European Economic and Social Committee

OPINION

European Economic and Social Committee

Role of nuclear energy in the stability of EU energy prices

Role of nuclear energy in the stability of EU energy prices
(Exploratory opinion requested by the Czech Presidency of the Council of the EU)

TEN/776

Rapporteur: **Alena MASTANTUONO**

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Referral	The Czech Presidency of the Council of the EU, letter of 26/01/2022
Legal basis	Article 304 of the Treaty on the Functioning of the European Union Exploratory opinion
Plenary Assembly decision	21/09/2022
Section responsible	Transport, Energy, Infrastructure and Information Society
Adopted in section	07/09/2022
Adopted at plenary	21/09/2022
Plenary session No	572
Outcome of vote (for/against/abstentions)	143/73/42 (recorded vote – see appendix II)

1. Conclusions and recommendations

1.1 The stability and affordability of energy prices is essential to preserve both the purchasing power of households and the competitiveness and resilience of the European industrial fabric. After a decade of relative price stability for energy import prices and the relatively low annual increase of domestic producer prices for energy of 0.9% between 2010 and 2019, Europe has been witnessing a sharp increase in energy prices since second half of 2021. Volatility in energy prices and uncertainty of energy supplies escalated with the war in Ukraine.

1.2 The challenge that Europe is facing today is twofold: the need to combat climate change and the need to ensure a stable energy supply at an affordable price. As the Commission writes in its REPowerEU plan, the challenge is to rapidly reduce our dependence on Russian fossil fuels by fast forwarding the clean transition and joining forces to achieve a more resilient energy system and a true Energy union. The solution has three time dimensions. The essence of the short-term perspective is primarily to resolve the situation with the supply of energy, as a possible shortage may exacerbate price increases. The current market situation is influenced by current and expected supply-side factors. It is therefore necessary to use all available energy sources in the EU as outlined in the REPowerEU plan. This is a crisis scenario, the purpose of which is primarily to secure the supply of energy. The medium-term perspective allows for greater respect for the sustainability and balance of energy sources, and the long-term perspective, provided that geopolitical security risks are reduced, will entail focusing on green goals.

1.3 The additional costs of safety and security caused by the war threaten to contribute substantially to the increase in energy prices. In the short term, existing nuclear power plants in EU Member States which opted to include nuclear power in their energy mix and where it is technically feasible will contribute to the stability of energy supply, which to a great extent influences price stability. Without the existing nuclear capacity, the shock to the energy system caused by Russia's invasion of Ukraine would certainly be even bigger.

1.4 Nuclear power as a source of low-emission electricity is available on demand to complement the leading role of renewables such as wind and solar in the transition to electricity systems with net zero emissions. The EESC points out that nuclear as a stable baseload can at this time contribute to stable supply. The marginal costs of nuclear energy are stable and much lower than those of gas and coal plants. Nuclear power plants do not emit a significant amount of CO_2 when in operation and so their marginal costs, like those of renewables, do not include any CO_2 costs and are not affected by volatile carbon pricing as we could see in 2021 when the carbon price rose more than 200%. The volatility in the EU ETS scheme significantly affects the price of gas and coal on the EU market.

1.5 From a regulatory point of view, the electricity prices on the EU wholesale market are determined by merit order in which the last power plant sets the price. In most cases of standard market behaviour, the price on a spot market is determined by gas or coal. This means that nuclear power does not influence energy prices on the spot market, except for when the energy mix includes a high share of low-emission sources. However, the spot market is only part of market sales. Energy companies often sell physical supplies of electricity on the basis of bilateral contracts. In this case, different financing models and bilateral contracts used in EU

Member States with nuclear in their energy mix help to stabilise the energy price for the customer.

1.6 The current energy crisis affected the functioning of the EU electricity market by distorting its basic rules due to the number of interventions to mitigate high energy prices or significantly decrease demand. This situation points to the important correlation between decreased supply and increased demand pushing up energy prices. With a more robust supply from stable low-carbon energy sources, energy prices will be less volatile and thanks to the interconnection of national energy markets the benefit can be shared across the EU.

1.7 The EESC considers that extending the life of the existing fleet of nuclear power plants makes sense in this particular situation and will, at the same time, contribute to the transition to a carbon-neutral economy. It has the potential to meet current expectations regarding energy supply and to reduce gas consumption in the electricity sector, thereby reducing the risk of gas shortages. It can also help to alleviate the unprecedented price volatility caused by non-economic factors, and meet current expectations regarding energy supply. The EESC recommends that the Member States work on solutions for storage capacity and reinforce transmission interconnections in order to respond effectively to outages in renewables in the longer term and in gas in the short term.

1.8 The EESC proposes that the Czech Presidency, within the European Nuclear Energy Forum (ENEF), discuss price stability in the nuclear sector and the role of nuclear power in stabilising supply as a response to reduced EU dependence on Russian gas. The EESC would like to be closely involved in this discussion.

1.9 The EESC suggests reinforcing bilateral cooperation with international partners in the nuclear sector in order to share the findings in terms of innovation and advances in new technologies. The EESC recommends that the Czech Presidency of the Council of the EU organise a conference on small modular reactors which could take the form of the EU-US high-level forum on small modular reactors and explore this promising research.

2. Background and explanatory notes

2.1 Article 194 of the Treaty on the Functioning of the European Union lays down the legal basis for energy policy in the EU. Specific provisions are laid down in other articles such Article 122 of the TFEU (security of supply), Articles 170-172 of the TFEU (energy networks), Article 114 of the TFEU (Internal energy market) and Articles 216-218 of the TFEU (external energy policy). The Treaty establishing the European Atomic Energy Community (Euratom Treaty) serves as the legal basis for most EU actions in the field of nuclear energy.

