NEW FRONTIERS OF INTERNATIONAL ECONOMIC LAW: THE QUEST FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

The purpose of this Article is to explain new horizons and perspectives in international economic law in the context of sustainable development. This Article explores the potential of the trading system in helping mitigate climate change and enhancing sustainable energy. The argument is that trade agreements have tremendous potential to help mitigate climate change, which is currently underexplored. The Article explains how trade agreements may be a legal instrument to mitigate climate change and enhance sustainable energy. It then provides an analysis of the challenges of mitigating climate change and enhancing sustainable energy. Next, it examines the synergistic links between the trading and climate regimes and offers forum options that best deal with them with the aim of helping to mitigate climate change and enhance sustainable energy. The Article ends with what the future may hold on the links between international trade and renewable energy.

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1. INTRODUCTION

There is a lot of talk about the fact that, as a result of trade, we have increased social inequality,[1] nationally and internationally, and that the level of carbon dioxide and other greenhouse gas ("GHG") emissions has been going up over time, also a result of international trade,[2] and what can be done about it.[3] Trade is, in many senses, considered to be the competitor of environmental protection. In this Article, however, I argue that, while all of that may be true, trade can contribute to climate change mitigation.

Climate change is one of the biggest challenges humanity faces today.[4] Today, 80% of the global energy supply comes from fossil

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[1] *See* WORLD ECON. FORUM, THE GLOBAL RISKS REPORT 2017, (12th ed. 2017), http://www3.weforum.org/docs/GRR17_Report_web.pdf [https://perma.cc/H446-9MVY] (discussing how overall globalization and trade have reduced global inequality, although the unequal distribution of these benefits remains a risk factor). Regarding arguments on the correlation between trade liberalization, on the one hand, and climate change and inequity, on the other, neither of these problems seems to be driven by economics or the trading system. For instance, trade makes every country richer. But it is not for the WTO to decide who individually (as citizens) gets how much from the benefits of trade. That is for national governments to decide based on national taxation. *See generally* CHRIS HUGHES, FAIR SHOT: RETHINKING INEQUALITY AND HOW WE EARN (2018) (discussing income inequality and arguing for a tax on the top one percent of earners to guarantee income for working people).

[2] *See* Org. for Econ. Co-operation and Dev. [OECD], *Is Trade Good or Bad for the Environment?*, http://www.oecd.org/trade/tradeandenvironment.htm [https://perma.cc/4VXK-KTWC] (weighing the benefits of a greater ability to manage the environment due to trade against the negatives of increased greenhouse gas emissions); *see also Envtl. Goods and Serv. Sector*, EUROPA: EUROSTAT, http://ec.europa.eu/eurostat/web/environment/environmental-goods-and-services-sector [https://perma.cc/5R27-B7FH] (indicating that "the purpose of environmental goods and services is to prevent, reduce and eliminate pollution and any other form of environmental degradation . . . and to conserve and maintain the stock of natural resources, hence safeguarding against depletion.").

[3] Some policy suggestions include a tax on the carbon content of imports and a refund of the tax to companies when they export, as the EU is doing with cement. *See Externalities: The Lives of Others*, THE ECONOMIST (Aug. 19, 2017), at 61. Others have studied the effects of a tax policy on GHG emissions. *See generally* NAT'L RESEARCH COUNCIL, EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS (William D. Nordhaus et al. eds., 2013), https://smarterfuelfuture.org/assets/content/NRC_GHG_-_July_2013.pdf [https://perma.cc/KV9R-392U] (reviewing tax provisions and their effects on carbon and other greenhouse gas emissions).

[4] *See How Do We Know That Humans are the Major Cause of Global Warming?*, UNION OF CONCERNED SCIENTISTS, https://www.ucsusa.org/global-warming/science-and-impacts/science/human-contribution-to-gw-

fuels.[5] Fossil fuels contribute to climate change and are finite,[6] which leads to energy insecurity.[7] Renewable energy can help here in that it is cleaner than fossil fuels. It also helps towards energy independence and therefore enhances energy security.[8] Trade law could be used as a vehicle to achieve this goal. Trade can help everyone lift their living standards by aligning international standards. Examples of this line of thinking are the policies of Canada, whose trade agreements include strict standards for labor rights and the environment. The European Union ("EU") has the same view and concluded the Comprehensive Economic and Trade Agreement with Canada in 2016. Other countries such as China,[9] however, want to keep trade deals just to trade issues, avoiding non-economic issues in trade agreements such as labor rights, equity, social welfare, and environmental protection.[10]

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faq.html#.WiQcnEx2vIU [https://perma.cc/ZZ5W-PQHN] (outlining the evidence to support that humans are the main driver of climate change).

[5] *See* Press Release, World Energy Council, *World Energy Council Report Confirms Global Abundance of Energy Resources and Exposes Myth of Peak Oil* (Oct. 15, 2015), https://www.worldenergy.org/news-and-media/press-releases/world-energy-council-report-confirms-global-abundance-of-energy-resources-and-exposes-myth-of-peak-oil/ [https://perma.cc/5ZK6-8LNL] (noting that current estimates of energy reserves indicate an abundance of resources).

[6] *But see* MEGHAN L. O'SULLIVAN, WINDFALL: HOW THE NEW ENERGY ABUNDANCE UPENDS GLOBAL POLITICS AND STRENGTHENS AMERICA'S POWER (2017) (arguing that fears of energy scarcity have given way to the reality of energy abundance).

[7] *See* INT'L ENERGY AGENCY [IEA], *CO2 Emissions from Fuel Combustion: Highlights* (2017), https://www.iea.org/publications/freepublications/publication/CO2EmissionsfromFuelCombustionHighlights2017.pdf [https://perma.cc/CCE6-3W6V] (reviewing global CO2 emissions from fuel combustion).

[8] *See* Aleh Cherp & Jessica Jewell, *The Concept of Energy Security: Beyond the Four As*, 75 ENERGY POL'Y 415, 421 (2014) (examining a new conception of energy security as "low vulnerability of vital energy systems"); *see also* Muhammad Asif & Tariq Muneer, *Energy Supply, Its Demand and Security Issues for Developed and Emerging Economies*, 11 RENEWABLE & SUSTAINABLE ENERGY REV. 1388, 1413 (2007) (assessing the current and future energy situation by evaluating five countries with prominent roles in the energy scene).

[9] Interestingly, China's One Belt One Road Initiative, a massive infrastructure project, will have significant impacts on the energy market, with climate-related consequences. *What is China's One Belt, One Road?*, BBC NEWS (May 12, 2017), http://www.bbc.com/news/av/business-39881895/what-is-china-s-one-belt-one-road [https://perma.cc/MM7J-GWKA] (explaining China's One Belt, One Road policy).

[10] It is interesting to note the separationist approach of mainstream economics, which has mainly focused on efficiency to the detriment of equity and sustainability considerations. Such an approach has been heavily criticized by Her-

I argue that trade agreements can help mitigate climate change. In the past, they have been a very powerful instrument for change, as the following two examples demonstrate:

1. poverty reduction:[11] due to trade agreements,[12] one billion people have come out of poverty between 1990 and 2010;[13]

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man Daly in his prolific work. *See* H. DALY, BEYOND GROWTH: THE ECONOMICS OF SUSTAINABLE DEVELOPMENT, Beacon Press (1997); Daly, H.E., *Against Free Trade: Neoclassical and Steady-state Perspectives*, 5 J. EVOL. ECON. 313 (1995).

[11] *See, e.g.*, Ram Upendra Das, *Regional Trade-FDI-Poverty Alleviation Linkages in* REGIONAL INTEGRATION, ECONOMIC DEVELOPMENT AND GLOBAL GOVERNANCE 149 (Ulrich Volz ed., 2011) (exploring the linkages between trade, foreign direct investment, and poverty reduction); Masato Hayashikawa, *Trading Out of Poverty: How Aid for Trade Can Help*, Org. for Econ. Co-Operation & Dev. [OECD] (2008), https://www.oecd.org/site/tadpd/41231150.pdf [https://perma.cc/B5WB-DUXY] (discussing the various ways in which trade can be a tool for poverty reduction); Org. for Econ. Co-operation & Dev. [OECD], *Trade for Growth and Poverty Reduction: How Aid for Trade Can Help*, http://dx.doi.org/10.1787/9789264098978-en [https://perma.cc/43CC-BQ7A] (noting that aid-for-trade programs have a high potential to alleviate poverty); U.N. COMM'N ON TRADE & DEV., TRADE, INCOME DISTRIBUTION AND POVERTY IN DEVELOPING COUNTRIES: A SURVEY, U.N. Doc. UNCTAD/OSG/DP/2012/1 (2012), http://unctad.org/en/PublicationsLibrary/osgdp20121_en.pdf [https://perma.cc/WQ4D-QVT9] (surveying the effects of trade and trade liberalization on poverty); U.N. DEP'T OF ECON. & SOC. AFFAIRS, RETHINKING POVERTY: REPORT ON THE WORLD SOCIAL SITUATION 2010, U.N. Doc. ST/ESA/324, U.N. Sales No. E.09.IV.10 (2009) (exploring new strategies to alleviate poverty); World Bank Grp. & World Trade Org., THE ROLE OF TRADE IN ENDING POVERTY (2015), https://www.wto.org/english/res_e/booksp_e/worldbankandwto15_e.pdf [https://perma.cc/SWM9-3BSC] (arguing international trade is essential for ending poverty); World Bank Grp. [WBG], *Taking on Inequality: Poverty & Shared Prosperity 2016* (2016), https://openknowledge.worldbank.org/bitstream/handle/10986/25078/9781464809583.pdf [https://perma.cc/2U44-ZL4S] (offering five different policy areas where trade can best be used to reduce poverty).

[12] Some voices question that trade can ease poverty. *See* Nicole Hassoun, *Free Trade, Poverty, and Inequality*, Philosophy Faculty Scholarship, 2011, https://orb.binghamton.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1014&context=philosophy_fac [https://perma.cc/ADY8-2G8C] (claiming that the poverty indicators used to support free trade by international financial institutions are flawed and that poverty is worse than the studies show); INEQUALITY, GROWTH, AND POVERTY IN AN ERA OF LIBERALIZATION AND GLOBALIZATION (Giovanni A. Cornia ed., 2004) (evaluating within-country income equality over twenty years and the factors impacting it).

[13] *Towards the End of Poverty*, THE ECONOMIST (June 1, 2013), http://www.economist.com/news/leaders/21578665-nearly-1-billion-people-have-been-taken-out-extreme-poverty-20-years-world-should-aim [https://perma.cc/WHD7-8TZY] (arguing that governments should agree reduce the number of people in poverty by a billion).

and

2. the protection of human rights:[14] 75% of countries use trade agreements to protect human rights.[15]

So why not use trade agreements as a novel tool to solve one of the most important challenges of today, namely climate change, given that they are legally binding, unlike traditional environmental agreements?[16]

The purpose of this Article is to explore the potential of the trading system in contributing to decarbonization, focusing on the EU and international level.[17] The Article first sets the scene on how trade agreements may be a legal instrument to mitigate climate change and enhance sustainable energy.[18] It then provides an

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[14] *See* HUMAN RIGHTS AND INTERNATIONAL TRADE LAW (Thomas Cottier, Joost Pauwelyn, & Elisabeth Bürgi Bonanomi eds., 2005) (discussing obligations under human rights law related to trade); ANDREW LANG, WORLD TRADE LAW AFTER NEOLIBERALISM: REIMAGINING THE GLOBAL ECONOMIC ORDER (2011) (providing an overview of the tension between trade and human rights law); Clair Gammage, *Protecting Human Rights in the Context of Free Trade? The Case of the SADC Group Economic Partnership Agreement*, 20 EUR. L.J. 779, 792 (2014) (exploring the relationship between human rights and trade in the context of regional trade agreements).

[15] Susan A. Aaronson, *Human Rights in* PREFERENTIAL TRADE AGREEMENT POLICIES FOR DEV. 443, 466 (Jean-Pierre Chauffour & Jean-Chrisophe Maur eds., 2011), http://siteresources.worldbank.org/INTRANETTRADE/Resources/C21.pdf [https://perma.cc/P5KD-KZX8] (examining the outcomes of efforts to link trade to human rights). *See also* Anthony E. Cassimatis, HUMAN RIGHTS RELATED TRADE MEASURES UNDER INTERNATIONAL LAW (2007) (detailing trade measures meant to address human rights abuses).

[16] *See* Kenneth W. Abbott & Duncan Snidal, *Hard and Soft Law in International Governance*, 54 INT'L ORG. 421, 456 (2000) (evaluating contemporary international legalization and how it reflects the preferences of international actors); Alan Boyle, *Soft Law in International Law-Making in* INTERNATIONAL LAW 118 (Malcolm D. Evans ed. 2014) (expounding on the importance of soft law in the international legal framework); Thomas A. Mensah, *Soft Law: A Fresh Look at an Old Mechanism*, 38 ENVTL POL. & L. 50, 56 (2008) (noting that the difference between hard and soft law is not always easy to ascertain).

[17] *See generally* RAFAEL LEAL-ARCAS, THEORY AND PRACTICE OF EC EXTERNAL TRADE LAW AND POLICY (2008) (exploring the law and practice of European Community trade relations); RESEARCH HANDBOOK ON EU ENERGY LAW AND POLICY (Rafael Leal-Arcas & Jan Wouters eds., 2017) (reviewing research and trends in EU energy law and policy); RAFAEL LEAL-ARCAS, THE EUROPEAN ENERGY UNION: THE QUEST FOR SECURE, AFFORDABLE AND SUSTAINABLE ENERGY (2016) (arguing for the creation of a European Energy Union as an effective and viable solution to the energy security problems that the European Union).

[18] There is extensive literature on how trade in environmental goods can support a sustainable future. *See, e.g.*, Zhong Xiang Zhang, *Trade in Environmental*

analysis of the challenges of climate change mitigation and of enhancing sustainable energy in the transition towards a decarbonized economy.[19] The Article then provides the state of the art and subsequently offers to go beyond the state of the art in the trade field to help decarbonize the economy. Next, the Article provides a section on the synergistic links between the trading and climate regimes. The penultimate section offers forum options for dealing with the convergence of the trade and climate regimes with the aim of helping to mitigate climate change and enhance sustainable energy. The Article ends with what the future may hold regarding the links between international trade and renewable energy.

Goods, with Focus on Climate-friendly Goods and Technologies, *in* RESEARCH HANDBOOK ON ENVIRONMENT, HEALTH AND THE WTO 673, 673–99 (Geert Van Calster & Denise Prévost eds., 2013) (arguing that trade liberalization will lower prices and increase competition for climate-friendly technologies, thereby making it easier for countries to meet existing and future greenhouse gas emission commitments); Mark Wu, *Why Developing Countries Won't Negotiate: The Case of the WTO Environmental Goods Agreement*, 6 TRADE L. & DEV. 93, 93–94 (2014) (rejecting the conventional reasons offered to explain the resistance of developing countries to negotiate the reduction of trade barriers in environmental goods and offering several methods to entice developing countries to participate in the negotiations); Monica Araya, *The Relevance of the Environmental Goods Agreement in Advancing the Paris Agreement Goals and SDGs. A Focus on Clean Energy and Costa Rica's Experience*, INT'L CTR. FOR TRADE & SUSTAINABLE DEV. 9 (Dec. 2016), https://www.ictsd.org/sites/default/files/research/the_relevance_of_the_environmen-
tal_goods_agreement_in_advancing_the_paris_agreement_goals_and_the_sdgs_0.pdf [https://perma.cc/6BXR-4LP7] (concluding that the WTO Environmental Goods Agreement has the potential to boost clean energy development goals if its focus is broadened to include environmental services from a larger group of countries, particularly developing nations); Simon Lester & K. William Watson, *Free Trade in Environmental Goods: The Trade Remedy Problem*, CATO INST. FREE TRADE BULL. No. 54 1 (Aug. 19, 2013), https://www.cato.org/publications/free-trade-bulletin/free-trade-environmental-goods-trade-remedy-problem [https://perma.cc/ML33-EKYD] (discussing how better trade policy can lead to lower prices for solar, wind, and other environmental energy goods and services).

[19] It is interesting to note that, in the negotiations to the Paris Agreement on Climate Change, there were countries that opposed the term "decarbonization" in the text. *See* Lorenz Moosmann et al., *Implementing the Paris Agreement – Issues at Stake in View of the COP 22 Climate Change Conference in Marrakesh*, at 73–74, PE 587.319 (Oct. 2016) http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587319/IPOL_STU%282016%29587319_EN.pdf [https://perma.cc/P9FQ-FQA8] (observing that Saudi Arabia prominently opposed the inclusion of terms like "decarbonization" in the Paris Agreement).

