

Trade Protectionism & China's International Trade Disputes: Renewable Energy Perspectives

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Renewable energy is frequently seen as one of the world's most promising industries, as it promises a sustainable future in the surge of climate change. Nevertheless, several trade disputes emerge as nations implement policies to boost the domestic green energy industry, putting current trade laws to the test and leaving the detrimental effects on the development of renewable energy technologies. As a result, trade tensions have risen, particularly in bilateral relations between the United States and China. It is impossible to deny that current trade disputes over renewable energy products have practical consequences for governments, institutions, and enterprises. Rising trade protectionism in the energy industry may endanger the fulfillment of specific sustainable development targets. Keeping that in mind, this study aims to examine the recent trade disputes over China's renewable energy products at the multilateral forum of the WTO, while analyzing protectionism in the context of international trade and practices.

Keywords: Trade Protectionism, Trade Dispute, Renewable Energy, China, WTO, Solar Photovoltaic

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I. INTRODUCTION

The global community hailed China's entry into the World Trade Organization (WTO) in December 2001. Some even referred to it as a significant economic reform and a win for capitalistic free trade structures.¹ China made several vows to decrease trade barriers with other States by joining the WTO as an active member of the rule-based global trading system.² China has been one of the most active members of the WTO since its participation, and as a consequence, its economy has become a vital link in global supply networks.³ Nevertheless, Beijing has not implemented significant, systemic changes, and its sporadic adherence to the WTO dispute resolution rules has put the WTO's fundamental standards in several challenges.⁴

One of those challenging sectors is renewable energy industry. In recent, many major economies prioritize the growth of renewable energy industries, such as the European Union (EU), China, and the United States (US). Renewable energy is frequently seen as one of the world's most prospering industries, as it promises a sustainable future in surge of climate change. Renewable energy development necessitates significant investment in research and development, which frequently surpasses the private sector's capabilities. As a result, governments play a vital role in expanding this industry, striving to boost the international competitiveness of domestic companies through their economic policies.⁵

Because the renewable energy industry is still in its inventive stages, it often encounters increased technical competition.⁶ As a result, a more significant rivalry for energy market share is evident with new developments in export opportunities.⁷ Due to the increased international competition, renewable technology firms in several nations are struggling for financial grounds in order to remove impediments to free trade on their products.⁸ As the industry becomes more protectionist, trade conflicts are more likely to arise among the nations. While the international community announces the need for worldwide energy cooperation, the leading economies have been involved in trade disputes over solar energy for more than a decade, which is subject to the WTO dispute settlement mechanism (DSM).⁹ Apart from bilateral trade disputes that are resolved through the WTO, a number of international investment disputes has recently erupted in the renewable energy industry, affecting companies in various countries.¹⁰

Today, many economists have evaluated the growth of the renewable energy sector.¹¹ As the renewable energy industry involves trade related elements, however, it should be analyzed from the perspective of international trade law and practice which is a crucial determinant of the renewable energy adoption and transition to clean energy.

This study aims to examine the recent trade disputes over China's renewable energy products at the WTO DSM and to analyze protectionism in the context of international trade law and practices through theory and case analysis. This paper comprises six parts, including Introduction and Conclusion. Main contents contain renewable energy trade under the WTO law, the WTO trade disputes on renewable energy, China's international trade disputes on renewable energy, effects of the international trade disputes over renewable energy development.

II. RENEWABLE ENERGY TRADE UNDER THE WTO LAW

Renewable energy technologies are made up of bundles of products, services, and embedded intangibles (such as software) that are put together through complex supply chains involving different stakeholders from different jurisdictions.¹² The commodities, services, and intellectual property (IP) involved in a renewable project often traversed companies from many countries to enter into legally binding contracts. Solar companies in the US and the EU, for example, are linked to Chinese companies through worldwide supply networks.¹³

Large solar photovoltaic (PV) firms have built up worldwide solar photovoltaic production capacity because of global supply chains.¹⁴ The photovoltaics sector has a long value chain from raw materials through solar system installation and maintenance. When people talk about the PV industry, they usually refer to solar-cell and module makers. However, there is also the upstream (materials, polysilicon production, wafer production, and equipment manufacturing) as well as the downstream (inverters, BOS components, system development, project development, financing, installations and integration into existing or future electricity infrastructure, plant operators, operation, and maintenance) networks to operate for ensuring a sustainable generation of electricity through solar power-plant.¹⁵ The character of the green energy industry has changed as a result of

technology and business changes, thereby increasing market acceptability of green energy goods and services and internationalizing green energy operations.¹⁶

Green energy commerce has accelerated due to the energy sector's tendency toward privatization and liberalization.¹⁷ Until the 1980s, markets were believed utterly inept in supplying adequate energy products, and governments all over the globe deemed the energy sector to capitalize through market forces.¹⁸ Nevertheless, for high initial investments in energy services, the industry turns out to be monopolized.¹⁹ However, the deregulation movement ushered in a paradigm shift in the global power business with decentralized structures, competition, independent regulatory scrutiny, and private ownership.²⁰ Accordingly, electricity trade represents a new dimension of energy commerce, with the green energy sector playing a key role.²¹ State-owned vertically integrated utilities,²² which would typically be involved in the production, transportation, and distribution of energy products, have no longer dominated businesses in the renewable energy sector.²³ As a result, there are plenty of opportunities for commerce and competitiveness in the late twentieth century and the beginning of the twenty-first century.

