European Market Design for Electricity - Enel Proposal

0. Executive Summary

During the last few months, policymakers and stakeholders have been debating on the need to reform the market design. The need has been originated from the sudden increase of day-ahead prices related with the increase in the gas prices and its double effect on electricity prices based on system marginal prices.

Policymakers are proposing different solutions. For instance, the UK Government has been considering different solutions, among them the introduction of separated markets for gas-powered plants and other sources. The Australian government has interrupted the results of short-term energy markets. The Spanish government has introduced a subsidy to reduce the bids of gas power plants.

This “white paper” represents a first step towards the analysis on the need for a new market design and puts forward a workable proposal for electricity markets in the European Union.

The current EU market design has been introduced in the mid-00s under particular conditions and policy asks: generation-centered, gas-centered and focused on short-term energy markets. This market has delivered good results, but its function has now been completed and we currently need to move towards a new market design able to satisfy the new needs.

The new market design should be based on customers’ needs and on how to accelerate the decarbonization of the economy. These needs translate into a revamp of the market design for retail and wholesale markets.

Retail customers, SMEs, and industrial customers must be able to sign contracts that caters their needs, for example PPAs. The market design must be based on competition between retailers, which must compete on firm financial grounds. For this reason, prudential regulations should be introduced, each retail contract should be backed up by LTC with producers, self-generation, forward contracts that match the duration of the retail contract. Regulated tariffs must not be offered below costs. Customers that choose dynamic prices must be aware that these contracts could bring some benefit (e.g., dynamic demand response) as well as risks, especially when based on hourly prices (e.g., the current Spanish Regulated Tariff).

Customer protection should not be based on blanket fiscal measures but based on market instruments (for example, Member States could analyze the introduction of some form of affordability options).
On the wholesale market, the market design must move its focus from the day-ahead market towards long-term price signals. With the development of forward markets, PPAs and renewable auctions, day-ahead markets become residual, thus also retail contracts should be mainly based on long-term instruments. For this reason, the market design must deliver adequate signal for customers to switch towards more adequate contractualization based on them.

Given that the day-ahead market will be used only for optimization of system dispatch and balancing of consumption and generation portfolios, the efficient pricing mechanism remains the system marginal price; the supposed infra marginal rents do not represent in any case the revenues for generators and the spot prices are not passed to final customers. In this way, the price of electricity would be decoupled from the price of natural gas.

Forward markets, PPAs and RES auctions (so called long-term markets) must be at the center of the future wholesale market. These instruments must work together. For example, PPAs could be the first way to provide long term contracts for renewable energy projects and allow customer to be fully hedged against future electricity price volatility. Their deployment could be further developed with measures that reduce their cost of guarantees and introduce market making functions. RES auctions could represent an opportunity to ensure that Member States reach their RES target and a way to provide long term price signals for specific technologies (small producers, innovative technologies). The market design should remove barriers for generators to sell their electricity in forward markets instead of in the short-term day-ahead market.

There must be incentives in place to deliver electricity when is needed, not when it is available. For this reason, we need to ensure that the market provides time-shift products that allow to consume RES electricity when it is needed, by ensuring the contracts resulting from RES auctions offer an adequate exposure to short-term market signals. Finally, CRM and balancing markets should be further developed to allow the participation of all resources, also with the introduction of long-term markets for balancing and system service.

This market design must be complemented with temporary measures to avoid the damaging effects of uncompetitive behavior of some international gas players. A European price cap on physical and financial transactions must be swiftly introduced.

Compared to other proposal, the New European Market Design here described brings many benefits and easily implementable. First of all, it is fully centered on retail competition because, thus it allows the introduction of innovative products and lower prices to customers. At the same time, it provides long-term price signals which reduce the cost of capital for decarbonized investments, avoid extra remuneration for inframarginal technologies, and provide price hedge for final customers.
1. Why a new market design?

The challenging decarbonization targets envisaged by the *Fit for 55 Package* and the radical transformation of the electricity system associated with them, coupled with the skyrocketed gas prices have stimulated a wide debate among *stakeholders and policymakers*, both at European level and in individual Member States, about the opportunity to change the current market design to ensure that these goals can be achieved, effectively and efficiently.

