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The future of the supply and pricing of electricity in the EU

(own-initiative opinion)

(C/2025/1187)

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1. Conclusions and recommendations

1.1. The EESC is convinced that the electricity market should not only be reformed in such a way that it meets the objective of climate neutrality by 2050 at the latest, but that this must be combined with the objectives of security of supply and stable and affordable prices. And precisely to protect vulnerable groups, it is necessary to enshrine the right to energy.

This combination of objectives, with the required mega investments, can only be achieved through a combination of state interventions and market mechanisms.

1.2. To this end, we advocate a model of government regulation where necessary and private entrepreneurship where possible. We want to give shape to this in an E-facility. The E-facility could take the form of a company set up by the government that, over time, will play the role of market maker in the electricity market with the aim of climate neutrality, security of supply and stable and affordable prices.

1.3. The required change in the electricity market can be divided into three phases:

(1) During phase 1 (now to 2030), the E-facility will grow its portfolio with a desired mix of (non-CO_2) power generation. During this period, power trading will take place on a day-ahead trading basis but the influence of the E-facility on the market will grow.

(2) During phase 2 (2030 to 2040), the E-facility will achieve its market maker position and will control an appropriate part of the supply side of the market through supply contracts. The role of day-ahead trading will adjust during this period due to the market maker position of the E-facility.

(3) During phase 3 (2040 to 2050), the E-facility will optimise the supply side of electricity to ensure, as from 2050, a sustainable long-term supply of electricity with net-zero greenhouse gas emissions at a stable and predictable price level.

1.4. The EESC reiterates its frequently shared message that small-scale electricity generation must be encouraged to keep the price of electricity affordable for consumers and to increase the flexibility options of the grids.

1.5. With the expected doubling of energy prices and doubling of transmission and distribution tariffs, the cost of electricity in the run-up to 2030 and beyond will require governments to revisit their policy for the taxation added onto the supply of electricity to consumers.

2. **Background**

2.1. The EU claims to be climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions. The role of electricity is central to this. On the one hand, because electricity will also have to be generated net-zero with a dominant role for renewable energy (such as wind and solar energy), supplemented with, for example, power stations running on green hydrogen, or other (low carbon) power stations with carbon capture and storage (CCS) and/or carbon compensation. On the other hand, the demand for electricity will increase sharply because this energy will have to replace a huge part of the use of fossil fuels, such as natural gas, in both households and companies.

2.2. This transition requires mega-investments that will not simply be made available from the market in the current electricity market structure, because the return is uncertain, especially during the transition phase. The big uncertainty is who will finance the necessary new dispatchable power plants. This is because a significant portion of the time, the cheaper renewable sources provide enough electricity to meet demand, and this means that dispatchable plants will at best run only part-time, with the result that their Levelised Cost of Electricity(LCOE) ([1]) will increase significantly. There will be no incentives for the market to invest in such power plants without cost compensation. For this reason, a long-term EU vision needs to be put in place with a realistic timeframe to allow the market, governments, consumers and companies to adjust in a controlled fashion. And Member States should draw up forward-looking implementation plans to guide the most appropriate investment decisions. In several Member States, this includes developing Capacity Payment Mechanisms that are priced through competitive auctions.

2.3. This does not only concern investments in production capacity, but also investments in the grid and in flexible options, such as storage capacity, at local/regional, national and European level. It is also clear that in the electricity market the role of self-generators, energy cooperatives and the like will grow, including small-scale storage capacity, such as in electric cars.

All this will lead to a potential doubling of the electricity price in the coming years, experts expect ([2]). Both companies and consumers, and vulnerable groups in particular, will encounter problems, unless adequate policies are developed for this.

In addition, the current market order, which is characterised by the merit order ([3]), ensures that consumers and companies do not benefit sufficiently financially from the rise of renewable energy.

2.4. The EESC is therefore convinced that the electricity market should not only be reformed in such a way that it meets the objective of climate neutrality by 2050 at the latest, but that this must be combined with the objectives of security of supply and stable and affordable prices. And precisely to protect vulnerable groups, it is necessary to ensure the right ([4]) to energy.

([1]) The levelised cost of electricity (LCOE) is a measure of the average net present cost of electricity generation for a generator over its lifetime. It is used for investment planning and to compare different methods of electricity generation on a consistent basis.

([2]) EU Energy Outlook 2060.

([3]) Merit order: the order of power plants based on the level of their marginal costs, starting with the lowest marginal costs and ending with the highest marginal costs. So, power plants with higher marginal costs are added until the demand is met. The order is: renewable energy, nuclear energy, coal, oil and gas. In today's electricity market design, the last power plant in the merit order (most often gas) sets the price using its marginal costs.

([4]) https://research.rug.nl/en/publications/the-right-to-energy-in-the-european-union.

This combination of objectives can only be achieved through a combination of state interventions and market mechanisms. That was also already argued by the Committee in its opinion Electricity market reform (TEN/793) from June 2023 ([5]). And that is also what the European think tank Bruegel writes in its study on the future of the electricity market from July 2024 ([6]).