The advancement of renewable energy technology is now causing legal, economic, and political wrangling worldwide, notably in terms of trade.²⁴ As a consequence, several trade disputes have emerged due to national programs implemented to boost the green energy industry, putting current trade laws to the test.²⁵ Among them, notable policy-related conflicts have been taken to the WTO's DSM.²⁶ Given the continuous international conflicts, there is a growing recognition of the relationship between trade and energy. In particular, the regulation of green energy trade has been identified as one of the WTO's critical concerns.²⁷ Energy is not particularly handled in the WTO legislation; it has not been designated as a separate trade sector under the WTO system, either.²⁸ Energy was not considered by the GATT when it was first formed in 1947.²⁹ The omission of energy as a distinct sector was explained by former WTO Director-General Pascal Lamy, who stated that: "[w]hen the rules of the GATT - which preceded the WTO - were negotiated 60 years ago, opening trade in energy was not a political priority. World energy demand was a fraction of today, and you could buy a barrel of crude oil for USD 20 at current prices."³⁰

Cross-border trading in grid-connected electricity was also in its infancy at the time of the GATT talks.³¹ Furthermore, renewable energy was not on the global

governance agenda at the time, nor was it on the domestic policy agenda of member states.³² Even though the WTO rules were not specifically drafted with energy in mind, numerous experts have claimed that the WTO standards apply to energy and its product's trade.³³ The WTO's non-discrimination standards are a fundamental aspect of the legal framework that governs international energy commerce. In fact, the WTO rules have been used in renewable energy trade disputes. The first green energy case was adjudicated by the WTO DSB, which established that green energy may come under the GATT as associated disciplines of individual agreements.³⁴ The WTO was regarded as a forum for renewable energy trade disputes due to the world's major green energy producers, exporters, suppliers, and importers of renewable energy generation equipment, such as China, the US, and the EU, the signatories of WTO's dispute settlement system.

Considering the multidimensional nature of renewable energy commerce, contracts covered under the WTO system are important to understand renewable energy issues, which involve a wide variety of topics such as trade in goods and services. Tariffs on hardware, such as solar equipment are governed by GATT Articles II and XXVIII. Articles XI and XX deal with renewable energy import and export limitations. Article III of the Agreement on Trade-Related Investment Measures (TRIMs), and the Government Procurement Agreement deal with local content standards and government procurement agreements (GPA). Articles VI, XVI and XIX of GATT deals with the Anti-Dumping Agreement (ADA), the Agreement on Subsidies (SG) and Countervailing Measures (ASCM); the Agreement on Safeguards applies to energy trade remedies (safeguards, anti-dumping, subsidies, and countervailing measures); and the Agreement on Agriculture (AoA) partially covers biofuels following the application of the AoA regime to bioethanol. Furthermore, the renewable energy business is heavily reliant on services like metering, scoping, scouting, engineering, installation maintenance, and funding under the General Agreement on Trade in Services (GATS). Technical standards, which are critical for both safety and high production, are covered under the Agreement on Technical Barriers to Trade (TBT). Finally, renewable energy may affect intellectual property rights, technological transfer and competitiveness, which are also covered by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs).

How energy should be classified for the WTO purposes is a key topic in international energy disputes.³⁵ Should energy, for example, be defined in terms of

either goods or usage? Many academics believe that energy should be defined as the “activity (product and process) of transforming and consuming energy-containing natural resources in response to a variety of societal and human demands.”³⁶ However, such a description is insufficient for the WTO context because it does not cleanly fit inside the WTO’s goods/services boundaries.³⁷ For example, there is no consensus on whether electricity is a product or service under the WTO regulations,³⁸ which are based on distinction between products and services, and applied following the categorization. Accordingly, this framework influences the green energy sources.³⁹ Consequently, the WTO considers no specific rules that addresses energy security in relation to renewable energy development.⁴⁰

Many of today’s most important renewable energy goods and services, such as wind turbines, solar panels, geothermal energy sensors, and storage technologies like batteries, were negotiated as environmental goods and services in the Doha Round, the WTO’s latest round of trade negotiations.⁴¹ While the WTO system lacks particular regulations on green energy and allied items, the 1994 WTO Agreement’s preamble references sustainable development.⁴² It mentions the need for Contracting Parties to make “optimal use of the world’s resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment.”⁴³ This element has been linked to green energy the literature and the WTO case law.⁴⁴

III. WTO TRADE DISPUTES ON RENEWABLE ENERGY

The term ‘conflict’ has been generally interpreted into two meanings: “overt conflict” and “subjective conflict.”⁴⁵ The former has been referred to as something that is understood as a dispute between two parties,⁴⁶ while the latter illustrates a conflict between two parties where one of the parties possesses the conflicting perception of the other party having opposite views and interests or the opposite party has deprived the first party’s rights differently.⁴⁷

