Policy Brief: Still time to reclaim the European Union Emissions Trading System for the European tax payer

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The criteria proposed by the EU Commission to identify industries that will receive free emission permits in the third phase of the European Union Emissions Trading System (EU ETS) are not restrictive enough. Evidence from interviews with almost 800 managers in Europe shows that most of the sectors entitled to free emission permits are not facing an increased risk of closure or relocation outside of the EU as a consequence of permit auctioning. Free permit allocation is therefore just a transfer of tax payers' money to industry without any additional social benefit. We propose a simple modification of the Commission's criteria for free permit allocation which could save European tax payers at least €7 billion annually.

The evidence

The EU Commission is currently finalising the design of the third trading phase of the European Emissions Trading System, which will begin in January 2013 and last until 2020. It is the Commission's stated objective to increase the share of emission permits that are auctioned rather than allocated for free to installations covered by the EU ETS. This would improve the fairness of the scheme because the current practice of allocating free permits on the basis of past emissions effectively rewards businesses that have been lagging behind with measures to reduce emissions. Permit auctioning would also provide additional revenue for governments to pay for R&D and infrastructure investments required for the transition to a low-carbon economy. The auction revenue could further be used to compensate low-income groups in the event that carbon pricing has regressive distributional effects or simply help to balance overly strained government budgets. Notwithstanding the high priority given to permit auctioning, European lawmakers have recently proposed criteria to determine which industrial sectors should continue to receive free permits during the third phase of the EU ETS. Under these criteria 147 sectors - more than half of the 258 manufacturing sectors under consideration - will be eligible for free permits, although in practice not all of these sectors include firms that are regulated by the EU ETS. This follows pressure from industry groups claiming that more stringent carbon pricing under the EU ETS will provoke job losses and cause carbon-intensive production to re-locate outside the EU – a process referred to as "carbon leakage".

In recent research we investigate how well the proposed criteria for exemption from auctioning capture the risk of downsizing or plant closure, and what the implications are in terms of job losses, carbon leakage and CO_2 emissions.[1] Our analysis is based on data from approximately 800 interviews with managers in manufacturing plants – both members and non-members of the EU ETS – in six EU countries (Belgium, France, Germany, Hungary, Poland and the UK).[2] For each in-

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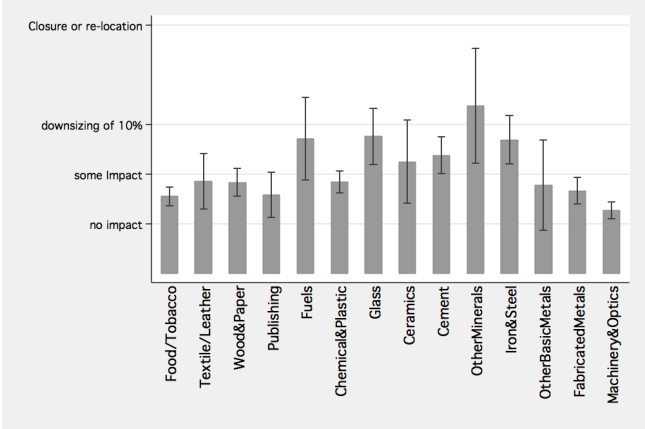
[1] For the complete study, see Anderson, B., Leib, J., Martin, R., McGuigan, M., Muûls, M., de Preux, L., and Wagner, U.J., (2010),"Climate Change Policy and Business in Europe – Evidence from interviewing managers", CEP Discussion Paper, LSE, forthcoming.

[2] The interviews were conducted via telephone between Au-

terviewed firm we rate on a scale from 1 to 5 the likelihood and degree of downsizing in response to future climate policy. A score of 1 corresponds to no expected impact from climate policy whereas a score of 5 indicates a high likelihood that the firm is going to close down or re-locate in response to tighter climate policy.

