CIGI

CIGI PAPERS
NO. 72 — JUNE 2015

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A PIECE OF THE PUZZLE

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ACRONYMS

APEC	Asia-Pacific Economic Cooperation
CFCs	chlorofluorocarbons
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of the Parties
EC	European Communities
EG	environmental good
EGA	Environmental Goods Agreement
Eurostat	Statistical Office of the European Communities
GATT	General Agreement on Tariffs and Trade
GHG	greenhouse gas
HS	Harmonized Commodity Description and Coding System
ITA	Information Technology Agreement
MEA	multilateral environmental agreement
MFN	Most Favored Nation
OECD	Organisation for Economic Co-operation and Development
PRIs	policies, regulations and incentives
TPP	Trans-Pacific Partnership
UNFCCC	United Nations Framework Convention on Climate Change
WTO	World Trade Organization

EXECUTIVE SUMMARY

Can a trade agreement help achieve environmental goals? The answer to this question has traditionally been mixed, even skeptical. For example, North American Free Trade Agreement negotiations produced a side agreement, the North American Agreement on Environmental Cooperation. Despite the novelty of this approach, many were disappointed with the outcome, calling it "shallow" and "vague," among other things (Charnovitz 1994). The World Trade Organization's (WTO's) Doha Round negotiations were ostensibly committed to certain issues at the intersection of trade and environment, but multilateral talks have long been stalled. United States Trade Representative Michael Froman has called the Trans-Pacific Partnership (TPP) "an agreement that will be historic in the precedents it sets for environmental protection" (Froman 2015). Yet, analysis of the leaked TPP environmental chapter suggests otherwise (see, for example, Clark Howard 2014).

Despite these underwhelming results in other trade negotiations, the Environmental Goods Agreement (EGA) has the potential to produce a more positive outcome. This paper explores this potential, beginning with an introduction to the EGA. It then reviews key aspects of the trade-environment relationship. Prevailing perceptions tend not to count trade agreements as key contributors to the achievement of environmental goals. The third section looks at the potential contribution of tariff reduction to environmental objectives, and then examines critical challenges to the completion of EGA negotiations. The conclusion reiterates that the EGA is an important piece of a complex environmental governance puzzle.

THE EGA

Negotiations toward the EGA were officially launched in Geneva, Switzerland, on July 8, 2014. Fourteen WTO members signed the official statement: "We the representatives of Australia; Canada; China; Costa Rica; the European Union; Hong Kong, China; Japan; Korea; New Zealand; Norway; Singapore; Switzerland; Chinese Taipei; and the United States…announce our commitment to achieve global free trade in environmental goods, and pledge to work together, and with other WTO Members similarly committed to liberalization, to begin preparing for negotiations in order to advance this shared goal" ("Joint Statement" 2014, 1).

The intention of the EGA at this time is to make trade in environmental goods tariff-free. The launch statement affirms that the EGA is intended to be a plurilateral agreement negotiated under WTO auspices: "We anticipate a structure for an environmental goods agreement that would reinforce the rules-based multilateral trading system and benefit all WTO Members, including by involving all major traders and applying the principle of Most Favored Nation [MFN]. Such an agreement would take effect once a critical mass of WTO Members participates" (ibid.). As Rene Vossenaar (2014) explains, the participants will have to determine the critical mass threshold. The 14 original participants are thought to account for 86–88 percent of trade in environmental goods. A 90 percent threshold would likely be considered, since the most recent successful plurilateral agreement, the Information Technology Agreement (ITA), defined critical mass as 90 percent of trade in information technology goods: "In theory EGA participants could adopt any threshold considered large enough to reduce concerns about free riding — where non-participants benefit from the tariff reduction and elimination without having to reduce or remove their own tariffs" (Vossenaar 2014; see also BioRes 2014).

Since the January 2014 launch, several countries have expressed interest in joining EGA talks. As of this writing, participants number 17 (counting the 28-member European Union as one), with the addition of Israel in January 2015 and Turkey and Iceland in March 2015 (BioRes 2015a). Several potentially interested countries with a stake in environmental goods trade have yet to join, notably Mexico (Vossenaar 2014); Brazil, India and South Africa are not involved. Most participants are relatively highly developed economies, although China has reportedly raised the possibility of special and differential treatment for developing countries, which might attract more participation (BioRes 2015b).

Six rounds of negotiations have taken place since January 2014, with the most recent in May 2015. Subsequent negotiations are scheduled for mid-June and late July 2015. To date, participants have been tabling possible environmental goods to be included in any agreement. Participating states compiled a list of over 650 tariff lines comprising more than 2,000 products by the end of the May 2015 meetings (ibid.). Summer 2015 discussions will shift parties into a "second stage" of negotiations, moving from technical discussions to "a focus on whittling down a compilation of potential tariff lines to a final list slated for tariff liberalisation" (BioRes 2015a). Participants are ostensibly aiming to have the contours of an agreement by the WTO's mid-December 2015 ministerial meeting in Nairobi. Those following climate change negotiations will note that the twenty-first session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) is due to take place in December 2015 in Paris. While there is no clear evidence to suggest that the EGA is being timed for COP 21, key observers have made the link (see, for example, Alliance of the Sustainable Energy Trade Initiative 2015). In addition, Jaime de Melo and Mariana Vijil (2014, 1) argue that progress on the EGA is a "barometer" for climate change negotiations. The original launch statement notes a two-fold purpose for the negotiations: "this effort in the WTO will add impetus and energy to the multilateral

trading system and support its mission to liberalize trade, and make a significant contribution to the international environmental protection agenda, including our shared efforts in the ongoing [UNFCCC] negotiations to combat climate change and transition to a green economy" ("Joint Statement" 2014).

