



Carbon Tax Creep Beyond Industrial Goods: Challenges and Risks for Extending Coverage to Agriculture

Institute for International Trade

Executive Summary

Governments around the world are implementing emissions reduction policies to mitigate the impact of global warming, however the application of climate policies will occur at different speeds and depth due to varying levels of development and degrees of ambition.

In light of this, unilateral domestic “emission[s] constraints in an open economy not only cause structural adjustment of domestic production and consumption but also affect comparative advantage”¹, as production (and the inherent emissions) shifts to where the regulatory burden is lower. Hence, without an equitable price on emissions amongst trading nations, domestic abatement measures may be undermined if other countries enforce a

lower price on carbon. To equalise the gap between national policies, Carbon Border Adjustment Mechanisms (CBAM) have been proposed to level the playing field between domestic and foreign companies and to prevent carbon ‘leaking’ to where the emissions cost is lowest.

With all G7 countries committing to net-zero emissions by 2050, “carbon prices within G7 states are likely to increase, making border adjustments more attractive”². The EU is the most progressed with such policies, proposing new regulations in July 2021 to begin phasing in a CBAM by 2023³ as part of efforts to reduce emissions by at least 55% by 2030.⁴

Goods currently being considered under a CBAM are Emissions Intensive and Trade Exposed (EITE) industrial products, such as cement, steel, fertiliser and energy.⁵

However, agriculture, particularly the beef sector, may eventually fall under the purview of a CBAM, given the industry’s contribution to both global emissions and trade. Moreover, there is no definitive consensus on where to draw the line of CBAM coverage, so in theory all goods could be captured under certain policy constructs.⁶

In that context, this brief suggests a cautious approach to the expansion of unilateral CBAMs to agricultural products, drawing on the beef industry as an example. The expansion of a CBAM should be incremental, based on multilaterally agreed rules and standards, and be incorporated into a global institutional framework. Policies that may be suitable for industrial goods may not translate to the beef industry due the sector’s diverse and fragmented nature.

¹ The views expressed here are the author’s alone and not those of the Institute for International Trade or Meat & Livestock Australia.

Challenge

EU pressing ahead with CBAM

A CBAM seeks to correct carbon leakage and to level the playing field for domestic firms affected by national emissions reduction policies, by taxing imports on carbon intensity and reimbursing exports on carbon taxes paid⁷. While they work in theory, there are a range of challenging considerations for establishing a CBAM; including determining the range of products covered; the method for calculating carbon intensity; the form and degree of price adjustment; the special treatment of countries; and, the distribution of revenue raised.⁸ These issues – and their legal, environmental and administrative implications – must be addressed when creating a CBAM.

The EU has recently proposed unilateral CBAM regulations, covering EITE industrial goods as part of its ‘Fit for 55 Package’.⁹ The EU CBAM is designed to bridge the gap between its domestic Emissions Trading System (ETS) and less ambitious foreign emissions policies. Other countries

have also deliberated CBAMs, such as the US¹⁰ and Canada¹¹, however this brief will use the EU as the basis for discussion given it is the most advanced.

The nature of proposed CBAMs vary, with their design likely having implications for compliance with World Trade Organisation (WTO) rules. Potential policy constructs include:

1. an indirect carbon tax at the border, based on carbon intensity of EITE goods;
2. incorporating imports into a cap-and-trade system comparable to the ETS; and,
3. an import duty applied to goods from non-signatories to the Paris Agreement or without a comparable domestic carbon price policy.¹²

In the proposed EU regulation, the assessed product carbon intensity may be based on a default or actual measure, less any credits for carbon already purchased prior to arriving at the border or recognition of third-party carbon abatement measures.¹³ This implies some degree of discrimination

