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EUROPEAN CLIMATE POLICY GOES GLOBAL

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- **A carbon border adjustment mechanism (CBAM) is a game-changer for global climate policy.** The need for financing the pandemic recovery package has jump-started the process of introducing an EU carbon border adjustment mechanism. In 2021, the European Commission plans to propose a bill for an EU CBAM, with a view to introduce it at the beginning of 2023. This is likely to be a game-changer for global climate policy. With a CBAM, the EU climate policy goes global – and as regulatory superpower, home to the biggest market worldwide, the EU stands a good chance to find some followers.
- **A CBAM is a superior instrument to avoid carbon leakage.** Today, carbon leakage is addressed by a system of free allocation of emissions certificates: The 4th period carbon leakage list includes over 50 sectors receiving free allocations; these amounted to 37% of ETS¹ emissions in 2015 – i.e. more than one third of relevant emissions is not priced. With a CBAM, all CO₂ emissions – including those embedded in imports – can be priced according to the certificate prices in the EU-ETS.
- **A CBAM creates huge costs for sectors, especially for cement, iron and steel and petroleum products.** With the end of the free allocation of certificates, many industries will face significantly higher carbon costs. To identify the sectors heading for a CBAM reality check, we look at the embedded emissions and import and export activities for 50 sectors in the carbon leakage list. Besides the most affected cement, iron and steel, and petroleum products, the next in line are basic chemicals, fertilizers, industrial gases, aluminum and paper.
- **A CBAM should be accompanied by transition measures.** To soften the blow to some industries – not least against the backdrop of the Covid-19 crisis – policymakers should introduce some transition measures. Options include subsidizing transition investments, implementing a ‘blank’ test phase, e.g. with free certificates being allocated to all participants, focusing on ‘test’ sectors like cement and steel and implementing bilateral preferential agreements, which relieve partners from the obligation of bearing the CBAM-related costs.

1 ETS = emission trading systems

CARBON BORDER ADJUSTMENT MECHANISM: NOT IF BUT WHEN

Introducing an EU carbon border adjustment mechanism (CBAM) has been debated for a while, but never made the cut as a complementary climate policy instrument. That changed with the EU Green Deal and the EU recovery plan for the Covid-19 pandemic. A new level of green ambitions combined with the need to generate revenue streams for an augmented EU budget has jump-started the efforts to introduce an EU CBAM. The implications are wide-ranging and go far beyond the shores of the EU: With a CBAM, the EU's climate policy goes global. While negotiations on a global carbon tax or trading system stall, the EU CBAM sets a precedent and might induce other jurisdictions to align their climate policies accordingly. By leveraging its status as the biggest market worldwide, EU regulations stand a good chance of being followed by others, as it happened, for example, with its standards for data protection. The EU is a regulatory superpower. That's why the planned introduction of

a CABM has the potential to be a game-changer in global climate policy. The timeline is ambitious. As a basis for additional own resources, the Commission plans to put forward proposals on a carbon border adjustment mechanism in the beginning of 2021, with a view to their introduction at the beginning of 2023². Depending on its design, a CBAM can complement carbon taxes (CT) and emission trading systems (ETS) in two senses:

- A CBAM supports climate protection by pricing CO₂ emissions that are not priced by CT or ETS and by doing so,
- A CBAM compensates for carbon leakage risks that are caused by CT or ETS, which are only imposed on domestic emissions.

The complementary properties of the CBAM are further explored in Figure A1 in the Appendix (cf. page 16).

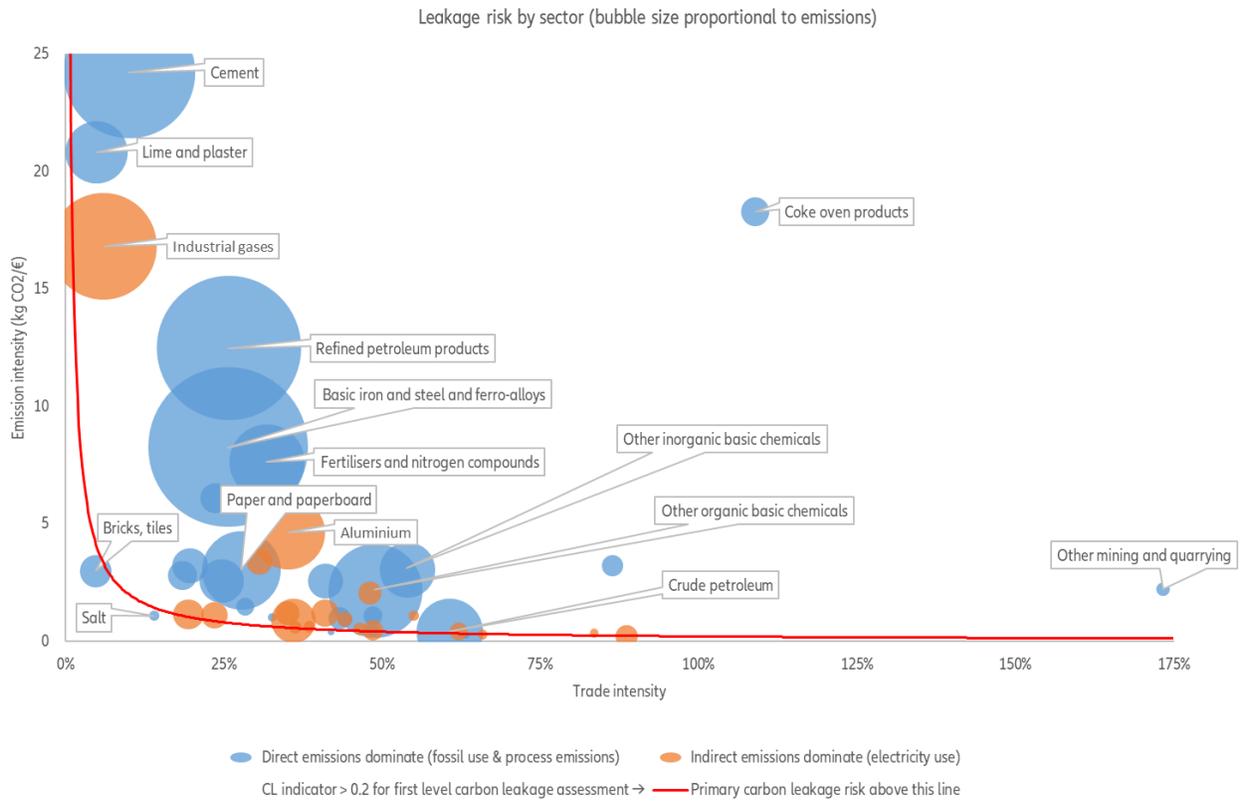
At the moment, companies in the EU receive free EU-ETS certificates if they are within a sector that is included in the carbon leakage list, and

