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THE WTO AND GREEN SUBSIDIES: LEGAL TENSIONS IN THE CLIMATE TRANSITION

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Abstract

Green subsidies have become an essential instrument of climate policy, supporting decarbonization, technological innovation, and the transition to cleaner production. Yet under WTO law, these measures may also distort markets by affecting prices, competition, and trade flows. This paper examines the tension between climate objectives and subsidy discipline within the WTO framework. It argues that existing WTO rules regulate green subsidies through traditional trade based criteria, but provide only limited adaptation for climate specific concerns. As a result, governments seeking to promote renewable energy and low carbon industries must navigate a legal system that is designed to prevent trade distortion rather than to facilitate climate mitigation. The analysis shows that the conflict reflects a deeper structural mismatch between trade fairness and climate urgency. While WTO law remains important in preventing disguised protectionism, it does not fully resolve the regulatory challenges posed by green subsidies. Future governance will therefore require better alignment between trade rules and climate policy objectives.

Introduction

Green energy subsidies have become a central instrument in contemporary climate and industrial policy. Governments increasingly rely on support measures for renewable electricity, hydrogen, electric vehicles, batteries, and related low carbon technologies in order to accelerate decarbonization, reduce reliance on fossil fuels, and promote the development of new industries. Yet the legal framework governing subsidies in the World Trade Organization remains largely rooted in an earlier economic context. The Agreement on Subsidies and Countervailing Measures was negotiated during the Uruguay Round in the 1980s and 1990s, when the global energy system was still overwhelmingly dependent on fossil fuels and when

climate transition had not yet become a central objective of international economic law.¹ As a result, the Subsidies and Countervailing Measures (SCM Agreement) was designed primarily to discipline trade distortions caused by conventional industrial subsidies, rather than to accommodate the policy needs of environmental transformation.

This creates a structural tension between trade discipline and climate policy. Green subsidies are often intended to lower the cost of clean technologies and to support innovation, scale economies, and market entry, but they may also be challenged under WTO law when they are specific, confer a benefit, or include local content requirements.² The absence of a clear environmental exception means that measures adopted for legitimate decarbonization purposes may still face legal uncertainty, particularly where they resemble the kinds of support measures that the SCM Agreement was originally designed to control. The tension is therefore not simply between protectionism and free trade, but between an older subsidy discipline and a newer governance agenda shaped by climate urgency.

This paper argues that the current SCM framework only partially accommodates the realities of the green transition. While WTO subsidy rules continue to serve an important function in preventing unfair competition, they do not clearly distinguish between subsidies that distort trade for protectionist reasons and subsidies that are necessary to support low carbon transformation. Reform is therefore needed to align subsidy discipline more closely with global decarbonization objectives, while preserving transparency, competitive neutrality, and the basic anti distortion function of WTO law. The paper first examines the economic effects of green energy subsidies, then analyses the WTO legal framework, and finally discusses the broader tension between climate policy and trade rules.

I. Economic Effects of Green Energy Subsidies

Green energy subsidies are designed to reduce the effective cost of clean technologies and accelerate the transition toward low carbon production and consumption. In economic terms, these subsidies can improve the commercial viability of renewable electricity, hydrogen, electric vehicles, batteries, and related clean technology sectors by lowering entry barriers, supporting investment, and encouraging innovation.³ They are often justified on the ground that private markets alone do not fully internalize the social benefits of decarbonization,

¹ Henok Asmelash, 'The Regulation of Environmentally Harmful Fossil Fuel Subsidies: From Obscurity to Prominence in the Multilateral Trading System' (2022) 33, *European Journal of International Law* 993.

² Aaron Cosbey and Petros C 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.

³ *ibid.*

especially where early stage technologies face high fixed costs, limited scale, and infrastructure constraints.⁴

At the same time, green subsidies may also generate market distortions. By lowering production costs or granting preferential treatment to certain technologies or firms, they can alter relative price signals and shift demand away from incumbent energy sources. This may be economically desirable from a climate perspective, but it can still affect competition by strengthening selected producers, supporting domestic supply chains, and influencing investment decisions across borders.⁵ In this sense, the economic function of green subsidies is dual in nature: they are both corrective instruments for market failure and interventionist tools that reshape competitive conditions.⁶

The effects of such subsidies are not limited to the recipient sector. As the economic literature on state aid and energy policy shows, support for environmentally friendly production techniques may primarily benefit suppliers of clean equipment, but it can also affect upstream and downstream markets through changes in demand, input prices, and production structure.⁷ For example, subsidies that reduce electricity costs for energy intensive sectors may increase electricity demand and thereby raise electricity prices for other users. Similarly, support for renewable generation may influence the investment incentives of conventional energy producers, network operators, and technology suppliers, creating spillover effects across the broader energy system.

