EERA's statement on the European Energy Crisis and Clean Energy Transition

EERA Secretariat
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In autumn 2021, the EU has been going through an energy crisis due to a dramatic energy prices surge. As per November 2021, gas prices in Europe are five times higher than a year ago[1]. Coal prices have followed a similar evolution. Simultaneously with these fuel price surges, electricity prices in Europe hit their record highs reaching more than € 200 per MWh in some countries[2] which is around five times higher than average electricity price in the EU a year ago[3].

The European Energy Research Alliance (EERA) puts forward its position regarding the energy prices' surge in Europe which has resulted in energy bills becoming unaffordable for many households and challenged economic activity across the bloc, especially for energy intensive sectors.

The scale of the evolving energy crisis has triggered a multitude of statements, many of which have no factual foundation and are highly inaccurate and misleading on the root causes of the observed energy price surge[4]. In this period of intensifying speculations on the future of energy, it is more than ever essential to provide a transparent analysis based on scientific evidence and established facts.

This document presents EERA's position on the current energy prices crisis in Europe and refutes the arguments that clean energy transition caused the current energy crisis in Europe.

1. Supply and demand of fossil fuels

Data shows that fossil fuels price spike is the main trigger of the current energy crisis[5] in Europe. There are several main factors explaining this situation which relate to both energy demand and energy supply. After the historical global economic slowdown caused by the Covid-19 crisis, the energy demand has recently

[1] https://www.theice.com/products/27996665/Dutch-TTF-Gas-Futures/data?marketId=5303640&span=2
[2] https://www.energylive.cloud/
[3] https://institutdelors.eu/wp-content/uploads/2021/10/PB_211006_Prix-de-lenergie_Nguyen-Pellerin-Carlin_EN.pdf
[4] See, for example: https://www.bloomberg.com/news/articles/2021-09-29/energy-crunch-fuels-calls-for-rethink-of-eu-green-shift-design; https://www.politico.eu/article/soaring-power-prices-anxiety-eu-climate-plans/; https://www.forbes.com/sites/arielcohen/2021/10/14/europes-self-inflicted-energy-crisis/
[5] https://www.iea.org/commentaries/what-is-behind-soaring-energy-prices-and-what-happens-next

rebounded as a result of a sharp economic recovery across many world regions6. The economic recovery in Asia alone lead to a considerable increase of the global gas demand in the region which then echoed as a gas supply shortage in Europe. The magnitude of gas demand increase was higher than expected also due to low gas storages in many major economies including China and the EU7. Cold autumn was an additional factor causing energy demand increase particularly in Europe.

At the same time with energy demand increase, the energy supply side responded slower and with the less capacity than was expected, caused by diverse disruptions such as unplanned outages due to maintenance activities8. In addition, investments in oil and gas infrastructures have also declined last year, notably as a consequence of growing investment uncertainty9, that led to supply side being less flexible in responding to rapid demand increases.

The higher prices on gas and other fossil fuels have driven higher power generation costs. The latter were additionally affected by an increase of the European carbon prices under the European Emissions Trading Scheme (ETS). It is worth mentioning, however, that the ETS price increase, which has been increasing since 2017 – only interrupted by the pandemic – and reaching € 62 per ton in September 202110, can only be accounted for a maximum of 20% of the total electricity price increase in Europe11.

Taken together, these factors explain the exceptional magnitude of the energy prices spike observed this autumn. However, there are other, more structural causes of the energy crisis in Europe which are essentially related to the design of the European energy system.

2. EU fossil fuel dependency

Notwithstanding the historical magnitude of the latest energy price spike, the fossil fuel prices surge that Europe experiences today is not a unique phenomenon. There is abundant historical evidence that fossil fuels prices are highly volatile[12]. Therefore, economies that are strongly dependent on fossil fuels, especially imported ones, are particularly vulnerable to such volatility. The EU is one of such economies.

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[6] https://www.iea.org/reports/global-energy-review-2021/economic-impacts-of-covid-19

[7] https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/050520-china-likely-to-miss-2020-gas-storage-targets-amid-covid-19-incomplete-reforms; https://www.reuters.com/business/energy/cusp-europes-winter-season-gas-storage-hits-10-yr-low-2021-09-22/

[8] https://www.iea.org/commentaries/what-is-behind-soaring-energy-prices-and-what-happens-next, https://www.iea.org/news/statement-on-recent-developments-in-natural-gas-and-electricity-markets

[9] https://www.iea.org/reports/world-energy-investment-2020/key-findings

[10] https://ember-climate.org/data/, https://ember-climate.org/data/

[11] https://institutdelors.eu/wp-content/uploads/2021/10/PB_211006_Prix-de-lenergie_Nguyen-Pellerin-Carlin_EN.pdf

[12] https://ec.europa.eu/energy/sites/ener/files/report_on_energy_prices_and_costs_in_europe_com_2020_951.pdf, https://www.eia.gov/finance/markets/crudeoil/spot_prices.php

Despite the efforts to drive the clean energy transition, with nearly all new capacity additions in the EU now being renewable technologies, the EU economy remains highly dependent on imported fossil fuels.