The possibility of negotiating an agreement on environmental goods is not new. Paragraph 31 of the 2001 Doha Declaration deals explicitly with trade and environment. In particular, paragraph 31 (iii) states the following: "With a view to enhancing the mutual supportiveness of trade and environment, we agree to negotiations, without prejudging their outcome, on…the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services."[1] For a variety of reasons, Doha Round negotiations toward such an agreement foundered. The EGA represents the most recent effort.

The EGA builds on efforts made by the Asia-Pacific Economic Cooperation (APEC) forum. In 2012, APEC leaders issued the Vladivostok Declaration. Appendix C of the declaration lists 54 environmental product categories. In the declaration, APEC members reaffirm a commitment made in 2011 to reduce tariffs to five percent or less on the list of 54 environmental goods by the end of 2015. The Asia-Pacific region has been called "an environmental goods trade hub" (Sugathan and Brewer 2012, 2). EGA negotiations aspire to move beyond both the Asia-Pacific region and the list of 54 environmental goods to make progress on a wider geographical and sectoral scale. In order to do so, they will have to confront significant definitional and conceptual hurdles to agree on what environmental goods will be covered by the EGA.

THE RELATIONSHIP BETWEEN TRADE AND ENVIRONMENT

From a theoretical or a philosophical standpoint, the relationship between trade and the environment is complicated. It is not clear whether they harm one another or whether they are mutually beneficial. For example, one could argue persuasively that *trade harms the environment* by pointing to increases in pollution as economies develop. One can cite the example of China, where impressive leaps in export-led development seem to correlate with worrying increases in pollution. China is not alone in this. South Korea, for example, faced serious environmental challenges during the height of its economic development, including air pollution, sulphur dioxide emissions from industry, rising mean air temperatures in industrial centres and contaminated tap water (Ali Khan 1996, 118). According to the Global Commission on the Economy and Climate Change (2014, 2), "Globalisation has been a major driver of both high- and low-carbon growth over the last 25 years. World trade more than tripled in that period, reaching US$18 trillion in 2012. This has provided an important boost to developing and emerging economies as well as developed ones, but…it has also led to a significant shift in production to countries with weaker pollution controls and predominantly coal based energy systems. Thus, the trade boom has likely increased global greenhouse gas [GHG] emissions."

This sort of analysis tends to focus on emissions due to the production processes of traded products. At the same time, Anca D. Cristea et al. (2011, 32) draw attention to equally important emissions from the transport of traded goods: "Many exporters and products that look relatively 'clean' when we focus only on output emissions are in fact heavy emitters once incorporating transportation. In some countries the impact of mitigation will be felt most acutely on the production side, whereas in countries like the US, the main effect will primarily be on transport." One can imagine the various combinations and permutations that can lead to positive environmental outcomes. They continue, "If a country has very high output emissions, and transports goods efficiently, importing the good from a low emission producer can reduce emissions" (ibid., 31). However, GDP growth trends and liberalization patterns may not always support such an outcome wherein both production and transportation emissions are simultaneously lowered.

On the other hand, one can also show that *trade can help to achieve environmental goals*. Some analysts posit a positive correlation between economic development and environmental responsibility. According to Sallie James (2009, 1), "Indeed, because trade leads to wealth, and wealth to an increased desire and ability to protect the environment, the two are complementary." The Global Commission (2014, 2) states that "trade has also played a major role in accelerating the diffusion of low-carbon technologies such as solar and wind power, and light-emitting diodes….The ability to produce components in low-cost countries, combined with expanding global markets, has led to a dramatic reduction in the cost of those technologies, enabling broader deployment." As Jennifer Clapp and Peter Dauvergne (2005) explain, this perspective is grounded in basic economic theories, such as comparative advantage. Efficiency gains associated with favoured liberal economic practices can ostensibly lead to positive environmental outcomes.

On the other side of this debate, one can argue that *positive attention to the environment can create economic and trade opportunities*. The Obama administration, for example, has tied the development of renewable energy and other green investments to growth and transformation in the American economy. At the same time, developing countries worry about the *opposite*. They claim higher environmental standards can be burdensome and make it more difficult

1 See www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm.

to achieve development gains. The relationship between trade and environment is clearly a complex one; nonetheless, the links are irrefutable. Perhaps the most tangible institutional efforts to work out this relationship have come in two places — international treaties and WTO disputes.

