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ORIGINAL ARTICLE

Multi-Purpose Green Industrial Policy and the WTO: An Unavoidable Clash?

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Abstract

Amid a new era of disruption spawned by looming climate threats and significant geopolitical tensions, an increasing number of countries have favored a more robust green industrial policy (GIP) to reduce carbon emissions and achieve other economic, political, and geostrategic objectives. The use of multi-purpose GIPs not only raises questions regarding the policies' compatibility with the World Trade Organization (WTO) rules but also, more broadly, profoundly implicates the interface between energy, trade, and the environment. This article selects China, the United States, and the European Union as case studies and provides a thorough analysis of the specific text and context of their GIPs to identify the new trends that deviate from past practices in order to capture the policy transformation. It highlights the disruptively adverse implications of the multi-purpose GIPs on the multilateral trading system. However, the WTO has an opportunity to mitigate such disruptions and avoid a seemingly unavoidable clash by facilitating international cooperation and coordination in the design and implementation of multi-purpose GIPs, particularly among major clean energy producer countries. In doing so, the WTO can strengthen its credibility and stability while also minimizing the misalignment of the diverse objectives and ensuring the decarbonization efforts will not undermined.

Keywords: green industrial policies; clean energy; China; the United States; the European Union

1. Introduction

Facing the urgent need to reduce greenhouse gas emissions and keep the temperature rise from exceeding what scientists warn is a perilous threshold, governments have deployed green industrial policies (GIPs) to develop clean and low-carbon technologies that may help decarbonizes the economy. The transition from a fossil-fuel-dominated economy to a low-carbon one would push for a drastic and complete transformation of the industrial landscape, with profound effects on consumption and production. In fact, the markets for green and low-carbon energy technologies have expanded dramatically with no sign of diminishing, attracting more than USD 1.4 trillion in global investment in 2022.[1] GIPs can be harnessed to capitalize on commercial opportunities and reap economic benefits, which can be instrumental in garnering sufficient political support for those policies.[2]

Amid an era of disruption spurred by heightened geopolitical and geo-economics tensions, such as the US–China rivalry and Russia's invasion of Ukraine, the use of industrial policies

[1]International Energy Agency, 'Energy Investment in 2022' (IEA, June 2022), www.iea.org/reports/world-energy-investment-2022/overview-and-key-findings.

[2]A. Terzi, M. Sherwood, and A. Singh (2023) 'European Industrial Policy for the Green and Digital Revolution', *Science and Public Policy* 842, 843.

in low-carbon and green sectors has experienced record-high popularity, even in the nations that have long favoured economic neoliberalism.[3] A paradigm shift is taking place as policymakers have been reassessing and re-engineering the relationship between markets and the state in advancing the low-carbon agenda. The appeal of integrating multiple purposes – economic, security, geopolitical, and environmental ones – in GIPs has been increasingly appreciated by both industrialized and emerging countries as a response to disruptions.[4] Nevertheless, the specific calibration of different factors in GIPs can differ from country to country, demonstrating their distinct policy priorities. The interweaving of increasingly diverse goals in GIPs has been particularly notable in major economies that fiercely compete for leadership in clean energy technologies and industries while also striving to strengthen the security and resilience of supply chains. The efforts to boost domestic clean energy manufacturing competitiveness are no longer exclusively or predominantly driven by the desire to maximize commercial profits but increasingly more by geo-economics and geopolitical considerations. In fact, the dominance of China in a range of green technologies has propelled advanced economies to reassess their reliance on Chinese exports with more scepticism. The emergence and growth of multi-purpose GIPs have been closely associated and will continue to be so with the evolving contextual background.

The use of multi-purpose GIPs is not without controversy. First, it raises questions regarding the compatibility with the rules-based multilateral trading system as administered by the World Trade Organization (WTO). Given the high litigiousness of GIPs within the WTO dispute settlement system,[5] it is relevant to apply international trade rules to identify potential violations. Although the dispute settlement system has been crippled by the dysfunction of the Appellate Body, WTO-proofing of green industrial policy remains essential in ensuring economic efficiency and avoiding the escalation of trade tensions. Nevertheless, a growing trend seems to be that countries have shown much less interest in using the WTO dispute settlement mechanism, when facing trade-restrictive GIPs, than in 'taking matters into their own hand', for instance, by adopting similar measures or seeking negotiated solutions bilaterally or minilaterally.

Second, from a broader perspective, the proliferation of multi-purpose GIPs would implicate the interface between energy, trade, and the environment. Trade-offs are likely to be made, and misalignment of different objectives might occur as the overemphasis on one single goal of GIPs could undermine efforts to achieve others. An undesirable consequence would be to marginalize or sacrifice climate targets and slow down the decarbonization process.

A vast body of scholarship has been devoted to examining the design and implementation of GIPs throughout the past decades from economic, political, public policy, and legal perspectives.[6]

[3]Low carbon technology products and critical minerals have attracted an increasing use of industrial policies since the beginning of 2023. See, S. Evenett et al., 'The Return of Industrial Policy in Data', International Monetary Fund Working Paper (January 2024), www.imf.org/en/Publications/WP/Issues/2023/12/23/The-Return-of-Industrial-Policy-in-Data-542828.

[4]Ibid.

[5]Renewable energy subsidies as a form of GIPs are particularly susceptible to WTO disputes, see, H. Asmelash (2015) 'Energy Subsidies and WTO Dispute Settlement: Why Only Renewable Energy Subsidies are Challenged?', *Journal of International Economic Law* 18(2), 261.

[6]For example, D. Rodrik (2014) 'Green Industrial Policy', *Oxford Review of Economic Policy* 30(3), 469; T. Altenburg and C. Assmann (eds.) (2017) *Green Industrial Policy: Concept, Policies, Country Experiences* (UN Environment; German Development Institute/Deutsches Institut für Entwicklungspolitk); I. Espa (2019) 'New Features of Green Industrial Policy and the Limits of WTO Rules: What Options for the Twenty-first Century?', *Journal of World Trade* 53(6), 979; R. Kemp and B. Never (2017) 'Green Transition, Industrial Policy, and Economic Development', *Oxford Review of Economic Policy* 33(1), 66; T. Matsuo and T.S. Schmidt (2019) 'Managing Tradeoffs in Green Industrial Policies: The Role of Renewable Energy Policy Design', *World Development* 122, 11; J.I. Lewis (2021) 'Green Industrial Policy after Paris: Renewable Energy Policy Measures and Climate Goals', *Global Environmental Politics* 21(4), 42; A. Cosbey, 'Green Industrial Policy and the World Trading System' (ENTWINED Issue Brief, October 2013); M.M. Fang (2021) 'Old Wine in a New Bottle? Green Industrial Policy and the Use of Safeguards in the Solar Sector', *Journal of World Trade* 55(4), 573; M. Wu and J. Salzman (2014) 'The Next Generate of Trade and Environment Conflicts: The Rise of Green Industrial Policy', *Northwestern University Law Review* 108(2), 401; J. Meckling (2021) 'Making Industrial Policy Work for Decarbonization', *Global Environmental Politics* 21(4), 134; B. Allan, J.I. Lewis, and T. Oatley (2021) 'Green Industrial

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However, it remains under-discussed how GIPs have been reimagined or re-engineered to change the calibration of policy objectives and functions as a response to a plethora of challenges in the new era and the implications on the multilateral trading system. Active GIP-user countries, particularly those with large influences and stakes in clean energy industries and value chains, are likely to generate profound global implications that can threaten the existing international order. Therefore, this article contributes to the ongoing debate by selecting the world's three largest clean energy producers – China, the US, and the EU, each of which is also a hegemon in their respective regions – as case studies to exemplify the intertwinement of diverse considerations in their multi-purpose GIPs and how they affect the international trading system.[7]

The remainder of the article is structured as follows. Section 2 reviews the existing literature on GIPs and highlights the newly emerged disruptions that have shaped and will continue to shape the composition and implementation of multi-purpose GIPs. Section 3 offers an updated account of China's, the US's, and the EU's multi-purpose GIPs, all of which demonstrate varying degrees of deviation from their past approaches to industrial policies. Section 4 delves into the implications of the multi-purpose GIPs on the multilateral trading system from three related yet distinct angles – compatibility, challenge, and opportunity. While there is a high probability that the proliferation of multi-purpose GIPs would clash with the international trade regime, a silver lining remains for the WTO to seize the chance to avoid such a clash.

2. An Overview of GIPs

As a terminology that is often interpreted differently depending on the audience, GIPs have no universal definition.[8] Scholars tend to rely on the intention and effect of GIPs in delineating the definitional boundary. For instance, Altenburg and Rodrik define GIPs as 'any government measure aimed to accelerate the structural transformation towards a low-carbon and resource-efficient economy in ways that also enable productivity enhancements in the economy'.[9] In other words, GIPs refer to sector-targeted policies that affect the economic production structure with the goal of delivering environmental benefits.[10] GIPs are designed to address the dual challenges of transforming economic structures to create wealth and increase prosperity while, at the same time, replacing ecologically unsustainable activities with sustainable ones.[11] Compared to other environmental actions, GIPs have a distinct policy objective – to restructure and transform the economy into a green one in order to limit climate change.[12]

There is no one-size-fits-all approach in the crafting and implementation of GIPs. In fact, GIPs can take a wide range of forms that go beyond single policy domains, including investments, fiscal

Policy and the Global Transformation of Climate Politics', *Global Environmental Politics* 21(4), 1; A. Harrison, L.A. Martin and S. Nataraj (2017) 'Green Industrial Policy in Emerging Markets', *Annual Review of Resource Economics* 9, 253.