if their carbon leakage indicator is larger than 0.2³, among other criteria. Figure 1 shows the location of the carbon leakage list sectors in the risk space. The size of the bubbles is proportional to the emissions and the color indicates if direct or indirect emissions dominate in the sector. The vertical axis measures the relative exposure to carbon pricing-related costs and the horizontal axis approximates the ability to pass through additional cost to customers. Moving up or right in the diagram increases the risk. The cut-off criterion for the primary leakage risk assessment is indicated by the red line. Salt or bricks have thus been added to the list through further assessment criteria. The sectors with more than 50% of direct emissions (blue bubbles) dominate the diagram.

² Cf. European Council meeting conclusions EUCO 10/20 or COM (2020) 442.

³ A definition of leakage indicators in the 4th trading phase of the EU ETS (2021-2030) can be found in the Appendix A2 or in the impact assessment publication of the European Commission, 15 February 2019.

Figure 1: Location and size of sectors in the leakage risk dimensions diagram



Source: Allianz Research.

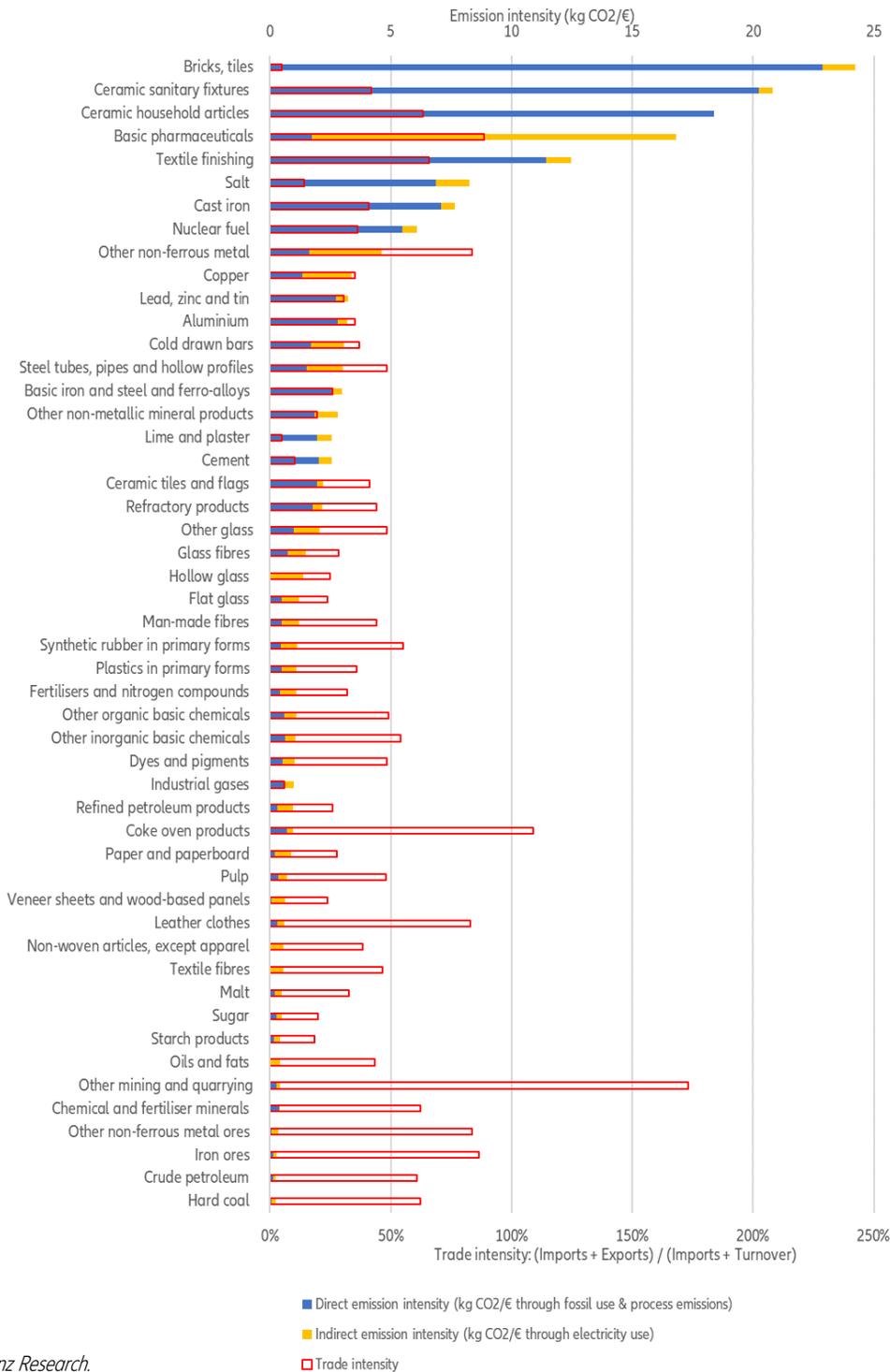


Figure 2 lists the direct and indirect emission intensities as well as the trade intensities for the sectors that are included in the carbon leakage list for the fourth trading period (2021-2030) of

the EU-ETS. Emission intensities and trade intensities are rather uncorrelated. Nevertheless, a sector that is unable to pass through any of the additional costs through carbon pricing is likely to

leak, even if the carbon-related cost share is small.

Figure 2: Trade and emission intensity values by sector



Source: Allianz Research.

WHAT COULD AN EU CBAM LOOK LIKE?

