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Options for EU trade policy to enhance climate action

Strategic and tactical considerations for incentivising low-carbon investment and addressing carbon leakage

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Summary

In her Political Guidelines, Commission President-elect Ursula von der Leyen declares climate neutrality to be one of the central objectives of a proposed European Green Deal. EU member states are now discussing whether to formally agree on an objective for climate neutrality in 2050. Some have already set deadlines – Finland as early as 2035. This has triggered reflection on the adequate policy mix, notably with a view to making a business case for low-carbon innovation and investment while addressing carbon leakage. The Commission President-elect thinks this will require a carbon border tax.

To address the strategic need for a robust EU framework for low-carbon investment, we discuss that the European Commission could investigate the economic, legal, and administrative viability and implementation timeline of carbon price adjustments at the border, and also could investigate the possibility to extend the EU Emissions Trading System (ETS) to include consumption of carbon intensive materials as well as the potential of product standards to achieve the same aim. All three instruments have different advantages and shortcomings as to political acceptability, effectiveness, or the implication for the World trade system. To facilitate the support for partner countries in advancing climate action, both bilateral and multilateral measures should be prepared.

Introduction

The need for more action to meet the Paris Agreement objectives and global climate targets has been highlighted repeatedly, most recently by the 2018 special report by the Intergovernmental Panel on Climate Change (IPCC) on 1.5°C average global temperature increase (IPCC 2018), and the reports on climate change and land (IPCC 2019a) as well as on oceans (IPCC 2019b). In the June European Council, EU leaders confirmed the urgency of global and EU climate action and the need for both ambition and leadership to address climate change.¹

Climate action will increasingly affect all sectors of the economy, rapidly extending from the energy sector to mobility, industry, buildings, infrastructure, and finance, for example. Among other measures, the decarbonisation of energy-intensive industries has come into focus in the EU, analytically through a raft of research² and politically with the creation of the High-Level expert Group on Energy-Intensive Industries in 2015 by the European Commission. Indeed, more than half of all greenhouse gas (GHG) emissions are related to economic activities that exploit, use and recycle materials (OECD, 2018, p. 3).

The EU Long-Term Strategy, published by the European Commission in November 2018, kicked off the debate about possible pathways to reach EU and global climate targets, set out necessary policies, and offered reflection about EU leadership and how to sustain it.

In the past, the EU has been instrumental in driving progress internationally, namely with its first climate target already set in 1990 for the year 2000. Moreover, the EU implemented its Emissions Trading System (ETS) and other energy policies to deliver on the Kyoto Protocol targets and was among the first Parties that submitted a Nationally Determined Contribution (NDC) for the Paris Agreement in 2015.

Recognising that there is a general economic imperative to engage in low-carbon industrial transformation, not least to position Europe's industry competitively for the future, how can the EU build upon its leadership role and continue to offer solutions for reductions and underpin growth in future industries? Leadership on climate change policies has enhanced the global role of the EU. Can it also do so at a time of multilateralism in crisis?

1. Why trade matters for climate action

Trade matters for climate action for two reasons: carbon is embedded in imported goods, and low-carbon technology is deployed and diffuses through trade. Both affect the relationship between the trade and climate regimes in several ways.

In its NDC of 2015, the EU announced that it would reduce emissions from its territory by at least 40% by 2030. This target is under scrutiny in 2019 given that new NDCs and a long-term strategy must be submitted under the Paris Agreement by 2020. Data on embedded carbon in trade flows show that since 1990 the amount of emissions imported

¹ The European Council of 20 June 2019 emphasised the importance of ... "stepping up global climate action so as to achieve the objective of the Paris Agreement, including by pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels". The "European Council invites the Council and the Commission to advance work on the conditions, the incentives and the enabling framework to be put in place so as to ensure a transition to a climate-neutral EU in line with the Paris Agreement that will preserve European competitiveness ..." (European Council 2019).

² The most comprehensive analysis has been undertaken by Wyns et al (2018).

into the EU (embodied in traded goods) is nearly equivalent to the amount the EU economy has reduced from production sources on its territory (Wood et al. 2019). Trade therefore plays a key role in the attribution of emissions. Moreover, new technologies can be adopted faster if markets grow beyond national borders through trade. Economies of scale bring down costs and thus work in favour of affordable low-carbon technologies across countries. Yet politically, trade relations have become a very difficult topic.

