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DISCUSSION PAPER

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A REGULATORY FRAMEWORK FOR CO_2-LEAN STEEL PRODUCED IN EUROPE

With supportive conditions in place, notably a regulatory framework and infrastructures, the European steel industry will be enabled and be fully committed to contributing to the achievement of the EU's long-term climate objectives. We would be enabled to developing, upscaling and rolling-out of new technologies that could reduce our sector's CO_2 emissions by 2050 by at least 80 to 95% compared to 1990 levels.

The steel sectors in other regions of the world will follow this path, if the EU demonstrates that the decarbonisation of the sector is possible without it losing competitiveness or market share as a result of CO_2 abatement cost. This is of particular importance for the protection of the earth' climate because global steel production represents a significant share – about 7% – of the world's anthropogenic CO_2 emissions. World steel production is even forecasted to grow from 1.7 billion tonnes in 2018 to 2.8 billion tonnes in 2050. It is also unlikely that steel scrap could satisfy global steel demand before the end of the century. It is therefore essential that both primary and secondary steel production are being advanced by the EU to meet the climate objectives.

The Commission's Strategic Vision "A Clean Planet for all" indicates that deep CO_2 emissions reductions in the steel sector are possible through a combination of technological pathways, including steel recycling, carbon capture utilisation and storage, process integration, and electricity/hydrogen-based metallurgy. At the same time, the Commission document confirms that the steel sector is the most exposed to carbon leakage among all energy intensive industries, both in terms of possible impact on output and on investment.

The transformation of the steel industry will require significant investment in the technologies required to decarbonise while the sector needs to remain competitive throughout the entire transition and beyond. External factors not directly controlled by the industry will play a crucial role, most importantly access to CO_2-low energy/electricity and feedstock, as well as CO_2 storage capacity, where available, at affordable prices. The EU steel industry will require yearly about 400 TWh of CO_2-free electricity in 2050 (including for the production and use of hydrogen); this corresponds to more than seven times its actual electricity purchase from the grid.

It is obvious that the EU needs to develop as soon as possible a comprehensive policy framework that delivers on the climate objectives and preserves the competitiveness of its industrial basis, in particular in the energy intensive industries exposed to international competition such as steel. Considering the additional time required for technology uptake and deployment, **it is essential that most promising breakthrough technologies are tested and implemented at industrial scale as soon as possible in the coming decade**. In this regard, it is important to understand that EU steel producers face not only the compliance costs of the EU ETS (29 €/t CO_2 in July 2019), but the full abatement costs, which include the costs to develop and/or implement the breakthrough technologies at industrial scale and increased operational cost, notably for CO_2-low energy. These operational costs can be more than ten times the current compliance cost per ton of CO_2 abated. Todays' steel markets will not tolerate respective cost pass-through and therefore an overall legal

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framework needs to address both issues. The most relevant elements in this respect are technology development, energy supply and investment.

- Public financial **support for implementation of CO_2-low production technologies, R&D into breakthrough technologies and up-scaling** of these to industrial demonstrators, including through the adaptation of EU state aid rules where necessary, will remain crucial. The new technologies will require around 50 to 60 billion € investment and will result in capital and operating costs between 80 and 120 billion € per year. The price per tonne of primary steel will increase by 35% to up to 100%.[1] This challenge can be overcome only if private capital is supported with a consistent and coordinated framework of public funding opportunities at EU, national and regional level.

- Availability and large supply of CO_2-low or CO_2-neutral energy vectors (mainly electricity and hydrogen) at affordable costs is also a necessary pre-condition for the successful transformation of the steel sector. This mandates the existence of a respective energy market and a timely development of adequate infrastructure, notably in the fields of electricity, gas, hydrogen, CO_2 transport and storage. For the investment planning a **mapping of the current state and the future requirements of the EU's energy infrastructure** is therefore of utmost importance. This needs to be supported by an appropriate regulatory framework of the energy system.

An **appropriate regulatory framework for EU's energy system**

- contributes to a reliable supply of electricity, gas and hydrogen at competitive costs to the European steel industry in order to deploy breakthrough steelmaking technologies as soon as possible
- leads to a common European hydrogen strategy which relies on national hydrogen strategies but considers in particular cross border energy streams
- enables the transport of hydrogen in former natural gas pipeline systems
- establishes appropriate legislation on hydrogen
- fosters the development of green electricity producing photovoltaic, onshore and offshore wind farms, or hydro power
- ensures the transport of green electricity from the production site also to remote steel plants
- supports the development of electrolysis plants resulting in the scale-up of the production of green hydrogen into the gigawatt range
- enables state aid for adjusting the price of green electricity and hydrogen to an internationally competitive level in a first time in order to provide a reliable and viable cost base for investment decisions in CO_2-lean steel plants. This measure assures that investments are directed to the best available technology in terms of CO_2 reduction and not biased by regional differences in hydrogen availability in start-up phase of a European hydrogen economy.