2. SETTING THE SCENE

The twentieth century was characterized by a top-down approach to the governance of climate change mitigation, energy, and international trade. The twenty-first century, however, offers a bottom-up approach. One of the mega-trends of the twenty-first century is the shift to this bottom-up approach (in the true sense of the term, namely that power remains with the citizens) implementation of climate change mitigation plans—a creation of the Paris Agreement on Climate Change, which has become the locomotive of unilateral[20] climate action.[21] The same is true in energy governance, where we are witnessing an energy democratization by decentralizing the governance of energy security and creating new actors such as prosumers. But how about international trade governance? How can it be governed from the bottom up?

Sustainable energy is a burning issue in a world where 1.4 billion people still have no access to electricity.[22] A solution for sustainable energy is better governance of energy trade.[23] Energy security, or access to energy at an affordable price, is one of the main problems humanity faces.[24] Without access to energy, people and countries cannot develop their potential. Today's environmental

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[20] By unilateral action, we mean that the Paris Agreement promotes diversity in that countries are free to do unilaterally what they think is best for their own political economy in the fight against climate change. Countries, therefore, agree to collective targets, but can also implement their own goals.

[21] Unlike the UN Framework Convention on Climate Change of 1992, which divides countries into Annex I and non-Annex I countries and makes only Annex I countries bound to climate change mitigation, the Paris Agreement on Climate Change of 2015 proposes universal goals for climate change mitigation. At the COP 23 in November 2017, the US was rather passive given its intent to withdraw from the Paris Agreement. Without the US's leadership, it might be difficult to reach new climate rules and China may use the potential American absence to lead future negotiations.

[22] *See generally* RAFAEL LEAL-ARCAS ET AL., ENERGY SECURITY, TRADE AND THE EU: REGIONAL AND INTERNATIONAL PERSPECTIVES 40-41 (2016) (analyzing the existing energy security solutions through the international trade system, using the EU as a case study).

[23] *Id.* at 40.

[24] *See generally* RAFAEL LEAL-ARCAS, THE EUROPEAN ENERGY UNION: THE QUEST FOR SECURE, AFFORDABLE AND SUSTAINABLE ENERGY (2016) (proposing the emulation of common commercial policy to reach a common energy policy in the EU, analyzing the possible advancements of pan-European energy infrastructure through financial boost, and discussing the climate change mitigation by focusing on decarbonizing the economy and analyzing the 2015 Paris Agreement).

challenges are driving a shift from fossil fuels to clean and renewable energy,[25] i.e., energy from sustainable sources, as opposed to conventional sources such as oil, natural gas, or coal.[26] As the price of oil goes up, there will be a greater incentive for countries to invest in renewables to eventually obtain a cheaper, cleaner and more secure supply of energy.

These three necessities—energy that is affordable, secure, and clean—can be encompassed by the term "sustainable energy." This article aims to develop effective trade policy instruments for sustainable energy in the EU. Some have contested trade's positive impact in the world, but it can be a very strong tool which, in the context of sustainable energy, has been under-utilized and under-theorized.[27] When dealing with energy, the role of trade in production, transit, and export/import is very relevant.

Currently, governance of energy trade is fragmented, disjointed, with selective membership and guided by State interests. Think, for instance, of the following institutions and instruments that deal with energy trade: the World Trade Organization, preferential trade agreements, the Energy Charter Conference, the Organization of the Petroleum Exporting Countries or the Gas Exporting Countries Forum. This situation hinders transnational energy flows. Despite apparent overlaps between institutions and regimes involved in renewable energy trade governance, there are significant gaps in the system. The result is a mixed bag of incidental outcomes arising from an array of disjointed energy-related institutions and processes operating at various scales (bilateral, regional, etc.), often each with its own selective membership.

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[25] *See Commission Proposes New Rules for Consumer Centered Clean Energy Transition*, COM (Nov. 30, 2016) https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition [https://perma.cc/JAB3-92QF] (declaring that the European Union should lead the transition to clean energy with three goals in mind: "putting energy efficiency first, achieving global leadership in renewable energies and providing a fair deal for consumers.").

[26] *See generally* LEONARDO MASSAI, EUROPEAN CLIMATE AND CLEAN ENERGY LAW AND POLICY (2012) (giving an overview of the EU's climate and clean energy law and policy since early 1990s and the EU's position in the international climate dialogue, covering topics such as GHG emissions, renewable energy, energy efficiency, etc.).

[27] *See* GLOBAL GOVERNANCE THROUGH TRADE: EU POLICIES AND APPROACHES 92–123 (Jan Wouters et al. eds., 2015) (arguing that regional trade agreements can be leveraged to achieve sustainable energy goals while also promoting environmental protection).

This Article goes beyond examining the law and governance of international trade in energy and its effects on sustainable energy to identify existing knowledge gaps in energy trade governance in conjunction with non-economic aspects of trade policy. The approach of this Article is thus interdisciplinary and large-scale, bringing together a holistic analysis of the ever-growing and complex interface between trade and renewable energy from the perspective of law, political economy, and international relations,[28] taking into account the fact that the energy field has been traditionally led by economists.

3. THE CHALLENGE OF MITIGATING CLIMATE CHANGE AND ACHIEVING SUSTAINABLE ENERGY

Predictions are that the total world energy consumption will increase by 28% from 2015 through 2040.[29] As depicted in Figure 1, with the exception of coal,[30] energy usage from all sources will increase during that period.

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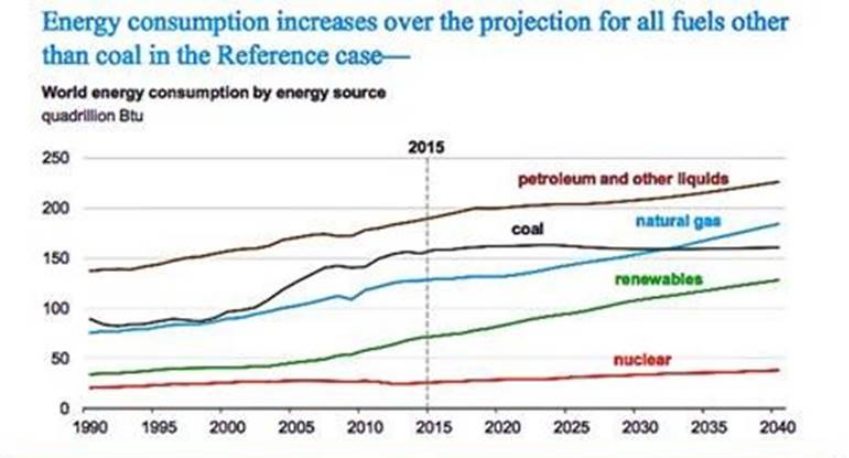
[28] *See generally* Joanna I. Lewis, *The Rise of Renewable Energy Protectionism: Emerging Trade Conflicts and Implications for Low Carbon Development*, 14 GLOBAL ENVTL. POL. 10, 10-35 (2014) (employing a framework that analyzes the global deployment of renewable energy through the lens of policy and legal research and international trade disputes).

[29] U.S. ENERGY INFO. ADMIN., INTERNATIONAL ENERGY OUTLOOK 2017 19 (2017), https://www.eia.gov/outlooks/ieo/pdf/0484(2017).pdf [https://perma.cc/C5E2-XW7Y]; *see also id.* at 8 ("The effects of economic growth assumptions on energy consumption are addressed in the High and Low Economic Growth cases. World gross domestic product (GDP) increases by 3.3%/year from 2015 to 2040 in the High Economic Growth case and by 2.7%/year in the Low Economic Growth case, compared with 3.0%/year in the Reference case.").

[30] Some EU governments are trying to shut down coal plants; the industry has reacted. *See Finland Considers Speeding Up Ban on Coal*, XINHUANET (Jan. 7, 2018, 5:51:20 AM), http://www.xinhuanet.com/english/2018-01/07/c_136877044.htm [https://perma.cc/2XHJ-QG9R] (showing that energy industry groups are opposing government plans to impose regulations that would prohibit or decrease the use of coal); *see also* Adam Vaughan, *UK Government Spells Out Plan to Shut Down Coal Plants*, THE GUARDIAN (Jan. 5, 2018, 9:34:00 AM), https://www.theguardian.com/business/2018/jan/05/uk-coal-fired-power-plants-close-2025 [https://perma.cc/8XUS-U4TR] (demonstrating that governments can implement regulations resulting in the phase-out of coal plants).

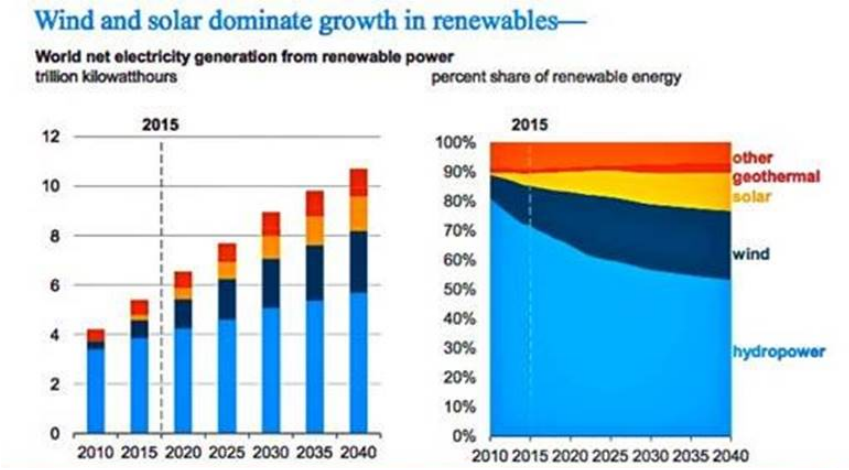
Figure 1: Energy consumption up to 2040



Source: U.S. Energy Information Administration

As depicted in Figure 2, renewables are projected to supply 31% of world electricity generation in 2040. The great advantage of electricity is that it is difficult to monopolize because it can be produced from several sources of fuel—from natural gas, wind, solar, or biomass. In addition, if the weather conditions are right, both rich and poor countries are capable of producing electricity, particularly from renewables.

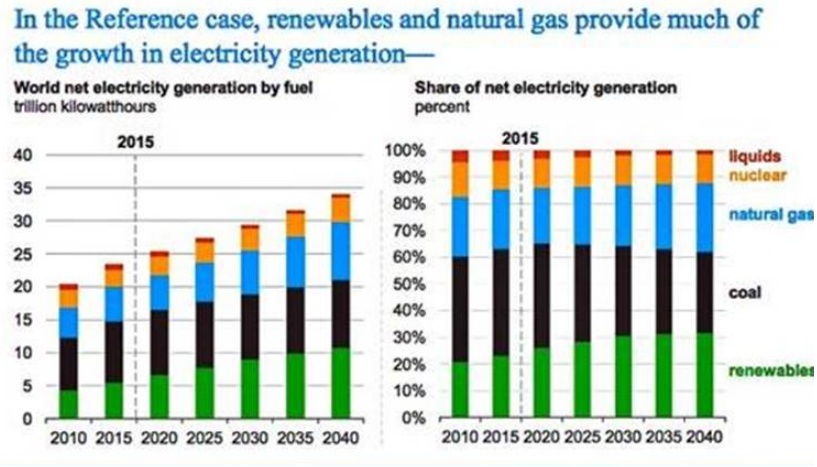
Figure 2: Share of renewables in world electricity generation



Source: U.S. Energy Information Administration

`Although wind and solar power will see the most growth among renewables for electricity generation, hydro will remain the largest single source of renewable electricity generation in the world (see Figure 3).

Figure 3: Input of wind and solar in renewable energy



Source: U.S. Energy Information Administration

With its extreme reliance on the rest of the world for its energy supply[31] and, consequently, its energy security,[32] it is in the EU's interest to diversify its energy sources and supply channels, and also increase energy efficiency by promoting more sustainable practices and greater energy market integration, which will enhance the EU's renewables potential. In fact, we see efforts in those directions through the promotion of the EU's Internal Energy Mar-

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[31] *See generally* Daniel Yergin, *Ensuring Energy Security*, FOREIGN AFF., (2006) (acknowledging the fact that the entire energy supply chain needs to be protected); *see also* DANIEL YERGIN, THE PRIZE: THE EPIC QUEST FOR OIL, MONEY AND POWER (2008), (discussing politically worrisome signs of stress throughout the US energy supply system); DANIEL YERGIN, THE QUEST: ENERGY, SECURITY, AND THE REMAKING OF THE MODERN WORLD (2011) (understanding the risks and requirements of energy security in the twenty-first century).

[32] *See generally* Jerry Taylor & Peter Van Doren, *The Energy Security Obsession*, 6 GEO. J. L. & PUB. POL'Y 475 (2008) (discussing the wide gulf between the way foreign policy elites view energy security and the way economists view energy security); *see also* David G. Victor & Linda Yueh, *The New Energy Order: Managing Insecurities in the Twenty-first Century*, FOREIGN AFF. 89 (2010) (positing that the world's energy market is becoming increasingly fragmented, necessitating a shift to new approaches to reliably supply the world's energy needs).

ket and the Energy Community. Trade policy and regulation can be instrumental in achieving these goals. For example, there is potential to incorporate renewable energy provisions within the EU's numerous regional trade agreements (RTAs);[33] there are trade incentives to better manage competition and invest in green technologies; there are possibilities for exporting cutting-edge EU technologies through the EU's trade and bilateral cooperation agreements.

Access to energy (and renewables more specifically) is a common concern and requires local and global action.[34] Currently, there is no cohesive governance for global energy trade, which has implications for renewable energy trade governance. Governance of energy trade arises by default, rather than design, through the *ad hoc* interplay of different aspects of the international economic system.[35] Many institutions involving different actors and geographical scope address energy security. If combined with climate change mitigation, there are studies that identify over sixty,[36] and even hundreds, of transnational organizations that deal with its

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[33] *See generally* Nicolas A.J. Croquet, The climate-change norms under the EU-Korea Free Trade Agreement: between soft and hard law, *in* GLOBAL GOVERNANCE THROUGH TRADE EU POLICIES AND APPROACHES 124–157 (Jan Wouters et al. eds., 2015) (offering a view into how the EU has implemented renewable energy goals in the context of the EU-Korea free trade agreement); *see also* Sikina Jinnah & Elisa Morgera, *Environmental Provisions in American and EU Free Trade Agreements: A Preliminary Comparison and Research Agenda*, REV. OF EUR., COMP. & INT'L ENVTL L. 324 (2013) (illuminating the differing approaches of the EU and America in incorporating environmental provisions into free trade agreements); Jean Frederic Morin & Rosalie Gauthier Nadeau, *Environmental Gems in Trade Agreements: Little-known Clauses for Progressive Trade Agreements*, CTR. FOR INT'L GOVERNANCE INNOVATION PAPERS (2017) (spotlighting important environmental provisions in recent trade agreements to identify best practices for future agreements).

[34] Jay Walljasper, *Elinor Ostrom's 8 Principles for Managing a Commons* (Oct. 2, 2011), http://www.onthecommons.org/magazine/elinor-ostroms-8-principles-managing-commmons#sthash.9MPxgwbH.dpbs [https://perma.cc/XA82-4MUG].

[35] *See generally* Ann Florini & Benjamin K. Sovacool, *Bridging the Gaps in Global Energy Governance,* 17 GLOBAL GOVERNANCE 57 (2011) (laying out global energy related issues to clarify areas needing further research); *see also* Ann Florini & Benjamin K. Sovacool, *Who Governs Energy? The Challenges Facing Global Energy Governance*, 37 ENERGY POL'Y 5239 (2009) (exploring the existing global energy governance system and providing support for the system's usefulness in tackling global energy issues).

[36] *See generally* Harriet Bulkeley et al., *Governing Climate Change Transnationally: Assessing the Evidence from a Database of Sixty Initiatives*, 30 ENV'T & PLAN. C: GOV'T & POL'Y 591 (2012) (analyzing sixty transnational governance initiatives and their implications on governing climate change).

governance.[37] As a result, we have a polycentric and very complex institutional structure.[38] While its polycentric nature is not a problem *per se*—in fact, arguably the complexity of the energy system lends itself to polycentric governance[39]—the situation has resulted in a fragmentation of the global[40] and European energy trade regimes, a lack of cohesiveness of the global and European energy trade systems, divergent national interests, and a diversity of energy sources.[41] For such a polycentric system to succeed, a high level of coordination and trust is necessary between the various actors involved. As it stands, the governance regime for energy trade is not conducive to EU sustainable energy.

