

# Retrofitting the regulation of net-zero subsidies: lessons from the US Inflation Reduction Act

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## ABSTRACT

The US Inflation Reduction Act (IRA) has heralded the advent of a new era of industrial policy within and beyond the USA. As the net-zero economy transition unfolds and national economic security paradigms entrench, industrial policy is here to stay. Net-zero subsidies are employed as multipurpose policy tools to promote domestic manufacturing, de-risk from China, and boost the net-zero transition. This new scenario prompts a fresh look at old questions surrounding environmental subsidies and their justification, actionability, and countervailability. This article makes three contributions. First, it articulates a conceptual framework to assess questions surrounding the justification of net-zero subsidies. It advocates a direct focus on their environmental effectiveness, drawing a distinction between justifiable trade-distorting effects and unjustifiable protective or discriminatory application associated with the pursuit of reshoring or geopolitical goals. Second, it employs a careful analysis of different IRA tax credits to operationalize the article's framework and test its robustness. Third, it draws on legal and economic insights to shed some light on the environmental effects of different groups of net-zero subsidies. On these grounds, it advances a streamlined three-fold categorization and demarcates the boundaries within which different subsidies should be justifiable, non-actionable and non-countervailable.

## INTRODUCTION: THE INFLATION REDUCTION ACT REVOLUTION AND THE LONG-STANDING QUESTION OF ENVIRONMENTAL SUBSIDIES

Since the adoption of *Canada—Renewable Energy*,<sup>1</sup> the legal debate on environmental subsidies and their treatment under the WTO Agreement on Subsidies and Countervailing Measures (ASCM) has never stopped. The geopolitical and economic landscape, however, has radically

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<sup>1</sup> WTO Panel Reports, *Canada—Certain Measures Affecting the Renewable Energy Generation Sector / Canada—Measures Relating to the Feed-In Tariff Program (Canada—Renewable Energy)*, WT/DS412/R and Add.1 / WT/DS426/R and Add.1, adopted 24 May 2013; WTO Appellate Body Reports, *Canada—Certain Measures Affecting the Renewable Energy Generation Sector / Canada—Measures Relating to the Feed-In Tariff Program (Canada—Renewable Energy)*, WT/DS412/R / WT/DS426/R, adopted 24 May 2013.

evolved throughout the last decade. In the meantime, and most importantly for our common future, the climate crisis is spiralling out of control.

The adoption of the \$384 billion Inflation Reduction Act (IRA) in August 2022<sup>2</sup> has heralded the advent of a new era of industrial policy within and beyond the USA. Different supply-side (production and investment) net-zero subsidies and controversial (and ASCM-prohibited) local content requirements (LCRs) and origin-related requirements are front and centre in the IRA. The Act includes an estimated \$237 billions of tax credits for renewable energy, renewable electricity, and energy efficiency, \$35 billions of tax credits for the decarbonization of carbon-intensive industrial sectors, \$71 billions of tax credits for the production of equipment and components in strategic net-zero sectors, and \$41 billions of tax credits for the purchase or leasing of electric vehicles (EVs).<sup>3</sup> The IRA has tilted the global playing field, sending shock waves on the other side of the Atlantic. The European Union (EU) has reacted by further relaxing its state aid rules<sup>4</sup> and by setting in place an EU-wide industrial policy framework for strategic net-zero sectors,<sup>5</sup> while striving to achieve a degree of transatlantic coordination on subsidy measures.<sup>6</sup> In March 2024, China, for its part, circulated a request for consultations with the USA with respect to the IRA provisions, including LCRs and origin-related requirements that otherwise discriminate against goods of Chinese origin.<sup>7</sup>

The USA and the EU have long been familiar with the tensions between the environmental benefits of upscaling renewables deployment via cheap subsidized imported components, and the economic costs associated with condoning trade-distorting subsidization practices adopted in different jurisdictions. The trade-offs between environmental and economic competitiveness factors and the diverging US and EU approaches have surfaced very clearly throughout the two decade-long solar photovoltaics (PVs) saga.<sup>8</sup> At present, fears of de-industrialization are contributing to the entrenchment of an increasingly inward-looking approach on both sides of the Atlantic. As the following paragraphs illustrate, the US and the EU's adversarial approach to China is going hand-in-hand with attempts to promote reshoring through industrial policy and reclaim a 'national fair share' of manufacturing in strategic net-zero sectors.

Starting from the position on China, recent developments illustrate that at this stage both the USA and the EU are prioritizing economic competitiveness factors over acceleration in the deployment of renewables. In May 2024, President Biden directed the US Trade Representative to increase tariffs under section 301 of the Trade Act of 1974 on \$18 billions of Chinese imports. This decision has resulted in a significant increase in the tariff rates for EVs, lithium-ion batteries, critical minerals, and solar cells,<sup>9</sup> which will *de facto* restrict access to the US market for Chinese

<sup>2</sup> The Inflation Reduction Act of 2022 (IRA), Public Law 117-169 (2022).

<sup>3</sup> The original forecast of the Congressional Budget Office refers to \$384 billions. However, as acknowledged by the US Department of the Treasury, different stakeholders have forecast the IRA's fiscal costs over its 10-year life differently and provided estimates of \$780 billion, \$800 billion, and \$1 trillion. See <<https://home.treasury.gov/news/featured-stories/the-inflation-reduction-acts-benefits-and-costs>> accessed 24 July 2024. Implementation of some of the provisions and access to some tax credits have been hampered by lack of clarity and delays in the adoption of relevant guidelines by the Internal Revenue Service. The upcoming US presidential elections may result in the repeal or amendment of some IRA provisions.

<sup>4</sup> European Commission, Communication from the Commission. Temporary Crisis and Transition Framework for State Aid Measures to Support the Economy Following the Aggression against Ukraine by Russia, OJ 2023 C 101.

<sup>5</sup> Regulation (EU) 2024/1735 of the European Parliament and of the Council of 13 June 2024 on Establishing a Framework of Measures for Strengthening Europe's Net-Zero Technology Manufacturing Ecosystem and Amending Regulation (EU) 2018/1724, OJ L 295. See also the proposal for a Clean Industrial Deal in European Commission (2024), *Europe's Choice. Political Guidelines for the Next European Commission (2024–2029)*, Strasbourg, 18 July 2024.

<sup>6</sup> See European Commission (2023), Joint Statement by President Biden and President von der Leyen, Washington DC, 10 March 2023; and the references to the EU–US Clean Energy Incentives Dialogue in European Commission (2024), Joint Statement, EU–US Trade and Technology Council, Leuven, 5 April 2024.

<sup>7</sup> Request for Consultations by China, *United States—Certain Tax Credits under the Inflation Reduction Act*, WT/DS623/1, G/L/1526 G/TRIMS/D/47, G/SCM/D137/1, 28 March 2024.

<sup>8</sup> For an analysis of the solar PV saga, see Julio Antonio García and María Moreno Sancho, 'The US and EU Solar Trade Remedies Saga: The Globalization of Mercantilism' (2022) 56 *Journal of World Trade* 615.

<sup>9</sup> For more information, see White House (2024), Fact Sheet: President Biden Takes Action to Protect American Workers and Businesses from China's Unfair Trade Practices, Washington DC, 14 May 2024. For media analyses, see <<https://www>

products and artificially insulate US manufacturers from competition on the domestic market. The EU institutions have also hardened their stance on Chinese non-market practices. In early April 2024, the European Commission opened two investigations under the EU Foreign Subsidies Regulation in the solar PV sector.<sup>10</sup> These have been followed by an investigation into Chinese suppliers of wind turbines.<sup>11</sup> Further, in the summer of 2024, the Commission closed its antisubsidy investigation into the imports of Chinese battery electric vehicles (BEVs) and announced its proposed provisional countervailing duties (CVDs), ranging from a minimum of 17.4 per cent to a maximum of 37.6 percent.<sup>12</sup> While the EU institutions are not going as far as attempting to exclude Chinese products from the EU market, their course of action reveals a heightened focus on unfair competition and restoring a level playing field.

As regards reshoring and industrial policy, abundant recourse to subsidies in strategic net-zero economy sectors, once the object of fierce criticism by the USA and the EU, are now at the top of their agenda. The pre-IRA defensive approach to Chinese non-market practices has gradually evolved into a reactive uptake of industrial policy. Non-market practices are increasingly perceived as a solution at the domestic level, and as a problem whenever adopted in different jurisdictions. At a time when all major global players sanction recourse to subsidization programmes, the criticisms against China are being rearticulated by emphasizing the scale of Chinese subsidies. Excess capacity and global over-supply in the solar PV and EV sectors, allegedly driven by Chinese subsidization, is regarded as a justification for the measures adopted in the USA and the EU.<sup>13</sup> This discourse is challenged by Chinese stakeholders, who instead emphasize the weakness of transnational demand in these sectors and the extent to which fierce competition on the Chinese domestic market, innovation, integrated supply chains, and clustering effects have helped Chinese firms to achieve economies of scale.<sup>14</sup>

It is against this complex backdrop that the analysis of this article is situated. In times of climate crisis, geopolitical friction and national economic security challenges,<sup>15</sup> industrial policy is here to stay. In the post-IRA era, net-zero subsidies are employed as multipurpose policy tools to de-risk from China, promote domestic manufacturing, and boost the net-zero transition. The boundaries between overlapping geopolitical, socio-economic, and decarbonization policy goals are becoming increasingly blurred; further, the extent to which these diverse policy drivers may be complementary or mutually reinforcing is too often overestimated. Policy-makers often assume that net-zero subsidies will produce environmentally beneficial effects in all cases and under all circumstances. At a closer inspection, however, this assumption does not hold true.