[7]China, the US and the EU stand out in terms of clean energy investment and market size for clean energy technologies. From 2019 to 2023, China invested more than USD 180 billion in clean energy technologies annually, followed by the EU (more than USD 150 billion) and the US (more than USD 95 billion). See, International Energy Agency (2023) 'Increase in Annual Clean Energy Investment in Selected Countries and Regions, 2019–2023' (IEA, 22 May 2023), www.iea.org/data-and-statistics/charts/increase-in-annual-clean-energy-investment-in-selected-countries-and-regions-2019-2023.

[8]This is the same case in industrial policies in general. See, Terzi, Sherwood, and Singh, supra n. 2, 843.

[9]T. Altenburg and D. Rodrik (2017) 'Green Industrial Policy: Accelerating Structural Change towards Wealthy Green Economies', in T. Altenburg and C. Assmann (eds.), *Gremen Industrial Policy: Concept, Policies, Country Experiences* (UN Environment; German Development Institute/Deutsches Institut für Entwicklungspolitk), at 12.

[10]S. Hallegatte, M. Fay, and A. Vogt-Schilb (2013) 'Green Industrial Policy: When and How' (World Bank, October 2013), at 3. Defined more narrowly, GIPs refer to government attempts to facilitate the development of low-carbon alternatives to fossil fuels. See, L. Karp and M. Stevenson (2012) 'Green Industrial Policy: Trade and Theory' (World Bank Policy Research Working Paper No. 6238), at 1.

[11]Altenburg and Rodrik, supra n. 7, at 2.

[12]See, P. Krugman (2023) 'How to Think about Green Industrial Policy?', *New York Times*, 9 May 2023, www.nytimes.com/2023/05/09/opinion/climate-inflation-reduction-act-biden.html.

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incentives, regulatory measures, and policy supports designed to stimulate and facilitate the development and deployment of green technologies across the value chain.[13] Green industrial policymakers usually deploy a mix of different policies affecting green and low-carbon technology at different development stages, and targeting both supply and demand sides. Given that different types of green technologies tend to differ in their design complexity and the extent to which they need to be customized, it is essential that policymakers develop targeted policy mixes.[14]

The rationale for supporting GIPs is primarily two-fold. The first one is to address long-existing market failures – carbon under-pricing and R&D externalities.[15] It is extremely difficult, if not entirely impossible, for the market to fix its own problems. Government support, primarily through fiscal and regulatory incentives, is much needed to create and shape the market for green technologies, at least before they can compete with fossil fuels in terms of cost. Private sector actors that are risk-averse would be highly reluctant to invest in green technologies that are far from marketable.[16] Moreover, it is noted that green technologies tend to have higher risks, uncertainties, and externalities than non-green ones.[17] The second reason is to realise a first-mover advantage in certain green technologies and industries in order to boost domestic competitiveness.[18] The potential of GIPs to generate societal and economic benefits makes it essential for policymakers to garner sufficient political support for the implementation of GIPs that extend beyond the core group of environmental advocates.[19] In light of powerful, enriched interests and political coalitions in the fossil fuel sector, efforts to address climate change are more likely to be acceptable when integrated with industrial objectives instead of market-based policies, such as carbon pricing, which may invite backlash.[20] Meanwhile, in some industrialized economies, a growing contradiction between government promises that clean energy markets will bring more jobs and the fact that manufacturing remains located abroad has pressured policymakers to recourse to GIPs.[21]

Nevertheless, opponents of the use of GIPs have mainly referred to the occurrence of government failures, citing the chequered history of industrial policies in general.[22] First, real-world governments are unlikely to obtain sufficient information about market failures and therefore unlikely to make the correct decisions, which can lead to picking the losers.[23] As green technologies are rapidly changing, there is a risk of spending resources in areas that quickly lose importance. This problem can be particularly acute with technology-specific GIPs.[24] In addition, firms and industries can easily engage in rent-seeking and put pressure on governments for support that ends up only furthering private interests.[25] Therefore, creating and implementing

[13]Rodrik, supra n. 4.

[14]See, A. Malhotra and T. S. Schmidt (2022) 'Accelerating Low-Carbon Innovation', *Joule* (2), 2259.

[15]Rodrik contends that the existence of R&D externalities, and carbon under-pricing serve as two mutually reinforcing reasons justifying government support for green technologies. See, Rodrik, supra n. 4, 470–471.

[16]A. Terzi (2023) 'Green Industrial Policy: The Necessary Evil to Avoid a Climate Catastrophe', in S. Tagliapietra and R. Veugelers (eds.), *Sparking Europe's New Industrial Revolution*. Bruegel, at 109.

[17]S. Tagliapietra and R. Veugelers (2021) 'Fostering the Industrial Component of the European Green Deal: Key Principles and Policy Options', *Intereconomics: Review of European Economic Policy* 56(6), 305, 311.

[18]Rodrik, supra n. 4, 471.

[19]See, J. Meckling et al. (2015) 'Winning Coalitions for Climate Policy', *Science* 349(6253), 1170, 1171.

[20]Ibid. Some scholars also argue that GIPs can lay the political groundwork for enacting carbon pricing mechanisms in the future. See, E. Biber, N. Kelsey, and J. Meckling (2017) 'The Political Economy of Decarbonisation: A Research Agenda', *Brooklyn Law Review* 82(2), 604, 618.

[21]For instance, facing mounting domestic pressure, the UK had to add blatantly discriminatory policy measures – local content requirements to its offshore auctions schemes to garner support for its renewable energy development plan. See, M.M. Fang (2023) 'When Decarbonization Meets Industralization: The First WTO Dispute Settlement between the EU and the UK', *Virginia Journal of International Law* 63(2), 165, 177–178.

[22]Rodrik, supra n. 4, 472.

[23]Ibid.

[24]J. Meckling, T. Sterner, and G. Wagner (2017) 'Policy Sequencing toward Decarbonization', *Nature Energy* 2, 918, 919.

[25]Ibid.

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effective GIPs require that governments know precisely when and where to intervene while also avoiding capture by interest groups.[26] This is by no means easy to pursue, nor is there a clear set of rules instructing states on how to select sectors and maintain competition.[27]

Despite the debates that have, for decades, played out among academics and in politics, the question should increasingly be framed as 'how' to design effective GIPs to achieve the underlying objectives.[28] The recent surge in the popularity of GIPs, even in nations that have traditionally followed a more *laissez faire* economic approach, has further stressed the significance of addressing the 'how' question. What adds to the difficulty of solving the 'how' question is that the proliferation of GIPs has coincided with the diversification of objectives that policymakers intend to pursue. While the traditional dual objectives – industrial development and climate change mitigation – remain, the emergence of new goals shaped by security, sustainability, social justice, geoeconomics, and geopolitics-related considerations have given new dimensions and purposes to GIPs.[29] For instance, the ascendency of China as an internationally competitive actor in a range of clean energy technologies and industries has been increasingly perceived by liberal economies as a serious threat. Also, the outbreak of COVID-19 and Russia's invasion of Ukraine has further aggravated the West's concern about supply chain resilience and national security. Almost inevitably, trade, climate, supply resilience, and national security interests have been closely intertwined with each other and started to shape the making of GIPs.

Efforts to combine diverse policy objectives in GIPs immediately point to the challenge of reconciling different and competing objectives. This task becomes particularly difficult when the objectives clash, as it entails trade-offs and a possibility of missing the climate change objectives.[30] For instance, prioritizing national security interests in GIPs could push for the re-organization of globalized supply chains in green industries that have delivered economies of scale, high innovation rates, and radical declines in costs. It might be challenging for multiple policy objectives to coexist. Instead, some objectives are likely to prevail over or contradict the others. Meckling cautions that a race for green industrialization may drive global competition in clean technologies but with negligible results on decarbonization when the technological gains fail to translate into sectoral coverage.[31] In addition, the intensification of a competitive relationship could derail global cooperation and pit countries against each other.[32] In fact, several Western economies have resorted to multi-purpose GIPs as a means to counter or undercut China's dominant position in the clean energy value chains by promoting onshoring and/or allyshoring, which would cause competitive duplication and impede climate action.[33] A cause for concern is that the pervasive use of multi-purpose GIPs can lead to a vicious cycle of protectionist measures that undermines rules-based international order and fuels the rise of nationalism. In addition, the distinct logic by which industrial policy and climate policy operate may not always be easy to integrate, adding to the difficulty of leveraging the potential of multi-purpose GIPs to advance environmental targets.

[26]R. Agarwal, 'Industrial Policy and the Growth Strategy Trilemma' (IMF, 31 August 2023), www.elibrary.imf.org/view/journals/022/0060/003/article-A013-en.xml?rskey=1GsMa6&result=42.

[27]R. Cherif and F. Hasanov, 'The Return of the Policy that Shall Not Be Named: Principles of Industrial Policy' (IMF Working Paper WP/19/74, March 2019), at 64.

[28]D. Rodrik (2008) 'Industrial Policy: Don't Ask Why, Ask How', *Middle East Development Journal* 1.

[29]D. Rodrik, R. Juhasz, and N. Lane, 'Economists Reconsider Industrial Policy' (Project Syndicate, 4 August 2023), www.project-syndicate.org/commentary/new-economic-research-more-favorable-to-industrial-policy-by-dani-rodrik-et-al-2023-08. There is an emerging trend to link GIPs with social policy to address the issue of injustice and inequality by delivering more benefits to the working and middle classes. See, L. Murphy, 'An Industrial Strategy at the Heart of a Green New Deal' (Common Wealth, 9 September 2019), www.common-wealth.org/publications/an-industrial-strategy-at-the-heart-of-a-green-new-deal.