Technology deployment and innovation diffusion to tackle emissions rapidly and substantially will necessitate investment on a huge scale. Companies, however, will only invest if there is a reasonable expectation of a profitable market. For low or near zero-carbon industrial products and related technologies, which compete with currently available carbon-intensive alternatives, the question is: who will buy these goods and why?

Unless there is a dynamic increase in global, regional, or national demand for low-carbon products, it is unreasonable to expect the global low-carbon economy to develop fast enough to substantially reduce emissions and drive forward cost reductions. This demand hinges, inter alia, on national climate action agendas and ambitions, business cases, and consumption trends.

The need for more low-carbon investment and stimulation of related demand is currently unfolding against a backdrop of a global trade regime increasingly marred by conflict. The EU is challenged on traditional trade issues such as tariffs and dumping to a growing extent. The acceleration of climate action, as for example suggested in the Long-Term Strategy, will increasingly bring to the fore the challenge of how to address the gap with trade partners keeping carbon constraints low for domestic companies and thus creating competitive advantages at the expense of the climate.

In the spirit of the United Nations Framework Convention on Climate Change (UNFCCC), which was re-confirmed by the Paris Agreement, industrial countries will have to reduce emissions at a faster pace than emerging economies and developing countries. There is good reason to include international flows of carbon embodied in trade in this debate.

With the 2050 climate strategy, the EU is positioning itself as the home of a nascent low-carbon industry, including the energy-intensive sectors. A solution to creating stable markets for future low-carbon technologies is yet to be found.

2. The strategic dimension

EU climate policy is targeting domestic greenhouse gas emitters, i.e. making them pay for their emissions or be responsible for actions that reduce emissions. However, if carbon prices under the EU ETS were at levels necessary to facilitate low-carbon investment in the industry sectors (e.g. in the order of 50 euro/t CO₂), producers of basic materials like steel or cement were likely to relocate some production and investment to other regions. This risk of carbon leakage is generally motivating governments to grant exemptions in carbon pricing schemes – in particular to basic material producers. Under the EU ETS, sectors 'at risk' receive free allowances for every tonne of material produced at a benchmark

level.³ Such exemptions largely mute the carbon price signal that would stipulate emission mitigation options along the value chain, and thus largely inhibit incentives for many of the emission reduction opportunities for most industries. From a climate perspective, the production of basic materials like steel, cement, or chemicals, accounting for some 25% of global greenhouse gas emissions (IEA 2017), is of particular concern.

While no perfect solution to this conundrum can be found, there are a number of policy options available to the EU. The focus should lie on strengthening the business case for innovation and investment in low-carbon technologies by creating a stable environment for such innovation and investment. The trade aspect of this is acknowledged in the chapter on a European Green Deal in the Political Guidelines of the new Commission President-elect Ursula von der Leyen, in the form of a 'carbon border tax'. However, other options exist and warrant equal attention, as discussed below.

a) Border taxes and adjustments

A tax on imports is among several design options for pricing imported carbon by so-called border carbon adjustment. Border carbon adjustments can internalise emissions that occur abroad by imposing a carbon price on imports. The carbon-based price adjustment at the border leads to a matching of the domestic price. The advantage is that this would allow for a shift from free allowance allocation to auctioning to domestic producers. There have been substantial analyses of the particular design and economics of border carbon adjustments, including a border carbon tax (e.g. Mehling et al. 2019; Horn and Sapir, 2013; Cosbey et al, 2012; Gros and Egenhofer, 2010; Ismer and Neuhoff, 2007).

A border adjustment can be made WTO-compatible in principle, notably by application of the general exemption clause of the General Agreement on Tariffs and Trade (GATT), and needs to clearly address the carbon leakage risk. Additional requirements are i) no rebates of carbon costs to exporters, ii) measures should be limited to primary goods, for example cement, steel, and aluminium, which would then no longer receive free allowances, iii) no discrimination against international producers and trade partners, i.e. by singling out specific countries, iv) the design and implementation of a border adjustment should occur through a deliberate process that ensures fairness, transparency, and predictability to improve political acceptance by trade partners. For further details, see Mehling et al, 2019 and Lamy, Pons, and Leturcq 2019.⁴ Some industries, typically those with high export intensity, have argued that border adjustments without rebates will neither address the lacking incentive for low-carbon investment nor carbon leakage; some argue that export rebates can be made compatible with WTO rules. Border adjustments would become obsolete once producers that face this charge have ramped up their climate performance.