This new scenario prompts a fresh look at old questions surrounding the justification, actionability, and countervailability of environmental subsidies. Promoting recourse to net-zero subsidies by allowing for their justification, non-actionability and non-countervailability could help tackle the climate crisis. Nonetheless, these subsidies should only be justified in so far as they

[ft.com/content/56685c0b-1bdd-43a5-b039-7bb2cb7c7f87](https://www.ft.com/content/56685c0b-1bdd-43a5-b039-7bb2cb7c7f87) and <https://www.ft.com/content/65ad5d93-51e2-4ef8-93bc-0ddcc15a2ad9> accessed 24 July 2024.

<sup>10</sup> See 'Commission Opens Two in-depth Investigations under the Foreign Subsidies Regulation in the Solar Photovoltaic Sector', [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_24\\_1803](https://ec.europa.eu/commission/presscorner/detail/en/ip_24_1803) accessed 24 July 2024.

<sup>11</sup> As reported by Wind Europe. See <https://windeurope.org/newsroom/press-releases/eu-starts-investigation-into-chinese-wind-turbines-under-new-foreign-subsidies-regulation> accessed 24 July 2024.

<sup>12</sup> Commission Implementing Regulation (EU) 2024/1866 of 3 July 2024 Imposing a Provisional Countervailing Duty on Imports of New Battery Electric Vehicles Designed for the Transport of persons Originating in the People's Republic of China, OJ 2024 L.

<sup>13</sup> See European Commission (2023), Speech by President von der Leyen at the European China Conference 2023, Brussels, 16 November 2023; US Department of the Treasury (2024), Statement from Secretary of the Treasury Janet L. Yellen on Announcement of New US-China Initiatives Following Meeting with Vice Premier He Lifeng of the People's Republic of China, Washington DC, 6 April 2024; and European Commission (2024), Speech by Executive Vice President Vestager on Technology and Politics at the Institute for Advanced Study, Brussels, 9 April 2024.

<sup>14</sup> For an overview of different arguments, see Camille Boullenois, *Overcapacity at the Gate* (Rhodium Group, 2024).

<sup>15</sup> For analyses of national economic security, see inter alia Harlan Grant Cohen, 'Nations and Markets' (2020) 23 *Journal of International Economic Law* 793; Kathleen Claussen, 'Trade's Security Exceptionalism' (2020) 72 *Stanford Law Review* 1097.

can yield environmentally beneficial effects and help accelerate the net-zero transition. The prospects for plurilateral agreement and coordination in this area are very bleak at present. Legal and economic analysis, however, can and should help to unpack the environmental implications of recourse to different subsidy measures, shining a light on their environmental credentials.

Rather than following a broad approach and encompassing all subsidies with environmental or sustainability effects within the scope of its examination, this article deliberately zooms in on the contentious and topical area of net-zero subsidies.<sup>16</sup> The article makes three contributions.

First, it articulates a conceptual framework to assess questions surrounding the justification, actionability, and countervailability of different groups of net-zero subsidies. The article advocates a direct focus on the environmental effectiveness of relevant subsidy measures, as opposed to their trade-distorting effects or the balance between their environmental benefits and trade-distorting effects. It draws a conceptual distinction between justifiable trade-distorting effects, and unjustifiable protective or discriminatory application associated with the pursuit of reshoring (protective application) or de-risking (discriminatory application) goals. The case-by-case assessment of protective or discriminatory application focuses on the extent to which different groups of subsidies may tackle a specific environmental externality and redress market or regulatory failures. This analysis resonates with the premise that net-zero subsidies should only be justifiable in so far as they advance the transition to climate neutrality, rather than pursue socio-economic or geopolitical goals.

Second, it employs a careful analysis of different IRA tax credits to assess the environmental credentials of different groups of subsidies, operationalize the article's framework, and test its robustness. Third, it draws on legal and economic insights to bring more clarity to the analysis of the environmental effects of different subsidies. On these grounds, it advances a streamlined three-fold categorization of net-zero subsidy measures and demarcates the boundaries within which they should be justifiable, non-actionable and non-countervailable (see [Table 1](#)).

The analysis proceeds as follows. Section 'The ASCM 'adverse effects' rationale and the conceptual framework of the article' provides a concise overview of relevant provisions in the ASCM and of the 'effects-based' approach underlying the Agreement. It also illustrates the foundations of the article's conceptual framework. Section 'Group I: unconditionally justifiable subsidies' focuses on subsidies that aim to tackle environmental externalities and address market or regulatory failures (Group I). The analysis illustrates that these subsidies produce trade-distorting effects, but do not have protective or discriminatory application. The article employs an examination of the IRA tax credits for renewable energy and electricity, industrial decarbonization, and hydrogen to explore the treatment of this category of subsidies, arguing that they should be unconditionally justifiable, non-actionable and non-countervailable.

Section 'Group II: conditionally justifiable subsidies' conducts the same form of analysis in respect to subsidies that may tackle environmental externalities, but are presumed to have protective application (Group II). The IRA tax credits for equipment and components in net-zero sectors provide a clear example. The article suggests that the justification, non-actionability and non-countervailability of this group of subsidies should be conditional on and subject to ad hoc forms of coordination.

<sup>16</sup> The analytical scope of the article is circumscribed to net-zero subsidies, ie subsidies aimed at mitigating climate change and promoting and accelerating the net-zero transition. As illustrated throughout the next sections, these include different groups of subsidies that are employed to reduce greenhouse gas emissions (eg via industrial decarbonization, or by promoting electric mobility) and boost renewables deployment (eg by promoting the production of renewable electricity, renewable energy, and equipment and components in net-zero sectors). For a broader analysis of subsidies with environmental and sustainability impacts, see Elena Cima and Daniel E Esty, 'Making International Trade Work for Sustainable Development: Toward a New WTO Framework for Subsidies' (2024) 27 *Journal of International Economic Law* 1.

**Table 1.** Groups of net-zero subsidies.

	Group I	Group II	Group III
Group of net-zero subsidies	Renewable electricity, renewable energy, industrial decarbonization (eg carbon capture and storage), hydrogen	Net-zero equipment and components (eg solar photovoltaics, wind turbines, electric vehicles, lithium-ion batteries)	Local content requirements and origin-related requirements
Type of subsidies	Production subsidies, investment subsidies, research & development investment subsidies, feed-in tariffs, fiscal exemptions/credits/offsets for carbon taxes, free allowances under cap-and-trade (i.e. emission trading) systems	Production subsidies, investment subsidies, research & development investment subsidies, preferential financing, equity investments, grants, provision of goods and services/land use rights/input products for less than adequate remuneration, fiscal exemptions and reductions	Applied to eg production subsidies, investment subsidies, consumption subsidies
IRA case study	Section 45, 48, 45Y, 48E, 45Q, 50 tax credits	Section 45X, 48C tax credits	Section 30D, 45, 48, 45Y, 48E tax credits
The subsidies tackle an environmental externality	Yes	Yes, under specific conditions	No
The subsidies have protective or discriminatory application	No	Presumed to have protective application (reshoring goals)	Local content requirements have protective application (reshoring goals); origin-related requirements have discriminatory application (de-risking goals)
The subsidies help accelerate the net-zero transition	Yes	Yes, under specific conditions	Unlikely, potentially detrimental
Treatment of the subsidies with a view to promoting the net-zero transition	Unconditionally justifiable, non-actionable, non-countervailable	Conditionally justifiable. Need for coordination to (i) promote transnational upscaling rather than protective import substitution effects; (ii) exclude countervailing duties. Agreement on maximum thresholds of non-actionable and non-countervailable subsidies	Unconditionally prohibited

Section ‘Group III: unconditionally prohibited LCRs and origin-related requirements’ turns to LCRs with protective application and origin-related requirements with discriminatory application (Group III). These measures can hardly tackle environmental externalities. An examination of relevant IRA provisions highlights the environmental pitfalls of this category of subsidies, confirming that they should be prohibited. Section ‘Treading a narrow path: geopolitical turmoil, reshoring, and the climate crisis’ ties together the strands of the analysis and concludes.

## THE ASCM ‘ADVERSE EFFECTS’ RATIONALE AND THE CONCEPTUAL FRAMEWORK OF THE ARTICLE

Pursuant to Article 1 ASCM, a subsidy is deemed to exist where a ‘financial contribution’ by a ‘government’ or ‘any public body’ within the territory of a Member<sup>17</sup> or ‘any form of income or price support in the sense of Article XVI of GATT 1994’<sup>18</sup> confers a ‘benefit’.<sup>19</sup> In order to be actionable under the multilateral (dispute settlement) track of Part III of the Agreement or countervailable under the unilateral (imposition of CVDs) track of Part V, a subsidy must also meet the ‘specificity’ criterion<sup>20</sup>; as the ASCM stipulates, it must be specific to an enterprise or industry or a group of enterprises or industries (‘certain enterprises’).<sup>21</sup>

Article 2 includes references to *de jure* as well as *de facto* specificity. Under Article 2.1(a), a subsidy shall be deemed to be specific where the granting authority or relevant legislation expressly limits access to a subsidy to certain enterprises (*de jure* specificity). Pursuant to Article 2.1(b), the existence of objective legal or regulatory criteria or conditions governing the eligibility for and amount of a subsidy will normally exclude specificity; nonetheless, *de facto* specificity may be established under sub-paragraph (c) by taking into account a number of factors. These include the use of a subsidy programme by a limited number of certain enterprises, the predominant use by certain enterprises, the granting of disproportionately large amounts of subsidy to certain enterprises, and the manner in which discretion has been exercised in the decision to grant a subsidy.

