Electricity Market Design Reform

– The Belgian steel sector emphasizes the need to structurally reform the electricity market design to secure affordable and reliable supply of low carbon electricity –

The Belgian steel sector, a highly electro-intensive industry, sees the reform of the electricity market design as an essential piece of the new European energy framework. For our sector, securing a reliable and affordable electricity supply is of critical importance. This requires significant and structural changes to the current market design.

The Belgian steel industry: short overview

- It is our ambition to significantly reduce the CO_2 footprint by 2030 and to come to climate neutral steel production by 2050.

- With 10 steel mills, producing a wide variety of steel products, Belgium is at the heart of the European steel industry. N°5 steel producer in Europe; N°1 for stainless steel.

- Production routes:

  4 factories are using the electric arc route to produce crude steel. 1 factory is using the blast furnace route and is preparing for a 'Direct Reduced Iron' (DRI) installation. This will be a key element in its roadmap to decarbonisation.

- The Belgian steel sector uses a significant amount of steel scrap.

  Steel scrap is 100% reusable without loss of quality. It is an essential part of our decarbonization route and the development of the circular economy.

- The Belgian steel sector is a very energy-intensive sector.

  The total annual electricity consumption is ± 4.000 GWh and the total annual gas use is ± 6.000 GWh. The consumption of electricity is expected to increase significantly in the near future, as a result of the technology shift towards climate neutral steel production.

- Steel production requires large amounts of electricity, particularly during certain stages of the production process. As the electricity consumption profile is not constant over time, the steel industry can be considered a non-flat electricity consumer.

The Challenges:

- Steel is traded on an international scale with fierce price competition between producers. Imports from non-EU-origin have increased to record levels with about 25% of market share (and higher carbon footprint).

- The cost of steel production in Belgium is strongly affected by high energy prices, high labour costs and by the increasing carbon pricing. The level playing field between EU/Belgian producers and non-EU producers, but also between Belgian producers and their EU competitors, is therefore heavily disturbed.

- ❑ The need for low carbon electricity will grow significantly in the Belgian steel sector as we continue to develop and implement our climate roadmaps and invest in low CO_2 technologies.

- ❑ Implementing large-scale and mandatory demand side flexibility in the steel sector would lead to substantial productivity loss, severe competitive disadvantages, and high-pressure working environment.

- ❑ Power Purchase Agreements (PPAs) with renewable assets are less suitable for the steel sector given the intermittence of most renewable power sources and the limited operational flexibility of steel plants.

Our needs and requests:

- ❑ Provide full access to cost-competitive and low carbon electricity for energy-intensive industries in general and for the steel sector in particular.

- ❑ Conduct a comprehensive assessment of alternative electricity market designs, with particular emphasis on pricing mechanisms.

- ❑ Implement short- and long-term measures to reduce and stabilize electricity prices for energy-intensive industries. Following measures should be particularly analysed for implementation:
  - Short-term measure: a temporary price shock absorber mechanism ('the Eurometaux proposal')[1]
  - Long-term measure: Two-way Contract for Differences [2]

- ❑ Adopt a unified European approach for the electricity market and energy policymaking, by introducing structural measures allowing to reduce and stabilize electricity prices (including appropriate revision of pricing mechanisms and supporting investment in adequate low carbon power generation capacities) rather than by encouraging a State aid race among Member States which would only create more distortions within the European Union and eventually lead to the dislocation of the European single market.

[1] https://eurometaux.eu/media/1yulgwkd/eurometaux-electricity-market-reform-recommendations.pdf
[2] Both measures are discussed in the text below.