The discussion has been focused on two ideas: the need to decouple prices paid to gas and coal power plants from other generators, the idea that a system marginal price creates inflation and extra-profits for inframarginal technologies, in particular nuclear, hydro, and other renewable energy sources (RES).

It is necessary to assess whether and to what extent the current European market design is "*energy transition proof*", or any *upgrades* or revolutions are to be made to the current market framework. To achieve this aim, it is necessary to carry out a *gap analysis* of the various *tools* envisaged by the current legislative and regulatory framework, with respect to the achievement of a secure and affordable energy transition.

A possible methodology for structuring this analysis is based on the examination of the *tools* currently available and the respective changes and innovations necessary to safeguard four key dimensions of the electricity system, namely: *affordability, decarbonization, security, and adequacy*.

Following this approach, the energy transition can be assimilated to the fulfilment of a key objective: providing decarbonized electricity to final customers at a cheap and stable price in compliance with *security* constraints (defined as the availability of resources flexible, current and innovative, able to integrate into the grid ever greater shares of non-programmable renewable production) and *adequacy* (defined as the availability of firm resources able to cover peak demand, with an adequate reserve margin).

2. Diagnosis of the current market design

The current European market design has been introduced during the mid-00s, a period characterized by a particular mix of policy needs and technologies:

- **Focus on European integration of national markets.** From the beginning, the European market framework was conceived as an instrument for the creation a single European market for electricity.
- **Focus on how to solve a problem of over-investment.** During the previous decades, the presence of isolated national markets brought a situation of excess generation capacity and ballooning costs for final customers and governments.
• **Focus on gas-fired power plants.** During the time the European Commission decided to proceed with integration of market design, most new investments moved from nuclear, coal and big hydro power plants towards CCGT power plants, which are programmable, and their costs are influenced more by the cost of gas than by the cost of capital.

• **Focus on the market design as mechanism to reveal private information on fuel costs.** Considering that most gas costs were covered by confidential long-term contracts, there was a need to find a market mechanism able to reveal those costs, thus avoiding excess market power.

• **Focus on TSO, instead of DSO.** Considering that most power plants were connected to the transmission grids and interconnections between Member States were used only for security reasons, the market design considered only TSO needs (congestions between zones and frequency) and did not consider the requirements of DSOs (for example, power quality, which was left to intervention of Member States).

• **Focus on wholesale, instead of retail markets.** The policymaker at that time considered that the competition in the wholesale markets would be transferred to retail markets. There was no discussion at European level on how to regulate retailers (e.g., resilience and risk hedging) and to bring customers on board since the beginning.

The result has been a market design centered on day-ahead market; real time markets have been introduced as residual markets for imbalances and forward markets have been based on financial derivatives with little liquidity and short deliveries. Retail markets have been based on day-ahead prices (especially the Spanish regulated tariff, PVPC) and year-ahead forward prices, but there is little demand for long term retail contracts (for example beyond 1-2 years).

**Is this market design up for the challenges of affordability, decarbonization, security and adequacy? The short answer is no.**

**Spot prices are heavily influenced by gas prices.** The coupling of electricity and gas prices assumes that both electricity and gas are traded in efficient markets, led by supply and demand. However, in recent months it has become painfully clear that the gas market is severely distorted by geopolitical considerations.

**Retail prices have been very high and very volatile.** In Spain, regulated tariffs have been based on hourly prices. In Italy, AU could not sign long term contracts to buy cheap renewable electricity. Many retailers went out of business because they did not cover their position with long-term contracts and based their strategy on thin margins on the assumption that the introduction of renewables would have reduced wholesale prices in a linear way.

**Day-ahead markets are delivering insignificant signals for investment.** For each hour, the day-ahead market provides the marginal value of electricity. In theory, this price represents the fuel cost (plus CO₂ costs and other variable O&M) of the marginal technologies, thus allows an efficient dispatch of power plants available during that hour. For inframarginal technologies such as hydro and nuclear, the historic values of day-ahead prices are well below the full costs.
For the marginal technologies, the market mechanism does not provide enough revenues to keep working, in fact it theoretically allows them to recover only their marginal costs\(^1\), not their fixed costs. For renewable technologies, it does not provide a framework to reduce their cost of capital, because it creates a variable stream of inframarginal rents.

