RSE Ricerca Sistema Energetico | we move research

APE

APPUNTI DI ENERGIA

EUROPEAN REFORM OF ELECTRIC MARKET DESIGN

July 2024

What is it about?

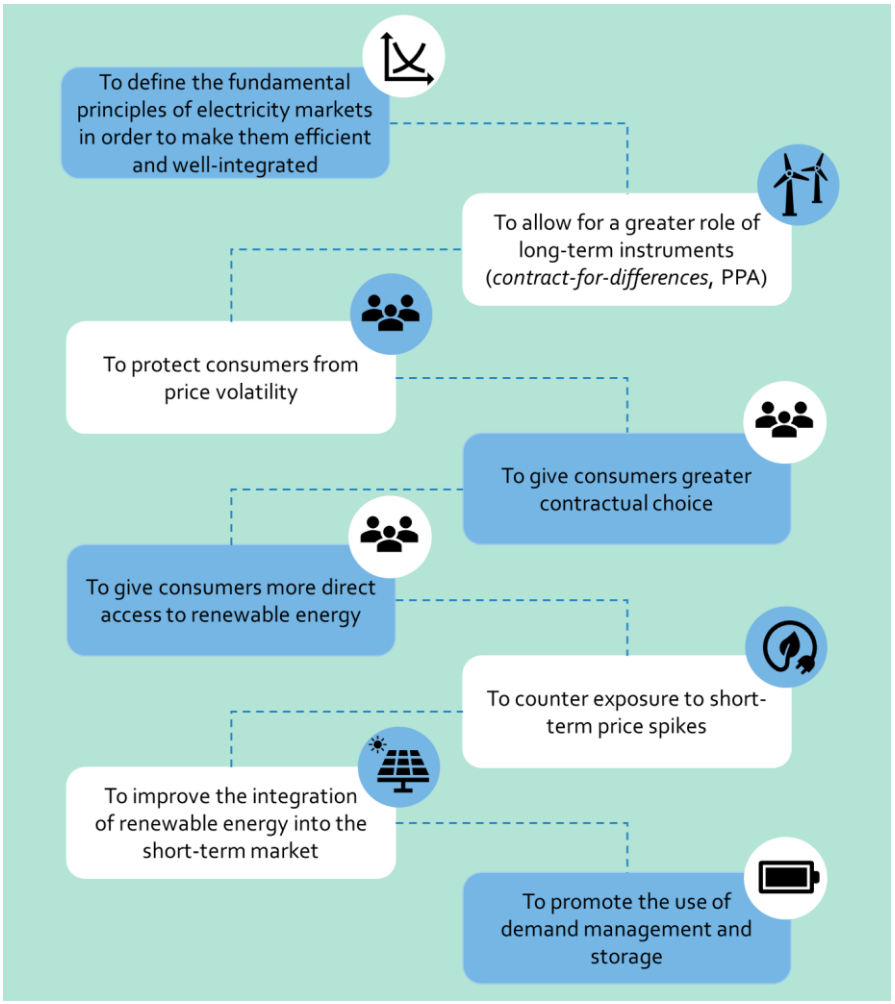
Regulation to improve the Union's electricity market design

On March 14, 2023, the European Commission published a **proposal for the reform of the European Union's electricity market**, which came into effect on July 16, 2024. The reform follows a period of public consultation, during which various stakeholders responded and shared their opinions with the Commission.
This reform aims to amend a series of existing European regulations and directives to improve the structure of the electricity market. It specifically focuses on three main areas of intervention:

European Commission

1) Protecting consumers from energy price volatility.
2) Improving the stability and predictability of energy costs (thus increasing the competitiveness of the Union's economy).
3) Encouraging investments in renewable energy.