How can we explain the proliferation of energy security institutions? Some scholars focused on the international level suggest that the regulatory activity of various international institutions represents a 'regime complex.'[42] This concept is used to refer to 'partially overlapping and nonhierarchical institutions governing a particular issue-area.'[43] Others propose understanding the

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[37] *See generally* Jessica F. Green, *Private Standards in the Climate Regime: The Greenhouse Gas Protocol*, 12 BUS. & POL. 1 (2010) (explaining the success of NGOs in causing the adoption of greenhouse gas emissions standards by private companies).

[38] *See generally* Kenneth W. Abbott, *The Transnational Regime Complex for Climate Change*, 30 ENV'T & PLAN. C: GOV'T & POL'Y 571 (2012) (generating frameworks to analyze the proliferation of transnational climate governance).

[39] *See generally* Philip Andrews-Speed & Xunpeng Shi, *What Might the G20 Under China's Presidency Deliver for Global Energy Governance?*, ENERGY STUD. INST. POL'Y BRIEF 8 (2015) (observing that the G20 is a good forum for the promotion and creation of global energy governance).

[40] *See generally* Timothy Meyer, *Global Public Goods, Governance Risk, and International Energy*, 22 DUKE J. COMP. & INT'L L. 319 (2012) (showing that the design of some international institutions increases the chance of gridlock concerning public goods, like climate change regulation).

[41] *See generally* Rafael Leal-Arcas & Andrew Filis, *Conceptualizing EU Energy Security Through an EU Constitutional Law Perspective*, 36 FORDHAM INT'L L.J. 1225 (2013) (focusing on EU energy production and consumption, and the challenges the EU faces in striving to create a compatible energy and security policy).

[42] *See generally* Robert O. Keohane & David G. Victor, *The Regime Complex for Climate Change*, 9 PERSP. ON POL. 7 (2011) (holding that the current global climate regime—a loose configuration of institutions—is better equipped to tackle climate change than a comprehensive global regime) ; *see also* Amandine Orsini et al., *Regime Complexes: A Buzz, a Boom, or a Boost for Global Governance*, 14 GLOBAL GOVERNANCE, 419 (2013) (building out a more comprehensive understanding of regime complexes in various areas of global governance).

[43] *See generally* Kal Raustiala & David G. Victor, *The Regime Complex for Plant Genetic Resources*, 58 INT'L ORG. 277 (2004).

governance activities by private and public actors in terms of a 'transnational regime complex,' which is composed of civil-society organizations, governments, and business, which is coined as 'governance triangle.'[44] In the same manner, how can we explain the fragmentation of renewable energy governance? And does it lead to forum-shopping?[45]

At the European level, it is vital that the EU take the right steps and decisions to ensure sustainable energy. A more cohesive governance system for energy trade would facilitate renewable energy usage, avoid unnecessary legal disputes and provide predictability. Achieving this will require a thorough understanding of the elements, workings, and evolution of the current energy trade governance regime and its consequences for European sustainable energy.

Energy trade is a key component of both the global and EU economies, and international trade in renewable energy spans a number of policy areas, including trade, investment, economic development, and environmental protection. The very nature of energy—namely its centrality to almost every field of human endeavor—and the very nature of traditional energy resources—namely finiteness, uneven distribution, and high desirability—lead to the politicization of energy and encourage intense competition for control over energy resources between actors.[46] While energy supply and consumption are important aspects of the global and EU energy economy,[47] they do not exist in an equilibrious relation-

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[44] *See generally* Kenneth W. Abbott & Duncan Snidal, *The Governance Triangle: Regulatory Standards Institutions and the Shadow of the State*, *in* THE POLITICS OF GLOBAL REGULATION (Walter Mattli & Ngaire Woods eds., 2009) (examining the role of non-state actors in providing "regulatory standard-setting" internationally).

[45] *See generally* Karen J. Alter & Sophie Meunier, *The Politics of International Regime Complexity*, 7 PERSP. ON POL. 13 (2009) (discussing the challenges of an increase in international regimes and impact on international cooperation, as well as the politics of power-play that arise in such a system).

[46] *See generally* PHILIP ANDREWS-SPEED, INTERNATIONAL COMPETITION FOR RESOURCES: THE ROLE OF THE LAW, THE STATE, AND OF MARKETS (2008); *see also* NICO SCHRIJVER, SOVEREIGNTY OVER NATURAL RESOURCES: BALANCING RIGHTS AND DUTIES 1–29 (1997) (studying the impact of sovereignty on states' rights as well as duties with regard to their natural resources); ENERGY AND THE TRANSFORMATION OF INTERNATIONAL RELATIONS (Andreas Wenger et al. eds., 2009) (focusing on how energy affects conflict and cooperation among consuming and producing nations).

[47] *See generally* DANIELYERGIN, THE QUEST: ENERGY, SECURITY, AND THE REMAKING OF THE MODERN WORLD (2011), *supra* note 31 (discussing the apparent

ship. Rather, they are heavily mediated by political considerations and by the very operation of global markets,[48] which dictate the extent to which energy needs are ultimately met.

The dominant opinion is that trade liberalization will increase economic activity[49] and therefore energy consumption. All countries require energy resources, but few possess them, and thus trade in fossil fuels (primarily oil and gas) and renewables is crucial to fulfill global energy needs.[50] Moreover, how energy from traditional sources is governed has an impact on renewable energy governance. Internationally, there is more trade in oil than in any other good or service. Half of world trade in services is energy-dependent. Yet, the GATT/WTO has historically not preoccupied itself with energy trade. Very few energy-rich countries saw a need to join the GATT/WTO club, given that the reduction of import restrictions—one of the main goals of the multilateral trading system—is not an issue when it comes to energy. Saudi Arabia, one of the main energy-producing countries in the world, only joined the World Trade Organization (WTO) in 2005 and several energy-producing countries are still not WTO Members.

The Article will focus on the trade aspects of renewable energy governance and on how they could be adjusted to better promote sustainable energy in the EU. EU sustainable energy depends upon institutionalized energy-related internal as well as international cooperation.[51] For instance, effective systems for energy trade and energy transit enhance energy security for those economies involved in such cooperation. At the domestic level, a single agent—namely the State—is the authority that adopts measures towards

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stress on the U.S. energy supply system).

48 *See generally* GEORGE A. AKERLOF & ROBERT J. SHILLER, PHISHING FOR PHOOLS: THE ECONOMICS OF MANIPULATION AND DECEPTION (2015) (illustrating how the free market results in sellers utilizing deceptive practices in order to maximize profit and outlining ways in which individuals have combatted such trickery).

49 *See* DANI RODRIK, THE GLOBALIZATION PARADOX: DEMOCRACY AND THE FUTURE OF THE WORLD ECONOMY 47–66 (2011) (exploring how free trade benefits countries and arguing for a new approach to promoting the benefits of trade liberalization).

50 *See generally* GIACOMO LUCIANI, SECURITY OF OIL SUPPLIES: ISSUES AND REMEDIES (2013) (surveying a variety of topics concerning the security of oil, including: resource nationalism, armed conflicts, the transportation of oil, strategic oil stocks, and international oil markets).

51 *See* Maya Jegen, *Two Paths to Energy Security: The EU and NAFTA*, 66 INT'L J. 73, 73 (2010) (discussing the interrelation of energy security, climate change, and open markets).

the energy security of the territory/economy that it controls.[52] Such an agent is not omnipotent in its attempts towards energy security, given that energy security often relies on factors—e.g., energy commodities' price and availability—over which it has little or no control.

At the EU level, there are numerous actors who have influence over the energy economy, including EU and Member State bodies. This plurality of actors and the variety of interests at play—e.g., interests across the national-regional-international spectrum, the public-private spectrum,[53] and across the policy spectrum—mean that the achievement of EU sustainable energy is a considerably complex challenge.[54] While all sovereign actors/economies have an interest in their respective energy security, global energy security is a concern to none. As such, global energy security is not currently considered a common concern as is climate change.[55] In that respect, this Article aims to shed light on incentives for States to cooperate on sustainable energy, highlighting ways in which it is, in fact, a common concern.

At the international level, the EU is one of a patchwork of institutions that may have implications for cross-border energy trade.[56] While the EU lacks the powers of a sovereign actor to diplomatical-

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52 *See generally* MICHAEL J. GRAETZ, THE END OF ENERGY: THE UNMAKING OF AMERICA'S ENVIRONMENT, SECURITY, AND INDEPENDENCE (2011) (arguing that Americans have experienced forty years of energy policy incompetence and that better policy decisions are required to prevent harmful effects on American environment, security, and independence).

53 *See generally* PAUL HAWKEN, THE ECOLOGY OF COMMERCE: A DECLARATION OF SUSTAINABILITY (2010) (claiming that business both causes the most harm to the environment and possesses the greatest potential to tackle the globe's sustainability problems).

54 *See generally* ANDREAS GOLDTHAU & JAN MARTIN WITTE, GLOBAL ENERGY GOVERNANCE: THE NEW RULES OF THE GAME 73–98 (2010) (outlining the major energy trends and how regulatory institutions spanning the globe can best adapt their governance systems to the new challenges).

55 *See* RAFAEL LEAL-ARCAS, CLIMATE CHANGE AND INTERNATIONAL TRADE 1–23 (2013) (offering the view that international trade regimes are tackling climate change and exploring how the international community can effectively respond to climate change through the international trading system).

56 *See* Sijbren de Jong & Jan Wouters, *Institutional Actors in International Energy Law*, 115 LEUVEN CTR. FOR GLOBAL GOVERNANCE STUD. 1, 21 (2013) (finding that "the contemporary international institutional energy architecture represents a strongly fragmented 'patchwork' of organisations and fora, each with its own member base, different degree of institutionalisation and enforcement capability.").

ly pursue its energy security in the manner that China or the US may, it does possess a comprehensive energy policy that is multi-faceted and that makes good use of the powers that lie within its competencies.[57] The WTO also provides governance over trade within its scope, including over energy trade. Many other institutions exist that provide degrees of governance over aspects of trade in energy at the inter-State level. This patchwork of institutions and regimes amounts to a sort of "accidental" energy trade governance regime, and presents some areas of overlap. For instance, both the WTO and the Energy Charter Treaty (a 1994 multilateral treaty that regulates energy) have rules that apply to the trade, investment, and environmental-protection aspects of energy. These overlapping rules in no way amount to cohesive governance of energy trade.

4. STATE OF THE ART

Existing literature has taken a comparative approach,[58] but focuses only on some aspects of the problem. Some have carried out their comparative analyses on the trade aspects of energy;[59] others

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[57] *See* SANAM SALEM HAGHIGI, ENERGY SECURITY: THE EXTERNAL LEGAL RELATIONS OF THE EUROPEAN UNION WITH MAJOR OIL AND GAS SUPPLYING COUNTRIES 1–8 (2007) (arguing that EU energy security depends on a triangular approach, which encompasses cohesion among member states on issues of energy policy, recognizing and cooperating with the development goals of oil-producing countries, and a focus on political cooperation with energy-producing countries).

[58] *See generally* ENERGY SECURITY FOR THE EU IN THE 21ST CENTURY: MARKETS, GEOPOLITICS AND CORRIDORS (Jose Maria Marin-Quemada et al. eds., 2012) (providing a comprehensive analysis of energy risks facing the EU as well as evaluating both the individual and collective energy security policies of the EU member states); THE PROSPECTS OF INTERNATIONAL TRADE REGULATION: FROM FRAGMENTATION TO COHERENCE (Thomas Cottier et al. eds., 2011) (examining how international trade regulation in areas ranging from environmental protection to labor standards); Rafael Leal-Arcas & Andrew Filis, *The Fragmented Governance of the Global Energy Economy: A Legal-Institutional Analysis*, 6 J. WORLD ENERGY L. BUS. 1 (2013) (dissecting the current multi-faceted regulatory environment governing global energy security and investigating models of governance to improve global energy security); Benjamin K. Sovacool, *An International Comparison of Four Polycentric Approaches to Climate and Energy Governance,* 39 ENERGY POL. 3832 (2011) (exploring a polycentric approach to climate and energy governance in which different actors—businesses, politicians, regulators, and individuals—and scales of governance—local, regional, national, and global—interact to overcome collective action problems in addressing energy and climate governance).

[59] *See generally* REGULATION OF ENERGY IN INTERNATIONAL TRADE LAW: WTO,

on the external dimension of EU energy law and policy[60] or the internal dimension of EU energy policy;[61] others on the interrelationships between trade,[62] investment,[63] transit[64] and/or envi-

NAFTA, AND ENERGY CHARTER (Yulia Selivanova ed., 2011) (presenting a holistic view of how trade law interacts with energy transactions while detailing the regulatory gaps and uncertainties stemming from the various sources of trade law); UN Conference on Trade and Development, *Trade Agreements, Petroleum and Energy Policies* (2000) (assisting with the challenges specific to petroleum-producing countries in the decision-making processes surrounding trade negotiations); Paolo Davide Farah & Elena Cima, *WTO and Renewable Energy: Lessons from the Case Law*, 49 J. WORLD TRADE 1103 (2015) (characterizing WTO treatment of subsidies generally and whether that framework will be adequate for the purpose of renewable energy subsidies); MAKING GLOBAL ECONOMIC GOVERNANCE EFFECTIVE: HARD AND SOFT LAW INSTITUTIONS IN A CROWDED WORLD (John Kirton et al. eds. 2010) (offering an analysis of existing international institutions and how they can be improved to address new challenges from an increasingly globalized world); Susan L. Sakmar, *Bringing Energy Trade into the WTO: The Historical Context, Current Status, and Potential Implications for the Middle East Region* 18 IND. INT'L. COMP. L. REV. 96 (2008) (discussing how the evolving treatment of oil at the WTO will impact the Middle East, the geopolitics of oil, EU trade proposals on energy, and additional proposals for freer trade in energy services).

60 *See generally* DECARBONIZATION IN THE EUROPEAN UNION: INTERNAL POLICIES AND EXTERNAL STRATEGIES (Claire Dupont & Sebastian Oberthuer eds., 2015) (examining the EU's objective to reduce greenhouse gas emissions by 80-95% by 2050 and how that will impact EU relations with external energy partners); ANDREAS GOLDTHAU & NICK SITTER, A LIBERAL ACTOR IN A REALIST WORLD: THE EUROPEAN UNION REGULATORY STATE AND THE GLOBAL POLITICAL ECONOMY OF ENERGY (2015) (detailing EU policies in oil, gas, and climate change); KIM TALUS, EU ENERGY LAW AND POLICY: A CRITICAL ACCOUNT (2013) (describing EU energy law and policy, its geopolitical aspects, and how it has changed over time).

61 *See* Florian Baumann, *Europe's Way to Energy Security. The Outer Dimensions of Energy Security: From Power Politics to Energy Governance*, 15 EUR. FOREIGN AFF. REV. 77, 77–95 (2010) (discussing European energy security).

62 *See* Wen-Chen Shih, *Energy Security, GATT/WTO, and Regional Agreements*, 49 NAT. RES. J. 433, 433–484 (2009) (discussing the role of the WTO and regional agreements in the context of energy security).

63 *See generally* Arunabha Ghosh, *Seeking Coherence in Complexity? The Governance of Energy by Trade & Investment Institutions*, 2 GLOBAL POL'Y 106 (2011) (describing how the international energy law framework is impacted by trade law and the mandates of numerous institutions and agreements); World Energy Council, *World Energy Perspectives: Rules of Trade and Investment* 4–7, (2016), https://www.worldenergy.org/wp-content/uploads/2016/08/Full-report__Non-tariff-measures_next-steps-for-catalysing-the-low-carbon-economy.pdf [https://perma.cc/M57J-LW86] (proposing the reduction in non-tariff measures that affect the low-carbon energy sector to support effective and efficient decarbonization).

