

# Key technologies and policy instruments for a climate-neutral industry

Webinar by Wido K. Witecka on 9 April 2020

Question from Adam Koehler

Which specific carbon neutral technologies do you see for the steel industry?

**Answer by Wido K. Witecka:** In the study "Climate-Neutral Industry" we assessed four low-carbon key technologies that have the potential for high amounts of emission reductions in the steel industry: The direct reduction with hydrogen, alkaline iron electrolysis, HIsarna® process in combination with CO<sub>2</sub> capture and storage and CCU of waste gases from integrated blast furnaces. According to our estimates the direct reduction with hydrogen, for example, could reduce the specific emissions compared to conventional steel-making by up to 97 percent.

Question from Sanjeev Kumar

How does CCU in steel reduce overall GHG emissions for the EU?

**Answer by Wido K. Witecka:** According to our estimates the CCU of waste gases from integrated blast furnaces could reduce the specific emissions compared to conventional steelmaking by up to 63 percent, if potential emission reductions in the chemical industry are also taken into account. However, in order to convert these waste gases into valuable chemicals a lot of green hydrogen is needed, which in turn is costly and requires high amounts of renewable energy. Furthermore, our estimates suggest that CO<sub>2</sub> avoidance costs for CCU (231 €/t of CO<sub>2</sub> in 2030; lower bound estimate) will be significantly higher compared to the direct reduction of hydrogen (99 €/t of CO<sub>2</sub> in 2030; lower bound estimate) which also means delivering less CO<sub>2</sub> reduction per ton of green hydrogen used. In light of these considerations,

we do not think that CCU in the steel industry will play a very large role in reducing overall GHG emissions for the EU.

**Question from Nora Wissner**

**What is the current status of any of these proposed policies in the Germany? Have any of these policies been implemented?**

**Answer by Wido K. Witecka:** None of these policies have been implemented in Germany yet. However, border carbon adjustment instruments and circular economy instruments are currently being discussed on the European level as part of the discussion around the Green Deal and the Industrial Strategy. And the idea of Carbon Contracts for Difference is also being discussed in Germany in different stakeholder formats.

**Question from Nikos Turlis**

**How should financial tools like the Carbon CfD be treated under the EU State Aid Rules? Would we need some commonly accepted rules in order to at least establish a level playing field across industries of the same sector in Europe?**

**Answer by Wido K. Witecka:** Yes, if Carbon Contracts for Difference are seen as a viable policy option to create an investment framework for low-carbon technologies, then EU State Aid Guidelines will have to be adapted accordingly. However, the inherent idea of Carbon Contracts for Difference is to allow for a level playing field for new low-carbon technologies with regard to the conventional technologies, as they cover the additional specific cost of the new technology compared to the conventional one. Over-Subsidizing of new low-carbon technologies should thus be avoided (e.g. through CfD auction mechanisms). Yet, some harmonization regarding the level of CfD payments/number of projects for new low-carbon technologies in different member states will likely be required.

Question from Christoph Reißfelder

As a CCfD is only derisking investments in LCBTs by catering for higher OPEX cost compared to conventional technologies, how long should a CCfD run? For carbon leakage protection you mentioned free allocation up to benchmark as a means in your comment on slide 21." Do you think it will be politically possible to ensure free allocation up to benchmark until 2030 and beyond in light of the current discussions surrounding increased ambition in the EU.

**Answer by Wido K. Witecka:** In order to derisk a low-carbon investment the project duration of a CCfD should probably be between 15 and 20 years depending on the design of the instrument. This indeed raises questions regarding the design of the instrument if it were to be coupled with free allocation based on conventional benchmarks as we suggested as one potential design option. The question is whether there will be enough free allowances to ensure carbon leakage protection for the energy-intensive industries, if the EU raises its climate target for 2030 and consequently reduces the cap of the EU ETS. This is a very relevant question that we are currently working on.