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

by Ralf Martin, Mirabelle Muûls and Ulrich J. Wagner *

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 CO₂ 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-


² The interviews were conducted via telephone between Au-
terviewed firm we rate on a scale from 1 to 5 the like-
lihood 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 indi-
cates 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 indus-
tries 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 sec-
tor (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 es-
timates in Figure 1 includes a score of 3. In no
case does the confidence band include the maxi-
mum score, meaning that the possibility of com-
plete relocation in response to carbon pricing is
very unlikely.

- **The EU Commission bases its assessment of sec-
tors at risk of carbon leakage on two statistics,
namely the carbon intensity (VaS) and the trade
intensity (TI).** We examine how well these statis-
tics capture downsizing risk by correlating them
with our score. Plotting carbon and trade in-
tensities 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 in-
tensity 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 leak-
age. A plausible explanation for the poor perfor-
ance 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 bene-
fits, 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 cri-
terion can be high because of strong non-EU com-
petition (which increases the risk of carbon leak-
age) but also because location specific advantages
enable EU firms to export more (which reduces
the risk of carbon leakage). Moreover, on the im-
port side, the TI criterion does not differentiate
between trade with non-EU countries that have
binding emission targets under the Kyoto Proto-
col and trade with non-EU countries that do not
have such commitments.

Fig. 2: Correlation between downsizing risk and inten-
sity 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\textsubscript{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 sug-
gested.** According to the Commission’s proposal
sectors will be exempt from auctioning if their
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 CO₂ emissions from the manufacturing sector regulated under the EU ETS. 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)

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.

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

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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 modifying 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 unspecified 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

