

Inclusion of Consumption of Carbon Intensive Commodities in Carbon Pricing Mechanisms

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Introduction

Climate protection is a global challenge that all countries have a common but differentiated responsibility to address. However, not all governments are willing to commit to targets of equal stringency. Moreover, countries may have different views on the choice of policy mix. Some countries may put a stronger emphasis on the carbon price and see a higher carbon price in the policy mix whereas other countries may make more use of other regulatory instruments. Carbon prices may thus continue to differ over longer time horizons. Without additional measures, this difference in the carbon price risks a shift in production of carbon intensive materials to regions with lower carbon prices, so called carbon leakage.

Measures to avoid carbon leakage have therefore been and most likely will continue to be taken that complement carbon pricing in the production of carbon intensive materials. All emission trading mechanisms covering industrial emitters thus offer some free allowance allocation and all carbon tax schemes have implemented some exemptions for materials production. Thus energy and carbon intensive materials do not bear the costs of carbon externalities, and the carbon price signal is largely eliminated for most of the value chain other than for efficiency improvements within the primary production process. In studies of the cement and steel sector Climate Strategies found that only 10% to 20% of emission reduction potential exists through further efficiency improvements. The

majority of future mitigation opportunities are linked to break-through technologies, the use of higher value products and thus lower weight and carbon intensity, alternative materials and more tailored use of materials. Thus the current approach to leakage protection cannot support the realization of the majority of mitigation options in these sectors. This puts at risk the low-carbon transformation of our economies because material production comprises the largest share of industrial emissions.

Hence for post 2020 a new approach is necessary for reducing emissions while avoiding carbon leakage. We therefore propose to introduce a scheme (Inclusion of Consumption) for high-carbon commodities that:

- i. continues to avoid leakage by (benchmark based) free allowance allocation or corresponding tax exemptions; and
- ii. includes the domestic consumption of selected carbon intensive materials in carbon pricing schemes.

Precedents for this scheme already exist in emission trading mechanisms of Chinese provinces, the Republic of Korea, and Tokyo where additional measures are taken to include the consumption of electricity. The combined approach would restore the carbon price signal for the value chain, which is broken where allowances are allocated for free to avoid leakage or activities are exempt from carbon taxes. The objective is to allow the carbon price to contribute to setting the incentives necessary for a

low-carbon transformation of production and consumption of carbon intensive commodities.

Basic features of Inclusion of Consumption

If carbon leakage is an issue for the longer term, measures taken to avoid leakage must at the same time provide incentives for innovation and investment, and do so across the value chain. This can be achieved through Inclusion of Consumption combined with free allocation.

In the proposed system, the production of commodities like steel would remain covered by a domestic carbon pricing mechanism. Leakage risk is addressed by free allocation of allowances. The use of benchmarks linked to recent production volumes to determine the volume of the free allocation preserves incentives for energy and carbon efficiency improvements in production of the basic material. Equivalent argumentation applies to special provisions in carbon tax schemes, but is not repeated for the remainder of the text to improve legibility. The downside of such free allocation is that it largely eliminates the cost and price impact on materials and therefore also removes mitigation incentives at subsequent stages of the value chain.

Hence, an additional measure – and this is the key aspect of Inclusion of Consumption – a consumption charge is levied for carbon intensive commodities like clinker (cement) and steel. The charge is levied per ton of steel, aluminum or clinker (cement) consumed. In order to arrive at the amount of the charge, the weight is multiplied by a benchmark emissions value (carbon emissions per ton of the commodity) and the carbon price. The charge serves the purpose of including consumption in the carbon pricing scheme. It is necessary for restoring the carbon price signal for mitigation opportunities in the materials sector, other than efficiency improvements of the primary production process. This full carbon price is necessary—albeit not always sufficient—for modernization and innovation opportunities in the value chain.

The consumption charge is levied for all consumption of carbon intensive materials at the same benchmark rate – irrespective of the origin or production process of the material. Thus discrimination across different installations and distortions of production decisions are avoided, and the mechanism is not considered to be a trade

related measure. This also implies that the mechanism does not create incentives for efficient production of carbon intensive materials in foreign installations. The consumption charge does however create incentives for the more efficient use of carbon intensive materials by all producers selling to the domestic market.

