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Liberalizing Climate-Friendly Goods and Technologies in WTO Environmental Goods Negotiations: Product Coverage, Modalities, Challenges and the Way Forward¹

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Abstract

The Doha Round Agenda (paragraph 31(3)) mandates to liberalize environmental goods and services. This mandate offers a good opportunity to put climate-friendly goods and services on a fast track to liberalization. Agreement on this paragraph should represent one immediate contribution that the WTO can make to fight against climate change. This paper presents the key issues surrounding liberalized trade in climate-friendly goods and technologies in WTO environmental goods negotiations. It begins with what products to liberalize and in which manner. Clearly, WTO environmental goods negotiations to date show that WTO member countries are divided by this key issue. Focusing on the issue, the paper explores options available to liberalize trade in climate-friendly goods and technologies, both within and outside the WTO, and along with these discussion, discusses how to serve the best interests of developing countries.

JEL classification: F18, F13, Q56, Q54, Q58, Q48

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1. Introduction

The Doha Round Agenda (paragraph 31(3)) mandates to negotiate “the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services (EGS).” This mandate offers a good opportunity to put climate-friendly goods and services on a fast track to liberalization. Agreement on this paragraph should represent one immediate contribution that the WTO can make to fight against climate change (Lamy, 2008).

Climate-friendly technologies (or goods) refer to those the production of which or the utilization of which reduce climate risks to a greater extent than alternative technologies for producing the same product (or alternative products that serve the same purpose). Among climate-friendly technologies are those aimed at improving energy efficiency or increasing energy generation from new and renewable sources and goods. Liberalizing such climate-friendly technologies, goods and services contributes to not only increasing the choices available for importing countries, but also lowering the costs of these choices for the countries to either comply with existing and future greenhouse gas (GHG) emission commitments or to limit the growth of GHG emissions. This market expansion as a result of trade liberalization will put a downward pressure on prices in home country markets and increase competition between imported and domestic goods, thus further lowering the compliance costs. By increasing the dissemination of climate-friendly goods and technologies at a lower cost, trade liberalization will make it less difficult to set stringent GHG emission targets beyond 2012, given that the world’s GHG emissions should be cut at least in half by 2050 that the IPCC argues necessary in order to avoid dangerous climate change consequences.

This paper will focus on environmental goods (EGs), as that is the area in which negotiations within WTO have to date been more active. This by no means undermines the importance of environmental services in preserving the environment and mitigating climate change. Arguably, many services directly address climate change mitigation.

2. What Products to Liberalize and in Which Manner?

2.1. Negative Approach versus Positive Approach

To identify which goods and services to ban or promote, a basic distinction can be drawn between negative and positive approaches. A negative approach would be to identify specific goods and services with which countries are required to ban trading. Clearly, the Montreal Protocol on Substances that Deplete the Ozone Layer (MP), which was signed in 1987 and has since been amended and strengthened in a number of aspects, has taken this approach. The MP uses trade measures as one enforcement mechanism among several policy instruments in achieving its aim of protecting the ozone layer. Parties to the treaty are required to ban trading with non-parties in ozone-depleting substances (ODS), such as CFCs, in products containing them, such as refrigerators, and potentially, in products made with but not containing CFCs, such as electronic components. The last provision has not yet been implemented primarily because of problems of detection, and also because of the small volumes of CFCs involved. These

trade measures have been gradually extended to all the categories of ozone-depleting substances covered by the MP (Brack, 1996; Zhang, 1998). Accompanied with finance and technology transfer mechanisms, this approach works effectively under the MP in phasing out the ODS and putting the ozone layer on a path to recovery (2009a).