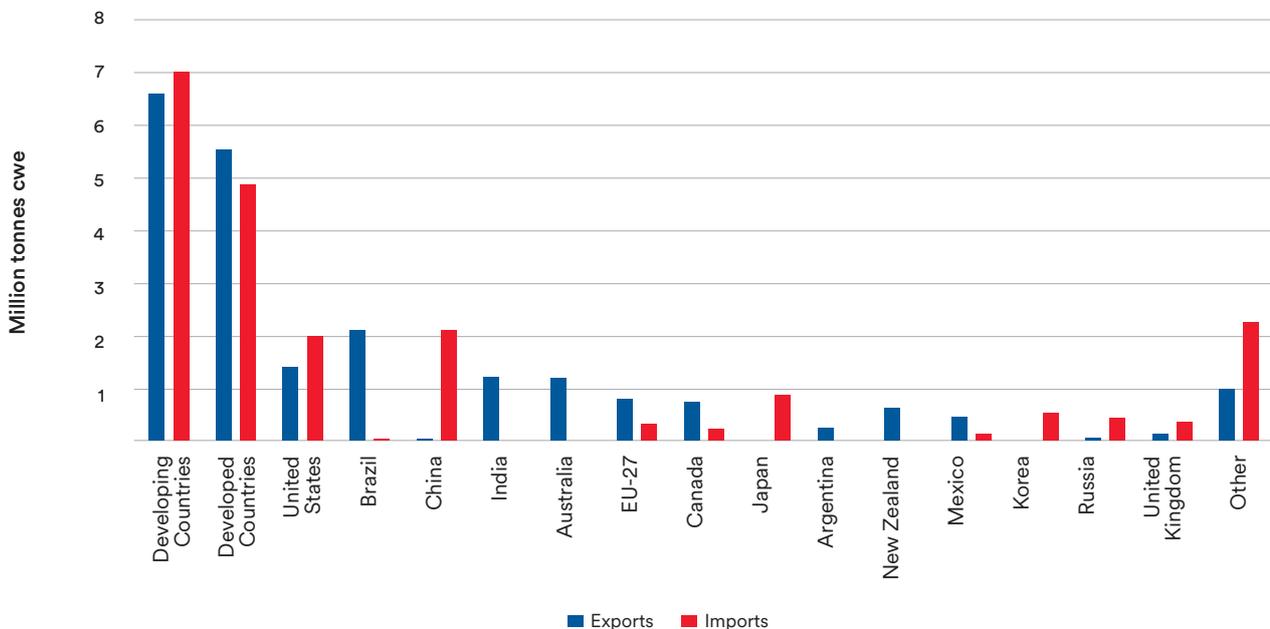
may be applied, either determined by characteristics of the product or emissions policies of the origin country. The proposed EU regulation considers “agreements with third countries could be considered as an alternative to the application of CBAM”;¹⁴ indicating there may be scope to negotiate differentiated treatment.

If a CBAM accommodates differences in country as opposed to product characteristics, this may violate the WTO principle of Most-Favoured Nation.¹⁵ Others suggest that CBAMs would likely be legal under WTO law but compliance would depend on the design of such measures and a precedent has yet to be set.¹⁶ While the legal debate will continue, this brief will focus on the implications of creep in CBAM coverage and heterogeneity between countries, specifically in the case of beef.

Expansion of CBAM coverage

In “starting with sectors where emissions are the highest in absolute numbers and therefore where it would matter most”¹⁷, the proposed EU Commission regulation infers that the CBAM coverage may be

Major beef importers and exporters



Source: OECD-FAO Agricultural Outlook 2021-2030



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open to revision in time. Furthermore, in reviewing the draft regulation, the EU Parliament rapporteur has reportedly recommended expanding coverage to include more industrial goods as well as indirect emissions.¹⁸ Cosbey et al. present two rules for assessing goods that could be subsumed under a CBAM: exposure to trade and carbon intensity.¹⁹

In terms of exposure to trade, using 15% as a trade intensity benchmark,²⁰ beef would be considered trade exposed at a global level. However, as highlighted below, EU beef may not meet this threshold, although beef imports into the bloc are already distorted by existing quotas and tariffs. If the EU was to apply a CBAM to beef imports, it may also need to reconsider its import regime to ensure a CBAM would comply with GATT Article XX on health and environmental exceptions²¹ and prove its application can “demonstrate that it actually addresses climate change.”²²

