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BRIEFING ON THE NECESSITY AND EFFECTIVENESS OF CARBON LEAKAGE MEASURES

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EXECUTIVE SUMMARY

Free allocation forms an important exemption from the EU Emissions Trading System (EU ETS). The system is advocated as an effective tool to protect carbon intensive industrial actors from the threat of carbon leakage which would harm the EU's economy while increasing total emissions because of the exodus of production abroad. The extent of the threat of carbon leakage remains questionable, however, as since the establishment of the EU ETS, the EU has methodically tried to avoid its potential

impacts with free emission allowances. With the current EU ETS reform, this strategy is to be changed and gradually replaced by the Carbon Border Adjustment Mechanism (CBAM). The conflict in Ukraine and the related changes in the EU energy sector will have long term consequences that may overshadow any impact of carbon leakage. Therefore, carbon leakage measures must be made sufficiently flexible for a quickly changing environment.

CARBON LEAKAGE IN A MULTIPOLAR WORLD

A majority of countries in the world representing over 60 % of global CO₂ emissions have proposed policies which should lead them towards net zero goals. They have committed themselves to significantly decreasing their CO₂ emissions. Most of the countries set these goals based on the 2015 Paris Agreement which has been ratified by 193 countries.¹ Although there is a worldwide consensus on the basic goals, the policies that are supposed to lead us towards these goals differ significantly. This manifests in differences in regulations on national and regional levels which impact market dynamics and carbon intensive sectors, especially. The European Union recognizes this as a factor that might lead to "carbon leakage", which is defined as a process during which businesses with high CO₂ emissions are transferred abroad to avoid significant costs to

their operations caused by climate mitigation policies, leading to an overall increase in greenhouse gas emissions.²

EXISTENCE OF CARBON LEAKAGE IS QUESTIONABLE

Studies have tried to assess the phenomenon of carbon leakage using either simulations of proposed policies or econometric analyses of the effects of existing policies. Theoretical simulations mostly conclude that carbon leakage has the potential to reach between 5 and 25 percent across economic sectors.³ This implies that up to 1/4 of the decrease of GHG emissions in the EU would be counteracted by additional emissions in other regions.⁴ Compared to the theoretical simulations, analyses of the effects of the present policies on trade flows between countries inside and outside the EU ETS find very limited evidence for carbon leakage at all.⁵ A widely accepted

¹ Michael Jakob, "Why carbon leakage matters and what can be done against it," *One Earth*, Vol. 4, Issue 5 (2021): Pages 609-614.

² European Commission decision, "determining, pursuant to Directive 2003/87/EC of the European Parliament and of the Council, a list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage," (2009): <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32010D0002>

³ The wide range of the carbon leakage potential is mainly caused by the dependence of the result on the side effects the climate mitigation policies might have on other regions. Frédéric Brangerab, Philippe Quirionac, "Would border carbon adjustments prevent carbon leakage and heavy industry competitiveness losses? Insights from a meta-analysis of recent economic studies." *Ecological Economics*, Vol. 99, (2014): Pages 29-39.

⁴ Helene Naegele, Aleksandar Zaklan, "Does the EU ETS Cause Carbon Leakage in European Manufacturing?" *DIW Berlin*, (2017).

⁵ Frédéric Brangerab, Philippe Quirionac, "Would border carbon adjustments prevent carbon leakage and heavy industry competitiveness losses? Insights from a meta-analysis of recent economic studies," *Ecological Economics*, Vol. 99, (2014): Pages 29-39.

explanation for the limited carbon leakage in the EU is the combination of low-to-moderate carbon prices and generous free allocation between 2005 and 2020.⁶

