Power to the People -

What is Missing in the EU Electricity Market Design Reform?

A Discussion Paper

GUE/NGL

THE LEFT

IN THE EUROPEAN PARLIAMENT

We have to decouple the dominant influence of gas on the price of electricity. This is why we will do a deep and comprehensive reform of the electricity market.

– Ursula von der Leyen (President of the European Commission)

Imprint

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Summary

The need to reform the EU electricity market has been highlighted repeatedly in the past years, not only since the war in Ukraine and the associated turbulences in the European gas and electricity markets. Several member states have provided "non-papers" with suggestions for electricity market fixes and the EU Commission has provided a legislative proposal (COM(2023) 148 final) on March 15. This study analyses the changes suggested in the proposal with a view on their possible contribution to a green electricity market that provides affordable power to industrial and household consumers.

The proposals can be summarized as follows: Long-term electricity (forward) markets shall ensure that investment keeps flowing. Renewable energy remuneration shall be capped by Contracts for Difference (CfD) through government intervention. Government revenues from this scheme shall be redistributed to power consumers to make power affordable. Renewable power shall also be provided through power purchase agreements (PPAs). The study argues that neither price volatility nor the long-term price increases that we expect due to rising ETS prices will be mitigated through these proposals.

A significant share of the proposals is focused on leveraging "flexibility options". The idea that country regulators are called upon to provide flexibility needs assessments is more productive. This should and can be a first step towards a more strategic and systematic development of policies around flexibility options which will include storage strategies and an integrated look at electrifying sectors like heat, mobility, and industry. On the demand side, the proposal is fuzzily calling on opening up more contractual opportunities for all consumers, from (energy poverty-prone) households to large industries. But most households and SMEs do not have the time or market knowledge to maintain structured power procurement strategies.

Summarizing, this proposal ignores an enormously important opportunity: Leveraging the low and fixed costs of renewable energy to provide affordable power to the people. Steps that are recommended from the perspective of the reviewers are:

- Prohibit power cuts for vulnerable groups and offer a basic welfare tariff – this will ensure that people can satisfy their basic needs and live a good life in Europe.
- Decouple the reference price signal from the EOM, - this should allow to leverage the price stabilizing effect of renewable energy in retail power prices.
- Propose a structured way to integrate load shifting and storage options – this will allow integrating more renewables by using electricity when wind and sun provide them.
- Provide long-term investment certainty through a floor price – this will avoid negative prices, provide incentives for infrastructure development and speed up the deployment of renewable power plants.
- Provide more transparency to consumers on infrastructure costs versus power costs by separating grid stability and flexibility costs from power costs – this will educate consumers about individual ways to participate in the electricity markets and save money and energy.
- Overall, a rethink of the unbundling paradigm is necessary to clarify the roles of storage as well as other activities that transgress the boundaries between generation, transmission/distribution, and retail, like energy communities and integrated utilities.

Foreword

The European electricity market is in need of profound reform. This has been obvious for a long time: On the one hand, the scaling of renewable energies has not taken place in recent years to the extent that it would actually have been needed to adequately counter the looming climate crisis. For another, consumers have also been repeatedly affected by high prices. The price increases, which left millions of Europeans in energy poverty, culminated in an energy crisis triggered by the Russian war of aggression in Ukraine. Reform was needed even before the war, but now it is overdue. It is essential to learn lessons from the last years and take courageous steps.

The Russian war of aggression in Ukraine triggered a profound energy crisis in Europe, as many member states of the European Union had been purchasing cheap gas and oil from Russia for decades. This allowed the Russian state to use the dependence of European states on Russian energy imports as leverage: Energy exports to Europe were curtailed and eventually suspended. Conversely, the European Union reacted with comprehensive sanctions packages, which also penalised the import of energy sources, as well as with a diversification of its sources of supply, especially for gas.

The developments outlined here caused the prices for gas and oil to rise significantly: Gas prices increased by 17,7 % between the second half of 2021 and the first half of 2022. Consumers across Europe suffered from this escalation, with low-income households being affected in particular by the high energy prices. These spend on average around 13,3 % of their income on energy costs, while the upper 10 % of the society only spent 5,3 % - the crisis does not hit everyone equally hard.

One of the curiosities of the energy price crisis was that not only the prices for oil and gas, but also for electricity skyrocketed - even though no electricity was purchased from Russia. So how can the connection be explained? The coupled prices have to do with the fact that electricity is also generated by gas or oil-fired power plants, especially during peak load periods. Even if these only handle a fraction of the total electricity generation, the expensive gas-fired power plants set the price for the entire electricity market - a phenomenon known as the merit order. Conversely, this means that the low production costs of renewable energies in particular are not passed on to consumers.

Against this background, Commission President Ursula von der Leyen announced her intention to decouple electricity and gas markets and to implement a „comprehensive reform“. But as we have known since the presentation of the Commission‘s proposal for the reform of the electricity market, the “comprehensive reform” has turned into a little reform - if at all.

As THE LEFT, we are committed in the long term to the socialisation of energy production. Central elements of public services should not be organised along market-based profit interests. But the social relations of forces are far from being able to achieve these long-term goals politically. This study therefore looks at left reform approaches to the existing market design in order to be able to formulate a left critique in the melee. In doing so, it follows the guidelines of socially just electricity production in the interest of consumers as well as a rapid ramp-up of renewable energies. In this respect, it should not only be understood as a critique of the Commission‘s proposal, but also as an outlook.

We wish you an insightful reading.

Cornelia Ernst (MEP)

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List of acronyms

AC	Alternating Current
ACER	European Union Agency for the Cooperation of Energy Regulators
B2B	Business to Business
CCGT	Combined Cycle Power Plant
CDU/CSU	Christlich Demokratische Union/ Christlich Soziale Union
CEM	Capacity + Energy Market
CfD	Contract for Difference
COD	Ordinary Legislative Procedure (EU)
COM/KOM	EU Commission
DSO	Distribution System Operator
EEG	Erneuerbare-Energien-Gesetz (Germany)
EOM	Energy-only Market
ETS	Emission Trading System (EU)
EU	European Union
EV	Electric Vehicle
kWh	Kilowatt-hour
MW	Megawatt
MWh	Megawatt hour
PPA	Power Purchase Agreement
REMIT	Regulation on wholesale Energy Market Integrity and Transparency (EU)
ROI	Return on Investment
SME	Small- or Medium-sized Enterprise
UK	United Kingdom
US	United States of America
TSO	Transmission System Operator

1 Background

The European electricity supply is organized in a single unbundled market that stretches (technically) even beyond the border of the European Union. Increasingly, reform demand has been highlighted. Specifically, researchers doubt that a model that builds on an "energy-only market" (EOM) can provide for long-term capacity additions and the ability to recover investment costs, especially in the renewables market. If they would, highly volatile price signals would be necessary to justify investments into "shadow" power plants. When these occurred in the past, concerns about price volatility have generally been very strong. High peak prices make policymakers nervous and make calls for regulation stronger. And there is some justification for it: large price swings make revenues more uncertain and lead to risk premia being added to revenue expectations. This discourages investments.

However, lower power costs for consumers and industry are possible with less volatile and risky investments, specifically investments into low-cost renewable energies. That is why concerns about market efficiency are generally also targeting low power costs for consumers. The main question is: How can markets be designed in a way that consumers receive the lowest possible offering, but fair prices are paid to the investors so that investment keeps flowing into the sector?

The most recent developments around the war in Ukraine have shown these challenges under a magnifying glass and have led to a stronger sense of urgency for the reform of the European Power Sector. The EOM setup has led to a steep increase in power prices at the power exchange and in the following also for consumers as all power prices are determined by the most expensive power plant on the market. Due to rising gas prices, this price was driven up very high by only a few gas power plants. This led to the introduction of price mitigation mechanisms including additional taxes (e.g., in Italy and Spain) or complicated reimbursement and state aid systems like in Germany. As a result of this situation, many stakeholders such as the Rosa Luxemburg Foundation pointed out an urgent need for reform of the European energy market. Looking at the German Parliamentary debate on a proposal of the LEFT to introduce a tax on excess profits, it is noteworthy that there was broad consensus about the urgency and need for action. Even the conservative and liberal groups pointed to a flaw in the power price formation mechanism[1].