**Day-ahead markets are given excessive visibility.** In countries such as Spain most of the energy is bid into the day-ahead market, even though most of it is covered by contracts and financial hedges and is not traded at the day ahead price. However, the day-ahead market is given an excessive visibility because of the way it is reported by OMIE and because of its impact in the regulated tariff, the PVPC. The day-ahead market, in practice, is a market for (i) defining the dispatching of power plants, (ii) day-ahead adjustments of demand and supply, and (iii) its economic signal is relevant only for a minor part of production, as it happens in the rest of Europe. However, it is perceived by policymakers and society at large as “the” electricity market. This leads to eternal debates about windfall profits, hydro energy being sold at the price of gas, etc. The intervention measures implemented in Spain in 2021/2022 are mostly based on this misconception.

**Forward markets should provide the relevant economic signals for producers and consumers\(^2\).** However, their liquidity and time horizon are limited. Sometimes regulation is a barrier for the development of liquidity. For instance, in Spain a large amount of production, the so-called RECORE regime of renewable production and cogeneration has no incentive to trade in the forward markets\(^3\), creating a significant imbalance between the amount of demand willing to hedge and the production offering such hedges. The time horizon is another concern: customers are rarely willing to contract beyond one or two years. Therefore, the economic signal provided by forward markets is insufficient for investment decisions.

**Day-ahead and forward markets have been complemented with additional instruments to allow investments in renewables and to keep the light on.** In particular, the main tools currently available in most European countries to support investments in renewable utility scale plants consist of **RES auctions** and **long-term PPA contracts**. Finally, with regards to the **adequacy** dimension, CRMs (**capacity remuneration mechanisms**) represent the tool typically dedicated to the procurement of resources associated with this dimension.

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\(^1\) CCGT that have long term gas supply contracts, at prices typically well below the spot gas prices, are receiving the inframarginal rent of those contracts. Only if a CCGT is buying spot gas it will recover only the marginal cost in the day ahead market.

\(^2\) There is an obvious link between spot and forward prices. However, until recently, periods of high spot prices were short, linked to specific events such as cold spells, large unavailability of nuclear power plants or disturbances in gas supply, and did not have time to influence the forward prices. The current crisis is the first time that the high prices last long enough to significantly influence the forward prices. However, the claw-back and the price cap implemented in Spain by RDL 6/2022 have prevented the high spot prices to influence the forward prices for a significant part of the energy.

\(^3\) This will change from 2023 onwards, due to recent regulatory reforms.
Because of this, the focus on day-ahead markets provides a biased understanding and leads to misdirected interventions. Real-life markets are not fully based on marginal prices. RES developed under auctions and PPAs do not receive the day-ahead system marginal price, they receive the value of the RES auction (generally based on pay as bid system) or of their contracts. Inframarginal generators receive the price of their forward contracts or PPAs. Only marginal technologies, for example OCGT, storage and demand side response really receive system marginal prices because they do not sell in advance.

In other words, the day-ahead market and its system marginal price is only a way to dispatch the system at minimum cost. It is a fundamental function, but it should not be confused with the price that is finally paid by customers.

Market signals are supposed to drive investment decisions, and therefore market design is linked to the system planning process. However, nowadays the planning of the development of the system is almost exclusively focused on planning the development of the transmission grid, and there is not a proper planning framework for the system as a whole. Additionally, the current challenge of reducing the dependence of Russian fossil fuels will increase the need for a carefully coordinated planning of gas and electricity infrastructure across Europe.

These facts show that the European Union must quickly update the entire market design if we want to avoid a spiral towards balkanization of energy markets, nationalization, high energy costs for customers, and impossibility to reach decarbonization through the electrification of the economy. If we do not act now in a coordinated way, there soon will be no internal energy market.

3. Attempts to improve market design and their shortcomings

Most of the aforementioned problems have been well known for years and have led to the implementation of several solutions, frequently focused on delivering some kind of long-term signal. The current energy price crisis has also brought some temporary interventions aimed at decoupling electricity and gas prices.

Regarding the long-term price signals, some instruments are already available. In particular, concerning the decarbonization dimension, the main tools currently available in most European countries to support investments in renewable utility scale plants consist of RES auctions and long-term PPA contracts.