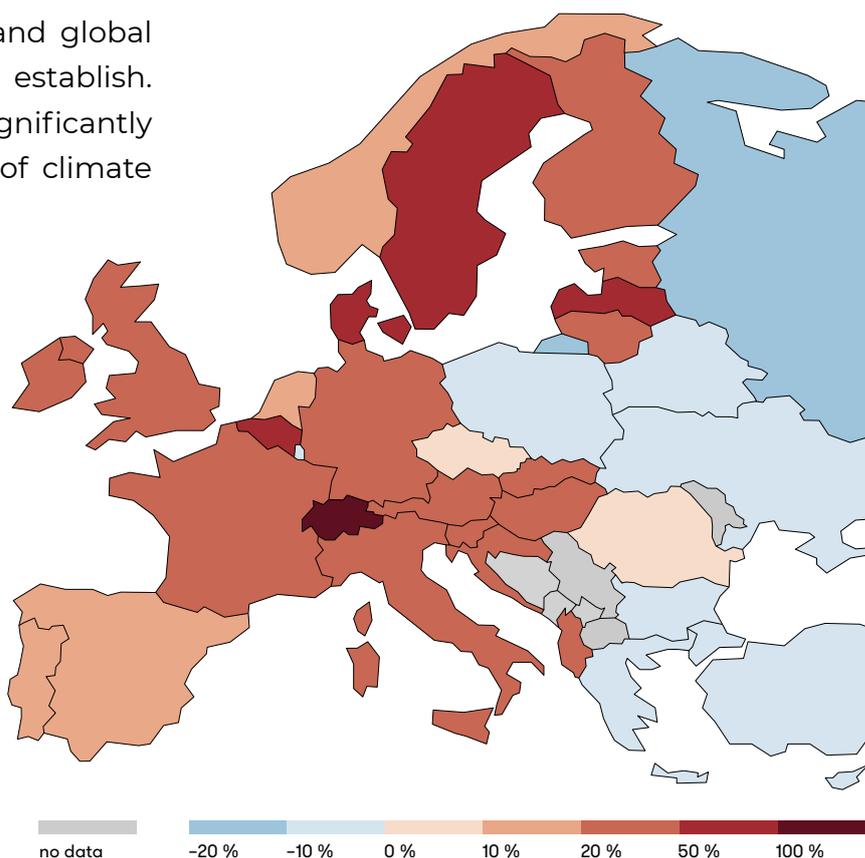
In addition to the above-mentioned direct carbon leakage, there are also indirect effects of carbon limiting policies that significantly influence overall global emissions. In a version of the Jevons paradox, decreasing CO₂ emissions in the EU may lead to a decreased demand for fossil fuels and, subsequently, to a depression of the global energy prices. The reduced energy prices however, may induce an increase of consumption in countries with less restrictive policies, thus leading to an increase in emissions.⁷ Compared to direct carbon leakage, indirect effects are harder to control, influence or even detect. The level of causality between regional policy and global fuel prices is therefore harder to establish. Still, indirect carbon leakage can significantly influence the overall effectiveness of climate mitigation measures.⁸

Even though the effect of carbon leakage is disputed and certainly limited, the threat of it is widely used by lobbyists to push for relief from environmental policies.⁹ It creates the opportunity to present environmental policies as in a direct clash with competitiveness. Consequently, public support for the climate policy can get distorted. Also even though the carbon leakage of heavy industry is disputed, the relocation of power production to

countries around the EU which have less strict regulation is already happening. Many non-EU Western Balkan countries like Bosnia and Herzegovina, Serbia or Montenegro are exporting a lot of electricity from inefficient fossil power generation to EU countries and the trend is growing. A similar situation is observable in other regions bordering the EU as well.¹⁰

To avoid the threat of carbon leakage and maintain the support of industry, two basic mechanisms were established in the EU. First, the system of free allocation which would provide industries at risk of carbon leakage

Map 1: Overall Carbon Emissions Embedded in International Trade, 2020 (emissions exported or imported as a percentage of domestic production emissions)



Hannah Ritchie, Max Roser, "CO₂ Emissions," Our World in Data, (2022): <https://ourworldindata.org/co2-emissions>

6 Stefano F. Verde, "THE IMPACT OF THE EU EMISSIONS TRADING SYSTEM ON COMPETITIVENESS AND CARBON LEAKAGE: THE ECONOMETRIC EVIDENCE," Journal of Economic Surveys, (2020).