64 *See generally* KATJA YAFIMAVA, THE TRANSIT DIMENSION OF EU ENERGY SECURITY: RUSSIAN GAS TRANSIT ACROSS UKRAINE, BELARUS, AND MOLDOVA (2011) (providing a framework for understanding the gas relationship between Europe, Russia, and the Western Commonwealth of Independent States).

ronmental agendas[65] vis-à-vis energy;[66] and others, while having carried out thorough cross-policy comparative examinations,[67] do

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[65] *See generally* DANIEL C. ESTY, GREENING THE GATT: TRADE, ENVIRONMENT, AND THE FUTURE (1994) (arguing for reform in the international trade rules and institutions in order to address environmental concerns); Thijs Van de Graaf, *Fragmentation in Global Energy Governance: Explaining the Creation of IRENA,* 13 GLOBAL ENVTL. POL. 14 (2013) (detailing the creation of IRENA and arguing that it was a result of institutions hedging against the perceived fossil fuel and nuclear bias of the IEA); Lakshman Guruswamy, *Energy and Environmental Security: The Need for Action,* 3 J. ENVTL. L. 209 (1991) (arguing that the environmental security and energy security challenges faced in the United States are a result of dependence on fossil fuels); Edith Brown Weiss, *Integrating Environment and Trade*, 19 J. INT'L. ECON. L. 367–369 (2016) (exploring the "difficulty [of] how to reconcile legitimate environment and trade concerns and to have the two bodies of law work together to address urgent problems today, especially climate change"); Jorgen Wettestad, *Interaction Between EU Carbon Trading and the International Climate Regime: Synergies and Learning*, 9 INT'L. ENVTL. AGREEMENTS: POL. L. ECON., 393–408 (2009) (analyzing the interaction between the EU emissions trading system and the international climate regime); Steven Yamarik & Sucharita Ghosh, *Do Regional Trading Arrangements Harm the Environment? An Analysis of 162 Countries in 1990* 6(2) APPLIED ECONOMETRICS & INT'L DEV. 15 (2006) (evaluating how regional trade agreements impact the environment); Rafael Leal-Arcas, *Trade Proposals for Climate Action*, 6 TRADE L. DEV. 11 (2014) (examining the ways trade policy, and in particular trade agreements, can promote positive environmental results, particularly in the context of climate change); Scott Barrett, *Climate Change and International Trade: Lessons on Their Linkage from International Environmental Agreement*s (2010), https://www.wto.org/english/res_e/reser_e/climate_jun10_e/background_paper6_e.pdf (explaining how linking trade and the environment was a success for the protection of the ozone layer and why a similar approach will not work for climate change).

[66] *See generally* GLOBAL CHALLENGES AT THE INTERSECTION OF TRADE, ENERGY AND THE ENVIRONMENT (Joost Pauwelyn ed. 2010) (compiling a variety of perspectives in order to determine how best to improve well-being through trade while simultaneously protecting the environment and optimizing the use of energy resources).

[67] *See generally* ENERGY SECURITY: MANAGING RISK IN A DYNAMIC LEGAL AND REGULATORY ENVIRONMENT (Barry Barton et al. eds., 2004) (providing an overview of energy security issues and themes and analyzing the approaches of a variety of countries before ultimately forecasting trends); MICHAEL B. MCELROY, ENERGY: PERSPECTIVES, PROBLEMS, AND PROSPECTS (2009) (explaining how humans came to be in a position to have such a significant effect on the global environment and what can be done to improve energy sustainability); JOSE GOLDEMBERG, ENERGY: WHAT EVERYONE NEEDS TO KNOW (2012) (explaining the world energy system); THIJS VAN DE GRAAF, THE POLITICS AND INSTITUTIONS OF GLOBAL ENERGY GOVERNANCE (2013) (providing an analysis of international energy cooperation and the potential for reform at the IEA); Benjamin K. Sovacool & Ann Florini, *Examining* the *Complications of Global Energy Governance,* 30 J. ENERGY & NAT. RES. L. 235 (2012) (examining the difficulties associated with global energy governance and arguing that a more nuanced approach is required); Matthew Smith & Naing Htoo, *Energy Security: Security for Whom?,* 11 YALE HUM. RTS. & DEV. L. J. 217 (2008) (assessing the human rights implications of natural gas extraction in Burma).

not explore the systemic implications of their subject matter for EU energy security *per se*.[68] Moreover, there is literature on the implications of global[69] and regional systems on energy security,[70] specific to certain structures—e.g., the EU[71] and the North American Free Trade Agreement—and to limited memberships.[72] Other research looks at the relationship of regional or sectoral systems for global energy governance,[73] but does not focus comprehensively

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[68] *See generally* INTERNATIONAL ENERGY GOVERNANCE: SELECTED LEGAL ISSUES (Rafael Leal-Arcas et al. eds., 2014) (surveying a variety of legal issues concerning energy such as energy market liberalization and energy exploration); ANGUS JOHNSTON & GUY BLOCK, EU ENERGY LAW (2012); THE ROUTLEDGE HANDBOOK OF ENERGY SECURITY (Benjamin Sovacool ed., 2011) (analyzing differing conceptions of energy security and ways that it can be measured nationally and internationally).

[69] *See generally* Fatih Birol, *Energy for All: The Next Challenge*, 3 GLOBAL POL'Y 184 (2012) (discussing issues related to universal access to modern energy services); Benjamin K. Sovacool & Ann Florini, *Examining the Complications of Global Energy Governance*, 30 J. ENERGY & NAT. RESOURCES L., 235 (2012) (examining fundamental obstacles to effective global energy governance); Aleh Cherp, Jessica Jewell, & Andreas Goldthau, *Governing Global Energy: Systems, Transitions, Complexity*, 2 GLOBAL POL'Y 75 (2011) (discussing the need for a polycentric governance system to meet interlinked energy challenges); Navroz K. Dubash, & Ann Florini, *Mapping Global Energy Governance*, 2 GLOBAL POL'Y 6 (2011) (discussing the challenges inherent in addressing global energy policy).

[70] *See generally* A. F. M. Maniruzzaman, *Towards Regional Energy Co-Operation in the Asia-Pacific: Some Lessons from the Energy Charter Treaty*, 3 J. WORLD INV. 1061 (2002) (addressing the importance of and challenges that arise from energy cooperation in the Asia-Pacific region).

[71] *See generally* EU ENERGY INNOVATION POLICY TOWARDS 2050 (Jean-Michel Glachant, Nicole Ahner & Leonardo Meeus eds., 2012) (discussing the roadmap and challenges that come with planning future EU energy police); JEAN-MICHEL GLACHANT ET AL., A NEW ARCHITECTURE FOR EU GAS SECURITY OF SUPPLY (2012) (exploring current EU gas security of supply governance in evaluating whether the EU in on track to meet their European supply security policy goals).

[72] *See generally* Sijbren de Jong & Jan Wouters, *Institutional Actors in International Energy Law* (Leuven Centre for Global Governance Studies, Working Paper No. 115, 2013) (assessing the merits and shortcomings of international organizations within the energy field).

[73] *See generally* ENERGY SECURITY: MANAGING RISK IN A DYNAMIC LEGAL AND REGULATORY ENVIRONMENT (Barry Barton et al. eds., 2004) (discussing energy security on international, regional, and national levels); Neil Gunningham, *Confronting the Challenge of Energy Governance*, 1 TRANSNAT'L ENVTL. L. 119 (2012) (examining "what forms of energy law, regulation and governance are most needed to overcome these challenges and whether answers are most likely to be found in hierarchy, markets, or networks"); DYNAMICS OF ENERGY GOVERNANCE IN EUROPE AND RUSSIA (Caroline Kuzemko et al. eds., 2012) (addressing energy issues in both Europe and Russia by focusing on questions of energy governance through an international political economy perspective); Rafael Leal-Arcas, *The EU and Russia as Energy Trading Partners: Friends or Foes?*, 14 EUR. FOREIGN AFF. REV. 337 (2009) (ex-

on EU sustainable energy.

5. MAKING GREATER USE OF THE TRADING SYSTEM

5.1. Rationale

Scholars have explained climate change activities in terms of multilevel governance,[74] transnational governance,[75] polycentricity,[76] or fragmentation.[77] This article will go a step further and look at how the trading system can be used as a vehicle to mitigate climate change, enhance energy security and help grow economies.[78] Is there a transnational legal order for renewables? If so, what are its boundaries? If not, why does it not yet exist?

Very little theoretical work exists on renewable energy law and even less on trade in renewables law, so this article will address an important knowledge gap from an interdisciplinary perspective.

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amining the potential for a European Commission and Russia trade partnership).

[74] *See generally* Hari M. Osofsky, *Local Approaches to Transnational Corporate Responsibility: Mapping the Role of Subnational Climate Change Litigation*, 20 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 143 (2007) (analyzing the impact of subnational tribunals on climate change litigation).

[75] *See generally* Philipp Pattberg, & Johannes Stripple, *Beyond the Public and Private Divide: Remapping Transnational Climate Governance in the 21st Century*, 8 INT'L. ENVTL. AGREEMENTS: POL., L. & ECON. 367 (2008) (discussing the need for non-state and transnational approaches in dealing with climate change).

[76] Elinor Ostrom, *A Polycentric Approach for Coping with Climate Change* (World Bank, Policy Research Working Paper No. 5095, 2009) (arguing that climate change poses a collective action problem that is best addressed at multiple scales and levels).

[77] *See generally* Cinnamon Pinon Carlarne, *Good Climate Governance: Only a Fragmented System of International Law Away?*, 30 L. & POL'Y 450 (2008) (advocating minimizing gaps between environmental law and other areas of international law in order to develop a system of global climate governance); William Boyd, *Climate Change, Fragmentation, and the Challenges of Global Environmental Law: Elements of a Post-Copenhagen Assemblage*, 32 U. OF PA. J. INT'L L. 457 (2010) (discussing the fragmentation and challenges that face global climate governance in since the 2009 UN climate conference in Copenhagen).

[78] *See generally* Céline Bak, *Growth, Innovation and Trade in Environmental Goods* (Center for International Governance Innovation, Policy Brief No. 67, 2015) (discussing the impact of global trade in environmental goods on climate change); KATE RAWORTH, DOUGHNUT ECONOMICS: SEVEN WAYS TO THINK LIKE A 21ST-CENTURY ECONOMIST (Joni Praded ed., 2017) (discussing economic ways of thought and potential benefits to the environment); HERMAN E. DALY, BEYOND GROWTH: THE ECONOMICS OF SUSTAINABLE DEVELOPMENT (1997) (criticizing mainstream economics for prioritizing efficiency over equity and for wrongfully assuming that efficiency and equity are necessarily competing goals).

As a result, it will create a new field of research and open up new horizons for scholarship in three ways: 1) by exploring how trade can promote renewable energy thereby helping to mitigate climate change;[79] 2) through the application of our findings to other areas of sustainable development, such as trade and gender issues;[80] and 3) by addressing how trade is underutilized as a tool to promote issues of global common concern.

We stand to achieve considerable gains when trade law becomes a tool for change.[81] Trade law can help mitigate climate change and enhance sustainable energy.[82] And it is well known that, thanks to trade, countries grow economically.[83] Trade brings the triple benefit of economic, environmental, and social impact. But can countries grow sustainably?[84] This hypothesis—that trade

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79 For some preliminary work, *see* RAFAEL LEAL-ARCAS & EDUARDO ALVAREZ ARMAS, EU CLIMATE DIPLOMACY: POLITICS, TECHNOLOGY AND NETWORKS (Stephen Minas & Vassilis Ntousas eds., 2018).

80 *See generally* Women Watch, *Gender Equality & Trade Policy*, (Resource Paper, 2011), http://www.un.org/womenwatch/feature/trade/gender_equality_and_trade_policy.pdf (linking gender equality and trade policy); JANET DINE, COMPANIES, INTERNATIONAL TRADE, AND HUMAN RIGHTS (2005) (evaluating the roles companies play in trade and globalization and how they fail to achieve basic human rights).

81 *See generally* WTO, *Harnessing Trade for Sustainable Development and a Green Economy* (2011), https://www.wto.org/english/res_e/publications_e/brochure_rio_20_e.pdf [https://perma.cc/5G9J-XSXP] (assessing the discussions and potential gains that trade can contribute to sustainable development and a green economy).

82 *See* Pascal Lamy, Director-General, WTO Speech at Yale University: The "Greening" of the WTO Has Started (Oct. 23, 2007), https://www.wto.org/english/news_e/sppl_e/sppl79_e.htm [https://perma.cc/3ENW-M77Y] (discussing the WTO as capable of delivering environmental justice).

83 *See* UN Sustainable Development Goal 8, https://sustainabledevelopment.un.org/sdg8 [https://perma.cc/LPV2-4YR4] (proposing a goal to be reviewed by the 2019 High Level Political Forum on Sustainable Development). *See also* Gregory Mankiw, *Why Economists Are Worried About International Trade*, N.Y. TIMES, Feb. 16, 2018, https://www.nytimes.com/2018/02/16/business/trump-economists-trade-tariffs.html [https://perma.cc/WL2B-3FG8] (stating that trade improves average living standards).

84 *See generally* RETHINKING CAPITALISM: ECONOMICS AND POLICY FOR SUSTAINABLE AND INCLUSIVE GROWTH (Michael Jacobs & Mariana Mazzucato, eds., 2016) (discussing ways of rethinking capitalism including a discussion on economic issues of environmental change); Lawrence H. Summers, *The Age of Secular Stagnation: What It Is and What to Do About It*, 95 FOREIGN AFF. 2 (2016) (discussing the theory of secular stagnation or the increased propensity to save as a drag on demand in industrial economies).

law can help mitigate climate change and enhance sustainable energy—may be replicated in other governance issues.[85]

I argue that renewable energy may become the engine to obtain the three attributes of sustainable energy: clean, secure and affordable energy. First, renewable energy does not pollute. Second, efforts are being made to make it increasingly secure via storage systems. Lastly, through significant research and many trials, the production of renewable energy will become more and more commonplace and thus more affordable. Like computers or cell phones, which initially were very expensive, renewable energy will become cheaper to produce, attain, and transport.

Trade has always played a role in foreign relations, poverty reduction, and societal advancement. Trade has had many positive impacts on the sustainability agenda, as mandated by the preamble to the WTO Agreement. We aim to fill the theoretical and empirical gap for how trade law can help mitigate climate change and enhance sustainable energy. As a result of this knowledge gap, we have missed crucial opportunities for cooperation between trade and climate change.

Let me give you examples of missed opportunities between the trade and climate change agendas: In the 1990s, two major agreements were concluded—one on climate change, the United Nations Framework Convention on Climate Change (UNFCCC),[86] and one on international trade, the WTO Agreement.[87] It is surprising that

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[85] One can think, for instance, of the argument that, if China and India bring millions of people into the middle class, the world will not be sustainable due to higher levels of consumption (of goods, food, energy) in these two countries; however, for a proposal to ensure sustainable consumption and production patterns, *see* UN Sustainable Development Goal 12, http://www.un.org/sustainabledevelopment/sustainable-consumption-production/ [https://perma.cc/WGZ5-9VPF] (ensuring sustainable consumption and production patterns are about "promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all.").

[86] *See* Geoffry Palmer, *The Earth Summit: What Went Wrong at Rio?* 70 WASH. U. L.Q. 1005 (1992) (analyzing what went wrong at the Rio Earth Summit when the UNFCCC was adopted).

[87] Some 20th-century trade agreements already contained reference to climate change or greenhouse gas (GHG) emissions reduction even before the UNFCCC was signed. *See* Fourth ACP-EEC Convention 1991 O.J. (L 229) 3, Article 41 *(*"The Parties recognize the value of exchanging views, using existing consultation mechanisms under this Convention, on major ecological hazards, whether on a planetary scale (such as the greenhouse effect, the deterioration of the ozone layer, tropical forests, etc.), or of a more specific scope resulting from the application of

the WTO Agreement only briefly mentions in its preamble the importance of "sustainable development" in the context of international trade since the trade community already knew of the danger of climate change from the existence of the UNFCCC.[88] I argue that this was a missed opportunity for trade law to play a bigger role in mitigating climate change. Years later, the Paris Agreement on Climate Change was created in 2015, and does not even mention the term "trade." These are missed opportunities to cooperate between the trade and climate regimes.

5.2. New concept: Trade as a vehicle for climate action and sustainable energy

Trade law can be used as a vehicle not only for climate action[89] and sustainable energy,[90] but also for many of the other sustainable

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industrial technology."). Europe Agreement between the European Communities and their Member States, of the one part, and the Republic of Hungary, of the other part, 1991 O.J. (L 347) Article 79 ("Cooperation shall centre on: . . . global climate change . . . . 3. To these ends, the Parties plan to cooperate in the following areas: . . . development of strategies, particularly with regard to global and climatic issues . . . . ").

[88] *See generally* Gabrielle Marceau & Fabio Morosini, *The Status of Sustainable Development in the Law of the World Trade Organization*, *in* ARBITRAGEM COMÉRCIO INTERNACIONAL: ESTUDOS EM HOMENAGEM A LUIZ OLAVO BAPTISTA 60 (Umberto Celli, Jr. et al. eds., 2013) (discussing the interaction between the WTO and sustainable development).