According to the rules and regulations of the WTO Dispute Settlement Understanding (DSU), trade disputes are defined as one where one State member undertakes measures against another WTO member to impair benefits which it accrues under the international agreements, directly or indirectly.⁴⁸ It also refers to a situation

where one WTO member takes necessary measures to resolve the disagreements of the trade policies or measures through negotiations.⁴⁹ In international trades, conflicts and disputes are not clearly distinguished. Trade conflicts have a direct nexus with trade interests, while the trade policies and measures taken by two countries through bilateral or international agreements may fall in the degree of tension, which is escalated by trade conflicts.⁵⁰ However, the same scenario may not be seen within trade disputes. In trade disputes, the trade effects of a member government may affect one or several member governments for the violation of an agreement or a commitment that it has made in the WTO.⁵¹ In the meantime, trade wars, which are considered the highest degree of tension between the countries, can occur through a series of trade conflicts.⁵² In the case of trade wars, it can often lead to significant financial losses with adverse political consequences.⁵³

In the renewable energy sector, international trade disputes are visible between different countries. A noticeable example is the trade disputes between the US and China in solar power energy.⁵⁴ Moreover, disputes between investors and countries are also increasing in the solar sector, along with the international trade disputes between two or more countries.⁵⁵ From different perspective, investors in such countries as Spain, Italy, and the Czech Republic have accused the respective host countries of initiating rollbacks within the renewable energy regulations, which cause inefficiencies and thus additional costs to renewable energy production.⁵⁶ Even though different treaties like the Energy Charter Treaty (ECT) have the mechanisms to address investor-state dispute settlement (ISDS), it nevertheless may also create barriers for the countries to address broader environmental objectives such as climate change.⁵⁷

A significant number of trade concerns are seen within different provisions under the WTO Agreements, such as subsidies and countervailing duties, safeguard clauses and anti-dumping agreements.⁵⁸ Infant industry arguments⁵⁹ and theories related to strategic trade policies are also some aspects that can explain the trade measures taken for implementation under the WTO rules.⁶⁰ The imports being allowed through the imposition of tariffs and the reduction of import quotas are decisive factors in protecting the new emerging industry. Furthermore, through strategic interactions by governments, the sensitive and specific markets retrieve supports to operate in foreign domains.⁶¹

Nevertheless, there has been a recent trend by the governments to actively

promote domestic renewable industries and reshape the market through strategic trade policy that supports only local firms.⁶² To achieve that goal, domestic regulation and policies have been changed as a protectionist measure in the renewable energy sector, especially in the solar power projects.⁶³ For instance, the EU has imposed trade restrictions on solar PV manufacturers in China. Nevertheless, the protectionist measures have been inefficient so far.⁶⁴ Different studies have clearly shown that it affected big international players in the renewable energy industries, mainly from China, eventually carrying through disputes against protectionist measures.⁶⁵

In recent times, the US has also changed its tariff policies in regard to the solar PV producers from China.⁶⁶ The reason for such tariff policies can be further illustrated as a political discourse where a protectionist coalition was formed between the American domestic manufacturers and the vital interest of Congress to utilize the country's trade laws in their interest.⁶⁷ This approach, having the oligopolistic essence, has adverse impact on most other US-based companies producing solar photovoltaics, as they highly depend on China's technology.⁶⁸ The introduction of such measures for protecting the domestic markets paves the way for a new call of restraining trade protectionism, as it possibly affects the trade flows, prices, and welfares, and consumer demands.⁶⁹ The protectionist measures made an impact on global competition, so that it may lead to trade conflicts or trade wars.

With the rapid growth of renewable energy, the world witnesses increasing disputes over renewable energy trade policies.⁷⁰ Climate change, other environmental issues, and national energy security concerns have prompted more usages of renewable energy programs.⁷¹ This emphasizes the need for a more effective international trade framework to address clean energy and climate change challenges, such as subsidies, technological transfers, and environmental goods and services trade. One way to move forward would be to develop a new list of subsidies linked to the development and diffusion of low-carbon energy sources. While seemingly a straightforward approach, the protectionist measures taken by different countries are notoriously deadlocked and may not be a viable means for developing new trade provisions in the near term. As most of the WTO members consider their economic competitiveness as integrally related to the success of their domestic renewable energy enterprises, it is unlikely that they would agree to relinquish the protectionist policies. Similar difficulties have been witnessed in the negotiations to establish an Environmental Goods and Services Agreement (EGSA) under the Doha Round

mandate calling for “the reduction, or as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services.”⁷²

In March 2014, fourteen WTO states, including the leading countries involved in ongoing trade disputes, agreed to begin negotiations on eliminating tariffs on a range of environmental goods, specifically citing the APEC decision as providing momentum for such negotiations.⁷³ Trade concerns are often raised during global environmental discussions, especially in the meetings of the parties to the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol. Nevertheless, such concerns do not see the light out of the tunnel due to fragmentation of international laws relating to the energy issues, as there is no overarching regulation that specifically addresses energy.⁷⁴

There are international organizations with the mission to limit the trade barriers relating to renewable energy, such as the International Energy Agency (IEA), but their membership is limited to the OECD nations. The International Renewable Energy Agency (IRENA), which was founded in 2009 to accelerate the use of renewable energy, has yet to enter the trade arena and lacks the political support to take on the WTO.⁷⁵ Although several large associations of renewable energy industry generally spoke out about recent trade disputes, such efforts had also failed because of their self-interested perspective on the issues.⁷⁶