7 DG for External Policies of the Union, "Economic assessment of Carbon Leakage and Carbon Border Adjustment," (2020): [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/603501/EXPO_BRI\(2020\)603501_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/603501/EXPO_BRI(2020)603501_EN.pdf)

8 On the other hand, policies leading to the reduction of CO₂ emissions go hand in hand with technological advancements which can spread and cause an overall reduction of emissions. And these effects are also very hard to detect or evaluate.

9 Carbon Market Watch, "Survival Guide to EU Carbon Market Lobby," Carbon Market Watch, (2021): https://carbonmarketwatch.org/wp-content/uploads/2021/06/Survival-guide-to-industry-lobbying_WEB.pdf

10 Chris Roslowe, "The path of least resistance," Ember, (2020): <https://ember-climate.org/app/uploads/2022/02/Ember-Path-of-least-resistance-2020.pdf>

with free carbon permits was implemented. Seeing the flaws in the free allocation system, the Carbon Border Adjustment Mechanism was proposed to rectify the deficiencies of free allocation, setting a carbon charge for materials and products imported to the EU from countries with less restrictive policies.

FREE ALLOCATION AS A STATUS QUO

From its outset, the EU ETS brought about free allocation. The goal of free allocation was to reduce the impact of the new system on companies with high CO₂ emissions in the heavy industry and power sectors and give them time to implement measures that would reduce their footprint. The intention was to gradually decrease the dependency of CO₂ intensive firms on free allocation while not undermining their businesses.

Seventeen years after implementation, power generation has experienced a gradual phase out of free allocation, but 95 % of the industrial emissions in the EU are still covered by free allocation.¹¹ Free allocation has been generously supporting European industry, creating windfall profits of over 50 billion EUR between 2008 and 2019. According to the current EU ETS Directive which is being revised, the EU industrial sector should receive about 6 billion free emission permits from now until 2030.¹² In addition, indirect compensation schemes have been implemented in 11 EU countries to reduce the impact of higher electricity expenses caused by the energy transition. It turns out the additional

help has not increased the beneficiaries' competitiveness. On the contrary, there seems to be a negative correlation between receiving compensation and a company's performance. In terms of turnover, value of total assets and number of employees, companies receiving compensation did on average about 5 % worse than companies with no aid at all.¹³

Years of handing out free permits has created an environment in which the system has almost ceased to motivate heavy industry companies to actively seek opportunities to reduce their emissions footprint.¹⁴ The system also seriously undermines the polluter pays principle when those who cause the pollution do not bear the costs of managing it.¹⁵ Heavy industry does not have to pay for the pollution it creates, in contrast with other economic sectors and even citizens.¹⁶

While the European industrial sector benefits from free allocation, member states and their citizens lose. Foregone revenues due to free allocation which would have been redistributed between member states after auctioning reached in 2021 alone 29.1 billion euros.¹⁷ This money could have been spent on climate action in member states in line with their priorities. According to the ETS directive, at least 50 percent of all auctioning revenues should be recycled and go back into financing climate action. Many countries such as Germany and France use their auctioning revenues for efficiency programs for buildings, while others, such as Portugal, use part of the revenues to

¹¹ Carbon Market Watch, "The Phantom Leakage," Carbon Market Watch, (2021): https://carbonmarketwatch.org/wp-content/uploads/2021/06/Phantom-leakage_WEB.pdf

¹² European Commission, "Revision for phase 4 (2021-2030)," European Commission, (2022): https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/revision-phase-4-2021-2030_en

¹³ Antonella Rita Ferrara, Ludovica Giua, "Indirect cost compensation under the EU ETS: A firm-level analysis," Energy Policy, Vol. 165, (2022).

