



A Snapshot of Current Trade Trends in Potential Environmental Goods and Services

By Carlos Kuriyama¹

To address the current environmental challenges, APEC Leaders instructed officials in November 2011 to work to develop an APEC list of environmental goods. It is envisioned that the list would contribute to APEC's efforts towards green growth and sustainable development, and more specifically, reduce applied tariffs on environmental goods to 5 percent or less by 2015, and eliminate non-tariff measures that distort trade of environmental goods and services (EGS)². This policy brief is an initial effort to estimate the magnitude of EGS trade, identify current trends and examine the relevance of EGS in APEC. The findings of the analysis show an increasing importance in EGS trade globally and in the APEC region, as well as the growing relevance of EGS for both industrialized and developing APEC member economies.

Difficulties in Measuring EGS Trade

Obtaining trade flows of particular goods or product categories tends to be a straightforward exercise. However, measuring EGS trade flows is a complex task. As explained in a previous 2009 APEC Policy Support Unit study³, the difficulty in accurately quantifying EGS trade is due to the following reasons:

- There is no agreed EGS definition.
- There are no established criteria that specify which goods and services may be considered as EGS.
- There is no consensus by any fora on a list of goods and services to be included as EGS.
- There is a "dual use" problem, as the current nomenclature to classify goods trade does not distinguish whether a good is used for an environmental purpose or not⁴. For example, pipes used for solar hot water systems are classified under the same Harmonized System (HS) category as those used for oil and gas transportation.
- Discussions on possible lists of environmental goods usually include "ex-outs" products, which refer to only part of the goods classified under a particular HS 6-digit sub-heading. "Ex-outs" are usually products identified at the 8 or 10-digit level. Harmonized trade data across economies is not available at that disaggregation level.

- The available data in services is inadequate to estimate the global trade flow of environmental services. In addition, new services that have developed and could reasonably be considered as environmental services have not been included in the Services Sectoral Classification List or the United Nations Central Product Classification version 2 (UN CPC v.2).

Nevertheless, this policy brief takes as a starting point, previous studies that have attempted to calculate the amount of EGS trade, as well as documents and proposals that have suggested a list of environmental goods. Using these as a point of reference, it will be possible to estimate the size of EGS trade and examine its recent trends.

It is important to highlight that this analysis is strictly for research purposes and respects APEC mandates. It does not prejudice APEC member economies' positions, rights and commitments in any fora. Hence, the goods and services referred in this policy brief should be considered as "potential" EGS.

Potential Environmental Goods Trade

- a) Friends of the EGS Group Proposal at the World Trade Organization (WTO)

One of the proposals on environmental goods was circulated by the Friends of the EGS Group at the WTO in April 2007⁵. Canada, the European Union, Japan, Korea, New Zealand, Norway, Chinese Taipei, Switzerland and the United States issued a non-paper with a list of 164 goods classified in 12 categories:

- 1) Air pollution control
- 2) Management of solid and hazardous waste and recycling systems
- 3) Clean up or remediation of soil and water
- 4) Renewable energy plant
- 5) Heat and energy management
- 6) Waste water management and potable water treatment
- 7) Environmentally preferable products, based on end use or disposal characteristics
- 8) Cleaner or more resource efficient technologies and products
- 9) Natural risk management

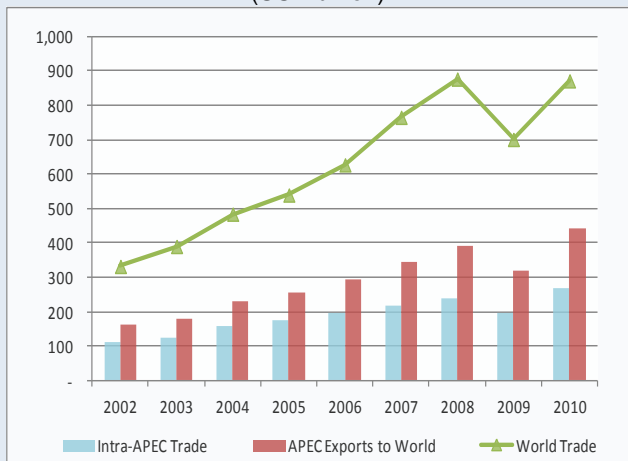
- 10) Natural resources protection
- 11) Noise and vibration abatement
- 12) Environmental monitoring, analysis and assessment equipment