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4 The information that producers must present to the Spanish authorities following the natural gas claw back introduced by RDL 17/2021 makes clear that the relevant price for consumers and producers is the forward market. The energy delivered in 3Q 2021 was sold at wholesale prices between 55 and 70 €/MWh, well below the prevailing spot prices of those days, since it had been sold one or two years in advance.
In many European countries (including Italy and Spain) the **RES auctions**, in their current configuration, provide that the assignee renewable producers stipulate with a central counterparty a long-term financial contract, based on or equivalent to a two-way contract for difference (CfDs) settled at the hourly level. These contracts provide that at the hours when the **strike price** (awarded price in the auction) is higher than the spot price the renewable producer receives the difference from the central counterparty (i.e., the system); symmetrically, at the hours when the spot price is higher than the **strike**, the producer returns this difference to the central counterparty (i.e., the system).  

This mechanism ensures that the successful bidder is totally or partially **covered** with respect to hourly fluctuations in the spot price or – in other words – totally or partially **shielded** from the price signals (temporal and geographical) provided by it. Regardless of the hours in which it feeds energy into the network the producer sometimes receives the same price (the **strike price**), in this case the mechanism does not transfer any **signal** that stimulates it to "shift" (for example through the installation of a storage system or the purchase from third parties of **time shift** services) the production of the plant itself to the hours more “valuable” for the system. However, auction schemes can be designed to supply a limited economic signal for this shifting, as is the case in Spain. The absence of such signals can entail the risk – gradually amplified by the progressive increase in generation, especially solar and wind, necessary to achieve the Renewable targets – that the TSO is forced to adopt in an increasingly massive way **curtailment** actions (cutting renewable generation), inefficient both from a system point of view (effectively compressing the positive externalities associated with the introduction of renewable energy into the grid) and for the producer himself.

The auction mechanism is a **centralized** tool that – if accompanied by proper corrections that will be described in the next paragraph, aimed at solving the critical issues just described – could allow to provide long-term signals to investors in renewable generation and – by virtue of its centralized configuration – seems particularly suitable to keep under control the achievement of pre-defined targets, so that it is possible to intervene in time with any necessary adjustments.

However, the settlement of the contracts derived from the auctions against the spot price contributes to the excessive relevance of the spot market. This situation can lead to the perception that the renewables are not benefitting the consumers, who do not seem to capture the low prices delivered by RES. For this reason, the results of the auctions should be directly accessible to retailers and end consumers. Additionally, to foster liquidity in the forward markets, Member States could consider auction products whose strike price is not related to day-ahead prices, but to forward prices.

Another tool that can play a particularly significant role in achieving renewable targets is **PPA contracts**, an instrument that – unlike auctions – is **decentralized** and relies on more **market-**

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5 There are mechanisms to limit the incentive to bid negative prices.

6 On the time shift we will return extensively later
oriented dynamics, based on the matching of renewable supply and demand curves on medium-long term horizons.

Currently the PPA market, especially in Italy (the PPA market in Spain is very dynamic), is not very liquid and developed, with particular reference to contracts lasting more than three years. One of the main barriers that hinder its development certainly lies in the excessive costs of guarantees ("collaterals") that the seller and (mainly) the buyer must deliver to ensure the fulfilment of contractual obligations. This problem has further worsened in the current crisis environment, characterized by particularly high spot prices and significant volatility.

Let us now turn to the key dimension security. The tool typically dedicated to this dimension is the dispatching services market, typically managed by TSOs. This market was originally designed - in most European countries - for a completely different context from the one that is gradually accompanying the energy transition (with an increasing presence of renewable and innovative resources, decentralized and small, and by a progressive increase in the role of demand), a context at the time dominated by conventional, centralized, large size assets.

It is worth highlighting how – unlike most European countries (including Germany, France, England, Ireland, etc.) – the architecture of the Italian and Spanish services markets is based exclusively on a "spot" segment, which supplies both reserve and balancing services through hourly “upward” and “downward” offers (referring respectively to increases and decreases in generation compared to the schedules resulting from the previous markets7) declined in €/MWh. The absence of a “forward” segment (except for some pilot projects8) risks making less effective the signals to attract investments in flexible resources, in particular capital-intensive resources (such as storage systems in particular), and therefore requiring medium-long term signals.