¹⁴ Life ETX, "EU ETS 101: A beginner's guide to the EU's Emissions Trading System," Emissions Trading Extra Consortium, (2022): https://etxtra.org/wp-content/uploads/2022/03/CMW_EU_ETS_101_guide_v05.pdf

¹⁵ Geert Van Calster, "Interview — Does the polluter pay?" European Environment Agency, (2022): <https://www.eea.europa.eu/signals/signals-2020/articles/interview-does-the-polluter-pay#:~:text=The%20%27polluter%20pays%27%20principle%20is, costs%20of%20the%20people%20affected>

¹⁶ e. g. In Sweden citizens pay the national carbon tax, whereas Swedish industry does not, because the industry participates in the EU ETS and is bound by its rules.

¹⁷ World Wide Fund for Nature, "WHERE DID ALL THE MONEY GO?" WWF, (2022): https://wwf.eu.awsassets.panda.org/downloads/ets_revenues_report_2022_web_final.pdf

finance renewable energy schemes. However in many countries a part of the revenues was also used for fossil fuels subsidies, such as gas and oil boilers.¹⁸

CBAM IS COMING

To address the defects experienced with free allocation, another tool to combat carbon leakage in the free-market environment was developed. It creates a border carbon levy on imported products called the Carbon Border Adjustment Mechanism (CBAM). At the time of writing the mechanism is still being discussed, but it should replace the current system of free allocation in about 10 years. The mechanism creates a system of taxes for imported products and materials to the EU, including electricity. The idea behind CBAM is to create a level environment for local and foreign companies on the domestic market since anything consumed is bound by similar carbon costs. This should limit carbon leakage and make free allocation redundant. CBAM should also stimulate the establishment of similar carbon pricing mechanisms abroad, because EU trading partners will be motivated to avoid the impact of CBAM.

However, CBAM in its core brings several practical problems that could influence its applicability. First is its compatibility with the rules of the World Trade Organisation. It is unclear what form and level of Border Adjustment would start to be in conflict with the non-discriminatory and free trade rules of the WTO, but the proposed allocation of CBAM revenues to the EU budget could strengthen the argument that CBAM is a protectionist

tool breaking WTO rules.¹⁹ Second, Border Adjustment, which is supposed to set the tax level based on a comparison of EU and foreign carbon pricing policy, will require a robust administrative structure capable of analysing the policies of any country in the world in any industrial sector. This can be quite challenging and may explain the EU decision to currently implement CBAM only for selected raw materials and electricity. Third, the potential parallel implementation of CBAM and free allocation may increase the already high windfall profits supporting certain industries and undermine the common goal of CO2 emissions reduction.²⁰

CBAM alone does not level the field for European companies exporting materials abroad. These companies will bear the costs of emitting carbon in the EU while competing with foreign unburdened companies. For this reason, European industry is trying to push for export rebates which would support their export oriented activities, although such measures might be breaking the rules of the World Trade Organisation. The European Parliament proposed an amendment to CBAM which would not create a system of export rebates, but it would maintain free allocation for export-oriented industry instead, albeit with all its current drawbacks.²¹ While CBAM has its problems, it certainly solves many of the issues free allocation has. CBAM has the potential to create a functional system levelling the field for EU and non-EU products while motivating governments in other countries to improve their climate policies.

¹⁸ Isabel Haase, Eike Karola Velten, Harrison Branner, Anna Reyneri, "The use of auctioning revenues from the EU ETS for climate action," Ecologic Institute, (2022): https://etextra.org/wp-content/uploads/2022/07/EcologicInstitute_2022_UseAucRevClimate_FullReport-1.pdf

¹⁹ Carbon Market Watch, "A brief explanation of the Carbon Border Adjustment Mechanism (CBAM)," Carbon Market Watch, (2022): <https://carbonmarketwatch.org/wp-content/uploads/2022/01/a-brief-explanation-of-the-cbam-proposal-1.pdf>

²⁰ George Mörzdorf, "A simple fix for carbon leakage? Assessing the environmental effectiveness of the EU carbon border adjustment," Energy Policy, Vol. 161, (2022).