[89] *See, e.g.*, Charles E. Di Leva & Xiaoxin Shi, *The Paris Agreement and the International Trade Regime: Considerations for Harmonization*, 17 SUSTAINABLE DEV. L. & POL'Y 20 (2016) (describing how many of the parties to the Paris Agreement have proposed to increase their use of renewable energy through financial incentives such as trade-in-tariffs and restrictions on energy-inefficient imports); Clara Brandi, *Trade Elements in Countries' Climate Contributions under the Paris Agreement*, INT'L CENTRE FOR TRADE AND SUSTAINABLE DEV. (2017) (explaining how trade can play a role in supporting climate action, in particular by "facilitating the diffusion of climate-friendly products"); Aaron Cosbey, *The Trade Implications of the Paris COP21 Agreement* (Commonwealth Secretariat 2016, Working Paper No. 2016/17, 2016) (noting that while the Paris Agreement does not directly reference trade or investment policies, the trade implications of the Agreement are indirect, and will be found as opportunities for expanded trade arise to fuel a "global green economy"); Andrew Prag, *Trade and SDG 13 – Action on Climate Change* (Asian Development Bank Institute, Working Paper No. 735, 2017) (arguing that increased trade can help achieve development goals in a greenhouse-gas-efficient manner, if greenhouse gases are efficiently priced globally).

[90] *See* Joel Trachtman, *WTO Law Constraints on Border Tax Adjustment and Tax Credit Mechanisms to Reduce the Competitive Effects of Carbon Taxes*, (Resources for

development goals (SDGs).[91] Trade can assist in the achievement of the SDGs because it embraces environmental, economic, and social dimensions.[92] This is in line with the commitments of many countries to sustainable energy. However, the governance of trade and renewable energy is currently fragmented among many institutions and legal instruments.

There is insufficient research on how the trade and renewable energy regimes can work together, and on trade's role in sustainability. New agreements have started to include sustainable development chapters[93] and various think tanks and institutes have be-

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the Future, Working Paper No. 16-03, 2016) (discussing questions such as could the trade regime be modified to reduce fossil fuel consumption? Should it be?); *see generally* AARON COSBEY ET AL., A GUIDE FOR THE CONCERNED: GUIDANCE ON THE ELABORATION AND IMPLEMENTATION OF BORDER CARBON ADJUSTMENT (2012) (providing guidance on possible border carbon adjustment legislation for policy makers); CLIMATE STRATEGIES ET AL., WORKSHOP REPORT: REFORMING FOSSIL FUEL SUBSIDIES THROUGH THE WTO AND INTERNATIONAL TRADE AGREEMENTS (2017) (describing a border carbon adjustment: "a measure applied to traded products that seeks to make their prices in destination markets reflect the cost they *would have* incurred had they been regulated under the destination market's greenhouse gas emission regime.").

[91] *See* G.A. Res. 70/1 (Sept. 25, 2015) (urging states "to refrain from promulgating and applying unilateral economic, financial or trade measures not in accordance with international law and the Charter of the United Nations that impede full achievement of the economic and social development, particularly in developing countries."); *see also* Jeffrey Sachs, *Happiness and Sustainable Development: Concepts and Evidence in* 1 WORLD HAPPINESS REPORT 2016 (John Helliwell et al. eds., 2016) (examining how trade freedom contributes to happiness); *see also* AMY CUTTER ET AL., SUSTAINABLE DEVELOPMENT GOALS AND INTEGRATION: ACHIEVING A BETTER BALANCE BETWEEN THE ECONOMIC, SOCIAL AND ENVIRONMENTAL DIMENSIONS (2017) (comparing how the SDGs connect to Germany's national sustainable development).

[92] *See* Balakrishna Pisupati, UNEP/DELC, Role of Multilateral Environmental Agreements (MEAs) in Achieving the Sustainable Development Goals (SDGs) 8 (April 2016) (showing there is also literature on how environmental agreements can help achieve the sustainable development goals).

[93] *See* Robert Falkner & Nico Jaspers, *Environmental Protection, International Trade and the WTO in* THE ASHGATE RESEARCH COMPANION TO INTERNATIONAL TRADE POLICY 245 (Kenneth Heydon & Stephen Woolcock eds., 2012) (discussing the general relationship between trade and environment as well as the institutional context for trade and environmental policymaking); *see also* Steve Charnovitz, *The WTO's Environmental Progress in* THE FUTURE OF INTERNATIONAL ECONOMIC LAW 249–251 (William J. Davey & John Jackson eds., 2008) (noting that all WTO agreements contain trade-related environmental measures, but within these agreements there are multiple provisions that specifically address the environment); *see also* Appellate Body Report, *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products*, WTO Doc. WT/DS135/AB/R (adopted Mar. 12, 2001) (regarding laws prohibiting products containing asbestos); *see also*

gun to discuss this issue,[94] but there is no thorough, empirical, theoretical study of what impact such sustainable development chapters are having so far, how they can improve, how the two regimes operate and can align better, and how to capitalize on trade to push forward the renewable energy agenda.[95]

Appellate Body Report, *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WTO Doc. WT/DS58/AB/R (adopted Oct. 12, 1998) (analyzing a dispute relating to the United States and implementation of its domestic legislation, the Clean Air Act); *see also* Appellate Body Report, *United States – Standards for Reformulated and Conventional Gasoline*, WTO Doc. WT/DS2/AB/R (adopted Apr. 29, 1996) (illustrating how environmental issues are starting to play a more prominent role in the WTO dispute settlement system).

94 *See e.g.*, David Blandford, *International Trade Disciplines and Policy Measures to Address Climate Change Mitigation and Adaptation in Agriculture*, *in* TACKLING AGRICULTURE IN THE POST-BALI CONTEXT: A COLLECTION OF SHORT ESSAYS (Ricardo Meléndez-Ortiz et al. eds., 2014) (discussing sustainable development efforts following the WTO Ministerial Conference in Bali); Petros C. Mavroidis & Jaime de Melo, *Climate Change Policies and the WTO: Greening the GATT, Revisited in* TOWARDS A WORKABLE AND EFFECTIVE CLIMATE REGIME 225–236 (Scott Barrett et al., eds., 2015) (arguing that the 'negative contract' in the present WTO does not suffice as a legal constraint to promote climate change-friendly policies because WTO members do not have to adopt those kinds of policies themselves); *see also* Aaditya Mattoo & Arvind Subramanian, *Four Changes to Trade Rules to Facilitate Climate Change Action*, VOX CEPR POLICY PORTAL (May 4, 2013), https://voxeu.org/article/four-changes-trade-rules-facilitate-climate-change-action [https://perma.cc/MDN8-YZME] (illustrating how think tanks and institutes have begun to address these issues).

95 *See* Herman E. Daly, *Against Free Trade: Neoclassical and Steady-State Perspectives*, 5 J. EVOLUTIONARY ECON. 313 (1995) (illustrating how this situation raises the question whether climate change demands a normative shift in how we think about the trade regime); *see also* Keiichiro Kanemoto et al., *International Trade Undermines National Emission Reduction Targets: New Evidence From Air Pollution*, 24 GLOBAL ENVTL. CHANGE 52 (2014) (concluding that because current reporting and regulatory regimes allow countries in Annex B of the Kyoto Protocol to displace emissions intensive production offshore, those countries have been able to inaccurately report decreasing emissions); BEN LILLISTON, THE CLIMATE COST OF FREE TRADE, INST. FOR AGRIC. AND TRADE POLICY (2016) (arguing that the intentional separation of trade goals and environmental goals in the TPP and the Paris Agreement is becoming increasingly untenable); *see also* Kate Gordon & Matthew Lewis, *It's Time to Close the 'Carbon Loophole'*, WALL ST. JOURNAL (Nov. 13, 2017), https://blogs.wsj.com/experts/2017/11/13/its-time-to-close-the-carbon-loophole/ [https://perma.cc/2QR3-5P4V] (highlighting the flaw of most countries' climate plans: that nations can export high-carbon products without accounting for them in their national climate commitments).

6. FINDING SYNERGISTIC LINKS BETWEEN THE INTERNATIONAL TRADING SYSTEM AND THE CLIMATE CHANGE REGIME

Just decades ago, few people would have thought to place the environment in the trade debate. Today, many people recognize that trade and the environment need to be integrated for institutional bureaucratic reasons. Given the importance of greater cooperation between the trading and climate change regimes for a sustainable future, the following questions arise: What trade instruments best deal with climate action, bearing in mind that there is much public opposition to trade agreements?[96] What kind of trade regime do we need to create for the great transformation of decarbonization? What should the role of the trading system be in reducing fossil-fuel consumption? In accordance with Article 4.2 of the Paris Agreement on Climate Change,[97] how do the nationally determined contributions (NDCs)[98] integrate with the trading system,[99] (taking into account that, unlike trade, they are a global public good)?[100] What will be the impact for investment flows, say, to

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[96] *See* Anabel Gonzalez, *Trade Agreements Under Attack: Can They Be Salvaged And Is It Worth It?*, HUFFINGTON POST (Oct. 24, 2016), https://www.huffingtonpost.com/anabel-gonzalez/trade-agreements-under-at_b_12619314.html [https://perma.cc/A2AG-85X2] (outlining the backlash to trade agreements).

[97] *See* Paris Agreement on Climate Change art. 4.2, Dec. 12, 2015, U.N. DOC. FCCC/CP/2015/10/Add.1 [hereinafter Paris Agreement] ("Each Party shall prepare, communicate and maintain successive nationally determined contributions that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.").

[98] *See Nationally Determined Contributions (NDCs)*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, https:// unfccc.int/process/the-paris-agreement/nationally-determined-contributions/ndc-registry [https://perma.cc/9TX9-2Q7A] (last visited Sept. 25, 2018) ("NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change."); *see also* Paris Agreement, *supra* note 97, at art. 2 (stating the idea with the NDCs is to make sure that the increase in the global average temperature is "well below 2 °C above pre-industrial levels." But note the NDCs are not legally binding).

[99] *See* Clara Brandi, *Strengthening Climate-Friendly Trade Elements in Future Nationally Determined Contributions*, INT'L CENTRE FOR TRADE AND SUSTAINABLE DEV. (May 10, 2017), https://www.ictsd.org/opinion/strengthening-climate-friendly-trade-elements-in-future-nationally-determined [https://perma.cc/2T3T-P7X3] (linking trade and the NDCs).

[100] *See* Rafael Leal-Arcas, *Sustainability, Common Concern and Public Goods*, 49 GEO. WASH. INT'L L. REV. 801 (2017) (discussing global public goods in the context of sustainability).

expand carbon sinks?[101] How can trade policy attract investments in climate action?[102] How can trade policy help climate action? How can fossil fuel subsidies be reconciled with attempts to integrate the trade and climate change regimes? What is the role of fossil fuel subsidies and border tax adjustments[103] in this equation? Is there a deficiency in WTO law regarding fossil fuel subsidies?[104] Since the trading system should support sustainable development, has globalization (personified by the world trading system) been delegitimized? Will greater cooperation between both regimes be possible in light of the current political threats to internationalism?[105] Is the fact that the Paris Agreement offers a territorial approach[106] to climate mitigation an issue for international trade? How will emerging technologies and business models affect both the trade and climate change regimes in the future?

There are deficiencies and potential tensions when trying to work out synergistic links between the trade and climate re-

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101 *See* U.N. ENVTL PROGRAMME, THE EMISSIONS GAP REPORT 2017 (2017) (arguing that cutting GHG emissions will not be enough to keep global warming within desired expectations and that GHGs must also be removed from the air).

102 A case in point here would be a climate-investment facilitation agreement. *See, e.g.*, WTO, ENVIRONMENTAL GOODS AGREEMENT (EGA), https://www.wto.org/english/tratop_e/envir_e/ega_e.htm [https://perma.cc/8A8A-4PC3] (representing the closest thing we have to one and which is currently being negotiated).

103 *See* JOHN S. ODELL, OUR ALARMING CLIMATE CRISIS DEMANDS BORDER ADJUSTMENTS NOW (Int'l Centre for Trade and Sustainable Dev. (ICTSD), 2018) (discussing border tax adjustments).

104 *See generally* Daniel Peat, *The Wrong Rules for the Right Energy: the WTO SCM Agreement and Subsidies for Renewable Energy,* 24 ENVTL. L. & MGMT 3 (2012) (arguing the possibilities for addressing subsidies under WTO law in general have major limitations).

105 Examples of political threats to internationalism are Brexit, the US's withdrawal from the Trans-Pacific Partnership, and President Trump's idea of leaving the Paris Agreement on Climate Change and the world trading system. President Trump is an example of someone de-stabilizing international cooperative structures in environment, climate change, and trade. *See* Shawn Donnan, *WTO Faces an Identity Crisis as Trump Weighs Going It Alone*, FIN. TIMES (Dec. 6, 2017), https://www.ft.com/content/38c56f52-d9a5-11e7-a039-c64b1c09b482?desktop=true&conceptId=a208e921-65cb-31b7-8a7c-3e4d0ddcdb53&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content:headline:html (detailing the US's shift to an antagonistic approach towards the WTO under the Trump administration).

106 *See Nationally Determined Contributions, supra* note 98 (stating that "[e]ach climate plan reflects the *country's* ambition for reducing emissions, taking into account *its domestic circumstances and capabilities*") (emphasis added).

gimes.[107] For instance, the term 'trade' does not appear in the Paris Agreement on Climate Change. In fact, the Paris Agreement incorporates few trade-related elements such as technology transfer[108] and renewable energy.[109] Moreover, updating[110] the NDCs may lead to tensions because of the process and production methods and to intergovernmental trade disputes at the WTO. In addition, it is often the case that officials at trade ministries do not have a mindset for the environment, which makes synergies between trade and climate change more challenging.[111]

Arguably, much of the difficulty with greater cooperation between trade and climate change is that the so-called 'trade-in' issues (such as trade in goods or trade-in services) are about the reduction or elimination of barriers to trade, whereas the so-called 'trade and' issues (such as trade and climate change) are about regulatory coherence. Any future climate action will need to be consistent with the WTO. In this sense, former Chairman of the WTO Appellate Body James Bacchus has argued that "to combine the most benefit for the climate with the least risk to trade, a WTO climate waiver is urgently needed"[112] so that "WTO members re-

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107 More broadly, for an analysis of integrating sustainable development with other themes, *see* Edith Brown Weiss, *The Evolution of International Environmental Law.*, 54 JAPANESE Y.B. INT'L L. 1 (2011) (discussing the development and evolution of international environmental law from 1900 to 2012); PHILIPPE SANDS ET AL., PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW (3rd ed., 2012) (examining the inter-linkages between international environmental law and other areas of international regulation); Joseph L. Sax, *Environmental. Law at the Turn of the Century: A Reportorial Fragment of Contemporary History*, 88 CAL. L. REV. 2375 (2000) (discussing the development of environmental law during the early 2000s, focusing primarily on the Endangered Species Act).

108 Paris Agreement, *supra* note 97, at art. 6.8.

109 Paris Agreement, *supra* note 97.

110 *See Nationally Determined Contributions, supra* note 98 ("The Paris Agreement requests each country to outline and communicate their post-2020 climate actions, known as their Nationally Determined Contributions (NDCs).").

111 *See* OFF. OF THE U.S. TRADE REP., PERU TRADE PROMOTION AGREEMENT, https://ustr.gov/trade-agreements/free-trade-agreements/peru-tpa [https://perma.cc/FQL4-R6WN] (describing how Peru has a ministry for the environment as a result of the 2009 US-Peru Free Trade Agreement).

112 *See* James Bacchus, *The Case for a WTO Climate Waiver*, CTR. FOR INT'L GOVERNANCE INNOVATION (Nov. 2, 2017), https://www.cigionline.org/publications/case-wto-climate-waiver?utm_source=climate-l&utm_medium=social&utm_campaign=cop23 [https://perma.cc/BF4S-D24D] (discussing looming collision between the rules frameworks of the two separate international institutions that have been created and entrusted with addressing trade and climate change).

vise and realign WTO rules in accordance with the objectives of sustainable development."[113] In addition, adding environmental and social issues to the WTO agenda might give the WTO more legitimacy,[114] presenting the WTO as an evolutionary body of law that may go beyond trade, classifying it as 'regime extension.'[115] Other possible solutions are the removal of impediments in the existing law as well as the gradual phase-out and eventual prohibition of fossil fuel subsidies.[116] Litigation at the WTO will most likely not move forward many of these difficulties.

Rather, constructive regulation through plurilateral agreements to develop regulation on emerging technologies, carbon capture and storage, batteries, and similar topics may be a more fruitful way forward. Much of the analysis thus far on how the trade and climate regimes can better work together has been done at the multilateral level. There is a need to think about the regime complex as well.[117] To do so, political will is necessary, which one can create through leadership. Ultimately, nature, technology, and science will make a difference. Moreover, tensions between the trade re-

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113 *Id.*

114 *See* Daniel C. Esty, *The World Trade Organization's Legitimacy Crisis*, 1 WORLD TRADE REV. 7, 7-22 (2002) (highlighting challenges the WTO faces in defending its legitimacy and exploring economic integration as a solution to the WTO's legitimacy problems).

115 Adding non-economic issues to the WTO agenda creates a legitimacy-enhancing effect of addressing these problems that clearly matter to the people who are now challenging the validity of the WTO's objectives. The counterargument, however, would be whether economists and trade law professionals have the necessary tools to tackle environmental and social concerns.

