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EUROPEAN ENERGY CRISIS: THE PROBLEM IS NOT THE DESIGN OF THE ELECTRICITY MARKET, BUT BUREAUCRATIC OBSTACLES

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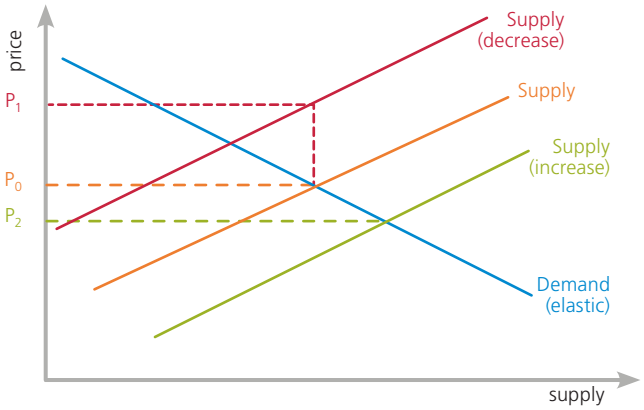
There is an extensive political discussion around whether the design of the electricity market in Europe is outdated. But in a market that, from an economic perspective, follows a clear framework and the generally valid rules of the scarcity of goods, a one-dimensional view leads to doubtful conclusions. If a functioning market is brought to a standstill by curbing the expansion of supply and the reactions to this are artificial market interventions, the basic idea of the market economy is taken ad absurdum. In this context, self-reflection can be doubted, since reactions to these distortions add up and, as a result, create complexity and uncertainty. This results in a counterproductive rationale for action.

By way of introduction, it should be noted that this article is to be understood as a sober but economically sound input for thought. The war in Ukraine following the global pandemic creates a unique and exceptional situation in which social solidarity, especially with vulnerable sections of the population, is essential. This is achievable due to the competitive advantages of renewable technologies and through the willingness of investors and operators of renewable energies to take solidary social responsibility. Nevertheless, short-term measures, seemingly legitimised by the circumstances, must not counteract long-term strategic orientations by eliminating price signals from the market. After the proposal of the EU Commission to introduce a "clawback mechanism" on revenues above 180 EUR/MWh for inframarginal technologies (including renewables) integration into national law is of fundamental importance for the economic development of the European energy supply.

Paradoxically, the public and political debate on renewable energies has turned away from the perspective of the enormous costs of the energy transition, to the assumption that "extremely cheap" electricity producers make disproportionate profits due to market design, which bear no relation to the entrepreneurial risk taken. This change of perspective, however, would attribute profits to a future-oriented, strategic business orientation, also affected by inflation. Rising commodity prices lead to an approximate one third increase in construction costs for wind and solar plants. Furthermore, it has to be recognised that high proportions of renewable energy generation are hedged via long-term private power purchase agreements (PPAs). The prices for these PPAs tend to be significantly lower than day-ahead market prices. The fact is that the development of energy production costs is not considered in the aforementioned abrupt change of perspective. Meanwhile, action focused on exceptional framework conditions lacks reconsideration and reorientation.

Even the basic models of economic theory are able to illustrate the impact of increased renewable electricity generation.



As the chart illustrates, the demand for electricity is far more elastic in the longer term than often assumed. The potential inherent in energy efficiency measures opens up savings of up to 70 % in widespread applications (e. g. lighting and IT systems). However, price signals are decisive for implementation. This means that when electricity costs are high, the incentives to save energy increase significantly and these reduce demand. In this context, it becomes clear that price signals that arise in the market play a key role in adapting to a new reality.

The intersection with supply results in the equilibrium quantity (demand coverage) on the market as well as the corresponding price P_0. A shortage of supply accordingly leads to significantly higher prices. Since demand cannot be reduced at very short notice, the new price P_1 results in the market model. An expansion of supply through renewable energies would counteract this or theoretically bring about a new market equilibrium at price P_2.