Finally, regarding the adequacy dimension, CRMs (capacity remuneration mechanisms) represent the tool typically dedicated to the procurement of resources associated with this dimension. For example, the CRM implemented in Italy (Capacity Market) is organized in a centralized way (adequacy is supplied by the TSO Terna "on behalf" of consumers), and based on reliability options, i.e. one way contracts for difference (options) that – against the recognition of a premium determined as a result of dedicated auctions – bind the assignees to return to the system any positive differences between the spot price (of the energy markets and services) and the strike price (equal to the standard variable cost of the peak technology, i.e. the open-cycle gas turbine), as well as to physically offer the awarded capacity on the energy and services markets. The mechanism, on the one hand, (through the stipulation of annual contracts for existing capacity and fifteen-year for the capacity of new construction) guarantees medium-long term signals able to support investments in adequacy resources, on the other (by virtue of

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7 Or, respectively, decreases and increases in consumption (as far as demand is concerned)

8 Pilot projects "Fast Reserve" (ultra-fast reserve procurement, with full activation time not exceeding one second) and "UVAM" (Unità Virtuali Abilitate Miste - Mixed Enabled Virtual Units)
the use of reliability options) protects consumers (as a sort of "insurance") with respect to any price "spikes".

It should be noted that the current European regulatory framework (in particular the Clean Energy Package) considers CRMs as transitional and "last resort" tools, also subject to many constraints. Moreover, in some cases (e.g., Italy) the local implementation framework, while formally adopting a technology-neutral approach for participation in CRMs, actually limits and makes less effective / remunerative the participation of innovative resources such as in particular storage systems and demand response, due for example to the calculation methodologies of derating factors applied to these technologies and some constraints provided for the operation of storage systems.

Regarding the decoupling of electricity and gas prices, Spain and Portugal have implemented a subsidy, to be paid to thermal generators, that tries to cover the difference between gas market prices and a target reference gas price. This subsidy is internalized by generators in their bids to the spot market, leading to lower prices that have also passed to the forward market. However, this mechanism has two main drawbacks: (i) The cost of the subsidy is passed through to retailers through an hourly adjustment to their purchase price. Since this is an important amount, it leads to a very volatile price even for customers who were protected by fixed-price contracts. This volatility cannot be hedged. (ii) The limited implementation of this mechanism in two countries has led to significant distortions in the export flows. Subsidized energy is now flowing from the Iberian Peninsula into France.

4. A market design fit for the energy transition

From the examination of the regulatory framework, some "weak" points of the tools currently implemented have already emerged, which could inhibit or limit an effective and efficient achievement of the decarbonization objectives, in compliance with the affordability, security and adequacy constraints.

First of all, we must rethink our market design because we must start from the consumer in mind. Customers want clean, affordable, and secure electricity. How can we deliver it to them?

Retail Markets

Retail markets should propose a different mix of short term and long-term contracts able to satisfy different risk profiles of different customers. Some customers prefer a stable price profile, some other customers would like some exposure to day-ahead prices. In addition, in the future, customers that willingly decide to be exposed to short term price signals should not be bailed out by the State with tariffs rebate. However, there could be still an imbalance between the time horizons required by investors in generation and those required by energy users.
Retail tariffs should be less exposed to day-ahead markets and mainly exposed to long-term price signals. As we have seen, the results of day-ahead market do not represent the total cost of generation, and it is a residual market that allows efficient dispatch of the system. Retail tariffs should on the contrary reflect the real cost of generation which is mainly defined in long-term markets for PPAs and RES auctions. Only a residual part of the generation would come from short-term energy markets to cover the residual differences between real time consumption and contracted generation.

Retailers should compete in the PPAs marketplace and could directly or indirectly have access electricity from RES auctions. These solutions will have the additional benefit of reducing the relevance of day-ahead markets.

Regulated tariff below costs must be avoided because they do not deliver incentives for energy efficiency; direct payments to customers correlated to their income should be preferred.

Measures to avoid high and volatile retail price could be considered by Member States. The protection of final customers from high and volatile prices should be based on market instruments, not fiscal interventions. For example, Member States could analyze in more detail ACER’s proposal for affordability options, measures introduced in anticipation of or as hedging against extreme price shocks in the future. They are subject to a centralized auction for long-term options, the execution of which depends on the average market price over a pre-defined period (e.g., a month). Only when the average price over the period exceeds the strike price, will the option be executed. Such options therefore keep the exposure of consumers to shorter-term market signals but hedge them against sustained high prices and correspondingly high electricity bills.