2.2 The Treaty on the Functioning of the European Union also guarantees to Member States their right to determine the conditions for exploiting their energy resources, their choice between different energy sources and the general structure of their energy supply[1].

1 TFEU Article 194(2)

2.3 The EU's plan to become the first climate-neutral continent in 2050 requires an energy transition towards zero and low-emission energy sources. The increasing part of renewables in the energy mix cannot happen without a backup made up of currently stable energy sources at our disposal such as fossil and nuclear energy; in addition, we need to invest in non-fossil gas-fired plants to cope with fluctuations in renewable energy. There is also a great need for storage capacity in order to avoid blackouts and satisfy growing energy consumption driven by electrification. Among the current stable energy sources, nuclear energy is the only source with low emissions which could reduce dependence on Russian gas.

2.4 Nuclear energy, with its 413 gigawatts (GW) of capacity operating in 32 countries, contributes to decarbonisation and reduces reliance on imported fossil fuels by avoiding 1.5 gigatonnes (Gt) of global emissions and 180 billion cubic metres (bcm) of global gas demand a year[2]. Nuclear power, as a source of low-emission electricity, is available on demand to complement the leading role of volatile renewables such as wind and solar in the transition to electricity systems with net zero emissions. According to the International Energy Agency, less nuclear power would make net zero ambitions harder and more expensive and global nuclear generating capacity is expected to double by 2050.

2.5 The European Commission delegated regulation of 9.3.2022[3] recognises the potential of nuclear energy to contribute to the decarbonisation of the Union's economy and considers nuclear energy a low-carbon activity. The Final Report of the Technical Expert Group on Sustainable Finance from March 2020[4] stated that "nuclear energy generation has near to zero green-house gas emissions in the energy generation phase" and "evidence on the potential substantial contribution of nuclear energy to climate change mitigation objectives was extensive and clear". The taxonomy provides for additional and stricter requirements on waste disposal, funding and decommission planning.

2.6 The stability and affordability of energy prices is essential to preserve both the purchasing power of households and the competitiveness and resilience of the European industrial fabric. After relative price stability for energy import prices in the last decade (except the drop in 2020 by 31%), and the relatively low annual increase of domestic producer prices for energy of 0.9% between 2010 and 2019 (in 2020, energy producer prices fell by almost 10%), Europe has been witnessing a sharp increase in energy prices since autumn 2021[5].

2.7 For the first time in its history, the European Union is confronted by several serious risks linked to energy supply, energy security and skyrocketing energy prices. One of the reasons is that some Member States were not careful, or have succumbed to external pressure, and reduced all backup resources too quickly, while foreign interference certainly played a role in this regard.

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2 https://iea.blob.core.windows.net/assets/0498c8b8-e17f-4346-9bde-dad2ad4458c4/NuclearPowerandSecureEnergyTransitions.pdf

3 Regulation amending Delegated Regulation (EU) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities

4 The TEG report available at: TEG final report on the EU taxonomy | European Commission (europa.eu)

5 Eurostat data from February 2022 https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20220210-2.

2.8 Hectic and volatile energy price developments were already evident before the war, from autumn 2021, caused by several disruptions in supplies as well as the global increase in the demand for gas. The reason for the unusually high energy prices since last autumn is the sharp global increase in the demand for gas, due to a number of key factors: upward economic recovery, tightened supplies to the EU, a lack of investment, and bad weather conditions which have resulted in reduced production of energy from renewables. In some cases, speculation has led to the emptying of gas storage facilities[6]. The current volatility in energy prices is mainly determined by the impacts of the Russian aggression against Ukraine, the uncertainty about a possible escalation in other countries and the effort to cut the EU's energy dependence on Russia as quickly as possible.

2.9 The additional costs for safety and security caused by the war threaten to substantially contribute to the increase in energy prices. The next period of diversification of EU energy input, connected with massive investments into new infrastructure (e.g. LNG terminals, hydrogen pipelines) and realignments of the existing energy delivery network, could be accompanied by an additional jump in prices. The situation is also exacerbated by a significant decline in nuclear generation, expected to decrease by 12% (more than 100 TWh) in 2022. According to the IEA electricity market report of July 2022, this decline is due to temporary decreased plant availability in France, the retirement of 4 GW of nuclear power in Germany and the impact of the Russian invasion on Ukraine's nuclear plants.

2.10 Under the current circumstances, at least until the fundamental EU energy shift makes progress, the use of already existing energy sources available in the entire territory of the EU and utilisable immediately without impediments and within the already installed infrastructure is the highest priority. At the same time, cutting supplies of energy commodities from Russia is well underway, including the risk of limiting the supply of fuel rods for nuclear power plants, and ensuring a stable energy supply to all Europeans is leading to a challenge in terms of complying with climate targets.

2.11 To a certain extent, nuclear power enables the adaptation of electricity generation, depending on how much power is produced from renewables. Nuclear power stations are less flexible than gas, but they bring an element of stability into the system as they contribute significantly to the energy base load, and current regulation in some EU Member States allows flexible regimes for nuclear power plant operations.

2.12 The already installed nuclear sources are able to immediately satisfy the higher demand for electricity and are characterised by low operating costs. It is true that the comprehensive levelised energy costs in the case of nuclear sources are rather high, especially due to the huge investment costs which reflect high security measures; however, in the case of gas, the levelised energy costs are even higher[7]. At the same time, given the war in Ukraine, we have no certainty

6 For more details, please see the TEN/761 opinion.

7 IEA/NEA, 2020.

that we will continue to be supplied with Russian gas or fuel rods until alternative supplies are found.

