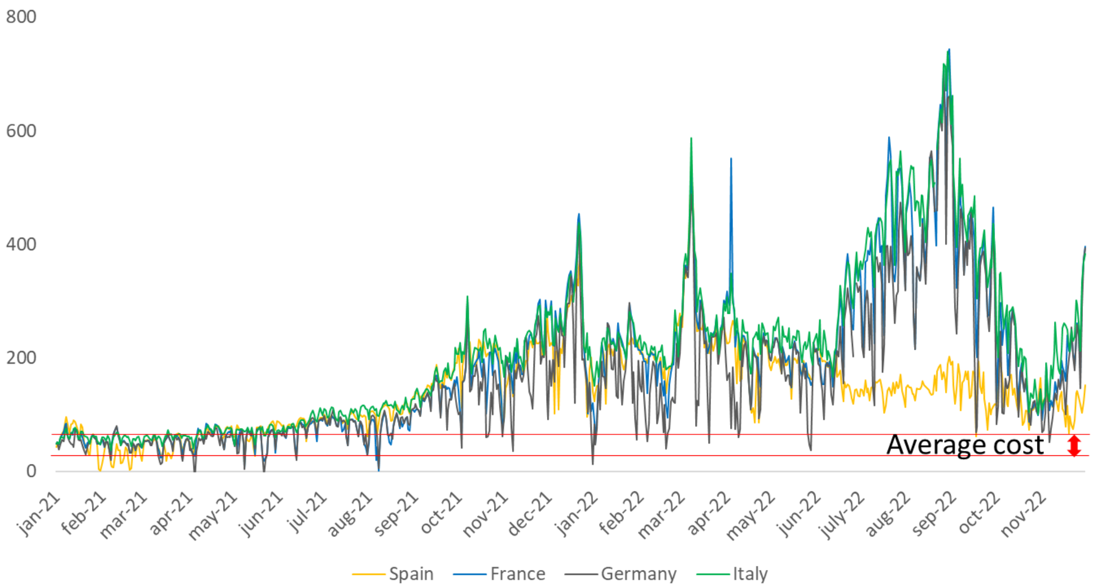
Proposal to reform the EU's wholesale power market

Non-paper by Spain

1. The current design of EU electricity markets is not fit to deliver affordable, clean and secure electricity during this decade

Over the past year, EU consumers have paid electricity prices several multiples above the average cost of producing electricity. Inframarginal generators have captured those rents, obtaining excessive profits, while record-high electricity prices were fuelling inflation, which has become the main economic hurdle in the EU.

Figure 1. *Day-ahead price (€/MWh) in Spain, France, Germany and Italy, January 21 – November 22*



Note: On the 14th of June the Iberian mechanism was introduced in Spain.

The welfare loss borne by EU electricity consumers is largely attributable to the current design of wholesale electricity markets. By and large, the EU relies on short-term markets, and particularly the day-ahead market, to deliver long-term price signals to supply and demand. Such design is neither stress-proof nor future proof: In a context of high gas prices, it has led to excessive electricity prices. In the longer run, it is not fit to deliver affordable, clean, and secure energy.

1.1 Current electricity markets will not deliver affordable, and stable, electricity prices

Generators' revenues depend on the prices set by short-term electricity markets (i.e. day-ahead, intraday and balancing markets). In an ideal setting, with no market failures, the current market design would lead to the efficient outcome: Short-term markets would incentivise efficient entry, and competition would drive electricity prices to the long run incremental cost (i.e. the average cost). In addition, nothing would prevent supply and demand from entering into long-term contracts to hedge against price volatility.

However, there exist market failures that explain why such conclusions do not hold and, in fact, are not observed.

Barriers to entry prevent competition from driving prices to the average cost. Entry is not possible, for example, if the resource is exhausted (e.g. hydropower), or if new entry is banned by regulation or does not have the political or social support (e.g. nuclear). In addition, entry might be possible, but at a speed that may not be fast enough to erode excessive rents (e.g. renewable entry). As a result, electricity prices do not reflect long run incremental costs, and generators obtain excessive rents for a sustained period of time when the costs of the marginal technology are subject to positive price shocks (e.g. increase in natural gas prices).

Barriers to entry explain why the current price crisis will not be short-lived. As we cannot rely on new entry to reduce prices, we can only hope for gas prices to fall. Indeed, power futures indicate that electricity prices will continue to remain above average costs for years to come. EEX German power futures are currently trading at a price of 364€/MWh in 2023, 256€/MWh in 2024, and 177€/MWh in 2025.[1] Such price levels will continue to exacerbate inflationary pressures, undermine the competitiveness of our industry, impoverish consumers and prevent electrification.

Other market failures prevent the development of long-term hedging. Over 20 years have passed since the liberalization of EU electricity markets, and yet forward futures with maturities beyond 1-3 years are illiquid at best, inexistent at worst.[2] Different market failures, such as market power in retail markets[3] and coordination problems[4], are at the root of the cause.

As a result, consumers are exposed to volatile electricity prices. Such price exposure not only generates a well-fare loss, but also prevents the necessary investments in electrification. Who is willing to take the risk to invest in an electric car or a heat-pump, if electricity prices can increase to 400 €/MWh at any given year?

