

Written evidence to the Environmental Audit Committee
The UK Trade Policy Observatory (UKTPO)
University of Sussex

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The Committee is inviting written submissions to the following questions:

What are the risks to the UK posed by carbon leakage?

The risk or possibility of carbon leakage occurs when a domestic economy (e.g. the UK) increases the costs for domestic carbon-intensive producing sectors. It may increase those costs, for example, either through regulation or through taxing carbon-intensive production. One possible consequence of that increase in costs is that less production takes place in the UK and the goods are imported from countries using more carbon intensive techniques. This is carbon leakage. The risk to the UK from carbon leakage is therefore twofold: First that less production takes place domestically which may impact on domestic output and jobs. Secondly, that while the UK may be reducing its carbon footprint from *production (in line with Glasgow COP26 commitments), its consumption carbon footprint may nevertheless remain high or even grow. The carbon footprint arising from consumption refers to the carbon intensity of consumption, as opposed to production. The difference between the two is often referred to as carbon transfers, or emissions transfers.

Following the UK's departure from the EU, the UK established its own 'Emissions Trading Scheme' (ETS), designed to regulate and reduce carbon emissions by UK producers. The UK ETS scheme is what is known as a 'cap and trade' scheme and is closely modelled on the EU's ETS scheme. The ETS essentially introduces a price for carbon emissions. The UK ETS covers energy intensive industries (defined as those with a thermal input exceeding 20 MW annually); the power generating sector and the aviation industry (only currently involving flights within Europe). It is therefore with respect to these sectors where there is an increased cost to UK firms that there is the greatest likelihood of carbon leakage. Since the UK ETS market was launched in May 2021, the price of the tradeable carbon permits has risen (see graph below) – suggesting (not surprisingly) that the scheme is impacting on firms' costs. As the UK seeks to further reduce its carbon emissions and tightens the ETS scheme by reducing the number of free allowances, the price of carbon will rise further and increase further the risks of carbon leakage.

Over time firms will adjust and switch to alternative sources of energy and thus reduce their demand for carbon permits, and hence the risks of carbon leakage with regard to UK production are likely to decline. While the risk of carbon leakage may decline, the overall contribution of the UK to carbon emissions is also in part determined by the carbon embodied in UK consumption, and hence in the carbon embodied in UK imports.

One way of identifying the sectors where carbon leakage is most likely to occur is to examine the information published by the government on the firms to which it handed out the initial free allocation of carbon permits, and then to identify the sectors these firms are active in. Leaving aside transport and other service industries, out of a total of 31 UK SIC 2-digit industries, there are 23 covering agriculture, mining and quarrying, and manufacturing

which have received free allocations – though of course to varying degrees. These range from iron and steel, rubber and plastics to transport goods. In addition, there were free allocations to the energy sector as well as to sewerage (which in turn is involved in the production of bio-mass fuels). While there is a wide range of industries with free allocations, the policy is de facto more targeted in that five industries accounted for just under 80% of all the allocations, and thus a probably a narrower range of industries at this stage vulnerable to carbon pricing.¹

The table below lists the 10 sectors with the largest free allocation of carbon permits. As these are the sectors where the allocation is the largest, in turn these are the sectors where increasing the cost of carbon is most likely to impact, and thus may be most subject to carbon leakage.

The first three columns of the table identify the UK industry (SIC) codes, the sector of activity and then the industry. The numerical data then gives the total level of employment in that industry, the average CO2 intensity of that industry, the import intensity of the industry, the number of free allocations given to that industry and the number of plants that received a free allocation.

The level of employment in each industry gives some indication of the relative economic importance of that industry for the UK economy, and also of the number of jobs that could be affected by a reduction in free permits. Overall, if we take all the industries at risk (from those that have received a free allocation) these account for close to 1 million jobs in the UK (using 2019 data from the ONS) or in manufacturing an estimated total of between 20-25% of all 2.7 mio. manufacturing jobs. Now, of course with current policy not all of these jobs are at risk, because the policy only applies to firms / plants with a thermal input exceeding 20 MW.

The import intensity is defined as imports divided by gross value added in that industry. A low level of import intensity indicates that imports are less important relative to domestic production. Out of these 10 industries the lowest level of import intensity is with respect to mining and quarrying at 17.2% followed by cement, lime and plaster at 31.3%.