2.13 Nuclear is the dispatchable low-carbon technology with the lowest expected costs for 2025. Only large hydro reservoirs can provide a similar contribution at comparable costs but remain highly dependent on the natural features of individual countries. Compared to fossil fuel-based generation, nuclear plants are expected to be more affordable than coal-fired plants. While gas-based combined-cycle gas turbines (CCGTs) are competitive in some regions, their levelised cost of energy (LCOE) depend strongly on the prices for natural gas and carbon emissions in individual regions. Electricity produced from nuclear long-term operation (LTO) by lifetime extension is highly competitive and remains not only the lowest cost option for low-carbon generation - when compared to building new power plants - but for all power generation across the board[8].

2.14 Similarly to renewable sources, the operating costs of nuclear energy are low. The variable costs are virtually independent of the global energy commodity market. For this reason, nuclear power plants bid on the electricity market at a stable price. Price of fuels and carbon pricing generally have the greatest impact on costs of electricity production. These variable costs or marginal costs vary greatly from one technology to another. The marginal cost of nuclear power plants depends on the price of nuclear fuel, which is much lower than that of gas or coal. Nuclear production being substantial, the price of fuel can be spread over a large production volume, a large quantity of MWh. Since nuclear power plants do not emit CO_2, their marginal costs do not include any costs related to CO_2 allowance prices, like renewables.

2.15 From a regulatory point of view, the electricity prices on the EU wholesale market are determined by order of merit, in which the last power plant sets the price. In most cases of the standard behaviour scenario, the price on a spot market is determined by gas or coal. This means that nuclear power does not influence energy prices on the spot market, except for when the energy mix includes a high share of low-emission sources, set to be the future European model. At present, the standard market model has been destroyed by the supply-side shock, especially as regards gas, which has to be accompanied by the other disposable sources to contribute to market equilibrium and price stability, along with regulatory interventions such as demand reduction across the Union[9].

2.16 The spot market is only part of market sales. Energy companies often sell physical supplies of electricity on the basis of bilateral contracts. In this case, different financing models and bilateral contracts used in the EU Member States with nuclear power in their energy mix help to stabilise the energy price for the customer, but not necessarily to lower it. We also have to distinguish between different layers of the electricity market (wholesale versus retail). The retail markets in the EU depend on many factors such as the level of competition, but also on factors that determine the final price. The electricity prices paid by household consumers in the EU

8 https://iea.blob.core.windows.net/assets/ae17da3d-e8a5-4163-a3ec-2e6fb0b5677d/Projected-Costs-of-Generating-Electricity-2020.pdf

9 Council regulation on coordinated demand reduction measures for gas.

include taxes and levies. According to Eurostat figures, the average share of levies and taxes paid by household consumers for electricity in the EU is 36%.

3. General comments

3.1 The EESC is well aware of and respects the seriousness of the situation. Under the current circumstances, as a part of crisis and emergency management, reliable deliveries of energy at an acceptable price are the way to survive. For that reason, any disposable source which can be reliable should be used not only to accommodate demand, but also to contribute to price stability in this very uncertain period of time.

3.2 The EESC fully supports the European Green Deal and the shift of the European economy to climate neutrality by 2050. At the same time, the climate transition needs to go hand in hand with the five pillars of the Energy Union, namely with the pillars on security of supply and affordability of energy prices. Future policies should aim to decrease the high import dependency, as highlighted by the EESC in several opinions.

3.3 In the light of the main targets of the European Commission's REPowerEU Communication, there are two phases of the effort for energy price stability in the EU; the first until some first steps of decreased the EU's dependence on Russia with visible results are made, and the second when the EU energy dependence on Russia is zero. The EESC admits that for the first phase, where stability and safety will play a fundamental role, nuclear energy from existing EU sources also plays a role as highlighted in the REPowerEU plan[10], bearing in mind that preparing the EU energy system for the next winter will not be easy (to create sufficient stocks and reserves of gas, to start the diversification of deliveries, to utilise more hydrogen and methane, to make massive additional investments into renewable and energy efficiency projects) as the International Energy Agency indicates in its recommendations of March 2022[11]. For the second, a return back to the Green Deal mainstream could be possible when any risks linked to the security of supply are eliminated.

3.4 The EESC points out that the supply of fuel rods to nuclear power plants in the EU with VVER reactors operated on their territory (Bulgaria, Czech Republic, Hungary, Finland and Slovakia) might be at risk due to the war in Ukraine. At the same time, it is pleased to see that alternative supplies are possible[12] and encourages the relevant Member States to find alternative suppliers as soon as possible. Nuclear plants do not require large storage capacity and can easily stock fuel for three to five years, so it is possible to switch to another supplier or buy fuel at a favourable price.

3.5 The EESC highlights that the stability of the EU energy market is an absolute priority for today as it can eliminate volatility in energy prices. The nuclear energy as a very stable base load

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10 REPowerEU Plan COM(2022) 230 final

11 IEA 10-Point Plan to European Union for reducing reliance on Russian supplies by over a third while supporting European Green Deal, with emergency options to go further, March 2022.

12 The Temelín nuclear power plant in the Czech Republic found alternative suppliers.

energy source (a backup to volatile renewables) can substantially contribute to stability of supply in periods of extraordinary risks.

3.6 The EESC points out that nuclear energy does not bare the risk of volatility in EU ETS prices, which reached an all-time high of EUR 100 per tonne of CO_2 in early February 2022. Since nuclear power plants do not emit CO_2, their marginal costs do not include any CO_2 costs, like renewables. The volatility in the EU ETS scheme significantly affects the price of gas on the EU market.