Based on this list, world trade for these 164 goods grew at an average annual rate of 12.8 percent between 2002 and 2010 and reached USD 871.5 billion in 2010 (Figure 1). Three categories registered the largest trade volumes in 2010⁶ – renewable energy plants (USD 254.8 billion), waste water management and potable water treatment (USD 215.7 billion) and management of solid and hazardous waste and recycling systems (USD 148.2 billion).

APEC exports to the world also increased by 13.5 percent per year and totalled USD 443.5 billion in 2010, amounting to 50.8 percent of world trade. The values for APEC imports from the world were close to those registered for APEC exports.

Intra-APEC trade increased by 11.8 percent per year and reached USD 269.3 billion by 2010. This amount was equivalent to 30.9 percent of the world's total and 50.9 percent of APEC exports to the world. Within APEC, the same categories, renewable energy plants (USD 75.2 billion), waste water management and potable water treatment (USD 63.2 billion) and management of solid and hazardous waste and recycling systems (USD 52.5 billion) had the largest trade volumes in 2010.

Figure 1: Trade of Environmental Goods based on the Friends of EGS Group Proposal at WTO (2002-2010)
(USD billion)



Sources: UN Comtrade; WITS; WTO (2007); Chinese Taipei's Bureau of Foreign Trade
Note: Figures may be overestimated due to the "dual use" problem and the inclusion of "ex-outs" in the proposed list,

Figure 1 shows an upward trend in the trade flows for the goods included in the Friends of the EGS Group at the WTO. A decline in trade flows was only recorded in 2009 as a consequence of the Global Financial Crisis. The trade flows recovered in 2010 in

all 12 categories.

Nine out of 12 categories included in the list at least doubled their trade values between 2002 and 2010. In addition, some categories have grown significantly in importance. For example, goods related to heat energy management, natural risk management, air pollution control and cleaner or more resource efficient technologies, experienced similar or higher growth rates than those categories with the largest trade volumes.

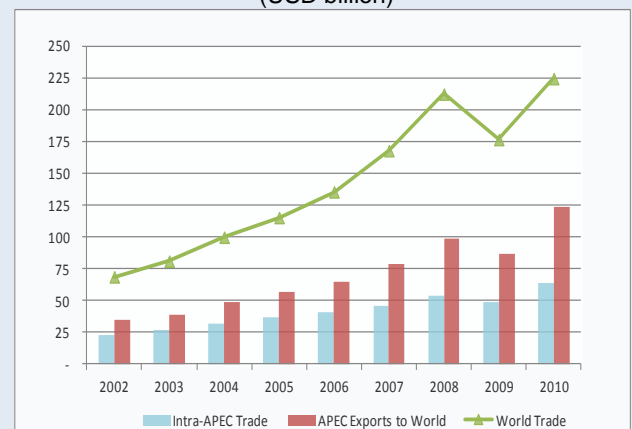
b) World Bank study of climate-friendly technology products

A 2008 study by the World Bank identified a list of goods that could be categorized as climate-friendly technology products, based on the proposal submitted by the Friends of the EGS Group at WTO⁷.

The study selected 43 goods from the Friends of the EGS Group proposal as climate-friendly technology products, taking into account their considerable increase in trade and the possibility that those goods may be more widely accepted by WTO members.

In fact, trade flows for the aforementioned goods showed a positive trend (Figure 2) and rose faster than the goods proposed by the Friends of EGS Group at WTO. The world trade for the climate-friendly technology products increased at an average annual rate of 16 percent during the period 2002-2010, reaching USD 224.4 billion in 2010. Over the same period, APEC exports of climate-friendly technology products to the world increased at a faster pace of 17.2 percent per year, totalling USD 123.7 billion; whereas APEC imports grew at a slower rate of 13.6 percent per year, reaching USD 100 billion.