The products to be banned under the MP are clear. However, the identification of products to be banned is less straightforward with relation to carbon abatement and climate change mitigation. Every product or technology causes environmental harm or contributes climate effect to some degree. A climate-friendly product or technology is just a concept of relative environmental performance. Such a product or technology tends to be sector- and country-specific, and is subject to change over time. For example, natural gas is less carbon-polluting than coal. Shifting to natural gas has been indentified as part of the solutions to climate change mitigation. This has been the main reason for Qatar in its submission to WTO to propose liberalizing natural gas and natural gas-related technologies as a way to reduce GHG emissions. But natural gas is more carbon-polluting than wind power that emits zero carbon emissions when operating. A coal-fired power is more carbon-polluting than a natural gas-fired one, but if coupled with carbon capture and storage (CCS) technology, it will be more climate-friendly than a natural gas-fired power without CCS. Besides, a country's choice of fuels and technologies depends to a large extent on its resource endowments and the relative prices. The fact that countries like China and India use more coal is not because they like coal, rather because of their abundance in coal and the relative price difference between coal and its more environmentally-friendly substitutes. So, while some countries or regional agreements (e.g., North American Free Trade Agreement) may have a negative list on services or investment in certain technologies which are restricted, it is most unlikely for countries will broadly agree on a list of goods that need to be banned. Moreover, arguably, for the service of climate change mitigation objective, if there were a ban or restriction, that would be on high GHG-emitting goods. This will face resistance from countries that object to the use of trade restrictions based on processes and production methods (PPMs), partly because it is difficult for customs officials at the border to distinguish high GHG-emitting products with low GHG-emitting counterparts. There also exists uncertainty about WTO compatibility regarding a distinction on a product based on a way that product is produced, rather than on the characteristics of the final product as well as a controversy over whether WTO jurisprudence has moved beyond the PPM concept (Zhang, 2004; Zhang and Assunção, 2004; Howse and Van Bork, 2006). Thus, a negative approach will not work in a post-2012 climate regime.

By contrast, a positive approach seeks to indentify certain goods and services to ensure their enhanced market access. A positive approach holds the promise. Establishing a list of goods, technologies and services that are encouraged encounters the problems on their own, but is easier than having a common list of goods, technologies and services that need to be banned.

2.2. List, Project, Integrated and Request-Offer Approaches

The question then is which EGS need to be encouraged. Identifying such EGS depends on the definition of EGS. Given the conceptual complexities in and a lack of consensus

on the definition of EGS, WTO members have persistently disagreed over how to identify which EGS should be subject to trade liberalization. Three approaches have been proposed in the WTO negotiations. The OECD has advocated a list-based approach, whereby goods and services on an agreed list will be subject to enhanced market access through the elimination or reduction of bound tariffs (and non-tariff barriers (NTBs)) permanently and on a most favored nation (MFN) basis. Such lists have been produced by the OECD and APEC. The two lists have 54 goods in common at the HS (Harmonized Commodity Description and Coding System) 6-digit level. However, 50 goods on the APEC list do not appear on the OECD list, while 68 goods on the OECD list do not appear on the APEC list. The main difference between the two lists is that minerals and chemicals for water/waste treatment are exclusive to the OECD list, while the APEC list includes a relatively more extensive set of goods needed for environmental monitoring and assessment. The OECD list also contains a large number of environmentally preferable products (Steenblik, 2005). Taking the OECD or APEC lists of EGs as reference points, the so-called “Friends of Environmental Goods” group of countries, comprising Canada, the EU, Japan, Korea, New Zealand, Norway, Switzerland, Chinese Taipei and the U.S., proposed in April 2007 a list of 153 products. Just prior to the UN climate change conference in Bali, the EU and U.S. submitted a joint proposal at the WTO calling for trade liberalization of 43 climate-friendly goods that were identified by the World Bank (2007) from a list of the Friends’ 153 products, with an aim to have a zero tariff for these climate-friendly goods by 2013.