3.7 Comprehensively, nuclear energy has high investment costs but relatively cheap operating costs. However, we are not starting from scratch, and existing (upgraded) nuclear capacities can be used to stabilise the market. The policies should allow Member States to prolong the operation of the existing fleet, as the long-term operation of nuclear power plants is by far the most affordable solution for 2030 and beyond which will allow a smooth transition to climate neutrality. It is necessary to avoid any measures that might negatively impact existing low-carbon capacity, or which would discourage investors from investing in the necessary technologies.

3.8 The EESC suggests factoring the role of nuclear energy into the future design of electricity market rules. Nuclear plants can offer electricity to end consumers at a fixed price, as several European countries use different models of contracts which ensure stability for consumers. A fixed purchase price ensures a return on investment and lower capital costs, and partially fixes the electricity price for end consumers.

3.9 Nuclear power accounted for around 25% of the electricity produced in the EU in 2020. More solidarity and better transmission interconnections on the energy market will help to respond effectively to the volatility of renewables in the longer term and outages in gas in the short term. The EESC also calls for Member States to work on storage capacity and replace gas plants with energy from low-carbon sources. Any provisions in the revision of the electricity market design should incentivise investments in the low-carbon technologies needed to decarbonise the power sector in a safe and affordable manner.

3.10 The EESC highlights the other element of price stability for nuclear energy ensured by the stability of supplies. Compared to gas, nuclear power plants do not require large storage capacities and can easily stock its fuel for three years[13]. Longer refuelling and stocking capacity help with buying the fuel under more favourable conditions as well as switching to other suppliers. For this reason, it encourages the five Member States with VVER technologies to look for alternative suppliers.

3.11 When the EU's energy dependence on Russia decreases, it will be a good starting point not only to think, but also to implement and materialise the innovation potential regarding nuclear energy, namely the utilisation of nuclear sources for the production of hydrogen and waste recycling as a part of a circular economy chain. Using electricity from nuclear power to produce

13 According to the Euratom Supply Agency's 2020 annual report, "uranium inventories can fuel EU utilities" nuclear power reactors for 2.75 years on average.

hydrogen and heat presents new opportunities according to the International Energy Agency. Surplus nuclear electricity could be used to produce an estimated 20 million tonnes of hydrogen in 2050 and co-generated heat from nuclear plants could replace district heating and other high-temperature uses[14], though the construction costs would need to fall to make it competitive.

3.12 The EESC proposes that the Czech Presidency discuss, within the European Nuclear Energy Forum (ENEF), price stability in the nuclear sector and also the role of nuclear power in the stability of supplies as a response to the reduction of the EU's dependence on Russian gas. The EESC wishes to be closely involved in this discussion.

3.13 The EESC suggests reinforcing bilateral cooperation with international partners in the nuclear sector, mainly with the U.S., in order to share results in innovation and advances in new technologies. The EESC recommends that the Czech presidency of the Council of the EU organise a conference on small modular reactors which could take form of the EU-US high-level forum on small modular reactors and explore this promising research.

4. Specific comments

4.1 The EESC is well aware of some risks connected with the utilisation of nuclear energy and supports the need for further research in order to make it even safer. It would be foolish to think that the risks do not exist. Nuclear power has been used to produce energy since the 1950s, and since then the level of security and safety have been reinforced, i.e. to withstand extreme external events, both natural and man-made, such as an aircraft crash or explosions. The EESC invites Member States not to stop research and innovation in this area and to comply with strict requirements on safety and waste disposal.

4.2 The current situation on energy market also affects uranium prices, which can be stabilised by better diversification of suppliers, or in the longer term by building power plants requiring less frequent refuelling. Power plants based on Small modular reactors (SMRs) may require less frequent refuelling, every three to seven years in comparison to between one and two years for conventional plants. Some SMRs are even designed to operate for up to 30 years without refuelling. In addition, the construction of GEN III power plants meets the needs of countries with large energy requirements and developed grids (as shown by the programmes underway or planned in different countries).

4.3 Small modular reactors designs are generally simpler, and the safety concept for SMRs often relies more on passive systems and the inherent safety characteristics of the reactor, such as low power and operating pressure. SMRs offer savings in cost and construction time, and they can be deployed incrementally to match increasing energy demand.

4.4 The fuel needed for nuclear plants is rather of small volume compared to the needs of power plants running on fossil fuels. One small pellet of uranium dioxide weighing five grams produces the same amount of energy as a ton of coal or about 480 cubic meters of natural gas.

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14 https://iea.blob.core.windows.net/assets/0498c8b8-e17f-4346-9bde-dad2ad4458c4/NuclearPowerandSecureEnergyTransitions.pdf

Nuclear plants do not require large storage capacities and can easily stock fuel for three to five years. Stocking capacity can be considered as stability for the plant, as it decreases the dependence on a particular supplier and gives the possibility to buy fuel when there are favourable prices.

4.5 The investments made in this sector also means that any upgrade can be used for the benefit of the green transition. Nuclear technologies and methods are used to contribute towards the transition to an increasingly hydrogen-based energy system in two main areas: (i) hydrogen production from nuclear assisted thermal/chemical dissociation of water and (ii) contribution of nuclear methods and techniques to improve understanding and allow subsequent tailoring of materials to better meet the requirements for hydrogen storage and conversion[15].

Brussels, 21 September 2022

Christa SCHWENG
The president of the European Economic and Social committee

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N.B.: Appendix overleaf.