The European Commission's 'Inception Impact Assessment' identifies three fundamentally different options, including 'a carbon tax on selected products – both on imported and domestic products, a new carbon customs duty or tax on imports, or the extension of the EU ETS to imports.'

Let us start with the version of **'a new carbon customs duty or tax on imports'** as this is closest to the original concept of the CBAM in economic research and allows best to illustrate potential elements of a CBAM. To understand the full potential, it is useful to recall the treatment options at a border. The trader of the good receives a reimbursement for the carbon costs that were paid in the originating country and then has to pay the carbon price of the destination country. The net 'payment' is thus the difference, which might well be negative. As seen in Figure 3, the core of the CBAM is the levy on the imports from a 'brown' foreign country, which will have to pay a carbon price on the embedded carbon content (labeled CO₂BROWN) of the imported good. In a textbook setting and comparable to the VAT procedure, the carbon costs that already applied in the originating country should be deducted from the carbon price that is imposed at the border. What makes this instrument particularly attractive for avoiding

carbon leakage is the option to refund carbon cost differences when exporting from the EU to a brown country. A consequent application of this instrument would result in a net levy of EU exports to green countries and net refunds on imports from green countries. While this might not be preferred from a fiscal perspective or from a domestic producer point of view, it would most certainly ensure compliance with WTO regulations that require the equal treatment of countries, and also reduce leakage from those green countries into the EU. A further complication is that a strict implementation of this CBAM variant not only requires the already demanding specification of the embedded carbon content, but also a potentially even more demanding assessment of the embedded carbon costs that have already been paid on the traded good. As messy as the generation of this information might seem, it should be noted that disclosure of this information would certainly have a remarkable value for further climate protection activities and for stakeholders beyond the scope of the fiscal authorities, with NGOs and institutional investors just being two examples.

Another version for a CBAM mentioned by the European Commission is a **'carbon tax on selected products – both on imported and domestic products'**.

Relating to Figure 3, this would basically mean not applying any of the arrows that are labeled with optional. The tax incidence of this instrument also doesn't need to be at the border. It can, for instance, occur at the final user of the good and thus rather relate to the category carbon tax on output. It wouldn't be called a CBAM in the academic economic literature, but would be seen as an output pricing carbon tax, which also includes imported products in its tax base.

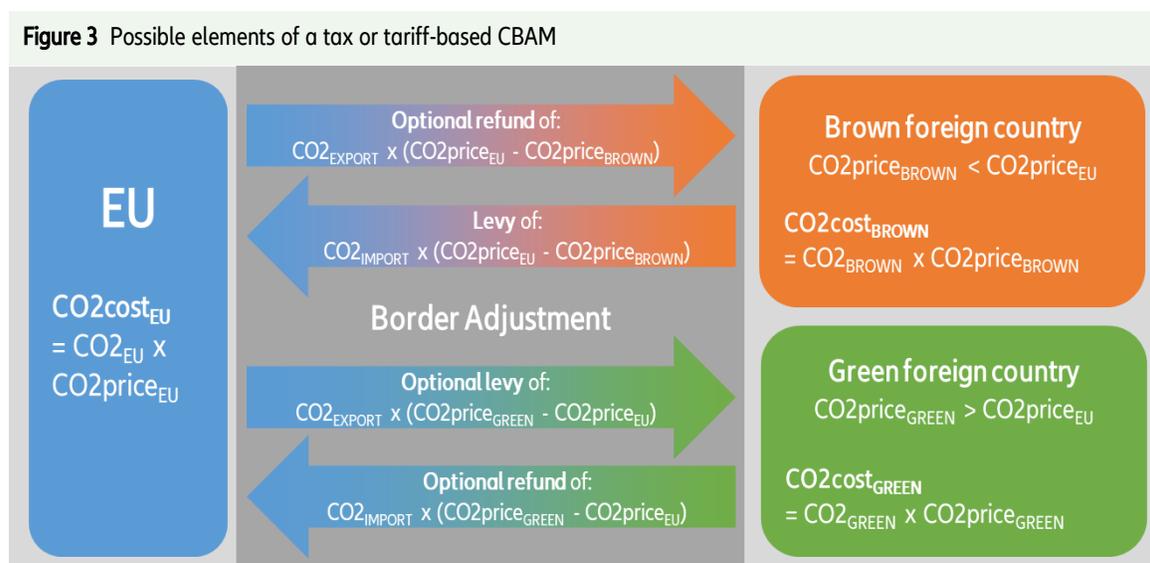
This instrument has been discussed for quite a while and it is puzzling why it is marketed under the label CBAM now, even though it might be valid alternative to a CBAM. The difference from existing taxes is largely that the tax is proportional to the embedded carbon content (labeled CO₂EU and CO₂IMPORT) and not the usual product value, and that it is imposed on intermediate products as well and not only on final consumption goods. The main drawback of this instrument is the inability to reimburse carbon tax payments for exports proportional to how brown the destination country is.

A further variant of the carbon tax on output that is discussed is the so called „consumption charge“⁴. It aims at simplifying the pricing process and ensuring compliance with international agreements by defining product-specific benchmarks, which are then used to price the carbon content. The downside of this approach is that it neither allows to discriminate between particularly brown or green producers, nor does it create a level-playing field for exports. At least the first concern can be partly addressed by choosing sufficiently high benchmarks and allowing companies to opt out of the benchmark pricing in favor of a standardized emission assessment by a legitimate institutional or private provider of such services.

The European Commission also mentions the „**extension of the EU ETS to imports**“ as another CBAM option. As displayed in Figure 4 (cf. page 8), the central element of this version is the

requirement of importers from brown countries to obtain emission certificates for the embedded CO₂ content of the traded good. This option is also the basis for the French proposal within the Commissions ‘Initial Impact Assessment’ for an EU CBAM mechanism, and seems currently the most likely route for implementation⁵: In principle, it is expected that the general requirement of obtaining emission certificates for the goods sold in the EU (independent of their origin) is WTO compliant. Nonetheless, in order to achieve WTO compliance, domestic and foreign producers have to be treated in a non-discriminatory way, which would either require abandoning the free allocation of certificates to domestic producers or implementing a free allocation of certificates to foreign producers. Industry and business associations have already positioned themselves against the first option. The latter one hasn’t emerged in the

discussion yet. It would, if coordinated with the planned phase out of domestic free allocations, at least result in the also requested slow and gradual implementation of the instrument and still allow for some control of the emissions related to imports. It is imaginable that this version of the CBAM also allows for the refund of certificates that were obtained for goods that are exported to brown countries, even though this point was only briefly mentioned by the French Authorities so far. Though it was a central element in the ‘Conservative Case for Carbon Dividends’ that entered the discussion in the U.S. in 2017, it is unlikely that this would be politically perceived as being compatible with EU climate ambitions, even if it could be argued that the additional pressure this imposes on the climate policies of brown countries outweighs the suspected effect on domestic emissions.