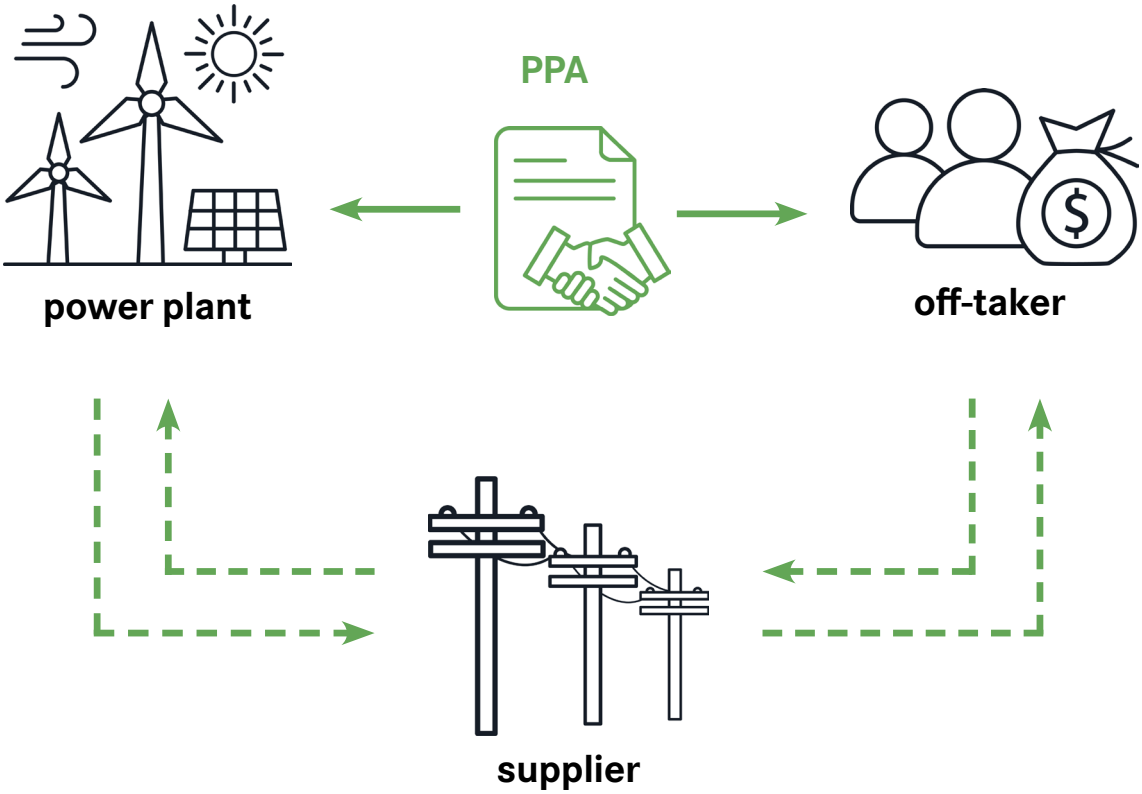
The EU Commission has now provided a proposal for a reform that intends to address high prices. The proposed measures are described in more detail in section 2 of this report. THE LEFT group of the European Parliament (GUE/NGL) aims to ensure that the reforms serve the overarching objective of an affordable, secure, and green supply in Europe. Section 3 will discuss to what degree the Commission's reform plans are contributing to these objectives. Section 4 will provide some questions and the – gap-ridden – answers from the EU Commissions Proposal. Section 5 will provide some additional suggestions that provide a basis for discussion to ensure Europe's path toward this goal is locked in.

1 „The problem lies not in tax law, but in the determination of electricity prices, which must be determined „honestly and fairly": „Then we would not have the problem that THE LEFT is addressing here," said Fritz Güntzler (CDU/CSU). Similarly, the Liberal party mentioned market failure in the electricity market and called for a limitation of profits that „exploded without any entrepreneurial action." „However, Herbrand acknowledged that there is no functioning market in the energy sector. Therefore, he said, there must be measures to limit profits that are currently exploding without any entrepreneurial action."

1.1 Power Purchase Agreement

A power purchase agreement (PPA) is a contract for power between a power plant and an off-taker. With a sufficient tenor and low enough power prices, they serve to secure an investment into power generation on the side of the power plant, and at the same time a specific power price to the off-taker. One challenge for PPAs with wind or solar energy operators lies in the "profile risk". As they depend on wind and sun, it cannot be predicted when this electricity will be available, and the price is likely low when they are available. This is associated with a quantity risk which means that the absolute quantity of electricity produced is lower than expected. Since these risks are usually covered by the off-taker, PPAs alone normally are not covering their entire power needs. For certain hours, they must purchase additional power via the short-term market, usually at higher prices. In turn, this means that PPA prices usually lie below average spot market prices.

PPAs are typically not directly linked to short-term developments on the spot market. Instead, PPA costs are determined by the expected average capture price of the respective energy form in the respective bidding zone. Yet, this capture price is reflective of the (marginal) cost of power in the bidding zone. Thus, renewables PPAs may be able to dampen short-term price hikes for consumers, but they still mirror price trends in the long run and are in no way detached from long-term market trends such as the structural increase in fossil fuel prices. If this is the case, PPAs do not ensure low power prices for consumers.



1.2 Energy Only Market and the Merit Order

The merit order is a construct that helps understand which power plants are needed to secure electricity supply at a given point in time. Figure 1 gives an example of a merit order in Germany – specific for a gas price and an ETS price both of which constitute marginal costs. It plots the power generation capacity on the x-axis, sorted by variable costs for producing this power on the y-axis. The variable costs are mostly consisting of fuel costs and carbon costs.

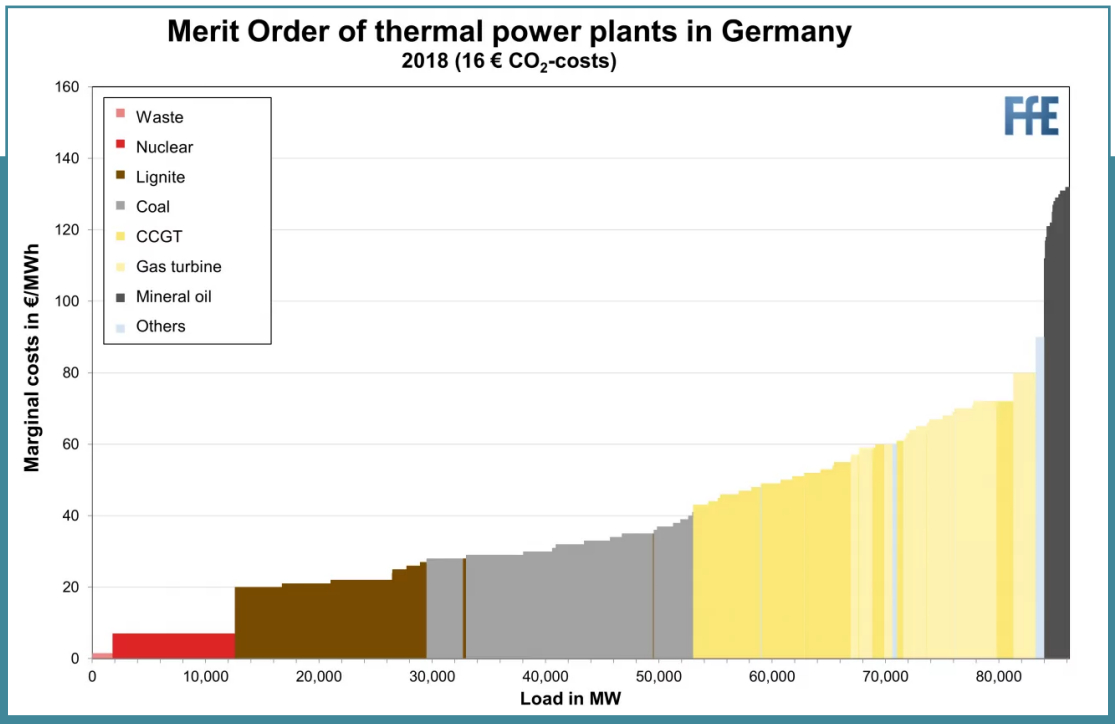


Figure 1: Example of Merit Order from Germany with gas and carbon prices of 26 Aug 2022

The electricity with the smallest variable costs is plotted closest to the y-axis. As wind and solar energy have no variable costs, they should be plotted there. (In Figure 1 they are left out.) As one progresses to the right side, the variable costs are rising. The high gas prices in August 2022 demonstrate this dependence very dramatically.

The merit order curve can be used to understand the cost of electricity generation. For a load of 30.000 MW, the merit ordered power plants would all generate electricity at less than 200 €/MW, and only nuclear and coal power plants would be deployed. But for higher (residual) loads, mineral oil and gas power plants would also need to be dispatched. If all power would be traded at the same market, the generation cost of the most expensive power plant would set the price for all electricity.

In reality, there are many different markets at which the price is set. Apart from the Spot Market of the power exchange, there are several forward markets and there are also multiple options to trade power outside of the spot market. But the spot market price is often used as a reference price in contracts and particularly in the public discussion about wholesale power prices. Even long-term fixed contracts will sooner or later expire and prices therefore converge to the levels at the power exchanges.

One opposite alternative to an EOM is a market that is compensating for installed capacity, sometimes called capacity market. There are several mixed forms conceptually possible.

1.3 Contract for Difference

Contracts for Difference (CfDs) are a public financial support scheme designed to ensure a steady baseline of income for power plants while at the same time preventing the possibility of excess profits. An electricity producer agrees to a contract with a public institution. It guarantees public funding in case prices at the spot market drop below a certain minimum. In that case, the state pays subsidies for every kilowatt hour equal to the difference between actual prices and the baseline price. In turn, if the spot market price lies above a certain threshold, the surplus income must be given away, usually to the government or energy suppliers which can then proceed to lower wholesale prices[2]. The directive introduces Chapter IIIa with Article 19 b (p. 36) which specifies that CfDs can be used for wind, solar, geothermal, hydro without reservoir, and nuclear energy generation.