15 IAEA-TECDOC-1676

APPENDIX I to the OPINION
of the
European Economic and Social Committee

The following counter-opinion, which received at least a quarter of the votes cast, was rejected during the discussions (Rule 71(7) of the Rules of Procedure):

AMENDMENT 7

TEN/776
Role of nuclear energy in the stability of EU energy prices

Replace the whole opinion presented by the TEN section with the following text (explanation/reason at the end of the document):

Tabled by:
DIRX, Jan
HERNÁNDEZ BATALLER, Bernardo
IZVERNICEANU, Ileana
KATTNIG, Thomas
KUPŠYS, Kęstutis
LOHAN, Cillian
MOSTACCIO, Alessandro
NABAIS, João
NIKOLOPOULOU, Maria
RIBBE, Lutz
SCHMIDT, Peter
SCHWARTZ, Arnaud

Amendment	
1.	**Conclusion and recommendation**
1.1	The answer to the question of the Czech presidency is, in summary, in the current market design of the electricity market, nuclear energy cannot play a role in price stability. This is because the merit order applies in the current market design (see point 2.8). Only when the market design is adapted with substantial financial state aid, in addition to private financing, a situation of price stabilization by nuclear energy is possible.
1.2	The EESC advises the Czech presidency to open a structured dialogue at EU level with the aim of agreeing on a new market design for the electricity market that guarantees price stability.
2.	**Introductory notes**
2.1	Prior to the Czech presidency of the Council of the EU (second half of 2022), this upcoming presidency asked the European Economic and Social Committee to prepare an exploratory opinion on the role of nuclear energy in the stability of EU energy prices.
2.2	The EESC is happy to comply with this request from the Czech presidency, as it offers the opportunity to provide a factual and unambiguous description of that role.
2.3	Achieving price stability is one of the preconditions for offering electricity customers, both businesses and consumers, certainty about their costs in the short and medium term. Stable

power prices therefore play a crucial role for the performance of European businesses and the creation and maintenance of employment.

2.4 Price stability is also necessary for all companies, especially small and medium-sized companies, in order to be able to provide realistic quotations in a timely manner and to make realistic forecasts.

2.5 In order to be able to provide the answer to the Czech presidency as factual and unambiguous as possible, in this exploratory opinion we will not discuss other aspects that are also interesting, but which are not important within the phrasing of the question for this exploratory opinion. That means, first, that we do not interfere with the right of each Member State to make its own choices about how electricity is generated in its own country. And second, that we do **NOT** comment on the actual and possible advantages and disadvantages of nuclear energy.

2.6 The issue of **security of supply** also falls outside the scope of this exploratory opinion. This issue deserves its own opinion. But it is of course indisputable that in the current situation with a war in Europe in which gas and oil are used as geopolitical weapons, it is important to keep the existing power stations operational as much as possible and flexibility should be exercised with regard to the temporary use of fossil and low emission fuels. And as already mentioned, the Committee recognizes the right of each Member State to make its own choices about how electricity is generated in its own country. The Committee reiterates that it strongly supports what the European Commission writes in its REPowerEU plan: the challenge is rapidly reducing our dependence on Russian fossil fuels by fast forwarding the clean transition and joining forces to achieve a more resilient energy system and a true Energy union.

2.7 Although it is tempting to also discuss the **level of energy prices**, we do not do that, because the stability of the prices does not depend on the level of the price. Stability may or may not apply at any price level.

2.8 Some technical terms are explained here:

Market design: the way in which the electricity price is determined in the market.

Marginal costs: the amount by which total costs increase if a company produces one additional product.

Spot market: a spot market is the market for the exchange of commodities, like electricity, on which transactions are carried out for immediate payment and prompt delivery.

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 from the merit order (mostly gas) sets the price with its marginal costs.

3. Answer to the question

3.1 Of course, every power plant plays a role in the electricity market. For example, it is clear that the recent failure of many of France's nuclear power stations and the consequent need to import more electricity is reflected in the development of the price. But in this exploratory opinion we do not look at these more or less temporary situations, but at the structural side of the way in

which the electricity market works.

3.2 We focus on the spot market, because it mainly determines the price that consumers have to pay. And, as mentioned, on the spot market the merit order is the market design.

3.3 The role of nuclear energy in the stability of EU energy prices depends on two variables, namely whether it concerns old or new nuclear power plants and whether it concerns the current market design or is it a new market design? So if you combine these variables, you get four different situations.

3.4 In order to give the clearest possible answer, it is therefore necessary to distinguish four different scenarios for these four different situations, namely the following:
A: existing nuclear power plants in the existing market design
B: existing nuclear power plants and a new market design
C: new nuclear power plants in the existing market design
D: new nuclear power plants and a new market design.

3.5 **A: Existing nuclear power plants in the existing market design**

3.5.1 In almost all Member States, electricity generated in current nuclear power plants does not and cannot play a role in the price stability of electricity. The reason for this is the current market design of the merit order, with the plant with the highest marginal costs as price setter (almost always gas, even in France). There is one exception in the EU: Sweden, due to their electricity mix (almost 60% renewables - mainly hydropower - and about 30% nuclear)[16].

3.6 **B: Existing nuclear power plants and a new market design**

3.6.1 In principle, it is conceivable that nuclear power plants then have a price-stabilizing effect - for example in a market design in which pricing is based on average costs and/ or nuclear power is out of the merit order. However, it is questionable what such a market should look like and how it should function. But in the UK, for example, a new model is now being implemented, namely to split the market into two segments: dispatchable power and non-dispatchable power. The dispatchable segment (mainly gas with residual coal and a little biomass) would follow the marginal pricing model, and the non-dispatchable would be paid on a full cost basis (some kind of regulated return on capital in the form of a Contract for Differences – which is where the UK has already gone with their new nuclear power station Hinkley Point C[17]. This does mean that the state will have to subsidize the nuclear power stations concerned if the electricity price in the market is lower than the agreed amount based on the regulated return on capital.

This means that such a new market design consists of two elements: a market segment in which the previous market design (= merit order based on marginal costs) applies and a second where there are de facto only contracts for differences. As a result, the electricity generated within the contracts for differences has a stable price and is thus reflected in a more stable price for the consumer. But the price for the consumer will still fluctuate, because a part of the electricity is still priced on the merit order.

