included in the End-User Sale Tariff.

Therefore, the main impacts on the consumer tariff from the promotion and usage of RES are:

- 1) On the **Global System Usage Tariff** are considered the costs arising from energetic, environmental and General Economic Interest policy measures (CIEG), where is included the SRP cost differential.
- 2) Simultaneously, the usage of RES has an influence in the reduction of the marginal cost of electricity in the market, since the **marginal cost of electricity generation from RES tends to be smaller than those from other sources.**

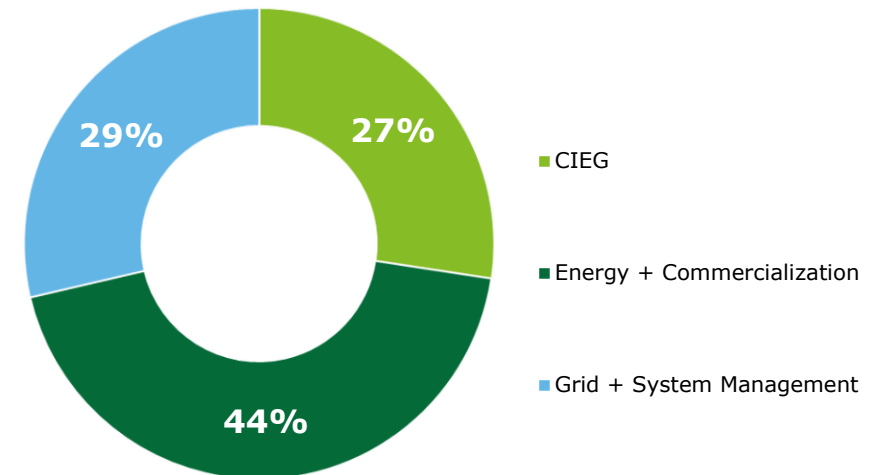


Figure 2. Electricity price composition in 2021

Source: APREN, Deloitte Analysis

There are also other impacts, **namely investments associated with the adjustment of the transport and distribution network to the increasing relevance of electricity generated from RES**, which were not analyzed in the present study.



# SPECIAL REGIME PRODUCTION



## Differential cost with the renewable SRP

The differential cost of the renewable SRP is a significant component of the CIEG, and it is reflected in the end consumer sale tariff. This component increased compared to prior years due to the downward trend in the price of electricity in the Iberian market

In order to promote the Special Regime Production (SRP) from a renewable source, the tariff includes a component related to the cost differential of the SRP against the market value, which then impacts the End Consumer Sale Tariff.

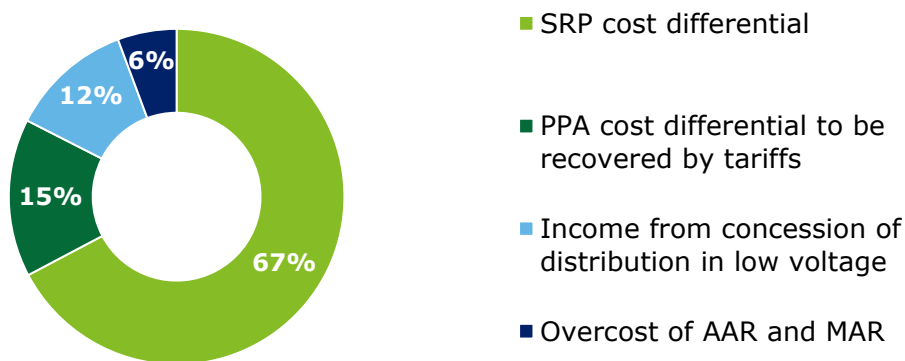


Figure 3. CIEG recovered in 2021 tariffs

Source: ERSE, APREN Analysis

In 2021, this differential cost when compared with the market values (renewable and non-renewable SRP) corresponded to approximately 67% of the total amount charged in tariff related to the CIEG.

In 2021, the costs related with the renewable SRP were approximately 1.5 billion euros.

This upscale is calculated by the difference between the average acquisition cost of this energy source by the Last Resource Supplier and the price of the power traded on the organized market.