Inclusion of Consumption builds on the experience from consumption based carbon accounting, or “carbon footprints”. Carbon footprints trace all emissions emerging along the value chain. Footprints connect consumption choices to the emissions required to support that consumption. The approach has been very useful in covering the international fragmentation of supply-chains, allowing for assessment of whether emissions reductions has occurred globally, or have only seen a shift in production to other regions. However, models to estimate carbon footprints are necessarily complex (monitoring and reporting at a high level of granularity both for domestic production and imported products is challenging). Hence it is unlikely that carbon footprint approaches could form a legal basis for a consumption charge. Hence Inclusion of Consumption reduces complexity and allows for direct verification by only charging for the emissions linked to the primary production process at a benchmark rate. Economically this simplification is efficient if the charge complements incentives from up-stream emission trading schemes for reduction of carbon intensity of primary production and from other domestic policies for reduction of emissions in down-stream manufacturing processes. The question we would like to address is whether Inclusion of Consumption can be a pragmatic approach to harness the principle drivers of carbon footprints.

Potential advantages of Inclusion of Consumption

Inclusion of Consumption restores the carbon price signal that is muted for the subsequent value chain by the free allowance allocation. The incidence of the charge is on final domestic consumers of the covered material. Anticipating the relevance for final consumers, decision makers along the value chain will consider how to make their product more competitive by more efficient use or substitution of the carbon-intensive materials to reduce the charge levied on their product. Efficient use of materials reduces payments for the consumption charge, and in the inter-materials competition, lower-carbon

materials benefit from a lower charge, thus providing an incentive for innovation. Inclusion of Consumption also improves the business case for break-through technologies like Carbon Capture and Storage (CCS) or Carbon Capture and Use (CCU). First, a long-term robust mechanism to avoid carbon leakage allows for carbon prices that are necessary to cover incremental costs. Second, the charge on consumers of carbon intensive materials avoids the need for a politically difficult cross-subsidy for large scale use of CCS from other sectors or general tax revenue.

Inclusion of Consumption is compatible with World Trade Organization (WTO) law as long as it is implemented without any discriminatory components. Like other consumption charges, the proposed charge is independent of country of origin, thus avoiding concerns about discrimination. It does not require the tracing and allocation of emissions specific to a particular product along the value chain. This avoids the need for complex carbon monitoring, reporting and verification protocols. It also makes Inclusion of Consumption independent of production processes, which might have given rise to concerns under WTO law.

Inclusion of Consumption provides long-term clarity to support investment. In the current setting, investors fear uncertainty about the volume of free allowance allocation in future years. Without Inclusion of Consumption, governments might reduce free allowance allocation below the best available technology benchmark to increase incentives for abatement in the value chain. A further motivation to limit the volume of free allocation could be securing a sufficient share of allowances that can be auctioned to create revenue to fund climate action. Inclusion of Consumption restores full incentives along the value chain and recovers the value forgone at auctions due to free allowance allocation. Thus the industry has long-term clarity that free allowance allocation will be pursued at full benchmark levels. This creates clarity for investment choices. Only the carbon price will have to be considered, not the leakage protection measures, as the mechanism avoids all incentive for leakage while imposing the full carbon price signal along the value chain.

Implementation

For ease of implementation, Inclusion of Consumption needs to focus on carbon-intensive materials that are internationally tradable or significant part of internationally traded products. Thus the carbon price signal can be reinstated along the value chain to realize mitigation opportunities for a large share of industrial emissions. To avoid distortions of materials choices, carbon intensive materials that are close substitutes (e.g. steel, clinker, aluminum) need to be jointly considered.

Conceptually, Inclusion of Consumption can be modeled after consumption levies that are well established, such as excises on fuels, alcohol and tobacco. Simple and effective schemes functioning in Europe (and globally) based on computerized systems, can be replicated.