Figure 2: Trade of Climate-Friendly Technology Products based on a 2008 World Bank Study (2002-2010)
(USD billion)



Sources: UN Comtrade; WITS; World Bank (2008); Chinese Taipei's Bureau of Foreign Trade
Note: Figures may be overestimated due to the "dual use" problem.

Intra-APEC trade of climate-friendly technology products nearly tripled from USD 23 billion to USD 63 billion between 2002 and 2010. Intra-APEC trade in 2010 was equivalent to 28.4 percent of the world total.

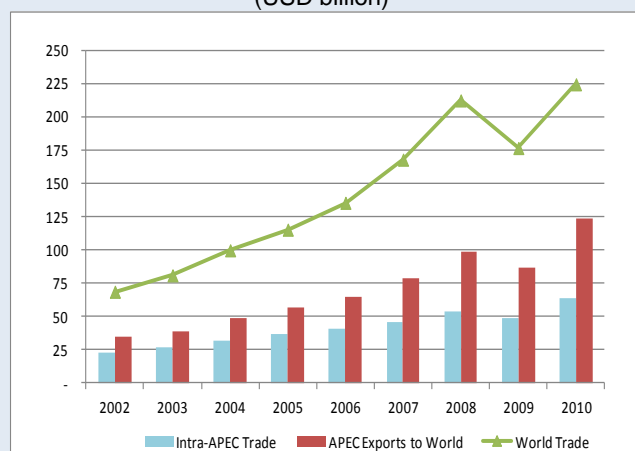
Nearly half of these 43 climate-friendly technology products are related to renewable energy plants, power generation, among others. The rest are related to air pollution control, management of solid hazardous waste, heat energy and management, cleaner or resource efficient technologies, waste water management and environmental monitoring, analysis and assessment equipment.

c) Combined OECD illustrative list and the list discussed at the APEC's Early Voluntary Sectoral Liberalization (EVSL)

A working paper released by the Economic Analytical Unit of Australia's Department of Foreign Affairs and Trade in the early 2000s combined the OECD illustrative list and the list discussed at APEC's EVSL, in an effort to estimate Australia's trade in potential environmental goods⁸. The combined list included 170 goods classified at the HS 6-digit level in 10 categories:

- 1) Chemicals
- 2) Plastics and rubber
- 3) Wood and straw
- 4) Textiles
- 5) Articles of stone, cement, ceramic and glass
- 6) Articles of base metals
- 7) Machinery
- 8) Electrical machinery
- 9) Transport equipment
- 10) Precision equipment

Figure 3: Trade of Potential Environmental Goods (OECD indicative list + list discussed at APEC's EVSL) (USD billion)



Sources: UN Comtrade; WITS; DFAT; Chinese Taipei's Bureau of Foreign Trade

Note: Figures may be overestimated due to the "dual use" problem and the inclusion of "ex-outs" in the list discussed at APEC's EVSL.

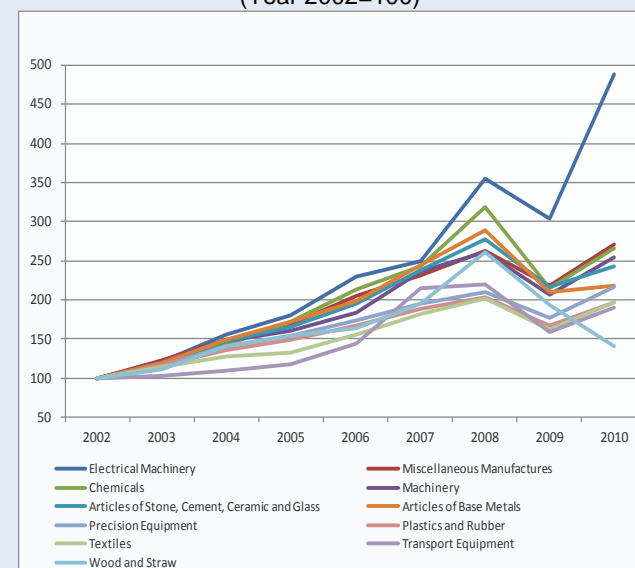
World trade of these goods experienced an upward trend by growing on average 12.6 percent per year between 2002 and 2010 and reaching USD 726.9 billion in 2010 (Figure 3). Most of this trade was explained by three categories: machinery (USD 365.7 billion), precision equipment (USD 130 billion) and electrical machinery (109.7 billion).