2.5. To this end, we advocate a model of government regulation where necessary and private entrepreneurship where possible. We want to give shape to this in an E-facility (see annex 1, a simplified view of the role of the E-facility).

The E-facility will be a company set up by the government that will play the role of market maker in the electricity market with the aim of climate neutrality, security of supply and stable and affordable prices. The E-facility will do this by concluding long-term contracts (2-way CFDs or PPAs ([7])) with electricity producers via tender procedures. The E-facility will then sell the electricity to distribution companies and, where desirable, directly to large electricity users.

The E-facility will not be the hub for all electricity produced. For example, prosumers, energy cooperatives and other small generators will often use, store, or supply their electricity back to their electricity supplier themselves. There may also be large electricity users who enter into a long-term contract directly with an electricity producer.

2.6. In this own-initiative opinion, we will further elaborate on the idea of the E-facility. We will do so with a broad outline and not in (technical) detail, because further elaboration will take place in the coming decades as the electricity market develops further.

3. **The functions of the electricity markets**

3.1. With regard to the electricity price on the wholesale market, there is a difference between the functions that the market price must fulfil:

(1) Short-term allocation between demand and supply – this is the dominant function the price plays today for wholesale electricity products (futures, day ahead, intraday, etc.) which are all primarily focused on the spot markets.

(2) Signalling function which means the capability of the market price to attract the investments needed to ensure security of (decarbonised) supply in the future.

(3) Refinancing of investments both in renewable capacities, dispatchable capacities and flexibility options, such as storage facilities, demand-side management and flexible consumption (heat pumps, e-vehicles).

3.2. The current wholesale market design has a clear bias in favour of the first function mentioned in point 3.1, i.e. organising (through the merit order effect) the most efficient short-term allocation of existing generation capacity and the efficient use of cross-border electricity transmission capacity by regional power exchanges. It is unclear to what extent the current market design can fulfil the second function, given that such investments require long-term revenue certainty in order to be bankable. For the same reason, it is almost certain that it does not fulfil the third function. These shortcomings in the existing market are the reasons why a new market design is being discussed.

3.3. The E-facility proposed in TEN/793 should be seen a as solution for how to better fulfil the third function mentioned in point 3.1, and it promises several advantages – most importantly, it guarantees a high degree of security of supply (for risk-averse states wishing to make well-informed decisions) at minimal costs for the consumer.

3.4. The E-facility, whose details will be described in the next chapter, is therefore a fundamentally important instrument capable of correcting the shortcomings in the existing electricity market through national policy interventions that fit within EU established frameworks.

([5]) OJ C 293, 18.8.2023, p. 112.
([6]) https://www.bruegel.org/policy-brief/changing-dynamics-european-electricity-markets-and-supply-demand-mismatch-risk.
([7]) A 2-way CfD (contract for difference) is a contract signed between an electricity generator and a public entity, which sets a strike price. It works like this: if the market price is below the strike price, the generator receives the difference; if the market price is above the strike price, the generator pays back the difference. PPAs (power purchase agreement) are long-term contracts between a supplier and buyer of electricity.

4. **The E-facility**

4.1. To put the challenges facing the power generation market in perspective, the targets for the EU indicated by Eurelectric (March 2024) ([8]) are worth noting:

(a) 35 % of final energy needs to be electrified by 2030 and

(b) 50-70 % by 2050

(c) Power generation needs to be fully decarbonised by 2040

(d) During the last decade the electrification rate was around 22 %

(e) This needs to increase to 35 % by 2030 and 61 % by 2050 to meet the above targets.

4.2. These objectives are extremely challenging and it is fair to say that a free market has insufficient incentives to achieve these objectives and the required changes in the market. The EESC therefore believes that these challenges can only be effectively managed by governments.

4.3. This requires a balanced vision and coordination supported at European level to create a regulatory framework that guarantees an environmentally-friendly, affordable and reliable supply of energy and the right to energy. This goes hand in hand with the need for the market to receive state guidance and financial state investment support due to such a large-scale transition, as has already been argued.

4.4. Therefore, in TEN/793 the Committee proposed setting up state-owned E-facilities to achieve these objectives in a controlled manner. Coordination between these state E-facilities could very well be organised at EU level to ensure an optimum European E-market with the required interdependence at EU level. The E-facility would be able to bid for specific E-sources to achieve an optimum E-mix based on meeting the required carbon reduction targets for the electricity market on time.

4.5. Energy pricing should be based on a LCOE through the E-facility, whose main objective is to ensure a fair and stable, weighted average pricing based on a balanced combination of E-sources, each with their specific LCOE. The E-facility will be placed between the commercial E-suppliers and the commercial E-distribution companies. Of course there may be large electricity users who enter into a long-term contract directly with an electricity producer.

To provide sufficient reassurance to the E-suppliers to engage in long-term contracts (20 years and more), such as PPAs and 2-way CfDs, direct state support would ensure sufficient financial backing for such contracts. Hence, it is clear that the E-facility could only provide such long-term contracts with state financial backing or via direct state ownership.