EU and national financial support schemes for the decarbonisation of industrial installations must be made available at sufficient scale for the entire transition from 2020 to 2050, namely a **de-risking facility** with zero or low-interest loans over very long time periods, CO_2 grants or other forms of "contracts of difference", for example supported by the proposed conversion of the EIB into a climate bank and revenues, e.g. from the EU ETS and Carbon Border Adjustment, as well as national and regional funding.

[1] Updated EUROFER Low-CO_2 Steel Roadmap (2019)

During the first phases of the transition of the EU steel industry towards a climate neutral economy a **supportive regulatory framework** that ensures a level playing field with third countries' competitors is required. A successful transformation of the EU steel industry is a pre-condition for preserving both the environmental integrity of the EU climate policy and industrial competitiveness, since it contributes to reduce emissions at global level while avoiding carbon and investment leakage.

To this purpose, **steel products sold on the EU market, whether produced in the EU or imported from third countries, need to have a similar CO_2 cost constraint**. Today, the EU imports 30 million tonnes of steel which do not face comparable carbon costs and exports around 20 million tonnes bearing the EU's CO_2 cost disadvantages on third country markets. For this reason, the proposal for a **Carbon Border Adjustment** by Commission President elect Ursula von der Leyen is a positive move to improve the regulatory framework and support industries that are willing to decarbonise.

Carbon Border Adjustment

- contributes to a better level playing field between EU products and third countries' competitors;
- is an effective tool of political diplomacy to foster climate ambition in third countries exporting to the EU so that deeper emission reductions are delivered globally;
- can be designed in a non-discriminatory way securing WTO compliance;
- provides additional revenues to the EU that should be fully used for climate measures, e.g. the President-elect's proposal to transform the EIB into a "climate bank" or – at least for a certain transitional period and in accordance with the EU state aid law – to support access to CO_2 neutral energy, in particular hydrogen at competitive conditions;
- must complement existing carbon leakage provisions on free allocation and indirect costs compensation. The combination with existing carbon leakage provisions would keep the border adjustment at a reasonably low level, which will contribute to avoid trade tensions;[2]
- should be set at the level of the EU ETS direct and indirect costs of the least CO_2 efficient products. Producers based in third countries with an equivalent monitoring and reporting system should have the possibility of applying for a company specific assessment that is based on their actual emissions. Their climate contribution at the border would be adjusted accordingly. The EU could adopt "Agreements of Equivalence" with third countries that either join the EU ETS or have identical CO_2 cost constraints for their industry, in which case there will be no border adjustment for products from such countries.
- should apply initially only to few sectors and others could opt in gradually, as proposed by the Commission President elect. Considering the very high carbon leakage exposure of the steel industry, steel should be prioritised. In order to keep the mechanism simple, it could initially apply only to steel finished and semi-finished products such as coils, slabs, plates, bars, billets, etc. The calculation of the adjustment would require data on EU emissions, free allocation, steel production volumes, and the official carbon price.
- should be applied for a transition period until breakthrough technologies reach sufficient market penetration and CO_2-lean products represent a critical mass in the market.

While a border adjustment based on the equivalent direct and indirect ETS costs can be an effective measure in the initial transition phases, a long-term regulatory framework is required for the

[2] Even with the current carbon leakage measures, an average EU producer is exposed to high carbon costs due to different elements: distance from the benchmarks, linear reduction of the benchmark, application of the cross sectoral correction factor, etc. Considering the digressive nature of the carbon leakage measures, such costs will inevitably increase in the future. The border adjustment would ensure that such costs are also applied at the border, while ensuring no overlap with existing carbon leakage measures for the same emissions.

advanced transition phase and the post-transition, i.e. when the breakthrough technologies reach sufficient market penetration and CO_2-lean steel represents a critical mass of the market, but operation costs are still significantly higher than for competitors with CO2-intensive production. At that stage, if the EU sector is successfully decarbonised, its carbon costs cannot be used anymore as a reference for the border measure as it does not capture the full decarbonisation costs, such as capital investment in new technologies and the higher costs of CO_2-low or CO_2-neutral energy vectors (e.g. hydrogen vs. coking coal). Therefore, a different regulatory framework will be required for the long-term, for instance

- **CO2 taxation** (carbon added tax functioning like a VAT) and/or
- **product standards** that do not allow access to products with higher embedded emissions; these standards could also be introduced earlier, if necessary, as soon as low-CO_2 steel represents a critical mass in the market; and
- **supply** of **low-cost** carbon free energy for use in the steel production value chain.

Both taxation and standards have to be based on the actual CO_2 footprint of the product, requiring the development of a proper accounting system, both at EU level and at the border. With the Product Environmental Footprint approach the Commission is already developing a methodology that potentially could be used for calculating the CO_2 footprint. Already in the transition phase – in parallel to Carbon Border Adjustment and EU ETS – it could be introduced gradually as a **CO_2 information declaration requirement** at the retailer. Consumers will be enabled to make informed decisions on the purchase of CO_2 intensive and CO_2-lean products. The accounting needs to be based on the full life-cycle and circularity ("cradle-to-cradle") in order to guarantee the lowest possible CO_2 impact. Once the CO_2 footprint is working properly through the value chain to the retailer, a CO_2 added tax or product standards may be introduced into the system.