Measuring the carbon content of traded materials in such a system is complex. One way to deal with it is via a benchmark value, for example based on the national average emissions of an industry. With the adjustment, products sold to European consumers bear carbon

³ A benchmark to calculate the number of free allowances is applied based on a technical formula along industrial products under the EU ETS. Generally speaking, a product benchmark is based on the average greenhouse gas emissions of the best performing 10% of the installations making that product in the EU; https://ec.europa.eu/clima/policies/ets/allowances/industrial_en

⁴ See Harro van Asselt; Susanne Dröge, Michael Mehling (2019), How von der Leyen could make a carbon border tax work, 22.7.2019, Climate Home News <https://www.climatechangenews.com/2019/07/22/von-der-leyen-make-carbon-border-tax-work/>

costs at the benchmark level, which is typically at or below the carbon cost faced by domestic producers. Thus, imported products would be treated in the same manner as domestic goods in the EU market. In this way the carbon price would be fully passed on to consumers as there would be no cost disadvantage to domestic producers. This price signal would create incentives for mitigation, clarity on cost allocation, and revenues to fund other climate policy measures, including supporting research and development (R&D) and innovation.

Even if justified from a climate perspective, there can be political and economic risks in pursuing an agenda that may be perceived as protectionist or may create protectionist results, if not monitored with sufficient care. For example, at some point the level of adjustments could exceed what is required to level the playing field. Thus, border measures risk trade conflicts and, if formulated carefully enough to reduce the risk of such conflicts, they will not eliminate all cost differences relating to climate policy. The inclusion of indirect costs would furthermore be difficult. Also, importers should be granted the right to a reduced adjustment rate if they can demonstrate a carbon intensity below the applied benchmark rate (Cosbey et al, 2012). This would provide incentives to encourage climate-friendly production abroad but may also create windfall profits for foreign production based, for example, on existing hydro power stations. Furthermore, including indirect costs increases complexity.

b) Consumption charges

Producers of basic materials fall under the category of ‘at risk’ of carbon leakage and are shielded, to some extent, from the cost impact of climate policies in the EU. For example, steel producers receive free allowances per ton of steel according to the benchmark of a best available technology for steel production (Zipperer, Sato, Neuhoff, 2017). Firms therefore only face costs for emissions that exceed the benchmark. As this only comprises a fraction of overall emissions, they will thus not pass most of the carbon price on to material prices.⁵ The carbon price signal is therefore muted.

This shortcoming could be addressed by including consumption in the emission trading system to ‘reinstate’ the carbon price (Climate Strategies, 2016). The consumption charge – as in the case of free allocation – would be levied at the ETS benchmark used for free allowance allocation to primary production (Ismer and Haußner, 2016). The charge is thus indifferent to location or production processes. In contrast to border adjustments, the consumption charge applies to any producers, whether European or not. This would make it compatible with WTO rules.

At the same time, implementation is relatively simple compared to carbon foot-printing approaches. There is no need to trace specific materials along the value chain. Administrative effort would be further reduced because the consumption charge only needs to be levied on a few basic materials (e.g. steel, cement, and aluminium) that represent the bulk of industrial emissions in the EU ETS. Most importantly, its main merit is that it creates economic incentives for innovation and investment in climate-friendly material production (see Elkerbout and Egenhofer 2018) as it allows clarity on cost allocation for over half of industrial emissions. Thus, it would serve a key objective of the EU Long-Term Strategy.⁶

⁵ This was different in early periods of EU ETS where allocation was linked to historic emissions or production volume.