The general objectives of the proposal are:



The context

Between 2021 and 2022, electricity prices in Europe increased significantly. This was mainly caused by the reduction in gas supply (following Russia's invasion of Ukraine) and shortages in production from hydroelectric and nuclear plants. To address the high prices, the European Union has defined the following measures:

Energy price measures

REPowerEU

State Aid

Gas storage

Reduction measures for gas

Emergency intervention to address high energy prices

Accelerate the deployment of renewable

A package of **measures on energy prices** has been defined (income support, tax relief, gas saving and storage measures), especially in favor of the most vulnerable consumers

The **REPowerEU plan** has been defined with additional measures and funding aimed at promoting **energy efficiency and renewable energy** in order to reduce dependence on Russian fossil fuels

A **temporary state aid regime** has been established to allow certain measures aimed at mitigating the impact of high prices

Objectives and trajectories for filling **gas storage** have been defined

A series of measures to **reduce the demand** for both gas and electricity have been defined

Faster authorization processes for renewable energy plants and grids have been outlined

Schemes for **price containment** have been established to prevent windfall profits in the gas and electricity markets

The general objectives

Several objectives are defined in the regulation.

In the day-ahead market (DAM), power generation plants with lower marginal costs are selected first. However, the price received by all market participants is set by the last plant needed to meet demand, which typically has the highest marginal costs (considering bid-up). Since all market participants receive the same market price, technologies with lower marginal costs consistently record higher revenues

With this reform, the aim is to lay the foundations to achieve climate neutrality by 2050, by sending market signals for increased efficiency, higher shares of renewable energy, supply security, flexibility, system integration across multiple energy vectors, sustainability, decarbonization, and innovation

The goal is to establish fundamental principles for integrated electricity markets, enabling non-discriminatory access and the development of forward markets. These principles should empower and protect consumers, ensure competitiveness in the global market, enhance supply security and flexibility, ensure energy efficiency, and facilitate demand and supply aggregation

The aim is to support long-term investments in renewable energy production, flexibility, and networks, enabling consumers to make their energy bills affordable and less dependent on short-term electricity market price fluctuations, particularly fossil fuel prices over the medium and long term

The reform outlines specific objectives and the steps that member states must pursue to achieve them. The specific objectives for each area of intervention are listed below.

Ape on DAM

Ape on IM

Improving the stability and predictability of energy costs

NEMO - Nominated Electricity Market Operators. The Italian NEMO is GME, which stands for Gestore dei Mercati Energetici (Italian Electricity Market Operator).

TSO – Transmission System Operator. *operator responsible for the transmission grid.* ***DSO – Distribution System Operator:*** *operators responsible for the distribution grid.*

Ape on Italian MACSE

The **gate closure time of the cross-zonal intraday market** should therefore be shortened and set closer to real time

Intraday markets are particularly important for the integration of variable renewable energy sources in the electricity system at the least cost as they give the possibility to market participants to trade shortages or surplus of electricity closer to the time of delivery. Since variable renewable energy generators are only able to accurately estimate their production close to the delivery time, it is crucial for them to maximize trading opportunities via access to a liquid market as close as possible to the time of delivery of the electricity

To maximise the efficiency and effectiveness of Union electricity day-ahead and intraday trading

TSOs and NEMOs shall cooperate at Union level at a regional level

To better understand the next objectives, some definitions are introduced.

Peak hour	An hour where, on the basis of the forecasts of TSOs and NEMOs, the gross electricity consumption or the gross consumption of electricity generated from sources other than renewable sources or the day-ahead wholesale electricity price is expected to be the highest
Peak shaving	The ability of market participants to reduce electricity consumption from the grid at peak hours at the request of the system operator
Peak-shaving product	A market-based product by means of which market participants can provide peak shaving to system operators

Member States may request system operators to propose the **procurement of peak-shaving products** in order to achieve a reduction of electricity demand during peak hours

Peak shaving products would lead to:

- A reduction of electricity demand during peak hours
- Ensuring supply security
- Ensuring efficient integration of electricity generated from non-programmable renewable energy sources
- A reduction of the need for electricity production based on fossil fuels in situations of high electricity prices