Source: Allianz Research

4 For details refer to Karsten Neuhoff et al. (2016): *Inclusion of Consumption of carbon intensive materials in emissions trading – An option for carbon pricing post-2020*. Project report.

5 French Authorities response to the preliminary EU consultation can be found as: NOTE DES AUTORITÉS FRANÇAISES. Paris, 20 avril 2020. Objet: Réponse des autorités françaises à la consultation publique de la Commission relative aux grandes orientations sur l’étude d’impact concernant le mécanisme d’ajustement carbone aux frontières. Réf.: Ares(2020)1350037.

Figure 4 Possible elements of a certificate-based CBAM

Source: Allianz Research

Although the final shape of an EU CABM remains at this stage unknown, it is very likely that it will end the distribution of free EU-ETS certificates to carbon leakage sectors, not least to achieve compliance with WTO rules. Thus, the political discussion on how to shape the transition of these sectors in a smooth and non-distortive way is already in full swing.

Given the assumption that emissions will be priced eventually, several options on how to address the additional costs have been put forward:

- Subsidize transition investments in low carbon production technologies and facilities (especially related to a hydrogen economy).
- Implement a 'blank' test phase of several years in which the regulatory system is applied to the players and a change in practices on the part of importers is applied, but e.g. free certificates are allocated to all participants.
- Apply the EU CBAM only to selected sectors first. The selection could be based on the importance for

the total emissions and on how 'easy' it is to measure the emissions. The cement and steel sectors have been put forward as 'test' sectors.

- Implement bilateral preferential agreements which relieve the partners from the obligation e.g. to procure emission certificates.



WHAT ARE THE POTENTIAL COSTS FOR SECTORS?

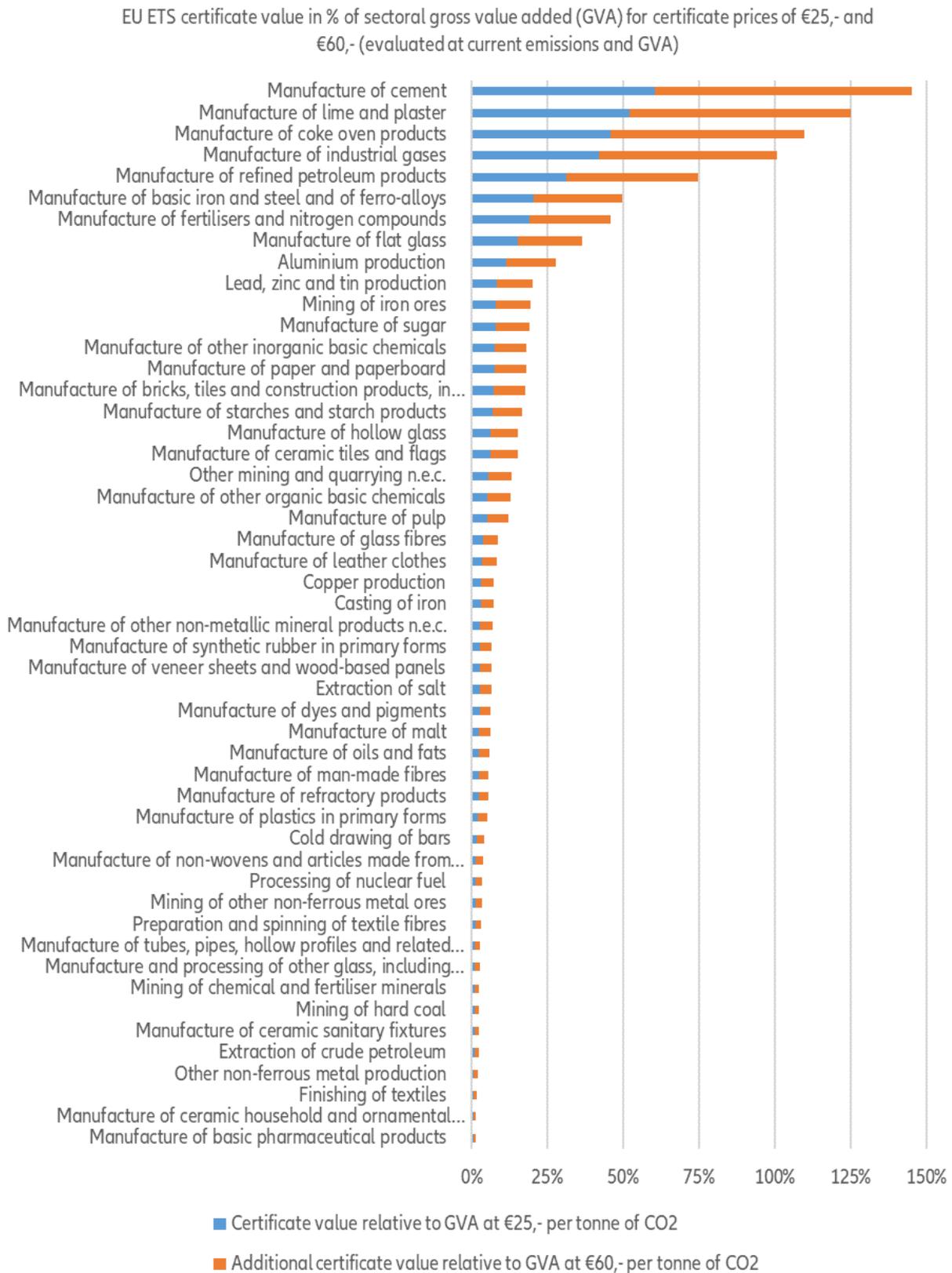
But even if some transition measures will be put in place, a CABM will eventually lead to higher costs for many sectors – which are by no means trivial. While the most relevant industries within the EU are already covered by the EU-ETS, they receive a free allocation of emissions certificates if they are carbon leakage sectors. In order to comply with WTO regulations, these free certificates are likely to be abolished. However, it should be noted that compliance with WTO regulations does not guarantee that trade retaliations won't be imposed, which could result in additional costs for European industries. Figure 5 shows the cost of acquiring emission certificates for current emissions relative to the current sectoral value added for the current emission price of €25,-/tCO₂ and for the €60,-/tCO₂ which is the goal for the middle of this decade. This is mostly for illustrative purposes as firstly, companies will react by lowering their emissions if certificate prices rise (at least that is the motivation for having certificates in the first place) and secondly, part of the additional cost will be passed through to customers. This would increase value added, as thirdly, per definition, the certificate expenditures are part of the value added. Thus, even if the hypothetical certificate expenditures exceeds 100% of value added, as for example in the cement sector (140%), in practice, it will never happen. However, such