In terms of carbon intensity, the EU might consider carbon emissions from beef to be adequately intensive. The European Environmental Agency has argued that “emission reductions in all Effort Sharing sectors need to accelerate if they are to contribute adequately towards the EU’s 2030 emission target.”²³ EU Effort Sharing sectors account for about 58% of EU emissions and agriculture – which represents 17% of Effort Sharing emissions, a large share of which is beef – has “hardly

contributed to reductions.”²⁴ Moreover, the EU has also signed up to the Global Methane Pledge, to reduce global methane emissions, of which ruminant livestock are a major contributor, by 30% by 2030.²⁵

Future EU policies may shift more of the emissions reduction burden onto agriculture or incorporate the sector into the ETS, as it has recently proposed for aviation and shipping²⁶, making the rationale for its inclusion into the CBAM more pertinent. In fact, some European farming groups have actively advocated for the expansion of the CBAM “to prevent carbon leakage in all agricultural sectors.”²⁷

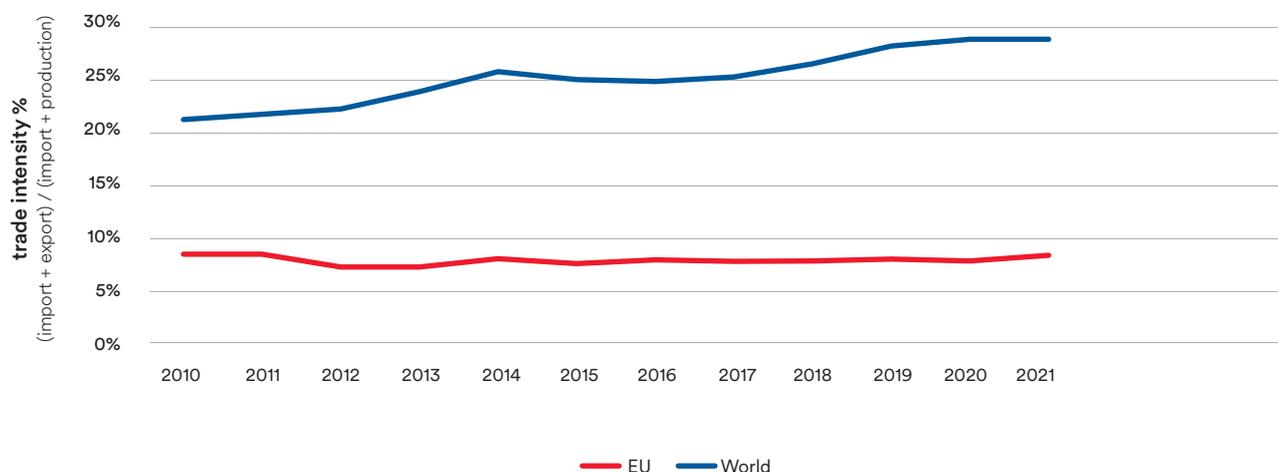
Measuring carbon intensity of beef production

Major challenges arise when it comes to measuring the greenhouse gas emissions of an agricultural product, such as beef, due to the difficulty in drawing the boundaries of the system and data availability. Furthermore, the global beef industry includes wide heterogeneity in terms of scale (large scale feedlots versus subsistent smallholders), feed base (grass versus grain versus silage) and climate (tropical versus temperate). The FAO, commenting on the Global Livestock Environmental Assessment Model, conclude that “[e]mission intensities vary greatly among producers, especially in ruminant products” and there is wide variability between regions.²⁸

Nevertheless, scientists have attempted to quantify the level of emissions from beef production using Life Cycle Impact Assessment methodology. Peters et al. assessed the CO₂e/kg of beef production for systems in Australia and benchmarked their study against others around the world, finding emissions in Australia ranged from 11.6–18.1 CO₂e/kg and globally from 5.9–25.5 CO₂e/kg.²⁹ Other studies found similar variability in beef production emissions in their cross-country comparison.³⁰ Wide variability within and between countries indicates either emissions or measurement methodologies differ vastly – both are fundamental problems in the context of a CBAM. Furthermore, the literature does not cover all countries and the wide array of beef production systems, indicating that the true variability may be even greater.