16 https://sweden.se/climate/sustainability/energy-use-in-sweden

17 https://www.gov.uk/government/collections/hinkley-point-c

3.7 **C: New nuclear power plants in the existing market design**

3.7.1 Nuclear power plants can have a stabilizing effect on prices if enough nuclear power plants are built so that nuclear power plants are regularly the last power plants in the merit order. This would mean that we would have to replace fossil power plants with nuclear power plants; so at least hundreds of new nuclear power plants in Europe! And: yes, then it would set the price, with a price level that – see Hinkley C – would be about twice as high as renewable electricity. However, due to marginal pricing, the inevitable consequence would be that the new nuclear power plants would not be able to finance themselves on the market, so they would need subsidies.

3.8 **D: New nuclear power plants and a new market design**

3.8.1 The nuclear power plants should be out of the merit order and under the cost (plus) system. The plus comes from the fact that next to government financial investments, the private sector needs to get on board to and have a fair RoI (Return on Investment), therefore the cost plus tariff. (See also point 3.5.1.)

4. **Summary**

4.1 The answer to the question of the Czech presidency is, in summary, in the current market design of the electricity market, nuclear energy cannot play a role in price stability. Only when the market design is adapted with substantial state aid, in addition to private financing, a situation of price stabilization by nuclear energy is possible.

4.2 Therefore the EESC advises the Czech presidency to open a structured dialogue at EU level with the aim of agreeing on a new market design for the electricity market that guarantees price stability.

Reason

In their statement of 8 September, EESC President Christa Schweng and TEN Section President Baiba Miltovica wrote: "The EESC calls for joint European action to ensure the stability of electricity prices and to urgently reform the energy market." And that is precisely the essence of this amendment, that we have drawn up in order to provide a clear and honest answer to the question from the Czech presidency.

The draft opinion TEN/776 that is on the table does not focus on the question of the Czech presidency, namely the question of the role of nuclear energy on the stability of the electricity price, but it is an opinion that is firstly mainly about security of supply and secondly an advertising message pro nuclear energy. Security of supply is of course also very important, but the presidency did not ask about that.
And unfortunately the rapporteur has also included many inaccuracies and questionable points in her opinion. We have described a selection of 20 of these points in a memorandum before the TEN section meeting earlier this month.

We want to underline that achieving price stability is one of the preconditions for offering electricity customers, both businesses and consumers, certainty about their costs in the short and medium term. Stable power prices therefore play a crucial role for the performance of European businesses and the creation and maintenance of employment.

Therefore we prepared this amendment and we ask the Bureau of the EESC to accept it as a counter opinion.

In this amendment we provide a clear and unambiguous answer to what this opinion should be about, namely what is the role of nuclear energy on the stability of energy prices in the EU. We will therefore NOT discuss the pros and cons of nuclear energy, nor the price level, because you may or may not have stability at any price level.

It is important to understand that if you want to do something about electricity prices, it is necessary to change the current energy price market system. A conclusion that is now expressed in many places in Europe, up to and including Ursula von der Leyen and the Energy Council of 9 September. A conclusion that we have repeatedly introduced in the process of this opinion.

Therefore we outlined in this amendment four scenarios to investigate in which situation of market design nuclear energy can and in which situation nuclear energy cannot have a stabilizing effect on energy prices. Our conclusion is that nuclear energy cannot have a stabilizing effect in two of the scenarios, but under certain conditions it may have a stabilizing effect in the other two scenarios.

Our view was supported by the three experts who were invited by the chair and the rapporteur of the study group to a meeting of the study group:
Prof Keppler: "Nuclear energy has no real impact on electricity prices, and neither does an increase of 10 or 20%!"
Mr Cometto (International Atomic Energy Agency, IAEA): “On the short-term nuclear has a limited impact to lower electricity prices.”
Mr Goicea (FORATOM): "Nuclear can in theory provide stability to final power prices but it's still a matter of market design."

Outcome of the vote:	
In favour:	98
Against:	135
Abstention:	27

APPENDIX II

RESULT OF THE VOTE ON THE OPINION BY MEMBER

#	MEMBER	GROUP	MEM	Delegated vote
1	ANDERSEN, Dorthe	II	A	SORGENFREY, Bente
2	ANDERSSON, Jan Torsten	III	N	
3	ANDERSSON, Krister	I	Y	
4	ANGELOVA, Milena	I	Y	
5	ANTONIOU, Michalis	I	Y	
6	ARDHE, Christian	I	Y	
7	ATS, Kerli	III	Y	
8	BABRAUSKIENE, Tatjana	II	A	
9	BACK, Thord Stefan	I	Y	
10	BALDZENS, Egils	II	Y	
11	BARBUCCI, Giulia	II	A	
12	BARCELÓ DELGADO, Andrés	I	Y	
13	BARRERA CHAMORRO, Maria Del Carmen	II	N	
14	BARTELS, Holger	II	N	
15	BÄUMLER, Christian	II	N	
16	BERNIS CASTELLS, Jaume	III	Y	
17	BERTOLINI, Silvestre	II	Y	
18	BIEGON, Dominika	II	N	
19	BLANC, Patricia	III	Y	
20	BLIJLEVENS, Réné	I	A	
21	BOGUSZ, Malgorzata Anna	III	N	
22	BOLAND, Séamus	III	N	
23	BOLLON, Pierre	I	Y	
24	BORSANI, Matteo Carlo	I	Y	
25	BRISHOUAL, Rachel	III	A	
26	BRONIARZ, Wincenty Slawomir	II	A	