To allow for the effective participation of demand response, energy storage and small-scale renewables including direct participation by customers, as well as through aggregation

NEMOs shall provide products for trading in day-ahead and intraday markets which are sufficiently small in size, with **minimum bid sizes of 100 kW** or less

Regional virtual hub	A non-physical region covering more than one bidding zone for which a reference price is set on the basis of a methodology

Introduction of **regional virtual hubs** to reflect the aggregated price of multiple bidding zones and to provide a reference price, which should be used by market operators to offer forward hedging products

Virtual hubs for the forward market:

- Ensure that energy consumers across the Union can fully benefit from integrated electricity markets and competition.
- Enable pooling of liquidity and provide additional hedging opportunities for market participants.
- Promote the integration of renewable energies and supply security.
- Support the use of flexibility services.
- Promote efficient and timely investments, including solutions to optimize the existing grid.
- Facilitate storage and demand-side response.
- Contribute to achieving the goals set in the integrated national energy and climate plans.
- Provide incentives to TSOs and DSOs for more cost-efficient operation and development of their networks, including through service procurement.

Transmission and distribution tariffs should incentivize TSOs and DSOs to use flexibility services, encouraging them to cooperate by consistently publishing information on available capacity for new connections within their respective operational areas.

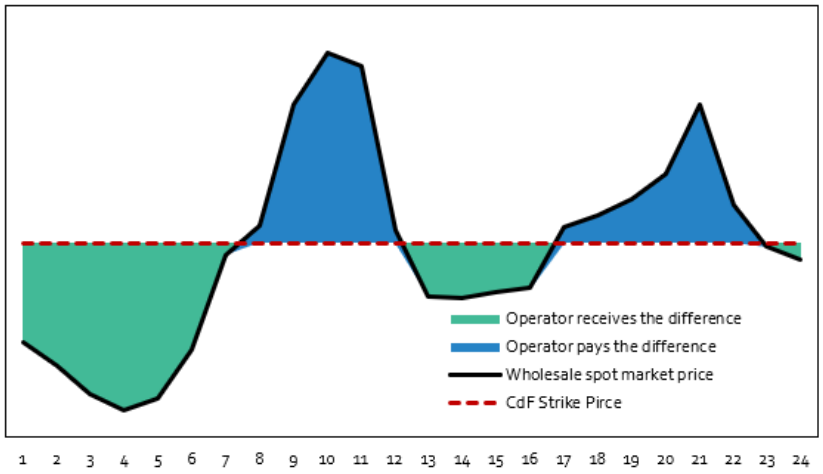
Network **tariffs methodology** considers the operational and capital expenses of system operators, enabling them to manage the electrical system in an economically efficient manner

The Union needs to **accelerate the deployment of renewable energy** at a much faster pace

To reach the Union's decarbonisation targets and the objectives set out in the REPowerEU plan to become more energy independent

Two-way contract for difference

A contract between a power-generating facility operator and a counterpart, usually a public entity, that provides both minimum remuneration protection and a limit to excess remuneration

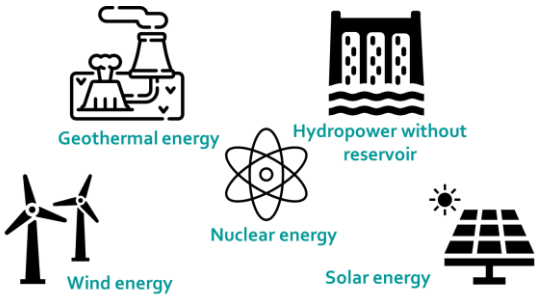


The two-way CfDs are allocated through competitive auctions at a downward bid. Winners are entitled to a predefined remuneration, known as the strike price (red line). If the market price is below the strike price (green area), the plant will receive a top-up equal to the difference between the two. If the market price is higher (blue area), the plant must instead return the difference.