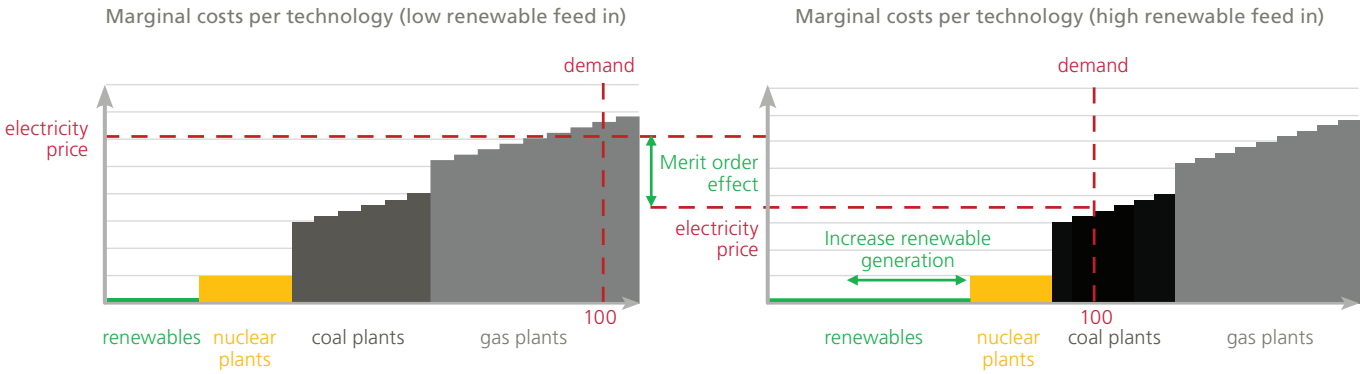
Furthermore, the existing marginal cost approach is the most effective way of allocating resources. Also based on economic theory, in a perfect market, assuming full competition and no barriers to market entry, the price is aligned with the variable costs (marginal costs) of production. In electricity markets, these costs are constantly monitored by regulatory bodies.

The existing merit order market design combines these theoretical foundations and thus enables efficient and market-based pricing.

Today's price peaks are the result of a severe supply shock, i.e. an extreme shortage of gas, and the market has reacted with the price determination described above. The massive price jump can furthermore be explained by the EU's enormous dependence on a single supplier. Also on the basis of market theory, Russia was able to use its quasi-monopoly position and the market power that comes from that to dictate prices in the EU and on the world market.

A high production of wind power and solar PV and correspondingly lower prices in hours with a high feed-in of renewable energies also shows the desired effect, i.e. supply expansion leading to significantly lower prices. This so-called merit order effect transfers the interaction of demand and supply to the electricity market.

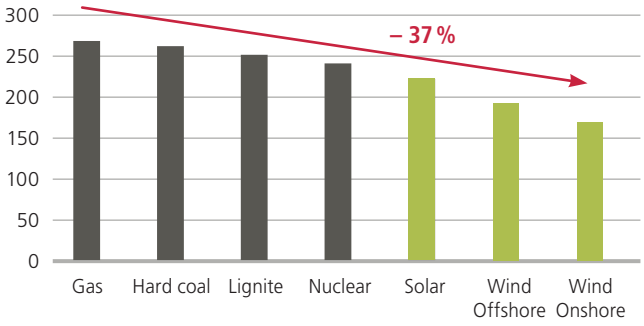
Merit order effect (constant demand)[1]



The chart above illustrates current market design and pricing. It can be seen that an expansion of renewable energy generation results in a desired price reduction (merit order effect). However, instead of pushing the massive expansion of renewable energies in the past and thus forcing expensive power plants out of the market, a safety net was put in place by means of new gas-fired power plants to meet the politically set deadlines for phasing out coal and nuclear power. The best proof of this is that gas and nuclear power plants receive a green label within the EU taxonomy if they replace coal-fired power plants. This double structure has made the energy transition more expensive and increased our dependence on gas.

The example of Germany – representative of the entire EU – shows the functionality of the market design that results from the price differences between conventional and renewable energy sources.

Captured rates Germany Day-ahead-market Jan-Aug 2022 (EUR/MWh)