Due to the difficulties of addressing renewable energy trade issues within the context of existing international agreements, some have proposed a new agreement: the Sustainable Energy Trade Agreement, which would take a holistic and integrated view of the sustainable energy sector and address a variety of market and trade-related barriers.⁷⁷ While such an agreement might help to inform and even influence future WTO and UNFCCC talks and activities, the world's political leaders would not agree to negotiate and execute such a new agreement for many of the above-mentioned reasons. While the frequency of renewable energy trade disputes in the future is unknown, all indications point to a rise in the coming years.⁷⁸ Many legal problems arise when countries adopt policies to help their domestic renewable energy industry because they may conflict with existing international trade regulations. However, whether a lawsuit is won or lost, it may be expensive to this emerging sector. Expanding the use of renewable energy technology will be a critical component of any climate change response, while trade tensions will raise the economic and political costs in the field.

IV. CHINA'S INTERNATIONAL TRADE DISPUTES ON RENEWABLE ENERGY

The renewable energy sector, especially solar power, has made remarkable growth recently. As the largest solar PV manufacturer China can claim credit for such progress.⁷⁹ According to the IEA's report, 60 percent of the global solar products are manufactured by China.⁸⁰ For instance, the world's top three solar manufacturers, Trina Solar, JinkoSolar, and JA Solar, are mainly Chinese companies.⁸¹ Generous subsidies and different forms of incentives for high-technology research initiated by the Chinese Government have played a significant role in such commercialization process and triggered the ultimate development of the industry.⁸² Nevertheless, China may not deny the role of the US market for contributing the energy product developments. The rapid growth of China's renewable energy industry has a strong nexus with the trade subsidies provided by the US, the largest consumer of renewable energy products.⁸³ However, the recent protectionist policies of the US to develop its domestic renewable energy products have created a difficult paradigm for China. That is the reason for most WTO disputes relating to renewable energy, where China, being a complainant, has alleged that the US breached several contractual obligations relating to the renewable energy trade and commerce.⁸⁴

In 2007-18, the WTO addressed eight disputes regarding the PV sector where half of them have been initiated by China as a complainant. The trade measures imposed within the renewable energy sectors were observed the main reason for the disputes.⁸⁵ The US Department of Commerce imposed countervailing duties on solar cell manufacturers from China in March 2012, alleging that the continuous subsidies have already been provided to the Chinese manufacturers by the Government of China, so that subsidies from the US are unreasonable.⁸⁶ In response, the Government of China filed a complaint before the WTO DSB (DS 437: *US-Countervailing Measures (China)*) against the countervailing and anti-dumping measures taken by the US on the products made in China.⁸⁷ In the *US-Countervailing Measures (China)* case, China challenged the US's protective measures and policy.⁸⁸ The US Department of Commerce additionally alleged that the Chinese enterprises, having the majority of ownership from the government, are government corporations.⁸⁹ However, such a view was challenged by China stating the case laws and doctrines that considers corporations as a "public body," and a

government being the major shareholders does not violate any legal provisions of international trade agreements.⁹⁰

According to the WTO DSM, the claims reflect that the US has unsuccessfully utilized protectionist measures, especially against China.⁹¹ The dispute between China and the US went through different stages of the WTO dispute settlement procedures, including consultations, panel proceedings, appellate proceedings, arbitration, and reverted to the appellate proceeding. As far as the trade conflicts between the US and China are concerned, the trade protectionism and imposed restrictions have been criticized by American scholars.⁹² They argued that the domestic companies aimed to be protected through the policies incurred losses due to its impact on the market value, thereby making the protectionist measures unsuccessful.⁹³

China has also engaged in several trade disputes relating to wind energy.⁹⁴ In September 2010, the Union Steelworkers filed a petition before the Office of the United States Trade Representative (USTR), claiming that the policies adopted by China in the wind sector were inconsistent with the WTO principles.⁹⁵ They also claimed that such policies paved the way for its local producers to receive unfair support in renewable energy technology.⁹⁶

Subsequently, in October 2010, an investigation was conducted by the USTR, and in February 2011, a decision was made to file a request for consultation in the WTO by challenging China's Special Fund for Wind Power Equipment Manufacturing.⁹⁷ The US then held its WTO-mediated consultations with China in February 2011. During those sessions, the US stated that domestic manufacturers receiving subsidies from China through the Special Funds was inconsistent with and violative of Article 3 of the WTO's Agreement on Subsidies and Countervailing measures which enshrines that WTO members are prohibited from providing subsidies that are contingent on the export performance or the use of domestic goods instead of imported goods.⁹⁸

The WTO's TRIMs also prohibit member countries from imposing performance requirements or implementing non-tariff barriers, such as export subsidies and local-content requirements, on foreign investors.⁹⁹ Despite these legal restrictions under the WTO, China's Special Fund promoted the use of domestic goods over the purchase of imported goods by offering grants (ranging from USD 6.7 million to USD 22.5 million) to Chinese wind turbine manufacturers that agreed to use key

parts and components made in China.¹⁰⁰ Consequently, domestic brands of wind turbines are 10 percent cheaper in China than domestically made foreign brands, and 20 percent cheaper than imports.¹⁰¹ In light of all these incidents and the WTO consultations, China rescinded the legal measure of establishing the Special Fund Program and lifted some protectionist measures on the foreign businesses in June 2011.¹⁰²