The WTO has identified 16 multilateral environmental agreements (MEAs) (from among more than 250) that contain provisions relevant to the trading regime. For the most part, these agreements co-exist well with the WTO. A useful example is the Montreal Protocol on Substances that Deplete the Ozone Layer. The Montreal Protocol targets chlorofluorocarbons (CFCs), commonly used in household appliances such as refrigerators and air conditioners. In the 1970s, CFC emissions were linked to a hole in the ozone layer, which, in turn, was said to explain higher incidences of skin cancer in humans. Cass Sunstein (2007) explains that the movement to ban CFCs did not gel immediately in response to the scientific evidence of their danger. In fact, the Europeans initially resisted such a ban while the United States promoted one. Nonetheless, a combination of strong US action, media attention leading to changes in consumer behaviour, subsequent scientific findings to reinforce earlier claims, and the prospects of private sector profits associated with the development and production of CFC substitutes eventually turned the tide (ibid.), culminating in an international agreement in 1987. The Montreal Protocol has been deemed an "extraordinary success" (ibid.), despite the fact that it deploys tools that interfere with open trade in CFCs and it disadvantages their producers. It has a high ratification and compliance rate, with very real and positive effects on the ozone layer. The Montreal Protocol suggests that trade concerns can be set aside when clear environmental concerns are in play and when a constellation of political and economic aspects align.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is another good example of an environmental agreement that uses trade mechanisms to achieve its goals. CITES oversees and restricts the import and export of species covered by the agreement. While this is a practice that might conceivably be challenged as incompatible with the trading regime, it has co-existed well with it. No formal dispute has ever been launched over an MEA, although "they remain vulnerable to legal challenge in the WTO" (Eckersley 2004, 24). The WTO coordinates with the secretariats of the MEAs through a variety of means, including some limited observerships; however, this relationship is uneven. WTO representatives can observe MEA proceedings with relative ease, while MEA representatives have more restricted access to the WTO. These MEA examples suggest that governments are willing to accommodate the trading regime to recognized environmental needs under certain circumstances. It is wise to temper optimism in assessing the relationship between the WTO and MEAs. Nonetheless, it is worth recognizing the set of MEAs in force that have, so far, successfully employed trade mechanisms to achieve environmental goals without challenge.

The relationship between trade and the environment has perhaps been more fraught in trade disputes, although not surprisingly so, given the principles that guide dispute panels. There is a narrow interpretation of the application of WTO provisions, which in disputes falls to a panel of judges — made up of trade experts — whose first duty is to ensure compliance with the provisions of the various trade agreements administered by the WTO. While these judges may be sympathetic to environmental measures, in their capacity, they can only endorse them if they prove to be "no less trade restrictive" than alternatives, evaluated against a benchmark of acceptable trade policy. Second, science is often the standard for determining the limits of trade regime provisions. Yet, in some environmental debates, advocates sometimes hold certain positions despite scientific evidence to the contrary or in the absence of decisive scientific conclusions. In sum, inside the trade regime, the criteria for judging the appropriateness of an environmental policy are not the same criteria that one might deem appropriate in a broader context.

Highlighting some key dispute decisions can serve to illuminate the prospects for achieving environmental goals when trade rules are privileged. Two categories of disputes can be identified: the General Agreement on Tariffs and Trade (GATT) and WTO disputes. Among the GATT disputes with particular implications for the environment, the US-shrimp case may be the best known. In 1997, India, Malaysia, Pakistan and Thailand lodged a complaint against the United States for a law banning the importation of shrimp caught in a manner that endangered species of sea turtles. The United States required shrimp trawlers to be equipped with "turtle extruder devices," which were not in use in the complainant countries. The United States lost the case because it was shown that US law was being enforced in a discriminatory way. In particular, the US government extended concessions to shrimp fishers from the Caribbean that it did not extend to fishers from the complainant countries. Mindful of the fact that the decision would likely be read as anti-environment, the WTO Appellate Body said the following:

> 185. In reaching these conclusions, we wish to underscore what we have not decided in this appeal. We have not decided that the protection and preservation of the environment is of no significance to the Members of the WTO. Clearly, it is. We have not decided that the sovereign nations that are Members of the WTO cannot adopt effective measures to protect endangered species, such as sea turtles. Clearly, they can and should. And we have not decided that sovereign states should not act together

> bilaterally, plurilaterally or multilaterally, either within the WTO or in other international fora, to protect endangered species or to otherwise protect the environment. Clearly, they should and do.
>
> 186. What we have decided in this appeal is simply this: although the measure of the United States in dispute in this appeal serves an environmental objective that is recognized as legitimate under paragraph (g) of Article XX of the GATT 1994, this measure has been applied by the United States in a manner which constitutes arbitrary and unjustifiable discrimination between Members of the WTO, contrary to the requirements of the chapeau of Article XX. (WTO 1998, 75)

This statement can be read as a clear expression of the limitations faced by dispute settlement panels. Their mandate is narrow and rarely admits consideration of non-trade issues, however relevant and important. Even panel members sympathetic to the environmental implications of a dispute will ultimately render their decision based primarily on trading regime criteria, especially the principle of non-discrimination.