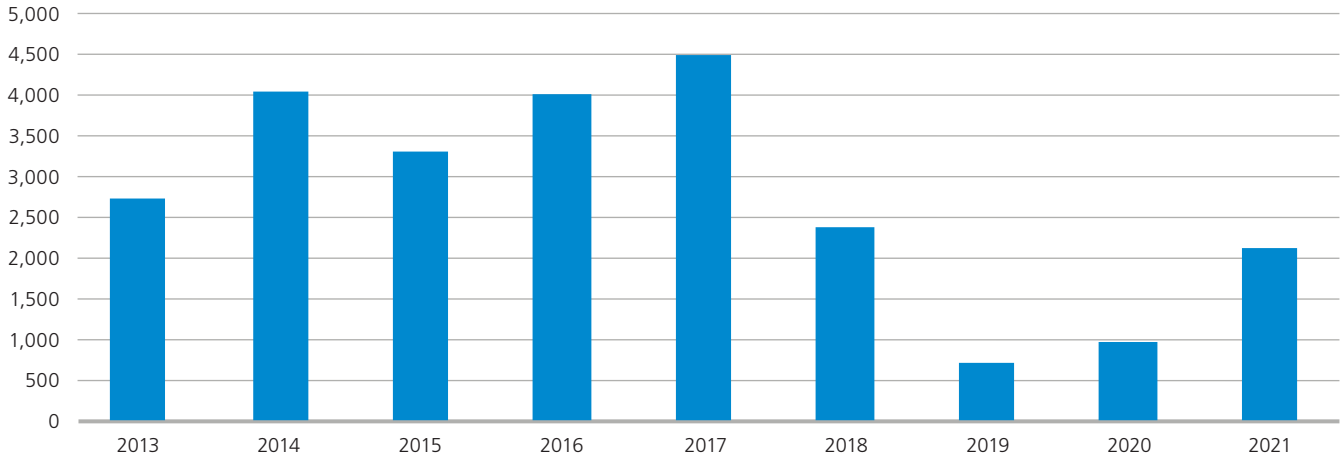


The chart shows, based on current market data[2], the realised revenues of different generation technologies, under simplified assumptions. Based on exchange trading, the significantly lower prices that renewable technologies offer in private long-term power purchase agreements are not taken into account. The chart therefore in no way shows the profits available for clawbacks but, on the contrary, the price reduction achieved for consumers resulting from the feed-in of renewable energies. In absolute terms, this results in cost reductions of around EUR 5 billion and EUR 8 billion respectively from wind energy and solar PV in Germany alone.

[1] Aquila Capital Research illustrative (2022)
[2] Aquila Capital Research based on data of ENTSO-E Transparency (2022)

In the long term, the market design is geared towards passing on these competitive advantages to consumers, but the bottleneck lies in the growth of renewable energies and, thus, in the necessary expansion of the electricity supply. Due to considerable bureaucratic shackles, there are massive hurdles to the way out of the crisis. With approval processes for wind power plants taking eight to ten years, Europe remains stuck in its current dilemma.

Germany Onshore Wind (MW) Additions



The example of Germany shows the consequences of this development. After a boom in wind power up to 2017, the expansion collapsed[3]. Owing to the loss of European solar cell production, wind turbine manufacturers are now also under massive pressure. In accordance with political objectives, they have significantly expanded their capacities to meet anticipated demand and are currently making large losses. This means that the EU runs the risk of becoming dependent on Chinese production in this sector as well.

This development must be reversed, as only then will we have a way out of the crisis and the most economically sensible development of Europe's energy supply. The hitherto half-hearted transformation on the basis of available, cheap gas must face up to a new reality. Phasing out coal and, to some extent, nuclear power was easy as long as gas-fired power plants could be relied on as a back-up solution. But due to its scarce availability, which is unlikely to change significantly in the medium term, gas is too valuable, i.e. it is not available at competitive prices. The EU is thus at a historic crossroads. Now there is an opportunity to use the comparative advantages of European countries based on different climate regions in an Energy Union.

The price-dampening effect that wind and solar energy, above all, are already having, remains unnoticed in the current debate. **But the fact that renewable technologies are the only remaining options to finance fossil fuel needs and financial transfers to vulnerable households and businesses illustrates their economic significance.** In countries representing nearly 60 % of the world's population and two thirds of global energy production, the construction of new wind and solar PV plants is already cheaper than paying the running costs of existing fossil power plants.

[3] *Bloomberg New Energy Finance (2022)*

It should also be noted that this competitive advantage has existed since 2019 and is therefore not the result of the current price spikes for fossil fuels.

The fundamental problem lies not in market design but in too little energy supply. The market is proving to be functional. Prices are set according to the simple relationship between supply and demand. Although there is no doubt that the current environment requires support for vulnerable groups of consumers, it is crucial to choose any intervention in the form of windfall profit taxes, price caps or similar measures in a very wise and strongly temporarily limited way.

Morally correct activism instead of economic rationality coupled with nationalistic autarky thinking must give way to the integration of Europe's energy markets and a return to basic market principles. Only via the expansion of renewable energies will it be possible to reduce the costs of electricity generation in the long term. This would mean financial relief for all the citizens of Europe, including those who are currently suffering particular hardship from increased energy prices.

The realisation of the energy transition through a united Europe with an integrated energy market and a coordinated EU external energy policy is an economically efficient and ecologically valuable alternative. With an appropriate expansion of renewable energies, an integrated European energy market can ensure security of supply and also energy affordability in the long term.

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