On the one hand a low import intensity might suggest that domestic carbon pricing will make it more likely that there will be a subsequent switch to imports from that sector, and hence carbon leakage. On the other hand, some goods may be inherently less tradeable (eg. mining and quarrying) or because of their weight (cement), and thus the import response would be dampened. More work assessing each of these industries would need to be undertaken for a proper understanding of the degree of possible carbon leakage.

SIC	Activity	Industry	Emp.	CO2 intensity	Import intensity	Free Allocations in 2021	Plants
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¹ Manufacture of basic iron and steel; coke and refined petroleum products, cement, lime, plaster and articles of concrete, crude petroleum and natural gas, industrial gases, inorganics and fertilisers (all inorganic chemicals).

24.1-3	Manuf.	Manufacture of basic Iron & Steel	33,500	4.76	118.3	10,316,589	15
19	Manuf.	Coke and refined petroleum products	9,000	5.58	479.9	6,530,367	7
23.5-6	Manuf.	Cement, lime, plaster and articles of concrete, cement and plaster	27,750	3.11	31.3	6,306,045	25
6	Mining & quarrying	Crude petroleum and natural gas	13,000	0.99	17.2	4,723,052	78
20.11, 20.13, 20.15	Manuf.	Industrial gases, inorganics and fertilisers (all inorganic chemicals)	9,250	4.75	114.9	3,073,113	14
20.14, 20.16, 20.17, 20.6	Manuf.	Manufacture of petrochemicals	18,050	2.16	114.9	1,732,640	16
23.1-4, 23.7-9	Manuf.	Manufacture of glass, refractory, clay, other porcelain and ceramic products, Stone, & abrasive products	52,500	1.30	31.4	1,338,952	42
17	Manuf.	Paper and paper products	53,000	0.51	68.8	771,498	20
35.2-3	Electricity, gas, steam and air	Manufacture of gas; distribution of gaseous fuels through mains and steam and air conditioning supply	39,400	0.40	29.8	634,757	26
10.8	Manuf.	Manufacture of other food products	98,000	0.20	52.8	528,916	18
			353,450			35,955,929	261

Notes: Carbon intensity: thousand tonnes CO₂ equiv per million pound sterling; import intensity: value of imports / gross value added.

What role could a carbon border adjustment mechanism (CBAM) play in addressing carbon leakage and meeting the UK's environmental objectives?

A carbon border adjustment mechanism (CBAM) is a way of dealing with the problem of carbon leakage. The idea behind a CBAM would be to levy a tax on imported carbon intensive goods which had not faced an equivalent level of taxation to the UK's. As the preceding sentence indicates levying a CBAM is complicated because it involves being able to assess both the carbon intensity of production of the imported good as well as the equivalence of the carbon pricing in the country where the good was produced. Assuming those obstacles (as well as the issue of WTO legality which we do not address here), then a

CBAM could be an effective way of tackling the problem of carbon leakage, and contributing towards the meeting of the UK's environmental objectives. It potentially brings the consumption and production footprints closer together although that depends on the goods on which the CBAM is applied. A CBAM would not compensate for, or deal with exports to third markets which may be displaced by dirtier suppliers.

However as discussed earlier a given country's carbon footprint should not just be seen in terms of the amounts of carbon produced, but also the amount of carbon consumed. To give a hypothetical example: The UK could introduce an effective ETS scheme which reduces emissions derived from UK production, and an effective border carbon tax such as a CBAM which addressed the issue of carbon leakage. However, UK consumers could continue to consume other goods and services, which are not produced in the UK, but produced elsewhere using carbon intensive methods. Thus, the UK's carbon footprint could remain high on the consumption side. It is for this reason that we **recommend** that the government also considers a broader consumption-based carbon tax, as opposed to one that is focused on the production side of the economy.

If the Government were to introduce a CBAM, which products or sectors should be included and why?

Following on from the previous analysis if the government were to introduce a CBAM then this should be focussed on those sectors where the domestic system of carbon pricing is increasing the costs of domestic firms. This would suggest that the CBAM would need to cover the 23 sectors we have identified as having achieved a free allocation of permits under the CBAM, but ideally ought to be targeted to those sectors most affected, and where imports are likely to be most sensitive. In order to impact the most on carbon emissions then, within that, the focus should be on those industries which are the most carbon intensive (iron and steel, coke and petroleum, chemicals and industrial gases).