These economic consequences help explain why green subsidies are politically attractive but also legally sensitive. On the one hand, they can generate wider social gains, including emissions reduction, technological learning, industrial upgrading, and improved long term energy resilience.⁸ On the other hand, because subsidies may be concentrated in specific sectors or technologies, they can create competitive asymmetries and trade friction, especially where foreign suppliers are disadvantaged or where domestic content conditions are attached. The economic debate is therefore not whether green subsidies have effects, but how those effects should be evaluated in light of climate policy objectives and competition concerns.⁹

In addition, the distributional implications of energy subsidies are important. Although much

⁴ *ibid.*

⁵ Asmelash (n 1).

⁶ Cosbey and Mavroidis (n 2).

⁷ Thomas Cottier and others, 'Energy in WTO Law and Policy' [2011] *The prospects of international trade regulation. From fragmentation to coherence* 221.

⁸ Miguel Mendonça, *Powering the Green Economy: The Feed-in Tariff Handbook* (Routledge 2009).

⁹ Robert Howse, *Climate Mitigation Subsidies and the WTO Legal Framework* (International Institute for Sustainable Development 2010).

of the available evidence in the reference materials focuses on fossil fuel subsidy reform, it is still relevant by contrast because it shows that energy pricing interventions can produce substantial welfare effects and uneven household impacts.¹⁰ This suggests that subsidy design matters not only for market efficiency but also for fairness and social legitimacy. Green subsidies, if well targeted, may help lower the cost of the energy transition and expand access to clean technologies, but poorly designed measures may disproportionately benefit particular firms or consumer groups while generating broader fiscal or competitive costs.¹¹

In conclusion, the economic effects of green energy subsidies should be understood as more than simple price reductions. They operate as instruments of industrial policy, innovation policy, and climate policy at the same time. Their relevance for WTO law lies precisely in this mixed character: they can produce positive environmental externalities, but they can also shift competitive advantage and trade flows in ways that trigger legal scrutiny.

II. WTO Subsidy Rules

The WTO subsidy regime is principally governed by the Agreement on SCM Agreement, which sets out the legal framework for identifying subsidies, classifying them, and regulating their effects on trade. Under Article 1 of the SCM Agreement, a measure qualifies as a subsidy only if three cumulative criteria are met: there must be a financial contribution by a government or public body, this must confer a benefit to the recipient, and the subsidy must be specific to certain enterprises or industries.¹² This definition deliberately limits the reach of subsidy disciplines to certain types of state intervention rather than all governmental measures affecting markets.¹³

Part II of the SCM Agreement addresses prohibited subsidies, which include subsidies contingent upon export performance or the use of domestic over imported goods. These are regarded as especially trade distorting and are subject to an outright ban.¹⁴ A well-known example is the *Canada Renewable Energy feed in tariffs* dispute, where Ontario's requirement that subsidy recipients use a minimum percentage of domestically produced equipment was found to constitute a prohibited local content subsidy under Article 3.1(b), notwithstanding the environmental objectives of the scheme.¹⁵ The WTO panels confirmed that environmental

¹⁰ 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.

¹¹ *ibid.*

¹² Agreement on Subsidies and Countervailing Measures 1994 art 1.1.

¹³ Rubini (n 10).

¹⁴ Asmelash (n 1).