Therefore, the increase in the SRP differential cost registered in 2021 was caused by the downward trend in the electricity market price experienced until 2020, leading to the need to adjust the upscale compared to previous years.

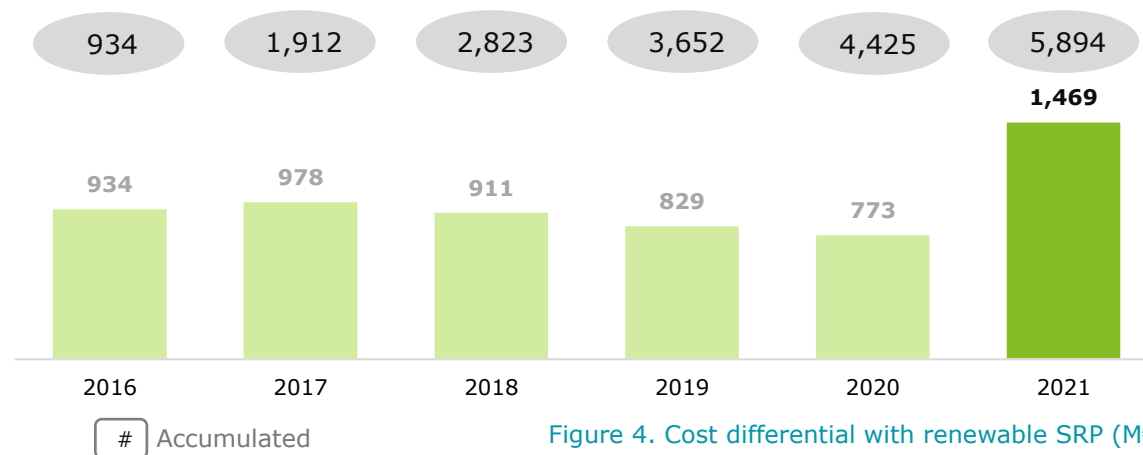


Figure 4. Cost differential with renewable SRP (M€)

Source: ERSE, APREN Analysis, Deloitte Analysis

# THE ELECTRICITY MARKET IN PORTUGAL

## Impact on the Iberian Market

The impact of renewable generation positively affects the market price of electricity commercialized in the Iberian Market due to its low marginal cost, which in 2021 allowed to save more than 4 billion euros

At MIBEL (Electricity Iberian Market), the bids to purchase and sell electricity are aggregated by both suppliers and producers, allowing the development of supply and demand curves. The intersection of these curves defines the market equilibrium point – the daily electricity market price for the respective hour.

**The renewable SRP typically has a zero marginal cost (or close to it),** which contributes for the introduction of electricity bids lower than the market cost, which reduces the daily electricity market price for a certain hour.

**In 2021, the electricity sale price without renewable SRP would have been, on average, 88 €/MWh higher than the sale price with renewable SRP.**

The accumulated savings obtained since 2016 are estimated to be about **€10.2 billion**, of which about **€4.1 billion corresponds to 2021.**

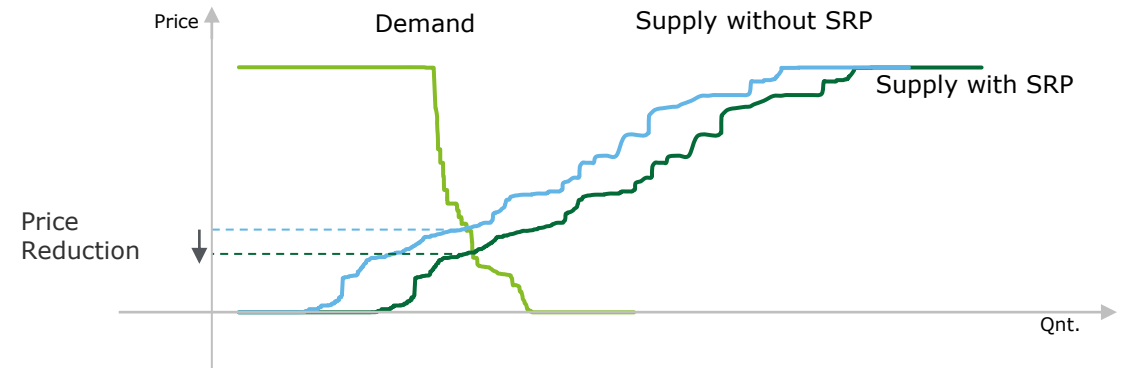


Figure 5. Impact of RES production on the daily market electricity price  
Source: Deloitte Analysis