27	BRZOBOHATÁ, Zuzana	III	N	
28	BYRNE, Peter	I	Y	
29	CABRA DE LUNA, Miguel Ángel	III	Y	
30	CALDERONE, Marina Elvira	III	N	
31	CALISTRU, Elena-Alexandra	III	A	
32	CAÑO AGUILAR, Isabel	II	N	
33	CATSAMBIS, Constantine	I	Y	
34	CHAMPAS, Panagiotis	III	Y	
35	CHARRY, Philippe	II	Y	DESIANO, Carole
36	CHOIX, Bruno	I	Y	
37	CLEVER, Peter	I	Y	HEMMERLING, Udo
38	COMER, John	III	Y	
39	CORAZZA, Chiara	III	Y	
40	COULON, Pierre Jean	II	Y	
41	COUMONT, Raymond	II	Y	
42	CSER, Ágnes	III	Y	
43	DE FELIPE LEHTONEN, Helena	I	Y	
44	DE LEEUW, Rudy	II	N	ULENS, Miranda
45	DE LOTTO, Pietro Francesco	I	Y	
46	DE MELLO, Vasco	I	Y	
47	DE MÛELENAERE, Robert	I	Y	
48	DEGUARA, Jason	II	N	
49	DEL RIO, Cinzia	II	N	
50	DESTOM, Joël	III	Y	
51	DIAMANTOUROS, Konstantinos	I	Y	
52	DIMITRIADOU, Stavroula	II	N	
53	DIRX, Jan	III	N	NEISINGH, Ody
54	DOZ ORRIT, Javier	II	Y	
55	DROBINSKI-WEIß, Elvira	III	N	
56	DUFEK, Bohumír	II	Y	
57	DULEVSKI, Lalko	III	N	
58	DUTTO, Diego	III	N	
59	EDELÉNYI, András	I	Y	

60	FELSZEGHI, Sára	II	Y	
61	FORNEA, Dumitru	II	Y	
62	GARAT PÉREZ, Francisco Javier	III	Y	
63	GARCÍA DEL RIEGO, Antonio	I	Y	SABATINI, Giovanni
64	GARCÍA SALGADO, Manuel	II	Y	
65	GARDIAS, Dorota	II	Y	
66	GAVRILOVS, Vitalijs	I	Y	
67	GEISEN, Norbert	III	Y	
68	GKOFAS, Panagiotis	III	Y	
69	GOBINŠ, Andris	III	N	
70	GONDARD-ARGENTI, Marie-Françoise	I	Y	
71	GRABO, Louise	III	Y	KILIM, Irma
72	HÄGGLUND, Sam	II	A	
73	HÄGGMAN, Maria	II	A	
74	HAJNOŠ, Miroslav	II	Y	
75	HAUKANÕMM, Monika	III	N	
76	HEALY, Joe	III	Y	
77	HERNÁNDEZ BATALLER, Bernardo	III	N	
78	HOFFMANN, Reiner Gerd	II	N	
79	HOLST, Sif	III	A	
80	IOANNIDIS, Athanasios	III	Y	
81	IZVERNICEANU DE LA IGLESIA, Ileana	III	N	
82	JAHIER, Luca	III	N	
83	JOHANSSON, Benny	II	A	
84	JONUŠKA, Alfredas	I	Y	
85	JOÓ, Kinga	III	Y	
86	JUODKAITE, Dovile	III	N	
87	KÁLLAY, Piroska	II	A	
88	KATTNIG, Thomas	II	N	BUZEK, Tanja
89	KIUKAS, Vertti	III	Y	
90	KLIMEK, Jan	I	Y	
91	KOKALOV, Ivan	II	Y	

92	KOLBE, Rudolf	III	N	
93	KOLYVAS, Ioannis	III	N	
94	KOMORÓCZKI, István	I	Y	
95	KONTKANEN, Mira-Maria	I	Y	
96	KOUTSIOUMPELIS, Stavros	II	Y	
97	KROPIL, Rudolf	III	Y	
98	KROPP, Thomas	I	Y	GERSTEIN, Antje
99	KRUPAVICIENE, Kristina	II	Y	
100	KÜKEDI, Zsolt	III	Y	
101	KUNYSZ, Maciej Dawid	III	A	
102	LADEFOGED, Anders	I	Y	
103	LE BRETON, Marie-Pierre	I	Y	
104	LEFÈVRE, Christophe	II	Y	
105	LEITANE, Katrina	III	A	
106	LOBO XAVIER, Gonçalo	I	A	
107	LOHAN, Cillian	III	N	
108	LUSTENHOUWER, Colin	I	N	
109	MACHYNA, Emil	II	Y	
110	MADSEN, Niels	I	Y	
111	MALLIA, Stefano	I	Y	
112	MANOLOV, Dimitar	II	Y	
113	MARCHIORI, Alberto	I	Y	
114	MARIN, Florian	II	N	
115	MARTINOVIC DŽAMONJA, Dragica	I	Y	
116	MASCIA, Sandro	I	Y	
117	MASTANTUONO, Alena	I	Y	LEMCKE, Freya
118	MATSAS, Andreas	II	Y	
119	MAVROMMATIS, Manthos	I	Y	
120	MEDINA, Felipe	I	Y	
121	MENSI, Maurizio	III	A	
122	MERLO, Nicoletta	II	Y	
123	MESKER, August Pierre	I	N	
124	MEYNENT, Denis	II	N	