⁶ For a detailed analysis see Climate Strategies Report and technical papers at <https://climatestrategies.org/projects/inclusion-of-consumption-in-emissions-trading/>

A limitation is that such a system for foreign producers only creates incentives for using carbon intensive materials efficiently, but does not create incentives for international material producers to reduce their emissions. The charge remains the same for both efficient and inefficient production processes. Instead, national policies of the country hosting the respective material producers will be required to create such incentives and may be supported through international climate cooperation. Moreover, it requires a continuation of free allocation, which may be politically challenging. A consumption charge will, however, open the way to develop a mechanism for international financial or technological cooperation to support innovation and investment in climate-friendly material production in other jurisdictions.

c) Environmental standards

There is a long tradition of environmental standards in the EU and they can take different forms. They are implemented as part of legislative processes, which can either take place at EU level or – under certain conditions – as part of member states’ decisions to implement EU directives.⁷ Standards ensure that only products that meet certain specifications can be sold to consumers and thus apply both to domestic and international producers. Examples are mandatory bio-fuel standards, the now abolished Fuels Quality Directive, product design standards, and also voluntary certification through private labelling programmes (e.g. for food or wood).

Under the WTO regime, standards are split into two groups, technical regulations and standards. Standards are specifications enabling safety and quality benchmarks to be met by a traded good, a production process, and services. In this way, they define market access. Mostly, these standards are set by private bodies such as industry associations or, internationally, by the International Standardization Organization (ISO) in order to meet demand from customers and reduce companies’ transaction costs. Technical regulations, including standards, decided on by governments define the group of ‘technical regulations’ under international trade law. The Technical Barriers to Trade (TBT) Agreement takes care of eliminating as far as possible the diversity of standards through a “Code of Good Practice”. It ensures common principles for trade partners and thus reduces obstacles to trade. Any new technical barrier to trade must be reported under the TBT notification procedure at the WTO.⁸

Climate protection can be advanced effectively via standards in all cases where the emissions from a product or from the production process can be monitored, measured, and reported. With respect to production, the basic materials sectors’ carbon neutrality could define a new standard, either voluntarily or mandatorily. This, however, requires a technological reference point (e.g. a pilot plant for carbon-neutral steel production) and pioneering technologies. The prescription of standards by policymakers therefore depends on knowledge about technological options. This is a critical point for regulators and the lack of knowledge is a strong argument for ‘technology-neutral’ environmental policy approaches, such as pricing instruments for the introduction of low-carbon processes.

Basic materials production with near carbon neutrality is at an early stage of innovation, demonstration, and commercialisation at various levels. As such, there is no benchmark technology that could or should be used to define a production standard. Instead, the EU

⁷ An overview on EU regulation tools can be accessed here: https://ec.europa.eu/info/sites/info/files/file_import/better-regulation-toolbox-18_en_0.pdf

⁸ See TBT notification procedure, <https://ec.europa.eu/growth/single-market/barriers-to-trade/tbt/>.

policy agenda could include announcements that from a certain date onwards only climate-friendly (produced) materials will be allowed within and into the EU, and that a technical regulation cannot be ruled out if carbon pricing does not deliver fast enough. This might further encourage basic material producers to engage in innovation and investment in climate-friendly materials and production processes. It may thus encourage the private initiative and prioritisation necessary to make public innovation support at national and EU level effective. In the best of cases, industries would develop their own approaches to technical standards across countries.

Given the potential of standards to hinder trade flows, the EU should also look for trade partner cooperation on this tool, creating a bigger market for goods with a carbon-neutral performance. Trade agreements need to specify how to handle the different levels of standards, either by agreeing on mutual recognition or by negotiating a common approach. A mutual recognition is the least intrusive way of alignment of such standards, while common standards are the highest possible form of convergence on the rules applied.

3. Trade policy as a tactical way to encourage climate action

Tactical measures can involve tackling specific issues and interactions by incorporating them into trade agreements, including technology transfer, intellectual property rights of breakthrough technologies, or subsidy control.

a) Trade conflicts and trade agreements

The EU climate policy can benefit from a closer link with EU trade policy – and possibly vice versa (Droege and Schenuit, 2018). Following the 2017 announcement of US-President Donald Trump to leave the Paris Agreement, a number of governments advanced the idea of sanction this move via trade measures, for example the governments of Mexico and France. Moreover, the Trump administration has repeatedly announced tariffs on EU goods, such as cars, which has challenged EU trade policymakers in an unprecedented way. One possible response is to link the EU's multilateral trade approach to the multilateral approach to climate policy (Mehling et al, 2018). The EU's response to the US tariff threat has so far centred on hurting Trump-voters by putting countervailing tariffs on whisky and Harley Davidson exports to the EU. A closer look at the embedded carbon of US materials and basic products could offer a tactical approach that would at least serve the political purpose of responding to US threats with a clear EU stance on multilateral concerns, namely delivering on the Paris Agreement.