high values clearly indicate that these industries (and their customers) – cement, lime and plaster, coke oven products and industrial gases – are in for a rough ride: adaption costs to a CBAM are challenging, to put it mildly. Figure 6 now extends the analysis to the core concern of reducing leakage, namely trade. The CBAM aims at reducing carbon leakage, incentivizing emission reductions in the production of all domestically utilized goods (for consumption or as intermediary input) independent of their origins. While the first should be incentivized by pricing imported emissions, the second one can be supported as well by relieving exports from additional emission-related obligations and even refunding carbon pricing related costs. This is the main point behind the endorsement of CBAM in the widely recognized “Conservative Case for Carbon Dividends (2017)”. From an industry perspective, the main concern should be that a product, independent of its origin, is exposed to the same regulatory costs in any domestic market. If that state can be reached, for instance by partially refunding carbon pricing-related costs on exports, the choice of the country for producing a good will be independent of the domestically imposed carbon price, creating a level playing field in this regard. The upshot: “Brown” countries lose their means to lure producer into their jurisdictions by

undercutting climate rules. By that, it would remove a big stumbling block for a global agreement on climate policies and carbon taxes.

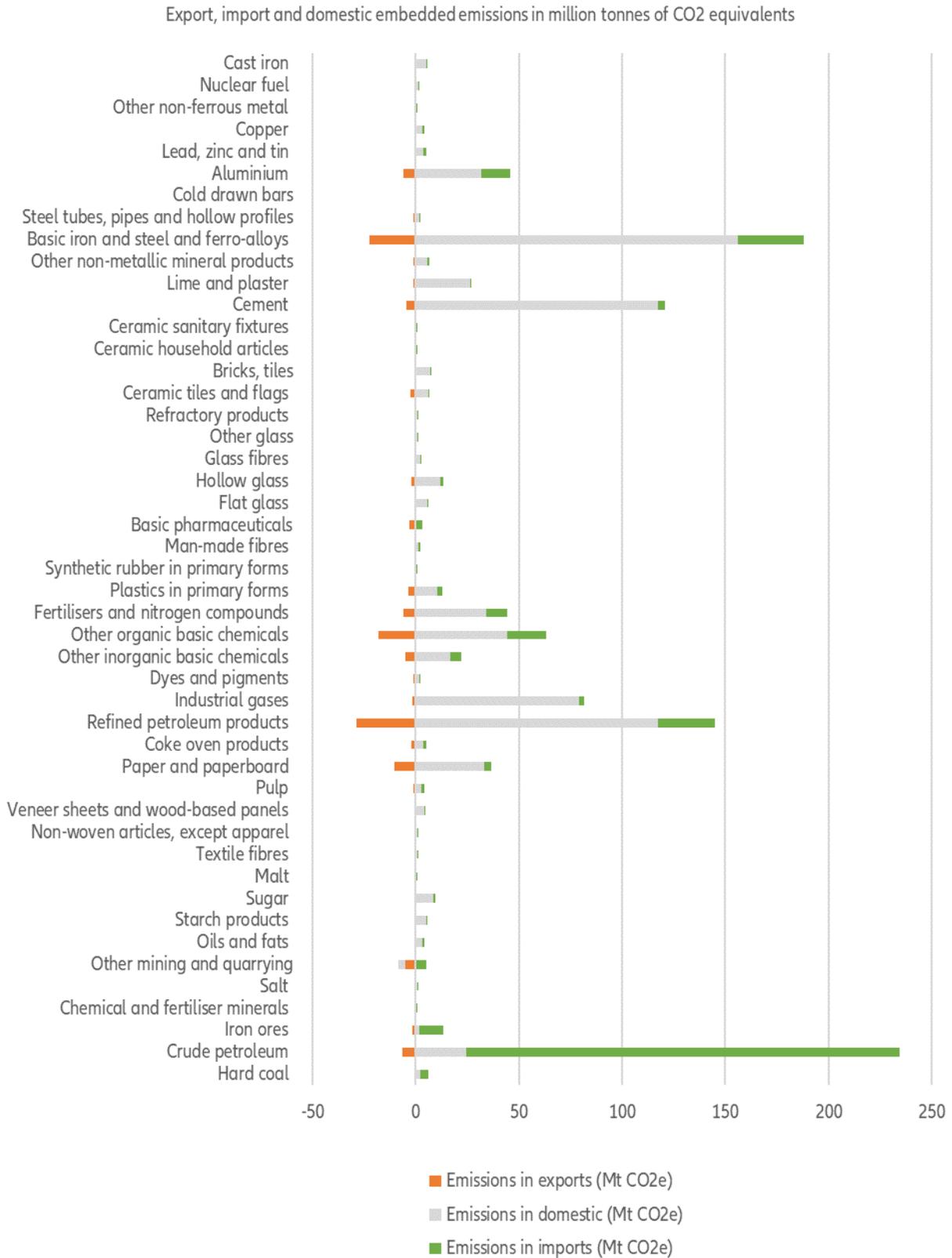
From a regulator's perspective, an additional question related to the CBAM is if the imported emissions dominate the exported emissions within a specific sector. Figure 6 suggests that the answer is mostly yes. The orange sections of the bars indicating the embedded emissions in imports dominate the red sections that indicate the embedded emissions in the exports (which are indicated in the negative direction in a concept that allocates emissions to the region of the consumption of a good). Still, the largest part of emissions would originate from domestically produced and sold products (The notion of exports always refers to extra-EU exports in the analysis shown). Although this analysis should be taken with a pinch of salt as, again, dynamic adaption processes are not taken into account, it still suggests that some sectors, notably aluminum, steel and chemicals, might benefit from a CBAM in a sense that foreign competition becomes fairer (but overall costs will be higher).