Dealing with this variability creates substantial problems for administering a CBAM where either a default carbon intensity value is assumed or suppliers contend an actual value that better reflects their context. In the case of the former, this would substantially punish emission efficient producers and may let high-emitters off the hook – ultimately, undermining the opportunity to mitigate global emissions. In the case of the latter, a substantial bureaucracy may be required to verify country carbon intensity, burdening developing countries in particular.

Trade intensity of beef production



Source: USDA FAS (2021) and author calculations following method outlined in Cosbey et al. (2019)

Effectiveness of a CBAM

Böhringer et al. caution that “legal and administrative barriers may substantially constrain the scope for efficiency gains”.³¹ Others have argued “from an environmental point of view border tax adjustments are not very effective but would mainly be justified by considerations of sectoral competitiveness”,³² while the burden of small emissions cost savings may disproportionately fall on developing countries.³³ Given the wide heterogeneity within the beef industry and variation in emissions, there is a risk that the administrative burden of a CBAM may exceed any potential emission abatement benefit.

While identifying the actual carbon intensity of each product would produce the best economic outcome³⁴, alternatives may need to be considered for administrative simplicity, such as applying a carbon intensity value based on the predominant production method in a country or assuming a value based on best practice or technology.³⁵ Cosbey et al. highlight that “collecting credible firm-level data is costly and requires third-party verification; mandating that foreign producers bear these costs could be considered an unacceptable trade barrier”.³⁶ Furthermore,

verifying actual carbon intensity is a major challenge and will require new customs expertise.³⁷ Actual carbon intensity measures may be possible in consolidated industries, such as steel production, where data is more readily available, but applying the same standard to fragmented, small-scale beef businesses may not be feasible.

Unilateral expansion of a CBAM to the beef sector risks creating a legal case of discriminatory actions in violation of GATT Article III.³⁸ Even if compliant with WTO law, the creep of a CBAM into agricultural trade could further impede multilateral trade and environmental negotiations. Consequently, this brief proposes a range of alternatives that could be pursued prior to widening the scope of unilateral CBAMs.

Proposals

Proposal 1: incremental application of CBAMs

As an untested trade policy instrument, much remains unknown with regards to the effectiveness and ability to administer a CBAM. Reflecting this challenge, Cosbey et al. “warn policymakers considering [a CBAM] ... about just how difficult it is to get it right”.³⁹

A wholesale application of a CBAM should be avoided. This is in line with Kuik and Hofkes, who found that the effectiveness of a CBAM in reducing carbon leakage in the EU was sector dependent: “[d]ifferent sectors and sub-sectors have different technical and economic characteristics that determine their response to increases in carbon costs”.⁴⁰

If the EU goes ahead with its proposed CBAM, efforts should be made to temper the expansion of products and jurisdictions until proper evaluations of the mechanism can be made. This will give others the ability to learn what works and what doesn’t in this new sphere of trade policy. The EU should remain open and engaged with global partners to avoid an uncoordinated escalation of competing CBAMs and be cognisant of the risks of these new tools being used for coercive reasons.

Proposal 2: multilateral standard setting required to align measures of carbon intensity

There is a clear lack of consensus when it comes to standardising carbon intensity measures for all products, especially in the beef sector. To (1) reduce the incidence of trade disputes, (2) better harmonise what



may grow into multiple CBAMs, and (3) reduce administrative costs, countries should seek to engage in global fora to harmonise standards.