¹⁵ Canada — Certain Measures Affecting the Renewable Energy Generation Sector (2013) — WTO Appellate Body Report WT/DS412/AB/R, WT/DS426/AB/R [5.35].

benefits do not exempt such measures from the prohibition.¹⁶

Part III of the SCM Agreement governs actionable subsidies. These are not prohibited per se, but they may be challenged if they cause adverse effects to the interests of other WTO Members, including material injury, nullification or impairment of benefits, or serious prejudice. The US India Renewable Energy dispute illustrates this point. *India's Jawaharlal Nehru National Solar Mission subsidies* were held to constitute specific subsidies under Article 2, although they were not found actionable in the absence of proven injury.¹⁷

A key feature of WTO subsidy law is its emphasis on definition and immutability. Green energy subsidies commonly satisfy the Article 1 requirements because governments purchase renewable electricity at above market rates, provide tax credits, or offer production incentives that confer a benefit and target particular technologies such as solar photovoltaics or offshore wind.¹⁸ In practice, this means that many green policy instruments are legally framed as subsidies before their environmental purpose is even taken into account.¹⁹

The regime's design reveals fundamental limitations regarding green subsidies. First, the SCM Agreement is blind to the policy purpose behind subsidies: a subsidy for solar power is legally indistinguishable from a subsidy for coal if it meets the SCM criteria. Second, common green subsidy designs, such as local content requirements, technology specific support, or infrastructure grants, regularly trigger WTO subsidy disciplines. Third, even when Members invoke GATT Article XX exceptions, panels consistently reject these defenses for green subsidies, as seen in *India — Solar Cells* Dispute, where environmental objectives failed to override SCM rules.²⁰

These doctrinal limits also reflect a broader tension between trade discipline and regulatory autonomy. The SCM Agreement prevents disguised protectionism and disciplines subsidies that distort competition, but it does not contain a climate specific exception or a general necessity type defense.²¹ As a result, Members seeking to support decarbonization must design subsidy schemes with considerable caution if they are to avoid triggering prohibited or actionable subsidy claims. This tension is particularly acute in the context of the energy transition, where governments increasingly rely on subsidies to overcome high upfront costs,

¹⁶ *ibid* 5.125.

¹⁷ *India — certain measures relating to solar cells and solar modules* [2016] — Report WT/DS456/R [7.230 – 7.235].

¹⁸ Henok Asmelash, 'The First Ten Years of WTO Jurisprudence on Renewable Energy Support Measures: Has the Dust Settled Yet?' (2022) 21, *World Trade Review* 455, 3–5.

¹⁹ Steve Charnovitz, 'Green Subsidies and the WTO'.

²⁰ *India — solar cells* (n 17) para 7.322-332 and 7.354-365.

²¹ Jaemin Lee, 'SCM Agreement Revisited: Climate Change, Renewable Energy, and the SCM Agreement' (2016) 15, *World Trade Review* 613, 613–644.

promote innovation, and accelerate deployment of clean technologies.²²

The consequence is that WTO subsidy law disciplines the form and trade effects of state support, rather than the policy objectives that motivate it. Green energy subsidies therefore sit uneasily within the SCM framework: they are central to climate policy, yet vulnerable to challenge when they take forms that the Agreement treats as trade distorting. That structural mismatch continues to drive calls for reform and provides the basis for the analysis in the next part of this paper.

III. The Conflict Between Trade Rules and Climate Policy

The relationship between climate policy and WTO trade rules is marked by a persistent dissonance. WTO subsidy disciplines were designed around free trade assumptions, whereas climate mitigation requires governments to intervene, steer investment, and often bear costs in the public interest. As Charnovitz notes, collective-interest objectives, since climate policy often serves public-interest goals, whereas WTO rules prioritize market liberalization and trade neutrality.²³

This tension is especially visible in subsidy regulation. Climate change abatement measures often depend on financial support for renewable energy, low carbon innovation, and industrial transition. Yet the SCM Agreement evaluates such measures through trade law categories rather than climate policy objectives. A subsidy supporting clean electricity, solar manufacturing, or emissions reduction may still be challenged if it is specific, beneficial to domestic producers, or linked to trade distorting conditions. In this sense, the WTO framework can treat climate support as a trade problem even when its purpose is environmental protection.²⁴

The core difficulty is that WTO subsidy law is largely indifferent to purpose, a feature rooted in the design and negotiating background of the SCM Agreement.²⁵ The legal question is not whether a measure promotes decarbonization, but whether it satisfies the elements of a subsidy and causes trade effects that WTO law regards as problematic. This means that climate policies designed to accelerate transition can be vulnerable simply because they use tools that are common in industrial policy. Free allowances under emissions trading schemes, support for renewable electricity, and targeted incentives for clean technologies may all raise SCM issues depending on their design.