Figure 5: Domestic EU carbon price burden under no pass-through assumption



Source: Allianz Research.

Figure 6: International carbon price burden under no pass-through assumption



Source: Allianz Research.

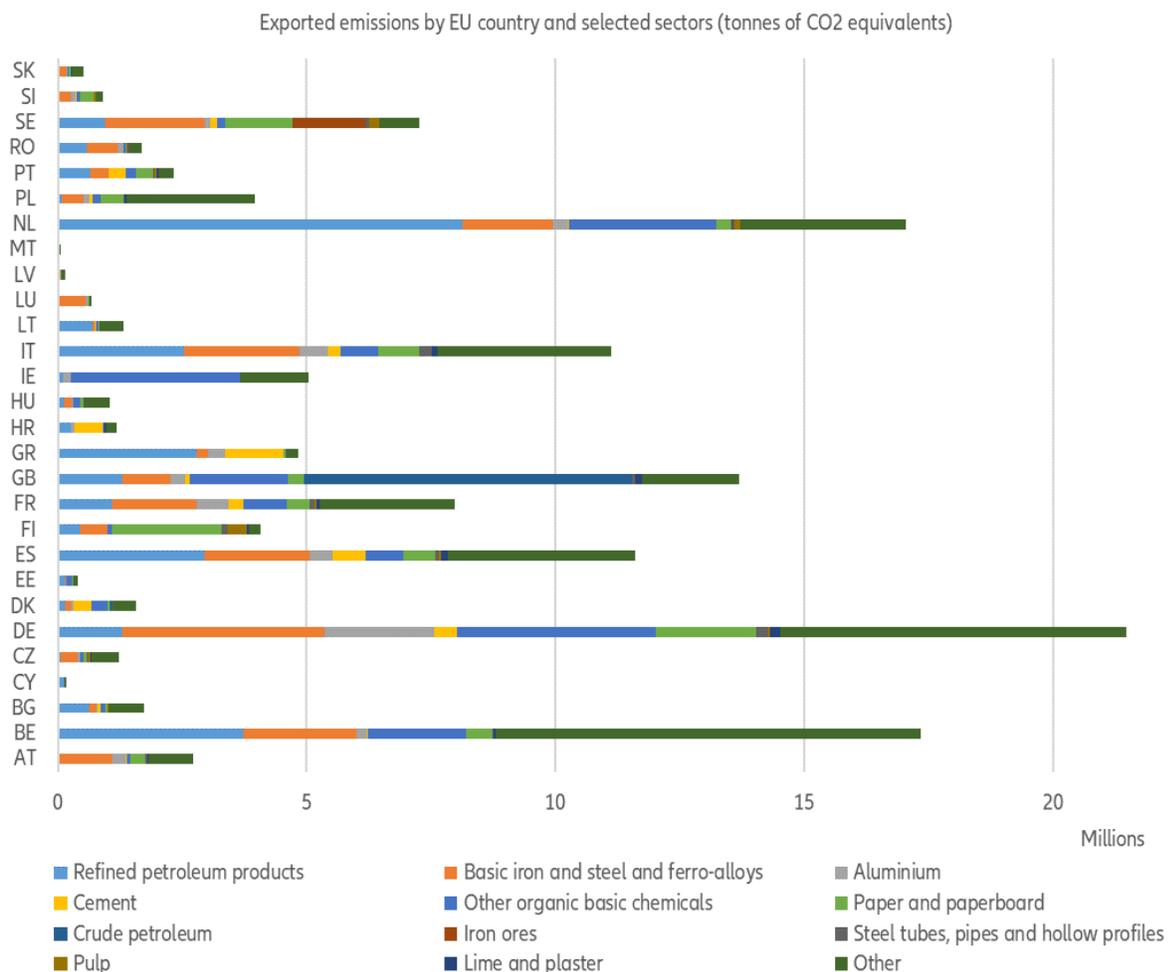
WHAT DOES THIS MEAN FOR EUROPEAN IMPORTS AND EXPORTS?

The sectoral composition of emissions among the different EU countries is very diverse and the national political discourse is often dominated by locally important industries. Figure 7 highlights

this by displaying the absolute emissions embedded in exports by EU countries and selected sectors and Figure 8 (cf. page 14) displays the national composition of these exported emissions. It