In 2019, in the EU primary energy demand, a share of renewable energy was only 15,3%, while fossil fuels accounted for more than 70% of the energy mix (Fig. 1).

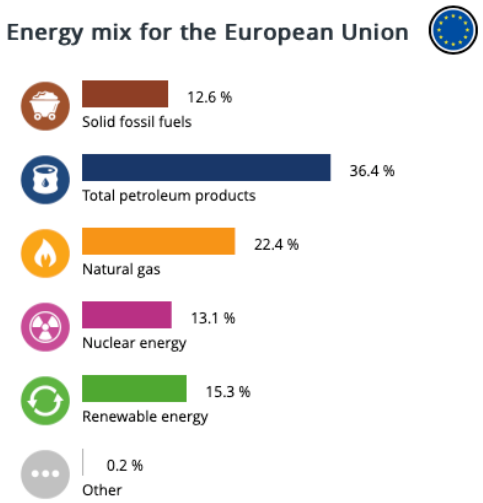

Figure 1. *Total energy demand by source in the EU, 2019*

At the same time, in the EU primary energy production, renewable energy occupies the top position. In 2019, the share of renewable energy in the in mix was 36,5% (Fig. 2) followed by 32% of nuclear energy and 28% of fossil fuels.

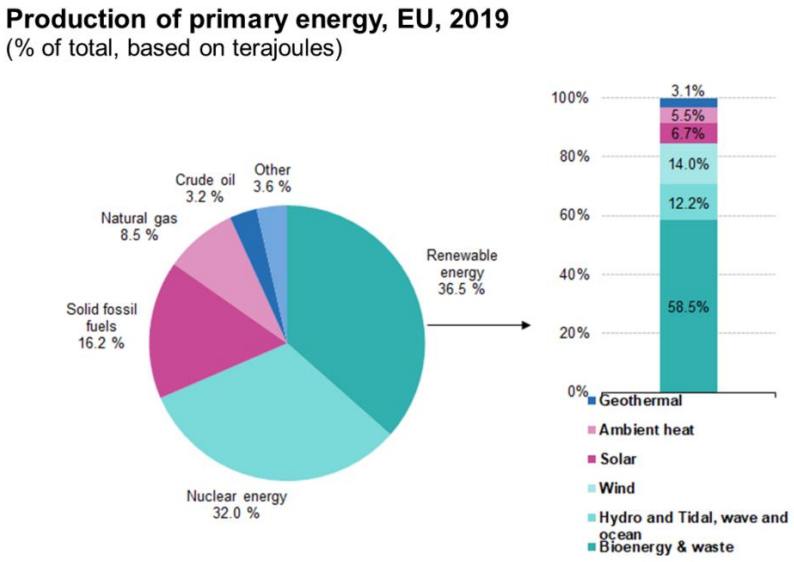

Figure 2. *Primary energy production by fuel in the EU, 2019*

During the last decade, the share of renewables in the EU primary energy production has been continuously growing. However, this growth happened simultaneously with the decrease of the overall primary energy production and thus could only partially offset the energy needs in the EU. Overall, in 2009-2019, total EU primary energy production has decreased by 8%, with natural gas production decreasing by almost 50%, crude oil and solid fossil fuels – by 33-35%, and nuclear energy – by 7% (Fig. 3).

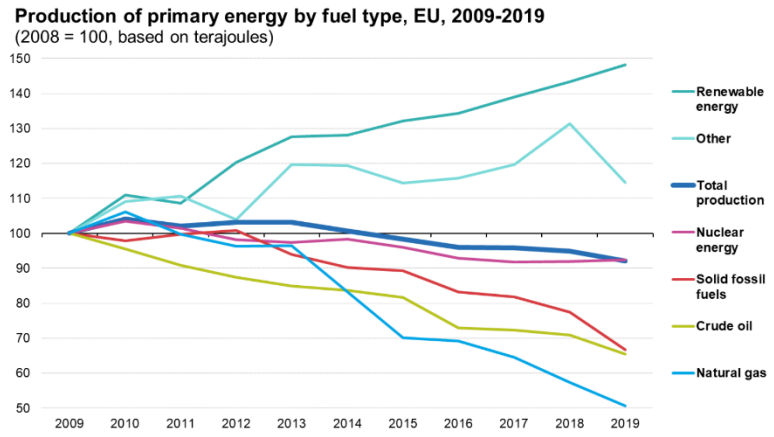

Figure 3. *Production of primary energy by fuel type in the EU, 2009-2019*

In terms of the absolute amount of energy produced in the EU, it is far from covering the bloc's energy demand, and most of the energy consumed in the EU is imported. Against a backdrop of decreasing domestic energy production and increasing energy needs, the EU fossil fuel dependency has been increasing during the last decade (Fig. 4). **In 2019, net energy dependency in the EU reached 60.6%, the highest level for the last 30 years[13].** The import dependency is particularly remarkable with highest rates ever recorded for crude oil (around 97 %) and for natural gas (90 %).