Many developing countries have consistently expressed concerns about using a list of environmental goods slated for expedited liberalization, noting that many products on that list are primarily of export interest to industrialized countries, thus compromising its development dimension.² The Indian Ambassador was quoted as even saying that this EU-U.S. proposal was “a disguised effort at getting market access through other means and does not satisfy the mandate for environment.” (ICTSD, 2007a). Another sticking point is related to the issue of dual use, in that many product categories proposed on an EGs list include, at the HS 6-digit level, other products that also have non-environmental uses as well as environmental uses. In response, India has advocated a project-based approach, whereby each WTO member would designate a national authority to select environmental projects based upon criteria developed by the Special Session of the Committee on Trade and Environment and whose domestic implementation would be subject to the WTO Dispute Settlement. The EGS required for a particular selected environmental project would temporarily have preferred market access for the duration of the project. India argued that the project approach would ensure that the approved EGS are used for environmental purposes. Argentina proposed an integrated approach. It aims to bridge the gap between the list approach and project approach, resembling the project approach but with multilaterally pre-identified categories of goods used in the approved

² U.S. Trade Representative rejected complaints that the EU-U.S. list consisted only of products of export interest to industrialized countries, pointing out that the U.S. was in fact a net importer of the 43 products in 2006, with US\$18 billion in imports surpassing exports by US\$3 billion and Mexico and China as the two top sources for those products (ICTSD, 2007c).

projects. Brazil suggested a request-offer approach, whereby countries would request specific liberalization commitments from each other on products of interest to them and then extend tariff cuts they deemed appropriate equally to all WTO members on a MFN basis. Brazil argued that its approach followed in previous GATT/WTO negotiations and took into account developing country interests more adequately than the common list that was put forward by the EU-U.S. submission (ICTSD, 2007a,b). An analysis of the Friends' 153 EGs list by Jha (2008) indicates that a handful of developing countries are among the top 10 importers and exporters in various categories of EGs relevant to climate change mitigation. Based on the findings, she suggests that these countries could usefully engage in a request-offer approach to ensure trade wins. In this way, while the benefits of trade liberalization may be multilateralized, the cost would be borne only by a few players. These would be the very players that have a lot more to gain through liberalization.

All these different voices clearly suggest that some WTO members have yet to be convinced of the climate mitigation credentials of some of the products that Europe and the U.S. have put on the table. Moreover, the advance of technology will inevitably eclipse the continuing merits of some existing products. Thus, an exclusive focus on the liberalization of these existing products raises the risk of being locked in existing patterns in international trade in technologically advanced climate change products (i.e., producers of technology and importers of that technology). Furthermore, the developing world is in search of both an economic and an environmental gain through these negotiations under the Doha Development Round — and rightly so (Lamy, 2008). Even if these negotiations are on environmental issues, they must nevertheless deliver a trade gain if they are being conducted under the Development Round roof of the WTO.

3. The Way Forward

While there are significant export opportunities for developing countries in a large number of low-tech EGs in the core list of environmentally preferable products defined by UNCTAD (2005), which also happen to be the dual-use products (Hamwey, 2005), most developing countries are hesitant to liberalize bound tariffs on dual-use products, due to concerns about the adverse impact of such broader liberalization on their established domestic industries and jobs and, in some cases, on their tariff revenues (ICTSD, 2008; World Bank, 2007). They insist in applying single end-use parameter in screening EGs, and only those identified EGs based on this parameter would then be taken up for tariff reduction negotiations (Howse and Van Bork, 2006). Isolating those products of single environmental use requires to assign clearer HS code or product descriptions for environmental goods. The HS allows countries to track trade volumes and tariff levels. The more digits are included in a code, the more specific the description of the good is. Currently, HS numbers for products are only harmonized cross WTO members up to the six-digit level. However, many HS product categories at the six digit level contain products that have both non-environmental uses and environmental uses. Clearly identifying goods of single environmental use needs to go beyond the six digit level. However, no uniform code exists beyond this level. So, as product descriptions get more specific, different WTO members use different codes and descriptions. To identify

and liberalize specific goods of single environmental use, including those climate mitigation goods, WTO members need to harmonize at least the ex-out product descriptions cross countries. However, harmonizing HS codes themselves beyond the six digit level will be time-consuming and would not be viable, given the short time horizon for a possible conclusion of the Doha Round and the timing of review cycles of the World Customs Organization, which considers HS amendments once every five years, with the latest amendment in June 2004 and entered into force on January 1, 2007 (see Vikhlyayev (2009) for further discussion on dual-use and the limitations of the HS nomenclature).