²² International Energy Agency, *How Governments Support Clean Energy Start-Ups: Insights from Selected Approaches around the World* (OECD 2022) 10.

²³ Steve Charnovitz, 'Green Subsidies and the WTO' 10–12.

²⁴ Ilaria Espa and Gracia Marín Durán, 'Renewable Energy Subsidies and WTO Law: Time to Rethink the Case for Reform beyond Canada–Renewable Energy/Fit Program' (2018) 21, *Journal of International Economic Law* 621.

²⁵ Robert Gulotty, 'WTO Subsidy Disciplines' (2022) 21, *World Trade Review* 330.

At the same time, the trading system is not entirely hostile to climate policy.²⁶ Trade liberalization can reduce the cost of climate friendly goods, expand access to efficient technologies, and prevent disguised protectionism from shielding high carbon incumbents. In that limited sense, WTO rules may support climate goals by promoting diffusion and lowering prices for cleaner products. But this benefit is partial. It does not solve the broader structural problem that climate policy often requires forms of intervention that trade law still scrutinizes suspiciously.²⁷

A further obstacle is that the SCM Agreement does not contain a climate-specific exception. While GATT Article XX(b) and XX(g) have been invoked to justify certain environmental-related trade measures, such logic has not been extended to subsidy-specific disciplines, and panels have not accepted GATT-style environmental justifications as a way to shield green subsidies from SCM scrutiny. For example, in *Canada – Renewable Energy* and *India – Solar Cells*, governments relied on GATT non-discrimination and SCM-based defenses to justify green support schemes, rather than attempting to invoke XX(b) or XX(g), and the panels ultimately found that the domestic-content-linked clean-energy subsidies violated WTO rules.²⁸ In contrast, in GATT-style environmental cases such as *United States – Certain Tax Credits Under the Inflation Reduction Act*, panels have accepted that environmental or public-morals-related objectives can inform the interpretation of trade-related measures, but only when those measures are genuinely designed and framed as such.²⁹ This indicates that panels are not uniformly “reluctant” to consider environmental justifications per se, but that they remain cautious about applying GATT-style exceptions to subsidy-law contexts, where the primary legal framework is the SCM Agreement and traditional GATT non-discrimination obligations.

In summary, the clash between climate policy and trade rules is not merely technical. It reflects a deeper institutional mismatch between a legal regime oriented toward market neutrality and a policy area that demands collective intervention. WTO subsidy rules remain important for preventing protectionism, but they are a poor fit for the urgent and exceptional character of climate mitigation. That mismatch is what makes reform increasingly difficult to avoid.

Conclusion

²⁶ Andrew James Green, ‘Climate Change, Regulatory Policy and the WTO: How Constraining Are Trade Rules?’ (Social Science Research Network, 11 April 2005).

²⁷ Jaemin Lee, ‘SCM Agreement Revisited: Climate Change, Renewable Energy, and the SCM Agreement’ (2016) 15, *World Trade Review* 613.

²⁸ *India — solar cells* (n 17).

²⁹ *United States — Certain Measures under the Inflation Reduction Act of 2022* (2026).

This paper demonstrates that green subsidies, while crucial for advancing climate policy, inherently distort markets by affecting prices and competitive dynamics. The WTO's subsidy rules regulate such measures to prevent undue trade distortion, yet these rules offer limited adaptation to the specific needs of climate objectives, applying largely traditional trade criteria rather than environmental considerations. This regulatory framework reflects a fundamental tension between the WTO's dual objectives. On one side is the commitment to trade fairness and non-discrimination; on the other is the urgent imperative to address climate change, which often necessitates state intervention that distorts trade in the short term. This tension reveals that existing WTO disciplines were not designed with the peculiar challenges of climate mitigation in mind and therefore struggle to fully accommodate green subsidies without conflict. The key insight is that the incompatibility stems from competing priorities rather than mere legal technicalities: trade rules seek market neutrality, while climate policy demands urgent corrective action. Looking ahead, effective governance of green subsidies will require better alignment between trade rules and climate goals. This may involve reforming WTO subsidy disciplines to integrate sustainable development considerations explicitly, enabling climate objectives to be recognized as legitimate policy rationales within the trade framework. Without such reforms, the deadlock between trade law and climate policy risks impeding the accelerated transition needed to meet international climate targets.

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