[30]Tagliapietra and Veugelers, supra n. 15.

[31]See, Meckling, supra n. 4.

[32]Allan, Lewis, and Oatley, supra n. 4, 9.

[33]T. Riofrancos (2023) 'The Security-Sustainability Nexus: Lithium Onshoring in the Global North', *Global Environmental Politics* 23(1), 20.

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3. The Making of Multi-purpose GIPs in the New Era of Disruption

As the world's largest clean energy producers, China, the US, and the EU have deployed various policy measures to advance their goals of green industrialization and decarbonization over past decades. Their experiences in designing and implementing GIPs exhibit considerable differences, owing to the divergence in their institutional and regulatory capacity and, increasingly so, to their geopolitical and geoeconomic considerations. A comparative analysis capturing the evolution of the multi-purpose GIPs in the three jurisdictions offers a fresh perspective to understanding how GIPs respond to and affect disruptions in the new era.

3.1 China

Following a socialist market economy model, or the so-called 'state capitalism', the Chinese government has actively pursued a mix of industrial policies in almost all its economic sectors.[34] The literature frequently cites China to showcase the effectiveness of its state-driven GIPs in fostering competitive clean energy industries in a complex global economy with important implications across the world.[35] Nevertheless, new geopolitical and geoeconomic challenges, particularly those that emerged after the US launched the trade war, have pushed China to revisit and redesign GIPs. This part discusses the paradigm shift in China's GIPs.

Dating back to the late 1970s, China's clean energy development started at a limited scale with the primary goal of providing electricity access to rural areas as a means to alleviate poverty.[36] It was not until the early 2000s when China launched the 10th Five-Year Plan, that developing clean energy and energy conservation technologies was viewed as a way to optimize the country's economic structure.[37] After that launch, enhancing Chinese domestic clean energy manufacturing capacity to reap economic and social benefits started to gain policy attention.[38] Around the same time, advanced economies in Europe and North America enacted support mechanisms to promote renewable energy deployment, contributing to a booming overseas market for Chinese manufacturers. The following years saw robust promulgation of laws and policy measures in China to enable the expansion of clean energy industries.[39] At the sub-national level, provinces and municipalities have competed fiercely with each other in rolling out generous supportive schemes, such as government grants, guaranteed loans, and low price lands to attract clean energy investors.[40]

[34]See, M. Hirson, 'State Capitalism and the Evolution of "China, Inc.", Key Policy Issues for the United States', Testimony before the US–China Economic and Security Review Commission on China's Internal and External Challenges (7 February 2019).

[35]See, S. Zhang et al. (2013) 'Interactions between Renewable Energy Policy and Renewable Energy Industrial Policy: A Critical Analysis of China's Policy Approach to Renewable Energies', *Energy Policy* 62, 342; K.S. Gallagher (2014) *The Globalization of Clean Energy Technology: Lessons from China*. MIT Press; J. Helveston and J. Nahm (2019) 'China's Key Role in Scaling Low-Carbon Energy Technologies', *Science* 366(6467), 794.

[36]The central government offered fiscal support to the development of biogas in rural China in 1979. See, J. Yao, 'The Problems Faced by the Transformation and Upgrading of Biogas Projects Are Yet to Solve' (People.cn, 16 January 2016), http://paper.people.com.cn/zgnyb/html/2016-01/18/content_1648870.htm.

[37]'The 10th Five-Year Plan for the National Economic and Social Development of the People's Republic of China', passed by the 4th Meeting of the 9th National People's Congress on 15 March 2001, www.gov.cn/gongbao/content/2001/content_60699.htm.

[38]'The 10th Five-Year Plan of New and Renewable Energy Industry Development' issued by the State Economic and Trade Commission on 10 October 2001, www.gov.cn/gongbao/content/2002/content_61602.htm.

[39]Examples such as the Renewable Energy Law, the Medium to Long-term Development Plans for Renewable Energy provided generous tax incentives and other forms of subsidies to develop renewable energy industries. See, J. Ball et al., 'The New Solar System: China's Evolving Solar Industry and Its Implications for Competitive Solar Power in the United States and the World' (Stanford Steyer–Taylor Center for Energy Policy and Finance, March 2017), at 123–134.

[40]Nevertheless, local governments have also contributed to the policy misalignment with central plans, leading to manufacturing overcapacity, power curtailment, and economically irrational expansion of renewable energy power industries. See, S. Corwin and T.L. Johnson (2019) 'The Role of Local Governments in the Development of China's Solar Photovoltaic Industry', *Energy Policy* 130, 283.

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The exponential growth of China's domestic manufacturing and export capacity in the clean energy sector has been met with backlash from its trading partners, such as the EU, the US, Canada, and India.[41] Ever since the early 2010s, Chinese clean energy exports, notably in the solar PV and wind sectors, have been subject to restrictive measures in the form of trade remedies and, more recently, regulatory standards, such as labour-related standards.[42] The deterioration of China's relations with Western economies in recent years has opened the eyes of Chinese policy-makers to the fact that the readiness of foreign markets to acquire Chinese clean energy final products can be easily disrupted. Against this backdrop, the Chinese government has scaled up efforts to readjust its GIPs priorities to reduce reliance on overseas markets in order to lessen its vulnerability to political pressure and restrictions employed by foreign countries.

A recently introduced development strategy – the 'Dual Circulation' ('*Shuang Xun Huan*') – has risen as a core component of China's new development model aimed at building a resilient economy with a robust domestic market.[43] While the new strategy by no means mandates the abandonment of China's export-growth model, it underscores the significance of achieving 'Internal Circulation' ('*Nei Xun Huan*') to adapt to an increasingly unstable and uncertain external environment.[44] Applying the 'Dual Circulation' strategy to the formulation of GIPs, the Chinese central government has increasingly emphasized the need to expand the domestic consumer market for clean energy products.[45] For instance, a series of incentive measures have been promulgated to stimulate domestic demand for new energy vehicles (NEVs), such as purchase tax rebates, preferential electricity tariffs for NEV charging, and government procurement targets.[46] For clean energy technologies that are still at an early stage with lower technological maturity,[47] China's GIPs tend to focus more on developing the value chains and advancing technological progress to reduce cost and enable commercial application, such as the designation of pilot and demonstration programmes.[48]

[41]See, Fang, supra n. 4, 578–580.

[42]The Uyghur Forced Labor Prevention Act (UFLPA) is one example, which effectively serves as a trade ban on Chinese PV products that source polysilicon from Xinjang. For an analytical discussion of the Act, see, M.M. Fang (2024) 'A Never-ending US–China Solar Trade War? The Uyghur Forced Labor Prevention Act and International Trade Law', *Minnesota Journal of International Law* (forthcoming), 33(1).

[43]The 'Dual Circulation' Strategy was raised for the first time by President Xi Jinping in the meeting of the Politburo on 14 May 2020 and included in China's 14th Five-Year Plan (2021–2025). The Strategy places a greater focus on China's domestic market with less reliance on export-oriented development model. As envisioned by President Xi, China would 'gradually form a new development model in which domestic circulation plays a dominant role'.

[44]F. Tang, 'What is China's Dual Circulation Economic Strategy and Why Is It Important?', *South China Morning Post*, 19 November 2020), www.scmp.com/economy/china-economy/article/3110184/what-chinas-dual-circulation-economic-strategy-and-why-it.

[45]See, 'Outline of the Strategic Plan of Increasing Domestic Demand (2022–2035)', issued by the Central Committee of the Chinese Communist Party and the State Council on 14 December 2022, www.gov.cn/zhengce/2022-12/14/content_5732067.htm; 'The 14th Five-Year Plan of Renewable Energy Development', issued by the National Development and Reform Commission, National Energy Administration and other seven central governmental departments on 1 June 2021, www.ndrc.gov.cn/xwdt/tzgg/202206/t20220601_1326720.html.

[46]See, 'Several Measures Incentivising the Vehicle Consumption',issued by the National Development and Reform Commission, the Ministry of Industry and Information Technology and other eleven central departments on 20 July 2023, www.gov.cn/zhengce/zhengceku/202307/content_6893476.htm; 'The Plan of New Energy Vehicle Industry Development (2021–2035)', issued by the State Council on 20 October 2020, www.gov.cn/zhengce/content/2020-11/02/content_5556716.htm.

[47]The new generation of green energy technologies include tidal and wave power, enhanced geothermal, thin film, perovskite and organic PV, green hydrogen, and others. For instance, the Mid-to-Long Term Hydrogen Industry Development Plan sets specific targets for green hydrogen development, one of which is to reach the production capacity of green hydrogen – 100,000 to 200,000 tons/per year by 2025. See, 'The Mid-to-Long Term Hydrogen Industry Development Plan', issued by the National Development and Reform Commission and National Energy Administration on 23 March 2023, www.ndrc.gov.cn/xxgk/zcfb/ghwb/202203/t20220323_1320038.html.

[48]'The Implementation Plan on the Green and Low-Carbon Advanced Technologies Demonstration Projects', issued by the National Development and Reform Commission, Ministry of Science and Technology and other eight central departments on 4 August 2023, www.gov.cn/zhengce/zhengceku/202308/content_6899582.htm.