What impact might a CBAM have on UK (i) industry, (ii) employment and (iii) consumers?

This is of course hard to predict, and in part because it depends on the height of the CBAM, and in part because technology is rapidly evolving and so the impacts will also evolve over time. From the point of view of consumers (and firms buying intermediate inputs), a CBAM raises the cost of imports and is thus likely to increase prices. It is possible, indeed likely, that to some extent the exporting firms will absorb some of those cost increases, but only to some extent. To the extent that the CBAM 'protects' domestic industries by making imports more expensive this could facilitate more domestic employment and production (relative to the absence of a CBAM as opposed to relative to there being no domestic carbon pricing) – though if that is carbon intensive it too will be taxed.

The other issue to consider here is that the net CBAM-effect on industries, employment and consumers will depend crucially on the actions of other countries. For example, it is extremely likely that the EU will introduce its CBAM, which is most likely to be applied to

sectors such as Steel and Cement, as well as others,. This is probably not likely to have a direct impact on UK producers as in principle the presence of a UK ETS scheme should mean that UK firms would not be targeted. However, should this not be the case and should UK sectors and firms be impacted by the EU CBAM these are sectors where a high share of exports is destined for the EU. Take for example steel stoves or radiators - nearly 80% of UK exports (2019 data) go to the EU. Similarly, 86% of HS 7210 (Iron and steel Flat-rolled products of iron or non-alloy steel....) go to the EU, and nearly 65% of HS 25 (inter alia cement) go to the EU. So should given firms or sectors be affected this could then have an impact on domestic production and employment.

The actions of other countries impacting on the UK can also be seen in the closely allied recent US-EU agreement on steel which in turn is likely to impact on the UK. The whole point of CBAM's is to ensure greater equality in the taxing of carbon intensive products sold at home across supplying countries. Once, the issue is phrased in this way the need for international cooperation and a combined approach across countries becomes more evident.

On these grounds we would **recommend** that the government opens up discussion with international partners on a climate club where countries with ambitious climate targets work together by agreeing on how to determine equivalence in domestic carbon charges, such as linking emissions trading schemes, while levying a CBA on those countries with less ambitious targets. For a climate club to work and indeed for the resolution of the trilemma there will need to be transparency and dialogue, means for addressing tensions, and an enforcement mechanism which allows either side to impose tariffs (CBAs) if the other isn't keeping pace. ²

The questions below are complex and hence we only point to some of the key issues to be borne in mind as opposed to providing a full answer.

What risks would need to be managed when designing and implementing a CBAM?

- Ensuring WTO compatibility
- Ensuring the scheme is sufficiently sensible to correctly target the high emitting industries/countries/firms, while being administratively and technically feasible. See the UKTPO Briefing Paper by Emily Lydgate on CBA design as a policy trilemma between environmental ambition, technical feasibility and fairness. The paper discusses each aspect of the trilemma and outlines potential tradeoffs that may be necessary between reducing emissions, navigating the complexities of calculating charges, and ensuring mechanisms are WTO-compliant and fair to developing countries.³
- Considering the possible impact across UK sectors and firms.

² See: <https://blogs.sussex.ac.uk/uktpo/publications/g7-leaders-should-discuss-international-trade-seriously/>

³ <https://blogs.sussex.ac.uk/uktpo/publications/the-carbon-border-adjustment-trilemma/>

How might a CBAM interact with the UK's international obligations, including on trade and the environment?

- See discussion above.

Should the CBAM design include any special regard, e.g. for developing countries or small and medium-sized enterprises? If so, which circumstances should be given special regard, and what impact might this have? If not, why not?

- In principle, the answer is yes. One would wish to give special consideration / regard to developing countries in formulating a policy that may impact on them. However, as revealed in the COP26 discussions, the issue here is complicated because some of the biggest carbon emitters are developing countries (eg. China and India). Any policy on this will therefore have to balance the need for WTO compatibility and applying the principles of special and differential treatment, with the desire to reduce emissions, without unreasonably impacting on poor countries ability to grow and increase living standards. One possible approach to this might be to have a policy which is linked to the level of emissions and not just the rate of emissions thus targeting the larger emitters. See also the paper by Emily Lydgate referred to above on the carbon border adjustment trilemma.

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