The goals of CfDs are to reduce income volatility for renewable electricity producers such as solar panels or windmills. The guarantee of a minimum return on investment (ROI) incentivizes investments because it can help leverage long-term financing for renewable power plants. This is increasingly important when they dominate the energy market, which will lower spot market prices to almost zero in many hours. Additionally, they prevent excessive price hikes for off-takers and windfall profits in hours of very high spot market prices, for example when supply is down, or prices are driven up by expensive gas power plants like in recent months.

What CfDs are critically lacking, is a lack of incentivizing flexibility on the supply and demand side which certainly must be done by complementary measures for the energy system to function effectively. In addition to that, CfDs require a certain amount of public funding that is very hard to predict in advance due to the dependence on the volatility of the spot market. This could explain why countries might limit them if budget is unavailable for such guarantees. If using a system like the one in Germany up until 2022 in which these subsidies were financed through the energy bills of consumers, this could again lead to higher average electricity prices.

1.4 Excess Profits

Private investors are investing with the perspective of a specific return on investment. The ROI is often expressed as an interest rate, comparable to the interest rate that can be earned from a savings account. As the investment in a power plant is much riskier than a savings account, the ROI is typically higher, commensurate with the “technical” risks (e.g., of lower wind or solar radiation than expected) and marketing risks (e.g., that products do not fetch the price on the market that the calculation was based on). In addition to that return on investment, the machinery also needs to cover its operations and maintenance costs.

There are benchmarks for expectations for “reasonable” and comparatively risk-free ROI in the energy sector. Specifically, for the EEG, the model calculations were based on an ROI of 7,5 %. The interest on equity in grid investments is around 6 %. The German Federal Network Agency (‘Bundesnetzagentur’) finds that for depreciated assets a risk premium of 3 % over the risk-free base interest rate is appropriate. For new investments, an additional ROI of 1,7 % (probably derived from depreciation of that height) can be expected.

It is important to point out that (financial) risk is comparatively low (compared to other energy investments) in both cases because it is more or less known how much product (electricity, electricity transport service) will be sold. The regulated price times the expected product amount is the expected overall revenue. If dispatch rules lead to a situation in which not the entire product can be sold, the cost of equipment per unit will rise. Because of

2 It is possible to design CfDs based on one strike price which is always ensured, or on a price corridor between a guaranteed minimum and a maximum. The authors of this study read the EU Commission proposal as referring to a price corridor. However, their conclusions remain valid even if CfDs are guaranteed a power-plant-specific strike price.

the additional risk (a so-called “risk premium”), the ROI that the investor requires will increase as well. This will be above and beyond some price rise that is necessary for the additional effort in marketing that will be required if there is no guaranteed take-off.

Against this backdrop, the expression “effortless excess profits” is not easy to define. The following considerations could be used as the starting point for a solution to this problem:

- Is it likely that the investor took the upside risk into consideration that the power price might rise (to the degree it did) when calculating the business case for the investment? In this case, we could maybe rename the excess profit into “unexpected excess profit”.
- More limiting but also more clearly defined is the definition that underlies the US and UK Excess Profits Taxes during World Wars 1 and 2, a tax on “the additional amount compared to the profits of a previous base period”.
- The emphasis on “effortless” implies that there are also excess profits that result from an extra effort, which of course is not correct.

In practice, the concept is less hard to grasp. It is a well-known phenomenon that profits can unexpectedly rise – as described above regarding the Merit Order. With unchanged costs, this leads to so-called windfall profits. The German government responded to the recent windfall profits in the energy sector by applying a skimming mechanism (‘Abschöpfungsmechanismus’). The conceptual basis of this mechanism is that 90 % of the profits that exceed the “standard profits” to be expected in “normal times” will be skimmed by the tax.

While the concept is easy, putting it into a legally sound taxation law is difficult. The price formation mechanism for almost all power plants depends to some degree on the EOM price signal. Therefore, the counterfactual price in the absence of that price signal is hard to identify and potentially different for each power plant. In Germany, this was “solved” by developing different, rather complicated rules for the typical situations of power purchase and generous safety margins, that in some cases are even higher than power prices at the power exchange of two years earlier. Still, several companies, including renewable energy companies, are fighting these regulations in the courts.

2 The proposal of the Commission

The proposal of the Commission consists of two parts. The "Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) No 1227/2011 and (EU) 2019/942 to improve the Union's protection against market manipulation in the wholesale energy market" (COM_2023_147_1_EN_ACT_part1_v5.pdf) COM (2023) 147 final 2023/0076 (COD), relates only to market transparency and market monitoring for wholesale energy products. The substantive market reforms are contained in COM(2023) 148 final, 2023/0077 (COD): "Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) 2019/943 and (EU) 2019/942 as well as Directives (EU) 2018/2001 and (EU) 2019/944 to improve the Union's electricity market design" (COM_2023_148_1_EN_ACT_part1_v6.pdf). The proposal amends the Electricity Regulation, the Electricity Directive, the REMIT Regulation, the ACER Regulation, and the Renewables Energy Directive.

2.1 Electricity Market Design Reform

2.1.1 Purpose and Intent of the Reform

According to the Commissions analysis, the energy crisis has demonstrated how vulnerable consumers are to price rises. The Commission's analysis entailed a summary of the shortcomings of the current electricity market, which is included in Box 1. Therefore, the President of the EU Commission, Ursula von der Leyen, has announced "the need for a fundamental reform of the electricity market design". The following purposes and intentions of the reform are mentioned in the preamble:

- The EOM's design provides for a focus on short-term gains, distracting from broader, longer-term goals. The proposal will counteract this by "complementing the short-term markets with a greater role for longer-term instruments, allowing consumers to benefit from more fixed-priced contracts" (p. 4);
- The direct reflection of short-term prices in final consumer prices led to a price shock which caused some supplier bankruptcies and caused energy-intensive industries to shut down. The proposal intends to "create a buffer between short-term markets and electricity bills paid by consumers" (p. 3).

Box 1: Shortcomings highlighted by the energy crisis (p. 4)

"the energy crisis has highlighted several shortcomings relating to:
(i) insufficient tools to protect consumers, including businesses, against high short-term prices;
(ii) the excessive influence of fossil fuel prices on electricity prices and the failure for low-cost renewables and low carbon energy to be better reflected in electricity bills;
(iii) the impact of extreme price volatility and regulatory interventions on investment;
(iv) the lack of sufficient non-fossil flexibility (such as storage or demand response) that could reduce dependence on gas-fired generation;
(v) the limited choice of supplier contract types;
(vi) the difficulties to directly access renewable energy through energy sharing; and
(vii) the need for robust monitoring of the energy market to better protect against market abuse."

Ultimately, the proposal will “mean that less fossil fuel generation is needed and will lead to lower prices for consumers during future fossil fuel crisis due to the low operational costs of renewable and low carbon energy.”

The preamble also identifies the need to deploy renewable energy faster (p. 3) but points to REPowerEU for the necessary boost. The justification of the actual act (p. 19) repeats that prices since September 2021 have been very high and volatile.

It is important to note that the absolute height of the power prices is not mentioned as a trigger of the whole reform proposal, even though it is of course the area of actual concern. Without a market reform, and with a continuation of marginal pricing based on fossil fuels, these marginal prices will always include ETS payments, i.e., the costs of carbon emissions as determined through the EU emissions trading system (ETS). These have been rising over the last years and are set to rise further in the near future, to unaffordable heights[3]. This is part of the mechanism through which emissions trading is expected to price fossil fuels out of the market, as an intentional effect of the market-based emissions policy that has been set for the European Union and each Member State. The power price is going to rise with that emissions price, as long as the renewables are undergoing pricing at the same mechanism as fossil energy. The resulting consumer electricity price can stop rising only when the price formation mechanisms for renewables and fossil energy are decoupled.

2.1.2 Inputs from Consultations

The document reports that during the online consultation of the draft reform proposal, several points were emphasized by stakeholders like business associations, network operators, research institutions, NGOs or national institutions (p. 11 f.):

- Short-term markets based on marginal pricing should be preserved, “as they function well and provide the right price signals” (somewhat ironic, as the high price signals were the reason for the reform);
- But they should be complemented with longer-term mechanisms (PPAs, CfDs, enhanced forward markets);
- Non-fossil flexibility solutions (specifically demand response and storage) should have better market access;
- As future markets will be characterized by increasing shares of renewable electricity, there should be more emphasis on the local dimension and grid development;
- Affordability is important and should be supported through emerging solutions like energy communities, internal consumption, and energy sharing.

3 In Germany, this has not been felt so much until 2022. Firstly, the certificate prices were not very high. Secondly, whenever certificate prices and thus also power prices rose, this had a reducing effect on the so-called EEG-Surcharge so that the net effect for consumers was dampened. Since 2022 consumers do not pay the Surcharge anymore which is now carried by the federal budget. Therefore, in the future, rises in certificate prices will be felt more strongly by consumers.

2.2 Aspects Relating to Power Generation

2.2.1 Longer-term Forward Markets

Several instruments are proposed that are intended to reduce volatility in purchase prices for large consumers and power retailers. Specifically, there is a focus on long-term forward markets, i.e., markets for the delivery of power in the distant future.