Domestic producers of carbon-intensive materials would incur a liability per ton of material, e.g. steel or clinker, produced or imported. The charge is calculated based on a benchmark for the primary production of the material and the carbon price applied in the upstream carbon pricing mechanism. They then pass the liability with the sale of their product; however, the payment of the charge is suspended through the intermediate good chain under duty suspension arrangements and comes due only at the time the good is released for consumption. As long as no release for consumption has taken place, the charge is not due. Producers and trading companies along the value chain do not have to participate in the mechanism. If they consider materials content insufficient to warrant the effort, they can pay the consumption charge to their trading partner when acquiring carbon intensive materials directly or as part of intermediate products.

Duty suspension requires that entities involved in the production, transportation and storage of goods must be licensed. All licensed entities receive an individual registration number. If a trade partner is licensed, a product can be moved under suspension arrangements. The movement is then monitored via an electronic registry based on double bookkeeping e.g., both the seller and buyer of a product report to the registry the volume of the carbon intensive commodities transferred. If any discrepancies are detected, then appropriate action is taken. If a firm prefers not to license under the duty suspension arrangements and hence opt out, any commodities or products purchased are assumed to be released for consumption and hence the charge is paid.

Once the charge has been paid, the liability is acquitted and no further monitoring is required.

As is the case under excises today, Inclusion of Consumption follows the destination principle: the charge mirrors the carbon price in force at the place of consumption, not of production. Where a product is exported outside the region covered by the carbon pricing system, the liability is acquitted. To benefit from this, firms with products that contain significant volumes of carbon intensive commodities will have to participate in duty suspension arrangements and hence licensing and registration. For products that are imported, the importing firm acquires a liability for the carbon intensive commodities contained in the imported goods. Thus for products in pre-defined categories of Standard International Trade Classification (SITC) the importer has to be licensed and has to report the weight of the carbon intensive commodities that are contained in the imported products, upon which the liability is calculated.

Administrative and compliance costs seem fairly limited as recording on production levels, sales and transportation of goods follow long established protocols. Reporting requirements under the Inclusion of Consumption in many cases would only be marginally additional to standard business reporting. As the consumption charge is not linked to the specific emissions of a product, Inclusion of Consumption does not require the tracing and allocation of emissions along the value chain. Instead it is assumed that all additional emissions in the subsequent stages of the value chain are covered by domestic policies. Hence the consumption charge only needs to reinstate the carbon price signal from the production of the basic material previously muted with free allowance allocation.

The role for international cooperation

Inclusion of Consumption is not a trade-related measure. The charge is paid by final consumers irrespective of the origin of the product and production process, and thus not WTO-relevant as long as it is implemented without any discriminatory components. This aspect is also essential for the interpretation of the approach in climate policy discussions: the charge reflects an internationally pursued aim to reduce the consumption of CO₂. It should thus avoid potential conflicts anticipated with border carbon adjustments, which operate solely at the point of

imports. Early discussion with international partners can facilitate mutual learning and help to explore options for cooperation to enhance the global benefit of domestic action.

The design and parametrization of emission benchmarks for the free allocation of allowances for the production of carbon intensive commodities could be one of the themes for a mutually beneficial cooperation. It still remains unclear how their design can best ensure effective leakage protection and incentives for innovation in process technologies. The definition of benchmarks based on the implementation of technologies within a country or region (for example based on the top 10th percentile) can create disincentives for the diffusion of new technologies, as incumbent firms implementing the new technology can suffer from reduced allocation for all their existing installations. Perhaps the use of international benchmarks can create new options to ensure incentives for innovation and diffusion of new technologies.

Regional dimensions

Asia

In South Korea, Tokyo and some of the Chinese pilot emissions trading schemes the regulation of the electricity sector mutes the carbon price signal on electricity prices. To re-instate some incentive for efficient electricity use, industry and large buildings need to surrender allowances proportional to electricity consumption at a benchmark rate of carbon intensity of power.

The consumption of electricity, an emission-intensive goods, is included in the emissions trading system as an object of regulation as well as a part of threshold criteria metric. In Korea, the coefficient for the calculation of indirect emissions according to the consumption of electricity is updated by the regulatory authority before each of the commitment periods, based on the average emission intensity of power production. In China, the updating of indirect emissions varies by pilot.