²¹ European Parliament, "Amendments adopted by the European Parliament on 22 June 2022 on the proposal for a regulation of the European Parliament and of the Council establishing a carbon border adjustment mechanism," European Parliament, (2022): https://www.europarl.europa.eu/doceo/document/TA-9-2022-0248_EN.html

CARBON LEAKAGE IN A NEW ERA

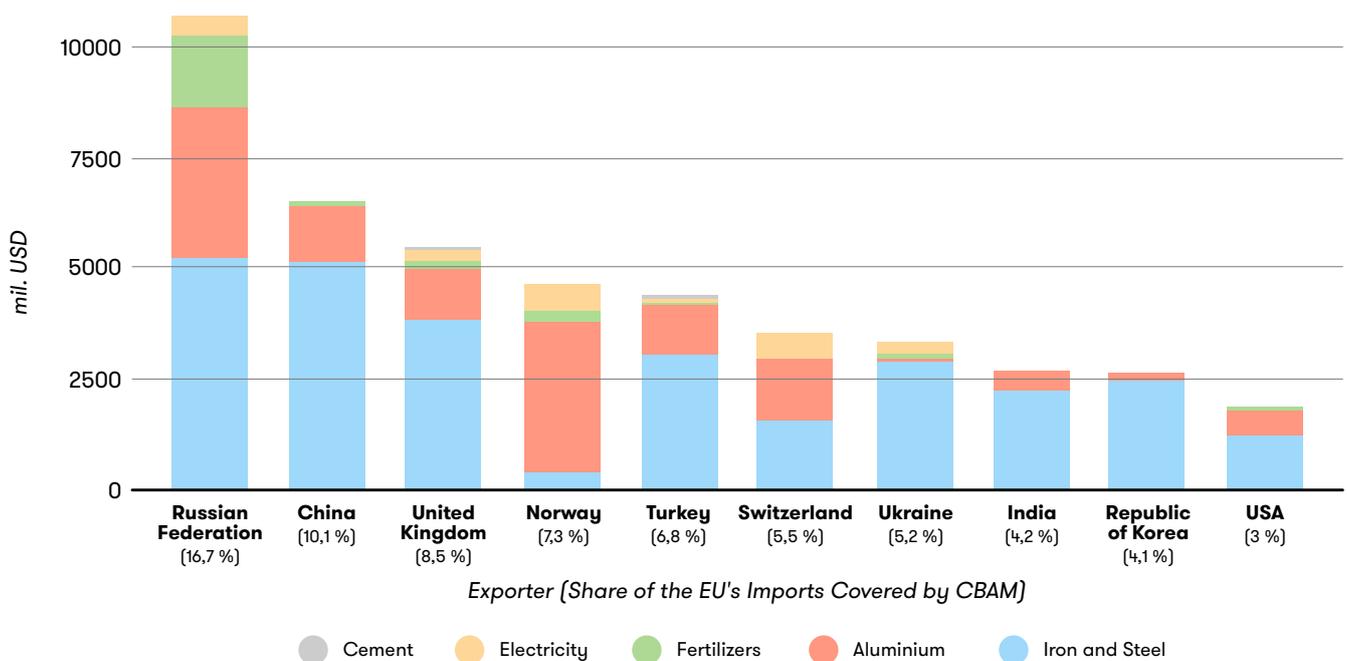
Contemporary developments on the international field and especially the war in Ukraine have changed the potential implications for the system of free allocation and CBAM. The countries commonly associated with carbon leakage potential from the EU are also primary actors in the conflict – the Russian Federation and Ukraine. At the level of trade between Ukraine and the EU before the war, the costs of the proposed CBAM for Ukraine would reach around 1 billion USD annually, mostly burdening the metallurgy sector.²² The war has also brought about a significant change in that Ukraine has received the status of candidate country for EU membership. This should lead to a gradual application of EU legislation to the Ukrainian legal system including regulations, directives and decisions. Therefore, we can expect Ukraine ultimately to implement the EU ETS and become part of

free allocation and CBAM. In contrast, the future trade of the EU with Russia is less clear cut and will be dependent on its relations with EU countries.