Until recently, forward markets at power exchanges for electricity had a tenor of fewer than two years (i.e., power plants could receive some money for power that they would commit to producing in two years, but not with a longer time horizon). Many power plants used that to lock in prices slightly above their production costs. But for longer terms, neither power producers nor traders nor retailers have any price visibility on this market[4]. Longer-term price security exists for PPAs or feed-in-tariff-like schemes[5]. The reason for that was that there was no private market rationale for a longer-term options market. On the supply side, there was significant overcapacity (in the absence of effective carbon markets). There might have been a logic for the demand side to lock in those low rates but for traders, there was obviously insufficient incentive. Large consumers might have contracted some longer-term B2B PPAs.

This also meant that forward markets were not supporting the establishment of new capacity. Due to the overcapacity on the market overall, it can be assumed that new power plants were only financed based on auctions, if at all. (cf. Hinckley Point, German gas auctions).

The new proposal's Article 9 tries to remedy this with the establishment of "virtual hubs for regional markets". Regional markets are defined as markets that encompass more than one bidding zones[6]. It is however questionable whether it is market size that kept longer-term forward markets from working. Other reasons might include the fact that price volatility and other risks associated with fossil energy are considered too risky (e.g., sunk asset considerations due to carbon regulations) and that some market segments – and specifically renewable energy – were kept away from that market as their time horizon was determined by other regulations (specifically the duration of their PPAs or feed-in tariff price guarantee). At any rate, it seems that the risk mitigation benefits a long-term market would offer, did not seem to outweigh the cost of participating in it.

4 Although it is possible to have direct power purchase agreements, see below.

5 Strictly speaking, the "auctions" for feed-in tariffs as well as the classic feed-in tariff are also the basis for PPAs which are the contractual way to implement them. Yet, these PPAs are highly regulated concerning prices, grid access, and offtaking conditions as well as tenor.

6 Probably the rationale behind this proposal is that larger markets will support additional financial products but then the question is why have regional hubs instead of a joint hub for all of the EU.

2.2.2 PPAs

Generally, the Commission's proposal sees a lot of promise in expanding renewable PPAs for direct sales to consumers, including SMEs. Currently, PPAs are typically concluded with large industrial companies as off-takers. The Commission intends an increase in the supply of PPAs to increase liquidity in the forward market. This shall be achieved by making it possible for renewable power plants financed via public support schemes to sell a share (which is not supported by the public scheme) of their production via PPAs, by financial guarantees for new market entries, and by incentivizing PPA deals with smaller companies.

In addition, the Commission identifies the off-taker risk of default as one challenge, which might be one of the possible difficulties. But for SMEs, the larger challenge is that they cannot spend a lot of time on the procurement process for power and negotiations of a PPA – and of the residual power purchase that will be necessary to secure the energy supply. They will mostly – even if possible from a regulatory point of view, which is not the case for the vast majority of SMEs – be working with power retailers who aggregate power from various sources. PPAs with retailers are in fact the larger market promise but are not discussed in the proposal. The proposal narrows its perspective – unrealistically – to direct sales from a producer to a consumer, excluding the option that even power from a PPA can be traded.

The proposal identified consumer (off-taker) credit risk as the main barrier to long-term PPAs. The proposal vents the idea of a guarantee scheme at market prices.

2.2.3 CfDs

The Commission seeks to introduce CfDs as the only form of direct public financial support for new investments in inframarginal electricity production, banning all other forms like the one used in the German regulatory framework ('Erneuerbare Energie Gesetz', EEG). The directive introduces Chapter IIIa with Article 19 b (p. 36), which specifies that CfDs can be used for wind, solar, geothermal, hydro without reservoir, and nuclear energy generation. This way, a stable income and therefore security for investments shall be guaranteed while preventing excess profits at the same time. For flexible production capacities, other forms of subsidies remain available.

Where the proposal falls critically short is in setting binding criteria for the issuing of CfDs by member states, particularly concerning the capacity for which CfDs are auctioned off, as well as how minimum and maximum prices shall be determined. To the degree that member states have an expansion path for renewable energy, they can be bound to achieve it.

2.3 Aspects Related to Infrastucture

2.3.1 Planning for Flexibility

The proposal requires member states to periodically assess their non-fossil flexibility needs and establish objectives to deliver on these needs. Possible flexibility options as proposed by the Commission include flexible renewable power generation, interconnectors, demand side response, energy storage, and renewable fuel production such as hydrogen. As possible public support schemes, member states are left to choose between creating or redesigning capacity mechanisms in national energy markets and direct subsidizing.

2.3.2 Network Tariffs as the Main Method of Incentivizing Flexibility

The proposal also suggests reforming network tariffs to incentivize system operators to use flexibility services[7]. While the flexibility of consumption and production is useful for the integration of renewable energies, and while it is correct that system operators need to utilize it more, it is misleading to formulate this as a requirement to change network tariffs. What is meant is probably that the regulation needs to be adapted such that it allows regulated system operators to recover investments that are needed to accommodate flexibility in their grid operations, including on the load side[8].

Using flexibility and enabling the grid operators to do so is a possibility to save investments into infrastructure and increase infrastructure utilization instead.

2.3.3 Peak Shaving Products

The proposal allows for Transmission System Operators to "design a peak shaving product enabling demand response to contribute to decreasing peaks of consumption," not only for purposes of frequency stabilization (p. 16). At least in Germany (and probably in most other markets) several markets for regulatory and balance power as well as for discardable loads already exist, the latter since 2013. Since the transmission system operators are not allowed to participate in forward markets due to unbundling, there is no interlinkage between this proposal and the creation of a longer-term forward market (which might be a natural expansion in the realm of demand-side management).

2.3.4 Avoiding Imbalances by Higher Transparency on Demand and Supply

The proposal promotes that system operators should increase transparency surrounding trading closer to "real-time". This might enhance the ability of the system to react and therefore reduce imbalances. It is unclear what issue shall be solved by this, given that markets are trading in real-time and weather predictions become better. The thinking might be that higher transparency allows for better foresight and therefore fewer "surprises" in situations when urgent purchases during high price peaks become necessary. This might have happened in exceptional situations, but whether higher transparency would have mitigated this situation on a quantitatively relevant scale is not yet supported by scientific data. Already, the prognosis capacity on wind energy production is extremely well developed, and this data would be available to consumers who can shift their loads in significant manners – although potentially at a cost. Whether better knowledge about that is sufficient for them to undergo the effort of actually shifting the loads, is up for discussion.

7 "Network tariffs should incentivize transmission and distribution system operators to use flexibility services through further developing innovative solutions to optimize the existing grid and to procure flexibility services, in particular demand response or storage. For this purpose, network tariffs should be designed to take into account the operational and capital expenditures of system operators or an efficient combination of both so that they can operate the electricity system cost-efficiently. This would further contribute to integrating renewables at the least cost for the electricity system and enable final customers to value their flexibility solutions."

8 Ultimately, it is the consumers and producers that need to become more flexible. The natural way to incentivize this would be to lower grid tariffs for more flexible consumers. Taken literally, the proposal says that the design of network tariffs should be adjusted. If grid operators are incentivized to leverage consumers' flexibility through the design of network tariffs, it implies that grid operators earn higher grid tariffs if they utilize more flexibility. This seems an inherent contradiction. There must be other ways to incentivize grid operators to use flexibility than through network tariffs. A more fundamental reform of grid fees would be necessary.

2.4 Aspects Relating to Consumers

2.4.1 Access to Multiple Contracts for Consumers, Supplier of Last Resort

The proposal points out that in the energy crisis, many consumers have been exposed to high price swings, and that this has put the less well-off but also middle-class consumers in dire straits. It calls for "adequate" protection from being disconnected from the electricity supply (p. 52) and for the opportunity for price regulation for vulnerable groups. The other propositions are less clear - the proposal calls at the same time for:

- Low-cost fixed price contracts;
- A supplier of last resort;
- The ability of consumers to choose from and access multiple contracts for power supply;
- A price signal to consumers regarding the availability of excess power.

These requests to some degree contradict each other and thus are not necessarily all fulfillable at the same time. Most EU countries will already have a supplier of last resort ('Grundversorger' in Germany) but their offerings are by necessity comparatively expensive as they have high transaction costs and – given their customer base – high risks for defaults. The lower-cost power retailers cannot provide fixed tariffs if they want to hand on low-power prices from sourcing to their customers.

In addition, the calls to "decouple their electricity bills from short-term price movements on energy markets" (p. 43) and for a situation in which "consumers are still to some extent exposed to the price signal, so that they reduce their consumption when the prices are high, or shift it to periods of lower prices" (p. 34) are also contradictory[9]. This can be interpreted to mirror the conditions of the German "electricity price break" ('Strompreisbremse') that guarantees consumers an affordable power price for 80 % of their consumption, while it requires them to pay the full prices for the additional 20 % of their consumption.

Digital metering is expected to provide the opportunity for consumers to trade-off between different power purchase contracts and to provide "flexibility" to the grid. This is supposed to help consumers take control of their power consumption and bills (p. 46). At the same time, the proposal admits that already, power systems are too complicated for consumers to fully understand (p. 47).