Article 5 enshrines the ASCM’s cornerstone principle that Members should not cause ‘adverse effects’ to the interests of other Members through the use of subsidies. Under the multilateral track (Part III), a Member may have recourse to three different tests to establish a subsidy’s ‘adverse effects’.<sup>22</sup> Under the unilateral track (Part V), Members may only prove the ‘adverse effects’ of a subsidy and impose CVDs where they have established ‘injury to its domestic industry’.<sup>23</sup> Finally, Article 3 enshrines a blanket prohibition of two categories of subsidies: these are subsidies contingent in law or in fact upon export performance and subsidies contingent in law or in fact upon the use of domestic over imported goods (LCRs). Prohibited subsidies are automatically deemed to be ‘specific’ and are the object of different remedies.

The ASCM protects the Members’ market access expectations by targeting trade distortions. Under the ASCM general impact standard, any such trade distortions are presumed to be caused by subsidies: a subsidy may be actioned or countervailed as long as the relevant and applicable ‘adverse effects’ legal standard is met.<sup>24</sup> The Agreement thus clearly draws on an ‘effects-based’

<sup>17</sup> art 1.1(a)(1) ASCM.

<sup>18</sup> art 1.1(a)(2) ASCM.

<sup>19</sup> art 1.1(b) ASCM.

<sup>20</sup> art 1.2 ASCM.

<sup>21</sup> art 2.1 ASCM.

<sup>22</sup> arts 5(a), 5(b), 5(c), and 6 ASCM.

<sup>23</sup> See art 5(a) ASCM and footnote 11.

<sup>24</sup> The ASCM impact standard (in general) and the ‘injury to domestic industry’ test (in particular) have been the object of criticism in so far as they relate to the mere propensity of the subsidized products to cause ‘adverse effects’. The ASCM impact standard fails to capture the extent to which the relevant subsidies have affected the competitive position of the recipients vis-à-vis

approach. In the case of prohibited subsidies, an irrebuttable presumption applies that they produce excessive trade-distorting effects.

The aims pursued by the subsidies, by contrast, do not play any role under the policy-agnostic ASCM; the Agreement does not establish any justification route for subsidies that pursue legitimate (e.g. environmental) policy goals. Several commentators throughout the years have advocated a reform of the ASCM arrangements, advancing arguments in favour of the justification of environmental subsidies. Analyses have often focused on the relevant procedural arrangements, emphasizing the need to strengthen the notification process for subsidies, enhance the transparency of the system, and facilitate information exchange and dialogue on the design of subsidy measures.<sup>25</sup> Turning to the substance of potential reform proposals, commentators have constantly pointed to the challenge of drawing a bright-line test to distinguish 'good' justifiable and 'bad' non-justifiable environmental subsidies.<sup>26</sup>

Some commentators have argued in favour of a detailed system of justifications, drawing inspiration in terms of rule and regime design from the EU state aid law regime.<sup>27</sup> Other analyses have stressed the difficulty of identifying clear criteria to carve out subsidies whose trade-distorting effects can be presumed to be outweighed by their environmental benefits.<sup>28</sup> A similar focus on the balance between trade-distorting effects and environmental benefits has informed past proposals for a 'due restraint clause' for renewable energy subsidies,<sup>29</sup> and for their non-actionability and non-countervailability.<sup>30</sup> Others have advocated exception for minimal trade-distorting subsidies and an application of the Bastable test to assess whether LCRs should be justifiable, while acknowledging the sensitivity of questions surrounding justification and considerable practical difficulties in the quantification of environmental benefits and economic (trade distortion) costs.<sup>31</sup> A more recent contribution has put forward a four-fold categorization to assess the justification of subsidies associated with different sustainability impacts. This framework combines an assessment of the positive and negative effects of different subsidy measures in terms of sustainability, with an evaluation of their trade-distorting effects. This results in the identification of 'green box', 'yellow box', 'red box', and 'double red box' groups of subsidies.<sup>32</sup>

What all existing proposals have in common is a consistent focus on the environmental benefits and trade-distorting effects of subsidy measures.<sup>33</sup> In the majority of cases, commentators have advocated weighing and balancing the two factors to identify justifiable subsidies whose beneficial environmental effects outweigh relevant trade impacts. The now expired Article 8 ASCM and the arrangements enshrined in the Agreement on Agriculture (AoA) reflect a similar focus. Article 8(c) ASCM provided for the non-actionability and non-countervailability of a

their competitors, producing a specific impact on trade flows and 'adverse effects' as a result. See Luca Rubini, *The Definition of Subsidy and State Aid: WTO and EC Law in Comparative Perspective* (OUP 2009), 142 and 404.

<sup>25</sup> Luca Rubini, 'Ain't Wastin' Time No More: Subsidies for Renewable Energy, the SCM Agreement, Policy Space, and Law Reform' (2012) 15 *Journal of International Economic Law* 525, 572; Ilaria Espa and Gracia Marín Durán, 'Renewable Energy Subsidies and WTO Law: Time to Rethink the Case for Reform Beyond Canada – Renewable Energy/Fit Programme' (2018) 15 *Journal of International Economic Law* 621, 649. See also IMF, OECD, World Bank, and WTO, 'Subsidies, Trade, and International Cooperation' IMF Working Paper (2022), 11, 22.

<sup>26</sup> Espa and Durán (n 25) 651; Aaron Cosbey and Petros Mavroidis, 'A Turquoise Mess: Green Subsidies, Blue Industrial Policy and Renewable Energy: The Case for Redrafting the Subsidies Agreement of the WTO' (2014) 17 *Journal of International Economic Law* 11, 46; Alan O Sykes, 'The Questionable Case for Subsidies Regulation: A Comparative Perspective' Stanford University Law and Economics Research Paper Series no 380 (2010).

<sup>27</sup> Rubini (n 25) 574.

<sup>28</sup> Espa and Durán (n 25) 649.

<sup>29</sup> Sherzod Shadikhodjaev, 'Renewable Energy and Government Support: Time to Green the SCM Agreement?' (2015) 14 *World Trade Rev* 479, 479–506.

<sup>30</sup> Gary Horlick and Peggy Clarke, 'Rethinking Subsidy Disciplines for the Future' (ICTSD and World Economic Forum, 2016).

<sup>31</sup> Cosbey and Mavroidis (n 26) 46. An application of the Bastable test involves an assessment of the economic and environmental costs associated with recourse to LCRs, and their expected long-term economic and environmental benefits.

<sup>32</sup> Cima and Esty (n 16).

<sup>33</sup> For express references to this trade-off, see Rubini (n 25), and Espa and Durán (n 25).

narrow group of environmental subsidies, subject to pre-implementation notification and compliance with a set of stringent criteria. This circumscribed its application to subsidies that were presumed to have limited trade-distorting effects.<sup>34</sup> The ‘green box’, ‘blue box’, and ‘amber box’ system underlying the AoA, as is well known, is informed by a similar logic. Different groups of subsidies are differently categorized and are the object of different treatment on the basis of their trade-distorting effects.<sup>35</sup>

The conceptual framework underpinning this article draws on a different rationale. Net-zero subsidies that affect the competitive relationship between like (subsidized and non-subsidized) products and produce trade-distorting effects should be justifiable to the extent that they reflect an environmental rationale and help advance the net-zero transition, just like measures that alter the equality of competitive opportunities between like products can be justified on environmental policy grounds under Article XX GATT. The existence and scale of trade-distorting effects or the balance between the environmental benefits and trade costs of subsidies cannot provide any indications regarding their specific environmental credentials. For this reason, neither element should be considered for the purposes of an analysis of their justification. Nonetheless, net-zero subsidies should only be justifiable in so far as they are designed and applied to promote the net-zero transition. This calls for a close examination of the extent to which they reflect climate neutrality goals, as opposed to reshoring and de-risking goals.

This approach resonates with the analysis of a measure’s justification on environmental policy grounds under Article XX GATT, and under the Chapeau (introductory clause) of this Article in particular. The Article XX examination combines a very light-touch necessity review, or an analysis of the extent to which a measure relates to conservation goals, with a more in-depth assessment of protective or discriminatory application under the Chapeau.<sup>36</sup> The examination under the Chapeau aims to demarcate the boundaries between justifiable barriers to trade and market access resulting from the pursuit of legitimate policy goals, and unjustifiable protective (National Treatment-type) or discriminatory (Most Favoured Nation-type) application of the relevant measures.<sup>37</sup> Symmetrically, this article’s framework for the justification of net-zero subsidies draws a distinction between justifiable trade-distorting effects, and unjustifiable protective or discriminatory application associated with the pursuit of reshoring (protective application) or geopolitical (discriminatory application) goals.

The assessment of unjustifiable protective or discriminatory application under the Chapeau of Article XX is intertwined with a close focus on a measure’s specific policy goal. As an expression of the principle of good faith,<sup>38</sup> the Chapeau targets any aspects in the practical application of a measure that are irreconcilable with its alleged policy goal<sup>39</sup> or otherwise reveal breaches of good faith and a disconnection with the measure’s policy objective.<sup>40</sup> Likewise, this article approaches the issue of the justification of net-zero subsidies and questions of unjustifiable protective or discriminatory application by addressing the relationship between a subsidy’s ‘design

<sup>34</sup> See section ‘Group I: unconditionally justifiable subsidies’.

<sup>35</sup> See sections ‘Group I: unconditionally justifiable subsidies’ and ‘Group II: conditionally justifiable subsidies’.

<sup>36</sup> See arts XX(b) and XX(g), respectively. As is well known, the ‘related to’ test of subparagraph (g) is easier to meet than the ‘necessity’ test. Nonetheless, the dispute settlement organs have followed a very soft approach in their analysis of ‘necessity’ under subparagraph (b). Confirming this soft approach, see most recently Panel Report, *European Union and Certain Member States—Certain Measures Concerning Palm Oil and Oil Palm Crop-Based Biofuels (EU and Certain Member States—Palm Oil (Malaysia))*, WT/DS600/R, adopted 26 April 2024, paras 7.1083 ff.