- Supporting non-programmable renewable energy sources to improve energy cost stability and predictability contributes to EU competitiveness.
- During periods of high prices, much of the economically supported energy has benefited from high market prices.
- Changing the structure of the electricity market ensures that the benefits from the growing use of renewable energies are passed on to consumers.
- Including, alongside revenue guarantees, a cap on revenue increases.
- Providing Member States with an additional revenue source during periods of high energy prices.
- Revenues, or the financial equivalent of such revenues, can also be used to finance support schemes or investments aimed at reducing electricity costs for end customers.

Where Member States decide to support publicly financed investment by direct price support schemes in new low carbon, non-fossil fuel power-generating facilities, those schemes should be structured as two-way contracts for difference or equivalent schemes with the same effects such as to include, in addition to a revenue guarantee, an upward limitation of the market revenues of the generation assets concerned

Contracts for Difference apply to investments in new generation from the following sources:



To stimulate investments in renewable energy

Faster implementation of **renewable energies** and clean flexible technologies

Thanks to their low operational costs, renewable sources can have a positive impact on electricity prices across the Union and reduce fossil fuel consumption. Additionally, they enable direct electricity consumption through demand electrification and energy system integration.

Power Purchase Agreement (PPA)

Bilateral power purchase agreements between electricity producers and buyers that are voluntarily concluded, defining a price without any regulatory intervention

*Through **PPAs**, private investors contribute to furthering the deployment of renewable and low-carbon energy, while also ensuring stable and competitive electricity prices for both parties in the long term. Similarly, governments achieve the same objective on behalf of consumers **through two-way Contracts for Difference** or equivalent schemes with similar effects.*

Member States should commit to creating the right market conditions for long-term market-based instruments like PPAs. Currently, only a few Member States have active PPA markets, and buyers are generally limited to large corporations, partly due to various barriers such as the challenge of mitigating the risk of payment default by the buyer.

Member States promote the adoption of **PPAs,** also by removing unjustified obstacles and disproportionate or discriminatory procedures or charges, to ensure price predictability and achieve the goals set in their national plans

Member States must remove unjustified regulatory and administrative barriers that hinder long-term PPAs and promote their adoption. In their national energy plans, they should outline policies that facilitate PPAs and ensure accessibility to tools that reduce financial risks associated with buyer default. They can establish market price guarantee schemes if private guarantees are insufficient, but they should not support PPAs for the purchase of electricity from fossil fuels. They should allow renewable energy producers to allocate part of their generation for PPAs and pay particular attention to cross-border PPAs by removing barriers that prevent consumers from accessing energy from other regions without discrimination.

Based on the national flexibility needs assessment, Member States should **define an indicative national target for non-fossil flexibility**, including specific contributions from both demand-side response and energy storage towards this target

- Integrating renewables into the grid and adjusting the system and network to the variability of generation and electricity consumption.
- Assessing different types of flexibility needs, at least on a seasonal, daily, and hourly basis.
- Considering the potential of non-fossil flexibility resources, such as demand-side response and storage, to meet flexibility needs.
- Assessing barriers to market flexibility and proposing relevant mitigation measures and incentives, including removing regulatory obstacles and potential improvements to markets and services.
- Evaluating the contribution of network digitalization.
- Taking into account flexibility sources expected to be available in other Member States.