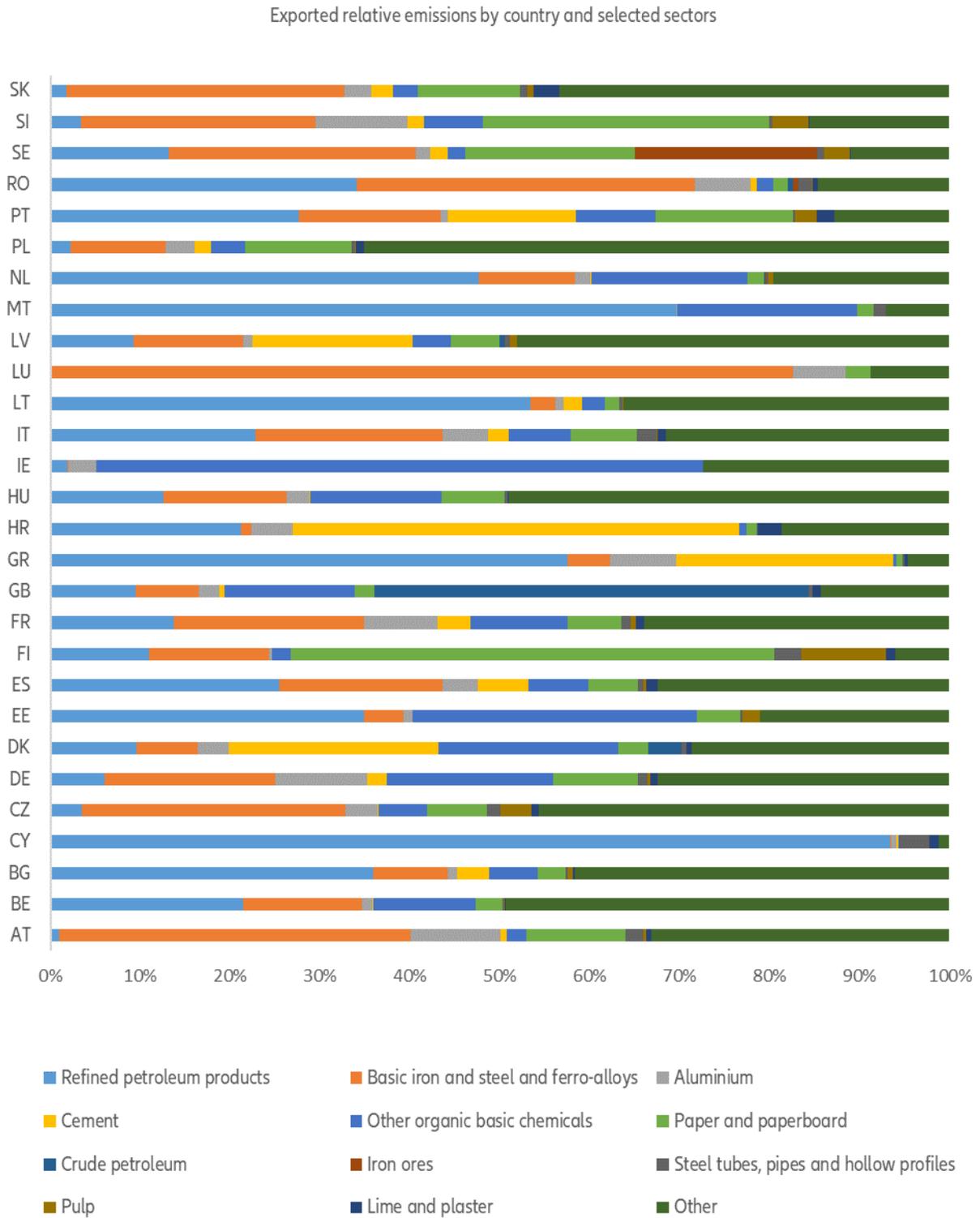
is striking that Germany and France are relatively similar in the composition and should be able to find common ground in formulating a position.

Figure 7: Absolute embedded emissions in Extra-EU exports by country



Source: Allianz Research.

Figure 8: Relative embedded emissions in extra-EU exports by country



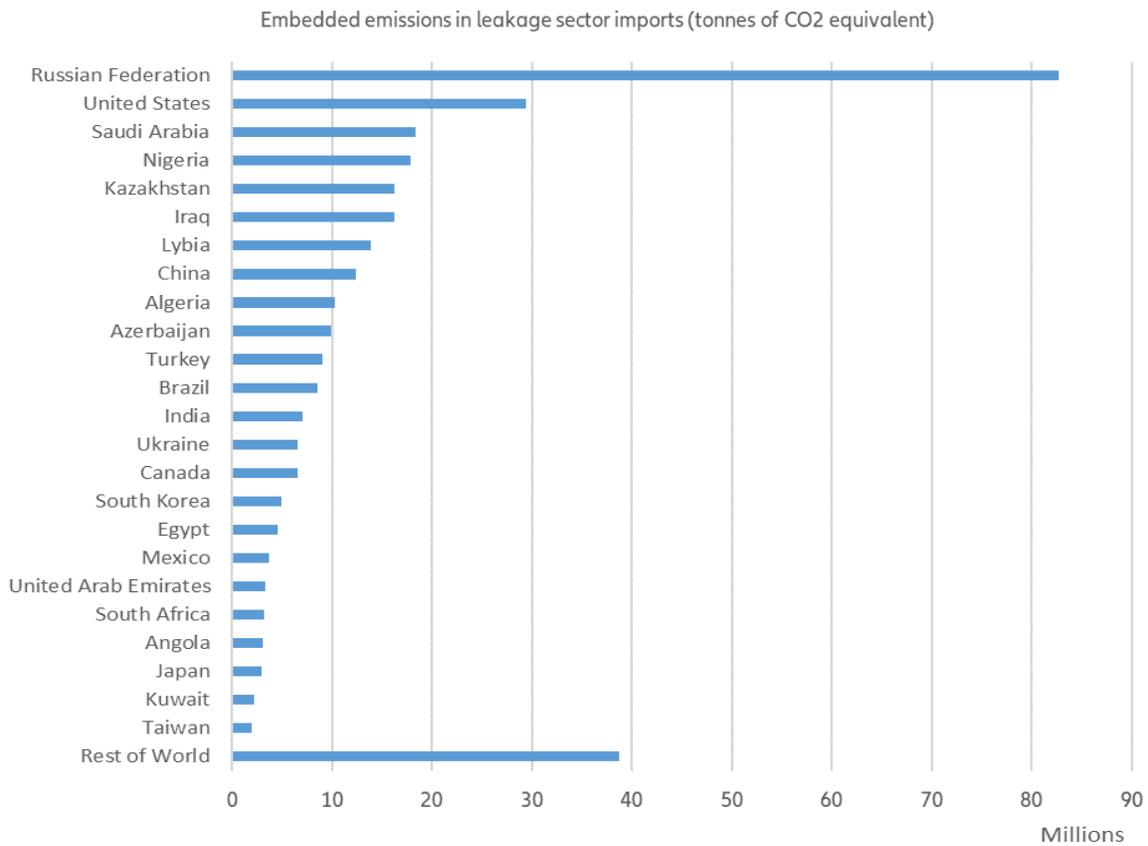
Source: Allianz Research.