Fig. 1: Average risk of downsizing score across sectors



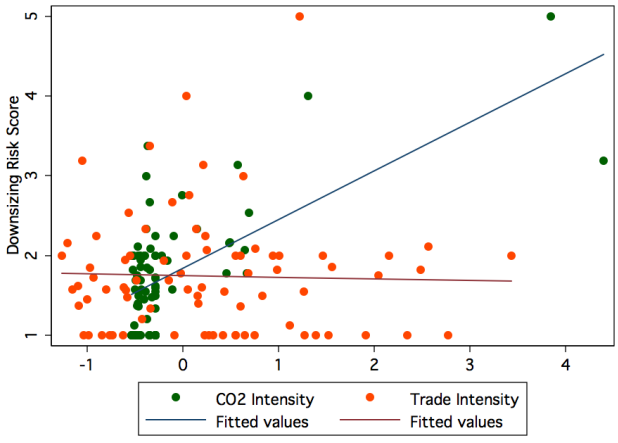
Notes: The bars show the sector level average score measuring the risk of downsizing as a consequence of climate policy. The segments represent the confidence bands, calculated at the 95% level.

The main results of the analysis are summarised as follows:

- **Among the principal manufacturing industries we sampled, there is not one for which the average firm is at risk of relocation or closure** (see Figure 1). There is only one sector (Other Minerals) where the average score is slightly above 3, implying downsizing by at least 10% of employment or output. For a few sectors (Iron and Steel, Ceramics, Glass, Fuels) the 95% confidence band around the average score which visualizes the uncertainty associated with the estimates in Figure 1 includes a score of 3. In no case does the confidence band include the maximum score, meaning that the possibility of complete relocation in response to carbon pricing is very unlikely.

- The EU Commission bases its assessment of sectors at risk of carbon leakage on two statistics, namely the carbon intensity (VaS) and the trade intensity (TI).[3] We examine how well these statistics capture downsizing risk by correlating them with our score. Plotting carbon and trade intensities of 3-digit sectors against downsizing risk scores, as shown in Figure 2, reveals that VaS is strongly correlated with downsizing risk whereas TI is not. This suggests that **using the trade intensity criterion to determine which sectors should be exempt from auctioning is bound to lead to exemptions for firms that are not at all at risk of downsizing or carbon leakage.** A plausible explanation for the poor performance of the TI criterion is that downsizing risk is not only determined by the cost impact of carbon taxation and by the tradeability of the products of a sector but also by location specific factors such as the skill of the workforce, agglomeration benefits, or the stability of institutions. To the extent that such factors are essential for the success of the firm's business model they take priority over concerns about carbon or energy costs, yet the TI criterion is unlikely to capture these factors. Lumping together exports and imports, the TI criterion can be high because of strong non-EU competition (which increases the risk of carbon leakage) but also because location specific advantages enable EU firms to export more (which reduces the risk of carbon leakage). Moreover, on the import side, the TI criterion does not differentiate between trade with non-EU countries that have binding emission targets under the Kyoto Protocol and trade with non-EU countries that do not have such commitments.

Fig. 2: Correlation between downsizing risk and intensity measures



Notes: Each 3-digit (NACE 1.1) sector is represented by one green and one red point. The horizontal axis measures for red points normalised CO_2 intensity (VaS) and for green points normalised trade intensity (TI). The vertical axis measures the downsizing risk score derived from the interviews with managers. The two lines represent the fitted values for each set of points.

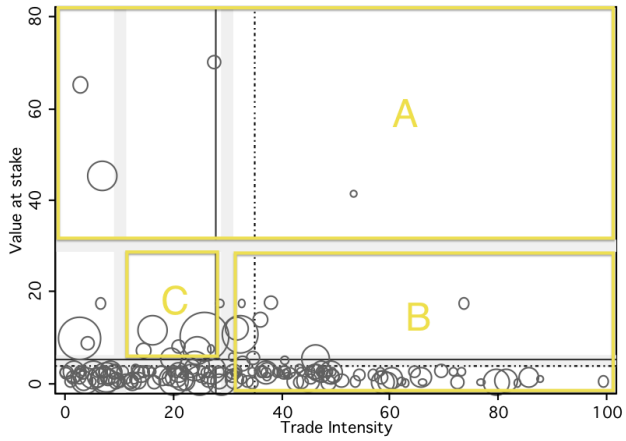
- We further examine the EU criteria by looking at the specific thresholds that are currently suggested. According to the Commission's proposal sectors will be exempt from auctioning if their

gust and November of 2009. The interview questions focused on companies' management practices related to climate change and touched upon various aspects of climate policy-making in Europe.