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[1] https://www.eex.com/en/market-data/power/futures#%7B%22snippetpicker%22%3A%2228%22%7D. Last accessed on 30th November 2022.

[2] See ACER 2022. *"Acer's Final Assessment of the EU Wholesale Electricity Market Design".*

[3] In order to promote retail competition, competition authorities in many Member States prevent retail suppliers from offering, to households and SMEs, contracts with permanence commitments beyond a certain period (e.g. one year). As a result, retail contracts that provide price certainty beyond that period cannot emerge, and consequently there is no demand for futures.

[4] Coordination problems affect the industrial sector. If the competitors of an industrial consumer are exposed to the pool price, the least risky strategy by the industrial consumer is to remain indexed to the pool price, as it is the only way to guarantee that it will face the same production costs than its rivals. Due to this lack of coordination, the amount of price hedging is below the optimum.

1.2 Current electricity markets will not deliver clean electricity

Electricity generation from fossil plants generate a negative externality, in the form of CO_2, which requires investing in renewable energies. However, if the entry of renewables depends on the short-term market price signals, investments in renewable energies will be, firstly at risk, and secondly expensive.

Renewable investments will be at risk because renewable entry drives down prices in the day-ahead market at times when they produce. As a result, the captured price of renewables in the day-ahead market will likely lie below their average cost, which will prevent further entry. [5]

In addition, if renewables' revenues are exposed to the volatility of pool prices, investors will face high uncertainty in their cash flows, which will translate, at best, into increases in the cost of capital, and at worst, into financing foreclosure.

1.3 Difficulties to guarantee security of supply

The recent natural gas crisis has taught us the hard way that security of supply cannot be taken for granted. As the share of intermittent renewables increases in our electricity systems, firm and flexible capacity will be needed to guarantee supply when the wind does not blow or the sun does not shine. We cannot rely on short-term markets to provide sufficient entry of firm and flexible capacity, as there are market failures that prevent it. Some examples include:

Positive externalities. Security of supply generates positive externalities for the economy that are not internalised by electricity consumers. Consider, for example, the private cost of supply disruption faced by an industrial consumer that manufactures an essential good (e.g. a medical drug). Its private cost of supply disruption is given by the profit loss due to the foregone production. However, the social cost, which is given by the cost to society of not being able to consume the essential good, is much higher. Consequently, the short-term market alone generates a sub-optimal level of security of supply.

Implicit price caps. For peaking plants to recover their investment costs, it is necessary that in some hours/year there is electricity rationing and prices increase to the willingness to pay (i.e. value of loss load, VOLL).[6] However, times of scarcity often generate opportunities to exercise market power. It may be difficult for a competition authority to differentiate between high prices generated by actual shortages, or generated by anti-competitive practices (e.g. excessive prices or capacity withholding). The risk of being sanctioned by the competition authority in times of scarcity constitutes an implicit price cap, which prevents the generator's revenues to reach VOLL values.

[5] Most renewable technologies have variable costs that are close to zero. As a result, in the near future, further renewable entry will drive prices close to zero in many hours of the year, preventing renewables from recovering their investment cost. This is known as the cannibalization effect.

[6] Absent market power, the revenues that peaking plants obtain from short-term markets only cover their variable costs. As a result, if prices do not increase to VOLL, peaking plants cannot recover their investment costs.

1.4 Current electricity markets and its failures have a deep macroeconomic impact

Electricity is both an essential consumption good and input for production. The surge in electricity prices and its impact on inflation has taken a toll on the competitiveness of our economies and our citizens´ welfare. This sudden rise in inflation has forced the European Central Bank and national governments to change the course of their respective monetary and fiscal policies, undermining the strength of the economic recovery.

2. A reform proposal that is stress-proof and future-proof

The market failures described above will not disappear. Most barriers to entry cannot be removed, CO2 will continue to harm our environment, security of supply will always generate positive externalities, futures markets for long-term price hedging have not substantially developed over the last 20 years, and only wishful think would presume that they would do so over the next 20 years.

In order to overcome these market failures, it is necessary to complement existing short-term electricity markets with long-term markets for electricity and capacity. Long-term markets for electricity will provide price stability to both consumers and producers, and will orientate electricity prices to average production costs. Capacity markets will remunerate the necessary firm and flexible capacity that guarantees security of supply. The reform proposal facilitates regulators to sign these long-term contracts with generators. In particular:

- **Inframarginal generators:** Electricity production from inframarginal generators is contracted, over their useful lifetime, at a fixed price that reflects their average cost, providing a secure cash flow for generators that reduces their cost of capital, and price stability for consumers that incentivises electrification.
- **Peaking resources**: Long-term capacity contracts remunerate the firm and flexible capacity provided by resources such as CCGTs, storage, and demand response, incentivising the necessary investments to guarantee security of supply.

These long-term contracts do not substitute the role of short-terms markets (i.e. day-ahead, intra-day and balancing), which would continue to function as of present, providing the necessary short-term price signals, and ensuring the efficiency of dispatch.[7] However, generators' revenues will not depend on short-term price signals, as these will be governed by long-term contracts that reflect the average cost of supply, and not shocks in fuel prices such as gas.