b) Bilateral cooperation

A more positive and thus politically more viable option is to offer preferential status to climate-friendly products from countries that also implement stringent climate action and are ready to join a club of like-minded trade partners. An example is the Environmental Goods Agreement under the WTO, which has been on hold since 2016 (WTO and UN environment, 2018, p. 64). The EU has turned to bilateral trade agreements in recent years and a more detailed approach to the sustainability chapters of such deals could pave the

way for concrete climate policy cooperation in trade. In any case, the trade-climate nexus might benefit from a strategic reflection, not only because of trade tensions, but also in the light of delayed climate action and a related role of trade agreements in enabling more climate policy cooperation (Droege et al. 2017; Das et al. 2019).

4. What possible next step?

The next cycles of NDC submissions in 2020 and the first global stocktake in 2023 under the Paris Agreement both require a careful assessment of the right policy mix, notably with a view to making a business case for low-carbon innovation and investment. The process will also create transparency regarding climate actions across countries. It has the potential to intensify the debate on who causes what emissions where, and who is responsible for their internalisation and, ultimately, their mitigation. Naturally, this will entail a closer look at trade flows in embedded carbon. As part of the EU Long-Term Strategy, the European Commission should consider how to approach this issue, not necessarily as a substitute for but certainly as a complement to addressing emissions from production.

As we have argued, basic materials are of particular relevance for an extension of policy from the production to the consumption sphere because data and knowledge about their production exist across countries and because they are an early input for products traded among countries. The European Commission will have to investigate the economic, legal, and administrative viability and implementation timeline of three options to make a business case for low-carbon investment while addressing carbon leakage: i) a border adjustment ii) an extension of the EU ETS to include the consumption of carbon intensive materials and iii) the potential of product standards.

To enhance cooperation with key trading partners or groups of countries with a stated interest in accelerating climate action, the monitoring of the carbon flows could be introduced into both trade and climate talks, with an explicit interest in implanting this in NDCs. Cooperation could develop further ways for providing information on embedded carbon as a matter of common interest in actual trade agreements.⁹ Joint commitments towards reducing the emissions intensity of products could also be included in the EU's economic cooperation and trade agreements. This would have the additional advantage of rendering the general sustainable development clauses in agreements more concrete.

⁹ As an example of such a supportive policy approach, see the German NDC partnership initiative with developing countries http://www.bmz.de/en/press/aktuelleMeldungen/2017/november/171114_pm_123_One-year-of-the-NDC-Partnership-new-members-and-more-funds-for-climate-action-at-COP23/index.html

References

- Climate Strategies (2016), *Inclusion of Consumption of carbon intensive materials in emissions trading – An option for carbon pricing post-2020*, Report <https://climatestrategies.org/wp-content/uploads/2016/10/CS-Inclusion-of-Consumption-Report.pdf>
- Droege, Susanne, Harro van Asselt, Kasturi Das, and Michael Mehling (2017), *The Trade System and Climate Action: Ways Forward under the Paris Agreement*, South Carolina Journal of International Law and Business 13 (1): 195–276. Accessed September 07, 2017.
- Das, Kasturi; van Asselt, Harro; Droege, Susanne; Mehling, Michael (2019), *Making the International Trade System Work for the Paris Agreement: Assessing the Options*, Environmental Law Reporter, June 2019, Vol. 49, No. 6; <https://elr.info/news-analysis/49/10553/making-international-trade-system-work-paris-agreement-assessing-options>
- Cosbey, Aaron et al (2012), *A Guide for the Concerned: Guidance on the elaboration and implementation of border carbon adjustment*, Policy Report: http://www.iisd.org/pdf/2012/bca_guidance.pdf;
- Dröge, Susanne and Felix Schenuit (2018), *EU Trade and Climate Policy Linkages. Potentials in Times of Repositioning*, 16.4.2018, https://www.swp-berlin.org/fileadmin/contents/products/comments/2018C16_dge_sux.pdf
- Elkerbout, Milan & Christian Egenhofer (2018), *Tools to boost investment in low-carbon technologies – five possible ways to create low-carbon markets in the EU*. CEPS Policy Insight 2018/11
- European Commission (2018), *A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy*. COM (2018) 773 final; https://ec.europa.eu/clima/policies/strategies/2050_en
- European Council (2019), *European Council meeting (20 June 2019) – Conclusions*. European Council, EUCO 9/19 <https://www.consilium.europa.eu/media/39922/20-21-euco-final-conclusions-en.pdf>
- Gros, Daniel and Christian Egenhofer (2010), *Climate change and trade: taxing carbon at the border?*, CEPS Paperback
- Horn, Henrik and André Sapir (2013), *Can border carbon taxes fit into the global trade regime?*, Brussels: Bruegel Policy Brief https://bruegel.org/wp-content/uploads/imported/publications/pb_2013_06_01.pdf
- IEA (2017), *Energy Technology Perspectives*. Paris: International Energy Agency, OECD/IEA.
- IPCC (2019a), *Climate Change and Land*, Special Report, August <https://www.ipcc.ch/site/assets/uploads/2019/08/SRCCL-leaflet.pdf>
- IPCC (2019b), *The Ocean and Cryosphere in a Changing Climate*, Special Report, September, available at <https://www.ipcc.ch/report/srocc/>
- IPCC (2018), *Special Report on Global Warming of 1,5°C*; Intergovernmental Panel on Climate Change, 2018; available at <http://www.ipcc.ch/report/sr15/>