APEC's trade in potential environmental goods also increased over the period 2002-2010. Exports and imports grew on average at 13.3 and 11.6 percent per year, respectively. In 2010, APEC exports totalled USD 366.2 billion and APEC imports totalled USD 376.7 billion.

Intra-APEC trade also went up in that period, reaching USD 220.6 billion in 2010. Nevertheless, its annual growth rate of 11.3 percent between 2002 and 2010 was slower than the world trade of potential environmental goods of 12.6 percent. Within APEC, machinery, precision equipment and electrical machinery were the categories that accounted for most of the trade (USD 116.4 billion, 41.9 billion and 37.6 billion, respectively).

All the listed categories of potential environmental goods have experienced a large increase in trade in recent years. Indeed, a simple comparison, by taking 2002 as the baseline year, shows that six out of ten categories (electrical machinery, miscellaneous manufactures, chemicals, machinery, articles of stone, cement and ceramic, articles of base metal and precision equipment) more than doubled their world trade between 2002 and 2010. Meanwhile, the remaining four categories also showed a significant increase in their world trade over the same period.

Figure 4: World Trade Index of Potential Environmental Goods (OECD indicative list + list discussed at APEC's EVSL) (Year 2002=100)



Sources: UN Comtrade; WITS; DFAT; Chinese Taipei's Bureau of Foreign Trade

d) Other recent references on potential environmental goods trade

Recent reports have made references to the importance of the world trade of environmental goods. A discussion paper published by the UNDP in 2010 with reference to the proposal by the WTO Friends of EGS Group, mentions that the total global exports and imports of environmental goods increased by USD 323 billion and USD 333.8 billion between 2001 and 2007, and totalled USD 783.2 billion and USD 753.8 billion by 2007. In addition, the paper affirmed that exports and imports of environmental goods for least developing economies increased at faster rates than the growth of world trade of environmental goods⁹.

Another report produced by the UNESCAP estimated the global trade of climate-smart goods and technologies at around USD 410 billion in 2008, based on a list of 64 goods at the HS 6-digit level, comprising low-carbon technologies such as solar photovoltaic systems, wind power generation, clean coal technologies and energy-efficient lighting. It also identified Asia and the Pacific as the most dynamic region to trade these goods, as the value of the region's exports increased significantly from USD 39.3 billion to USD 132 billion over the period 2002-2008, representing an average increase of 22.7 percent annually¹⁰.

Potential Environmental Services Trade

Estimating the value of the environmental services trade is more challenging than the value of the environmental goods trade, as detailed services trade data classified by the Services Sector Classification List or the UN CPC v.2 are not available. In addition, these classifications do not explicitly include activities that may reasonably be considered as environmental, such as prevention, research and development, design, consulting, among others.

Some studies have released estimations on the value of the global environmental services market. For example, a paper released by the International Centre for Trade and Sustainable Development noted that the value of the environmental services sector reached USD 640 billion in 2010¹¹. An earlier OECD study estimated that the value of the global environmental services market in 2002 was approximately USD 376 billion and identified solid waste management, water distribution and wastewater management as the most important sectors¹².

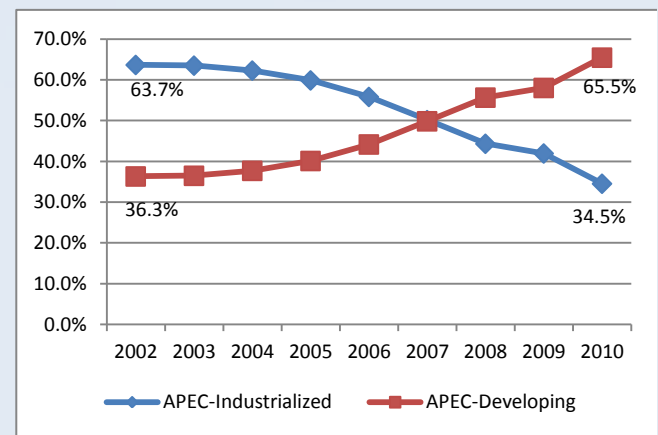
Final Remarks

The findings of this policy brief show clearly the growing importance of EGS trade within the APEC region as well as around the world. In this context, policy-makers in the region should make it a priority to discuss ways to reduce barriers to EGS trade and