Electricity Market Design Reform

– Challenges and considerations from the Belgian steel sector –

As Europe explores the reform of its existing electricity market design, several interesting proposals and strategies have emerged. The Belgian steel industry seeks to contribute to the debate by highlighting the challenges and needs of our sector. The energy-intensive nature of steel production renders it particularly vulnerable to energy price fluctuations, which has significant impact on our competitiveness. **Essentially, we want to emphasize the absolute necessity for energy-intensive industries to have access to a cost-competitive and reliable supply of low carbon electricity.**

The European steel industry is a vital component of the green transition (as an example, a single windmill can require about 120 tonnes of steel per MW of capacity), but it faces significant economic challenges due to high production costs and intense competition from outside the EU. Steel is an essential material for many products and services, including solar panels, wind turbines, pipelines, hydrogen storage, and grid infrastructure in the energy sector. To ensure the viability of the steel industry and other critical sectors, we must not rely on untargeted handouts. Instead, we need to develop a robust, low-carbon European energy system that supports sustainable industrial development and reduces reliance on external markets.

We see the reform of the electricity market design as an essential piece of the puzzle and urge all stakeholders to embrace an open-minded approach and contribute to the solutions that will secure energy supply and affordability for all. By doing so, we can create a thriving society in Europe, where locally manufactured goods play a vital role in building the green future, we all desire.

Reform of the current electricity market model

In the last decades, natural gas has emerged as a central player in Europe's energy landscape. It holds a crucial position as a source of heating, transportation fuel, industrial feedstock, and electricity generation. The importance of natural gas and the influence of its price over electricity prices has been further increased by the growing share of renewable electricity supply: because of the intermittent nature of solar and wind power, flexible generation capacities must be able to take over when there is not enough wind or solar power. In practice, this flexibility can be mainly provided by gas turbines, which means that the electricity price is more and more often determined by the costs of natural gas.

The Russian aggression against Ukraine and the weaponization of natural gas supplies have led to intolerably high natural gas and electricity prices in the course of 2022 and clearly highlighted the need for a new energy strategy for the European Union.

The reform of the current electricity market design is a first and essential step in this new narrative. The exorbitant cost of natural gas has severely impacted electricity prices, putting unwanted pressure on much needed electrification to become climate neutral and undermining competitivity of energy intensive industries. The energy crisis has created a significant disadvantage for European industries on the global stage, as non-EU countries are capable of producing at much lower costs.

In the coming years, we expect natural gas prices to remain both considerably higher than in prior years and highly volatile due to the increasingly unstable global geopolitical environment. Moreover, the foreseen elevation of carbon taxation in Europe will add further costs to natural gas consumed in the EU, even if Europe eventually regains access to reliable natural gas supplies.

As there is no credible alternative in the short or medium term to natural gas in order to provide the flexible and dispatchable power generation required for the stability of the electricity system, alternative pricing mechanisms should be considered that decouple the volatile prices of natural gas from other power generation methods. We strongly support rapid measures that can bring immediate relief to electro-intensive industries. The European steel industry plays a crucial role in securing the future welfare and independence of Europe, and it is essential that they receive support today. There have been numerous proposals from various stakeholders to mitigate the high electricity prices and encourage investments in new production capacity. We insist on careful consideration of these propositions as the urgency is just as significant in the short-term as it is in the long-term.

In the short-term context, we strongly support the 'Eurometaux proposal', which outlines a system to split algorithmically the market in two tiers (90% / 10%) and apply to the upper part of the merit order into a pay-as-bid model. The resulting price would thus be an average of the price paid for the first 90% (which price being determined by the supply-demand equilibrium price corresponding to 90% of the overall demand) and of the pay-as-bid prices paid for the rest of the demand. This system aims to mitigate the impact of fossil fuel prices on the final price, promoting resilience to economic and industrial shocks. It achieves this without introducing unnecessary complexity or opacity in the mechanisms used to collect and redistribute energy sector surplus revenues to final customers.

In the broader context, we encourage the European Commission to take an open approach to all proposals that can help replace the role of natural gas in the European energy system without jeopardizing our climate ambitions. We fully support a strong deployment of renewable energy but are stressing on their intermittent characteristics – it is thus critical to find solutions that foster the development in the medium-term of flexible low-carbon production capacity whilst at the same time avoiding the detrimental impacts in terms of high and volatile prices of the current system, where flexibility is mainly provided by power production based on natural gas.