<table>
<thead>
<tr>
<th>Sector Description</th>
<th>NACE sector code (Rev 1.1)</th>
<th>Sector Description</th>
<th>NACE sector code (Rev 1.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing and preserving of fish and fish products</td>
<td>152</td>
<td>Manufacture and processing of other glass including technical glassware</td>
<td>2615</td>
</tr>
<tr>
<td>Manufacture of crude oils and fats</td>
<td>1541</td>
<td>Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic</td>
<td>262</td>
</tr>
<tr>
<td>Manufacture of starches and starch products</td>
<td>1562</td>
<td>Manufacture of ceramic tiles and flags</td>
<td>263</td>
</tr>
<tr>
<td>Manufacture of sugar</td>
<td>1583</td>
<td>Production of abrasive products</td>
<td>2681</td>
</tr>
<tr>
<td>Manufacture of distilled potable alcoholic beverages</td>
<td>1591</td>
<td>Manufacture of tubes</td>
<td>272</td>
</tr>
<tr>
<td>Production of ethyl alcohol from fermented materials</td>
<td>1592</td>
<td>Precious metals production</td>
<td>2741</td>
</tr>
<tr>
<td>Manufacture of wines</td>
<td>1593</td>
<td>Lead, zinc and tin production</td>
<td>2743</td>
</tr>
<tr>
<td>Manufacture of other non-distilled fermented beverages</td>
<td>1595</td>
<td>Manufacture of cutlery</td>
<td>2861</td>
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<tr>
<td>Preparation and spinning of woollen-type fibres</td>
<td>1712</td>
<td>Manufacture of tools</td>
<td>2862</td>
</tr>
<tr>
<td>Preparation and spinning of worsted-type fibres</td>
<td>1713</td>
<td>Manufacture of fasteners, screw machine products, chain and springs</td>
<td>2874</td>
</tr>
<tr>
<td>Throwing and preparation of silk, including from noils, and throwing and texturing of synthetic or artificial filament yarns</td>
<td>1715</td>
<td>Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines</td>
<td>291</td>
</tr>
<tr>
<td>Manufacture of sewing threads</td>
<td>1716</td>
<td>Manufacture of furnaces and furnace burners</td>
<td>2921</td>
</tr>
<tr>
<td>Preparation and spinning of other textile fibres</td>
<td>1717</td>
<td>Manufacture of non-domestic cooling and ventilation equipment</td>
<td>2923</td>
</tr>
<tr>
<td>Textile weaving</td>
<td>1724</td>
<td>Manufacture of other general purpose machinery n.e.c.</td>
<td>2924</td>
</tr>
<tr>
<td>Manufacture of made-up textile articles, except apparel</td>
<td>174</td>
<td>Manufacture of agricultural and forestry machinery</td>
<td>293</td>
</tr>
<tr>
<td>Manufacture of other textiles</td>
<td>1754</td>
<td>Manufacture of machine-tools</td>
<td>294</td>
</tr>
<tr>
<td>Manufacture of knitted and crocheted fabrics</td>
<td>176</td>
<td>Manufacture of other special purpose machinery</td>
<td>295</td>
</tr>
<tr>
<td>Manufacture of weapons and ammunition</td>
<td>177</td>
<td>Manufacture of weapons and ammunition</td>
<td>296</td>
</tr>
<tr>
<td>Manufacture of other wearing apparel and accessories</td>
<td>182</td>
<td>Manufacture of electric domestic appliances</td>
<td>2971</td>
</tr>
<tr>
<td>Dressing and dyeing of fur; manufacture of articles of fur</td>
<td>183</td>
<td>Manufacture of office machinery and computers</td>
<td>300</td>
</tr>
<tr>
<td>Tanning and dressing of leather</td>
<td>191</td>
<td>Manufacture of electric motors, generators and transformers</td>
<td>311</td>
</tr>
<tr>
<td>Manufacture of luggage, handbags and the like, saddlery and harness</td>
<td>192</td>
<td>Manufacture of electricity distribution and control apparatus</td>
<td>312</td>
</tr>
<tr>
<td>Manufacture of footwear</td>
<td>193</td>
<td>Manufacture of insulated wire and cable</td>
<td>313</td>
</tr>
<tr>
<td>Sawmilling and planing of wood, impregnation of wood</td>
<td>201</td>
<td>Manufacture of accumulators, primary cells and primary batteries</td>
<td>314</td>
</tr>
<tr>
<td>Manufacture of articles of cork, straw and plaiting materials</td>
<td>2052</td>
<td>Manufacture of lighting equipment and electric lamps</td>
<td>315</td>
</tr>
<tr>
<td>Manufacture of pulp, paper and paperboard</td>
<td>211</td>
<td>Manufacture of other electrical equipment n.e.c.</td>
<td>3162</td>
</tr>
<tr>
<td>Manufacture of wallpaper</td>
<td>2124</td>
<td>Manufacture of electronic valves and tubes and other electronic components</td>
<td>321</td>
</tr>
<tr>
<td>Other publishing</td>
<td>2215</td>
<td>Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy</td>
<td>322</td>
</tr>
<tr>
<td>Manufacture of refined petroleum products</td>
<td>232</td>
<td>Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods</td>
<td>323</td>
</tr>
<tr>
<td>Processing of nuclear fuel</td>
<td>233</td>
<td>Manufacture of medical and surgical equipment and orthopaedic appliances</td>
<td>331</td>
</tr>
<tr>
<td>Manufacture of dyes and pigments</td>
<td>2412</td>
<td>Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment</td>
<td>332</td>
</tr>
<tr>
<td>Manufacture of pesticides and other agro-chemical products</td>
<td>242</td>
<td>Manufacture of optical instruments and photographic equipment</td>
<td>334</td>
</tr>
<tr>
<td>Manufacture of pharmaceuticals, medicinal chemicals and botanical products</td>
<td>244</td>
<td>Manufacture of watches and clocks</td>
<td>335</td>
</tr>
<tr>
<td>Manufacture of perfumes and toilet preparations</td>
<td>2452</td>
<td>Building and repairing of ships and boats</td>
<td>351</td>
</tr>
<tr>
<td>Manufacture of essential oils</td>
<td>2463</td>
<td>Manufacture of aircraft and spacecraft</td>
<td>353</td>
</tr>
<tr>
<td>Manufacture of photographic chemical material</td>
<td>2464</td>
<td>Manufacture of motorcycles and bicycles</td>
<td>354</td>
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<tr>
<td>Manufacture of prepared unrecorded media</td>
<td>2465</td>
<td>Manufacture of other transport equipment n.e.c.</td>
<td>355</td>
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<tr>
<td>Manufacture of other chemical products n.e.c.</td>
<td>2466</td>
<td>Manufacture of jewellery and related articles</td>
<td>362</td>
</tr>
<tr>
<td>Manufacture of man-made fibres</td>
<td>247</td>
<td>Manufacture of musical instruments</td>
<td>363</td>
</tr>
<tr>
<td>Manufacture of rubber tyres and tubes</td>
<td>2511</td>
<td>Manufacture of sports goods</td>
<td>364</td>
</tr>
<tr>
<td>Manufacture of flat glass</td>
<td>2611</td>
<td>Manufacture of games and toys</td>
<td>365</td>
</tr>
<tr>
<td>Manufacture of hollow glass</td>
<td>2613</td>
<td>Miscellaneous manufacturing n.e.c.</td>
<td>366</td>
</tr>
</tbody>
</table>

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.