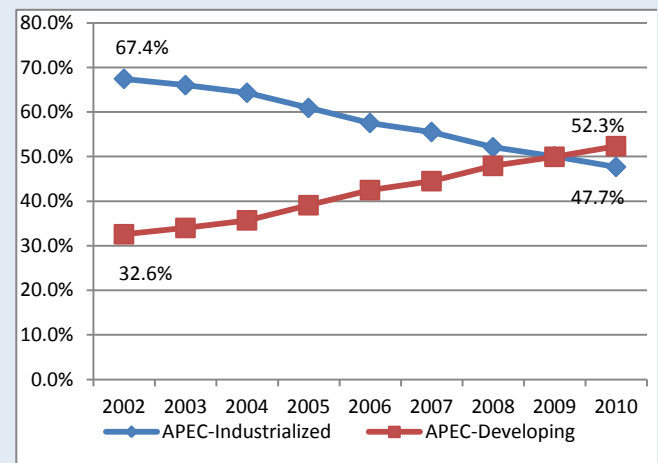
promote greater trade liberalization in this fast growing sector. While global trade grew at 11.6 percent per year between 2002 and 2010, potential environmental goods trade for APEC and the world grew at faster rates of between 12 to 17 percent during the same period, based on the three product groupings analyzed in this brief.

In addition, a more comprehensive look at the data shows that EGS trade is important not only for APEC-industrialized economies, but also for APEC-developing economies¹³. For instance, in 2010, APEC-developing members accounted for 65.5 percent of the APEC exports that were included in the World Bank's selection of climate-friendly technology products. In addition, APEC-developing members accounted for 52.3 percent of the APEC exports from the Friends of the EGS Group proposal at WTO and 50.1 percent of the APEC exports taken from the combination of the OECD indicative list and the list discussed at the APEC's EVSL.

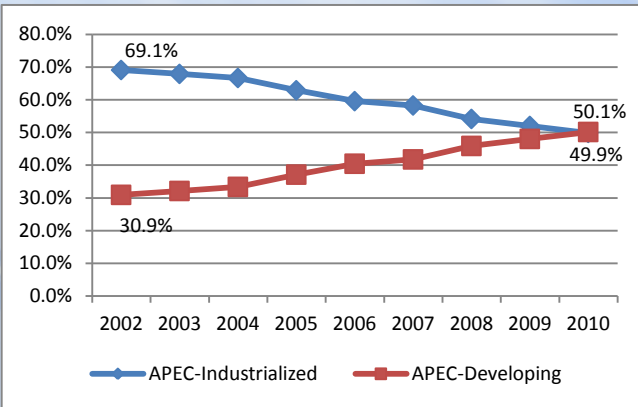
Figure 5: Share of APEC Exports by Development Level Climate-Friendly Technology Products based on the 2008 World Bank Study



Friends of EGS Group Proposal at WTO



OECD indicative list + list discussed at APEC's EVSL



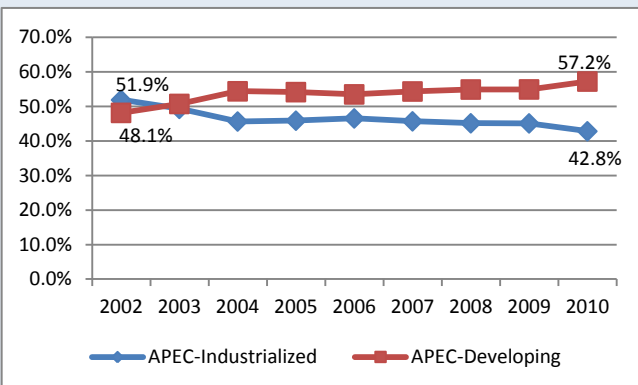
Sources: UN Comtrade; WITS; World Bank; WTO; DFAT

The current situation is a complete change from 2002, when APEC-industrialized economies accounted for most of APEC's trade in potential environmental goods across the board. The share of trade by APEC-industrialized economies had previously ranged from 63.7 percent to 69.1 percent of the APEC exports.