Requirements regarding risk hedging ratios could be introduced for retailers. Like the prudential regulation introduced after the 2008 financial crisis, also energy retailers should operate under similar requirements. Sales of gas and electricity with fixed prices should be backed up (at least partially) by enough forward contracts, PPAs or inhouse generation to avoid maturity mismatches and risk of default. In this way the system will be able to align timeframes of wholesale and retail markets.

**Development of Renewable Capacity**

The development of renewable power plants should be accelerated with adequate renewable auctions and PPAs. Some improvements could be introduced, especially in Italy where until now the deployment of RES has been below its potential.

The design of the Renewable Auctions should be institutionalized and not subject to the approval of DG Comp.
Renewable auction. Auction products, in any case, should not totally shield producers from the temporal and geographical signals provided by the spot market. This result could be obtained in different ways. For example, Member States could gradually introduce auctions products based on 2-way CfDs with strike prices based on forward markets or weekly/monthly average of day-ahead market prices. Otherwise, it could provide contracts with capacity remuneration (€/MW).

As we have seen, a further fundamental tool for achieving renewable objectives, and which also has the advantage - compared to Auctions - of being more market oriented, consists of renewable **PPA contracts**.

We have already anticipated how one of the main barriers that inhibit an effective development of this tool lies in the high cost of the guarantees. A possible solution to this problem – already partly provided for in European and (for example) Italian legislation\(^9\) – consists in the implementation of a platform managed by a central counterparty, for example the PX - NEMO ("PPA platform"), accompanied by appropriate mechanisms to mitigate the costs of guarantees for participants (sellers and in particular buyers), such as: *margining*\(^10\), *multilayer risk allocation*\(^11\), *cascading*\(^12\), possible takeover of an institutional entity (e.g., in Italy GSE) in the fulfilment of contractual obligations in the event of default of the buyer, and centralized settlement. To increase the liquidity of this platform, as well as to send *time shift* signals similar to those obtainable through the corrections to the RES auctions described above, the trading of products characterized by standard profiles could be envisaged.

As a permanent solution, it may be appropriate to stimulate and leave as much space as possible to a development of renewable initiatives guided by *market* principles, thus focusing on PPA platforms; centralized interventions (auctions) would take place only where and to the extent that the market autonomously should not be able to achieve predefined renewable penetration targets, defined in line with the decarbonization trajectories (so-called *backstop* mechanism). This approach would in fact enhance the typical and complementary benefits of the two instruments examined, namely: drive for innovation and *market-oriented* approach (PPA platforms) and effectiveness in monitoring and achieving renewable targets (centralized schemes based on auctions).

The modifications in auction products and the need to cover customers consumption with PPA will create a demand for *"time shift"* "service", which could be satisfied through the direct implementation of a coupled (to the RES plant) storage system (*"make"* option), or alternatively

\(^9\) See the REDII Directive and the related Italian transposition decree
\(^10\) deposit of cash or guarantees to guarantee the fulfillment of obligations and frequent adjustment of gains and losses resulting from changes in the value of the contract (with partial risk coverage)
\(^11\) This approach could, by way of example, provide for an allocation of credit risk to: a) the participant (margining); b) the other members of the clearing system, within the limits of a contribution paid to a dedicated guarantee fund; c) the clearing house, which is liable with its own capital; d) socialization on consumers of the residual risk not covered by the above mechanisms
\(^12\) splitting the contract into a set of contracts with shorter delivery periods
by purchasing the *time shift* (virtual of psychical storage) service from third market parties, on a specific "market" ("buy" option). In any case, the time shift product should be provided by market participants and not TSOs.

**Decoupling of gas and electricity markets**

The recent geopolitical events have demonstrated the need to decouple our electricity system from the natural gas.

**The lasting solution is the development of renewable energy sources.** Being the cheapest source of electricity, RES reduce the total generation cost. In addition, being developed under PPAs and RES auctions, which are based on pay as bid mechanisms, RES reduce the effect of system marginal price system in short-term electricity markets.

**We must induce to sell most of the production in forward market, instead of day-ahead market.** For instance, in Spain a large amount of production, the so-called RECORE regime of renewable production and cogeneration, has the incentive to participate only in the day-ahead and no incentive to trade in the forward markets, creating a significant imbalance between the amount of demand willing to hedge and the production offering such hedges.