Two other disputes warrant attention as part of the present inquiry. The first is the case filed by the United States against the European Union over its apparent moratorium on the approval of biotech products — the European Communities (EC) — Measures Affecting the Approval and Marketing of Biotech Products (EC-Biotech) case. This case is important for several reasons. However, for present purposes, the panel report's discussion of the appropriate interaction between WTO law and other bodies of international law is noteworthy. In their submissions to the panel, the European Union justified its biotech measures in terms of the precautionary principle. It further invoked the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, which came into force in September 2003. The Biosafety Protocol establishes "a right for parties to take precautionary measures at the national level" (Graff 2002, 419). It enshrines the "precautionary principle," which "provides the philosophical authority to take public policy or regulatory decisions in the face of scientific uncertainty" (ibid.). If we have a hunch that genetically modified corn, for example, may have a negative effect on our environment or on our bodies, the precautionary principle gives governments the justification to restrict the circulation of corn in their national economies, even if they cannot prove scientifically that harm may ensue.

WTO agreements, such as the one concerning sanitary and phytosanitary measures, contain some provisions to address related issues, but they require member states to provide scientific proof of potential harm before they can impose barriers to the movement of relevant goods. By enshrining the precautionary principle, the Biosafety Protocol strengthens the ability of national governments to make judgments about how to define potential threats to their respective societies and to make policy accordingly. Under the protocol, governments can refuse the entry of relevant GMOs into their market, a move that, for some, amounts to a nullification of key market access and non-discrimination principles underlying the trading regime. Indeed, the Miami Group[2] of countries (the United States, Japan, Canada, Argentina and others) resisted the Biosafety Protocol on free trade grounds.

Sikina Jinnah (2010, 57) calls EC-Biotech "a landmark decision with respect to clarifying how the WTO will legally approach overlap between the WTO and other bodies of international law….In short, the panel decided that it need not consider the provisions of the Convention on Biological Diversity's…Cartagena Protocol in evaluating the legality of the European Communities'…regulations restricting biotech trade because not all parties to the WTO dispute were also parties to the Protocol." The following excerpt from the panel report illuminates their thinking:

> 7.74 We note that like most other WTO Members, Argentina, Canada and the European Communities have ratified the Convention on Biological Diversity and are thus parties to it. The United States has signed it in 1993, but has not ratified it since. Thus, the United States is not a party to the Convention on Biological Diversity, and so for the United States the Convention is not in force. In other words, the Convention on Biological Diversity is not 'applicable' in the relations between the United States and all other WTO Members. The mere fact that the United States has signed the Convention on Biological Diversity does not mean that the Convention is applicable to it. Nor does it mean that the United States will ratify it, or that it is under an obligation to do so. We have said that if a rule of international law is not applicable to one of the Parties to this dispute, it is not applicable in the relations between all WTO Members. Therefore, in view of the fact that the United States is not a party to the Convention on Biological Diversity, we do not agree with the European Communities that we are required to take into account the Convention on Biological Diversity in interpreting the multilateral WTO agreements at issue in this dispute. (WTO 2006, 335)

The third dispute of interest is Canada — Certain Measures Affecting the Renewable Energy Sector (Canada-Renewable Energy). This dispute was brought

2 For more information on the Miami Group, see www.iisd.org/pdf/biosafety.pdf.

by Japan, who contested the province of Ontario's feed-in tariff program. Avidan Kent and Vyoma Jha (2014, 1) call this dispute "the first-ever case at the [WTO] to address the tenuous 'trade versus climate' debate in the context of renewable energy policies." This may be an emerging trend (Lewis 2014), and "it is estimated that 14% of WTO disputes since 2010 have related to renewable energy, at least in part" (Global Commission 2014, 8).

Two issues were in play in this dispute: the compatibility of local content rules with WTO principles of non-discrimination and the status of the feed-in tariff process as a subsidy. The dispute panel found that the feed-in tariff program did not constitute a subsidy, or, at least, they were unwilling to make a judgment on this issue at the time. The panel also ruled that local content requirements were discriminatory. Again, the decision in this dispute clearly shows that certain key considerations will prevail every time if issues are adjudicated according to the principles of the trading regime. Measures that are discriminatory, whether they are environmentally friendly or not, will not pass muster at the WTO.

The results in these types of disputes have been called "damaging to the growth of low-carbon policy" (Global Commission 2014, 8). Even a robust EGA cannot offset the issues that will emerge in the context of WTO disputes: "It would clearly be beneficial to all sides if these disputes were avoided if possible, and resolved more quickly when they occur" (ibid., 9). In any event, a deeper conversation about how legitimate trade concerns can be reconciled with desirable environmental outcomes seems warranted. The necessity of such a discussion underlines the degree to which the EGA will only be one part of a much larger climate change mitigation puzzle.

THE EGA — WHAT CAN TARIFF REDUCTION ACHIEVE?

Tariffs make imported goods more expensive. They can be a source of revenue. They can also shield domestic producers from unwanted competition. Economic theory teaches that tariff reduction and removal is the preferred outcome in most instances to offset any inefficiencies they create. An economist, therefore, would applaud efforts at tariff reduction for economic reasons. But what can the reduction of tariffs on green goods achieve more broadly? What contribution can attention to this trade mechanism make to larger climate change mitigation and adaptation goals?