<sup>37</sup> Panel Report, *China—Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum (China—Rare Earths)*, WT/DS431/R, WT/DS432/R, TW/DS433/R, adopted 29 August 2014, paras 7.190 and 7.350.

<sup>38</sup> WTO Appellate Body Report, *United States—Import Prohibition of Certain Shrimp and Shrimp Products (US—Shrimp)*, WT/DS58/AB/R, adopted 6 November 1998, para 158.

<sup>39</sup> For an analysis of the equal treatment of (eg environmentally) equivalent products, even-handedness, calibration, and the rational relationship test, see Giulia Claudia Leonelli, ‘Anti-Deforestation npr-PPMs and Carbon Border Measures: Thinking about the Chapeau of Article XX GATT in Times of Climate Crisis’ (2023) 26 *Journal of International Economic Law* 416.

<sup>40</sup> *ibid.*, with an analysis of due process, coercion, and ‘situational’ discrimination.



and application,<sup>41</sup> and its climate neutrality policy goals. On these grounds, the analysis focuses on the extent to which specific categories of net-zero subsidies may tackle a specific environmental externality and address market or regulatory failures, as opposed to pursuing reshoring goals (protective application) or de-risking goals (discriminatory application). This case-by-case assessment is informed by legal and economic insights.

An examination of the justification of net-zero subsidies through this specific lens places the environmental credentials of net-zero subsidies centre stage, brings more clarity to the analysis of their specific effects, and lays the foundations for a streamlined categorization of different groups of net-zero subsidies. The analysis developed in the next sections and the examination of specific IRA tax credits illustrate these points in practical terms.

## GROUP I: UNCONDITIONALLY JUSTIFIABLE SUBSIDIES

The IRA includes several production and investment tax credits for renewable electricity, renewable energy, and ‘clean’ electricity. Section 13101 of the Act modifies the Internal Revenue Code section 45 production tax credits for renewable electricity by setting a base credit amount of \$0.3 cents per kilowatt-hour. Section 13102 of the Act modifies the section 48 investment tax credits for energy property by setting a 6 per cent base credit rate and by broadening its scope of application. Section 13701 of the Act introduces a new production tax credit for ‘clean’ electricity whose production is associated with a zero greenhouse gas (GHG) emission level; the base amount is also \$0.3 cents per kilowatt-hour. Section 13702 introduces a corresponding investment tax credit, with a base rate of 6 per cent. Section 13104 IRA modifies the section 45Q tax credits for carbon capture and storage (CCS) and direct air capture (DAC). It broadens the scope of application of the tax credits and modifies their base amounts. Further, section 13204 IRA creates a new production tax credit for ‘clean’ (‘green’ or ‘blue’) hydrogen.<sup>42</sup>

The preliminary question to address is whether this group of subsidies may be actionable and countervailable under the ASCM arrangements, at all. This is unlikely to be the case for the IRA decarbonization (CCS and DAC) tax credits, due to their non-specificity. As is well known, an assessment of specificity focuses on the extent to which ‘access to a subsidy is limited to a particular class of recipients.’<sup>43</sup> This question must be examined on a case-by-case basis.<sup>44</sup> The dispute settlement organs have found that the notion of an ‘industry’ or ‘group of industries’ enshrined in the Chapeau of Article 2 ASCM ‘[...] relates to producers of certain products. [...] At some point that is not made precise in the text of the Agreement [...] a subsidy would cease to be specific because it is sufficiently broadly available throughout an economy as not to benefit a particular limited group of producers of certain products.’<sup>45</sup> The IRA decarbonization tax credits are broadly available to any producer in any carbon-intensive sector, and thus fail to meet the specificity criterion.

The IRA renewable or ‘clean’ energy and hydrogen tax credits, on the other hand, meet the criteria for *de facto* specificity<sup>46</sup> and are likely to be actionable and countervailable. First, infrastructure upgrades and improved grid connectivity have increased and will further increase trade intensity in the energy and hydrogen sectors.<sup>47</sup> The scale of the IRA tax credits is such as

<sup>41</sup> WTO Appellate Body Reports, *European Communities—Measures Prohibiting the Importation and Marketing of Seal Products (EC—Seal Products)*, WT/DS400/AB/R, WT/DS401/AB/, adopted 18 June 2014, para 5.302.

<sup>42</sup> ‘Blue’ hydrogen is produced through steam methane reforming processes; carbon dioxide is then captured and stored. ‘Green’ hydrogen is produced through electrolysis.

<sup>43</sup> WTO Appellate Body Report, *United States—Countervailing Duty Measures on Certain Products from China (US—Countervailing Measures (China))*, WT/DS437/AB/R, adopted 16 January 2015, para 4.169.

<sup>44</sup> WTO Panel Report, *United States—Subsidies on Upland Cotton (US—Upland Cotton)*, WT/DS267/R, adopted 21 March 2005, para 7.1142.

<sup>45</sup> *ibid.*

<sup>46</sup> art 2(c) ASCM.

<sup>47</sup> International Energy Agency, *Electricity Market Report—December 2020* (International Energy Agency, 2020).

to potentially cause ‘adverse effects’ to the interests of other Members. EU stakeholders have already raised concerns surrounding the increased economic competitiveness of subsidized US hydrogen.<sup>48</sup>

Second, the scale of these IRA tax credits may produce complex trade-distorting effects by reducing costs for downstream firms. Sizeable energy subsidies may result in significantly lower energy prices and thus alter the industrial competitiveness of a country, due to general equilibrium effects. The IRA renewable and ‘clean’ energy tax credits are expected to substantially reduce the levelized cost of utility-scale solar and wind projects deployed in the USA, making US energy cheaper.<sup>49</sup> Similar considerations apply to the hydrogen tax credits.

This could make these subsidies actionable and countervailable under a ‘pass-through’ test, as both the energy and hydrogen subsidies are highly likely to pass-through to producers in energy-intensive industries. Pursuant to Articles 5(a) and 15 ASCM, a determination of ‘injury to domestic industry’ involves positive evidence and an objective examination of the volume of subsidized imports,<sup>50</sup> the effects of subsidized imports on prices in the domestic market for like products,<sup>51</sup> and the consequent impact on domestic producers.<sup>52</sup> Under this general impact standard, we can envision a scenario where a significant increase in imported US products that have benefited from low-energy prices or subsidized hydrogen could be found to injure the EU domestic industry.

The dispute settlement organs have addressed questions surrounding the pass-through of benefits from producers of subsidized upstream input products to producers of downstream products in a handful of disputes.<sup>53</sup> Both energy and hydrogen would qualify as input products under the ASCM.<sup>54</sup> A pass-through analysis is not required where the same firm produces both upstream and downstream products;<sup>55</sup> nor is it required where ‘an input product and a further manufactured product both are covered by the definition of the product subject to the countervailing duty investigation.’<sup>56</sup> In the case of unrelated producers operating at arm’s length, by contrast, the examination must focus on the extent to which a subsidy granted to the producer of the upstream input product has indirectly benefited the downstream product.<sup>57</sup> Despite the absence of any references to Article 2 by the dispute settlement organs, some commentators have advocated the application of a ‘double specificity’ test in the context of a pass-through analysis.<sup>58</sup> This would make the energy subsidies non-actionable and non-countervailable. However,

<sup>48</sup> ‘EU Parliament Trade Chief Calls for Tariffs on US Hydrogen’, <<https://www.euractiv.com/section/politics/news/eu-parliament-trade-chief-calls-for-tariffs-on-us-hydrogen/>> accessed 24 July 2024.

<sup>49</sup> Yohan Min and others, ‘Effects of Renewable Energy Provisions of the Inflation Reduction Act on Technology Costs, Materials Demand, and Labour’, BlueGreen Alliance (2023). CGE model simulations of climate policies in G7 countries have shown that feed-in subsidies to the power sector lead to a slightly increased trade share of G7’s EITE industries in 2030, compared to baseline projections. This protects the market shares of emission-intensive trade-exposed (EITE) industries relative to non-acting countries by keeping electricity prices lower. See Jean Chateau, Florence Jaumotte and Gregor Schwerhoff, ‘Climate Policy Options: A Comparison of Economic Performance’, IMF Working Papers (2022).

<sup>50</sup> arts 15.1 and 15.2 ASCM.

<sup>51</sup> *ibid.*

<sup>52</sup> art 15.4 ASCM.

<sup>53</sup> As the Appellate Body noted in *US—Softwood Lumber IV*, art VI:3 GATT 1994 and footnote 36 to art 10 ASCM refer to subsidies bestowed directly or indirectly upon the manufacture, production or export of any merchandise. On these grounds, it found that ‘financial contributions by the government to the production of inputs used in manufacturing products subject to an investigation are not, in principle, excluded from the amount of subsidies that may be offset through the imposition of countervailing duties on the processed product’. WTO Appellate Body Report, *United States—Final Countervailing Duty Determination with Respect to Certain Softwood Lumber from Canada (US—Softwood Lumber IV)*, WT/DS257/AB/R, adopted 17 February 2004, paras 140 and 141.

<sup>54</sup> See Annex II to the ASCM, footnote 1. See also Annex I to the ASCM, points (h) and (i).

<sup>55</sup> WTO Panel Report, *United States—Preliminary Determinations with Respect to Certain Softwood Lumber from Canada (US—Softwood Lumber III)*, WT/DS236/R, adopted 1 November 2002, paras 7.71 ff.