The inclusion of electricity consumption, via indirect emissions, is introduced by the regulatory authority to circumvent the strict government control of electricity prices, both at wholesale and retail levels. In Korea, there was a grave concern that without liberalized market-based pricing of electricity, the carbon price on direct emission would not be passed through to the price of electricity and so the demand of electricity would

not be managed to an efficient level. This concern was shared by some pilot regulators in China.

Europe

In Europe, several EU member states would object to taxation at the EU level. However, Inclusion of Consumption can be implemented as part of environmental regulation (e.g. the EU ETS Directive). A set of requirements for this interpretation seem to be met, including that Inclusion of Consumption secures incentives towards environmental objectives. It is merely implemented as a charge instead of an obligation to surrender allowances for ease of administration. The charge is linked to the carbon-bearing component of the product, the level of the charge is linked to the EU ETS allowance price, and the revenue goes into national trust funds for national and international climate action to fund activities that otherwise would have been supported through EU ETS auction revenue. Finally, some of the revenue from the trust fund will be used to retire EU ETS allowances corresponding to the net imports of carbon embodied in trade. Comparable political objectives may exist in other jurisdictions, where a similar approach could work.

United States

In the United States, California's cap-and-trade program requires electricity producers and importers to retire allowances for their emissions. In addition, regulators are currently considering whether to regulate emissions associated with cement imports. One reason that motivates the current coverage of electricity imports and potential coverage of cement imports is emissions leakage. California, for example, imports a significant amount of electricity from out-of-state, some of the source for which are more carbon-intensive than domestic state production. Moreover, the states that surround California have yet to price carbon emissions. Without a price on the carbon emissions associated with electricity imports, a substantial degree of leakage would likely occur via California electricity providers shuffling their purchases from in-state to out-of-state sources. With a price on the carbon emissions associated with electricity imports, leakage is certainly reduced relative to a case without leakage protections, but the extent to which leakage is reduced (and whether this is the ideal policy to combat leakage) is still under debate.

Emerging questions

- 1) Which commodities to include: To limit complexity and administrative efforts, the implementation of Inclusion of Consumption will require a focus on a limited number of commodities. To avoid cross-commodity distortions, materials that are in close competition should be jointly covered.
- 2) Which imported products to include: While domestic producers can self-select whether to participate in the duty suspension arrangements or acquire products for which the consumption charge is already paid, a clear rule is necessary for imported products determining whether the importers incurs a liability for carbon emissions at benchmark rate linked to the carbon intensive materials that are contained in the product. This raises the question for which trade categories (i.e., how far down the value chain) the content of the carbon intensive materials has to be reported?
- 3) What benchmark rates to use: There are multiple options to define benchmarks for carbon emissions from the production of carbon intensive materials. This raises the question how this should be defined to create appropriate incentives for innovation and investment. We would like to explore how international cooperation can widen the information basis and reduce uncertainty?
- 4) What can be learned from international experience with consumption charges: similar schemes have been proposed or are implemented in Asia and North America. Such schemes may offer insights into the specific implementation choices for the Inclusion of Consumption in Europe.
- 5) What administrative costs to expect: It needs to be quantified what public administration and private compliance costs will be incurred as input for cost-benefit assessments on the implementation of the new mechanism.
- 6) How to realize benefits from international benchmarks: International processes harmonize the methodologies used for the calculation of benchmarks. How can these – or other approaches – be used to ensure benchmarks create incentives for innovation and diffusion of new technologies?

- 7) What will be the cost impact for different consumer segments: It needs to be assessed how different consumer segments will be impacted, also dependent on the use of revenue, e.g. re-placing otherwise tax funded expenditure on climate action.
 - 8) The use of revenue: How to balance different objectives and provide long-term clarity for funding of break-through technologies in the material sector, climate action with visible shorter-term mitigation impact, and measures to mitigate potential disproportional cost impact on specific consumer segments?
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