Demand side flexibility has its limits

While we support the increasing use of renewable energy in Europe, we are cautious about relying strongly on energy storage and demand side flexibility to address fluctuations in availability. Energy storage facilities face limitations in terms of capacity and lifespan, and there will be a significant number of critical materials needed. We must consider these limitations in our approach.

Demand side flexibility, which allows customers to adjust their energy consumption based on the availability of renewable energy, has been suggested by many as a solution to balance the energy grid. When combined with energy storage, it is seen as a key factor in ensuring a stable power system. However, this approach also has its drawbacks.

The electric arc furnace route is an important production method for crude steel that provides steelmakers with some demand side flexibility. In Belgium, factories using this route take into account the availability of affordable electricity when scheduling production, which allows them to somewhat adjust their production time for cost-effectiveness. These factories also collaborate with grid operators to shut down activities when necessary to maintain grid security. However, the flexibility provided by this production method has its limitations, both in terms of productivity and the social impacts on workers: a model that would require to stop or restart operations of a steel plant at very short notice, depending on highly volatile conditions of the electricity market, is of course not manageable from an industrial perspective and would result in a major deterioration of our sector's competitiveness versus its non-EU competitors.

For the steel sector, demand side flexibility measures are problematic for the long-term viability of our activities, especially if made obligatory: we would be like an athlete confronted with small running shoes and forced by the coach to curl up his toes to run the marathon, uncertain even of the right to participate in the marathon! This is not the way to go. Not only are we, already today, impacted by much higher production prices than our competitors outside the EU, but the foresight of long periods of limited production times is one too many on the list of challenges. Furthermore, the lower production capacities for certain periods will impact our customer relations and limit our productivity and will entice our customers to find alternative (i.e., non-EU) suppliers. Even in times of high availability of cheap electricity (in a windy and sunny period), we cannot easily enhance our production: we are limited by the flexibility of our machinery, start-and-stop procedures, planning of operator teams, storage capacities, etc. We also care mostly for a healthy and safe work environment for our steel workers. These flexibility strategies would impose high pressure on the work and live balance of our workers, being summoned depending on the volatile energy system.

In conclusion, while we support the deployment of renewable energy in Europe, we must carefully consider the limitations and potential negative impacts of relying on energy storage and demand side flexibility as the main solutions. A scenario with obligated demand side flexibility would very likely result in a decline of European industrial activities.

A unified approach is needed for Europe

While stressing the unwanted consequences of demand side flexibility, we would like to express our support for a strong interconnected Europe regarding the power system.

Geography plays a crucial role in the effectiveness of renewable energy sources as the amount of energy produced by these sources is impacted by local climate conditions. Without investments in interconnections within the European Union, investments in renewable energy sources may not be as effective in increasing the affordability and reliability of energy supply. Connecting multiple energy grids and allowing for energy to be shared across borders can help regions benefit more from a more diverse energy mix. There is a great need to connect supply and demand within Europe and to address the EU electricity market as a single market.

Regrettably, the current energy crisis has had a negative impact on Europe's unity, with member states adopting their own strategies. In the short term, the national implementations of state aid and price caps have caused major distortions in the EU internal market at a time of high vulnerability on the global stage. The race to more and more state aids cannot and should not be the solution.

We also see that some member states are advocating for smaller bidding zones and energy systems. This would in effect lead to more, not less, barriers to the intra-EU electricity trading, and thus to an overall less efficient energy sector. The proper way forward is not to go for smaller bidding zones but – on the contrary – to strongly develop interconnection capacities and remove existing obstacles to trading that exist in some of the national bidding zones.