Apart from the trade conflicts with the US, China had several trade disagreements in its bilateral relationship with the EU. However, almost all the part of the dispute was resolved bilaterally between the countries through consultation and negotiation.¹⁰³ Furthermore, in 2012, China brought a case before the WTO against Italy and Greece on the grounds of certain measures imposed, *inter alia*, the restrictions in the form of protectionist measures.¹⁰⁴ Nonetheless, the dispute did not proceed further after the first consultation in the WTO.¹⁰⁵

Countries engaging with trade disputes may disrupt the advancement of renewable technology. Multilateral forums such as the G20 summits and Energy Charter conferences should be considered to mitigate trade conflicts among different countries, rather than considering the WTO as the only forum to address trade disputes.¹⁰⁶ An example of using such forums is G20 summits where both the US and China conducted bilateral negotiations of the ongoing trade disputes without the assistance of the WTO.¹⁰⁷

V. EFFECTS OF THE INTERNATIONAL TRADE DISPUTES OVER RENEWABLE ENERGY DEVELOPMENT

In all of the above analyzed cases, the application of certain protectionist measures by China and in some cases, US, was the main reason for submitting a complaint to the WTO. The disputed trade measures basically protectionist in nature violated the WTO rules and established a market barrier limiting renewable technology imports and protecting domestic sectors from international competition. As a result, it has harmed competition and caused market distortions. Protectionism is linked to the current state of the renewable energy business, which is characterized by rapidly rising China's supply dominance and burgeoning renewable energy consumption.¹⁰⁸ China as a key participant in the global renewable energy market has piqued its

major trading partners with its unfair trade practices.

Major trade tensions have risen, particularly in bilateral relations with the US.¹⁰⁹ The analysis of trade conflicts between the US and China in the solar panel sector revealed the US's shifting policy approach to trade tensions and dispute resolution from relying on the WTO dispute settlement procedures for the most part to unilateral trade remedies actions based on the Trade Act of 1974.¹¹⁰ New US tariffs for manufactured solar cells and modules enhance market obstacles to international competition, primarily against China.¹¹¹ The new import limits are intended to safeguard American producers to revive the solar panel manufacturing industry in the US.¹¹²

While the tariffs may benefit the US solar panel makers, experts and proponents contend that most US solar business employment is in supporting industries such as installation rather than panel production.¹¹³ Accordingly, more employment in the US may be threatened rather than safeguarded due to this new policy. According to the Solar Energy Industries Association (SEIA), roughly 23,000 jobs might be lost as a result of new tariffs, because hardware costs rise as a result of import taxes, delaying or cancelling numerous solar projects.¹¹⁴ Reuters report the US corporations have halted or postponed USD 2.5 billion in big PV installation projects due to increasing solar panel tariffs.¹¹⁵

So far, the trade remedies appear neither to be endangering Chinese solar firms' worldwide competitiveness, nor to persuade China to change its policies and practices. On the one hand, it calls into doubt the effectiveness of trade remedies, particularly when the importance of global value chains is considered in the industry and where imported intermediate items are frequently employed in domestic production. When tariffs are imposed on certain commodities, domestic manufacturers and consumers of the nation applying the duties may suffer, as well. On the other, it raises questions about the WTO's role in resolving disputes, given most of the disputes do not appear to be effective in addressing protectionist policies.¹¹⁶

China's comparative advantage has decreased in bilateral trade with the US, which might be explained in part by the US imposing additional trade barriers.¹¹⁷ In addition, China's Revealed Comparative Advantage values in bilateral trade with the EU have been trending lower, despite its considerably comparative advantage in exporting to the European market.¹¹⁸ The concern remains as to how these

developments would affect global competitiveness of China in the future and the industry's growth.

Many scholars have pointed that the increasing political interests in the renewable energy industry might hamper the development of the sector,¹¹⁹ which has resulted in protectionist trade policies and international trade conflicts. It may also jeopardize the long-term policies and goals of decarbonization and sustainable development.

VI. CONCLUSION

In trade disputes over renewable technologies, there are primarily two types of measures that are challenged. One is remedy measures, such as countervailing duties, anti-dumping duties, or safeguards measures (in the form of increased import tariffs), while the other is domestic content requirements, which are frequently questioned as a violation of national treatment obligations.¹²⁰ The use of protectionist measures can be linked to the current situation in renewable energy industry which is still in early stages of development. It is characterized by rapid growth and fierce competition among companies for an export share of the expanding market. Also, governments are playing a significant role in supporting domestic renewable energy sectors. The idea of infant industry and strategic trade policy considerations can be used to justify protectionism in this sector. Nascent trade barriers appear to be mostly driven by a desire to safeguard a new industry and encourage domestic enterprises to operate in a highly competitive market.