Cosbey et al. argue that “compatibility with WTO rules may be enhanced by adhering to international standards and protocols”, avoiding duplication and reducing compliance costs under a streamlined institutional framework.⁴¹ In addition, greater transparency on standards will reduce the chance of rent-seeking by domestic firms.⁴² The EU should proactively work to ensure recent efforts to standardise methodologies for measuring the environmental footprint of products and organisations⁴³ are open processes and can be harmonised with other multilateral efforts, such as those of the International Organization for Standardization (e.g., ISO 14067 for the carbon footprints of products).⁴⁴

In the beef sector, the FAO Livestock Environmental Assessment and Performance (LEAP) partnership is leading the establishment of “comprehensive guidelines on the assessment of the environmental performance of large ruminant supply chains” which are aligned to ISO and Intergovernmental Panel on Climate Change guidelines⁴⁵—such multilateral fora should actively be pursued by countries to ensure policy instruments can be later stitched together across jurisdictions. Moreover, onerous and complicated CBAM verification requirements should not present yet another barrier for developing countries accessing developed markets.⁴⁶

To focus efforts, greater consensus of what goods should be considered with the scope of a CBAM is needed. This would require greater clarity of what is defined as ‘emissions intensive’ and ‘trade exposed’ and collaboration across a range of multilateral institutions. From there, sector specific standards of how to measure emissions intensity across a range of production systems is required.

If CBAMs are to emerge across multiple jurisdictions, a transparent and harmonised global ledger may be required⁴⁷ and even the addition of production processes and carbon intensity into the World Customs Organization Harmonised System of trade classification⁴⁸—lessons could be drawn from the classification of environmental goods as part of the protracted

Environmental Goods Agreement negotiations.⁴⁹ Customs officials will need to be trained and systems enhanced to accommodate additional checks at the border.

Proposal 3: institutionalisation of carbon measures and monitoring

Beyond aligning standards, countries should work to institutionalise carbon measures into the existing, and potentially new, fora of multilateral organisations. Much could be learnt from how the World Organisation for Animal Health (OIE) underpins the trade in animal products and fits within the broader framework of the WTO and national competent authorities.

The WTO SPS agreement states “members shall base their sanitary or phytosanitary measures on international standards, guidelines or recommendations” and names the OIE as the recognised body to manage such with respect to animal health.⁵⁰ The WTO recognises member sovereignty to choose appropriate levels of protection as long as they comply with the provisions of SPS Agreement, i.e. compliance with OIE standards or use of a science-based approach.⁵¹ OIE standards are developed and voted-on by member delegates.

The OIE fosters transparency by monitoring and reporting on the animal disease status of member countries – from which other members can assess risk and determine import requirements. The use of regionalisation for disease status also permits greater flexibility. The OIE publishes standards for managing trade in animal products, which can then be adopted by national competent authorities to develop regulations and rules. The OIE can also mediate disagreements as a precursor to the formal WTO dispute settlement mechanism.⁵²

If a new institution (say, the ‘*World Emissions Organisation*’ or WEO) could apply similar organisational principles to assessing sector-specific carbon emission credentials, the risk of carbon leakage may be mitigated and the administrative and legal challenges of a CBAM reduced. Just as the OIE assesses animal health status, the WEO could designate an emissions status to members’ specific sectors. To make such assessment, members of the WEO could establish sector rules for assessing carbon emissions. If recognised

by the membership of the WTO, members could use the carbon emission status of sectors within a country to assess the risk of carbon leakage and choose a policy response for each trade partner, one of which could be a variant of a CBAM. Under such an arrangement, instead of completely equalising carbon emissions embedded in domestic and imported products, border adjustments could be focused on where there is greatest leakage risk via a multilaterally recognised process and at a lower administrative burden.

To accommodate within country emissions variation, the OIE principle of regionalisation could be adapted to differentiate production systems or regions within a member’s jurisdiction, and varying treatments applied in the import market accordingly. Multiple treatments of products at the border, based on production processes and emissions levels, may be possible. A WEO could play a mediatory role in managing disagreement prior to formal WTO dispute resolution channels. GATT Article XX is already used to justify trade rules based on human and animal health⁵⁴; it could similarly be used within an institutional framework as the basis to guide trade on environmental principles.