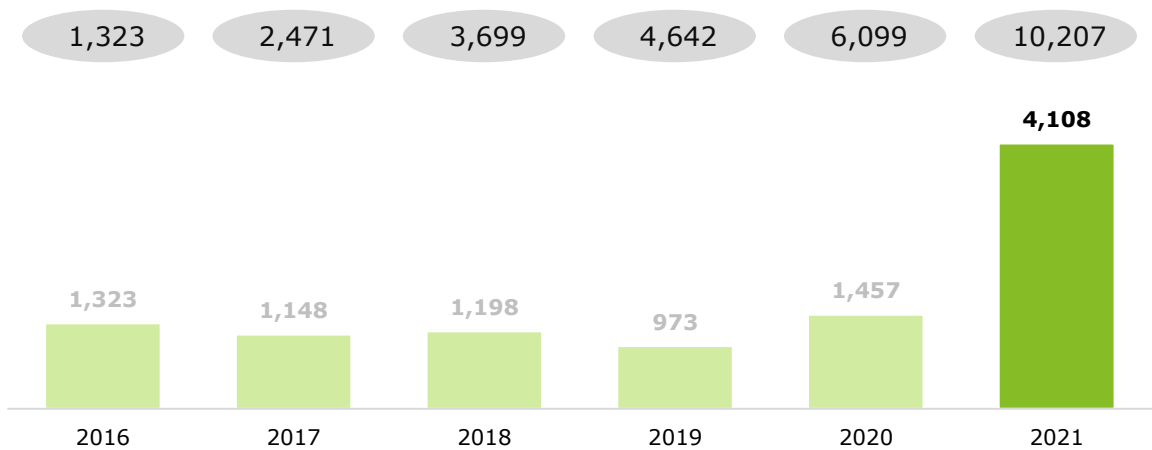


Figure 6. Savings from the purchase of electric energy (M€)  
Source: ERSE, OMIE, Deloitte Analysis

# ECONOMIC IMPACT OF THE RENEWABLE SRP

## Balance of the SRP Cost differential versus the Iberian Market Savings

Considering the differential cost of the renewable SRP and its impact on the daily market electricity price, in 2021, there was a positive net effect for the system of about 2.6 billion euros

It is important to analyze the impact of the introduction of electricity generation from RES on the daily electricity market against its differential cost, evaluated as the difference between the FIT and the daily electricity market price.

In order to simplify, it was assumed that there were no variations in the other components of the tariff (e.g., costs associated with the transmission and distribution networks).

When analyzing the values for the differential cost with renewable SRP, it was verified that, in 2021, **the positive impact for the electric system reached 2.6 billion euros, the highest value in the last 10 years.**