China had the largest and generally steady comparative advantage in global commerce in renewable energy products, while other nations had lesser or no comparative advantage (as in the case of the EU and the US).¹²¹ Current trade disputes over renewable energy goods should have practical consequences for governments, institutions and enterprises that must consider the detrimental effects of trade disputes on the development of renewable energy technologies and the transition to clean energy. Rising trade protectionism in the renewable energy industry may endanger the fulfillment of specific sustainable development targets. As a result, decision-making organizations should recognize the need to take steps to resolve international trade conflicts.

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REFERENCES

1. Jason Garred, *The persistence of trade policy in China after WTO accession*, 114 J. INT'L ECON. 131 (2018). See also Michele Imbruno, *China and WTO liberalization: Imports, tariffs and non-tariff barriers*, 38 CHINA ECONOMIC REVIEW 223 (2016).
2. Beijing, even in recent times, made the pledges during a WTO review of China's trade practices to accelerate efforts to foster "a new development paradigm" - a strategy in which the domestic and international markets reinforce each other, with the domestic market as "the mainstay." Beijing believes the potentially vast market for domestic demand among China's 1.4 billion people would be "fully unleashed" by the plan. China has regularly pledged to further open up its market over the years, from the beginning of its accession, but its trade practices frequently come under criticism. See Daniel C. Chow, *The myth of china's open market reforms and the world trade organization*, 41 U. PA. J. INT'L L. 944-5 (2020).
3. Frank Altemöller, *China and the emerging powers in international trade relations: The future of the multilateral trade system, the role of free trade agreements and new unilateralism*, 14 GLOBAL TRADE & CUSTOMS J. 529 (2019).
4. *Supra* note 2, at 944.
5. Xiaolei Yang et al., *Effect of government subsidies on renewable energy investments: The threshold effect*, 132 ENERGY POL'Y 157-9 (2019).
6. Rapid technology improvements and decreasing costs of renewable energy resources, along with the increased competitiveness of battery storage, have made renewables one of the most competitive energy sources in many areas. See also Benjamin D. Leibowicz, *Growth and competition in renewable energy industries: Insights from an integrated assessment model with strategic firms*, 52 ENERGY ECON. 14 (2015).
7. *Id.*
8. *Id.* at 15.
9. *Id.* at 19.
10. Gracia M. Durán, *Sheltering government support to "green" electricity: The European Union and the World Trade Organization*, 67 INT'L & COMP. L. Q. 130-2 (2018). See also Daniel Peat, *The wrong rules for the right energy: The wto SCM agreement and subsidies for renewable energy*, 24 ENVTL L. & MGMT. 3 (2012).
11. Matthew J. Burke & Jennie C. Stephens, *Political power and renewable energy futures: A*

- critical review*, 35 ENERGY RES. & SOCIAL SCI. 79-80 (2018).
12. Faissal Jelti et al., *Renewable power generation: A supply chain perspective*, 13 SUSTAINABILITY (SWITZERLAND) 16-8 (2021).
 13. *See generally* GREGORY F. NEMET, HOW SOLAR ENERGY BECAME CHEAP: A MODEL FOR LOW-CARBON INNOVATION (2019).
 14. The global supply chain is the ground for reasonable prices of solar PV in 2020. The price to install a new residential solar panel system in the US has fallen roughly 64% since 2010, according to National Renewable Energy Laboratory. Since 2005, utilities, businesses, and homeowners have installed more panels almost every year, representing about 700 GW of solar panels worldwide. *See* Mu'Azu Mohammed Abdullahi et al., *A review of building integrated photovoltaic: Case study of tropical climatic regions*, 12 INT'L J. POWER ELECTRONICS & DRIVE SYSTEMS 475 (2021).
 15. The solar industry is separated into upstream manufacturing and downstream installation and finance. Upstream solar has traditionally been the most dominating section due to solar energy's proportionally lower installation costs. Still, these expenses are now becoming a significantly more significant part of the whole solar equation. This development is partly due to solar panels' exponential cost reductions, which have reached a point where production and installation prices are approximately equal. While the rise of downstream solar has provided additional possibilities for solar investors, more research is needed to establish which solar segment is the best investment. *See* World Economic Forum, Here's how supply chain issues are affecting renewable energy projects World Economic Forum, <https://www.weforum.org/agenda/2021/11/supply-chain-problems-solar-power-renewable-energy>.
 16. Chiranjib Bhowmik et al., *Social acceptance of green energy determinants using principal component analysis*, 160 ENERGY 1030-46 (2018).
 17. Francesco Nicolli & Francesco Vona, *Energy market liberalization and renewable energy policies in OECD countries*, 128 ENERGY POL'Y 854 (2019).
 18. *Id.*
 19. Aviel Verbruggen et al., *Renewable energy costs, potentials, barriers: Conceptual issues*, 38 ENERGY POL'Y 850-61 (2010).
 20. Santiago Arango-Aramburo et al., *Renewable energy sources and the cycles in deregulated electricity markets*, 223 ENERGY 1-9 (2021).
 21. *Id.*
 22. Vertical integration refers to the combination, within a single firm, or two or more stages of production, where each stage was previously undertaken by separate firms.
 23. *Supra* note 13.
 24. Kati Kulovesi, *International Trade Disputes on Renewable Energy: Testing Ground for the Mutual Supportiveness of WTO Law and Climate Change Law*, 23 REV. EUR., COMP. & INT'L ENVTL L. 342-53 (2014).
 25. *Id.* at 343.
 26. *Id.*