APE on Capacity Market

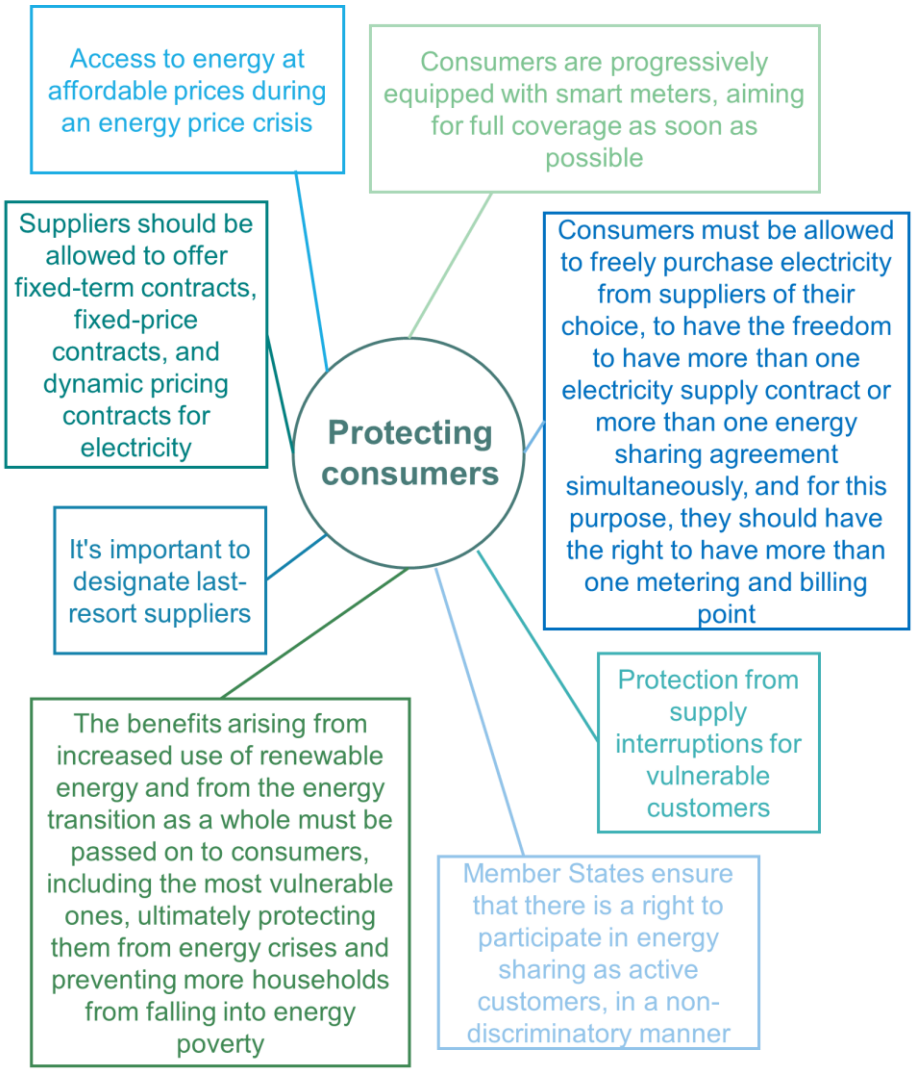
Capacity mechanisms can play a crucial role in ensuring resource adequacy, especially during the transition to a CO_2-free system. Capacity mechanisms should be open to the participation of all resources capable of providing the required technical performance.

Continue or begin promoting **capacity remuneration mechanisms**

TSOs and DSOs should publish and regularly update information on **available capacity for new connections**. Additionally, they should provide clear and transparent information on the status of connection requests

The connection of new generation and demand facilities to the grid, especially renewable energy plants, often faces delays in the connection procedures. One of the reasons for these delays is the lack of available grid capacity at the investor's chosen location, which necessitates grid extensions or reinforcements to safely connect the plants to the system. The new procedure would provide investors with easier access to information on grid capacity availability within the system, thereby accelerating the decision-making process, which in turn would expedite renewable energy development.

Protecting consumers



The author of the report is:

Federica Davò

Researcher in the Department of Energy Systems Development in the Energy Market Regulation research group.
After completing a Master's degree in Mathematics, she obtained a Ph.D. in "Analytics for Economics and Business".

For any information, doubts or clarifications please contact us!

appuntidienergia@rse-web.it

This work has been financed by the Research Fund for the Italian Electrical System in compliance with the Decree of Minister of Economic Development April 16, 2018.