<sup>56</sup> WTO Panel Report, *Mexico—Definitive Countervailing Measures on Olive Oil from the European Communities (Mexico—Olive Oil)*, WT/DS341/R, adopted 21 October 2008, para 7.152.

<sup>57</sup> WTO Appellate Body Report, *US—Softwood Lumber IV*, paras 142 and 143.

<sup>58</sup> Sherzod Shadikhodjaev, ‘How to Pass a Pass-Through Test: The Case of Input Subsidies’ (2012) 15 *Journal of International Economic Law* 621.

the hydrogen production tax credits would still meet the requirement of ‘double specificity’; at present, hydrogen-based technologies are only employed in a limited number of carbon-intensive sectors. Regardless of the applications of the pass-through test, these examples again demonstrate that the IRA subsidies for renewable energy and hydrogen may be actionable and countervailable under the ASCM.

These preliminary findings beg the question whether the group of subsidies under analysis in this section should be justifiable, non-actionable and non-countervailable. Under the article’s framework, this matter should be approached by enquiring into their potential protective or discriminatory application. The following legal and economic analysis of these IRA tax credits confirms that these subsidies may produce trade-distorting effects, but do not have protective or discriminatory application. Rather, they are adopted to tackle specific environmental externalities and to address regulatory or market failures.

Renewables deployment and the decarbonization of specific industrial sectors have proceeded at a rather slow pace in the USA. As legal analysis demonstrates, these environmental externalities stem from regulatory failures which the IRA subsidies aim to address. The Environmental Protection Agency (EPA) has faced several regulatory constraints in its policy action throughout the years. Under sections 111(b) and (d) of the Clean Air Act (CAA), the EPA may respectively establish new source performance standards (NSPSs) for the emissions of air pollutants (eg GHGs) from new and modified facilities or installations, and emission guidelines (EGs) for existing facilities or installations.<sup>59</sup> These emission limits are determined on the basis of the best system of emission reduction (BSER) that has been adequately demonstrated by the EPA taking economic considerations and technical feasibility into account, and are then implemented via the permit system.

This system is associated with two problems. First, recourse to emission limits calculated on the basis of BSERs is effective when standards are set in place for new and modified facilities (eg green hydrogen steel plants); however, the EPA faces structural limitations when it seeks to increase the stringency of emission limits for existing facilities (eg blast furnaces) over time. This problem is exacerbated by the statutory reference to the BSER that has been adequately demonstrated ‘after taking economic considerations and technical feasibility into due consideration’.

Second, the Supreme Court’s restrictive interpretation of the CAA’s text has interfered with the EPA’s attempts to address these legal shortcomings via implementing rules. In 2009, the EPA sought to accelerate decarbonization by subjecting any source emitting 100,000 tons of GHG emissions per year to a permit including specific GHG emission limits. In its 2013 decision in *Utility Air Regulatory Group v EPA et al*, the Supreme Court found that the EPA had exceeded its statutory authority by adding these non-statutory thresholds.<sup>60</sup> Further obstacles to the regulation of GHG emissions came into play in *West Virginia v EPA*. The EPA had sought to accelerate the decarbonization of electricity production and promote renewables through ‘generation shifting’ from existing coal-fired power plants to (less polluting) natural gas-fired plants, and from both existing coal and natural gas-fired plants to renewables. Operators could choose to reduce their production of electricity, build or invest in a less polluting power plant facility, or purchase credits under a cap-and-trade system. In its decision, the Supreme Court held that the EPA had exceeded the authority granted to the Agency in section 111(d) CAA when adopting these rules.<sup>61</sup>

<sup>59</sup> The Clean Air Act of 1955 (CAA), Public Law 84–159 and the Amendments Made by Subsequent Enactments.

<sup>60</sup> *Utility Air Regulatory Group v Environmental Protection Agency et al*, 573 US 302 (2014), 24–29. The Court held that emission limits for GHGs may only apply to ‘anyway sources’, ie sources that in accordance with the CAA’s text require a permit due to their emissions of 100 or 250 tons per year of specific hazardous pollutants.

<sup>61</sup> *West Virginia v Environmental Protection Agency*, 597 US (2022), 28–31.



As the legal and economic analysis developed above demonstrates, the IRA tax credits under examination in this section tackle specific environmental externalities and remedy regulatory or market failures. Under the article's conceptual framework, this excludes their protective or discriminatory application and suggests that these subsidies simply produce trade-distorting effects.

One final consideration relates to the effects that this group of subsidies may produce in other jurisdictions, and their environmental implications. The March 2023 EU revision of the Temporary Crisis and Transition Framework (TCTF) for State Aid Measures covers the very same areas regulated under the IRA tax credits under analysis in this section.<sup>72</sup> Following Germany's lead, EU Member States are taking increasing action to subsidize GHG-intensive industrial production by lowering electricity prices.<sup>73</sup> The European Commission has approved billions of state aid granted by EU Member States to support industrial decarbonization and the uptake of renewable hydrogen.<sup>74</sup> The EU institutions have also accelerated the roll-out of the European Hydrogen Strategy and the allocation of relevant funding.<sup>75</sup> There can be little doubt that the IRA subsidies have tilted the global playing field and have triggered a transatlantic subsidies race. The subsidies race argument is one recurrent objection against unilateral recourse to subsidies.<sup>76</sup> In the case of renewable energy and industrial decarbonization subsidies, however, the IRA tax credits have resulted in a subsidies race to the top in environmental terms, accelerating the transition to net-zero. This lends further support to the argument that this group of subsidies produce environmentally beneficial effects.

Under the article's framework, all these considerations militate in favour of the unconditional justification, non-actionability and non-countervailability of renewable energy and electricity and industrial decarbonization subsidies. This should apply irrespective of the nature of the measures, which may take the form of production subsidies, investment subsidies, research and development (R&D) investment subsidies, feed-in tariffs, fiscal exemptions, credits or offsets for carbon taxes, or allocation of free allowances under cap-and-trade systems.<sup>77</sup>

The expired Article 8 ASCM and the treatment of 'green box' subsidies during the implementation period of the AoA set a precedent for this approach.<sup>78</sup> Unlike under the defunct Article 8 ASCM and Annex 2 of the AoA, the approach advocated in this section does not aim to carve out subsidies whose trade-distorting effects are limited in nature; by implication, the subsidies are identified by reference to their beneficial environmental effects and scope of application, rather than being the object of specifications surrounding their scale and conditions for their allocation.<sup>79</sup> Just like under the expired Article 8 ASCM, however, non-actionability and

<sup>72</sup> European Commission (n 4) ss 2.5 and 2.6.

<sup>73</sup> B McWilliams and others, *Europe's Under-The-Radar Industrial Policy: Intervention in Electricity Pricing* (Bruegel 2024).

<sup>74</sup> European Commission (2023), State Aid: Commission Approves €550 million direct grant and conditional payment mechanism of up to €1.40 billion to support ThyssenKrupp Steel Europe in Decarbonizing its Steel Production and Accelerating Renewable Hydrogen Uptake, Brussels, 20 July 2023; European Commission (2023), State Aid: Commission Approves €850 million French Measure to Help ArcelorMittal Decarbonize its Steel Production, Brussels, 20 July 2023. See also <<https://www.euractiv.com/section/energy-environment/news/berlin-kicks-off-e23-billion-green-industry-subsidy-scheme>> accessed 24 July 2024.

<sup>75</sup> On the European Hydrogen Strategy, see <[https://energy.ec.europa.eu/topics/energy-systems-integration/hydrogen\\_en](https://energy.ec.europa.eu/topics/energy-systems-integration/hydrogen_en)> accessed 24 July 2024.

<sup>76</sup> For recent analyses see IMF, OECD, World Bank, and WTO (n 25) Réka Juhász, Nathan Lane and Dani Rodrik, 'The New Economics of Industrial Policy', National Bureau of Economic Research Working Paper Series (2023).

<sup>77</sup> In 2020, the US Department of Commerce found that free allowances allocated under the EU Emission Trading System (ETS) to installations in the steel sector constituted a countervailable subsidy; see US Department of Commerce, C-475-841, 7 December 2020.

<sup>78</sup> Under art 13(a) of the AoA, 'green box' subsidies were non-actionable and non-countervailable due to their limited trade-distorting effects. The same applied to the art 8.2(c) ASCM subsidies, even though art 9 ASCM laid out an ad hoc procedure to apply if the subsidies had caused 'serious adverse effects'.

<sup>79</sup> See the definitions, details, and specifications for the identification of 'green box' subsidies under Annex 2 of the AoA. As expressly acknowledged in the Annex, the 'green box' subsidies '[...] shall meet the fundamental requirement that they have no, or at most minimal, trade-distorting effects or effects on production'. See also the specifications for the decarbonization subsidies of art 8.2(c) ASCM.

non-countervailability could be made conditional on the prior notification of the relevant subsidies.<sup>80</sup> This would enhance transparency and facilitate dialogue on the design, scale, timing, and phase-out of the subsidy measures. The next section turns to an examination of the IRA subsidies for equipment in the renewables sector, conducting the same form of analysis.

## GROUP II: CONDITIONALLY JUSTIFIABLE SUBSIDIES

Strategic dominance in key net-zero sectors has been consistently portrayed as a precondition to pursue the Biden Administration's threefold agenda: addressing Chinese non-market practices, promoting reshoring and reshaping trade flows in line with a 'worker-centred' trade policy, and tackling the climate crisis.<sup>81</sup> Production or investment subsidies to promote domestic manufacturing of equipment and components for the net-zero sectors are a key part of this broader national economic security strategy. The IRA includes two groups of subsidies that conform to this logic. Section 13501 has extended the Advanced Energy Project (section 48C) investment tax credits to include investments for the establishment, expansion or re-equipment of facilities that produce components and equipment for the net-zero sectors, energy storage, grid modernization, CCS components, EVs, and critical minerals. Section 13502 has introduced a new production tax credit (section 45X) for the domestic manufacturing of components for the solar and wind sectors.