Lastly, the hope is expressed that energy sharing offers an opportunity for those "that do not otherwise have the option of becoming an active customer due to financial or spatial constraints, such as energy poor and vulnerable consumers" (p. 49). In that respect, the proposal points back to two directives which facilitate not only private investment but also the integration of renewable energy (p. 50). It entails specifically opportunities for net billing within energy communities including temporal shifting of loads and storage (p. 52).[10]

9 Paragraph 34 relates to the discussion on periods of high energy prices. In these periods, the revenues of producers under CfDs are capped, and they must pay their excess billings to the government. The government in this paragraph is asked to redistribute these revenues to the consumers to ensure their ability to pay their bills. This points not only to the magnitude of the redistribution task but also to the fact that somebody needs to pay these high prices first. The experience of e.g., the German "energy price breaks" has demonstrated how difficult it is to get the timing on these compensation schemes right and to ensure the fairness of these schemes.

10 "Member States should put in place the appropriate IT infrastructure to allow for the administrative matching within a certain timeframe of consumption with self-generated or stored renewable energy to calculate the energy component of the energy bill. The output of these facilities should be distributed among the aggregated consumer load profiles based on static, variable, or dynamic calculation methods that can be pre-defined or agreed upon by the active customers."

2.4.2 Energy Sharing

The proposal provides “a new right for households and small and medium-sized enterprises” to “participate in energy sharing – that is the self-consumption by active customers of renewable energy generated or stored offsite either from facilities they own, lease, rent in whole or in part or which has been transferred to them by another active customer.” (p. 17) For this, important member states like Germany have not yet developed implementation rules while there are many active energy communities in France and Spain, where the implementation framework has been clarified a while ago.

Depending on the local details of the regulation on grid fees, taxes, and surcharges, such power might be very cheap for some. But as these fees are usually there to finance infrastructure costs, they will then need to rise and others might pay even higher network tariffs, at least in the absence of a fair network tariff reform. Also, without a specific participatory orientation, these will be projects for people with capital to spare.

Without more explicit guidance on this topic, it cannot be assessed whether more energy sharing leads to more affordable power for all or not. To see more clearly here, first, infrastructural costs need to be more transparently separated from power costs on consumer bills.

3 Assessment

3.1 What Do the Commission`s Proposals Mean for the Generation Side?

CfDs are a logical evolution of the current model and progress compared to the current situation. Green and affordable energy requires that renewable energy capacity is added faster to the grid than currently. The proposal secures the options for renewables expansion that are utilized already but does not enhance the market. No market-driven expansion of renewables is triggered. Quite the contrary: the reliance on CfDs is putting a cap on the expansion as CfDs will be auctioned and each auction is for a fixed capacity. Thus, the expansion will not be market driven but directly dictated by political decisions. If auctioned amounts are on track with the necessary expansion paths, this approach can work, but there is a political risk to it.

PPAs are currently relevant mainly for older renewable facilities whose economic depreciation is complete. Where CfDs are more attractive than direct financing through PPAs for new investments, these two systems will compete against each other. No clear rules or support mechanisms for long-term PPAs are described in detail – the proposal points to the option that countries might make guarantee schemes for off-taker risk available, but the other barriers for long-term PPAs are not tackled. The proposal to create longer-term forward markets remains murky and unplausible.

One way, the Commission tries to increase liquidity in forward markets is by creating virtual hubs that span multiple bidding zones and provide reference prices. In practice though, this will only be relevant for certain regions in Europe that have smaller bidding zones, but not for large bidding zones such as Germany, which is composed as one bidding zone with its neighbor Luxembourg. Furthermore, it is not explained what the functioning mechanism of these hubs is supposed to be in detail. Therefore a lot more conceptual work must be done to make the approach implementable.

The proposal thus makes concessions to the fact that without revisiting the fundamental price formation mechanism of the current market design, renewable power plants will not be able to financially sustain themselves in a market dominated by them since their operating costs are almost at zero. In such a market their capture prices at the spot market will be close to zero in many hours. They will depend on fossil fuel power plants to set high enough prices on the market for renewables to cover their investment costs at the EOM. PPAs do not solve this dilemma as their prices are closely oriented on long-term average capture prices of renewables at the spot market. CfDs are essentially giving a classical floor price guarantee but will be restricted by the available funding as well as the auctioned capacity. A reform of the energy market must pick up this challenge.

Longer-term forward markets might help to finance new power plants, including fossil power plants. They are one way of price hedging for consumers. This might serve to reduce the volatility of the power price and dampen price oscillations for consumers. But the spot market price likely remains the most relevant pricing index also for longer-term PPAs.

The explicit mandate of the virtual hubs is to provide a reference price (index) to enhance liquidity, but a (very low) floor price would essentially function equivalently with smaller transaction costs. It would also serve the same purpose as the guarantee scheme for off-taker risk.

3.2 What Do the Commission's Proposals Mean for the Infrastructure Side?

To accommodate larger amounts of renewable energy, infrastructure should be amended in a way that ensures the transport of renewable-rich regions (rural areas) to urban areas. In addition, infrastructure (i.e., TSOs and DSOs) needs to utilize additional flexibility options, including dynamic transmission optimization, digitalization, and storage. The proposal, however, will not have any noticeable impact, among other things because most of the proposals are not new ideas but implemented already.

The Commission proposes more transparency on supply and demand for markets to become more efficient and loads to react more flexibly. While this most likely will not reduce volatility, it also does not seem to cause problems at this time. Power trades happen in close to real-time and even after the delivery. In the short term, no change can be expected from this. In the long-term, adequately sized expansion planning and new business models (like energy sharing) become more promising with improved access to information. These – specifically business models around the flexibilization of supply and demand – might benefit from more data and might in turn allow more renewables on the grid. But neither power price volatility nor absolute height will be reduced by this change.

In the scenario of a fully renewable energy system, fossil power plants are not considered part of the power generation portfolio. Grid stabilizing infrastructure should be fed from storage. This paradigm shift is not promoted by the proposal.

Infrastructure and system flexibility are supposedly addressed by two somewhat newer ideas in the proposal:

- The proposal calls for network tariff reform, but in an inconsistent manner and without clear orientation towards 100 % renewables (cf. section 2.2.2);
- The proposal calls for regular flexibility needs assessment.

The former is inherently inconsistent and will not have any positive effect. The latter might (in the long term) enhance clarity on the diverse basket of "flexibility options" and might support a structured and systematic leveraging of such options.

3.3 What Do the Commission‘s Proposals Mean for the Consumer?

Green and affordable energy means that consumers need to benefit from the cost advantages posed by renewables. The proposal might reduce volatility in consumer prices but will not leverage the low-cost nature of renewable energy production for the benefit of the consumers of Europe.

Even if all suggestions are fully implemented, price formation will still follow the current paradigm, i.e., will follow the marginal costs of the marginal power plant. As this is a fossil power plant, carbon certificate prices will also be fully internalized into these costs. This price will also be decisive for existing renewable power plants, including those that are sold within PPAs, which are indirectly also influenced by the strike price (as the “capture price” is following the strike price).

For new renewable energy capacity, the revenues will be capped at the upper limit of the Contract for Difference. However, the purchasers of this power will still have to pay the strike price. The difference between the upper limit and the strike price is “an additional source of revenues for Member States in periods of high energy prices.” They shall be passed on to “all final electricity consumers, (...) based on their consumption” (p. 34), i.e., not based on their needs and not distorting competition.

Generally, thus, the power prices for consumers will rise as predicted by global fossil fuel prices and carbon prices. The entitlement to various power purchase options will not influence overall pricing levels significantly. It is also not relevant for small consumers or poor households. Similarly, the right to energy sharing is more suited to support consumers with some expendable capital who can, to name an example, buy shares in an energy cooperative. However, even here issues on fees and taxes remain unresolved.

3.4 Where Are the Gaps?

The most important gap is: The proposal fails to discuss the challenge of the absolute height of the power price – without a change in the pricing mechanism, the average power price will continue to rise with the carbon price even as renewable electricity generation becomes cheaper and cheaper. How can consumers be protected?

The lack of a discussion about a possible de-coupling of renewable energy markets from fossil markets is very short-sighted. The affordability advantage of renewable energy should be leveraged as soon as possible. The de-coupling needs to happen sooner or later, and sooner will be more helpful than later. It is time to acknowledge that the concept of free electricity market economists has failed. It reads that there will always be fossil power plants if only for a few hours and for these hours, prices will be extremely high. This concept has already been disproven because it overstretches the nerves of politicians to accept these high prices. When it happened in Germany, the prices got capped almost immediately. Now, the price hikes trigger a similar action on the EU level. Politically, a free electricity market is not acceptable. The need for a reform of the pricing mechanism needs to be acknowledged now.