**Market design schemes based in the division into two markets are complex and present implementation difficulties.** The most relevant problem is how to allocate demand to each of the markets, and how to integrate such a two-tier market into the European internal electricity market. An adequate combination of forward and spot markets can deliver the same results (among other things, making sure that the benefits of RES in terms of prices are perceived by consumers and removing any suspicion of windfall profits) without the practical difficulties.

**In the meantime, considering the still high exposure to gas prices, we must reduce the effects of high gas costs through a UE-wide gas cap price.** The recent events have shown that there is no functioning gas market, it is an oligopoly distorted by geopolitical interests. We cannot continue acting as if the gas market was a real market, therefore we need some form of price intervention. *It is essential that the level of cap should be fixed in line with the pre-crisis levels and should be set equally on all Member States. The price cap should apply to all physical and financial transactions inside the European Union (e.g., trades on EU gas hubs, imbalance payments, etc.).* We should avoid changing the terms of import contracts. Import prices will be affected in an indirect way through the price index formula.

Since Europe must continue to import LNG cargos also when international prices are above the cap to make up for possible shortages from pipelines, in a first application phase a simple CfD (Contract for Difference) mechanism that refunds the importers of the difference between the international price and the cap could be put in place. In a second phase, this simple CfD mechanism could be extended at European level and based on auction mechanisms able to coordinate needs of different Member States.
Dispatching services market

To efficiently integrate renewable generation into the grid, and at the same time provide sufficient investment signals for the flexibility resources enabling such integration, it is necessary implement three main upgrades.

Expand participation in the services market (with particular reference to innovative resources such as electrochemical storage systems, demand side response, V2G), removing some pre-existing direct or indirect barriers resulting from a market designed in a different context, dominated by conventional, centralized, and large generation.

Introduction - in European countries where this is not already foreseen - of forward procurement market segments, with the dual purpose of providing medium/long-term signals to investments in flexibility resources (typically characterized by high fixed costs, such as Storage Systems, and which therefore require medium/long-term signals) and to give long-term visibility of the flexibility needs of the system.

Capacity Markets

As anticipated, capacity remuneration mechanisms (CRMs) are considered by European legislation to be transitional mechanisms, of last resort, and subject to numerous constraints. This approach should be revised, providing that CRMs assume a structural role in the architecture of the market, as the main tool to procure the adequacy resources by providing long-term signals for the related investments and divestments.

This tool would have a pivotal role in selecting and remunerating, in an efficient and virtuous way, the resources (not only the new, also the existing ones) necessary to ensure adequacy, providing appropriate signals for the entry or the keeping in the market of the least expensive resources, and the exit of the most expensive ones (also considering the entry of new resources into the system). In fact, existing resources also play a fundamental role for adequacy, and it is therefore necessary to ensure that the CRM ensures their keep in operation, for the share strictly necessary to preserve the adequacy target.

To make the role of CRMs more effective in line with the technology-neutral approach, it would be appropriate to remove the barriers that currently limit (for example in the Italian Capacity Market) the participation of "innovative" resources such as demand response and storage systems, reviewing the rules for calculating the respective derating coefficients and limiting some operational constraints envisaged for storage systems.

System planning

In the new market design, there must be a better coordination between the European Union, the Member State, the National Regulatory Authority, TSOs, DSOs, Market
Operators and Market Participants. The European Union must press ahead defining decarbonization goals for 2030 in line with the objective of a full decarbonization of the economy by 2050 and strategic independence for the main material and technologies (for example EU supply chain for PV). The European Union must ensure that in all Member States there are the right mix of policy that allow adequate investments in the electricity market and adequate market instruments in the retail market. The National Governments must ensure that the minimum conditions for retail customers and investments are satisfied. TSOs and DSOs, on an equal footing, will have a shared responsibility to coordinate investments in grids and investment in generation and other technologies. Market operators must facilitate the creation of markets for each product and for each timeframe. Finally, market participants (generators, DSM, storage, retailers, and final customers) must operate inside these markets to deliver competitive results.

This coordination must specially focus on the planning of gas infrastructure of purchases. The European energy system must remove its dependence on natural gas within a few years, but in the meantime some new infrastructures and supply contracts will be needed. It is important to prevent stranded investments while offering the necessary security to gas suppliers in this transition period.