Trade intensity is increasing in the net-zero equipment sector, and the Section 48C and 45X tax credits could unquestionably cause 'adverse effects' to the interests of other Members. For these reasons, they are potentially actionable and countervailable under the ASCM. This begs the question whether this group of subsidies should be justifiable at all and, if so, under what conditions. As already seen in the previous section, the analysis should focus on the extent to which this category of net-zero subsidies may tackle specific environmental externalities and address market or regulatory failures, as opposed to pursuing domestic industrial policy or de-risking goals (protective or discriminatory application).

The design, structure, and architecture of these tax credits for net-zero equipment reflect a clear focus on the promotion of domestic (green) industry; the reshoring component prevails over their environmental rationale. This justifies a presumption that this group of subsidies have protective application. The ensuing question is whether they may tackle environmental externalities and help accelerate the net-zero transition. A positive answer would help rebut the presumption of protective application; consequently, it would lend support to arguments in favour of their justification, non-actionability and non-countervailability.

The following analysis suggests that subsidies for net-zero equipment and components can tackle environmental externalities, but only under specific conditions. Economic insights testify that this group of subsidies can remedy market failures and yield environmental benefits. Where relevant product markets are concentrated and scale effects are strong, subsidies for net-zero equipment can help correct market failures that drive a wedge between private and social returns.<sup>82</sup> By depressing global prices of net-zero goods, well-designed and time-limited subsidies can thus generate environmental benefits.<sup>83</sup> China's robust programme of subsidy measures

<sup>80</sup> See art 8.3 ASCM.

<sup>81</sup> See White House, 'Remarks by National Security Advisor Jake Sullivan on Renewing American Economic Leadership at the Brookings Institution' (27 April 2024); and White House, 'Remarks by National Security Advisor Jake Sullivan on the Biden-Harris Administration's National Security Strategy' (13 October 2022), available at <<https://whitehouse.gov/>> accessed 24 July 2024.

<sup>82</sup> Rodrik (n 76); Carolyn Fischer, 'Strategic Subsidies for Green Goods', RFF Discussion Paper (2016).

<sup>83</sup> Fischer (n 82); Chiara Criscuolo and others, 'Are Industrial Policy Instruments Effective? A Review of the Evidence in OECD Countries' OECD Science, Technology and Industry Policy Papers (2022).

and coordinated incentives to promote its solar PV industry offers a clear example.<sup>84</sup> Carefully designed state interventions have enabled China to obtain a quasi-monopolistic position in polysilicon production and a dominant position in the manufacturing of solar ingots, wafers, and cells.<sup>85</sup> Upscaling effects and the rapid growth of Chinese solar PV output have depressed global prices of solar PV components considerably, accelerating solar PV deployment at the transnational level.<sup>86</sup>

Legal analysis, however, strikes a note of caution. Lack of transnational coordination in recourse to this group of subsidies can result in a prisoner's dilemma scenario, paving the way for non-cooperative approaches, whereby each Member seeks to promote its domestic net-zero industry and undercut other Members. This inward-looking turn is bound to undermine the net-zero transition at a time when access to low-cost equipment and components is more important than ever. For this reason, this group of subsidies can only tackle environmental externalities under specific circumstances and should only be conditionally justifiable.

The first precondition for justification is that subsidies for net-zero equipment and components should be designed and applied so as to promote transnational upscaling effects, as opposed to protective import substitution impacts. The key question to address in this regard is whether and to what extent subsidies may depress global prices, accelerating the net-zero transition. Unlike in the case of renewable energy and decarbonization subsidies, unilateral and uncoordinated recourse to subsidies for the promotion of domestic manufacturing of net-zero equipment can trigger a subsidies race to the bottom, and is less likely to yield any substantial environmental benefits.

The second and closely related precondition is that recourse to this category of subsidies can only produce environmentally beneficial effects and be justified in environmental terms in so far as Members restrain from imposing CVDs on imported subsidized products. As the unfolding of the solar PV saga in the USA proves, Members are unlikely to reap any economic benefits from the use of CVDs. Despite abundant recourse to trade remedies for over a decade, the USA has failed to establish a globally competitive domestic solar PV industry. On the contrary, the unavailability of cheap Chinese components or the increase in their final price have hurt US downstream producers in this sector and hampered the competitiveness of the US industry.<sup>87</sup> The EU faces a similar situation at present. The imposition of CVDs on Chinese EVs will not make the struggling EU industry more competitive on export markets, where Chinese manufacturers will maintain their competitive edge. Nor is it certain to shield EU manufacturers from competition on the EU market. Not only could Chinese firms potentially avoid CVDs via foreign direct investment in the EU, or circumvention practices, but several Chinese EV models are also likely to remain cheaper and more competitive than EU EVs after the imposition of the EU 10% tariff rate and CVDs.<sup>88</sup> More importantly for the purposes of the present enquiry, the USA and

<sup>84</sup> Xin-Gang Zhao, Guan Wan and Yahui Yang, 'The Turning Point of Solar Photovoltaic Industry in China: Will It Come?' (2015) 41 *Renewable and Sustainable Energy Reviews* 178; Yongqing Xiong and Xiaohan Yang, 'Government Subsidies for the Chinese Photovoltaic Industry' (2016) 99 *Energy Policy* 111; Ranran Luan and Boqiang Lin, 'Positive or Negative? Study on the Impact of Government Subsidy on the Business Performance of China's Solar Photovoltaic Industry' (2022) 189 *Renewable Energy* 1145.

<sup>85</sup> International Energy Agency, 'Special Report on Solar PV Global Supply Chains' (International Energy Agency, 2022).

<sup>86</sup> Sufang Zhang and Yongxiu He, 'Analysis on the Development and Policy of Solar PV Power in China' (2013) 21 *Renewable and Sustainable Energy Review* 393. Data cited by the Financial Times refer to a further 40% decrease in the price of solar PV components in 2023; see <<https://www.ft.com/content/4a5f6396-c29d-40bb-baa6-13679c35cdca>> accessed 24 July 2024.

<sup>87</sup> For a full list of US trade measures affecting the US solar PV industry since 2012, see 'Solar Panel Import Tariffs are Affecting the Industry by Increasing Prices by Up to 286%', available at <<https://pv-magazine-usa.com/2024/06/06/solar-panel-import-tariffs-are-affecting-the-industry-by-increasing-prices-by-up-to-286>> accessed 24 July 2024. For further examination of their economic effects, see Gabriella Beaumont-Smith, Congress's Shade on Suspended Solar Duties Shines Light on Troublesome Trade Remedy Laws (Cato Institute, 2023). On the broader economic effects of tariffs, see Erica York, *Separating Tariff Facts from Tariff Fictions* (Cato Institute, 2024).

<sup>88</sup> For an in-depth analysis, see Gregor Sebastian and Agatha Kratz, *Ain't No Duty High Enough* (Rhodium Group, 2024). These findings lend support to the argument that the threat of material injury to the Union EV industry is associated with the subsidized products and their competitiveness, rather than with the subsidies that the producers have received. See (n 25).

the EU experiences unequivocally demonstrate that CVDs produce detrimental environmental effects, by increasing the final price of net-zero goods. This problem is further exacerbated by the domino effects of the imposition of CVDs on other Members, who may feel inclined to follow the same course of action.

This brief analysis casts an unforgiving light on the environmental implications of lack of cooperation. These considerations militate in favour of a nuanced approach to the treatment of net-zero equipment subsidies. Under the article's framework, their justification, non-actionability and non-countervailability should be conditional on ad hoc forms of coordination.

Coordination would have to reflect the two goals identified above. The arrangements should aim to prevent the opportunistic use of subsidies to promote domestic manufacturing and import substitution, tackle unfair competition resulting from over-subsidization, and avoid a subsidies race to the bottom. Further, coordination would have to go so far as to ensure the non-imposition of CVDs on imported products.

Agreement on maximum ceilings of non-actionable and non-countervailable net-zero equipment subsidies would provide a promising way forward to achieve these goals. The AoA's Aggregate Measurement of Support (AMS) mechanism, as applied to 'amber box' subsidies, provides a blueprint.<sup>89</sup> Like under the AMS mechanism, Members would have to take on general and product-specific domestic support reduction commitments. The rationale, goals and specific design of environmentally effective coordination arrangements for net-zero equipment subsidies, however, would differ considerably from the ones of the AoA.

First, coordination to accelerate the net-zero transition would not aim to limit recourse to trade-distorting subsidies. Rather, allocating 'national fair shares' of subsidies would ensure that cooperation and coordinated subsidization practices produce transnational upscaling effects and depress global prices. For this reason, unlike under the AoA's AMS, all categories of subsidies directed at net-zero industries should be part of the calculations of the maximum ceilings, regardless of the existence of any potential trade-distorting and output-maximizing effects.<sup>90</sup> This includes for instance R&D investment subsidies, which do not have any such effects and are excluded from the AoA's AMS mechanism.<sup>91</sup>

Second, unlike in the case of the AMS mechanism and AoA's 'amber box' subsidies, net-zero equipment subsidies granted within the limits of predetermined maximum ceilings would have to be non-actionable and non-countervailable, rather than subject to a mere 'due restraint' clause. This approach would also mark a clear shift away from the AoA's focus on trade-distorting effects.<sup>92</sup> Further, it would be associated with two benefits: it would create considerable incentives for Members to comply with the maximum ceilings, and it would prevent the environmentally detrimental effects of CVDs.