What are then other options that need to be explored to accelerate liberalization of EGS? Arguably, countries are likely to agree upon a narrow choice of climate-friendly products that would be acceptable to a broader range of countries rather than a broader range of products that would be acceptable to only a few countries. One way forward along this line is to initially focus on specific sectors in which the interests of both developed and developing countries coincide in fostering trade liberalization. Increasing energy efficiency is widely considered as the most effective and lowest cost means of cutting GHG emissions, and trade in renewable energy products in developing countries appears sensitive to reduction in tariffs (Jha, 2008) and industrialized countries are set to take on higher proportions of renewable energies in their energy mix either for complying with their GHG emission targets or aimed at cutting their dependence on foreign oil or both. Thus, the initial round of liberalization should include renewable energy products and energy-efficient technologies. The World Bank (2007) estimates that a removal of tariffs for four basic clean energy technologies (clean coal, efficient lighting, solar and wind) in 18 developing countries of high GHG emissions would result in a trade gain of up to 7%. The trade gain could be boosted by as much as 13% if the non-tariff barriers could also be removed. These gains were calculated based on a static trade analysis, and were well underestimated because they didn't take into account the dynamics of these EGs, i.e., trends in the growth of their export levels and the size of their world export market. Added to the trade gains is that using these more climate-friendly technologies and products to replace those more GHG-polluting alternatives will translate into a significant reduction in GHG emissions. Clearly, liberalizing trade in low-carbon goods and technologies serves both trade and climate mitigation interests.

Another area of accelerated liberalization is products, technologies and services used for small-scale CDM (clean development mechanism) projects (e.g., micro-hydro projects, efficient cooking, and efficient lighting) and programmatic CDM.³ The CDM has, in part, been successful (Zhang, 2008). The global number of CDM projects registered and in the pipeline totals 4588 (UNEP Risoe Center, 2009) - well above what was envisioned by countries when they negotiated, designed and launched this mechanism. However, the lion's share of these CDM projects has gone to a handful of major developing countries

³ Van der Gaast and Begg (2009) argue that programmatic CDM is very suitable for energy efficiency improvement projects in households (e.g., cooking, lighting) and industry (e.g., one technology applied within an industrial sector at different locations but under similar circumstances).

like China and India, and many countries, Sub-Saharan Africa in particular, have been left out. One of the main reasons is that the transaction costs associated with the CDM project cycle have seriously hampered small-scale CDM projects in these countries. Although registration fees are set considerably lower for small-scale CDM projects and simplified methodologies and procedures are also set for those projects, many other transaction costs are independent of project size and will thus have a bigger relative impact on small-scale CDM projects. Programmatic CDM bundles together small-scale CDM projects or a programme of activities makes a better contribution to sustainable development and communality empowerment than a single CDM project, but entails high transaction costs. So, liberalizing products, technologies and services in this area could reduce equipment costs and contribute to lowering transaction costs for potential investors, thus facilitating to capitalize on untapped potential of programmatic CDM and extend the mechanism's reach of both project type and geographical region.⁴

Even for the two areas, they still need to respond to developing country concerns about the impacts that liberalization has on their domestic industries before a deal is eventually hammered out. This particularly applies to environmental goods and technologies that developing countries are not competitive in producing. For example, aimed at encouraging domestic production and jobs, India has imposed very high tariffs on and China has put in place a local content requirement for wind turbines (Alavi, 2007; Zhang, 2008). These policies act as barriers to foreign suppliers of wind turbines, and are seen beneficial for local wind turbine makers. Indeed, the three largest local turbine makers, namely, Sinovel Wind, Goldwind Science and Technology, and Dongfang Electric, contribute an increasing share of total new installations in China. Together they now account for over 50% of a market once dominated by foreign firms until 2008. However, such policies hurt home countries in financial terms. While being less costly, domestic wind turbines in China break down more often and have overall capacity factors of several percentage points lower than foreign models. Such a few percentage points difference might not seem significant, but could well make a difference between a wind farm that is economically viable and one that is not (Zhang, 2009b). Such a local content requirement may be considered necessary when a domestic market was dominated by foreign firms. Now local turbine makers already dominate the market, and it becomes increasingly questionable to still practice such a policy. However, there is no sign that China is going to dismantle this protection. This clearly exemplifies challenges ahead and uncertainty about whether there is a deal on a desired level of trade liberalization. No need to say, having an agreement on EGS or a subset of EGS such as climate-friendly goods under WTO is the first best choice. However, should WTO members fail to reach such an agreement, then alternative options, ideally still under the Doha Round, need to