- Ismer, Roland and Karsten Neuhoff (2007). *Border Tax Adjustments: A feasible way to support stringent emission trading*, European Journal of Law and Economics 24, p. 137–164
- Ismer, R. and M. Haußner (2016), *Inclusion of Consumption into the EU ETS: The Legal Basis under European Union Law*, Review of European, Comparative & International Environmental Law (2016), S. 69-80
- Lamy, Pascal, Geneviève Pons and Pierre Leturq (2019), *Time to green EU trade policy: But how?*, Policy Paper No. 241, Notre Europe – Jacques Delors Institute, 17 July 2019 <http://www.institutdelors.eu/wp-content/uploads/2019/07/190717-PP-EN-V2-Time-to-green-EU-policy-but-how-1.pdf>
- Mehling, Michael A., Harro van Asselt, Kasturi Das, Susanne Droege, and Cleo Verkuijl (2019), *Designing Border Carbon Adjustments for Enhanced Climate Action*. American Journal of International Law 113 (03): 433–81. doi:10.1017/ajil.2019.22. https://www.cambridge.org/core/services/aop-cambridge-core/content/view/BF4266550F09E5E4A7479E09C047B984/S0002930019000228a.pdf/designing_border_carbon_adjustments_for_enhanced_climate_action.pdf
- Mehling, Michael A., Harro van Asselt, Susanne Droege and Kasturi Das (2018), *Beat protectionism and emissions at a stroke*, Nature 559, no. 7714 (2018), doi:10.1038/d41586-018-05708-7; <https://www.nature.com/articles/d41586-018-05708-7>
- OECD (2018), *Global Materials Resources Outlook to 2060: Highlights*, Paris: OECD <https://www.oecd.org/environment/waste/highlights-global-material-resources-outlook-to-2060.pdf>
- Wood, Richard, Karsten Neuhoff, Dan Mora, Moana Simas, Michael Grubb and Konstantin Stadler (2019), *The structure, drivers and policy implications of the European carbon footprint*, Climate Policy, <https://doi.org/10.1080/14693062.2019.1639489> <https://www.tandfonline.com/doi/full/10.1080/14693062.2019.1639489>
- WTO and UN environment (2018), *Making trade work for the environment, prosperity and resilience*, https://www.wto.org/english/res_e/publications_e/unereport2018_e.pdf
- Wyns, Tomas, Gauri Khandekar & Isobel Robson (2018), *Industrial value chain – A bridge towards a carbon neutral Europe*, Institute for European Studies, Vrije Universiteit Brussel https://www.ies.be/files/Industrial_Value_Chain_25sept.pdf
- Zipperer, Vera, Misator Sato & Karsten Neuhoff (2017), *Benchmarks for Emissions Trading – General Principles for Emissions Scope*, DIW Discussion Papers 1712. https://www.diw.de/documents/publikationen/73/diw_01.c.574078.de/dp1712.pdf

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