Under such conditions and subject to these forms of coordination, net-zero equipment subsidies that are presumed to have protective application could tackle environmental externalities and redress market failures. By implication, they would also be justifiable, non-actionable and non-countervailable under the article's conceptual framework. In order to maximize the beneficial environmental effects of this group of subsidies, their justification, non-actionability and

<sup>89</sup> See art 6 AoA on Domestic Support Commitments, and Annex 3 AoA on the calculation of the Current Total AMS on a product-specific and non-product-specific basis.

<sup>90</sup> 'Green box' subsidies (art 7 and Annex 2 AoA), developmental measures (art 6.2 AoA), *de minimis* product-specific and non-product-specific domestic support (art 6.4 AoA), and 'blue box' subsidies (art 6.5 AoA) were all excluded from the calculations of the Current Total AMS due to their limited trade-distorting effects.

<sup>91</sup> See Table 1 for reference to different types of subsidies granted to promote renewables equipment and components industries. These may include production subsidies; investment subsidies; R&D investment subsidies; preferential financing; equity investments; grants; provision of goods and services, land use rights, or input products for less than adequate remuneration; and fiscal exemptions and reductions.

<sup>92</sup> Under art 13 AoA, 'amber box' subsidies (included in the AMS), 'blue box' subsidies (not included in the AMS), *de minimis* measures (not included in the AMS) and developmental measures (also not included in the AMS) were countervailable if trade-distorting, although subject to a 'due restraint' clause. They were only non-actionable as long as they met specific criteria.



non-countervailability could be further conditioned on compliance with environmental non-product related process and production method (npr-PPM) standards; by way of example, a maximum carbon footprint for EV batteries or solar cells and modules. This concludes the analysis of this group of subsidies. The next and final substantive section turns to the controversial IRA local content and origin-related requirements.

### GROUP III: UNCONDITIONALLY PROHIBITED LCRS AND ORIGIN-RELATED REQUIREMENTS

The third and final group of subsidies under analysis includes the IRA LCRs, domestic content bonus provisions, and other origin-related content requirements. Section 13401 of the IRA has modified the section 30D consumer tax credits for the purchase of EVs by adding specific LCRs and origin-related requirements. First, in order to be eligible for the tax credits, EVs must have undergone final assembly in North America.<sup>93</sup> Second, they may only be eligible for 50 per cent (\$3750) of the relevant tax credit where a specific (increasing) percentage of the components of their batteries has been manufactured or assembled in North America.<sup>94</sup> Third, they will only be eligible for the remaining 50 per cent of the tax credit where their batteries contain a specific (increasing) percentage of critical minerals recycled in North America, or extracted or processed in the USA or 'any country with which the United States has a free trade agreement in effect'.<sup>95</sup> Further, the tax credits are unavailable for any EVs whose batteries contain components 'manufactured or assembled by a foreign entity of concern' (FEOC),<sup>96</sup> and will soon be unavailable for those containing critical minerals extracted, processed, or recycled by a FEOC.<sup>97</sup>

Turning to the IRA domestic content bonus requirements, the production and investment tax credits for renewable electricity and energy (sections 45 and 48) and the new production and investment tax credits for 'clean' electricity and energy (sections 45Y and 48E) include a domestic content bonus for projects that meet domestic content requirements relating to steel, iron and other manufactured products used in the facilities. Under the sections 45 and 45Y credits, the bonus amounts to 10 per cent of the tax credit. Under the sections 48 and 48E credits, the bonus amounts to 2 percentage points. The domestic content requirements to qualify for the bonus are based on the 'Buy American' rules.<sup>98</sup> The requirements for steel and iron are met if 'all manufacturing processes with respect to any steel or iron items that are applicable project components take place in the United States'.<sup>99</sup> A more flexible system applies to manufactured products. In this case, the requirements are met if the manufactured products that are applicable project components are either produced in the USA, or deemed to be produced in the USA. The latter condition is met where the domestic cost percentage of the project, as calculated by taking US manufactured products and product components that were manufactured, produced or mined in the USA into account, is at least equal to the adjusted (and increasing) percentage of 40 per cent.<sup>100</sup>

The design, structure, and architecture of LCRs reveal that conditions regarding the sourcing and use of domestic over imported products or components have protective application. Under the article's framework, this suggests that they do not aim to tackle any environmental externality.

<sup>93</sup> s 13401(b) IRA.

<sup>94</sup> s 13401(e)(2)(A) and (B) IRA.

<sup>95</sup> s 13401(e)(1)(A) and (B) IRA. For a critical analysis, see Kathleen Claussen, 'What is a Free Trade Agreement, Anyway?' <<https://ielp.worldtradelaw.net/2023/01/what-is-a-free-trade-agreement-anyway.html>> accessed 24 July 2024.

<sup>96</sup> Section 13401(e)(7) IRA. Under point (B), this exception applies after 31 December 2023.

<sup>97</sup> *ibid*, under point (A), this exception applies after 31 December 2024.

<sup>98</sup> 49 CFR, SS. 661.1 to 661.21.

<sup>99</sup> Department of the Treasury, Internal Revenue Service, Domestic Content Bonus Credit Guidance under ss 45, 45Y, 48, and 48E, Notice 2023-38 (May 2023), at 7.

<sup>100</sup> *ibid* 7.

Similar considerations apply to origin-related requirements, including the FEOCs exclusion. Unlike LCRs, these requirements pursue geopolitical policy goals and have discriminatory application. These conditions reflect a desire to exclude strategic rivals from supply chains, and facilitate (opportunistic) forms of friendshoring.<sup>101</sup> These attempts to surgically restructure supply chains ensure the availability of key components in circumstances where full reshoring is impossible, and help exclude strategic rivals by proxy. Like LCRs, these discriminatory requirements cannot be applied so as to tackle environmental externalities.

A legal analysis of the effects of the IRA LCRs and origin-related requirements sheds light on their environmental pitfalls. The section 30D LCRs and origin-related requirements have already slowed down the transition away from fossil fuel vehicles in the USA. As of 2024, just over 20 EV models qualify for the full amount of the tax credit.<sup>102</sup> This number is likely to decrease further due to the exclusion of EVs whose batteries contain CRMs originating from FEOCs. Against this backdrop, it is unsurprising to see that more EVs have been leased than purchased so far<sup>103</sup>; none of the section 30D conditions apply under the section 45 W tax credits for commercial clean vehicles. It is equally unsurprising to see how the Final Regulations produced by the US Treasury Department Internal Revenue Service have partly loosened the rules. First, they categorize the ‘constituent materials’ of EV batteries as critical minerals, rather than battery components.<sup>104</sup> Second, they define ‘recovery of critical minerals from waste’ as a form of extraction.<sup>105</sup> Third, they replace the use of the ‘physical tracking’ criterion to determine compliance with the FEOCs restriction with a more lenient ‘allocation’ requirement.<sup>106</sup> Finally, they provide a transitional exception from the IRA requirements for critical minerals and from the related FEOCs restriction for ‘impracticable to trace’ ‘constituent materials’ of EV batteries, which will be applicable until 1 January 2027. This covers natural and synthetic graphite, which is almost exclusively refined in China.<sup>107</sup> These adjustments clearly aim to broaden the number of EVs that are eligible for the section 30D tax credit.

Similar considerations apply to the IRA domestic content bonus provisions. At the present stage, there is virtually no developer in the solar PV sector who is in a position to qualify for the IRA bonus; this is due to limited US production capacity for solar cells.<sup>108</sup> According to media reports, uncertainties as to whether a project would qualify for the bonus have already slowed down investments in this sector.<sup>109</sup> The rules include two acknowledgments of the system’s weaknesses. First, as of 2024, large facilities that do not meet LCRs will only be granted 90 per cent of the sections 45 and 48 tax credits. This provision, however, will not apply if domestic materials are unavailable or if their use would increase the final costs by more than 25 per cent. Second, unlike solar modules and solar cells, solar wafers are not covered by the domestic content bonus rules; the reason is that US manufacturing capacity is extremely limited.<sup>110</sup> This case study again confirms the environmental pitfalls of LCRs. Had the IRA included *stricto*

<sup>101</sup> The term ‘friendshoring’ was famously employed by the US Secretary of the Treasury Janet Yellen during an Atlantic Council event in April 2022. For a full transcript, see <<https://www.atlanticcouncil.org/news/transcripts/transcript-us-treasury-secretary-janet-yellen-on-the-next-steps-for-russia-sanctions-and-friend-shoring-supply-chains/>> accessed 24 July 2024.

<sup>102</sup> See <<https://fueleconomy.gov/feg/tax2023.shtml>> accessed 24 July 2024.

<sup>103</sup> Chad Bown, ‘Industrial Policy for EV Supply Chains and the US-EU Fight over the Inflation Reduction Act’, Peterson Institute for International Economics (2023).

<sup>104</sup> This means that the more lenient requirements for critical minerals will apply, rather than the local content requirements applied to battery components. ‘Constituent materials’ include powders of cathode and anode active materials, foils, metals for solid electrodes, binders, and electrolyte salts and additives. 26 CFR, Parts 1 and 301, s 1.30D-2(b)(12).

<sup>105</sup> The rationale for this categorization is precisely the same.

<sup>106</sup> 26 CFR, Parts 1 and 301, ss 1.30D-2(b)(25)(i) and (ii), and 1.30D-6(c)(1), (2) and (3).

<sup>107</sup> 26 CFR, Parts 1 and 301, s 1.30D-6(c)(3)(iii). In May 2024, however, the tariffs on Chinese natural graphite and Chinese natural and synthetic graphite anodes have been increased to 25%, with a view to promoting the restructuring of supply chains. See White House (n 9).