The proposal also fails to resolve the issues around sector coupling or storage, which points to a larger issue: vertical unbundling reaches its limits in the new energy system with increased calls for flexibility on all three levels – generation, infrastructure, and consumption. Currently, for example, EU market setup and unbundling provide no clear role for electricity storage which could be defined as belonging to generation, transmission, or consumption respectively in some form. This is fundamental because this determination is decisive for fees and taxes which in turn are crucially important for the financial viability of storage. Depending on which sector they belong to, a business case for storage can be found and the market can be unleashed which would be crucial for accommodating large amounts of volatile renewables in the grid and is necessary in the long term. This is true for many other so-called flexibility options.

There are also many gaps in the details of the regulations. There is no guidance on how to distribute CfDs and what can be considered acceptable price levels. It is not clear what follows from flexibility needs assessments and how this interacts with CfDs/PPAs. There is also no discussion of incentives for storage – demand-side management is the only flexibility option considered. And many of the actual barriers for flexibility, for example on the regulatory, permitting, and land use planning side, are not even considered.

4 Specific Questions

4.1 Efficient Power System

4.1.1 How Does the Proposal Secure - in the Medium and Long Run - Investments into Renewable Power Plants?

The proposal does not provide a long-term perspective beyond the continuation of anchor-price guarantees through CfDs or PPAs. Specifically, it does not recognize that in a fuel-free market, marginal pricing is not going to work anymore. It also does not take a stance on whether or not the power generation should be maximized, or "flexibility" is required from renewable generators, i.e., whether they are requested to shut off in terms of supply excesses.

4.1.2 How Does the Proposal Secure – in the Medium and Long Run – the Investment into Power Plants that Will be Necessary in the Rare Periods when Insufficient Renewable Generation is Provided?

The proposal does not discuss this. It does propose capacity and subsidy mechanisms for "flexibility options" but not for "shadow power plants". CfDs – which could be considered here – are limited to low-carbon power plants. The proposal also does not consider storage. It generally takes on a short-term perspective, focusing on power price volatility, not on the security of supply in the long run.

4.1.3 Does the Proposal Discuss the Efficient Leveraging of Flexibility Options in the Electricity Market?

The proposal does not discuss the specific organization of flexibility options. It discusses firstly the need for more flexibility, including on the side of the consumer, secondly, the need for national Flexibility Needs Assessments that are to be conducted by the regulatory agencies, and thirdly, it also discusses that network tariffs should be designed such that grid operators should be incentivized to leverage flexibility options. This partially contradicts other objectives – and it would be possible to create this incentive through other means. But at least the role of the (distribution) system operators is acknowledged to some degree.

4.1.4 Are Grid Costs Integrated into Market Pricing? Are there any Local Signals Proposed that Might Allow to Integrate the Cost of Power Transport into Trade?

The proposal discussed the establishment of long-term / forward markets through regional virtual trading hubs that are integrated across several bid zones. They are complemented by the proposal to have forward markets for interconnector capacity at the "single allocation platform". Through the combination of these two markets, the location of energy facilities in low-production-cost zones and of energy demand in less favorably equipped areas could be planned and priced.

However, none of the past efforts to create a longer-term forward market was successful. No specifics of how CfD and PPA offerings could lead to a longer-term forward market are discussed. Therefore, skepticism is appropriate as to how realistic this proposal is. Nodal prices are not discussed. Overall, the ideal of the "copper plate" prevails. The discussion seems to imply that bidding zones are too small rather than too big (probably starting from non-German concepts – Norway has 6 bidding zones).

4.2 Decarbonization

4.2.1 Will the Proposal Lead to Price Signals that Support the Transition to a Fully Renewable Energy System?

The proposal does not include any structural changes to the price formation mechanism or market design. The price signals of carbon emissions trading will continue to be impressed on the EOM, for coal, fuel oil, and natural gas. The strike prices will continue to rise. Renewables will also be priced at these levels that include carbon certificates proportional to the carbon footprint of the marginal power plant. All power prices – including those at non-spot markets - that are indexed to them directly or indirectly will also continue to rise.

This will prevent a market-driven expansion of the demand for renewable energy as PPAs are also indexed to these strike prices and CfDs are limited in supported capacity. The price corridors for CfDs will be determined in auctions. These auctions are managed by authorities in auction rounds, each of which has predetermined volumes, maximum prices and depend on the availability of public funding. The amount of renewable capacity that can be built will always be lower than the auctioned volumes in the current setup, as not all projects that are called in the auctions are built on time. In addition, if auctions are underwritten, i.e., if an insufficient volume of projects is bid in the auction, the auctioned volume has to be reduced (as per EU regulation). This means, if auctions and CfDs are the only way to receive some kind of price stability for renewable energy generation, there is a feedback cycle that can theoretically lead to a standstill in renewables deployment. In fact, the volumes are strongly regulated and depend on political will.

4.2.2 Is the Transition to a 100 % Renewable Energy System Left to the Market or Are There Any Provisions for Intervention?

See 4.2.1. The transition is not discussed. The proposal is focusing on a short-term fix of what is perceived as high price volatility.

4.3 Fair Power Prices/Prevention of Excess Profits

4.3.1 Are the Prices that Reach Customers Decoupled from the Marginal Costs of the Marginal Power Plant? Are these Dampened? If yes, how?

No. The proposal is motivated by concern about the volatility of the current market, and its price signal to the consumers. It proposes that this shall be buffered by the offer of multiple power supply contracts with varying contractual structures to consumers. It emphasizes fixed-price contracts and supplier of last resort concepts for

that. However, even if the revenues of renewable power generators are capped through CfDs, their functioning mechanism does not affect the prices at the EOM. The price formation mechanisms at the EOM are untouched. All buyers at the EOM (i.e., the power brokers and retailers) must pay the potentially high prices. They will need to recover these prices from their customers. This means that consumer prices will also trace prices at the EOM and are not decoupled from the marginal costs of the marginal power plant.

In addition, the proposal insists that a price signal should be conveyed to the consumer that expresses scarcity or excess availability of power so that consumers can adjust their consumption behavior. The proposal emphasizes the value of long-term forward markets and price stability in CfDs and PPAs for dampening the effect, ignoring that it was not possible so far to establish functioning forward markets and that most PPAs are indexed to the short-term markets in some way.

Finally, the proposal does not discuss the fact that the challenge for the final customer – specifically the household – is not volatility but the absolute height of the power price. These prices are set to rise as carbon certificate prices are rising. This is intentional and a mandatory part of climate policy - rising carbon certificate prices are the necessary vehicle to force fossil fuels out of the market. A market reform should allow this mechanism to go forward, by “opening the door” for fossil energies to leave the market (or for renewables to leave the same market as fossil energies).

4.3.2 Are Excess Profits of Inframarginal Producers (Renewables, Nuclear, Coal) Effectively Minimized or Taxed?

Changes in ownership structure are not discussed in the proposal.

Excess profit margins are avoided through CfDs. These will introduce revenue caps for those renewables that will be newly built under the CfD framework. Whether or not it will be possible to also introduce CfDs for existing renewable energy is not discussed. Other inframarginal producers are not affected by the proposal.

4.3.3 Is Energy Sharing Promoted and Supported with Proposals for Network Tariffs and Other Surcharges?

Energy sharing is promoted. Specific proposals for network tariffs or other surcharges are not provided.

4.3.4 How Does the Proposal Deal with Industrial Power Prices?

The proposal does not discuss the price developments specifically for large consumers or the industry. But where “consumers” are discussed, some proposals are made that are only suitable for large consumers, e.g., when the opportunity to have multiple power supply contracts is promoted. As no special subsidies for the industry are discussed, there is also no need for compensation.

For household consumers potentially affected by energy poverty, price regulation for a maximum of 80 % of the annual consumption, and for SMEs a maximum of 70 % of the previous year’s power consumption is flagged as an option during periods of sudden price hikes (analogous to the German 'Strompreisdeckel‘/power price cap for consumers).

5 Alternatives

At this point, no comprehensive proposal for the necessary reforms for the power sector of Europe has been provided. These reforms – just to reiterate and summarize – need to create a situation in which:

- Grid stability and supply security are ensured;
- Low power prices of renewable energy are handed to the customers;
- The continued expansion of renewable energy production is ensured;
- The usage of fossil power generation capacities is minimized.

The objective of reducing volatility in power exchange prices, which features so prominently in the EU proposal, is potentially a lower priority than the points listed above. However, continued high volatility constitutes a high risk for investors and as such, will result in higher average prices than in a situation with more price stability. Nonetheless, the means proposed by the EU are not necessarily the most effective to achieve a risk reduction through reduced price volatility.

During the last two years, in light of rising gas and electricity prices, two "non-papers" were already brought forward by member states. These documents typically have few pages and none of them provides a conclusive and complete proposal for a new market design. However, they propose ideas and components of ideas that can inspire further discussion.

The Spanish proposal from January 2023 suggests complementary long-term electricity and capacity markets to the spot market. Inframarginal generators are guaranteed a fixed price that reflects their average costs over their full useful lifetime. For new renewable power plants, these should be granted through auctioned non-mandatory CfDs (at regulated quantities that ideally meet the objectives of respective member states). For existing ones, member states are allowed to voluntarily introduce equivalent CfD-auctioning models. On the other hand, there are mandatory CfDs with regulated strike prices for technologies that provide a non-flexible fixed power generation capacity (nuclear and non-flexible hydropower). In addition to that, they propose long-term capacity contracts that incentivize investments to guarantee the security of supply and a simplification of the notification and approval process for capacity markets in member states. The functioning mechanism of these capacity markets, however, is left unclear. Also, this proposal would most likely fail at preventing short-term price hikes and at solving the problem of windfall profits in the near future.