125	MILTOVICA, Baiba	III	Y	
126	MINCHEVA, Mariya	I	Y	PANGL, Andreas
127	MIRA, Luís	I	Y	
128	MISSLBECK-WINBERG, Christiane	I	Y	
129	MITOV, Veselin	II	Y	
130	MONE, Andrea	II	A	
131	MOOS, Christian	III	A	
132	MORENO DÍAZ, José Antonio	II	A	
133	MORKIS, Gintaras	I	Y	
134	MOSTACCIO, Alessandro	III	N	
135	MURESAN, Marinel Danu?	I	Y	
136	MURGUÍA ESTEVE, Aitor	II	N	
137	NIKOLOPOULOU, Maria	II	N	
138	NIKOLOV, Bogomil	III	N	
139	NOWACKI, Marcin	I	Y	
140	NYGREN, Ellen	II	A	
141	OCHEDZAN, Justyna Kalina	III	A	
142	O'CONNOR, Jack	II	A	
143	ÖNGÖRUR, Berivan	II	A	
144	OSTROWSKI, Krzysztof	I	A	
145	PADURE, Decebal-Ștefăniță	I	Y	HAUNERT, Nora
146	PAIDAS, Ioannis	II	Y	
147	PALMIERI, Stefano	II	A	
148	PARTHIE, Sandra	I	A	
149	PATER, Krzysztof	III	Y	
150	PAVIĆ-ROGOŠIĆ, Lidija	III	A	
151	PENTTINEN, Markus	II	Y	
152	PETRAITIENE, Irena	II	Y	
153	PIETKIEWICZ, Janusz	I	Y	
154	PILAWSKI, Lech	I	Y	
155	PLOSCEANU, Aurel Laurentiu	I	N	
156	POCIVAVŠEK, Jakob Krištof	II	A	
157	POPELKOVÁ, Hana	II	Y	VAN KELLE, Lottie

158	POTTIER, Jean-Michel	I	Y	
159	POTYRALA, Dariusz Miroslaw	II	Y	
160	PREDA, Bogdan	I	Y	VUORI, Timo
161	PROUZET, Emilie	I	Y	
162	PUECH d'ALISSAC, Arnold	I	Y	
163	PUXEU ROCAMORA, Josep	I	Y	
164	QUAREZ, Christophe	II	Y	
165	RAMMO, Alari	III	Y	
166	RAVNIK, Branko	III	Y	
167	REALE, Maurizio	I	Y	
168	REDING, Jean-Claude	II	N	
169	REISECKER, Sophia	II	A	RUSU, Sabin
170	RELIC, Danko	III	A	
171	REPANŠEK, Neža	III	N	
172	RIBBE, Lutz	III	N	
173	RISTELÄ, Pekka	II	A	
174	ROBYNS, Wautier	I	Y	
175	ROCHE RAMO, José Manuel	III	N	
176	RÖPKE, Oliver	II	N	KLUGE, Norbert
177	SAKAROVÁ, Dana	II	Y	
178	SALIS-MADINIER, Franca	II	N	
179	SAMMUT BONNICI, Dolores	I	A	
180	SCHAFFENRATH, Martin Josef	III	N	
181	SCHLÜTER, Bernd	III	A	
182	SCHMIDT, Peter	II	N	
183	SCHWARTZ, Arnaud	III	N	
184	SCHWENG, Christa	I	A	
185	SERRA ARIAS, Ricardo	III	Y	
186	SIBIAN, Ionut	III	N	
187	SILVA, Carlos	II	N	
188	SILVA, Francisco	III	N	
189	SILVA, João	II	N	
190	SINKEVICIUTE, Elena	III	Y	

191	SIPKO, Juraj	III	A	
192	ŠIRHALOVÁ, Martina	I	Y	
193	SMOLE, Jože	I	N	
194	SÕBER, Kristi	I	Y	
195	SOETE, Paul	I	Y	
196	STOEV, Georgi	I	Y	
197	STUDNICNÁ, Lucie	II	A	MILIĆEVIĆ-PEZELJ, Anica
198	SÜLE, Katalin Elza	I	Y	
199	SVENTEK, David	I	Y	
200	SZALAY, Anton	II	Y	
201	SZYMANSKI, Mateusz	II	Y	
202	TCHOUKANOV, Stoyan	III	N	
203	TEDER, Reet	I	Y	MAJETIĆ, Davor
204	THURNER, Andreas	III	N	
205	TIAINEN, Simo	III	Y	
206	TOPOLÁNSZKY, Ákos	III	A	
207	TRINDADE, Carlos Manuel	II	N	MAURICIO DE CARVALHO, Fernando
208	TUPILUȘI , Tudorel	III	Y	
209	TZOTZE-LANARA, Zoe	II	N	
210	ULGIATI, Luigi	Non-insc	Y	
211	UNGERMAN, Jaroslav	Non-insc.	Y	
212	VADÁSZ, Borbála	I	Y	
213	VARDAKASTANIS, Ioannis	III	N	
214	VASK, Kaia	II	Y	
215	VERNICOS, George	I	Y	
216	VIIES, Mare	II	Y	
217	VILARES DIOGO, Edgar	III	N	
218	VON BROCKDORFF, Philip	II	N	
219	VORBACH, Judith	II	N	
220	VYYRYLÄINEN, Tiina	III	Y	
221	WAGENER, Marco	II	N	WOLFF, Romain
222	WAGNSONNER, Thomas	II	N	

223	WILLEMS, Heiko	I	Y	
224	WILLEMS, Marie Josiane	III	A	
225	WRÓBLEWSKI, Tomasz Andrzej	I	Y	
226	WYCKMANS, Ferdinand	II	N	
227	YIAPANIS, Anastasis	III	Y	
228	YILDIRIM, Ozlem	II	Y	
229	YLIKARJULA, Janica	I	Y	
230	ZARINA, Katrina	I	Y	
231	ZIELENIECKI, Marcin Antoni	II	Y	
232	ZORKO, Andrej	II	N	
233	ZVOLSKÁ, Marie	I	Y	HARTMAN RADOVÁ, Jana
234	ZYCH, Tymoteusz Adam	III	N	