⁴ Here I advocate that priority is given to products, technologies and services used for small-scale CDM projects and programmatic CDM in liberalizing EGS. Put simply, they should be included in any list of EGS for accelerated liberalization. While being motivated for facilitating small-scale CDM projects and programmatic CDM, any agreed tariff reduction or elimination would apply to all these EGS, irrespective of whether these EGS are used for CDM projects. This makes it conceptually different from the Indian project proposal that ties the liberalization of any EGS to specific projects.

be explored, although business groups have even voiced to remove EGs talks from Doha.⁵

An agreement similar to the Information Technology Agreement (ITA) is one option to go, whereby a certain number of members representing a minimum percentage of trade in climate-friendly goods and services would need to join⁶ in order for it to come into effect (World Bank, 2007). Such an agreement will be open to voluntary participation, and once it came into effect, the benefits of trade liberalization in climate-friendly goods and technologies would extend to all WTO members on a MFN basis. The ITA has incorporated a mechanism for a review of product coverage every three years. This may have tempered the disappointment among many countries with the initial exclusion of certain products. Given that developing countries are currently not significant suppliers of climate-friendly goods and technologies, priority should be given to additional products being submitted by developing countries for inclusion in the future review. However, the downside of this ITA's mechanism is that no new products have ever been added since 1997. So, developing countries may be suspicious of this trap, and feel reluctant to join.

Another option is a plurilateral agreement in this area, similar to the WTO Agreement on Government Procurement. WTO members could opt to join or to stay outside of, but the benefits of trade liberalization would extend only to participating members on a MFN basis, not to non-signatory WTO members as the aforementioned an-ITA type agreement does. While such a plurilateral agreement is not ideal, it would still have value, in particular if the key trading parties were involved. Such an agreement could eventually be made multilateral once a certain number of members representing a minimum percentage of trade in climate-friendly goods and services would join

Other options for this sort of agreement may be within the context of regional or bilateral trade agreements (RTAs). Such agreements aim to liberalize substantially goods at the HS six-digit level. As a result, product classification and the dual-use problems associated with WTO negotiations on EGS may be less of a concern. These agreements surely liberalize fully EGs. However, the downside of the RTAs approach is that trade may be diverted from countries that are most efficient at producing certain EGs but are excluded from the RTAs. Moreover, by entailing generally the zero rating of all products,

⁵ In a letter to President Barack Obama on August 3, 2009, the National Foreign Trade Council and eight other U.S. business groups urged his administration to “use all possible channels” to pursue an agreement on reducing barriers to trade in EGS, even if that means going outside the Doha Round (Palmer, 2009).

⁶ It would make more climate sense to define critical mass as a share of emissions rather than as a share of trade. After all, any agreement on climate-friendly goods aims to cut GHG emissions by providing more choices of low costs. However, this approach depends on how such climate-friendly goods are produced and what goods they are going to replace. Thus, it is much more difficult to calculate emissions than to calculate trade value/volume. Moreover, such an effort is well beyond the familiar for the WTO. Taken together, while the approach sounds very appealing theoretically, these complications would make it hard to implement in practice.

the RTAs approach removes any tariff differential between EGs and their non preferable like products. Whether such an elimination of tariffs in EGs would be enough to encourage their larger utilization in a competitive environment with other non-EGs depends on their relative prices and the stringency of environmental policy in home countries. Even if the prices of energy-efficient EGs are higher than that of their non preferable like products, that would not necessarily put these EGs at a disadvantage position. Provided energy subsidies are removed and prices are attached to emission reduction, any higher initial costs of energy-efficient EGs may well be compensated by cost-saving through energy-saving over their lifetimes. The demonstration of new EGs (technologies) that a country has not yet familiar with but have a high replicability potential plays a role in this context as well, because that is the first but crucial step in showing how effective these new EGs are in cutting pollution and supporting its spin-off to the rest of the economy.