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Given China's economic decentralization, local governments have played an instrumental role in implementing the centrally crafted GIPs, although they differ in their ability and capacity to enact policy to achieve the underlying goals. It is essential that local governments adjust national policy to local conditions and institutional constraints to maintain policy alignment.[49] Achieving the objective of 'Dual Circulation' and domestic demand expansion would ultimately depend on an effective and coordinated policy implementation at the local level. It is noted that an increasing number of Chinese provincial governments have issued high-level policy plans to boost local demand for clean energy products.[50] The coming years are likely to witness the roll out of more consumer-oriented policy incentives at China's central and sub-national levels to create a large and stable domestic clean energy market.

Although China's GIP-making in recent years has directed much more emphasis on developing its domestic consumer market for clean and low-carbon technologies, the practices of resorting to GIPs to counteract or retaliate against foreign countries have persisted. Given China's dominance in the critical mineral sector, in particular the refining and processing segment, GIPs can take the form of restricting the exportation of critical minerals that are integral to clean energy manufacturing. A recent addition to China's export restrictions on critical minerals is the imposition of export permits for three grades of graphite based on national security concerns.[51] Not equivalent to a ban, the new export control system can still generate uncertainty for industries dependent on graphite and mandate the submission of possibly confidential commercial information.[52] Export restrictions on critical minerals can also effectively serve as subsidies for domestic manufacturers that still enjoy uninterrupted access while their foreign counterparts do not. Nevertheless, given China's WTO obligations, the legality of export licensing or other restrictions remains questionable.[53]

To sum up, China's GIPs in the new era demonstrate a paradigm shift from zealously boosting its manufacturing and exportation capacity to tapping domestic market potential and building up homegrown innovation capacity to reduce dependence on Western countries and enhance self-sufficiency. Meanwhile, China appears to be even more assertive in using defensive GIPs, such as export restrictions on key inputs of clean energy products, in retaliation against foreign countries. These changes and developments in China's GIPs demonstrate an increasingly deep permeation of security-related considerations in a broad range of policymaking arenas out of the need to safeguard national security.[54]

[49]A. De Podesta Gomes, R. Pauls, and T. ten Brink (2024) 'Industrial Policy and the Creation of the Electric Vehicles Market in China: Demand Structure, Sectoral Complementarities and Policy Coordination', *Cambridge Journal of Economics* 47(1), 45, 48.

[50]See, 'The Plan of Implementing the Strategy of Expanding Domestic Demand in the Guangdong Province', issued by the Guangdong Provincial Government on 14 August 2023, www.gd.gov.cn/zwgk/wjk/qbwj/yfb/content/post_4250544.html; 'The Plan of Implementing the Strategy of Expanding Domestic Demand in the Jiangsu Province', issued by the Jiangsu Provincial Party Committee on 29 May 2023, www.zgjssw.gov.cn/fabuting/shengweiwenjian/202305/t20230529_7955774.shtml.

[51]As the world's largest graphite producer and exporter, China accounts for over 90% of the globe's graphite processing capacity. Graphite features on the latest critical minerals lists for the US, Canada, Europe, the UK, and Australia, owing to its wide application in clean energy technologies, particularly EV batteries. See, C. Sandell-Hay, 'Graphite: A Big Winner in the Global Clean Energy Race' (Assay, 10 June 2021), www.theassay.com/articles/feature-story/graphite-a-big-winner-in-the-global-clean-energy-race/. A few months ago, China has imposed an export licensing requirement on another two critical minerals – germanium and gallium, which can be applied in manufacturing high-efficiency solar cells and other electronic devices. See, 'Germanium and Gallium in Today's Technology Landscape' (Brunel, 26 July 2023), www.brunel.net/en-au/blog/mining/germanium-and-gallium-in-technology.

[52]E. White, W. Langley, and H. Dempsey, 'China Imposes Export Curbs on Graphite', *Financial Times* (20 October 2023), www.ft.com/content/8af8c05c-8e54-40e9-9051-5a0b2b036c32.

[53]See, M. Wu (2017) 'China's Export Restrictions and the Limits of WTO Law', *World Trade Review* 16(4), 673.

[54]S.C. Greitens, 'Xi's Security Obsession: Why China Is Digging in at Home and Asserting Itself Abroad', *Foreign Affairs* (28 July 2023), www.foreignaffairs.com/united-states/xis-security-obsession.

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3.2 The US

The US GIPs have been traditionally implemented with a focus on the upstream (i.e. new technology R&D) and downstream (i.e. market demand) segments and less emphasis on the supply chains and manufacturing, as the former is where market failures have been assumed to exist.[55] The US government has committed various public funds to R&D to fix negative spillovers in innovation and has created fiscal incentives and regulatory policies to develop a domestic market for clean energy technologies.[56] Few industrial policies were deployed to boost the US manufacturing capability or export performance directly. The difficulty the US companies face in translating their leadership in the invention and innovation of clean energy technologies into an equally competitive position in commercial application and manufacturing becomes acute.[57] The US has developed a heavy reliance on foreign suppliers for a wide range of components and products that are essential to decarburizing the electricity and transportation sectors, such as solar PV, wind turbines, and power batteries.

The rising sentiments against losing market share to foreign competitors, particularly Chinese competitors in the clean energy sector, have compelled the US administration to resort to highly defensive GIPs – anti-dumping, and countervailing duties and safeguards – over the past decade.[58] However, the use of both country-specific and global-scale trade remedies has not effectively boosted the US domestic manufacturing capacity nor reduced its dependence on imports for several reasons.[59] First, targeted countries under anti-dumping and countervailing duties can relocate their domestic firms elsewhere to circumvent tariff increases.[60] Second, the broad structural changes in the composition of the US domestic economy over past decades has led to the shrinking of manufacturing, particularly in clean energy-related industries.[61] Third, the inadequacy of financing tools available to clean energy companies in the US has severely restricted their capacity to construct or scale up manufacturing plants, which are usually capital intensive.[62] The prevalence of offshoring and outsourcing in the US clean energy industry has triggered serious concerns that the loss of production capacity might quickly lead to the loss of the innovative edge.[63]

Largely following Trump's rhetoric of bringing jobs back to the US and counteracting China's growing influence, Biden, nevertheless, reversed his predecessor's rejection of climate change efforts and integrated climate policies with economic policies.[64] In addition to maintaining the Trump-era tariffs on Chinese clean energy products, the current US administration has also crafted a new set of multi-purpose GIPs as embodied in the recently passed bills – the Infrastructure Investment and Jobs Act (IIJA), the CHIPS and Science Act, and the Inflation

[55]J. Nahm, 'Reimagine: Clean Energy Technology and US Industrial Policy' (Center for a New American Security, 7 September 2022), www.cnas.org/publications/reports/reimagine-clean-energy-technology-and-u-s-industrial-policy.

[56]Ibid.

[57]Ibid.

[58]Trade defense mechanisms also constitute a form of GIPs as they restrict the market access of imports and provide an advantage for domestic products.

[59]J. Nahm, 'A Green Economic Recovery: Global Trends and Lessons for the United States' (House Foreign Affairs Committee, 23 September 2020), https://docs.house.gov/meetings/FA/FA14/20200923/111050/HHRG-116-FA14-Wstate-NahmJ-20200923.pdf.

[60]L. Nguyen and H.W. Kinnucan (2019) 'The US Solar Panel Anti-Dumping Duties Versus Uniform Tariff', *Energy Policy* 127, 523, 524.

[61]Nahm, supra n. 55.

[62]Ibid.

[63]See, G. Pisano and W. Shih (2012) *Producing Prosperity: Why America Needs A Manufacturing Renaissance.* Harvard Business Review Press. The book argues that in certain sorts of industries with rapidly evolving production processes, it is crucial that research and manufacturing should be kept in close proximity. This is important to obtain the production know-how and supplier networks that are key to future innovation.

[64]C. Welch and S. Gibbens, 'Trump vs. Biden on the Environment – Here's Where They Stand', *National Geography* (19 October 2020), www.nationalgeographic.com/science/graphics/trump-vs-biden-environment-heres-where-they-stand.

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Reduction Act (IRA). While all of these Acts provide funding to promote clean technologies and support basic research, the IRA stands out, not just as the largest climate legislation ever passed in the US, but also for its support mechanisms that condition the eligibility on meeting explicit sourcing and domestic content requirements (DCRs).[65] For instance, the IRA provides up to USD7,500 consumer tax credits for electric vehicles, with a threshold requirement that the final assembly takes place in North America, and origin content requirements on battery components and critical minerals.[66] Besides setting a specific minimum percentage requirement on the critical minerals extracted or processed in a country with which the US has a free trade agreement, restrictions on content sourcing also apply on Foreign Entity of Concerns, which according to the proposed guidance issued by the Department of the Treasure would include even Chinese state-owned investment outside of China.[67] An additional incentive of up to USD 4,500 per vehicle is offered to support the production of battery cells, modules, and components in the US.[68] For other clean energy projects, the IRA also mandates similar DCRs as eligibility conditions for tax incentives.[69]

The signing of the IRA into law represents a radical departure of the US GIPs from its traditional preference for free market fundamentals towards a much higher degree of government intervention to strengthen domestic competitiveness. The is highly problematic from the perspective of the multilateral trading system, as some of the IRA's provisions, such as the DCRs have been consistently ruled illegal by the WTO dispute settlement.[70] Unsurprisingly, many US allies and partners, notably the EU, Japan, South Korea, India, and the UK have strongly opposed the IRA despite the understanding of the need to diversify supply chains and reduce overdependence on one or a limited number of countries.[71] As reported, an increasing number of projects across different segments of clean energy value chains have been relocated or announced to relocate in the US, which was previously set to operate in the EU or other countries.[72] The concern that the IRA would create immediate economic distortions in foreign direct investment to the detriment of the US trading partners is rising. The IRA also has notable goals to undercut China's growing influences in clean energy industries and supply chains. However, the myriad rules and limitations on eligibility for tax incentives provided by the IRA demonstrate the complexity of balancing different and even competing interests in designing GIPs.[73] It remains unclear whether the

[65]See, the Inflation Reduction Act, Public Law No. 117–169, 136 Stat. 1818 (2022).