[3] Carbon intensity is measured as the amount of carbon a sector emits divided by its value added. In previous studies on the topic this has been referred to as Value at Stake (VaS), a convention we adopt in this briefing. The Commissions defines the trade intensity as the value of imports and exports to non EU countries over the total market size of the sector within the EU.

carbon intensity is very high (VaS>30%), if their trade intensity is very high (TI>30%) or if both trade and carbon intensity are moderately high (VaS>5% & TI>10%). **We find that the Commission's thresholds lead to an exemption from auctioning of 60 to 88% of CO_2 emissions from the manufacturing sector regulated under the EU ETS.**[4] This is illustrated in Figures 3 and 4.

Fig. 3: Value at Stake and Trade Intensity of sectors in the interview sample

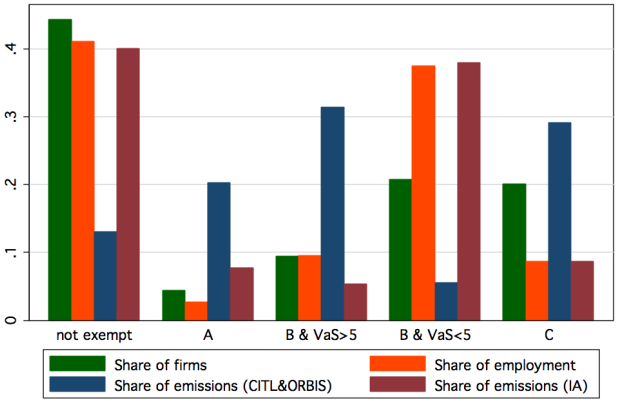


Notes: The figure plots the position of the sectors included in our interview sample in terms of the two criteria proposed for exempting sectors from auctioning of permits. The size of the circles is proportional to the number of firms in a given 4-digit industry (NACE 1.1 classification). The rectangles A, B and C represent the three sets of eligible sectors defined by the EU Commission's thresholds for the two criteria. The solid lines show mean trade and carbon intensities, and the dotted lines represent the respective employment-weighted means.

- The thresholds proposed by the EU Commission implicitly define three groups of exempted sectors, depicted as the rectangles A, B, and C in Figure 3 . It is striking that group B contains a particularly heterogenous group of industries, namely a large number of industries with very low carbon intensity as well as a few sectors with moderate carbon intensity. We thus further subdivide this group by carbon intensity and analyse the following 4 groups:

  1. high carbon intensity: VaS>30% (Group A)
  2. high trade intensity and moderate carbon intensity: TI>30% and 5%<VaS<30% (Group B & VaS>5%)
  3. high trade intensity and very low carbon intensity: TI>30% and VaS<5% (Group B & VaS<5%)
  4. moderate trade and carbon intensity: 5%<VaS<30% & 10%<TI<30% (Group C)

Fig. 4: Relative size of the sectoral groupings



Notes: The figure plots, for each set of sectors as described on the horizontal axis, the shares in the total number of firms, total employment as well as on the basis of two different ways of measuring total CO_2 emissions. For a discussion of the differences between the two CO_2 measures see Footnote 4.

Figure 5 plots the average downsizing risk and associated 95% confidence bands for these groups. It is evident that **only carbon intensive firms (group A) and the more carbon-intensive among the trade-intensive firms (group B & VaS>5%) are at heightened risk of outsourcing a significant part of their production.**[5]

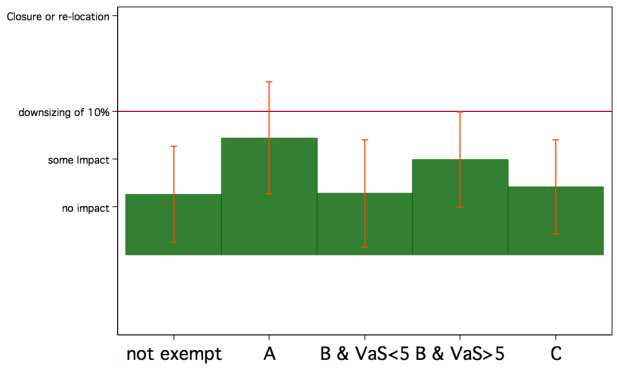
Policy recommendations

Adjusting the thresholds for exemptions Our analysis of risk scores in different exemption groups suggests that it is only in sectors with very high carbon intensity (Group A) or in sectors with high trade and moderate carbon intensity (Group B & VaS>5%) that there is a heightened - although not dramatic - risk of downsizing. Exempting only those two groups from permit auctioning would thus considerably increase the