In contrast to this, the Greek proposal from July 2022 suggests a separation of the short-term market into two steps. The first step considers non-flexible inframarginal generators (renewables, non-flexible hydropower, nuclear, and co-generation of electricity and heat) which submit volume-based offers to the day-ahead market and are remunerated via CfDs (either with public or private contract partners). These volume-based offers are prioritized in the market clearing process. In the case of an overshoot of volume-based offers, all offers are curtailed proportionally. Alternatively, these power plants can participate in a publicly managed pool that acts as a single buyer on the spot market. The latter still adheres to the current merit order principle but only integrates flexible power generation sources (coal, natural gas, storage, and demand side response) and only, in the second step, covers the market share not already covered by inframarginal generators. This implies that consumer prices will reflect the lower costs of inframarginal generators since it follows a weighted average of production prices of flexible and inflexible power sources. On the other hand, it outlaws market-based options for renewables, erases incentives for supply-side flexibility, and dilutes price signals to the supply sides.

Both these proposals feature interesting aspects that can inspire an effective solution. At the same time, the clear deficits require a new solution to be developed that achieves all the goals, which made reform necessary, in the first place.

5.1 Providing Affordable Power for the People

Prices of power generation will rise in the near future. The EU proposal does not even discuss this fact. Nevertheless, significant investment requirements in (renewable) energy generation capacity as well as storage, digital technology, and infrastructure are necessary. This necessity would be the same for fossil energy, simply because in vast parts, the power system is still applying technologies from past centuries.

In addition, the price path of emission certificates is set to rise because of their increasing scarcity. The intention is that fossil fuels become so expensive that they are driven out of the market. In the current system, this can take place only if enough low-carbon energy capacity is installed. But as long as the marginal power plant is fossil-fueled, and as long all power costs are determined by that power plant, the expensive carbon prices will directly affect consumer prices.

However, this energy market mechanism has implications for people. Electricity needs to remain affordable to the degree that it covers basic needs for humans and is part of a decent life. Therefore, two things need to happen:

1. The cost advantages of renewable energy need to be leveraged for consumers (see the following section) and
2. The energy tariff and supply conditions need to ensure that a certain amount of energy remains so cheap that it remains affordable for everyone.

There are several options to comply with the second demand: progressive power tariffs, basic allotment (e.g. 1000 kWh per household per year or 500 kWh per person per year, or measuring by typical needs for lighting, hot water, a washing machine, and a refrigerator) should be free of cost or almost free of cost, or the acknowledgment of a minimum standard of living that needs to be affordable across all of Europe.

A tempting tool is across-the-board consumer price regulation. This is a proposal that has been very costly in places like California (leading to an overall shortage of power, scheduled brownouts, and possibly the bankruptcy of power retailers) and does not fulfill the goals above: it does not prevent energy prices from rising, and it does not enable a decoupling of the price for renewables from the price for fossil power. It can be part of the solution but needs to be embedded in a range of supporting measures that ensure the sustainable continuity of supply. Partial power price regulations like the basic needs tariff are preferred.

Smart meters should be provided to all households at nominal costs and with a data save setup. They allow households to understand their power consumption and take charge of their consumption behavior. They can also support grid-friendly behavior of individual households, although the overall effect of the flexibilization of current household consumption on grid stability will be minimal. This will change where heat pumps and fast EV charging constitute a significant share of household loads.

5.2 Expansion of Renewable Energy

Long-term markets for electricity are useful only if they provide sufficient confidence to investors to leverage financing and investments. However, none of the proposals considers this as the sole means of financing renewable energy. All proposals currently on the table are relying on CfDs for financing the investment of renewable energy.

In principle, CfDs are a good idea. They should and they will be introduced Europe-wide. However, they are nothing but feed-in-tariffs with a price corridor instead of a fixed tariff. They still require finding a suitable price corridor for each installation. According to current EU legislation, this will be done through auctions on the member state level. Auctions typically have a price cap and a quantity cap and thus are also (potentially) limiting the speed of deployment of renewables. Auctioned amounts need to be adjusted to reflect the quantity paths that are dictated by the climate targets and need to be flexibly adapted in case demand for CfDs greatly exceeds their availability to not artificially hinder the deployment of renewables. A way to prevent this problem would be to turn auction results into a "standing offer", i.e., in the period that follows the auction, power plants can connect to the grid at the strike price of the last auction[11]. In addition, auctions and standing offers need to have provisions that they can be changed (structurally or in terms of height) under certain conditions to minimize gaming.

The EU proposal suggests a guarantee facility and a larger market area ("virtual hubs") as a remedy for the fact that no long-term forward markets exist. The important function of these long-term forward markets is that they give investors some kind of certainty that their product will find a market over the whole payback period of their investment. In the absence of such a market, investment will be difficult, particularly for renewable energy where investment costs make a much bigger share of total costs[12]. The guarantee facility shall now take over the off-taker risk, i.e., if an off-taker fails to purchase the power, the facility will purchase it. However, investors understand that without a major change in market design, the steady addition of more and more renewables will lead to power prices of zero in an increasing number of hours every year. That is not a situation in which investment activity will be stimulated.

A simple and effective alternative proposal to provide some kind of certainty to renewable energy investors is the offering of a permanent floor price, i.e., a minimum price that will always be paid for every kWh. It shall complement the PPA and CfD modalities proposed by the Commission. This price guarantee is a much more powerful and efficient instrument than the off-taker risk guarantee facility as it guarantees all other financial risks. It also is more effective and less bureaucratic than the virtual trading hubs and long-term connector capacity markets, as it provides a market guarantee for all of Europe. The following aspects need considerations in designing such a floor price.

11 For wind, the generation costs are strongly dependent on the wind quality on site. For this, adjustment models like the 'Referenzertragsmodell' from the German EEG have been successful in the past. Any standing offer along these lines needs to have such a built-in correction.

12 This challenge is not discussed as a reason for the lack of a longer-term forward market. Instead, the commission finds that the reason for the absence of longer-term forward markets lies in "off-taker risk", i.e., the risk that the purchaser of the electricity might go broke between the time of the option purchase and the respective power usage. In the opinion of the authors, this understanding is flawed.

Firstly, it needs to be lower than the marginal costs of the most inexpensive power production technology that has marginal costs. At the same time, it needs to be higher than 0 ct/kWh, as technologies with no marginal costs (wind, solar) will shut off if they have to pay off-takers. A potential price could be around one Cent.

Secondly, there are experts who will argue that a floor price will reduce the financial viability of storage and load shifting and thus slow down the transition of the system towards a flexible system that can accommodate large amounts of volatile renewables. The following arguments can be brought forward against this rationale:

- Any proposal that reduces price volatility will have this effect;
- Policy makers have demonstrated a lack of acceptance for the kind of significant price volatility that includes negative costs and high peak prices;
- Specifically, policymakers will not accept extended periods of negative prices which play a crucial role in the argumentation of price volatility advocates. Overall, negative prices are a transition phenomenon with a lifetime shorter than any payback period of flexibility business models (see the information box below). Financing investments in flexibility options based on volatile prices is a risky and non-viable business model;
- The floor price has the advantage of being a low-cost element that the investors of storage systems can factor into their calculations. In effect, it also reduces their risk premia, not only the risk premia of renewable energy investors. They also have a long-term investment rationale, and it would not be in line with cautious investing if they would count on negative prices for an extended amount of time (as then, generators will shut down).

Generally, the authors consider the floor price preferable to a guarantee facility as included in the Commission's proposal.

Box 2: Negative power prices and the perceived need for volatility to incentivize flexible consumption

At the power exchange, times when power supply exceeds power demand result in negative prices, i.e., power producers will pay power consumers to consume more energy. This is seen by many as a situation that leads to positive business cases for storage models. More generally, the volatility of power prices is seen as a necessary incentive for the development of flexibility on the consumer side and business models around this as well as peak shaving and shifting activities. However, in practice, none or very few business models have been built on this effect.

There are several reasons for that. Firstly, these situations have happened not very often in the past. In Germany, the regulation for marketing renewable energy has even given subsidies to this situation, at a significant cost to society. Secondly, when these situations actually occurred, they attracted attention and negative press so in these cases, regulators have limited the range in which negative prices can happen. Even if free market economists argue that negative power prices are a necessary symptom of a free market, policymakers have limited tolerance for negative power prices or high price volatility. Building storage business models on volatility bears significant policy risks. Thirdly, the more flexibility will be implemented, the less of these extreme price situations will arise. Therefore, business models around e.g., storage, that reduce the volatility will damage their own viability when

being built on this volatility. Fourthly, negative power prices are an effect of slow technical reactions in power plants. Flexible power plants, including renewable energy facilities, can shut off in seconds so that they will not have to pay for the power that they produce. Only old and slowly steerable fossil power plants in some cases need to "ride through" phases of negative power prices, i.e., rather than having costly phases of shutting down and restarting – which can take several hours to days in old power plants – they pay the negative prices for a couple of hours and are prepared to sell power at positive prices when the negative price period is over. These power plants are exiting the market more and more, also reducing the number of periods in which negative power prices are available for financing flexibility business models.