[66]Instead of a single $7,500 tax credit, the IRA creates two $3,750 tax credits: one contingent on battery component origin and the other on critical mineral origin. The content requirements will be gradually increased from the first year of enactment. See, Section 30D of IRA. For a detailed analysis of the IRA incentives for EVs, see, Chad Bown, 'Industrial Policy for Electric Vehicle Supply Chains and the US–EU Fight Over the Inflation Reduction Act' (Peterson Institute for International Economics Working Paper 23-1, May 2023), www.piie.com/publications/working-papers/industrial-policy-electric-vehicle-supply-chains-and-us-eu-fight-over.

[67]See, 'Section 30D Excluded Entities, A Proposed Rule by the Internal Revenue Services'. The finalization of the Rule is expected around 2024.

[68]See, Section 45X of IRA. Only production that takes place in the US can qualify for the tax credits.

[69]For project components considered 'manufactured products', 40% of the equipment installed at solar and land-based wind projects must be made in the US and 20% of the equipment installed at offshore wind projects must be made in the US, although the minimum domestic content requirement for manufactured components increases to 55% for both types of projects after 2026 and 2027, respectively.

[70]M.M. Fang (2020) 'Local Content Measures and the WTO Regime: Addressing Contentions and Trade Offs', in D.S. Olawuyi (ed.), *Local Content, Sustainable Development and Treaty Implementation in Global Energy Markets*. Cambridge University Press, at 43.

[71]C. Cavanagh, 'The United States Rights a Wrong with Critical Minerals Agreements', *Georgetown Security Studies Review* (26 April 2023), https://georgetownsecuritystudiesreview.org/2023/04/26/the-united-states-rights-a-wrong-with-critical-minerals-agreements.

[72]M.G. Attinasi, L. Boeckelmann, and B. Meunier, 'Unfriendly Friends: Trade and Relocation Effect of the US Inflation Reduction Act' (Center for Economic and Policy Research, 3 July 2023), https://cepr.org/voxeu/columns/unfriendly-friends-trade-and-relocation-effects-us-inflation-reduction-act.

[73]S. Lincicome, 'Electric Vehicles and the Unintended Consequences of Industrial Policies' (Cato Institute, 11 January 2023), www.cato.org/commentary/electric-vehicles-unintended-consequences-industrial-policy.

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US can achieve the intended goals of the IRA while minimizing the unintended effects, including fiscal burden on taxpayers to fund projects eligible for IRA incentives. Also, given that clean energy projects – particularly those in the upstream segment, such as mining and processing – can take a long time period to complete, the difficulty of achieving the IRA's industrial targets remains daunting.[74] The fragmentation of decision-making authority among a large number of agencies creates institutional barriers for the implementation of specific rules under the IRA.[75] The constant political conflicts between the Democrats and Republicans over federal support for clean energy technologies are but one reason for the IRA's uncertain future.[76]

Defending national security has taken an increasingly prominent role in shaping US multi-purpose GIPs, which aim not only to secure the country's position in clean energy industries but also to undercut the influences of countries that are not politically or ideologically aligned, such as China. It is noted that the scope of the US GIPs has been expanding to cover even the very upstream segment – mineral extraction and processing, which used to attract limited attention from the US policymakers due to environmental and social concerns. The unprecedented content sourcing requirements on critical minerals clearly testify to the new security dimension of the US GIPs. While it remains too early to tell whether the newly formulated multi-purpose GIPs in the US will achieve the underlying objectives, the shockwaves sent by the White House have been acutely felt across many jurisdictions.

3.3 The EU

For decades, the EU's approach to industrial policies has been holistic, integrated, and horizontal, with a focus on promoting R&D and preserving a competitive internal market to ensure fair and undistorted competition.[77] The EU member states' autonomy in resorting to industrial policies has been limited to avoid market distortion and maintain the integrity of the single market.[78] Therefore, the EU's use of GIPs in the clean energy sectors has been oriented towards boosting domestic demand and establishing liberalized and integrated energy markets, in addition to incentivizing innovation ability.[79] For instance, the EU Renewable Energy Directive (RED) has established a regulatory framework for the promotion of the use of energy from renewable sources through setting binding national targets on the share of renewable energy in different sectors for application.[80]

While the EU has achieved rapid progress in the deployment of clean energy, its domestic manufacturing companies have largely failed to transfer a booming demand into a commensurate increase in market shares or industrial competitiveness. When the EU clean energy market was drastically infiltrated with imports, most notably those produced in China, the European Commission responded with multiple rounds of investigations that led to the imposition of

[74]Mining projects can take between seven and 20 years to be completed. See, H. Dempsey, 'Higher Investment in Critical Minerals Boosts Chances of Meeting Climate Targets', *Financial Times* (11 July 2023), www.ft.com/content/c51d4601-e2ec-40d2-93d7-fcd7d7ab1310.

[75]V.K. Aggarwal and A. Reddie, 'Putting the Biden Administration's "New Economic Statecraft" in Context', *Lawfare* (21 August 2023), www.lawfaremedia.org/article/putting-the-biden-administration-s-new-economic-statecraft-in-context.

[76]M. McCormick, 'White House Warns against Republican Efforts to Gut "Tremendous" IRA', *Financial Times*, 20 December 2023, www.ft.com/content/cc0be27d-fdeb-4841-8502-1df2637409e9.

[77]See, D. Di Carlo and L. Schimitz (2023) 'Europe First? The Rise of EU Industrial Policy Promoting and Protecting the Single Market', *Journal of European Public Policy* 30(10), 2063.

[78]S. Dullien and J. Hackenbroich, 'European Industrial Policy: A Crucial Element of Strategic Autonomy' (Foundation for European Progressive Studies, May 2022), at 5–6.

[79]A. Prontera and R. Quitzow (2022) 'The EU as Catalytic State? Rethinking European Climate and Energy Governance', *New Political Economy* 27(3), 517, 524.

[80]The binding renewable target for the EU has been steadily raised throughout the years. The primary target as of 2023 is to source a minimum of 42.5% of total energy consumption from renewable energy by 2030, up from the previous 32% target. See, 'European Green Deal: EU Agrees Stronger Legislation to Accelerate the Rollout of Renewable Energy' (European Commission, 30 March 2023), https://ec.europa.eu/commission/presscorner/detail/en/ip_23_2061.

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trade remedies, such as anti-dumping and countervailing duties.[81] The constant use of trade remedies has not effectively boosted the competitiveness of the EU's domestic clean energy industries, similar to the US case, as discussed in the preceding section. Although the EU has placed clean energy transition and decarbonization as the priority for a long time, the changing geopolitical and geoeconomic circumstances may have pushed the bloc to rethink its pathway.

Against this background, the EU has scaled up its legislative and policy-making efforts to incorporate multiple objectives in its GIPs, such as supply chain security, resilience, and industrial strength. For instance, the goal of reinforcing and protecting Europe's leadership role and competitiveness in key sectors set in the renewed EU Industrial Policy Strategy has been consistently emphasized in the subsequent policy documents.[82] Nevertheless, how to foster a highly competitive clean energy manufacturing sector in Europe remains largely unsettled as these strategy documents only generally define roadmaps without providing a workable and effective framework for GIPs.[83] Although a growing number of programmes and initiatives have been established to provide funding to incentivize R&D and innovation in cleantech sectors, they are also broad in scope and support industrial ecosystems encompassing all players across the value chain in a non-targeted fashion.[84]

It was not until 2023 that two legislative proposals – the Critical Raw Materials Act (CRMA) and the Net-Zero Industry Act (NZIA) – set specific targets for domestic content sourcing in the EU as a response to the globally popular trend of enhancing national competitiveness. The CRMA, which provides a list of strategic raw materials that are considered crucial for the manufacturing of green, digital, and defence technologies, sets precise domestic targets – in terms of boosting the EU's domestic production, refining, and recycling capacity – that should be achieved by 2030.[85] The CRMA is considered to represent the EU's first comprehensive attempt to regulate critical raw materials management and shape the practices of related industry stakeholders.[86] In conjunction with the CRMA, the NZIA identifies a list of net-zero technologies that are of strategic importance, such as solar PV, solar thermal, and battery storage, and sets a target of reaching a manufacturing capacity for these technologies equivalent to at least 40% of the EU's annual deployment needs by 2030.[87] The goal of the NZIA is to enable the EU to regain its leadership for clean technologies that it lost to a few countries and create a 'competitive, green, and job-creating' industrial sector.[88]

The announcement of specific targets in relation to domestic manufacturing capacity in critical raw materials and clean energy products has stirred considerable controversy. Some commentators argue that the policy objectives of the two proposed acts were 'unabashedly protectionist' and constituted 'crude protectionism and dirigisme'.[89] It is warned that an unproductive subsidy

[81]J. Meckling (2019) 'Governing Renewables: Policy Feedback in a Global Energy Transition', *Politics and Space* 37(2), 317.

[82]For instance, the New Industrial Strategy for Europe and the Green Deal Industrial Plan also underscore the objective of boosting the EU's manufacturing competitiveness.