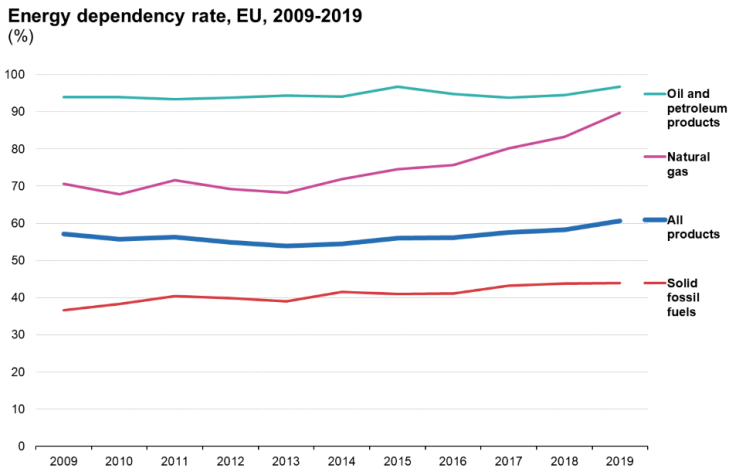

Figure 4. *EU Energy dependency by fuels, 2009-2019*

[13] https://ec.europa.eu/energy/sites/default/files/state_of_the_energy_union_report_2021.pdf

One more factor making the EU energy system even more vulnerable is the fact that a high proportion of the energy imports is covered by very few countries, among which Russia is the main supplier of crude oil, natural gas and solid fossil fuels. **As for 2019, 45% of all EU gas was imported from Russia (Fig. 5).**

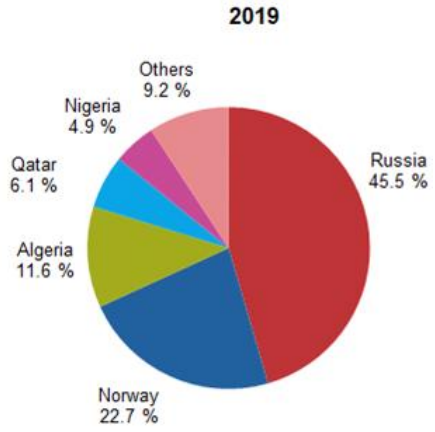

Figure 5. *Imports of natural gas by partner, EU, 2019*

3. Role of fossil fuel price in the EU electricity pricing

Electricity pricing mechanism in the EU is based on a complex combination of drivers which need to be understood in the context of the EU electricity market. Additionally, when it comes to the price of electricity for households, electricity generation cost accounts for only about 35% of the retail price, the rest being network costs, taxes and fees[14].

The EU member states have considerable differences in their energy mixes[15]. **However, electricity prices across the block are dependent on the overall EU electricity generation mix which accounts for 42.8% of conventional thermal power generation (Fig. 4).** Therefore, even in countries such as France – where cheaper nuclear power provides about 70% of electricity – conventional thermal power generation prices are still driving the electricity price.

[14] https://documents.acer.europa.eu/en/The_agency/Organisation/Documents/Energy%20Prices_Final.pdf

[15] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Electricity_production_by_source,_2019_(%25).png

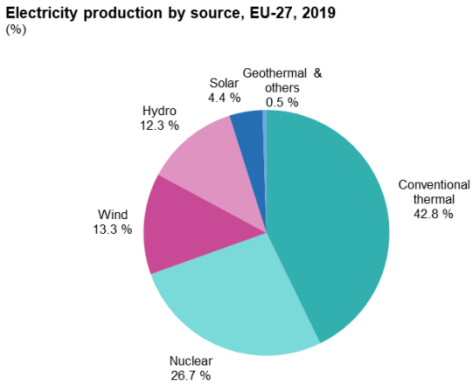

Figure 6. *EU Power mix in 2019 (Ref 16)*

The mechanism responsible for a high correlation between electricity and fossil fuel prices in the EU is called a "marginal pricing method" also known as "pay as clear method"[16].

All electricity producers use their true generation costs but are paid the same price for the electricity they produce depending on the final market clearing price, provided their bid fall under this price. Figure 5 illustrates how this mechanism works and how the most expensive type of power generation used to meet electricity demand determines the final price of electricity.