4.6. The market ensures short term (day ahead and intraday) balancing between supply and demand while the E facility's main objective is ensuring mid and long term price stability. The balancing at national and EU level would be an ideal application for the with new AI capabilities expanded EUPHEMIA ([9]) market coupling algorithm.

4.7. A stable pricing mechanism provided through the E-facility will also benefit consumers and encourage them to take up initiatives for shared cooperative local power generation and consumption, which in our view will be one of the solutions needed in future.

4.8. Member States decide for themselves whether or not to set up an E-facility. The EESC encourages EU-wide coordination on how the lowest possible and most stable energy prices can be achieved. The required capacity, grid infrastructure and the complementary energy mix can then also be coordinated between Member States.

5. **Between now and 2050**

5.1. It is proposed that the required change in the electricity market be divided into three phases:

(1) Between now and 2030 (while coal and fossil gas-fired power plants are still in operation).

([8]) https://www.eurelectric.org/publications/eurelectric-electrification-action-plan.

([9]) EUPHEMIA stands for: EU + Pan-european Hybrid Electricity Market Integration Algorithm.

(2) From 2030 to 2040 when we need to replace the dispatchable fossil fuel power plants with dispatchable non-CO_2 emission plants (e.g. green hydrogen, fossil gas with CCS) and storage capacity systems.

(3) From 2040 to 2050 when we can fine-tune the options chosen to allow a stable system from 2050 onwards.

During phase 1, the E-facility will grow its portfolio with a desired mix of (non-CO_2) power generation. It needs time to grow into a market maker position. During this period, the coal-fired power plants will be closed down and the gas-fired power plants will either be converted to H2 or combined with CCS. During this period (until 2030), power trading will take place on a day-ahead trading basis but the influence of the E-facility on the market will grow.

5.2. During phase 2, the E-facility will achieve its market maker position and will control an appropriate part of the supply side of the market through supply contracts. These could be 2-way CfDs or PPAs contracts. Towards the end of this phase, the E-facility, in its role as market maker, will ensure the supply of electricity to consumers (via the energy distributing companies). The role of day-ahead trading will adjust during this period due to the market maker position of the E-facility, but day-ahead and intraday trading will remain important for balance supply and consumption.

5.3. During phase 3, the E-facility will optimise the supply side of electricity to ensure, as from 2050, a sustainable long-term supply of electricity without CO_2 emissions at a stable and predictable price level. On the basis of the experience gained, this can be achieved by optimising the power mix through long-term (20-30 years) supply contracts.

5.4. In addition to the above, and from a systemic point of view, other important options to balance supply and demand include energy sharing and peer-to-peer trading. These have the added benefit of inviting energy communities such as cooperatives and individual prosumers to play an active role in the energy transition. The EESC therefore reiterates its frequently shared message that small-scale electricity generation must be encouraged to keep the price of electricity affordable for consumers and to increase the flexibility options of the grids.

6. **Finance and Taxation**

6.1. It is envisaged that the price of electricity will rise until 2035, and double in the worst scenario. Fortunately, this price increase is being dampened by the increase in renewable sources (see footnote 2). That is why more modelling work on pricing needs to be carried out to assist governments to make cost-effective choices for the power generation mix. Such services could very well be provided by the E-facility.

6.2. Even now, some TSOs ([10]) indicate they will be unable to guarantee sufficient grid uptimes after 2030 unless major investments are made in the meantime to upgrade their network and in some Member States prosumers are decoupled from the distribution grid because of insufficient distribution grid capacity. To finance these upgrades in time, sufficient funds need to be made available by governments as regulators of the TSOs and DSOs ([11]). These additional investments will lead to increased tariffs for users. Given the size of investments needed, current tariffs could very well double.

6.3. It is believed that, in order to ensure a smooth transition from fossil to renewable and low carbon-generated electricity, more effort throughout the EU is needed to establish consistent, EU-wide pricing models based on LCOE and LFSCOE (Levelised Full System Cost of Electricity ([12])). This would help governments make sound choices during the transition period from now to 2050 to ensure that electricity remains affordable for citizens and companies alike.

([10]) A Transmission System Operator (TSO) is an organisation responsible for the efficient and reliable transmission of electricity from generation plants via the power grid to regional or local electricity distribution operators.

([11]) A Distribution System Operator (DSO) operates, manages, and sometimes owns the local and regional energy distribution networks, which transport electricity to end users.

([12]) Levelised Full System Costs of Electricity (LFSCOE) is an all-cost evaluation metric that compares the costs of serving the entire market using just one source plus storage. https://drive.google.com/file/d/1JB-x88wPQuKwWoFnxvkDAzbJ7hnM1-sj/view.

6.4. So with the increase of the energy prices and of the transmission and distribution tariffs, the cost of electricity in the run-up to 2030 and beyond will require governments to revisit their policy for the taxation added onto the supply of electricity to consumers. Without compensation by reducing taxation, electricity could very well become unaffordable for groups of EU citizens and reduce the competitiveness for companies with competition from outside the EU.

Brussels, 22 January 2025.

The President
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