[83]Tagliapietra and Veugelers, supra n. 15, 308.

[84]For instance, Next Generation EU, RePowerEU, pandemic Recovery Fund, and a host of member state-level support measures have allocated sizeable funding to support renewable energy, energy efficient applications.

[85]See, 'Proposal for a Regulation of the European Parliament and of the Council Establishing a Framework for Ensuring a Secure and Sustainable Supply of Critical Raw Materials and Amending Regulations (EU) 168/2013 (EU) 2018/858, 2018/1724, and (EU) 2019/102' (European Commission, 16 March 2023).

[86]A. Hool et al. (2023) 'Challenges and opportunities of the European Critical Raw Materials Act', *Mineral Economics* (20 September).

[87]See, 'Proposal for a Regulation of the European Parliament and of the Council on Establishing a Framework of Measures for Strengthening Europe's Net-Zero Technology Products Manufacturing Ecosystem' (European Commission, 16 March 2023).

[88]This is based on some remarks made by the Minister Jo Brouns. See, 'Net-Zero Industry Act: Council and Parliament Strike a Deal to Boost EU's Green Industry' (Council of the EU, 16 February 2024), www.consilium.europa.eu/en/press/press-releases/2024/02/06/net-zero-industry-act-council-and-parliament-strike-a-deal-to-boost-eu-s-green-industry/.

[89]N. Poitiers et al., 'The EU Net Zero Industry Act and the Risk of Reviving Past Failures', *Brugel* (9 March 2023), www.bruegel.org/first-glance/eu-net-zero-industry-act-and-risk-reviving-past-failures.

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race involving the EU would weaken its internal market and further increase existing inequalities in Europe.[90] Another concern is that the EU's industry dynamics and economic structure confer on the region an advantage in producing some clean energy technologies but not so in producing others, particularly those that require extraordinary economies of scale, such as solar PV.[91] Therefore, an across-the-board import substitution as dictated by the two acts, even for goods that are currently imported from a diversified base of trading partners with no or limited security concerns, can be counterproductive.[92] In other words, it is irrational to engage in strategic competition over almost all parts of the clean energy value chains, regardless of whether the EU realistically has a comparative advantage.

While the EU member states remain deeply divided over whether Europe needs a massive-sized stimulus package with mandatory 'buy European' requirements,[93] their support for setting high standards in the clean energy sector has been strong.[94] Notable examples, including the Batteries Regulation and the proposal for the Ecodesign for Sustainable Products, demonstrate the EU's efforts to lead the globe in setting regulatory standards for clean energy products and production processes.[95] These regulations, although primarily aimed at safeguarding sustainability interests, still retain a notable policy objective of strengthening the union's industrial competitiveness by levelling the playing field and, therefore, effectively becoming multi-purpose GIPs.[96] Non-EU-based manufacturers, as long as they wish to place their products on the EU market, will have to comply with the regulations. With market access as the condition, the EU regulations re-setting the standards can shift the centre of competition away from the unit cost of production to sustainability-related factors for which the European manufacturers may already have competitive advantages. GIPs in the form of regulatory standard-setting, when used by countries with an outsized domestic consumer market such as the EU, can have far-reaching implications.

The EU's multi-purpose GIP making in the new era has demonstrated the Union's efforts to navigate between different, and sometimes competing, policy objectives with the risk of dividing

[90]G. Wolff, M. Fratzscher, and A. Wambach, 'For A Green European Industrial Policy' (German Council on Foreign Relations, 27 February 2023), https://dgap.org/en/research/publications/green-european-industrial-policy.

[91]R. Hausmann and K. Ahuja (2023) 'A More Globally Minded European Green Industrial Policy', in S. Tagliapietra and R. Veugelers (eds.) 'Sparking Europe's New Industrial Revolution', *Bruegel*, at 159.

[92]J. Jansen, P. Jager, and N. Redeker, 'For Climate, Profiles, or Resilience? Why Where and How the EU Should Respond to the Inflation Reduction Act' (Hertie School Jacques Delors Center Policy Brief, 5 May 2023), www.delorscentre.eu/fileadmin/2_Research/1_About_our_research/2_Research_centres/6_Jacques_Delors_Centre/Publications/20230505_JDC_IRA.pdf, at 8.

[93]J. Henley and J. Rankin, 'Can EU Anger at Biden's "Protectionist" Green Deal Translate into Effective Action?', *Guardian* (18 January 2023), www.theguardian.com/world/2023/jan/18/eu-anger-biden-green-370bn-deal-action-industrial-policy; N. Crawford (2023) 'The Energy Transition, Protectionism and Transatlantic Relations', *Global Politics and Strategy* 65(2), 75, 91–92.

[94]See, A. Bradford (2020) *The Brussels Effect: How the European Union Rules the World*. Oxford University Press.

[95]The Batteries Regulation sets extensive sustainability-oriented requirements that cover the entire life cycle of batteries with key measures such as a compulsory carbon footprint declaration and labeling requirement, maximum levels of carbon footprints, minimum levels of recycled content from manufacturing and consumer waste for use in new batteries, minimum levels of materials recovered from waste batteries, and traceability requirement. See, 'Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 Concerning Batteries and Waste Batteries, Amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and Repealing Directive 2006/66/EC', https://eur-lex.europa.eu/eli/reg/2023/1542/oj. The proposal for Ecodesign for Sustainable Products Regulation sets requirements to make products more durable, reliable, reusable, upgradable, reparable, easier to maintain, refurbish and recycle, and energy and resource efficient. The proposal has a much more extensive coverage of products, compared to the Ecodesign Directive 2009. Clean energy products placed on the EU market such as wind turbines, and solar panels will be subject to the Regulation. See, 'The Proposal for a New Ecodesign for Sustainable Products Regulation (European Commission, 30 March 2022), https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/sustainable-products/ecodesign-sustainable-products-regulation_en.

[96]For instance, the Council of the EU posited that the new rules of the Batteries Regulation have an aim to ensure fairer competition. See, 'Council Adopts New Regulation on Batteries and Waste Batteries' (Council of the EU, 10 July 2023), www.consilium.europa.eu/en/press/press-releases/2023/07/10/council-adopts-new-regulation-on-batteries-and-waste-batteries/.

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the member states.[97] While the energy crisis induced by Russia's invasion of Ukraine has pushed Europe's efforts to reduce fossil fuel imports to the forefront, the EU policymakers are increasingly reluctant to rely on imported equipment and components for clean energy generation. The pass of the US IRA has further aggravated the EU's fear of losing home-grown industrial capacity in the clean energy sector. However, simply duplicating the US or China's GIPs and providing generous subsidies to domestic manufactures in the EU may not be feasible, fiscally or institutionally. The EU faces inadequate funding and a high degree of policy fragmentation, among other problems, that may prevent it from using heavy subsidization.[98] Whether the EU can strike a delicate balance between 'selective protectionism' and openness to international trade and investment becomes vital.[99] Pursuing a long list of objectives with GIPs challenges the EU's capacity to deal with the urgent challenges while minimizing unintended consequences.[100]

4. The Implications of the Multi-purpose GIPs on the WTO – An Unavoidable Clash?

Considering the high tradability of clean energy technologies and their increasingly globalized value chains, the use of multi-purpose GIPs is bound to profoundly affect international trade and create important spillover effects across jurisdictions. It is important to take stock of the implications of the proliferation of multi-purpose GIPs on the WTO before identifying solutions. This part proposes a new analytical framework to assess how the multi-purpose GIPs interact with the multilateral trading system from three interrelated yet distinct angles – WTO-compatibility, challenge, and opportunity.

4.1 The Compatibility of the Multi-purpose GIPs with the WTO Rules

As a rules-based multilateral trading system, the WTO promotes trade liberalization among its 164 members by mandating the reduction of tariff and non-tariff barriers. In addition to applying the non-discrimination obligation, including principles of national treatment and most-favored-nation (MFN), the WTO also has a set of rules governing the use of subsidies, trade remedies, and border restrictions that are potentially relevant to GIPs.[101] Among the WTO Agreements, the General Agreement on Tariffs and Trade (GATT), the Agreement on Subsidies and Countervailing Measures (ASCM), and the Agreement on Trade-Related Investment Measures (TRIMs) have been more frequently cited, while the Agreement on Safeguards and the Technical Barriers to Trade (TBT) are less cited in GIP-related disputes.[102]

[97]Tagliapietra and Veugelers, supra n. 15, 308.

[98]See, Carlo and Schimitz, supra n. 76; M. Pianta and M. Lucchese (2020) 'Rethinking the European Green Deal: An Industrial Policy for a Just Transition in Europe', *Review of Radical Political Economies* 52(4), 633.

[99]Dullien and Hackenbroich, supra n. 77, 3.

[100]S. Tagliapietra and J. Zettelmeyer, 'Europe's Critical Struggle with Its Economic Paradigm' (Politico, 25 May 2023), www.politico.eu/article/europes-critical-struggle-with-its-economic-paradigm/.

[101]See, S. Lester, B. Mercurio, and A. Davies (2018) *World Trade Law: Text, Materials and Commentary* (3rd edn, Hart).