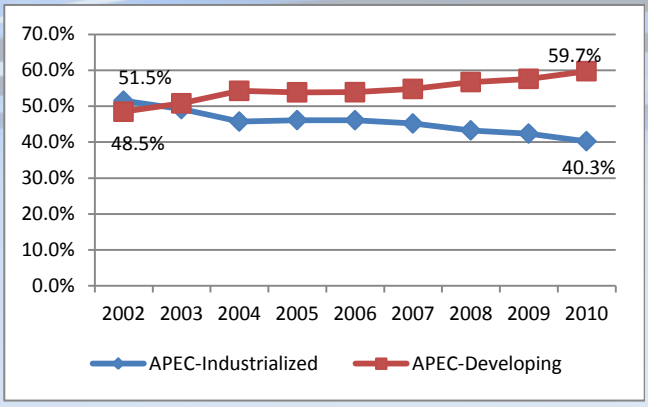
Similarly, on the import side, APEC-developing economies have also increased their participation as follows: from 48.1 percent to 57.2 percent in the case of the APEC imports calculated by the World Bank's selection of climate-friendly technology products; from 48.5 percent to 59.7 percent of the APEC imports taken from the Friends of EGS proposal at WTO; and from 48.6 percent to 58.6 percent of the APEC imports based on the OECD indicative list and the list discussed at the APEC's EVSL.

Figure 6: Share of APEC Imports by Development Level

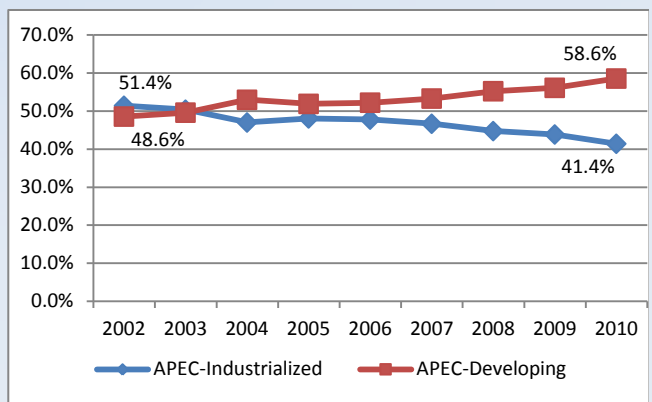
Climate-Friendly Technology Products based on the 2008 World Bank Study



Friends of EGS Group Proposal at WTO



OECD indicative list + list discussed at APEC's EVSL



Sources: UN Comtrade; WITS; World Bank; WTO; DFAT

The increased participation of APEC-developing members in this industry is one of the reasons behind the growth of APEC's potential environmental goods trade. Some of the drivers for this upward trend in trade include:

- Emerging economies moving into the production of higher value-added goods.
- Greater participation of emerging economies in the global supply-chain of environmental goods and services.
- The need to use resources more efficiently, which involves the application of environmentally friendly "green" technologies with lower carbon footprint.
- Sustained high oil prices create an incentive to develop alternative sources of energy such as renewable energy, as well as using energy-efficient products. Elevated oil prices make the sourcing of renewable energy more commercially viable. In fact, the category of products related to renewable energy plants experienced highest trade volumes among those categories proposed by the Friends of the EGS Group at the WTO.
- Increasing public awareness on prevention, control and protection of the environment. Government regulations on environmental matters in both industrialized and developing economies are creating new markets for EGS.