This paper focuses on liberalizing climate-friendly goods and technologies in terms of the reduction or elimination of tariffs. Undoubtedly, the results of such a tariff reduction or elimination would be positive, but it would not be significant for increased uptakes of these goods and technologies in developing countries. Many African countries already have very low tariffs on many environmental goods, but have little imports because of a lack of purchasing power and technical assistance. Also, as tariffs in developed countries are already very low, - generally less than 3% for EGs on the OECD list (Vikhlyayev, 2003), and as not all EGs are sensitive to reduction in tariffs,⁷ the market access of developing countries to developed country markets thus depends more on reduction or removal of trade restrictions in terms of NTBs, such as, technical standards and certification requirement, labeling requirements, and tied-aid that grants a tariff preference for donor country's goods and services, as well as tax and subsidy measures, which are considered significant impediments to developing countries' access to developed country markets. Developing countries constantly refer to intellectual property rights as a barrier to access much-needed and advanced low-carbon technologies as well because of their high licensing fees or royalty payments. All this suggests that high tariffs are only one of the factors that determine access to and affordability of climate-friendly goods and technologies, and thus that action beyond tariff reduction or elimination is needed.

To serve the best interests of developing countries, other efforts than an exclusive focus on tariff reduction or elimination need to be considered to enable developing countries to access both climate-friendly goods and technologies at an affordable price and developed country markets. Special and different treatment provisions will also be essential to fully recognizing the concerns of developing countries. They include less than full reciprocity, flexibility in terms of longer implementation periods, or both for developing countries, or optional participation for least developed countries. A package of technical and finance assistance is badly needed as well to ensure that all developing countries are able to benefit from the rapidly growing world market for climate-friendly goods and

⁷ An analysis of 84 energy supply products in the Friends' 153 EGs list by Jha (2008) reveals that only 30% of these products are sensitive to a tariff reduction.

technologies. At least one WTO industrialized country member – Canada – in its submission has recognized the importance of such an assistance and has pledged to provide it. In my view, all these aforementioned initiatives could be made part of the EGS package for it to work. Moreover, EGS talks need boost from other areas. Effective technology transfer and financial mechanisms are widely believed to have played the decisive role in making the MP to work effectively (Zhang, 2009a). Given that the scope of economic activities affected by a climate regime is several orders of magnitude larger than those covered by the MP, technology transfer and deployment, financing and capacity building are considered as the even more essential components of any post-2012 climate change agreement that developing countries would agree upon to succeed the Kyoto Protocol. If and when such a post-2012 climate change deal were reached, that would significantly enhance possibilities for a breakthrough of reaching an EGS deal under the WTO.

References

Alavi, R. (2007), *An Overview of Key Markets, Tariffs and Non-Tariff Measures on Asian Exports of Select Environmental Goods*, ICTSD Trade and Environment Series Issue Paper No.4, ICTSD, Geneva.

Brack, D. (1996), *International Trade and the Montreal Protocol*, The Royal Institute of International Affairs and Earthscan, London.

Hamwey, R. (2005), *Environmental Goods: Where Do Dynamic Trade Opportunities for Developing Countries Lie?*, Working Paper, Centre for Economic and Ecological Studies, Geneva.

Howse, R. and Petrus van Bork (2006), *Options for Liberalizing Trade in Environmental Goods in the Doha Round*, Trade and Environment Series Issue Paper No.2, ICTSD, Geneva.

ICTSD (2007a), *EU, US Call for Eliminating Trade Barriers to Climate-Friendly Goods and Services*, Geneva, December 18, Available at: <http://ictsd.net/i/news/biores/9151/>.