[102]See, Request for Consultations by the European Union, *United Kingdom – Measures Relating to the Allocation of Contracts for Difference in Low Carbon Energy Generation*, WTO Doc. WT/DS612 (28 March 2022); Request for Consultations by Malaysia, *European Union – Certain Measures Concerning Palm Oil and Oil Palm Crop-Based Biofuels*, WTO Doc. WT/DS600/1 (15 January 2021); Request for Consultations by Indonesia, *European Union – Certain Measures Concerning Palm Oil and Oil Palm Crop-Based Biofuels*, WTO Doc. WT/DS593/1 (9 December 2019); Request for Consultations by China, *United States – Certain Measure Related to Renewable Energy*, WTO Doc. WT/DS563/1 (14 August 2018); Request for Consultations by China, *United States – Safeguard Measure on Imports of Crystalline Silicon Photovoltaic Products*, WTO Doc. WT/DS562/1 (14 August 2018); Request for Consultations by India, *United States – Certain Measures Relating to the Renewable Energy Sector*, WTO Doc. WT/DS510/1 (9 September 2016); Request for Consultations by Argentina, *European Union and Certain Member States – Certain Measures on the Importation and Marketing of Biodiesel and Measures Supporting the Biodiesel Industry*, WTO Doc. WT/DS459/1 (15 May 2013); Request for Consultations by the United States, *India – Certain Measures Relating to Solar Cells and Solar Modules*, WTO Doc. WT/DS456/1 (6 February 2013); Request for Consultations by China, *European Union and Certain Member State –*

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The compatibility of multi-purpose GIPs with the WTO rules requires a case-by-case analysis because it is determined by the specific design and implementation of a GIP. While an in-depth analysis of how the surveyed multi-purpose GIPs fare under WTO law is beyond the scope of this article, a few observations can be made. First, the existing WTO jurisprudence in relation to clean energy measures sheds important light, though sometimes blurry, on the boundary between WTO-consistent GIPs and inconsistent GIPs.[103] It is made abundantly clear that the use of blatantly discriminatory policy measures, such as DCRs, which also became the primary target in most WTO clean energy disputes, have a low chance of surviving legal scrutiny. Meanwhile, export restrictions on upstream materials that constitute critical inputs to clean energy products also face tight policy space under the WTO. Second, analysing measures that do not constitute clear-cut violations of WTO rules yet still generate restrictive implications on the trading system will be fact-intensive. For instance, the exercise of regulatory power to set product standards, as led by the EU, would be problematic if it turned out to be more restrictive than necessary or if the *de facto* favours domestic producers over foreign ones.[104] Third, the WTO-proofing of GIPs is not only important for preserving the authority of the multilateral trading system but also essential for ensuring the policies' economic efficiency and reconciling the interplay between industrial and climate objectives.[105] This is because trade discriminatory GIPs usually impede an optimal allocation of resources by favouring less-efficient domestic producers over foreign ones, thus driving up the cost of clean energy production, which would slow down deployment of such technologies.

4.2 The Challenges of the Multi-purpose GIPs on the WTO

The challenges that multi-purpose GIPs pose on the WTO are not, as stated earlier, limited to members' violation of the multilateral trading rules. This section cautions that an increase in the use of multi-purpose GIPs would profoundly challenge the WTO in three ways, which warrant a clear understanding in order to figure out how a clash between them could be avoided.

First, when facing multi-purpose GIPs, adversely affected countries tend to adopt similarly restrictive or discriminatory measures as a preferred 'tit-for-tat' response, fostering a race to the bottom competition. No trade disputes so far have been brought to challenge the legality of the recent use of multi-purpose GIPs with WTO-inconsistent aspects despite threats to do so.[106] This might signal the countries' inclination to 'take matters into their own hands'. Examples include the EU and India's legislative responses to the US IRA by providing similarly discriminatory support to their own domestic industries, as well as the EU's consideration to impose retaliatory tariffs on US products.[107] The increasing unilateralism may also reflect

Certain Measures Affecting the Renewable Energy Generation Sector, WTO Doc. WT/DS452/1 (5 November 2012); Request for Consultations by China, *United States – Countervailing Duty Measures on Certain Products from China*, WTO Doc. WT/DS437/1 (25 May 2012); Request for Consultations by the European Union, *Canada – Measures Relating to the Feed-In Tariff Program*, WTO Doc. WT/DS426/1 (11 August 2011); Request for Consultations by United States, *China – Measures Concerning Wind Power Equipment*, WTO Doc. WT/DS419/1 (Dec. 22, 2010); Request for Consultations by Japan, *Canada – Certain Measures Affecting the Renewable Energy Generation Sector*, WTO Doc. WT/DS412/1 (13 September 2010).

[103]For a critique of the WTO renewable energy disputes, see, H. Asmelash (2022) 'The First Ten Years of WTO Jurisprudence on Renewable Energy Support Measures: Has the Dust Settled Yet?', *World Trade Review* 21(4), 455.

[104]For instance, several WTO members have raised special concerns regarding the EU Batteries Regulation to the TBT committee. For a legal analysis, see, M.M. Fang (2023) 'Regulating EV Batteries' Carbon Footprint: EU Climate Ambition or Green Protectionism?', *The Environmental Law Reporter* 53(7), 10590.

[105]I. Espa (2022) 'Reconciling the Climate/Industrial Interlay of CBAMs: What Role for the WTO?' *American Journal of International Law Unbound* 116, 208, 212.

[106]It is noted that the EU challenged the UK's contract for difference measures in the renewable energy sector under the WTO dispute settlement, nevertheless, the challenged measures do not qualify as multi-purpose GIPs but as traditional GIPs.

[107]Cameron Cavanagh, 'The United States Rights a Wrong with Critical Minerals Agreements' (Georgetown Security Studies Review, 26 April 2023), https://georgetownsecuritystudiesreview.org/2023/04/26/the-united-states-rights-a-wrong-with-critical-minerals-agreements/.

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countries' declining faith in the WTO dispute settlement system as a viable solution for trade frictions. The race among countries to craft and implement multi-purpose GIPs to defend or serve their own interests without deferring to the laws of the WTO can easily lead to a downward spiral, with trade tensions intensifying. As discussed earlier, the use of DCRs in GIPs has shown no signs of fading away, despite the potential breach of several trade obligations with little or no chance of being justified by WTO exceptions. The spread of trade-discriminatory measures might be hard to contain without any legally binding rulings being issued by the WTO dispute settlement system against rule-breakers. A vicious circle appears to arise and persist – the more reluctant members are to litigate against each other's WTO-inconsistent GIPs, the more likely they are to resort to equally restrictive, if not more restrictive, measures in response. It would undermine the credibility of the WTO if its dispute settlement mechanism had no role to play in regulating and scrutinizing the growing use of multi-purpose GIPs.

Second, an emerging trend among WTO members for coping with highly distorting GIPs is to deviate from multilateralism and seek bilateral solutions that are inherently politics oriented. For instance, notwithstanding the US trading partners' increasing dissatisfaction toward the IRA and their threats to file WTO disputes against the Act, several countries have already negotiated or been in the middle of a negotiation with the US to reach a deal to obtain the eligibility for tax or other fiscal benefits available under the Act.[108] The negotiated outcomes, notably bilateral agreements with the US, such as the US–Japan Critical Minerals Agreement, represent a radical deviation from one of the most important trade obligations – the MFN.[109] If the negotiation of bilateral or minilateral deals, which hardly count as free trade agreements that are pursuant to the GATT Article XXIV, becomes the new option for politically, militarily, or economically aligned countries to overcome trade-related barriers under multi-purpose GIPs, the global trading system risks fragmentation or breaking into blocs. The leverages that large economies have in dictating the terms of bilateral or minilateral deals would be disproportionately bigger than that of their counterparts. Countries that are excluded from those small-group trade deals will suffer the losses of market access, leading to trade diversion and distortion. Low-income countries with much less bargaining power to negotiate effectively bilaterally will likely be cut out or coerced into unfair deals to the detriment of global equity and justice. Therefore, it is vital for the preservation of the WTO, as an institution based on the MFN, that the tendency of countries seeking bilateral or minilateral deals with each other, in order to circumvent restrictive or discriminatory requirements entailed in GIPs, be reversed.

Third, another potential challenge that has yet to come up is that if a case is filed against WTO members at the dispute settlement system, the members rely on the GATT Article XXI national security exception to seek exemption for their multi-purpose GIPs. Although GIPs-using countries being challenged to the WTO dispute settlement system have only invoked exceptional clauses under the GATT Article XX, such as Article XX(d) and (j), there exists a possibility that defending members might seek justification from the national security exception. In light of the increasing recognition of climate change as a threat to national security,[110] multi-purpose GIPs, which directly or indirectly affect emission reduction, are likely to be connected with security-related considerations. However, the interpretation of the WTO national security exception remains highly controversial, as evidenced by the several disputes citing this clause and panel decisions made in recent years.[111] The US, in particular, has strongly asserted that claims of

[108]The EU and UK have started talks with the US on critical minerals used for EVs. See J. Mason, S. Holland, and A. Shalal, 'United States, EU Agree to Start Talks on Critical Minerals Amid Trade Tensions' (Reuters, 11 March 2023), www.reuters.com/markets/commodities/amid-trade-dispute-us-eu-seek-minerals-agreement-talks-subsidies-2023-03-10/.

[109]'United States and Japan Sigh Critical Minerals Agreement' (USTR, 28 March 2023), https://ustr.gov/about-us/policy-offices/press-office/press-releases/2023/march/united-states-and-japan-sign-critical-minerals-agreement.

[110]C. Flavelle et al. (2023) 'Climate Change Poses a Widening Threat to National Security', *New York Times*, 23 June 2023, www.nytimes.com/2021/10/21/climate/climate-change-national-security.html.

[111]See, B. Heath (2020) 'The New National Security Challenge to the Economic Order', *Yale Law Journal* 129(4), 1020.