[4] The actual number is uncertain because (i) the EU Commission's analysis at the 4-digit sectoral level is based in part on estimates and interpolations and (ii) the Commission makes only part of their data available to the public. We use two alternative methods of calculating carbon emissions. First, we match installation level data on carbon emissions in the current trading period taken from the Community International Transaction Log (CITL) with firm level data from the ORBIS firm level database. This is necessary to determine the sector an installation belongs to and to match CITL data to our interview data. Not all installations in the CITL can be matched in this way because lookup tables are not available in some countries. Unsuccessful matches are more likely for smaller firms that are less carbon and trade intensive, so we expect that this leads to an underestimation of the share of firms in the exempted category. This is the basis of our higher figure of 88% (CITL&ORBIS in Figure 4). Second, we use data on sectoral carbon emissions taken from the EU's impact assessment (IA in Figure 4) documents for EU ETS phase 3. Since these data include emissions from both firms regulated under the EU ETS and firms that are not, this method is likely to underestimate the share of exempted firms. This leads to the lower estimate of 60%.

[5] This finding is corroborated in multivariate regressions that control for confounding factors.

Fig. 5: Impact measures across "at risk" groups



Notes: The green bars represent, for each set of firms as described on the horizontal axis, the average score measuring the risk of downsizing as a consequence of climate policy. The orange segments represent the confidence bands, calculated at the 95% level. The chart is based on the sample of interviewed EU ETS firms.

amount of permits auctioned during the third phase of the EU ETS without aggravating the overall risk of job losses and carbon leakage in the EU ETS. This could be achieved by modifiying the thresholds as follows: Only sectors with a carbon intensity higher than 30% or sectors with a trade intensity greater than 10% and carbon intensity of more than 5% should be granted an exemption. This modification would revoke the exemptions currently envisaged for groups C and B & VaS<5%. By a conservative estimate this would provide an additional revenue for European governments of at least €7 billion annually.[6]

Reconsidering the trade criterion We find no evidence that the trade intensity criterion reliably measures the risk of downsizing or closure across sectors. The European Commission should therefore in the longer run replace this criterion with one that more accurately reflects a sector's vulnerability to carbon leakage. The trade intensity measure potentially misses an important aspect that determines vulnerability, namely locational specificity. The more strongly a firm benefits from factors that are specific to the EU such as the skill set of the workforce, agglomeration economies, the stability of institutions, etc., the less likely it is to shift production abroad in response to EU climate change policy. More research into the measurement of locational specificity is needed before this concept can be operationalised in EU climate change policy. An alternative criterion that is more easily amenable to objective measurement could be the share of competition from outside the EU.[7] It might equally be worthwhile to explore if more sophisticated versions of the TI criterion – such as, for example, the share of imports into the EU from emerging economies – perform better.

Conclusion

Despite many design improvements there is a concern that even in the third phase of the EU ETS the Commission is accommodating the interests of the industry lobby too generously at the expense of European taxpayers. However, there is still a window of opportunity for European governments to improve the design of the EU ETS significantly while raising additional income on the order of €7 billion annually. Rather than providing an unspecific subsidy for industry this money could be earmarked to finance investments and R&D crucial for the transition to a low-carbon economy. It could equally be used to mitigate possibly regressive effects of higher carbon prices on low-income groups. Finally, it could help to balance strained government budgets in the wake of the recent financial and economic crises.

[6] To compute this figure we multiply the share of emissions in groups C and B & VaS<5% implied by our match between CITL and ORBIS data (see Footnote 4) with the total emissions figure from the CITL excluding power plant emissions. Alternatively we can use the share of emissions in C and B & VaS<5% that is implied by the EU Impact Assessment figures. This leads to an estimate of additional revenue of approximately €9 billion. We follow the EU Impact Assessment and assume an average revenue per permit of €30. Table 1 lists the sectors currently exempted from auctioning, which would cease to be exempted under the suggested rule changes.

[7] We construct such a measure on the basis of our management interviews and find it to be strongly correlated with the downsizing risk score.