So far trade in materials with high carbon leakage potential has not mirrored the development of the international relations between the EU, Russia and Ukraine. For instance, iron exports from Ukraine to the EU have dropped significantly since February due to high utilisation of transportation routes and operations connected to the conflict and the state of emergency. By contrast, exports of a number of iron semi-products from Russia to the EU increased in the first half of 2022. In the case of pig iron, exports doubled to 709 000 tonnes.²³

In some sectors, the impact of high energy prices, if they persist, could be reduced by the implementation of CBAM. The sector which CBAM does not help and the current change in the energy landscape may disadvantage are EU export-oriented companies with higher energy

Top 10 Exporters of Goods Covered by CBAM to the EU-27, Average 2015—2019



²² European Business Association, "Ukrainian exporters to pay more than € 1 billion in carbon tax to the EU under the CBAM," European Business Association, (2022): <https://eba.com.ua/en/ponad-1-mlrd-yevro-podatku-na-vuglets-shhoroku-splachuvatymut-ukrayinski-eksportery-v-yes-v-ramkah-svam/>

²³ Andrii Glushchenko, "EU increased pig iron imports from Russia by 2.5 times y/y in 2Q 2022," GMK Center, (2022): <https://gmk.center/en/infographic/eu-increased-pig-iron-imports-from-russia-by-2-5-times-y-y-in-2q-2022/>

demands. Their comparative disadvantage on foreign markets will persist regardless of CBAM. It is uncertain whether the European Parliament's proposal of free allocation for some manufactured commodities will be implemented, but should it be, it will reopen the door for windfall profits and is not coherent with EU climate goals.

In the fourth EU ETS phase, the main tool for carbon leakage mitigation is still going to be free allocation for heavy industry. Free allocation should be gradually replaced by CBAM in the second half of the 2020s. Compared to the previous version of free allocation, flexibility has been improved to partially reduce heavy industry's huge windfall profits. For instance, the value of benchmarks will be updated twice in the fourth phase to reflect technological development.²⁴ That provides a lot of predictability for producers, but the depth of updates to the benchmark values is still not high enough to keep track of technological progress and the frontrunners in European energy and industry for whom the current benchmark definitions create huge disincentives to invest in decarbonisation.²⁵ Therefore, without any changes, the fourth phase of the EU ETS will continue to bring huge windfall profits for heavy industry.

CONCLUSION

Over one and a half decades of carbon leakage measures in the EU have largely shielded EU industry from having to reduce its emissions. At the same time, free allocation has created huge windfall profits for European heavy industries and violated the polluter pays principle. Prolonging the current system may threaten the climate goals set by the EU for the next two decades.

Reform of the carbon leakage measures in the EU seems to be inevitable. While CBAM will probably become the key measure to avoid carbon leakage in the long term, at least for the fourth phase of the EU ETS, free allocation will remain the main mechanism supporting European companies. The potential parallel application of CBAM and free allocation would create large windfall profits for heavy industry, creating significant comparative advantages for large polluting industries compared to other sectors of the economy in the EU.

There are factors clearly overshadowing the carbon leakage concerns, like the fast changing conditions for European heavy industry with rising energy prices and the uncertainty of positive economic development in the EU. On the other hand, contemporary issues are also having the additional effects such as the decreased export of materials from Ukraine to the EU. Overall, however, evidence suggests that there seems to be only limited traces of carbon leakage from the EU connected to its climate policy and whilst free allocation is an expensive and ineffective tool, it is slowly being replaced by a new system with bigger potential to level the playing field in the EU and influence climate measures abroad.

²⁴ Euromines, "Emissions Trading System (phase IV: 2021 – 2030), Euromines, (2022): <https://www.euromines.org/what-we-do/energy-climate-change/emissions-trading-system-phase-iv-2021-2030>

²⁵ "Open letter: Time to agree on an EU Emissions Trading System (ETS) and a Carbon Border Adjustment Mechanism (CBAM) that work for the climate and support industrial transformation," Carbon Market Watch, (2022): <https://carbonmarketwatch.org/wp-content/uploads/2022/11/Letter-on-ETS-and-CBAM-for-trilogue.pdf>

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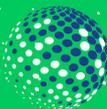
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