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national security should not be justiciable or actionable as this is a matter that only a sovereign nation can decide.[112] Should any GIP-related case be filed for dispute settlement, and the national security exception be invoked, WTO adjudicators will be tested in how they tackle the highly sensitive issue with the risk of inviting backlash.

4.3 The Opportunities to Avoid the Clash between the WTO and the Multi-purpose GIPs

As the preceding section cautions, if left uncontrolled or unmitigated, the rising use of multi-purpose GIPs, as offensive and/or defensive measures with highly discriminatory or restrictive impacts on international trade, would jeopardize the openness and stability of the multilateral trading system. Discussions on disciplining multi-purpose GIPs are important for addressing trade tensions and building a stronger multilateral trading system that stays at the center of global trade governance. This section proposes a twofold solution for the WTO to mitigate negative spillovers from multi-purpose GIPs.

The first option, which is also less challenging, is to establish a WTO informal dialogue on multi-purpose GIPs to enhance the organization's deliberative function more productively. In fact, WTO members held discussions on trade and industrial policy in an informal retreat in 2023, which indicates their willingness to undertake more deliberations on this issue.[113] Meanwhile, the existing WTO Dialogue on Plastics Pollution and Environmentally Sustainable Plastics Trade (DPP) can serve as an effective template for coordinating members to engage in exchanges on salient issues.[114] The DPP has played an increasingly important role in driving information sharing and international coordination in using trade and trade rules to solve plastic pollution. The fact that the US, China, and the EU have joined the DPP as coordinators or co-sponsors also demonstrates the acceptability of the initiative's open and informal format, which presents a viable alternative to the formal negotiation of trade rules. Therefore, it is advisable for the WTO to create a similar informal dialogue on multi-purpose GIPs and to involve the US, China, and the EU as coordinators while also being open to other members. Such a platform is conducive to exchanging energy and climate-related plans and strategies *ex-ante* among the participating members and enabling groups directly affected by specific GIPs to be heard. Otherwise, for some GIPs that are opaque and have limited information available, members who might be adversely affected would stay uninformed or unable to outline the negative impacts on their economies. In addition, members can learn from others' policy designs and perhaps even more importantly, identify new opportunities for potential cooperation. An initiative in the form of an informal dialogue is also politically feasible for countries such as the US that harbour increasing resistance against compulsory and binding international regimes. Given that the US and China have signed the Sunnylands Agreement, indicating their willingness to 'enhance pragmatic cooperation' to address the climate crisis,[115] it is likely that both countries would not object to being part of a WTO dialogue on GIPs. Enhancing deliberations and mutual understanding about multi-purpose GIPs via an informal WTO forum would be an important first step for members to take.

The second option, which is more ambitious and can be built on the first one, is to reach a plurilateral agreement among major economies under the auspices of the WTO to set out new rules and commitments with regard to the use of GIPs. Article II:3 of the WTO Agreement allows

[112]See, W. Maruyama and A.W. Wolff, 'Saving the WTO from the National Security Exception' (PIIE Working Paper, May 2023), www.piie.com/publications/working-papers/saving-wto-national-security-exception.

[113]'Members Share Views in Informal Talks on Trade and Industrial Policy' (WTO, 26 September 2023), www.wto.org/english/news_e/news23_e/gc_26sep23_e.htm#:~:text=The%20retreat%20was%20held%20to,meetings%20on%20the%20WTO%20calendar.

[114]'New Initiatives Launched to Intensify WTO Work on Trade and the Environment' (WTO, 17 November 2020), www.wto.org/english/news_e/news20_e/envir_17nov20_e.htm.

[115]See, 'Sunnylands Statement on Enhancing Cooperation to Address the Climate Crisis' (US Department of State, 14 November 2023), www.state.gov/sunnylands-statement-on-enhancing-cooperation-to-address-the-climate-crisis/.

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a subset of the WTO membership to conclude a plurilateral agreement that lays out certain rules applying to signatories only.[116] While plurilatralism has not received much attention since the establishment of the WTO,[117] the changing context, including the growing complexity of trade policy in the twenty-first century, has rendered plurilatralism more suitable than multilaterism.[118] In the case of multi-purpose GIPs, the rationale of seeking a multilateral agreement is limited as most WTO members either do not enact such policies or their policies do not yield broad and concerning spillovers. Although plurilateral agreements have traditionally been sought after by like-minded members, countries that have high stakes or interests in certain sectors or issues, despite their disagreements, remain likely to opt for a plurilateral approach to move forward on issues of common concern. Therefore, it would be possible to include major producer countries across the clean energy value chains in the negotiation of a plurilateral agreement. The coverage of such a plurilateral agreement does not necessarily need to be extensive, but it should aim at one core objective – to put down guardrails on the use of multi-purpose GIPs. It is critical for signatory members to delineate the scope of unacceptable multi-purpose GIPs, such as blatantly discriminatory measures that are highly distorting for international trade and therefore not justifiable. Institutionally, a committee on GIPs composed of representatives from each party can be established to host meetings periodically and review the implementation of the agreement. Both options aim to foster international cooperation on GIP-related issues at the WTO, which, while challenging, have the potential to provide significant benefits. In a time of heightened geopolitical tensions and rising economic nationalism, it is easy to overlook that it is the rules-based multilateral trading system that has propelled the globalization of the clean energy value chain, which has efficiently delivered economies of scale and price reductions for clean technologies.

5. Conclusion

In an era of intensified geopolitical and geoeconomic competition among nations over the issue of leadership in low-carbon technologies and a looming climate crisis with a narrowing window of opportunity for action, the use of multi-purpose GIPs has moved into the centre of climate and economic policymaking. Efforts to interweave an increasingly complex web of policy objectives – economic, political, environmental, and national security – in GIPs have been rapidly ramping up, particularly by the world's largest economies. The adoption of multi-purpose GIPs in one jurisdiction could incentivize the adoption of similar, if not identical, policies in other countries, particularly in competitor ones.[119]

While multi-purpose GIPs are today being viewed more favourably as a solution to a plethora of challenges and disruptions due to balancing between different, and sometimes conflicting, policy objectives remains intractable. When policymakers intend to pursue a diversity of policy objectives in GIPs, it is almost inevitable that some objectives will be hard to reconcile, thus necessitating trade-offs. A cause for concern is that climate-related goals, such as decarbonization might be considered to be lower priority compared to other objectives. The increasingly fierce competition for leadership in green technologies, industries, and supply chains has prompted GIPs to disrupt global clean energy value chains to undermine efficiency and market competition. Multi-purpose GIPs aimed at insulating domestic manufacturing from foreign competition or forging a small club consisting of 'like-minded' countries to support supply chain security may

[116]See, 'Agreement Establishing the World Trade Organization 1994', 1867 UNTS 154.

[117]Nevertheless, the use of plurilateral agreements was quite widespread during the GATT era. See, B. Hokeman and P. Marvroidis (2015) 'WTO 'à la carte' or 'menu du jour'? Assessing the Case for More Plurilateral Agreements', *European Journal of International Law* 26(2), 319, 320.

[118]R. Basedow (2018), 'The WTO and the Rise of Plurilateralism – What Lessons Can We Learn from the European Union's Experience with Differentiated Integration', *Journal of International Economic Law* 21(2), 411, 414.

[119]D.A. Farber, 'Turning Point: Green Industrial Policy and the Future of U.S. Climate Action' (SSRN Working Paper, 16 June 2023), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4482489, at 18.

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succeed in reducing unwanted dependence, but with a possibly hefty price to pay, including wasteful spending and inefficient resource allocation.[120] It is inherently perplexing to decide where the line between acceptable and unacceptable reliance on foreign products and suppliers should be drawn.[121] There is a risk that policymakers might narrowly focus on competition and turn a race in GIPs into a zero-sum game that obstructs a much-needed collective action for decarbonization.

The proliferation of multi-purpose GIPs would severely threaten the openness and stability of the rules-based multilateral trading system with countries' rising inclination for unilateralism and minilateralism and potential abuse of the national security exception. Nevertheless, the WTO still stands a chance of curbing an aggressive use of GIPs by creating an issue-specific informal dialogue and later, a plurialteral agreement as forums for members to explore opportunities for collaboration. Strengthening the WTO's role in steering countries away from direct confrontation is vital to avoiding a clash between major economies' multi-purpose GIPs and trade rules. This is also immensely important to ensure that low-income countries that cannot compete on a dollar-to-dollar basis with large economies would not be pushed to the periphery of clean energy supply chains, thus upholding fairness and equity in low carbon transition. Trade liberalization, climate change, national security, and geopolitical competition are now interacting in unprecedented ways. The WTO needs to be prepared to meet the challenge and play a pivotal role in fostering international policy cooperation and coordination in the design and implementation of multi-purpose GIPs. In doing so, the WTO can significantly contribute to the alignment between trade and non-trade values and the ultimate goal of sustainable development.

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[120]J.P. Helveston, G. He, and M.R. Davidson (2022) 'Quantifying the Cost Savings of Global Solar Photovoltaic Supply Chains', *Nature* 612, 83, 84.

[121]For instance, the US IRA and the administration have not clarified the exact level of Chinese involvement in the clean energy value chains that would trigger the prohibition. See, H. Sanderson, 'What Counts as De-risking? The Geopolitics of Energy and China' (Oxford Institute for Energy Studies, August 2023), www.oxfordenergy.org/publications/taking-stock-of-china-and-the-geopolitics-of-energy-issue-137/, at 15.

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