The findings of this policy brief indicate that EGS is a potentially huge market for the APEC region. Given the growing importance of this market, removing barriers would be beneficial to both industrialized and developing APEC member economies. Barriers are not limited to tariffs and cover a wide array of issues, such as over-stringent technical regulations that go beyond what is reasonable to allow the commercialization of a product; cumbersome certification procedures; quantitative restrictions to imports and exports; local content requirements; low enforcement to prevent infringement of intellectual property rights; subsidies to goods and services with higher levels of carbon footprint; and sectoral restrictions to foreign investment, among others.

Trade and investment liberalization and facilitation initiatives in this sector will allow producers to expand their markets, which will in turn, provide consumers with cheaper access to EGS and contribute towards building a more sustainable environment over the long term.

Notes:

1. The author would like to thank Denis Hew for his valuable comments and suggestions and Azul Ogazón for providing statistical and research assistance. The views expressed in this document are those of the author and do not represent the views of the APEC Secretariat or APEC member economies.
2. APEC, 2011 Leaders' Declaration, The Honolulu Declaration – Towards a Seamless Regional Economy. 12-13 November 2011.
3. APEC Policy Support Unit, "Study on Good Regulatory Practices for Goods and Services Necessary or Desirable for Climate Change Mitigation and Adaptation". October 2009.
4. A 2005 proposal in WTO by India on an "Environmental Project Approach" on EGS seeks to mitigate the dual use problem by linking the tariff reduction to the EGS used on certain environmental projects designated by a designated authority. The EGS would qualify for concessions during the duration of the project. Nevertheless, this proposal seems not to be efficient as temporary preferential concessions for a limited period may be difficult to administer and the cost of implementing that system may outweigh the benefits of the concessions. In addition, it is not clear how designated authorities will ensure that the projects will meet environmental standards and how the goods under preferences will only be used for environmental purposes, as they could be resold and used later in non environmental activities.

The Author is Senior Analyst at the APEC Policy Support Unit. The views expressed in this Policy Brief are those of the author and do not represent the views of the APEC Secretariat or APEC member economies. This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Singapore License.

5. WTO, "Continued Work Under Paragraph 31 (III) of the Doha Ministerial Declaration. Committee on Trade and Environment Special Session. JOB(07)/54. 27 April 2007.
6. Calculations are taking into account trade flows at the HS 6-digit level. Trade figures may be overestimated in some cases, as some proposed EGS goods are "ex-outs", which only includes products at particular HS 8 or 10-digit level. Trade data at those levels of disaggregation are not harmonized across economies and it is not publicly available in some cases.
7. World Bank, "International Trade and Climate Change: Economic, Legal and Institutional Perspectives". 2008.
8. Department of Foreign Affairs and Trade, Australia. "Australia's Trade in Environmental Goods and Services". Economic Analytical Unit Working Paper.
9. Khatum, Fahmida, "Trade Negotiations on Environmental Goods and Services in the LDC Context". United Nations Development Programme, August 2010.
10. United Nations Economic and Social Commission for Asia and the Pacific, "Asia-Pacific Trade and Investment Report 2011: Post-Crisis Trade and Investment Opportunities", 2011. This report refers to climate-smart goods and technologies as those that tend to have a relative less adverse impact on climate change and the environment in general.
11. Kim, Joy A, "Facilitating Trade in Services Complementary to Climate-friendly Technologies". Environmental Goods and Services Series. Issue Paper 16. International Centre for Trade and Sustainable Development. 2011.
12. Geloso-Grosso, Massimo, "Managing Request-Offer Negotiations under the GATS: The Case of Environmental Services". OECD Trade Policy Working Paper 11. 2005.
13. APEC-industrialized economies are Australia; Canada; Japan; New Zealand and the United States. APEC-developing members are Brunei Darussalam; Chile; China; Hong Kong, China; Indonesia; Korea; Malaysia; Mexico; Papua New Guinea; Peru; Philippines; Russia; Singapore; Chinese Taipei; Thailand and Viet Nam.

The APEC Policy Support Unit provides APEC members and fora with professional and tailor-made research, analysis, policy support and evidence-based policy suggestions.

Address: 35 Heng Mui Keng Terrace, Singapore 119616
Website: <http://www.apec.org/en/About-Us/Policy-Support-Unit.aspx>
E-mail: PSUGroup@apec.org

APEC#212-SE-05.4