International trade in environmental goods and services is sizable and growing. According to the Global Commission (2014, 2), "International trade in environmental goods and services totals nearly US$1 trillion per year, or around 5% of all trade. Trade in low-carbon and energy-efficient technologies alone is expected to reach US$2.2 trillion in 2020, a tripling of current levels. Two-fifths of that market are expected to be in emerging and developing economies, and the companies supplying these markets come from all over the world." It continues, "The global market for environmental goods and services was estimated to have reached US$ 866 billion in 2011 and is expected to rise to US$ 1.9 trillion by 2020" (Bucher et al. 2014, 9). Excluding services from the calculations, exports of environmental goods have risen from approximately US$231 billion in 2001 to US$ 656 billion in 2012 (ibid., 10). One report identifies the top five environmental goods exporters (average yearly export value 2008–2013) as Germany, China, the United States, Japan and Italy. The same report identifies the top five importers (average yearly import value 2008–2013) as the United States, China, Germany, France and the United Kingdom (ibid., 11).

While the environmental goods industry is growing at a rapid rate, tariffs are already relatively low. According to Vossenaar (2014), "For the APEC list, the overall simple average MFN-applied tariff is only 1.67 percent. This very low average can mostly be explained by the large number of duty-free items and more than half of all imports are fully duty-free on an MFN basis. Considering only those dutiable items, the simple average MFN-applied tariff at 4.3 percent is more significant, although still modest…. Bound tariffs among the largest participants are also already low. For example, the simple and trade-weighted averages of bound tariffs are only around 1.5 percent in both the EU and the US, although this figure sits at 5.2 percent for China." Tariffs on some products — such as solar cells, panels and modules — are already low because they are covered by the ITA (ibid.). All 17 current participants in EGA negotiations are ITA signatories.

Despite relatively low tariff levels, there is still room for gains. There are tariff peaks as high as 35 percent (de Melo and Vijil 2014, 3). In addition, the tariff story is different when expanded from EGA participants to the world. According the United Nations Environment Programme (2012, 2), "Overall it is estimated — using a sample of environmental goods [EGs] in renewable energy, environmental monitoring and assessment, waste management, recycling and remediation — that average world tariffs on EGs are bound at a level of 8.7 percent, almost three times higher than the average applied rate for all goods — considering full use of preferences — at 3 percent." The same report notes that market access gains may not be significant for environmental exports from least-developed countries and developing countries to developed countries, but more so between developing countries: "The real opportunities lie within South-South trade, where EGs face much higher bound and applied tariffs" (ibid., 3).

Even among EGA participants, tariff reduction holds some appeal, largely due to global value chains. Bill Krist (2014, 1) notes that tariffs among the 14 original participants in the EGA are so low that they might be characterized

as "nuisance tariffs." Eliminating low tariffs can still "have some impact in reducing costs and simplifying paperwork, and eliminating these duties can also have some symbolic benefits. Importantly, many [EGs] are produced from parts and components that may cross a number of borders. Nuisance tariffs can add up in these supply chains; for example, windmills may contain gear boxes, towers, blades, advanced batteries and other parts and components that cross borders multiple times" (ibid.).

Reduction of tariffs on EGs has been part of the climate change mitigation and adaptation discussion for some time. Many experts concede that it is an important piece of the puzzle. De Melo and Vijil (2014, 2) claim that "unimpeded trade in Environmental Goods and Services… is recognized to be a center-piece of the needed mitigation measures to combat climate change." An ambitious EGA, for de Melo and Vijil, would be an important step in the right direction.

The *Stern Review: The Economics of Climate Change* observes that "the reduction of tariff and nontariff barriers for low-carbon goods and services, including within the Doha Development Round of international trade negotiations, could provide further opportunities to accelerate the diffusion of key technologies" (Stern 2006, xxv). Of course, diffusion of clean technologies will not take place as a result of tariff reduction alone. A variety of mechanisms will likely be needed. A World Bank report (2008, 49) identifies several ways of transferring clean energy technologies. These include international joint ventures, technology licencing and temporary relocation of employees. Other innovative approaches include "making climate-related patents available free or at low cost through voluntary patent pools, open source innovation and open licensing arrangements" (Global Commission 2014, 7). Once technology is transferred, those on the receiving end must be equipped to deploy it. The Global Commission continues, "More generally, there is strong evidence that a key factor in enabling greater clean energy technology transfer is having local capacity to successfully adopt the new technologies. Strengthening technical and scientific capacities in developing countries is therefore a critical step toward enhanced technology transfer" (ibid.).

Effective diffusion of clean technologies is an increasingly important issue as developing countries, such as China and India, join the roster of large emitters. According to the World Bank report, "Some developing countries have already taken measures to unilaterally mitigate climate change; for instance, they have increased expenditures on R&D for energy efficiency and renewable energy programs. It is important that these countries identify cost-effective policies and mitigation technologies that contribute to long-term low-carbon growth paths. Especially for coal-driven economies like China and India, investments are critical in clean coal technology and renewable energy such as solar and wind power generation" (2008, 12-13). The report goes on to characterize tariffs and non-tariff barriers as "a huge impediment to the transfer of these technologies to developing countries. For example, energy-efficient lighting in India is subject to a tariff of 30 percent and a nontariff barrier equivalent of 106 percent" (ibid., 13). Aside from the tangible benefits of technology diffusion, Mahesh Sugathan (2015) argues that "a meaningful EGA outcome that promotes the diffusion of energy efficiency products would send a positive signal to the global economy that trade policy can support emissions abatement efforts and systemic long-term decarbonisation."