The proposed design is future-proof, allowing electricity markets to provide clean, secure, and affordable energy as we transit towards a carbon free electricity system. It is also stress-proof, as the system will substantially reduce its exposure to fuel price

[7] In fact, we would recommend strengthening the short-term role of short-term markets, particularly the day-ahead market, by increasing its liquidity and transparency through i) compulsory participation in day-ahead market, and ii) compulsory submission of bids per plant (i.e. as opposed to portfolio bidding).

shocks in international markets, enhancing the resilience of the EU economy to global instability.

Below we explain how the different contracts would function.

2.1 Contracts for differences (CfDs) for renewable generators

The regulator signs contracts for differences (CfDs) with renewable generators. These contracts establish i) a strike price (i.e. the price that the renewable generator will receive per unit of output, e.g. 30€/MWh) ii) a duration of the contract (aligned with the useful lifetime of the generating plant, e.g. 20 years), and iii) for those renewable plants that can choose when to produce, CfDs include some exposure to pool prices.

The scheme is very similar to current renewable schemes in several Member States:

Assignment of CfDs: CfDs are assigned among generators through competitive auctions the regulator fixes the quantity of electricity to be procured and generators compete by specifying the prices at which they are willing to supply the renewable energy. Competition for these contracts will drive down the strike price of the CfD to the average cost of producing electricity.

Settlement of CfDs: Generators submit, as they currently do, their bids to the day-ahead, intra-day and balancing services. If they are dispatched, CfDs are settled against pool prices at every hour. In a given hour, generators obtain a compensation (if the pool price is below the strike price) or a payment obligation (if the pool price is above the strike price). Electricity suppliers and other market agents that purchase electricity in the spot market pay (receive from) generators those compensation rights (payment obligations).

For new entry, participation in these auctions is voluntary. However, in order to incentivise entry through the auction scheme, MS should commit to auction electricity volumes aligned with their renewable objectives in their NECPs, through a pre-stablished auction calendar. Incentivising new renewable investments to enter the market through auctions has the benefit of reducing capital costs to generators, while providing stable prices that reflect average costs to consumers, who would then benefit from the lower costs of renewable investments.

The regulator can also conduct separate voluntary auctions for existing renewable plants, which would ensure a stable cash flow to generators and reduce price volatility to consumers. In the current context of high electricity prices, these auctions could immediately reduce prices for consumers, as they would bring to the present day, lower future prices, while reducing price risks to the energy companies. To the extent that the design of these auctions ensures effective competition among existing plants, auctions for existing renewables should be deemed compatible with the internal market.

2.2 Contracts for differences (CfDs) for non-contestable technologies

As previously stated, some technologies are non-contestable in several MS. Clear examples are hydropower in those MS where the hydro resource is exhausted, or nuclear energy in those MS where further nuclear entry is banned, or does not have the political or social support.

In such cases, existing generators are in a position to obtain supra-competitive profits, as rents cannot be competed away by new entry. In such cases, the European legal framework should allow MS to sign CfDs with those generators at a regulated strike price.[8] In the context of high electricity prices, these contracts could immediately reduce prices for consumers, and provide generators with regulatory certainty.

2.3 Capacity markets for peaking resources

Short-term energy markets cannot be relied upon to provide sufficient investment in firm and flexible capacity in order to guarantee security of supply. In fact, many MS, when faced with such difficulties, have introduced in their jurisdictions various forms of capacity markets.

Nevertheless, it is still too complex and lengthy to notify and obtain EU approval for such mechanisms, as these are considered as a temporary instrument of last resort. Capacity markets are needed because there are underlying market failures that prevent energy-only markets from delivering sufficient amounts of security of supply, and these market failures are not going to disappear. It is necessary to acknowledge this fact, and simplify the notification and approval process. Electricity markets are evolving faster than they used to, and will certainly continue to do so at an even faster rate. Regulation should follow suit or else, security of supply will be at risk.

3. *Conclusions*

In the short-run, the proposed reform can substantially reduce electricity prices. As soon as cost-reflective CfDs with existing infra-marginal technologies (i.e. merchant renewables and non-contestable technologies) are signed, consumers will see their electricity bills decrease.

In the long-run, the proposed reform will address the structural problems that the current design will not be able to solve:

- Prices will reflect average costs, thus preventing consumers from paying excessive prices, and generators from obtaining windall profits (and losses).
- Price volatility will be reduced, as CfDs offer price stability to both consumers and generators. For consumers, price-stability will enhance electrification, while for producers it will reduce their cost of capital.
- Decarbonisation targets will be met, as CfD auctions for renewable entry will attract sufficient levels of investment.
- Security of supply will not be at risk, as regulators will be able design capacity markets to attract sufficient investment in firm and flexible resources.

[8] In addition, for flexible generators, the design of the CfD should include some pool price exposure, in order to incentivise them to produce during hours of high prices.

Finally, the proposed reform does not affect the design of short-term electricity markets, which simplifies and shortens its implementation.