27. *Id.* at 345.
28. *Id.*
29. Ilaria Espa & Gracia Marín Durán, *Renewable energy subsidies and WTO law: Time to rethink the case for reform Beyond Canada-Renewable Energy/Fit Program*, 21 J. INT'L ECON. L. 621-53 (2018).
30. WTO, Doha Round will benefit energy trade-Lamy, https://www.wto.org/english/news_e/sppl_e/sppl80_e.htm.
31. Harri Kalimo et al., *Market definition as value reconciliation: the case of renewable energy promotion under the WTO Agreement on Subsidies and Countervailing Measures*, 17 INT'L ENVTL AGREEMENTS: POLITICS, L. & ECON. 427-43 (2017).
32. Gabrielle Marceau, *The WTO in the Emerging Energy Governance Debate*, 106 PROCEEDINGS OF THE ASIL ANNUAL MEETING 385-9 (2012).
33. Yulia Selivanova, *Energy Challenges for International Trade Rules*, 8 TRANSNAT'L DISPUTE MGMT. 3 (2011).
34. *Supra* note 32.
35. Henok B. Asmelash, *Energy Subsidies and WTO Dispute Settlement: Why only Renewable Energy Subsidies Are Challenged*, 18 J. INT'L ECON. L. 261-85 (2015).
36. Anna A. Marhold, *WTO law and economics and restrictive practices in energy trade: The case of the OPEC cartel*, 9 J. WORLD ENERGY L. & BUS. 475-94 (2016).
37. *Id.*
38. *Id.* at 447.
39. *Id.* at 479.
40. *Id.*
41. Richard Baldwin, *The world trade organization and the future of multilateralism*, 30 J. ECON. PERSPECTIVES 95-116 (2016).
42. Angelica Rutherford. *The Applicability of the Law of the WTO to Green Energy Security*, in ENERGY SECURITY AND GREEN ENERGY 103-39 (2020).
43. Marrakesh Agreement, pmbl.
44. Rutherford, *supra* note 42, at 107.
45. Agnieszka Hajdukiewicz & Bozena Pera, *International trade disputes over renewable energy-the case of the solar photovoltaic sector*, 13 ENERGIES 1-4 (2020).
46. Dean Pruitt, *Social Conflict: Some Basic Principles*, J. DISP. RESOL. 1-6 (2007).
47. *Id.* at 152.
48. The trade dispute occurs when a WTO member adopts certain measures or policies against one or more of the other WTO members. Such measures or policies are considered a breach of the obligation enshrined under the agreements of WTO. *See supra* note 46.
49. *Supra* note 42, at 110.
50. Chad P. Bown & Kara M. Reynolds, *Trade flows and trade disputes*, 10 REV. INT'L ORG. 145-77 (2015).
51. *Id.*

52. See generally Tolulope A. Adekola, *US-China trade war and the WTO dispute settlement mechanism*, 18 J. INT'L TRADE L. & POL'Y (2019).
53. *Id.*
54. *Supra* note 45 at 8.
55. *Id.*
56. *Id.*
57. Anna A. Marhold, *Fragmentation and the nexus between the WTO and the ECT in global energy governance - A legal-institutional analysis twenty years later*, 16 J. WORLD INV. & TRADE 389-435 (2015).
58. *Supra* note 32.
59. The infant industry argument is an economic rationale for trade protectionism. The core of the argument is that nascent industries often do not have the economies of scale that their older competitors from other countries may have, and thus need to be protected until they can attain similar economies of scale.
60. *Supra* notes 32 and 46.
61. Bilgin O. Örgün, *Strategic Trade Policy Versus Free Trade*, 58 PROCEDIA-SOCIAL & BEHAVIORAL SCI. 1283-92 (2012).
62. Federico Etro, *Endogenous Market Structures And Strategic Trade Policy*, 52 INT'L ECON. REV. 63-84 (2011)
63. Luca Rubini, *Ain't Wastin' Time no more: Subsidies for renewable energy, the SCM Agreement, policy space, and law reform*, 15 J. INT'L ECON. L. 525-79 (2012). See also *supra* note 24.
64. Killian J. McCarthy, *On the influence of the European trade barrier on the chinese pv industry: Is the solution to the solar-dispute "successful"?*, 99 ENERGY POL'Y 154-7 (2016)
65. Llewelyn Hughes & Jonas Meckling, *The politics of renewable energy trade: The US-China solar dispute*, 105 ENERGY POL'Y 256-62 (2017).
66. *Id.*
67. *Id.* at 257.
68. *Id.* at 258.
69. Sherzod Shadikhodjaev, *Renewable Energy and Government Support: Time to "Green" the SCM Agreement?*, 14 WORLD TRADE REV. 479-506 (2015).
70. Daniel Scholten et al., *The geopolitics of renewables: New board, new game*, 138 ENERGY POL'Y 1-6 (2020).
71. *Id.*
72. Joanna I. Lewis, *The rise of renewable energy protectionism: Emerging trade conflicts and implications for low carbon development*, 14 GLOBAL ENVTL POLITICS 10-35 (2014).
73. In 2012, the 21 members of the Asia-Pacific Economic Cooperation (APEC) conference agreed to a list of environmental goods, including renewable energy technologies, on which member countries must reduce their applied tariff rates to 5 percent or less by December 31, 2015; APEC has also taken up the issue of LCRs and alternative ways to