5.3 Managing the Electricity Market

The current price formation mechanism at the electricity market makes it possible that all inframarginal producers are generating profits in line with price oscillations at global energy commodity markets. In the last years, these were natural gas markets but as ETS prices increase, this role could fall to coal prices as well. Any large price hikes on these commodity markets affect all power that is traded there. To break this logic, two things need to happen:

1. The lowest-cost energy sources are not traded on this market anymore;
2. Power tariffs (for consumers) are calculated at real purchase cost. This can be achieved easiest through competitive pressure. It is in theory also possible to achieve this through very bureaucratic control processes.

A drawback of the floor price is that it cannot serve to fully finance renewable electricity generation. They need to be complemented by a power price, e.g., from an EOM. The question is how this is a good fit with a smooth transition to the future 100 % renewable energy market. Potentially, under that light, the general gist of the Greek proposal – taking out renewables from the EOM where fossils then compete only with each other – would be more appropriate. In this scenario, fossil prices at the EOM would continue to rise while fixed-priced renewables would remain at the same costs. There would need to be some allocation mechanism, i.e., a mechanism that determines who can sell the renewable electricity vs. who will have to purchase power at the power exchange.

Alternatively, the Merit Order could be broken apart by taking out the most expensive part. Costs for renewables could be decoupled from ETS costs by establishing several markets – one EOM market and several reserve markets (Capacity + Energy-Market, CEM) – ultimately with the objective of moving to a capacity market. This could be done by technology ("gas power generation is traded on a separate market") or by price ("anybody who cannot bid below 100 €/MWh has to bid in the CEM where they cannot bid for more than 70 €/MWh plus x Euro/MW"). Notably, two EOMs for the same geography will have converging prices, therefore the good traded in the second market needs to be something else. Further, note that this requires that the ETS can function with rising prices and tightening supplies of emission certificates. This is the key to pricing fossil fuels out of the market.

5.4 Provide Clarity on Infrastructure Cost and Rethink Unbundling

A relevant reason for rising consumer prices is the need for investment in infrastructure. These arise from the need to connect renewable energy sources (including in less populated areas and to the distribution grid) and from modernization requirements (digitalization). Depending on the future regulation (to be defined at the EU level), storage might also be counted as infrastructure and add to these costs.

Generally, if the EU level needs to provide rules for this sector (which is still regulated concerning its prices), they should consider the following:

- Higher transparency on grid and infrastructure costs could achieve higher acceptance for such costs with the consumers. For example, consumers might appreciate having a choice between a very level of supply security and a lower level of supply security at a significantly lower cost. At the very least, they deserve to know what determines the height of their infrastructure payments;

- To incentivize local power generation and power sales, clarity should be provided on the grid fees, taxes, and surcharges of power that is traded locally, e.g., through energy communities.

This will require grid fee reform in many jurisdictions.

At the same time, the current bidding zone design in some areas is not based on the infrastructural reality. Germany, for example, is one large bidding zone together with Luxemburg, based on the thought model of the "copper plate".[13] This thought model is not in line with reality, in which a transmission system bottleneck cuts Germany into a Northern region (with a power surplus) and a Southern region (with a power deficit). This leads to costly redispatch, reflecting the power price differential between power plants north of that line and south of that line. Rather than making bidding zones larger (as in the proposal of the Commission), bid zones should be designed such that they correspond to physical bottlenecks in the transmission systems. It is also possible to create price formation mechanisms on lower levels[14], which would better reflect the "local" power price, and thus allow to finance power plants for regional consumption. Such local markets would be better able to reflect transport costs in power prices[15].

13 In a copper plate, it is immaterial where power is provided or consumed, because it is transmitted across the whole copper plate equally.

14 The most extreme such model is so-called nodal pricing. In a tightly meshed system like Germany, this might be too local, but stakeholders argue that Germany could be split into 36 grid regions which reflect distribution net "islands" that are less than perfectly connected.

15 Because for each transaction, local power generation would compete against power generation plus transmission from some remote location.

5.5 Rethink the Unbundling Paradigm

Overall, a rethink of the unbundling paradigm is necessary to clarify the roles of storage as well as other activities that transgress the boundaries between generation, transmission/distribution, and retail, like energy communities and integrated utilities.

The current vertical unbundling paradigm separates the power sector in generation, grid operation, and retail. Grid operators are excluded from trading power. In the pure theory of the unbundling paradigm, consumers cannot also generate power. This complies with the old paradigm of a centralized power generation system, where generation can follow load by keeping a single parameter (AC frequency) in a narrow range across the whole system. It is not in line with a system dominated by distributed and non-dispatchable small generation units that produce electricity when the sun is shining, and the wind is blowing. Here, consumers can and should be producing energy, and flexible production and consumption should be managed locally and decentrally.

In this system, there are many options to make a load more "flexible". But everything is made easier if generation and consumption of electricity can happen within the same unit – the same person or the same company or the same group of individuals. This is not possible under the unbundling paradigm.

Already, in practice, the paradigm does not match the current situation. Examples of deviations from the unbundling paradigm range from municipal utilities – who typically operate all three parts of the unbundled power system – to energy communities and energy sharing to industrial self-generation to self-consumption from your "own" roof to storage. All these areas transgress the narrow boundaries of the unbundled system.

Even with all "flexibility options" on the consumer side, not all power consumption will take place during appropriate weather conditions. Different types of storage will be needed – characterized by different technical traits (capacity, form of storage, storage duration, ramping). Storage does not fit the unbundling paradigm – it is generating power but also consuming power and can serve as a part of the grid infrastructure. A rethink of the unbundling paradigm in this regard gives power to the people.

5.6 Participation

The energy of the future should allow people to not only be energy consumers but to actively participate in the design and functioning of the system. This requires (but will also support) a certain understanding of the energy system – energy issues should be integrated in basic school curricula in all member states. But it also requires opportunities for such engagement, e.g., in local councils and cooperatives that advise planning authorities, system operators and project developers, or as shareholders / members of cooperatives and other participatory forms of ownership. An important form of such co-governance should e.g., be found for the (very important) sector of housing, including heat and including sourcing solar energy from your "own" roof in rental homes.

The current energy sharing regulation needs to be implemented in all member states. But as it is, it is only affordable to the rich. Amendments to the EU regulation and implementation in Member States should guarantee that access to energy sharing models is also possible for poor households.

Contributers to the Study

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Dr. Christine Wörlen is the founder of the research and consulting company Arepo, which evaluates energy and climate policy plans and projects in Germany and internationally and advises political decision-makers on institutions, instruments and measures. Previously, she headed the renewable energies division at the German Energy Agency (Dena) and held the position of Programme Manager Renewable Energy at the Secretariat of the Global Environment Facility (GEF). Christine Wörlen holds degrees in geoecology and economics and completed her doctorate at Boston University.

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Editor of the Study

Dr. Cornelia Ernst (MEP)

Dr. Cornelia Ernst is a German politician from DIE LINKE. and energy policy spokesperson for DIE LINKE in the European Parliament. Since 2009, she has been working for DIE LINKE. in THE LEFT in the European Parliament (GUE/NGL). She is the coordinator of the Left group in the Committee on Civil Liberties, Justice and Home Affairs (LIBE) and Substitude in the Committee on Industry, Research and Energy (ITRE).

She stresses that it will be the task of the Industry Committee and especially of THE LEFT to ensure strong social and environmental guard rails and to hold companies accountable to uphold human and environmental rights along the value chain.

We have to decouple the dominant influence of gas on the price of electricity. This is why we will do a deep and comprehensive reform of the electricity market. - Ursula von der Leyen

Von der Leyen makes big promises, but will they be enough?

So far, the European Commission has only given us empty headlines, one of them particularly worrying, talking about injecting liquidity into future markets. The specific measures that we expect to hear from Brussels must state that public resources are used to meet the needs of the most vulnerable people and working families, as well as the strategic sectors of the economy. These measures cannot shield and protect speculative operations, increasing and generating a bubble.

- Sira Rego, MEP (Unidas Podemos, Spain)

If we want to prevent the social disaster coming, we need an immediate EU-wide ban of power cuts and the full protection of people from the price explosion for which they are not responsible. This can only be done with a radical excess profits tax and genuine price capping. With a "revenue cap" and then still at €180 per MWh, the Commission does not solve the problems, but continues to secure large profits for the multinationals, because to the Commission the market is sacred and not the people.

- Cornelia Ernst, MEP (Die Linke, Germany)

Almost a year has gone and, finally, some of the necessary measures to tackle the energy crisis start to be announced, such as limiting the immoral profits of the energy companies. Nevertheless, the main characteristic of the commission's approach is too little, too late. The system it's deeply wounded and the Commission keeps using band aids. The pressure must be done to have structural answers that can properly protect those who are paying the bill.

- Marisa Matias, MEP (Bloco de Esquerda, Portugal)