Turning to imports, the Russian Federation is the most exposed compared to all other countries with respect to the import of embedded emissions (Figure 9). Over 78% of the Russian emissions imported by the EU are linked to petroleum products. Well behind, the U.S. follows in rank 2 with 56% of embedded emissions being lin-

ked to petroleum products. Ranks 3 through 7 are occupied by oil-producing countries. China follows only on rank 8 and features a more diverse portfolio, with its top three emission imports originating from chemicals, pharmaceuticals and aluminum. These numbers point at the potential international difficulties of introducing a

CBAM. While it might be easier to convince the likes of Japan, South Korea or India to rally behind the idea, stiffer resistance can be expected from China and particular from the U.S. (not to mention Russia – but relations with Russia have reached a new nadir anyway).

Figure 9: EU imports absolute CBAM exposure by country



Source: Allianz Research.

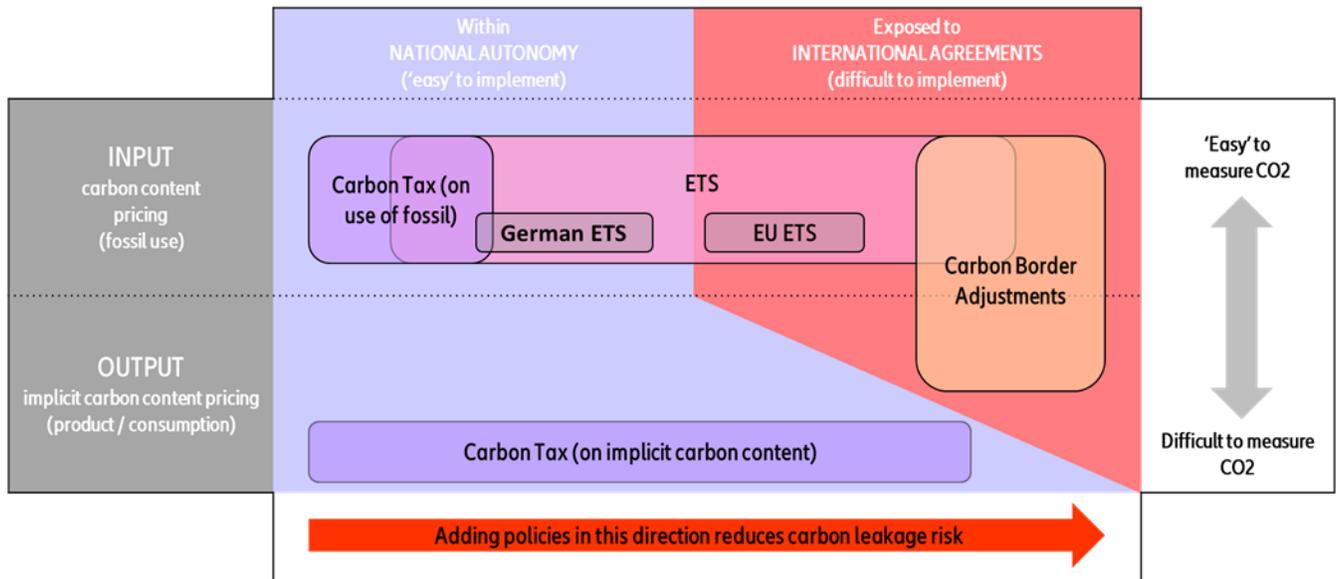
Appendix: Carbon pricing instruments

Figure A1 conceptualizes different CPI according to being imposed on the factor input level (INPUT) or the intermediate or consumption product level (OUTPUT), and on the CPI being within national autonomy to implement or being exposed to international agreements like the regulations by the WTO.

The factor input level (INPUT) refers to a carbon price that is imposed early in the value chain on the direct use of fossil energy carriers. The used CPI can differ by sector, activity and regional aggregate. For instance, the use of fossil fuels by the utilities sector is priced through the EU-wide EU-ETS. The use of fossil fuels for activities that are not covered by the EU-ETS is priced through a carbon tax in Sweden and through a national German-ETS in Germany. Even though being the more complex measure to apply (e.g. because a certificate trading mechanism and market needs to be implemented), specific national ETS are sometimes preferred since: 1) they can, in principal, be linked to other ETS, and 2) in political terms they have in some countries a less bad reputation with voters than CT.

Pricing late in the value chain on the intermediate or consumption product level (OUTPUT) requires determining the embedded carbon content of a product (which is then priced). The embedded carbon content assesses the CO₂ that has been emitted throughout the supply chain for producing the good and is not attributed to another product. Depending on the concept of the assessment and the depth of the supply chain that is considered, this analysis can be complex and thus, costly. The further the instruments reach to the right of the diagram, the more they are able to address leakage considerations. While displayed separately, the spectrum of options between a CBAM and carbon taxes on outputs is continuous and the instruments politically discussed under the CBAM label, include options that are academically labeled as carbon taxes.

Figure A1: Carbon pricing instruments in the value chain and autonomy dimension



Source: Allianz Research.

Appendix: Carbon pricing instruments

Figure A2 displays the definition of the carbon leakage indicator. Direct emissions (also scope 1 emissions) dominantly relate to the combustion of fossil energy carriers (but also to further direct process emissions, e.g. in the cement sector), while indirect emissions (also scope 2 emissions) are defined as:

Indirect emissions = Electricity consumption in kWh * Emission factor in tCO₂/kWh

Figure A2: Definition of leakage indicators

The phase 4 carbon leakage indicator is set as:

$$(1) \quad CL \text{ indicator} = Trade \text{ Intensity} * Emission \text{ Intensity}$$

Where:

$$(2) \quad Trade \text{ Intensity} (TI) = \frac{(Imports+Exports)}{(Imports+Turnover)}$$

$$(3) \quad Emission \text{ Intensity} (EI) = \frac{(Direct \text{ Emissions}+Indirect \text{ Emissions})}{(GVA)}$$

Where Trade Intensity is defined in the revised Directive as the relation between the total value of exports to third countries plus the value added of imports from third countries and the total market size for the European Economic Area (annual turnover plus imports from third countries) and Emission Intensity is defined as the Sector Direct Emissions plus Indirect Emissions divided by their Gross Value Added.

Source: European Commission.



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