Tab. 1: List of additional sectors *not* to be exempted from auctioning

Sector Description	*NACE sector code (Rev 1.1)*	*Sector Description*	*NACE sector code (Rev 1.1)*
Processing and preserving of fish and fish products	152	Manufacture and processing of other glass including technical glassware	2615
Manufacture of crude oils and fats	1541	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic	262
Manufacture of starches and starch products	1562	Manufacture of ceramic tiles and flags	263
Manufacture of sugar	1583	Production of abrasive products	2681
Manufacture of distilled potable alcoholic beverages	1591	Manufacture of tubes	272
Production of ethyl alcohol from fermented materials	1592	Precious metals production	2741
Manufacture of wines	1593	Lead, zinc and tin production	2743
Manufacture of other non-distilled fermented beverages	1595	Manufacture of cutlery	2861
Preparation and spinning of woollen-type fibres	1712	Manufacture of tools	2862
Preparation and spinning of worsted-type fibres	1713	Manufacture of fasteners, screw machine products, chain and springs	2874
Preparation and spinning of flax-type fibres	1714	Manufacture of other fabricated metal products, n.e.c.	2875
Throwing and preparation of silk, including from noils, and throwing and texturing of synthetic or artificial filament yarns	1715	Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines	291
Manufacture of sewing threads	1716	Manufacture of furnaces and furnace burners	2921
Preparation and spinning of other textile fibres	1717	Manufacture of non-domestic cooling and ventilation equipment	2923
Textile weaving	172	Manufacture of other general purpose machinery n.e.c.	2924
Manufacture of made-up textile articles, except apparel	174	Manufacture of agricultural and forestry machinery	293
Manufacture of other textiles	175	Manufacture of machine- tools	294
Manufacture of knitted and crocheted fabrics	176	Manufacture of other special purpose machinery	295
Manufacture of knitted and crocheted articles	177	Manufacture of weapons and ammunition	296
Manufacture of other wearing apparel and accessories	182	Manufacture of electric domestic appliances	2971
Dressing and dyeing of fur; manufacture of articles of fur	183	Manufacture of office machinery and computers	300
Tanning and dressing of leather	191	Manufacture of electric motors, generators and transformers	311
Manufacture of luggage, handbags and the like, saddlery and harness	192	Manufacture of electricity distribution and control apparatus	312
Manufacture of footwear	193	Manufacture of insulated wire and cable	313
Sawmilling and planing of wood, impregnation of wood	201	Manufacture of accumulators, primary cells and primary batteries	314
Manufacture of articles of cork, straw and plaiting materials	2052	Manufacture of lighting equipment and electric lamps	315
Manufacture of pulp, paper and paperboard	211	Manufacture of other electrical equipment n.e.c.	3162
Manufacture of wallpaper	2124	Manufacture of electronic valves and tubes and other electronic components	321
Other publishing	2215	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	322
Manufacture of refined petroleum products	232	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	323
Processing of nuclear fuel	233	Manufacture of medical and surgical equipment and orthopaedic appliances	331
Manufacture of dyes and pigments	2412	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	332
Manufacture of pesticides and other agro-chemical products	242	Manufacture of optical instruments and photographic equipment	334
Manufacture of pharmaceuticals, medicinal chemicals and botanical products	244	Manufacture of watches and clocks	335
Manufacture of perfumes and toilet preparations	2452	Building and repairing of ships and boats	351
Manufacture of essential oils	2463	Manufacture of aircraft and spacecraft	353
Manufacture of photographic chemical material	2464	Manufacture of motorcycles and bicycles	354
Manufacture of prepared unrecorded media	2465	Manufacture of other transport equipment n.e.c.	355
Manufacture of other chemical products n.e.c.	2466	Manufacture of jewellery and related articles	362
Manufacture of man-made fibres	247	Manufacture of musical instruments	363
Manufacture of rubber tyres and tubes	2511	Manufacture of sports goods	364
Manufacture of flat glass	2611	Manufacture of games and toys	365
Manufacture of hollow glass	2613	Miscellaneous manufacturing n.e.c.	366

Notes: The table lists sectors that under current EU Commission rules would be exempted from auctioning but under our proposed rule change would not longer be exempted. This list contains about half of the sectors currently exempted under EU Commission proposals. The EU rules apply at the 4 digit (NACE Rev. 1.1) sectoral level. For conciseness we report the 3-digit sector if all 4-digit sub sectors in a 3-digit sector would cease to be exempted.