116 *See Who We Work With*, GLOBAL SUBSIDIES INITIATIVE, https://www.iisd.org/gsi/about/who-we-work-with/friends-fossil-fuel-subsidy-reform [https://perma.cc/D78K-PHEL] (detailing a partnership with the Friends of Fossil Fuel Subsidy Reform, "a group of countries committed to supporting the reform of inefficient fossil-fuel subsidies"). Some international organizations have studied the cost of energy subsidies. *See IMF Survey: Counting the Cost of Energy Subsidies*, INT'L MONETARY FUND (July 17, 2015), https://www.imf.org/en/News/Articles/2015/09/28/04/53/sonew070215a [https://perma.cc/NW8Y-9ZEW] (detailing a study on the costs of energy subsidies implemented by countries in 2015); *see also* IPEK GENCSU ET AL., PHASE-OUT 2020: MONITORING EUROPE'S FOSSIL FUEL SUBSIDIES (2017) (analyzing and reporting the findings of a study by the Overseas Development Institute on the social cost of fossil fuel subsidies).

117 *See* Robert O. Keohane & David G. Victor, *The Regime Complex for Climate Change*, 9 PERSP. ON POL. 7 (2011) (arguing that the diverse range of institutions involved in climate change governance constitutes a regime complex, which has advantages and disadvantages compared to a unitary international regime).

gime and the environmental regime are also due to the fact that the two regimes do not share a common language. Trade is mainly concerned with the market and is a field in which governments are strongly influenced by business and industry groups. In contrast, the environmental regime is concerned mainly with regulation.

Another way forward would be the support of the green infant industry. Doing so would generate green jobs and would translate into climate action without having to import green goods. Furthermore, creative avenues for international dialogue between finance and climate change ministers, instead of trade and climate ministers, is very promising, especially as countries start to feel the economic effects of climate change and extreme weather. Moreover, since the WTO is a member-driven institution, it is relevant in the trade-climate debate to pay close attention to the domestic politics and policies of WTO member states that are major GHG emitters, followed up with individualized action plans on how to address the issue in each of these countries and link the debate to the investment system. The investment regime is relevant in the broader political economy of this debate to address the clean-energy agenda, climate infrastructure, company sustainability, and eco-system protection. In addition, carbon pricing, not trade, is one of the main issues in the climate change mitigation debate, to reach the social cost of GHG emissions.[118]

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[118] Even the US Supreme Court ruled in 2007 that GHGs are a risk to human health. *See* Massachusetts v. EPA, 549 U.S. 497 (2007) (holding that the EPA could regulate GHGs as they pose a threat to public health or welfare). There is a vast body of literature on the links between human rights and environmental protection. *See also* Gunther Handl, *Human Rights and Protection of the Environment*, *in* ECON., SOC. AND CULTURAL RTS.: A TEXTBOOK 303 (Asbjorn Eide et al. eds., 2nd ed. 2001) (addressing the question of whether a relationship exists between the protection of the environment and the protection of human rights); SVITLANA KRAVCHENKO & JOHN E. BONINE, HUMAN RIGHTS AND THE ENVIRONMENT: CASES, LAW AND POLICY 549 (2008) (examining the role of different human rights laws in dealing with climate change); Ben Pontin, *Environmental Rights under the UK's Intermediate Constitution*, 17 NAT. RESOURCES & ENV'T 21 (2002) (providing a summary and analysis of environmental rights within the UK); Emilio Padilla, *Intergenerational Equity and Sustainability*, 41 ECOLOGICAL ECON. 69 (2002) (analyzing methods of sustainable development with consideration to both present and future generations); Francesco Bosello et al., *Economy-wide Estimates of the Implications of Climate Change: Human Health*, 58 ECOLOGICAL ECON. 579 (2006) (studying the economic impacts climate change as on human health); Jon Barnett & W. Neil Adger, *Climate Change, Human Security and Violent Conflict*, 26 POL. GEOGRAPHY 639, 639 (2007) (analyzing research on the threats climate change poses to human security and the capacity of states); Shubhankar Dam & Vivek Tewary, *Polluting Environment, Polluting Constitution: Is a 'Polluted' Constitution Worse Than a Polluted*

Below is a list of recommendations for how the trade and climate regimes can better cooperate:[119]

6.1. Minimize conflicts between the trade and climate regimes

Making greater use of existing fora, such as the Committee on Trade and Environment at the WTO Secretariat, is very promising. One could also explore the role for a mandatory climate dispute settlement mechanism in the UN Framework Convention on Climate Change and in other international climate agreements. Equally, it may be worth proposing tough environmental trade regulations given that very few dispute settlement cases related to environmental restrictions have been successful and such cases take years to adjudicate.

Moreover, one could make an exception to the most-favored-nation (MFN)[120] and national-treatment (NT)[121] principles of non-discrimination for policy objectives, e.g., climate change mitigation. This could be the drafting of WTO norms to not impose duties on renewables. In addition, one could establish a "peace clause" for climate action. Similar to the WTO's Agriculture Agreement, the

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Environment?, 17 J. ENVTL. L. 383 (2005) (analyzing the impact of environmental regulation and laws within Indian Supreme Court decisions and constitution); Edward Cameron, *Development, Climate Change and Human Rights: From the Margins to the Mainstream?*, (World Bank Soc. Dev., Working Paper No. 123, 2011) (exploring how communities vulnerable to the negative impacts of climate change have used human rights as a strategy to push for advances in climate change research and policy); Rosemary G. Rayfuse & Emily Crawford, *Climate Change, Sovereignty and Statehood*, (U. of Sydney L Sch., Legal Studies Res. Paper No. 11/59, 2011), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1931466 (examining the threats climate change poses and their effect on the international law on statehood).

119 *See* JAMES BACCHUS ET AL., GLOBAL RULES FOR MUTUALLY SUPPORTIVE AND REINFORCING TRADE AND CLIMATE REGIMES (2016), http://www3.weforum.org/docs/E15/WEF_Climate_Change_POP.pdf [https://perma.cc/SU73-NRFM] (discussing policy options for mutually supportive regimes).

120 *See* General Agreement on Tariffs and Trade art. I, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194 [hereinafter GATT] (defining the Most-Favored-Nation-Treatment as the principle of not discrimination between one's trading partners). *See also* General Agreement on Trade in Services art. II, Apr. 15, 1994, 1869 U.N.T.S 183, 33 I.L.M. 1167 [hereinafter GATS]; Trade-Related Aspects of Intellectual Property Rights art. IV, Apr. 15, 1994, 1869 U.N.T.S. 299, 33 I.L.M. 1197 [hereinafter TRIPS] (reiterating the concept of the Most-Favored-Nation-Treatment).

121 *See* GATT, *supra* note 120, at art. III (defining the National Treatment Obligation as principle of giving others the same treatment as one's own nationals).

peace clause would enable countries to protect themselves from action taken against each other's fossil fuel subsidies.[122] In general, although the trade regime does not seem to be an obstacle to climate change action per se, it is also not driving such action. Therefore, the international community should re-gear the trade regime to incentivize innovation and capital flow toward sustainability initiatives.

6.2. Revisit the concept of "like" products

One could establish an international standard for calculating the amount of carbon used in the making of products. In addition, it would be desirable to agree on a "waiver" from WTO obligations for all trade-restrictive climate measures that are based on the amount of carbon used in making a product.

6.3. Climate action via the formation of climate clubs

An option to be explored is plurilateral action to promote green technology transfer among club members –e.g., G20, G7, the Major Economies Forum, participation of cities (C40), namely a group of 90+ of the largest cities in the world for the implementation of the Paris Agreement on Climate Change. In addition, climate measures pursuant to a climate agreement should fall within the scope of Article XX(b) and (g) of the GATT and of Article XIV of the GATS (i.e., the general exceptions). Moreover, one could envisage granting a waiver for a climate club organized outside the WTO framework to become a plurilateral agreement under the WTO Agreement.

A club approach would overcome free-riding issues of climate change mitigation (e.g., the EU and NATO as examples of clubs where only members have benefits). This area is of great im-

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122 For an overview of global energy subsidies, *see Energy Subsidies*, INT'L ENERGY AGENCY (Oct. 3, 2018), www.iea.org/statistics/resources/energysubsidies/ [https://perma.cc/2UE9-ALZA] (breaking down data of energy subsidies by country and fossil fuel type in 2016). *See also* Benjamin K. Sovacool, *Reviewing, Reforming, and Rethinking Global Energy Subsidies: Towards a Political Economy Research Agenda*, 135 ECOLOGICAL ECON. 150 (2017) (reviewing the basic principles of global energy subsidies and highlighting the net costs of these subsidies to society overall).

portance because, despite all the progress in scientific and economic understanding of climate change, achieving international agreements on climate change has proven difficult because of the threat of free-riding. In addition, a carbon price, rather than carbon emission reduction requirements, should be a core element of this climate-club approach because states are more likely to reach agreement on a carbon price than on carbon emission reduction levels. Ideally, carbon prices should reach a level up to that of the social cost of GHG emissions.

6.4. An agreed framework for a global Emissions Trading System and border measures

The idea is to ensure that WTO rules apply to a global emissions trading system and to ensure that a carbon tax is an indirect tax on a product that is eligible for a "border tax adjustment" under Article II:2(a) of the GATT. Border tax adjustments can be perceived as a carrot to avoid or minimize a loss of economic competitiveness and to avoid carbon leakage, or as a stick to spur climate action.

6.5. Shift subsidies from fossil fuels to renewable energy

The international community is not penalizing pollution; rather, it is subsidizing it via fossil fuel subsidies. So, the international community should agree on the gradual phase-out and eventual prohibition of fossil-fuel subsidies. If we are serious about climate change mitigation, fossil fuel subsidies must come to an end and green industrial policy tools (i.e., renewable energy subsidies, specific performance requirements, technical standards, and local content requirements) must take priority.[123] We should

[123] The international community should find ways to reduce both the strong influence wielded by industries benefiting from fossil fuel subsidies and the hesitance of political leaders, even those generally committed to environmental issues, to take a stand publicly despite growing awareness of such measures' economic and environmental repercussions. For a study on the benefits of fuel subsidies, *see* David Coady et al., *The Unequal Benefits of Fuel Subsidies Revisited: Evidence for Developing Countries* (IMF, Working Paper No. WP/15/250), http://www.imf.org/external/pubs/ft/wp/2015/wp15250.pdf (analyzing the

also allow only non-discriminatory purchases of climate-friendly environmental goods and services under the WTO Government Procurement Agreement (GPA) while encouraging more WTO Members to accede to that Agreement.[124] Finally, subsidies should go to the renewable-energy industry to make the transition to a green economy a reality. The need is great, but the science is nascent and economic incentives in the market are still missing. Governments can play a role here through subsidies and green taxes.[125]

6.6. Foster sectoral approaches such as aviation and shipping

Climate agreements affecting trade made by organizations such as the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) should be upheld in WTO dispute settlement by WTO Members that are parties to those agreements. In addition, one could improve the fuel efficiency of new and existing ships and planes via electric engines. Electric or hybrid engines in aviation and shipping would be very effective for climate change mitigation. For instance, hybrid planes, with a capacity of 100 passengers, could take off and land using jet engines but during the cruise they could make use of electrically-powered engines. Similarly, lighter electric engines for aviation have been developed.

In fact, aviation would be an interesting sector for the fight

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benefits of fuel price subsidies and welfare impact, particularly among developing countries). *See also* Peter Wooders & Cleo Verkuijl, *Making the International Trade System Work for Climate Change: Five Ways to Address Fossil Fuel Subsidies through the WTO and International Trade Agreements*, INT'L INST. FOR SUSTAINABLE DEV. (June 20, 2017), https://www.iisd.org/blog/making-international-trade-system-work-climate-change-five-ways-address-fossil-fuel [https://perma.cc/45XB-YE8T](exploring the use of fossil fuel subsidies to complement and strengthen climate change reformation efforts and agreements).

[124] *See Agreement on Government Procurement*, WTO, https://www.wto.org/english/tratop_e/gproc_e/gp_gpa_e.htm [https://perma.cc/7T72-ZVLS] (stating that as the date of publication of this article, the GPA comprises only 47 WTO members out of 164 members).

[125] That said, Germany has invested $1trn on low-carbon electricity and yet still depends at 50% on fossil fuels for its power. *See* "Negative-Emissions Technology: What They Don't Tell You About Climate Change," THE ECONOMIST (Nov. 18, 2017), https://www.economist.com/leaders/2017/11/16/what-they-dont-tell-you-about-climate-change [perma.cc/Y9NF-WR6R] (describing the incentives governments can provide to mine CO2 from the atmosphere, if the market demand is not enough).

against climate change if we could manage to use battery powered planes. The main issue is that battery-powered engines weigh more than jet engines.[126] But there are advantages to using electric motors rather than jet engines: they are lighter and more energy-efficient.[127] Flight tests are set to begin in 2020 with the goal of a hybrid-electric airliner with a capacity of 50-100 passengers entering the market in 2030.[128]

7. FORUM FOR ACTION: EXPLORING THE CLUB-OPTION AND BEYOND

There are several options to push forward the trade agenda for climate action and sustainable energy.

7.1. Multilateralism

Multilateralism, in terms of trade liberalization, has been in decline for some time.[129] A case in point is the Doha Development Agenda, which was initiated in 2001 but never concluded.[130] In the case of multilateral trade, the Trump administration questions its validity and the WTO's way of settling disputes,[131] where "frustra-

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126 That said, there are already companies that make two-seater electric training planes. *See* Julia Hetz, *Airbus, Rolls-Royce, and Siemens to Develop Flying Demonstrator*, SIEMENS (Nov. 28, 2017), (https://www.siemens.com/innovation/en/home/pictures-of-the-future/mobility-and-motors/the-future-of-mobility-e-fan-x.html) [https://perma.cc/MD6M-NTTY] (announcing the plan to make the E-Fan X, a demo version of a hybrid-electric passenger plane).

127 *See The Electric-Flight Plan: Small Hybrid-Electric Airliners Ready for Take Off*, THE ECONOMIST (Dec. 2, 2017) at 70, https://www.economist.com/science-and-technology/2017/11/30/small-hybrid-electric-airliners-ready-for-take-off [perma.cc/DA6B-U8K6] (claiming that electric motors are 95% more efficient and are lighter than jet engines).

128 *Id*. at 69–70 (citing a Samsung Electronics statement that, while demonstrating other growth in the technology industry, it managed to maximize its energy capacity by 45 percent by incorporating graphene into a lithium-ion battery).

129 *See generally* RAFAEL LEAL-ARCAS, INTERNATIONAL TRADE AND INVESTMENT LAW: MULTILATERAL, REGIONAL AND BILATERAL GOVERNANCE (Edward Elgar ed., 2010) (outlining the decline of international investment agreements).

130 *The Doha Round*, WTO, https://www.wto.org/english/tratop_e/dda_e/dda_e.htm#development [https://perma.cc/DCV4-9K7H].

131 *The Art of the Impossible: The WTO Remains Stuck in its Rut*, THE ECONOMIST (Dec. 16, 2017) at 64, https://www.economist.com/finance-and-

tion has turned to aggression."[132] In fact, Mr. Robert Lighthizer, the US trade representative, has suggested a return to the pre-WTO system, where "might was right,"[133] rather than making use of the dispute settlement system to resolve trade disputes.[134] One great difficulty for the WTO process of creating new agreements is that decisions are made by consensus. In a WTO of 164 members, and more to come, such structure does not make decision-making easy.

In the context of multilateralism, there is a new global agreement to mitigate climate change: the Paris Agreement on Climate Change of 2015.[135] Two years later, more than 50 world leaders met in Paris for the One Planet Summit to launch an ambitious project to win the battle against climate change.[136] In 2017 the World Bank announced that it would stop funding fossil fuel explorations in two years.[137] The consequences of climate change are well known and most climate scientists agree that if the global temperature continues to increase, there is a serious risk of catastrophic sea level rises and more inundations around the world. It is therefore imperative that CO2 emissions be reduced. In fact, the 2017 Emissions Gap report of the UN Environment Program states

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economics/2017/12/14/the-wto-remains-stuck-in-its-rut [perma.cc/8CH7-8SSE].

132 *Disaster Management: The WTO is Under Threat from the Trump Administration*, THE ECONOMIST (Dec. 9, 2017) at 19, https://www.economist.com/leaders/2017/12/07/the-wto-is-under-threat-from-the-trump-administration [perma.cc/2ZVW-KCQX].

133 *See also* BRINK LINDSEY AND STEVEN TELES, THE CAPTURED ECONOMY: HOW THE POWERFUL ENRICH THEMSELVES, SLOW DOWN GROWTH, AND INCREASE INEQUALITY (2017) (arguing similarly regarding America's political dysfunction, exploring social problems that result in the rich further entrenching themselves).