Renewable power generation technologies are usually characterized by high initial capital investment (CAPEX) and low operations costs (OPEX) due to no fuel costs. In contrast, fossil-fuel-based power general is associated with higher OPEX due to high fuel costs. Currently, in the EU, gas is used to ensure that enough energy is supplied to meet electricity demand and to guarantee the needed system flexibility to accommodate intermittent renewables. **Therefore, in the situation of high electricity demand, it is gas and coal prices, not renewables' prices, that define the electricity price in the EU.** This explains why, in the EU, the gas price surge led to the electricity price increase[17].

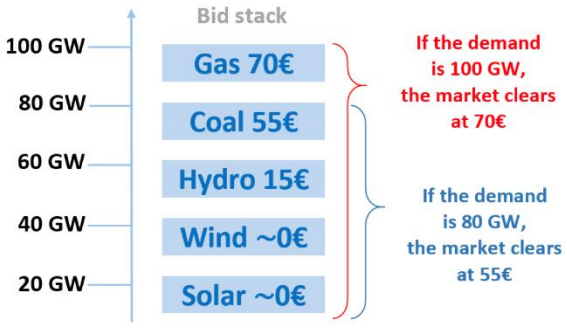

Figure 7. *EU Marginal Pricing model (Ref 17)*

[16] ACER, October 2021: https://documents.acer.europa.eu/en/The_agency/Organisation/Documents/Energy%20Prices_Final.pdf
[17] https://documents.acer.europa.eu/en/The_agency/Organisation/Documents/Energy%20Prices_Final.pdf

4. Clean energy transition as a solution to the energy crisis

Against this background, the strategic priority for Europe to avoid similar crises in the future must be to address their structural causes, i.e., reducing EU Member States' dependency on both domestic and imported fossil fuels.

The clean energy transition, materialized by the accelerated replacement of fossil-based generation assets by renewable and/or low-carbon energy technologies, is therefore the core strategy for the EU to move away from fossil fuel dependency, toward a more secure, resilient, predictable and clean energy system and economy.

In this regard, EERA supports the *"Toolbox for action and support for tackling rising energy prices"* released by the European Commission[18], which enshrines the clean energy transition as the main shield against the current and future energy crises.

However, if the clean energy transition constitutes the structural response to avoid energy crisis, its implementation is anticipated to span over the coming three decades. Considering the magnitude of the unfolding energy crisis, short-term temporary measures need also be implemented to avoid the damaging consequences for more fragile households and economic sectors.

EERA furthermore supports the European Commission's suggestion to prioritize, in the short-term, combating energy poverty and supporting vulnerable groups of energy consumers most affected by energy prices' fluctuations. **High energy prices together with low incomes and low-quality housing constitute the main causes of energy poverty affecting millions of people in Europe[19].** Multiple evidence already suggests that the clean energy transition combined with implementing energy efficiency measures – is the best way to address the root causes of energy poverty[20].

To solve the European energy crisis of today and to design effective policies helping prevent similar ones in the future, it is crucial that EU policymakers, experts and research community provide full transparency on the main causes of the energy prices surge.

Blaming the clean energy transition for triggering the energy prices increase is highly misleading and contradicts available evidence.

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[18] https://ec.europa.eu/commission/presscorner/detail/en/fs_21_5213

[19] https://coebank.org/media/documents/CEB_Study_Energy_Poverty_in_Europe.pdf,

[20] See, for example: https://coebank.org/media/documents/CEB_Study_Energy_Poverty_in_Europe.pdf, https://enr-network.org/wp-content/uploads/EnR-Possition-Paper-Energy-poverty-2017.pdf, https://op.europa.eu/en/publication-detail/-/publication/4a440cf0-b5f5-11ea-bb7a-01aa75ed71a1/language-en, https://friendsoftheearth.eu/wp-content/uploads/2019/03/european_energy_poverty_index-eepi_en.pdf

In this context, EERA supports the EU in the continuous work towards reaching the goals of the European Green Deal[21] and Fit For 55 package[22] in the most efficient and fastest way possible.

If anything, what the current energy crisis highlights is that the clean energy transition in Europe is not happening at the required speed and needs to be strongly accelerated.

To this end, and in line with the policy recommendations of the EERA White paper on the Clean Energy Transition[23], EERA calls for dramatically scaling up investments in research and innovation of low carbon energy technologies across the entire TRL scale, as well as for accelerating their market deployment.

As the largest clean energy research community in Europe, EERA commits to deliver research and innovation excellence to achieve a climate-neutral, socially fair, competitive and sustainable society in Europe by 2050.

[21] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
[22] https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541
[23] EERA White Paper on the Clean Energy Transition: https://mailchi.mp/eera-set/clean-energy-transition