Tariff reduction can benefit exporters by making their products more accessible, but will not likely help countries that have not already developed an export sector to become a renewable energy producer: "The trade in environmental goods remains, predominantly, as occurring between developed countries. European countries, the United States of America and Japan are the main exporters of environmental goods globally. However some emerging economies, especially in East Asia and among the BRICS [Brazil, Russia, India, China and South Africa], are already important export and import markets. China, the Republic of Korea, Mexico, Brazil, Malaysia, the Russian Federation, Chinese Taipei and Thailand are significant global players" (Bucher et al. 2014, 11).

A conversation about what is included in current EGA talks quickly invites questions about what is *not* included. Current negotiations will only address tariff reduction. There is an ongoing discussion about which *products* should appear on the EGA agenda. Simon Lester and K. William Watson (2013, 1) have posed a different question: which *tariffs*? They distinguish between "normal" tariffs and "special tariffs imposed through the so-called 'trade remedies' — antidumping…duties, countervailing duties…and safeguards." They suggest that normal tariffs will likely be targeted in the EGA, while trade remedies will not. The relevance of a conversation about trade remedies to environmental goods trade is undeniable. China, the European Union, India and the United States have all been (or are currently) embroiled in disputes over trade remedies, mostly relating to solar energy products. The United States has imposed anti-dumping tariffs between 44.99 and 70.63 percent, as well as countervailing duties between 21.86 and 34.81 percent on the Chinese wind industry, and anti-dumping tariffs ranging from 24 to 36 percent on the Chinese solar industry. China has imposed preliminary anti-dumping duties on polysilicon, an input into photovoltaic cells, from US (between 53.3–57 percent) and Korean (between 2.4–48.7 percent) producers (statistics in Lester and Watson 2013, 1). Lester and Watson float a proposal to exempt environmental goods from trade remedies. Robert Howse (2013) also suggests strategies for discouraging recourse to trade remedies. At this time, there is no evidence to suggest that EGA participants are entertaining these possibilities.

Also not on the immediate agenda for EGA participants are non-tariff barriers and environmental services. However, this may be temporary. Subsequent negotiations may bring these important elements into the discussions. Although tariff reduction is not without challenge, it may well be the low-hanging fruit compared to non-tariff barriers, such as standards, certification requirements, technical regulations and testing, inspection and quarantine requirements (Sugathan 2015; United Nations Environment Programme 2012, 3).

Services may not now be on the agenda in EGA talks, but they may eventually. EG services may also be part of negotiations toward the Trade in Services Agreement (Goff 2015). This remains to be seen. Regardless of where it is addressed, environmental services liberalization would be an important part of both the trade and climate change mitigation objectives. "Environmental services have been estimated…to make up approximately 65 per cent of the environmental industry as a whole. It is conceptually difficult to discuss environmental goods and services separately. Many environmental services require some environmental goods in their provision. Likewise, the sale of an environmental product usually involves embedded environmental services content or requires some form of associated installation, maintenance service and monitoring. For example, in the photovoltaic industry, it is estimated that the rooftop installation cost of photovoltaic modules accounts for 60% of the total cost of purchase" (Bucher et al. 2014, 10).

Some thought has already gone into environmental services liberalization. Lists of environmental services exist at the WTO, the Statistical Office of the European Communities (Eurostat), the Organisation for Economic Co-operation and Development (OECD) and others (Bucher et al. 2014, 8). Identifying key environmental services requires attention to different elements. According to the World Bank report, "The modes of trade are different from those for goods (often involving investment, or 'commercial presence'). While there are issues with regard to classification, the definitional complexity is certainly less than for [EGs], and the trade issues are of a different nature and often involve domestic regulatory issues as well" (World Bank 2008, 74).

Even if the EGA were to liberalize trade across a large list of goods and, eventually, services and non-tariff barriers, it is one element in a much larger suite of measures. Certainly, tariff reduction can provide a stimulus for those who are established in the industry and provide more affordable access to green technologies for those who are not. Nonetheless, EGA talks "represent an excellent opportunity for trade policymakers to *complement* emissions abatement and climate change mitigation efforts" (Sugathan 2015; author's emphasis). This is true on two levels. On the one hand, complementary measures will be necessary to ensure that the EGA delivers on its promise. This might include capacity building in receiving countries, among other things. On the other hand, the EGA is just one piece of a larger climate change mitigation and adaptation puzzle. As Sugathan (2015) states, "Trade liberalisation efforts will of course need to be complemented by domestic energy-efficiency policies, regulations, and incentives (PRIs) that constitute major drivers for national market transformation. Such PRIs include minimum energy performance standards…and comparable labels for products. However, keeping markets open for energy efficiency technologies by lowering or eliminating import duties represent a policy measure that governments can easily adopt and implement, whereas many domestic PRIs may take time to put in place."

WHAT COUNTS AS AN EG?