Guided by the established standards and protocols within a WEO, national competent authorities could engage in bilateral mutual recognition of each other’s domestic emissions policies, similar to how veterinary services recognise animal health standards and systems, making trade easier still. As a chief veterinary officer signs a health certificate declaring the health status of an exported animal product, a ‘*chief emissions officer*’ may sign a certificate affirming the product was produced within a specified carbon emissions range and/or attest to any carbon credits already applied to that product. Such carbon emissions certificates could then be assessed at the border by customs. However, developing countries would likely require substantial assistance to develop the internal bureaucracy and capacity to fit within such an institutional framework. While the function of the national competent authority is, in fact, included within the EU Commission draft regulation, it only refers to the EU member importing country and is silent on how such bodies would interact with counterparts in the exporting country.⁵⁵



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Conclusion

Climate change is a global problem requiring a global response. Multilateral efforts, such as the Paris Agreement, recognise that countries will adopt domestic policies at varying speeds due to their development levels and countries will choose their own path to reduce emissions. Sector-specific unilateral action risks undermining multilateral trade cooperation and may isolate some members of the global community.

The EU CBAM initiative may have the right intentions, but the application and further expansion of the mechanism faces substantial challenges. Using beef as a case study, this brief has argued for: the incremental expansion of the CBAM to assess the effectiveness of the mechanism and its practical enforcement; a more multilateral approach in establishing rules and standards for measuring carbon emissions across and within sectors; and, the establishment of an institutional framework to govern this new component of the trade landscape.

Such efforts may bolster the effectiveness of a CBAM to mitigate carbon leakage, add transparency and certainty for businesses and support global initiatives to reduce emissions. Multilateralism is by no means an easy road, but EU unilateralism might just be the catalyst to stimulate collective action.

References

- ¹ Böhringer, C., Balistreri, E. J., & Rutherford, T. F. (2012). The role of border carbon adjustment in unilateral climate policy: Overview of an Energy Modeling Forum study (EMF 29). *Energy Economics*, 34, S97-S110.
- ² Muller, F., Saddler, H., & Melville-Rea, H. (2021). Carbon Border Adjustments: what are they and how will they impact Australia? The Australia Institute. Retrieved from <https://australiainstitute.org.au/wp-content/uploads/2021/06/P1031-Carbon-Border-AdjustmentsWEB.pdf>
- ³ European Commission. (2021). Proposal for a Regulation of the European Parliament and the Council establishing a carbon border adjustment mechanism. Retrieved from https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf
- ⁴ European Commission. (2021). European Green Deal: Commission proposes transformation of EU economy and society to meet climate ambitions. Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3541
- ⁵ European Commission. (2021). Proposal for a Regulation of the European Parliament and the Council establishing a carbon border adjustment mechanism. Retrieved from https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf
- ⁶ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ⁷ Böhringer, C., Balistreri, E. J., & Rutherford, T. F. (2012). The role of border carbon adjustment in unilateral climate policy: Overview of an Energy Modeling Forum study (EMF 29). *Energy Economics*, 34, S97-S110.
- ⁸ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.