- achieve similar local economic development objectives.
74. Rajeeesh Kumar, *The United Nations and Global Environmental Governance*, 44 STRATEGIC ANALYSIS 479-89 (2020).
 75. Marco Citelli et al., *Renewable Energy in the International Arena: Legal Aspects and Cooperation*, 2 GRONINGEN J. INT'L L. 1-33 (2018).
 76. *Id.*
 77. Rafael Leal-Arcas, *New frontiers of international economic law: The quest for sustainable development*, 40 U. PA. J. INT'L L. 83-133 (2018).
 78. Chi Wei Su et al., *Does renewable energy redefine geopolitical risks?*, 158 ENERGY POL'Y 1-10 (2021).
 79. Qili Huang, *Insights for global energy interconnection from China renewable energy development*, 3 GLOBAL ENERGY INTERCONNECTION 1-11 (2020).
 80. *Supra* note 45, at 6.
 81. *Id.*
 82. Ka Zeng, *Domestic politics and US-China trade disputes over renewable energy*, 15 J. E. ASIAN STUD. 1-22 (2015).
 83. *Supra* note 24.
 84. *Supra* note 65.
 85. *Supra* note 45.
 86. *Id.*
 87. Panel Report, United States - Countervailing Duty Measures on Certain Products from China, WTO Doc, WT/DS437/R (adopted Jan. 16, 2015), https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds437_e.htm.
 88. USTR, Countervailing Duty Measures on Certain Products from China, <https://ustr.gov/node/1464>.
 89. *Supra* note 87.
 90. *Id.*
 91. *Supra* note 65, at 258.
 92. Chi Hung Kwan, *The China-US Trade War: Deep-Rooted Causes, Shifting Focus and Uncertain Prospects*, 15 ASIAN ECON. POL'Y REV. 55-72 (2020). *See also* Simon J. Evenett, *Protectionism, state discrimination, and international business since the onset of the Global Financial Crisis*, 2 J. INT'L BUS. POL'Y 9-36 (2019).
 93. *Supra* note 64.
 94. Nany Hur, *Historical and strategic concern over the US-China Trade War: Will They Be within the WTO?*, 11 J. E. ASIA & INT'L L. 393-411 (2018).
 95. Peter Buchholz & Torsten Brandenburg, *Demand, Supply, and Price Trends for Mineral Raw Materials Relevant to the Renewable Energy Transition Wind Energy, Solar Photovoltaic Energy, and Energy Storage*, 90 CHEMIE-INGENIEUR-TECHNIK 141-53 (2018).
 96. USTR, China Ends Wind Power Equipment Subsidies Challenged by the United States in WTO Dispute, <https://ustr.gov/about-us/policy-offices/press-office/press-releases/2011/>

- june/china-ends-wind-power-equipment-subsidies-challenged.
97. *Id.*
98. *Id.*
99. Ilaria Espa, *New features of green industrial policy and the limits of WTO rules: What options for the twenty-first century?*, 53 J. WORLD TRADE 979-1000 (2019).
100. *Supra* note 92.
101. *Id.*
102. For instance, before lifting the restrictive measures, foreign developers were banned from implementing certain projects such as establishing offshore wind farms in the country. However, the developers having overseas experience in the development of wind farms are now free to establish such farms. See Youcheer Kim & Yongshin Kim, *Institutional Origins of the US-China Trade War: The Concurrence of America's Limited Legal Leverage and China's Overproduction*, 34 PACIFIC FOCUS 345-75 (2019).
103. *Supra* note 45
104. *Id.*
105. *Id.*
106. Joost Pauwelyn, *WTO dispute settlement post 2019: What to expect?*, 22 J. INT'L ECON. L. 297-321 (2019).
107. *Id.*
108. *Supra* note 45, at 17.
109. Pui Sun Tam, *Global impacts of China-US trade tensions*, 29 J. INT'L TRADE & ECON. DEV. 510-45 (2020).
110. *Supra* note 45.
111. *Id.*
112. *Id.*
113. Robert Y. Shum, *The coming solar trade war: Obstacles to decarbonization from a political-economy conflict*, 30 ELECTRICITY J. 49-53 (2017).
114. *Supra* note 45.
115. See *Billions in US Solar Projects Have been Shelved after Trump Panel Tariff*, CNBC, June 7, 2018, <https://www.cnbc.com/2018/06/07/billions-in-us-solar-projects-have-been-shelved-after-trump-panel-tariff.html>.
116. Alexey Portanskiy, *The imperative of WTO reform in an era of rising protectionism and trade wars*, 14 INT'L ORG. RES. J. 238-49 (2019).
117. *Supra* note 45.
118. *Id.*
119. Bongsuk Sung & Cui Wen, *Causal dynamic relationships between political-economic factors and export performance in the renewable energy technologies market*, 11 ENERGIES 874 (2018).
120. *Supra* note 45.
121. *Supra* note 46.