**Therefore, in the last 10 years, an accumulated positive balance of 5.9 billion euros was attained.**

Without SRP the daily market electricity price would increase



Without SRP the cost differential with the SRP would not exist

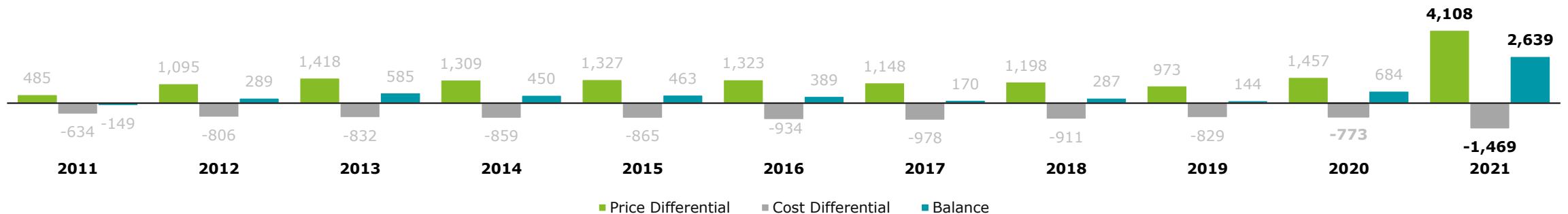


Figure 8. Differential between the obtained savings with the renewable SRP and the cost differential of the renewable SRP (M€) Source: ERSE, Deloitte Analysis

# ECONOMIC IMPACT OF THE RENEWABLE SRP

## Further impacts of the SRP in 2022 due to the market prices

In 2021, the price of electricity on the Iberian market registered an all-time high, due to the increase of gas prices and higher prices of emissions permits. This will lead to an increased of estimated savings with SRP in 2022

Despite the impact of renewable energy sources, **the electricity prices on the Iberian market registered an all-time high in 2021.**

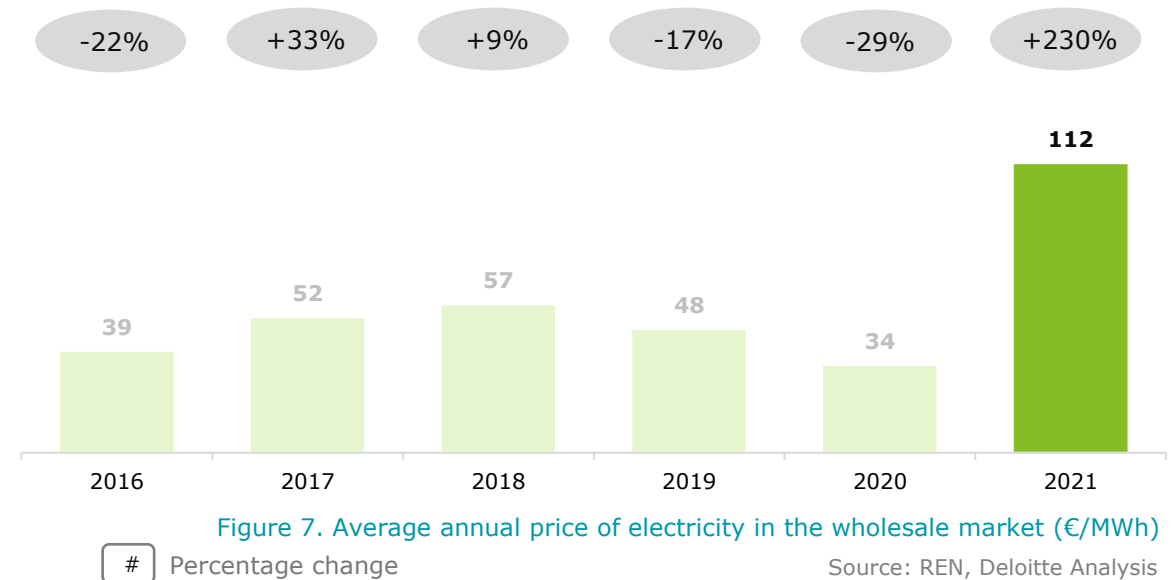
**Compared to 2020, the average annual price of electricity in the wholesale market has increased by 230%.**

**This is the result of the upward trend in the prices of emissions permits in the EU Emissions Trading System (EU ETS) and the rise in gas prices,** which reached values six times higher than those registered in 2020.

The **MIBEL employs a marginal-cost pricing model,** which means the price of electricity is defined by the highest priced supply to meet demand.

The increase in gas prices has contributed to a significant increase in the electricity generation cost from this source which, consequently, led to higher market prices. Due to the soaring prices registered in the Iberian market in 2021, **it is not foreseen that there will be an upscale of renewable SRP in 2022.**

In fact, the **renewable SRP will henceforth provide an economic benefit to the system,** since the forecasted electricity price for 2022 exceeds the average guaranteed tariff assigned to the SRP.