134 *Situations Vacant: The World Trade Organization*, THE ECONOMIST (Dec. 9, 2017) at 68, https://www.economist.com/finance-and-economics/2017/12/07/as-wto-members-meet-in-argentina-the-organisation-is-in-trouble [https://perma.cc/8Q7V-4U8T]. *See also* DOUGLAS IRWIN, CLASHING OVER COMMERCE: A HISTORY OF US TRADE POLICY (2017) (analyzing the history of US trade policy and arguing that trade is neither dull nor as bad as people think).

135 *See* Michael A. Levi, *Two Cheers for the Paris Agreement on Climate Change*, COUNCIL ON FOREIGN RELATIONS (Dec. 12, 2015), https://www.cfr.org/blog/two-cheers-paris-agreement-climate-change [perma.cc/F6AK-WAYT] (commenting on The Paris Agreement, stating that it "is fundamentally different. All countries, not just developed ones, are supposed to curb emissions").

136 *First One Planet Summit*, ONE PLANET SUMMIT, https://www.oneplanetsummit.fr/en/events-16/first-one-planet-summit-6 [https//perma.cc/V36K-JBQM] (last visited Sept. 25, 2018).

137 *Summit-Mania: New Life for the Paris Climate Deal*, THE ECONOMIST (Dec. 14, 2017) at 51–52, https://www.economist.com/international/2017/12/14/new-life-for-the-paris-climate-deal [https://perma.cc/JGU8-M4V8].

that the climate pledges submitted by 164 countries represent merely one third of the reduction in GHG emissions needed to meet the Paris Agreement target.[138] Further complications have arisen due to the Trump administration's announcement that it will not honor the nationally determined contributions submitted by the Obama administration and it will not pay into the UN's Green Climate Fund, whose purpose is to transfer 100 billion US dollars per year to poor countries by 2020.[139]

7.2. Plurilateralism

Plurilateralism can ease barriers to trade in environmental goods and services.[140] For instance, climate clubs (i.e., getting countries to join various regimes) could serve as a way to promote technology transfer within the club members.[141] Clubs of major countries (e.g. G-8, G-8+5, G-20, APEC) could serve as a platform

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[138] *See* U.N.E.P., *The Emissions Gap Report 2017* (Nov. 2017), https://wedocs.unep.org/bitstream/handle/20.500.11822/22070/EGR_2017.pdf [https://perma.cc/93HH-8Z73] (detailing the gap between necessary and actual emissions reductions).

[139] *See Summit-Mania*, *supra* note 137 (describing the problem that while commitments to date are only nearing 70 billion US dollars, poor countries have made their pledges to the Paris Agreement conditional on rich countries providing them assistance).

[140] *See generally* RAFAEL LEAL-ARCAS, INTERNATIONAL TRADE AND INVESTMENT LAW: MULTILATERAL, REGIONAL AND BILATERAL GOVERNANCE (Edward Elgar ed., 2010) (defining plurilateralism as agreements that are non-binding to parties that do not agree to them).

[141] For literature on climate clubs *see generally* Thomas Brewer, *Artic Black Carbon from Shipping: A Club Approach to Climate and Trade Governance*, ICTSC GLOBAL ECONOMIC POLICY AND INSTITUTIONS, Issue Paper No. 4 (Oct. 2015), https://www.ictsd.org/sites/default/files/research/Arctic%20Black%20Carbon%20from%20Shipping%20-%20A%20Club%20Approach%20to%20Climate%20and%20Trade%20Governance%20-%20ICTSD2015_0.pdf (addressing the issue of black carbon problems and proposing the formation of a club-like partnership to combat this problem); Jon Hovi, et al., *Climate Change Mitigation: A Role for Climate Clubs?*, PALGRAVE COMMUNICATIONS 2, Article No. 16020 (May 10, 2016), 1–9 (http://www.nature.com/articles/palcomms201620) [https://perma.cc/CY8G-2HFC] (exploring climate clubs and their potential usage in climate change mitigation); William Nordhaus, *Climate Clubs: Overcoming Free-Riding in International Climate Policy*, 105 AM. ECON. REV. 1339 (2015) (providing an overview of climate clubs and exploring the problems facing climate clubs and their possible solutions).

to conclude RTAs in green energy technologies.[142] The Environmental Goods Agreement (EGA),[143] for example, is a plurilateral[144] trade agreement currently under negotiation between 18 WTO Members which would reduce tariffs on environmentally beneficial goods[145] in order to stimulate sustainable practices within global supply chains.[146] The idea is that "there could be a benefit for the multilateral trading system in lowering technical barriers to trade in energy-related goods and services, including in relation to technological goods and services that could encourage the proliferation of renewables."[147] The advantage of the EGA is that it is a

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142 For views on regional integration and climate change *see* Carlo Carraro, Christian Egenhofer, and Noriko Fujiwara, *Do Regional Integration Approaches Hold Lessons for Climate Change Regime Formation? The Case of Differentiated Integration in Europe*, *in* CLIMATE AND TRADE POLICY: BOTTOM-UP APPROACHES TOWARDS GLOBAL AGREEMENT (Carlo Carraro & Christian Egenhofer eds., 2007) (stating how "[d]espite almost 15 years of negotiations to achieve and implement global climate change agreement, the international community appears to be still some way from a breakthrough.").

143 *See* OFF. OF THE U.S. TRADE REPRESENTATIVE, EXEC. OFFICE OF THE PRESIDENT, ENVIRONMENTAL GOODS AGREEMENT, https://ustr.gov/trade-agreements/other-initiatives/environmental-goods-agreement [https://perma.cc/GRN8-NH8C] (last visited Sept. 25, 2018). The EGA ended up being an open plurilateral agreement because one needs the consensus of the WTO membership for a closed plurilateral agreement in the context of WTO decision-making.

144 A plurilateral approach to trade agreements means that the agreements are optional and not binding on those WTO members who do not engage in them. In the WTO context, multilateral negotiations, as opposed to plurilateral negotiations, imply the participation of all WTO members. The nature of the consequent multilateral agreements from these multilateral negotiations implies that commitments are taken by all the WTO members. *See* Rafael Leal-Arcas, *The GATS in the Doha Round: A European Perspective*, *in* THE WORLD TRADE ORGANIZATION AND TRADE IN SERVICES 28 (Kern Alexander & Mads Andenas, eds., 2008) (saying that the idea behind plurilateral negotiations is to make the WTO deliver again on progressive liberalization).

145 Lower environmental goods tariffs would allow for cheap procurement of, say, solar panels and other renewable technologies, thus facilitating a transition to a clean energy future as fast as possible. On the other hand, temporarily higher tariffs may allow a country to build up, say, a solar industry that will then be able to compete on the global market, bringing prices down overall and leading to further innovation globally.

146 The 18 WTO members are: Australia, Canada, China, Costa Rica, the European Union, Hong Kong, Iceland, Israel, Japan, South Korea, New Zealand, Norway, Singapore, Switzerland, Liechtenstein, Chinese Taipei (Taiwan), Turkey, and the United States. Leal-Arcas, *supra* note 144. All the EU member states are represented by the European Union in the negotiations, which means that there is a total of forty-six WTO member states represented in the Environmental Goods Agreement (EGA).

147 Rafael Leal-Arcas, *How Governing Int'l Trade in Energy Can Enhance EU*

plurilateral agreement that extends concessions to all WTO members on an MFN basis once adopted.

Combined, the parties represented at the EGA discussions produce 90% of environmental goods.[148] Since tariffs are already very low in many countries, the issue with the EGA is mainly about non-tariff barriers. Much of the issue with the EGA is defining what an environmental good is. Even if a trade agreement can be formed with explicit environmental objectives, arguably, the fact that the EGA has stalled is detrimental in that it is evidence that the international trade regime has little to offer sustainability efforts and is thus disconnected from the Paris Agreement.

Also in the trade context, RTAs are examples of trade clubs, offering the advantage of preferential treatment in trade without penalties, in accordance with GATT Article XXIV. A joint statement by the United States, the EU, and Japan at the 11th WTO Ministerial Conference in Buenos Aires in December 2017 pledging "to enhance trilateral cooperation in the WTO" shows that plurilateralism is a strong alternative to multilateralism.[149] Another example of plurilateralism being on the rise is the fact that a coalition of countries has signed up for the negotiation of new rules on e-commerce plurilaterally.[150] So long as there is critical mass, such a deal would be possible if there is no discrimination against other WTO members.

In the context of climate change, there is hardly any international cooperation in that countries do what they think is best for them, as opposed to what is good for the world as a whole. International climate agreements offer no incentives for countries to go beyond what is in their self-interest, which explains the lack of international climate cooperation. An example is Canada's with-

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Energy Security, 6 RENEWABLE ENERGY L. AND POL'Y REV. 202, 203 (2015).

148 *Environmental Goods Agreement*, TRANSPORT AND ENVIRONMENT, at 1 (2015) https://www.transportenvironment.org/sites/te/files/publications/2015%2009%20TE_EGA%20briefing%20note_FINAL.PDF [https://perma.cc/Q622-JWRQ].

149 Press Release, USTR, Joint Statement by the United States, European Union and Japan at MC11 (Dec. 12, 2017), https://ustr.gov/about-us/policy-offices/press-office/press-releases/2017/december/joint-statement-united-states [https://perma.cc/F8HL-3HPH].

150 *See* Luc Cohen, *Some WTO Members to Push for E-Commerce Rules as Broader Deal Fails*, CNBC (Dec. 13, 2017), https://www.cnbc.com/2017/12/13/reuters-america-some-wto-members-to-push-for-e-commerce-rules-as-broader-deal-fails.html [https://perma.cc/X2WA-UNV8] (noting that a group of 70 WTO countries pledged to work toward new electronic commerce trade rules).

drawal from the Kyoto Protocol in 2011 without legal consequences, which weakened both the environmental effectiveness and legitimacy of the Kyoto Protocol regime.[151] The current legal instruments are not enough for what the international community needs to solve the climate change issue.

A solution would be to find a mechanism where countries want to join the club and no country wants to leave. That would mean offering benefits to the club members,[152] where the negatives become positives, and where the members can exclude others, who themselves do not wish to join the club.[153] To be in the club, one would need participation and compliance.[154] Such a situation would create stable coalitions. Economic theory and empirical evidence show that stable coalitions with substantial emissions abatement are not likely to form without sanctions against non-participants.

Arguably, in the case of climate change agreements, they are doomed to failure because there is no incentive to remain a Contracting Party to the agreements, as there is no penalty if a country chooses to withdraw from the agreement. Equally, there is no punishment if a Contracting Party does not comply with the agreement. So a future club for climate mitigation could be construed as one that offers benefits for joining, but there would be no punishment if countries wish not to join.

Three characteristics appear evident for the creation of a successful climate club:

1. Most big GHG emitters need to be members of the club;
2. Membership benefits are a must, and they should outweigh obligations; and

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151 *See Canada Pulls out of Kyoto Protocol*, THE GUARDIAN, December 13, 2011, https://www.theguardian.com/environment/2011/dec/13/canada-pulls-out-kyoto-protocol [https://perma.cc/AST8-635R] (citing Canada's legal right to withdraw).

152 *See* Michael Tomz, Judith Goldstein, & Douglas Rivers, *Membership Has Its Privileges: The Impact of the GATT on International Trade* (2007), https://web.stanford.edu/~tomz/pubs/TGR2007.pdf [https://perma.cc/Y7P4-PAEK] (describing the benefits offered to members of GATT).

153 For further details on the economic theories of clubs, *see* James Buchanan, *An Economic Theory of Clubs*, 32 ECONOMICA NEW SERIES 1 (1965) (developing a general theory of consumption ownership-membership agreements, or clubs).

154 A simple example of compliance would be a speeding ticket: if the speeding ticket is very high, the driver will be very careful not to go beyond the speed limit and would therefore comply with the law.

3. The club would need to be related to sanctions for non-compliance.[155]

Who might be the right institution to host such a climate club? The WTO? The Organization for Economic Co-operation and Development (OECD)? The Major Economies Forum on Energy and Climate (MEF) could well be a good platform to link clean energy, climate action and international trade.[156] It was initiated in 2007 by the Bush administration under the name "Major Emitters Forum"[157] and launched by the Obama administration on March 28, 2009.

The MEF is intended to facilitate a candid dialogue among major developed and developing economies, help generate the political leadership necessary to achieve a successful outcome at future UN climate change conferences, and advance the exploration of concrete initiatives and joint ventures that increase the supply of clean energy while cutting GHG emissions.[158]

The MEF partners include: Australia, Brazil, Canada, China, the EU, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, South Africa, the UK, and the US[159] Bringing to-

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155 One would need to make sure that such sanctions would not violate international law and/or WTO legal rules.

156 U.S. DEP'T OF STATE, MAJOR ECONOMIES FORUM ON ENERGY AND CLIMATE, https://2009-2017.state.gov/e/oes/climate/mem/index.htm [https://perma.cc/VH36-KVLB].

157 The name was changed because, according to the members, the initial name sounded like an oligopoly of polluters. The MEF has gone through a number of name changes. Other proposed names were the Major Economies Process on Energy Security and Climate Change and Major Economies Meeting on Energy Security and Climate Change. U.S. DEP'T OF STATE, MAJOR ECONOMIES PROCESS ON ENERGY SECURITY AND CLIMATE CHANGE, http://2001-2009.state.gov/g/oes/climate/mem/index.htm [https://perma.cc/JM6B-HB2E]; THE WHITE HOUSE, FACT SHEET: MAJOR ECONOMIES MEETING ON ENERGY SECURITY AND CLIMATE CHANGE, http://georgewbush-whitehouse.archives.gov/news/releases/2007/09/20070927.html [https://perma.cc/5VJD-HJDB].

158 *See* R. Stewart, et al, *Strategic Analytics for Building a Global Climate Regime Bottom-Up*, at 4–5, paper presented at the conference 'Reaching International Co-operation on Climate Change Mitigation,' (December 21-23, 2011) (advocating for a bottom-up approach that incentivizes greenhouse gas reduction as a byproduct of other economic goals).

159 *See* U.S. CHAMBER OF COMMERCE, MAJOR ECONOMIES BUSINESS FORUM, http://www.majoreconomiesforum.org/about/descriptionpurpose.html [https://perma.cc/YF7P-9FHN] (providing a forum for multi-sectoral business organizations from major economies to discuss climate change).

gether these major emitters, which were responsible for around 75 per cent of GHG emissions in the world as of 2009 (these numbers include land-use change),[160] will increase the likelihood of reaching a climate change agreement, as the MEF is a more efficient and effective negotiating forum than the UN Framework Convention on Climate Change (UNFCCC).[161] Even bringing together the six major emitters, responsible for 60% of global GHG emissions, will be very beneficial for climate action.[162] As a platform for action, the MEF carries legitimacy: it represents 80% of global GHG emissions, 80% of the world's GDP, and 80% of the world's population.[163]

The MEF fosters technological innovation, brought about by increased trade.[164] To avoid the obstacles faced by the UNFCCC machinery, the MEF should focus on each member's economic weight, GHG emissions reduction responsibilities, and the calculation of responsibility for GHG emissions such as sharing the burden equally between producers and consumers, in order to fairly decide who should reduce GHG emissions and by how much. For instance, most GHGs are emitted because countries do not have clean sources of energy. They have no choice but to use available technologies. If energy-producing countries have to pay 50 per cent of the cost, there would be a greater incentive to shift energy production from fossil fuels to clean energy. Investing in clean energy would then enhance innovation, which is beneficial for the economy.[165]

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160 John M. Broder, *Clinton Says U.S. is Ready to Lead on Climate*, N.Y. TIMES (Apr. 27, 2009), http://nyti.ms/huEbYb [https://perma.cc/QX25-D9ZL].

161 *See* Kenneth A. Oye, *Explaining Cooperation Under Anarchy*, 38 WORLD POL. 21 (1985) ("The creation of rules of thumb and mechanisms of collective enforcement and the maintenance and administration of regimes can demand an extraordinary degree of cooperation.").

162 *See, e.g.*, Dina Cappiello, *These 6 Countries Are Responsible For 60% Of CO2 Emissions*, BUSINESS INSIDER (Dec. 5, 2014), http://www.businessinsider.com/these-6-countries-are-responsible-for-60-of-co2-emissions-2014-12 [https://perma.cc/L926-U36T] (suggesting that the future of the planet will be shaped by the emissions decisions of China, the United States, India, Russia, Japan, and Germany).

163 *See* RAFAEL LEAL-ARCAS, CLIMATE CHANGE AND INTERNATIONAL TRADE 337-338 (Edward Elgar ed., 2013) (discussing differences between MEF and the Kyoto Protocol as a means to respond to climate change).