ICTSD (2007b), *Brazil Peru Discuss New Ideas on Environmental Goods Liberalisation*, Geneva, November 16, Available at: <http://ictsd.net/i/news/biores/9144/>.

ICTSD (2007c), *Bali Climate Conference: The Next Two Years Will Tell*, November, <http://ictsd.net/i/news/bridges/3159/>.

ICTSD (2008), *Liberalization of Trade in Environmental Goods for Climate Change Mitigation: The Sustainable Development Context*, Geneva.

Jha, V. (2008), *Environmental Priorities and Trade Policies for Environmental Goods: A Reality Check*, Trade and Environment Series Issue Paper No.7, ICTSD, Geneva.

Lamy, P. (2008), A Consensual International Accord on Climate Change Is Needed, Presented to the Temporary Committee on Climate Change, The European Parliament, Brussels, May 29, Available at:

http://www.wto.org/english/news_e/sppl_e/sppl91_e.htm.

Palmer, D. (2009), Remove Environmental Goods Talks from Doha: U.S. Groups, *Reuters*, August 4, Available at: <http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE5725Z520090804>.

Steenblik, R. (2005), Environmental Goods: A Comparison of the APEC and OECD Lists, The OECD Joint Working Party on Trade and Environment, COM/ENV/TD (2003) 10/FINAL, OECD, Paris, Available at:

<http://www.oecd.org/dataoecd/44/3/35837840.pdf>.

UNCTAD (2005), Environmental Goods: Identifying Items of Export Interest to Developing Countries, CBTF Briefing Note, Geneva.

UNEP Risoe Center (2009), CDM and JI Pipelines by August 1, Denmark, Available at: <http://www.cdmpipeline.org/Publications/CDMPipeline.xls>.

Van der Gaast, W. and K. Begg (2009), Enhancing the Role of the CDM in Accelerating Low-Carbon Technology Transfers to Developing Countries, *Carbon and Climate Law Review*, Vol. 3, No. 1, pp. 58-68.

Vikhlyaev, A. (2003), Environmental Goods and Services: Defining Negotiations or Negotiating Definitions, *Trade and Environment Review 2003*, United Nations Conference on Trade and Development, Geneva, pp. 33-60.

Vikhlyaev, A. (2009), Can Renewable Energy Equipment be Fast-tracked in the WTO Negotiations on the Liberalization of Trade in Environmental Goods and Services?, *Trade and Environment Review 2009*, United Nations Conference on Trade and Development, Geneva.

World Bank (2007), *International Trade and Climate Change: Economic, Legal and Institutional Perspectives*, Washington DC.

Zhang, Z.X. (1998), Greenhouse Gas Emissions Trading and the World Trading System, *Journal of World Trade*, Vol. 32, No. 5, pp. 219-239.

Zhang, Z.X. (2004), Open Trade with the U.S. without Compromising Canada's Ability to Comply with its Kyoto Target, *Journal of World Trade*, Vol. 38, No. 1, pp. 155-182.

Zhang, Z.X. (2008), Asian Energy and Environmental Policy: Promoting Growth While Preserving the Environment, *Energy Policy*, Vol. 36, No. 10, pp. 3905-3924.

Zhang, Z.X. (2009a), Multilateral Trade Measures in a Post-2012 Climate Change Regime?: What Can Be Taken from the Montreal Protocol and the WTO?, *Energy Policy*, [doi:10.1016/j.enpol.2009.07.020](https://doi.org/10.1016/j.enpol.2009.07.020).

Zhang, Z.X. (2009b), Energy Policy in China in the Transition to Low-Carbon Economy, Invited Presentation at the East-West Center/Korean Energy Economics Institute Conference on Fossil Fuels to Green Energy: Policy Schemes in Transition for the North Pacific, Honolulu, Hawaii, August 20-21.

Zhang, Z.X. and L. Assunção (2004), Domestic Climate Policy and the WTO, *The World Economy*, Vol. 27, No. 3, pp. 359-386.