A unified approach in the electricity market and policymaking is imperative for the European Union to effectively address the current challenges and secure a sustainable energy future. This will ensure the efficient and effective implementation of renewables, leading to increased energy security and affordability for all member states. It will also facilitate the integration of new technologies and promote innovation in the energy sector. By working together towards a common goal, the EU will be better equipped to tackle the challenges and realize its ambitions in the energy sector.

Long-term contracts alone are not enough to mitigate high electricity prices

Even with high prices dominating our markets, we have seen many stakeholders oppose to any substantial reform of the current pricing mechanism. Given the reluctance by many to reform the current pricing mechanism, long-term contracts have been proposed as the solution for high prices.

Despite being presented in many proposals as the solution to deliver stable and affordable electricity prices, there have been in practice significant obstacles that have slowed down or prevented a considerable development of long-term contracts between electricity suppliers and electro-intensive suppliers such as ourselves. **To address this issue, it is essential to implement comprehensive and consistent long-term energy policies that can provide stability and predictability in the market and lower risks for both suppliers and consumers. This would encourage new long-term commitments and lead to more favourable electricity pricing negotiations for the European industry.**

Power Purchase Agreements (PPAs) have been receiving much attention in this context. Despite recent efforts to make it easier for industries to participate in PPAs, when it comes to renewable PPAs for the steel sector, this may not be the most optimal solution to obtain lower electricity prices. This is primarily due to the intermittent nature of renewable energy sources, which can result in gaps in energy generation at times when it would be needed for our industrial operations. The steel sector cannot fully and/or easily align its production schemes to the intermittent generation profile of renewable assets. When there is no production from the PPA asset, the consumer or producer may be forced to source electricity from the spot market or another contract. **These significant gaps in energy generation result in additional costs and make PPAs with renewable assets less suitable for obtaining an affordable price for the entire consumption of the consumer.**

Contract for Difference (CfD) mechanisms offer a promising solution to increasing new electricity capacity and minimizing costs to society. These mechanisms are attractive due to their two-way nature and selection modalities. **To maximize the benefits for energy-intensive industries, it is crucial to ensure transparency in the operation of CfD mechanisms. Even so, the industrial consumers should be able to purchase electricity at the agreed CfD price from the public counterpart of electricity producers.** Furthermore, to ensure a fair and accessible development of CfD mechanisms across all member states, tendering at a European level should be considered. This approach prevents national budget differences from impacting the deployment of CfD mechanisms and allow for wider adoption.

Long-term contracts are important tools to stabilize prices and encourage investments. Nonetheless, it is equally critical to acknowledge the need for a predictable energy policy framework that fosters trust among both consumers and producers. This trust, in turn, enables long-term engagements with cost-based prices, benefiting all stakeholders.

Conclusion

In summary, the Belgian steel industry places a significant emphasis on the critical need to access cost-competitive and low carbon electricity, both for energy-intensive industries as a whole and for the steel sector in particular. This is a fundamental requirement to maintain the competitiveness of the Belgian steel industry and support the implementation of its decarbonization roadmaps.

In order to achieve the main goal of accessing cost-competitive and low carbon electricity, we strongly recommend conducting a thorough assessment of alternative electricity market designs, with a particular emphasis on price formation and the implementation of short- and long-term measures to lower electricity prices to competitive levels and secure appropriate investments in flexible low carbon electricity production capacities. We also firmly believe that adopting a unified European approach to the reform of the electricity market design and energy policymaking in general will enable us to fully leverage the benefits of a low carbon energy system, while also preventing internal competition among member states.

GSV-Steelbel is the Belgian federation dedicated to supporting the steel industry. We assist Belgian steel manufacturers in a variety of domains by providing market insights and tracking policy developments. Additionally, we represent the steel sector in discussions and negotiations with government officials and other important stakeholders, including environmental organizations and labour unions. Our goal is to enhance the competitiveness of our member companies and promote the growth and success of the entire Belgian steel industry.