The EGA negotiations are in the early stages of defining what exactly is on the table. The process to date has revolved around drawing up lists of relevant EGs. This is not necessarily a straightforward proposition, but it is an extremely important exercise. Which goods should appear on the list? The answer to this question has consequences for the degree to which this agreement can make a real contribution to climate change mitigation and adaptation.

In an early effort to identify the "environment industry," the OECD and Eurostat offered the following definition: "The environmental goods and services industry consists of activities which produce goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems. This includes cleaner technologies, products and services that reduce environmental risk and minimise pollution and resource use" (OECD and Eurostat 1999, 10). While this definition provides useful guidance, there is no consensus on which products fit this definition. Indeed, beyond the challenge of agreeing on a definition, it is worth noting that even the terminology is different in different quarters. A World Bank (2008) report observes that "in the global discourse on climate change, technologies that help in mitigating the impacts by reducing the GHG emissions have been termed variously as 'environmentally sustainable technologies,' 'environmentally sound technologies,' 'sustainable energy technologies,' 'clean energy technologies' (World Bank 2008). The UNFCCC materials use the term "environmentally sound technologies."

Leaving aside definitional exercises, another approach has been to generate tangible lists of specific environmental goods. The APEC list of 54 products is perhaps the best known, but it is not the only one. The OECD created a list of 154 environmental goods and services based on the OECD/Eurostat definition. The United Nations Conference on Trade and Development created a list of 25 "environmentally preferable products," defined as "products which cause significantly less environmental harm at some stage of their life cycle (production,

processing, consumption, [or] waste disposal) than alternative products that serve the same purpose, or products, the production and sales of which contribute significantly to the preservation of the environment" (Bucher et al. 2014, 5). WTO members circulated possible lists as part of a failed attempt to negotiate environmental goods and services liberalization during the Doha Round.

EGA negotiations to date have focused on just this issue of determining which goods will form the basis of the agreement. At the close of the sixth round, over 600 tariff lines (BioRes 2015b) had been included on members' "indicative lists." Ten broad categories of products have been discussed, which include "cleaner and renewable energy; energy efficiency; wastewater management and water treatment; environmental remediation and clean-up; noise and vibration abatement; air pollution reduction and mitigation; and solid and hazardous waste management… environmental monitoring, analysis, and assessment… environmentally preferable products…as well as resource efficiency" (BioRes 2015a). Consideration of goods and their corresponding categories during the first five rounds of talks has been referred to as the first stage of negotiation. In the second stage, which ostensibly began in May 2015, participants will start negotiating the final list, which "will collate their various indicative product proposals made during the category discussions….This exercise will be geared towards streamlining proposals and examining their environmental justifications, as well as starting to identify areas of consensus" (BioRes 2015a; see Inside US Trade 2015).

We can identify a list of products whose place on a list of environmental goods is unambiguous and straightforward. Such goods might correspond to "the narrow, conventional conception that focuses on treating a specific environmental problem" (World Bank 2008, 75). This might include wastewater treatment, air-pollution-control equipment (ibid.) or photovoltaic cells — goods with "an obvious environmental function" (Bucher et al. 2014, 4). The list, however, quickly becomes more complicated — there is great variety. H. Bucher et al. (2014, 4) explain that EGs range from commodities and resources (such as lime) to complex manufactured goods (such as solar panels). Furthermore, some products have a dual use, "which can be used for both environmental and non-environmental purposes (e.g. pumps)" (ibid.). Sugathan (2013, 1) explains that this invites debate about whether goods with an environmental application, however minor, should be included in the lists of EGs or whether only goods whose main application is environmental should be listed. The World Bank report states, "A good example is a pipe, which can be used as an input to a renewable energy plant or wastewater treatment plant but can also be used to transport oil. Should a pipe therefore be liberalized as an [EG]?" (2008, 77).

Other products are not intrinsically environmental on their face, but they might appear to be relatively more environmentally friendly than what is currently in use. Natural gas, proposed for inclusion during the Doha Round by Qatar, is a good example since it is said to be relatively cleaner than coal (Sugathan 2014). It is, nonetheless, a fossil fuel. Indeed, the methane emissions from natural gas have led some to question if they can be portrayed as a cleaner alternative (Howarth et al. 2012: Tollefson 2013). Nonetheless, Sugathan and Brewer (2012, 2) note that natural gas turbines are on the APEC list: "This raises the question as to whether natural gas-related technologies can be considered an 'environmental good.' While natural gas is clearly not free of emissions and often competes with renewable energy sources, it is also considered by many as a 'bridge' technology that could help ease the transition towards more sustainable forms of energy. Indeed, substituting coal-fired power plants with natural-gas facilities using conventionally extracted gas could have a significant impact on emissions reductions."

Inclusion on a list of EGs can be a function of a product's process of production. Organic products, for example, are "produced in a manner which causes less environmental harm than a comparable/like product" (Bucher et al. 2014, 4). However, this sort of classification is not always easy to see, making practical considerations, such as tracking, a challenge. According to the World Bank, "Most WTO members have sought to avoid including products that were deemed environmentally preferable based on their process and production methods….This implies, for instance, that aluminum produced using renewable energy as an input is not likely to be included as an '[EG],' since customs authorities would find it physically indistinguishable from aluminum produced through coal-generated electricity" (2008, 76).