- ⁹ European Commission. (2021). Proposal for a Regulation of the European Parliament and the Council establishing a carbon border adjustment mechanism. Retrieved from https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf
- ¹⁰ USTR. (2021). 2021 Trade Policy Agenda and 2020 Annual Report. Retrieved from <https://ustr.gov/sites/default/files/files/reports/2021/2021%20Trade%20Agenda/Online%20PDF%202021%20Trade%20Policy%20Agenda%20and%202020%20Annual%20Report.pdf>
- ¹¹ Department of Finance Canada. (2020). Canada Fall Economic Statement 2020. Retrieved from <https://budget.gc.ca/fes-eea/2020/report-rapport/FES-EEA-eng.pdf>
- ¹² Pauwelyn, J., & Kleimann, D. (2020). Trade related aspects of a carbon border adjustment mechanism (No. BOOK). European Union, Policy Department, Directorate-General for External Policies.
- ¹³ European Commission. (2021). Proposal for a Regulation of the European Parliament and the Council establishing a carbon border adjustment mechanism. Retrieved from https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf
- ¹⁴ European Commission. (2021). Proposal for a Regulation of the European Parliament and the Council establishing a carbon border adjustment mechanism. Retrieved from https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf
- ¹⁵ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ¹⁶ Pauwelyn, J., & Kleimann, D. (2020). Trade related aspects of a carbon border adjustment mechanism (No. BOOK). European Union, Policy Department, Directorate-General for External Policies.
- ¹⁷ European Commission. (2021). Proposal for a Regulation of the European Parliament and the Council establishing a carbon border adjustment mechanism. Retrieved from https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf
- ¹⁸ Kira, T. (2022, Jan 12). Lawmaker drafts 'complete overhaul' of EU carbon border levy. *Euractiv*. Retrieved from <https://www.euractiv.com/section/energy-environment/news/eu-lawmaker-drafts-complete-overhaul-of-carbon-border-levy/>
- ¹⁹ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ²⁰ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ²¹ Pauwelyn, J., & Kleimann, D. (2020). Trade related aspects of a carbon border adjustment mechanism (No. BOOK). European Union, Policy Department, Directorate-General for External Policies.
- ²² Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ²³ European Environmental Agency. (2020). National action across all sectors needed to reach greenhouse gas Effort Sharing targets. Retrieved from <https://www.eea.europa.eu/themes/climate/trends-and-projections-in-europe/national-action-across-all-sectors/national-action-across-all-sectors/download.pdf.static>
- ²⁴ European Environmental Agency. (2020). National action across all sectors needed to reach greenhouse gas Effort Sharing targets. Retrieved from <https://www.eea.europa.eu/themes/climate/trends-and-projections-in-europe/national-action-across-all-sectors/national-action-across-all-sectors/download.pdf.static>
- ²⁵ CCA Coalition. (2021). Global Methane Pledge. Retrieved from <https://www.ccacoalition.org/en/resources/global-methane-pledge>
- ²⁶ European Commission. (2021). European Green Deal: Commission proposes transformation of EU economy and society to meet climate ambitions. Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3541
- ²⁷ Lambert, C. (2021). Opinion Piece: The future of our arable farmers will (also) depend on a carbon adjustment mechanism with realistic borders. Retrieved from <https://copa-cogeca.eu/Archive/Download?id=3870542&fmt=pdf>
- ²⁸ FAO. (2022). GLEAM 2.0 - Assessment of greenhouse gas emissions and mitigation potential. Retrieved from <https://www.fao.org/gleam/results/en/>
- ²⁹ Peters, G. M., Rowley, H. V., Wiedemann, S., Tucker, R., Short, M. D., & Schulz, M. (2010). Red meat production in Australia: life cycle assessment and comparison with overseas studies. *Environmental Science & Technology*, 44(4), 1327-1332.
- ³⁰ De Vries, M., & De Boer, I. J. (2010). Comparing environmental impacts for livestock products: A review of life cycle assessments. *Livestock Science*, 128(1-3), 1-11.
- ³¹ Böhringer, C., Balistreri, E. J., & Rutherford, T. F. (2012). The role of border carbon adjustment in unilateral climate policy: Overview of an Energy Modeling Forum study (EMF 29). *Energy Economics*, 34, S97-S110.
- ³² Kuik, O., & Hofkes, M. (2010). Border adjustment for European emissions trading: Competitiveness and carbon leakage. *Energy Policy*, 38(4), 1741-1748.
- ³³ Böhringer, C., Balistreri, E. J., & Rutherford, T. F. (2012). The role of border carbon adjustment in unilateral climate policy: Overview of an Energy Modeling Forum study (EMF 29). *Energy Economics*, 34, S97-S110.
- ³⁴ Fischer, C., & Fox, A. K. (2012). Comparing policies to combat emissions leakage: Border carbon adjustments versus rebates. *Journal of Environmental Economics and Management*, 64(2), 199-216.
- ³⁵ Kuik, O., & Hofkes, M. (2010). Border adjustment for European emissions trading: Competitiveness and carbon leakage. *Energy Policy*, 38(4), 1741-1748.