164 Major Economies Forum on Energy and Climate, *Technology Action Plan – Executive Summary* (Dec. 2009), http://www.majoreconomiesforum.org/images/stories/documents/MEF%20Exec%20Summary%2014Dec2009.pdf [https://perma.cc/R66R-CKPX].

165 *See* LEAL-ARCAS, *supra* note 163, at 338 (discussing differences between

7.3. Bilateralism

Bilateralism, which should be understood as complementary to multilateralism and not mutually exclusive, has been very constructive in clean-energy terms, e.g., US-China relations (the G2). Since a few years now, the US and China[166] have made remarkable advancement on energy- and climate-related cooperation. The United States and China are already cooperating on a number of joint efforts over clean technology, which plays a major role in the relations of the two countries. Below are a few:[167]

1. The United States-China Clean Energy Research Center,
2. The United States-China Energy-Efficient Buildings,
3. The United States-China Electric Vehicles,
4. The 21st Century Coal Program,
5. The China Greentech Initiative,
6. The United States Alliances in Chinese Cleantech Industry,
7. The United States-China Renewable Energy Partnership,
8. The United States-China Energy Cooperation Program, and
9. The U.S.-China Regional Cooperation Initiatives.

In the trade front, bilateralism seems to be beneficial for the big party in a bilateral trade negotiation because it is able to bully the other country. However, higher tariffs mean that prices would rise for the consumers of the country that raises the tariffs. For instance, exports that depend on imported components would become less competitive.

MEF and the Kyoto Protocol as a means to respond to climate change).

166 In fact, China leads the world in clean energy. In recent years, China has spent more on cleaning up its energy system than the United States and the European Union combined. *See* "The East is Green," THE ECONOMIST, Mar. 17, 2018, at 8 (noting that China leads the world in clean energy). A case in point is the fact that China sells more electric vehicles than the rest of the world. *See* INTERNATIONAL ENERGY AGENCY, GLOBAL EV OUTLOOK 2017, https://www.iea.org/publications/freepublications/publication/GlobalEVOutlook2017.pdf, at 5 [https://perma.cc/46TC-CUE5] (stating that China accounted for more than 40% of the electric cars sold in the world, which is more than double the amount sold in the United States).

167 For further details on the impact and scope of collaboration between the US and China in climate negotiations, *see* LEAL-ARCAS, *supra* note 163, at 333-336.

7.4. Unilateralism

There have also been unilateral, sector-specific attempts to mitigate climate change using trade as a tool. For example, the EU has tried to include aviation in the Emissions Trading System.

7.5. Vertical policy-making

Very promising is the idea of going beyond a horizontal (intergovernmental) approach to policy-making so that the international community starts exploring vertical approaches[168] too (*i.e.*, the involvement of cities through their mayors, NGOs, and of states through their governors,[169] companies).[170] At the Conferences of the Parties (COPs), there is the issue of physical design when the international community is serious about engaging non-state actors in the negotiations.[171] At the moment, the structure is such that on-

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168 *See, e.g.*, AMERICA'S PLEDGE, https://www.americaspledgeonclimate.com/ [https://perma.cc/5N8B-YHCK] (last visited Sept. 25, 2018) (consisting of a number of the US cities, states, businesses, and universities that have reaffirmed their commitment to helping America reach its Paris climate goals).

169 *See, e.g.*, UNITED STATES CLIMATE ALLIANCE, https://www.usclimatealliance.org/ [https://perma.cc/X73B-RZ8P] (last visited Sept. 25, 2018) (detailing the bipartisan coalition of states in the US committed to implementing the objectives of the Paris Agreement on Climate Change within their borders).

170 *See generally* David G. Victor, *Three-Dimensional Climate Clubs: Implications for Climate Cooperation and the G20*, Geneva: International Centre for Trade and Sustainable Development (Aug. 2017), https://www.ictsd.org/sites/default/files/research/three-dimensional_climate_clubs_and_the_g20-david_victor.pdf [https://perma.cc/A8D6-YWR7] (outlining the potential benefits of 3D climate clubs in combatting climate change issues national governments have been unable to address).

171 *See* Mike Bloomberg, *Mike Bloomberg Delivers Remarks on America's Pledge at COP23* (Nov. 11, 2017), https://www.mikebloomberg.com/news/mike-bloomberg-delivers-remarks-americas-pledge-cop23-bonn-germany-saturday-november-11th-2017/ [https://perma.cc/KR7N-WQCA] (transcribing Mike Bloomberg's address at COP23, where he reaffirmed America's pledge to combat climate change at the state-level in light of uncertainty of commitment by the federal government). To watch the remarks of former New York mayor Michael Bloomberg and California Governor Jerry Brown regarding the first America's Pledge report, which details how the US cities, states and businesses can continue to make progress on climate change mitigation regardless of the US federal level of governance, *see* Bloomberg Philanthropies, *America's Pledge at COP23*, YOUTUBE,

ly governments are participants in the climate change negotiations. In this respect, we have recently seen the relevant work of C40 Cities[172] and R20 regions of climate action outside the COPs.[173]

In fact, in December 2017, city leaders from different parts of the world met in Chicago, invited by its mayor, to discuss how cities could implement the Paris Agreement.[174] As of December 2017, California governor Jerry Brown was planning for an equally innovative summit to mitigate climate change at the sub-national level.[175] All these sub-national green efforts are most welcome.

7.6. Regionalism

Finally, regionalism seems to be on the rise,[176] certainly since the decline of multilateralism.[177] The number of RTAs has increased considerably since right before the creation of the WTO in 1995. This phenomenon has created the so-called spaghetti bowl.[178] Adjustments by just a few major GHG emitters[179] and just

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https://www.youtube.com/watch?v=gXyFW9_EJ_U (last visited Sep. 25, 2018) [https://perma.cc/6ZVB-FX4Q].

172 C40 CITIES, http://www.c40.org/ (last visited 4 November 2017) [https://perma.cc/J53Q-WNQ9].

173 REGIONS OF CLIMATE ACTION, http://regions20.org/ (last visited 4 November 2017) [https://perma.cc/8EPB-X2QN].

174 *Summit-Mania*, *supra* note 137, at 57.

175 *Id.*

176 *See generally* Jagdish Bhagwati, *US Trade Policy: The Infatuation with FTAs*, COLUMBIA UNIVERSITY DISCUSSION PAPER SERIES, No. 726 (1995), available at http://www.columbia.edu/cu/libraries/inside/working/Econ/ldpd_econ_9495_726.pdf [https://perma.cc/9RFU-T6HJ] (analyzing and cautioning against current policy of further expanding and creating FTA); Scott L. Baier et al., *Do Economic Integration Agreements Actually Work? Issues in Understanding the Causes and Consequences of the Growth of Regionalism*, 31 THE WORLD ECON. 461 (2008) (reviewing the effectiveness of economic integration agreements and analyzing the impact of the growth of regionalism on international trade agreements).

177 *See generally* Thomas Risse, *The Diffusion of Regionalism, Regional Institutions, Regional Governance*, originally presented at the EUSA 2015 Conference in March 2015, later included in TANJA A. BÖRZEL, THOMAS RISSE, OXFORD HANDBOOK OF COMPARATIVE REGIONALISM 88 (2016) (reviewing the concepts and exploring theories of the rise of regional organizations); Rafael Leal-Arcas, *Proliferation of Regional Trade Agreements: Complementing or Supplanting Multilateralism?*, 11 CHI. J. INT'L L. 597 (2011) (reviewing the rise of regionalism and regional trade agreements and their impacts on and relationship with multilateral trade agreements).

178 *See generally* Jagdish Bhagwati, *Regionalism versus Multilateralism*, 15 THE WORLD ECON. 535 (1992) (reviewing the history of regionalism, including its recent

three mega-RTAs (namely the Trans-Atlantic Trade and Investment Partnership (TTIP), the Trans-Pacific Partnership (TPP), and the Regional Comprehensive Economic Partnership (RCEP))[180] can make a great contribution towards climate change mitigation and the enhancement of sustainable energy.[181]

The evidence for this claim is that RTAs have often served as laboratories for covering new disciplines that do not exist in the WTO context.[182] Moreover, RTAs today cover many topics well beyond trade: competition, investment, environmental protection, natural resources, intellectual property rights, labor rights, and so forth.[183] Since most of the contracting parties to these three mega-

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rise, and contrasting it with multilateralism in international trade agreements).

179 According to the World Resources Institute, based on cumulative emission which describes a country's total historic emission, almost half of the global emission of greenhouse gases comes from four parties to the United Nations Framework Convention on Climate Change, namely China, the United States, the European Union, and India. *See* Mengpin Ge et al., *6 Graphs Explain the World's Top 10 Emitters*, WORLD RESOURCES INSTITUTE (Nov. 25, 2014), https://www.wri.org/blog/2014/11/6-graphs-explain-world%E2%80%99s-top-10-emitters [https://perma.cc/4A9B-496W].

180 That said, since early 2018, the TPP has had a new name (the US withdrew from it in early 2017), the RCEP has come to a halt, and the TTIP negotiations are frozen. For the TTIP negotiations, *see* Philip Blenkinsop, *U.S. Trade Talks in Deep Freeze After Trump Win, Says EU*, REUTERS (Nov. 11, 2016), https://www.reuters.com/article/us-usa-election-eu-trade/u-s-trade-talks-in-deep-freeze-after-trump-win-says-eu-idUSKBN1361UN [https://perma.cc/TBE3-RFZQ].

181 *See generally* RAFAEL LEAL-ARCAS et al., INTERNATIONAL ENERGY GOVERNANCE: SELECTED LEGAL ISSUES (2014) (reviewing the timelines of the Trans-atlantic Trade and Investment Partnership and the Trans-Pacific Partnership and their impact on promoting sustainable development); LEAL-ARCAS, *supra* note 24 (reviewing different multilateral, regional, and bilateral trade agreements and their impact on energy trade); *see also* WORLD ECONOMIC FORUM, MEGA-REGIONAL TRADE AGREEMENTS GAME-CHANGERS OR COSTLY DISTRACTIONS FOR THE WORLD TRADING SYSTEM? (July 2014), http://www3.weforum.org/docs/GAC/2014/WEF_GAC_TradeFDI_MegaRegionalTradeAgreements_Report_2014.pdf [https://perma.cc/K9SG-82T3] (detailing the key issues, impact, and potential responses to mega regional trade agreements such as TPP and TTIP).

182 For analysis of the link between regional trade agreements (RTAs) and the WTO, *see* Rafael Leal-Arcas, *Proliferation of Regional Trade Agreements: Complementing or Supplanting Multilateralism?*, 11 CHI. J. INT'L L. 597 (2011).

183 *See* Rafael Leal-Arcas, *Brexit and the Future of UK Trade*, QUEEN MARY UNIVERSITY OF LONDON (Nov. 25, 2016) http://www.qmul.ac.uk/media/news/items/hss/190227.html [https://perma.cc/AS3M-VPQM] (discussing how the fallout of Brexit extends past trade agreements and what future trade agreements between the UK and the EU may look like).

regional agreements are also the main GHG emitters, and since RTAs have provisions that bind countries to mitigate climate change, then RTAs may potentially become a very effective solution to climate change mitigation and the promotion of clean energy.[184] In addition, one can think of even multilateralizing RTAs.[185]

Multilateralism might be the best way forward in terms of legal certainty, predictability, and transparency. The second-best option seems to be regionalism/plurilateralism.

8. OUTLOOK

There is still much to do about how the trading system can support clean energy and climate action. Investing in renewable energy makes economic sense, not just environmental sense, given that solar energy is the fastest growing energy source. There are obvious social and economic benefits in renewable energy in general and solar energy in particular. Renewables can provide energy for all. They can increase the quality of health by reducing the level of pollution.[186] They can be scalable: citizens can decide what type of energy they want (micro-grids or big solar panels). Renewables can enable students to study where there is not light after dark. The key drive of solar energy is its business case: the price has dropped dramatically in recent years. For renewable energy to be produced at large scale, international cooperation will be neces-

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[184] The same argument applies to sustainable energy. *See generally* Rafael Leal-Arcas et al., *Renewables, Preferential Trade Agreements and EU Energy Security*, 4 LAWS 472 (2015) (discussing how the rise of renewable energy would lead to an increase in international trade in energy and exploring the role of preferential trade agreements in such a market).

[185] *See generally* Joost Pauwelyn, *Legal Avenues to Multilateralizing Regionalism: Beyond Article XXIV*, *in* RICHARD BALDWIN AND PATRICK LOW, MULTILATERALIZING REGIONALISM: CHALLENGES FOR THE GLOBAL TRADING SYSTEM 368 (2009) (exploring how regional trade agreements can legally be multilaterized through balancing dispute settlement systems of RTAs and the WTO); Richard Baldwin, *Multilateralising Regionalism: Spaghetti Bowls as Building Blocs on the Path to Global Free Trade* (Nat'l Bureau of Econ. Research, Working Paper No. 12545, 2006), http://www.nber.org/papers/w12545 [https://perma.cc/S9KJ-HHWV] (explaining how the multilateralization of regionalism is necessary to achieve a global free trade economy).

[186] For views on the negative impact of GHG emissions on human health due to air pollution, *see* WORLD HEALTH ORGANIZATION, AIR POLLUTION, www.who.int/airpollution/en/ [https://perma.cc/6HGW-DWVT] (last visited Sept. 13, 2018).

sary. One could also have a more decentralized and democratized energy system.[187]

The role of international trade (agreements) in renewable energy may be enhanced in the future. For instance, wind and sunshine in northern Europe is not the same as in southern Morocco. The price of northern European renewable energy will therefore be higher. International trade will therefore play a major role to reduce prices. For that to happen, free and fair solar trade in the global value chain of trade in goods and services is a must. The elimination of trade barriers damaging the global value chain is necessary, whether it is local content requirements or fossil fuel subsidies,[188] as is the promotion of green growth for a sustainable future.[189] Equally, greater cooperation will be necessary between developed countries that possess the solar-energy technology and sunshine countries between the Tropic of Cancer and the Tropic of Capricorn, who are fortunate to have tremendous solar-energy potential. All of this will take place with new thinking and innovation, instead of more of the same.

The reduction of GHG emissions is possible if we switch to 100% renewable energy and if we stop using fossil fuels in the en-

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187 For a thorough analysis, *see generally* Rafael Leal-Arcas et al., *Smart Grids in the European Union: Assessing Energy Security, Regulation & Social and Ethical Considerations*, QUEEN MARY SCHOOL OF LAW LEGAL STUDIES RESEARCH PAPER 263 (2017), available at https://ssrn.com/abstract=3062957 [https://perma.cc/7GGS-AJ38].

188 For climate change and the elimination of trade barriers, *see generally* Christopher Frey, *Tackling Climate Change through the Elimination of Trade Barriers for Low-Carbon Goods: Multilateral, Plurilateral and Regional Approaches*, *in* VOLKER MAUERHOFER, LEGAL ASPECTS OF SUSTAINABLE DEVELOPMENT 449 (2016). For fossil fuel subsidies in the maritime and aviation realms, *see* Michael Keen et al., *The (Non-) Taxation of International Aviation and Maritime fuels: Anomalies and Possibilities,* VOX (Sept. 9, 2014), http://voxeu.org/article/non-taxation-international-aviation-and-maritime-fuels-anomalies-and-possibilities [https://perma.cc/4YWV-PMXX].

189 *See, e.g.*, BELT AND ROAD PORTAL, GUIDANCE ON PROMOTING GREEN BELT AND ROAD (May 8, 2017), https://eng.yidaiyilu.gov.cn/zchj/qwfb/12479.htm [https://perma.cc/KY6Y-TXRC] (providing the sustainability views and explaining the policy of the Chinese Communist Party regarding the Belt and Road Initiative). *See also* Brian Parkin, *China Assumes Green Power Mantle, Leaving Germany, U.S. Behind*, BLOOMBERG (Dec. 5 2017), https://www.bloomberg.com/news/articles/2017-12-05/china-assumes-green-power-mantle-leaving-germany-u-s-behind (summarizing a report commissioned by the German government published by the Federal Environmental Office showing an increase in Chinese exports of environmental goods and services and detailing the impact of this shift on climate change and the global economy).

ergy sector, transportation and agriculture.[190] Green buildings, reforestation of large areas, and organic agriculture will be necessary elements to reach this goal. To all this, one should add the engagement the US, the EU, and China (as the major GHG emitters), helping navigate the transition to renewable energy, and the promotion of carbon pricing.

[190] *See generally* Hsin Huang et al., *Climate Change and Trade in Agriculture*, 36 FOOD POL'Y S9 (2011).