# IMPACT ON CONSUMER BILLS

## Net effect for the Consumer of the renewable SRP cost differential versus Savings in the Iberian Market

RES can generate, on average, an annual saving on electricity bills, of up to 300 euros for a domestic consumer and up to 30,000 euros for a non-domestic consumer

For the comparison of electricity prices between Portugal and other countries of the European Union, the following consumption bands are representative of most Portuguese domestic and non-domestic consumers :

- **Domestic** (DC Band): 2,500 to 5,000 kWh;
- **Non-Domestic** (IB Band): 20,000 kWh to 500,000 kWh;

Considering the difference between the savings obtained from the presence of renewable SRP in the market and the additional cost renewable SRP is €0.06/kWh, it means that SRP-RES can generate an **annual saving in the electricity bill of up to 300 euros for a domestic consumer and up to 30,000 euros for a non-domestic consumer.**



Figure 9. Differential between the savings obtained with the presence of renewable SRP and the overcost of renewable SRP (€/KWh) Source: ERSE, Deloitte Analysis

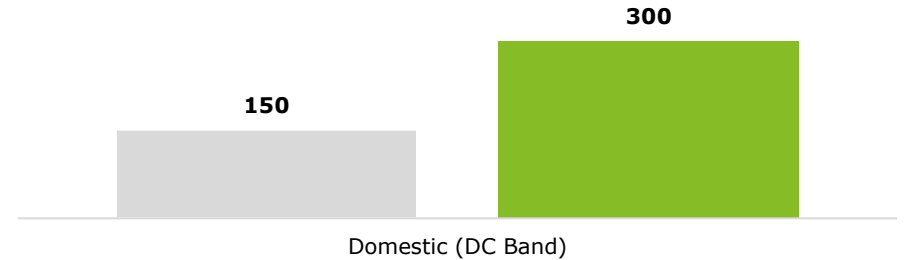


Figure 10. Minimum and maximum annual savings values in electricity consumption (€) for a domestic consumer

Source: ERSE, OMIE, Deloitte Analysis

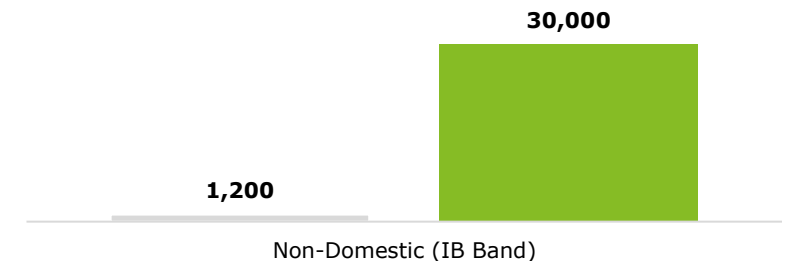


Figure 11. Minimum and maximum annual savings values in electricity consumption (€) for a non-domestic consumer

Source: ERSE, OMIE, Deloitte Analysis

# CONSUMER SAVINGS

## Findings

- The price of electricity borne by companies and private consumers results from the costs related to production and sale of electric energy, transmission and distribution grids, and the commercialization of electricity;
- The differential cost of the renewable SRP is a significant component of the CIEG. In 2021, it accounted for 67% of the total tariff charge for CIEG and was around 1.5 billion euros;
- The impact of the renewable sources positively affects the market price of the electricity commercialized in the Iberian Market due to its low marginal cost, which allowed savings of 4.1 billion euros in 2021;
- The increase of the price in the wholesale electricity market is mainly due to unrelated factors to renewable energies, particularly the increase in gas prices and the higher prices of emissions permits in the EU Emissions Trading System (EU ETS);
- Considering the differential cost of the renewable SRP and its impact on the daily electricity market price, there is a positive net effect for the system of 2.6 billion euros, the highest value of the last 10 years;
- RES can generate annual savings on electricity bills of up to 300 euros for a domestic consumer and up to 30,000 euros for a non-domestic consumer, on average.





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