- ³⁶ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ³⁷ Muller, F., Saddler, H., & Melville-Rea, H. (2021). Carbon Border Adjustments: what are they and how will they impact Australia? The Australia Institute. Retrieved from <https://australiainstitute.org.au/wp-content/uploads/2021/06/P1031-Carbon-Border-AdjustmentsWEB.pdf>
- ³⁸ Pauwelyn, J., & Kleimann, D. (2020). Trade related aspects of a carbon border adjustment mechanism (No. BOOK). European Union, Policy Department, Directorate-General for External Policies.
- ³⁹ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ⁴⁰ Kuik, O., & Hofkes, M. (2010). Border adjustment for European emissions trading: Competitiveness and carbon leakage. *Energy Policy*, 38(4), 1741-1748.
- ⁴¹ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ⁴² Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ⁴³ European Commission. (2021). Commission Recommendation of 16.12.2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations. Retrieved from https://ec.europa.eu/environment/publications/recommendation-use-environmental-footprint-methods_en
- ⁴⁴ ISO. (2018). ISO 14067:2018 - Greenhouse Gases - Carbon Footprint of Products - Requirements and Guidelines for Quantification. International Organisation for Standardisation (ISO).
- ⁴⁵ FAO-LEAP. (2017). Environmental Performance of Large Ruminant Supply Chains: Summary of Guidelines for Assessment. Food and Agriculture Organization of the United Nations (FAO), Livestock Environmental Assessment Program (LEAP).
- ⁴⁶ Lowe, S. (2021). The EU's carbon border adjustment mechanism: How to make it work for developing countries. Centre for European Reform. Retrieved from https://www.cer.eu/sites/default/files/pbrief_cbam_sl_21.4.21.pdf
- ⁴⁷ Bernasconi-Osterwalder, N., & Cosbey, A. (2021). Carbon and Controversy: Why we need global cooperation on border carbon adjustment. International Institute for Sustainable Development. Retrieved from <https://www.iisd.org/articles/carbon-border-adjustment-global-cooperation>
- ⁴⁸ Condon, M., & Ignaciuk, A. (2013). Border carbon adjustment and international trade: A literature review. OECD Trade and Environment Working Papers. Retrieved from <https://www.oecd-ilibrary.org/docserver/5k3xn25b386c-en.pdf?expires=1627181404&id=id&accname=guest&checksum=3513C36057FABFBB3DC5F5D7F6CADB01>
- ⁴⁹ Steenblik, R. (2019). Using the HS in Trade Negotiations – Lessons from attempts to Liberalize Environmental Goods. Conference on the future of the Harmonized System. Retrieved from http://www.wcoomd.org/-/media/wco/public/global/pdf/events/2019/hs-conference/panel01_03_steenblik_iisd.pdf?la=en
- ⁵⁰ WTO. (n.d.). The WTO and the World Organization for Animal Health (OIE). Retrieved from https://www.wto.org/english/thewto_e/coher_e/wto_oie_e.htm
- ⁵¹ OIE. (2009). Relations between the OIE and the WTO. Retrieved from <https://www.oie.int/doc/ged/D6993.PDF>
- ⁵² OIE. (2009). Relations between the OIE and the WTO. Retrieved from <https://www.oie.int/doc/ged/D6993.PDF>
- ⁵³ Cosbey, A., Droege, S., Fischer, C., & Munnings, C. (2019). Developing guidance for implementing border carbon adjustments: Lessons, cautions, and research needs from the literature. *Review of Environmental Economics and Policy*, 13(1), 3-22.
- ⁵⁴ Pauwelyn, J., & Kleimann, D. (2020). Trade related aspects of a carbon border adjustment mechanism (No. BOOK). European Union, Policy Department, Directorate-General for External Policies.
- ⁵⁵ European Commission. (2021). Proposal for a Regulation of the European Parliament and the Council establishing a carbon border adjustment mechanism. Retrieved from https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf

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