Status as an EG might also depend on the product's end use. Bucher et al. (2014, 4) note that bicycles have "an environmentally beneficial end-effect." Similarly, monitoring equipment can be classed as an EG because it "contributes to cleaning up or reducing damage to the environment" (ibid.). The authors go on to note that a country's stage of development can affect how they prioritize a list of EGs — "while developed countries are prioritizing energy efficiency, renewable energy and reduction of CO_2 emissions, developing and particularly least developed countries will probably place a higher priority on investments in waste and wastewater management" (ibid.).

Sugathan (2015) explains that, "a large number of technologies and components, such as boilers and pipes, may enable energy savings gains only when deployed as part of a system and so individually it may sometimes be difficult to identify such products as being energy-efficient in and of themselves." Analysts have noted that the APEC list contains a mix of goods. "The APEC list

includes products typically thought of as '[EGs],' such as solar panels, solar water heaters, electric generating sets for wind turbines, etc., but it also includes articles such as gas turbines and laboratory instruments used in environmental technologies (e.g., air quality monitors, furnaces used to destroy hazardous and solid waste, etc.)" (ibid.).

Other products that seem to have a clear environmental purpose are not on the list. Indeed, numerous organizations have taken a stab at generating lists of environmental goods. These lists all tend to be longer than the APEC list. For example, Mahesh Sugathan and Thomas L. Brewer (2012, 2) note that "only 10 products from a list of 79 climate-friendly products identified by the International Centre for Trade and Sustainable Development, the publisher of BioRes, and 10 products from the World Bank's list of 43 climate-friendly products are included in the APEC list."

Another factor is the manner in which tradable commodities are typically categorized. The World Customs Organization oversees the Harmonized Commodity Description and Coding System (HS): "The [HS] contains over 5,000 product codes. Under the system, each product traded is assigned a six-digit code" (World Bank 2008, 50). While this is an efficient tracking system for many aspects of trade, it complicates matters when devising a list of environmental goods: "At a six-digit HS code level, clean energy technologies and components are often found lumped together with other technologies that may not necessarily be classified as environmentally sustainable or clean technologies….In countries where a large proportion of the tax revenue comes from international trade, the challenge faced by the government becomes more complex as a government's ability to consider special breaks for clean energy is constrained, especially if clean technologies are lumped together with other technologies" (ibid., 50, 52).

Any list of EGs would likely be a "living list." Technology is evolving at a rapid rate in this sector, making constant updating of the list necessary (ibid., 75). Aaron Cosbey (2014, 1) notes the centrality of this dimension: "Most important to a green goods agreement would be a mechanism that regularly assessed the items on the list." He goes on to observe that such a mechanism is not a simple proposition. There should be "an independent scientific advisory body making regular reviews and recommendations," something that is "unlikely to appear at the WTO" (ibid., 2). He further notes that even if such a body were to materialize, it would be difficult for it to be effective in the absence of clear objectives for the agreement and a clear definition of environmental goods (ibid.).

Merely drawing up the list of EGs that would form the basis of an agreement is fraught with challenges. Ultimately, the list of goods must be linked to the overall purpose of the process. The original joint statement launching EGA talks identified two clear objectives: "we [the 14 original parties of the EGA] strongly believe that this effort in the WTO will add impetus and energy to the multilateral trading system and support its mission to liberalize trade, and make a significant contribution to the international environmental protection agenda, including our shared efforts in the ongoing [UNFCCC] negotiations to combat climate change and transition to a green economy" ("Joint Statement" 2014). A list that achieves the first goal will not necessarily achieve the second. Achieving the second goal requires, at a minimum, seeing the EGA not only as a trade agreement, but, equally, as an environmental agreement.

CONCLUSION

The EGA has the potential to be extremely important. From a practical standpoint, tariff reduction (or elimination) can facilitate the transfer of climate-friendly technologies by lowering their cost. This is significant — however, likely insufficient on its own — making it one piece of a larger environmental governance puzzle. Ideally, the EGA will be accompanied not only by measures that will be of direct relevance to those countries availing themselves of lower-cost technologies (such as technical capacity building), but also broader efforts to address climate change, such as those on the table for the COP 21 meetings in Paris at the end of 2015.

Attaining a positive outcome will not be without challenges. Arriving at a realistic and viable list of goods, determining how to maintain the list, and anticipating inclusion of new participants and expansion of the agreement to services and non-tariff barriers are just some of the hurdles. All of this will happen in a context where trade principles are perceived to have trumped environmental goals in those moments when they have intersected. In its favour may be the fact that the EGA is a distinctive agreement. It is not a run-of-the-mill comprehensive trade agreement that includes an environmental chapter, nor is it an environmental treaty that will use trade mechanisms to achieve its goals. In the EGA, trade objectives are not working at cross-purposes with environmental goals. The question is not *whether* the agreement can have an impact; it is *how much* of an impact. A well-structured, critical mass agreement on a viable list of goods, accompanied by a range of complementary measures, will allow Andrew Martin, counsellor at the Permanent Mission of Australia and chair of the EGA talks, to achieve one of the key goals that he has set, "to show that trade agreements can also be beneficial from an environmental perspective" (International Centre for Trade and Sustainable Development 2015).

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