<sup>108</sup> For media reports, see <<https://www.ft.com/content/14fdf69a-48ca-4765-87c1-6426598af4bb>> and <<https://www.nytimes.com/2023/06/09/business/economy/energy-tax-credits.html>> accessed 24 July 2024.

<sup>109</sup> *ibid.*

<sup>110</sup> CleanTechnica, ‘US Treasury Announces New Solar Tax Credit Guidance – Who’s Happy?’

*sensu* domestic content requirements instead of a more circumscribed domestic content bonus, the relevant environmental effects would have been even more pervasive.

The economic literature lends further support to the argument that LCRs are unlikely to tackle environmental externalities. If compared with production subsidies for net-zero goods, LCRs have clear protective import substitution impacts and are less likely to produce environmentally beneficial effects.<sup>111</sup> Under ‘learning-by-doing’ or ‘infant industry’ theory, sectoral productivity can increase with experience and cumulated production volumes.<sup>112</sup> This suggests some potential beneficial effects of LCRs. Nonetheless, the positive spillovers of infant industry protection depend on the industry’s learning potential, the shape of its learning curve, and the degree of substitutability of domestic and foreign goods.<sup>113</sup> LCRs are also deemed ineffective unless they are coordinated with a set of complementary and coherent policies,<sup>114</sup> and in the absence of a number of preconditions (such as a stable pre-existing industrial base).<sup>115</sup> Further, domestic protection creates a moral hazard and reduces the incentives for domestic industry to climb the learning curve and become competitive.<sup>116</sup> Last but not least, trade protection via LCRs reduces competition and results in an inefficient allocation of resources, especially in the short term. LCRs constrain the efficient organization of supply chains, increasing deployment costs and input prices for domestic downstream industries.<sup>117</sup> This increase in short-term costs is not necessarily compensated by lowered production costs in the long term. Against this analytical backdrop, the economic literature does not support the assertion that domestic protection via LCRs may yield environmentally beneficial results and accelerate the net-zero transition.

In a similar vein, the section 30D origin-related requirements promote a very complex and costly restructuring of supply chains; this is bound to produce economically and environmentally inefficient results, increasing the production costs of EVs and affecting supply and quality levels.<sup>118</sup> The attempts to exclude China from EV supply chains via the IRA are particularly problematic, as China holds a dominant position in the EV battery sector and a quasi-monopoly in the refining of several critical minerals.<sup>119</sup> The IMF has warned about the risks of friendshoring for the stability of global growth, and for the transnational net-zero transition.<sup>120</sup>

As the analysis of this section has demonstrated, LCRs have protective application and are unlikely to tackle environmental externalities and redress regulatory or market failures; on the contrary, they are likely to slow down the net-zero transition. Similar considerations apply to origin-related requirements, which have discriminatory application. On these grounds, the article’s framework confirms that neither form of conditionality should be justifiable.

<<https://cleantechnica.com/2023/05/13/us-treasury-announces-new-solar-tax-credit-guidance-whos-happy/>> accessed 24 July 2024.

<sup>111</sup> OECD, ‘Local Content Requirements in the Solar and Wind Energy Global Value Chains’ in *Overcoming Barriers to International Investment in Clean Energy* (OECD Publishing, Paris 2015); Susan Stone, James Messent and Dorothee Flaig, ‘Emerging Policy Issues: Localization Barriers to Trade’, OECD Trade Policy Paper 180 (2015).

<sup>112</sup> Criscuolo et al (n 83).

<sup>113</sup> Marc Melitz, ‘When and How Should Infant Industries Be Protected?’ (2005) 66 *Journal of International Economics* 177.

<sup>114</sup> Tyeler Matsuo and Tobias Schmidt, ‘Managing Trade-Offs in Green Industrial Policies: The Role of Renewable Energy Policy Design’ (2019) 122 *World Dev* 11; and Ulrich Elmer Hansen and others, ‘The Effects of Local Content Requirements in Auction Schemes for Renewable Energy in Developing Countries: A Literature Review’ (2020) 127 *Renewable and Sustainable Energy Review* 109843.

<sup>115</sup> Matsuo and Schmidt (n 114).

<sup>116</sup> Criscuolo et al (n 83).

<sup>117</sup> Rodrik (n 76). See also Benedict Probst and others, ‘The Short-Term Costs of Local Content Requirements in the Indian Solar Auctions’ (2020) 5 *Nature Energy* 842. The analysis of India’s domestic protection of its solar PV sector by Probst et al reveals that the application of LCRs resulted in a ~6% per kilowatt-hour increase in the cost of solar power, compared to similar projects.

<sup>118</sup> OECD (n 111).

<sup>119</sup> See eg the reference to graphite (n 107). For a detailed overview of horizontal (country-level) and vertical (firm-level) concentration in this sector, see International Energy Agency, *Critical Minerals Market Review 2023* (International Energy Agency, 2023).

<sup>120</sup> The IMF has warned that the long-term efficiency costs of reshoring and friendshoring strategies could reduce global GDP by 2%. See Diego Cerdeiro, Siddharth Kothari and Dirk Muir, ‘Harm from De-Risking Strategies Would Reverberate Beyond China’, IMF Blog (October 2023).

## TREADING A NARROW PATH: GEOPOLITICAL TURMOIL, RESHORING, AND THE CLIMATE CRISIS

This article has advanced a conceptual framework to assess questions surrounding the justification, actionability, and countervailability of a circumscribed group of environmental (net-zero) subsidies. At a time when net-zero subsidies are designed and applied as multipurpose policy tools to de-risk from China, promote reshoring, and accelerate the transition towards climate neutrality, it has advocated a close focus on their environmental effectiveness. In line with this premise, the article has drawn a conceptual distinction between the justifiable trade-distorting effects of net-zero subsidies, and unjustifiable protective or discriminatory application associated with the pursuit of reshoring or de-risking goals. The case-by-case assessment of protective or discriminatory application has focused on the extent to which different groups of subsidies may tackle a specific environmental externality and redress market or regulatory failures.

The article has employed an examination of different IRA tax credits to test the robustness of this conceptual framework. Drawing on this analysis and on legal and economic insights, it has put forward a streamlined three-fold categorization and it has demarcated the boundaries within which different groups of subsidies should be justifiable.

Unlike previous proposals, the article has placed the environmental effectiveness and green credentials of net-zero subsidies centre stage, de-emphasizing questions surrounding their trade-distorting effects or the balance between trade costs and environmental benefits. The 'green box' approach advocated for unconditionally justifiable subsidies and the argument in favour of maximum thresholds of conditionally justifiable, non-actionable and non-countervailable subsidies to some extent mirror pre-existing arrangements under the ASCM and AoA. However, as illustrated throughout sections 'Group I: unconditionally justifiable subsidies' and 'Group II: conditionally justifiable subsidies', the proposals of the article are informed by a different rationale, driven by different goals, and operationalized differently.

Throughout the last couple of years, several stakeholders have floated the idea of a plurilateral net-zero subsidies club.<sup>121</sup> None of these proposals has ever progressed or taken any clear shape. Could the framework laid out in this article provide a potential blueprint for a plurilateral subsidies club? Albeit not practically or politically impossible, this scenario is unlikely to materialize.

Agreement on the application of a 'green box' approach to unconditionally justifiable but unquestionably trade-distorting renewable energy and decarbonization subsidies would be very difficult to reach. The post-IRA tensions and the creation of a transatlantic Clean Energy Dialogue testify to the political and economic sensitivity of this matter.<sup>122</sup>

Plurilateral agreement and coordination on maximum thresholds of conditionally justifiable, non-actionable and non-countervailable net-zero equipment subsidies would be even more sensitive in political terms. In legal terms, this form of arrangements is sufficiently practicable to operationalize and potentially within reach. The prospective negotiations on EV CVDs between the EU and the Government of China offer an ideal opportunity to closely scrutinize the latter's subsidization practices, promote fairer competition, and push for agreement on the scale and the nature of subsidies granted to firms in strategic net-zero sectors.<sup>123</sup> Greater coordination could deliver a double (economic and environmental) win, enabling Members to reclaim a 'national fair share' of manufacturing and associated subsidies in these sectors and yielding environmental

<sup>121</sup> Most recently, see European Commission (2024), Speech by Executive Vice President Vestager on Technology and Politics at the Institute for Advanced Study (n 13).

<sup>122</sup> See (n 6).

<sup>123</sup> See art 18 ASCM, on undertakings, and art 13 of the Consolidated Version of Regulation (EU) 2016/1037 of the European Parliament and of the Council of 8 June 2016 on Protection Against Subsidized Imports from Countries not Members of the European Union, OJ L 176. See also European Commission, Commission Staff Working Document on Significant Distortions in the Economy of the People's Republic of China for the Purposes of Trade Defence Investigations, SWD(2024) 91 Final.

benefits. The extent to which China may be willing to engage, however, is unclear. Perhaps more problematically, the USA is at present not inclined to search for any such consensual and coordinated solution. Excluding China and restricting market access for Chinese products is regarded as an end, more than a means to an end.

As a final note, it is worth stressing again that ASCM-prohibited LCRs and origin-related requirements are front and centre in the IRA. Their inclusion in the IRA, combined with China's request for consultations with the USA, cast an unforgiving light on the uncooperative and opportunistic patterns of behaviour of different Members.

In times of national economic security, geopolitical frictions and fears of de-industrialization are very likely to trump environmental considerations. The prospects for the creation of a truly environmentally effective net-zero subsidies club are bleak, and in this scenario the climate system is paying the price. It is in this spirit and in response to this challenge that this article has advocated a close and direct focus on the environmental credentials of net-zero subsidies. The article's framework does justice to the rationale and policy goals that should inform the design and application of *net-zero* subsidies.

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