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Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

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Evaluation of the APEC Environmental Goods Initiative: A Dominant Supplier Approach

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Abstract. Trade negotiations in environmental goods and services (EGS) did not make much headway at the multilateral level. The difficulty of finding a common ground among countries suggests that in the negotiations, economic priorities of countries matter as well as their environmental objectives. In this study, we provide an economic rationale why APEC should consider liberalizing a number of environmental goods in the APEC list. This involves accounting for the free-rider problem that usually afflicts liberalization on a Most-Favored-Nation (MFN) basis and the significance of trade in EGs for APEC and its individual members. Using the framework developed by Wonnacott, we assess the predominance of APEC in the world supply of each good and the comparative advantage of the region in clusters of EGs. We find that, on average, the world sources about 56 per cent of EGs from APEC. But overall, the comparative advantage of the APEC is greatest in goods which the region supplies 60 per cent of world supply. In terms of problem areas, the most promising category for the APEC is renewable energy and clean technology production. But the optimal benchmarks vary across member-economies.

Introduction

Calls to liberalize trade in environmental goods and services (EGS) are couched along the lines of sustainable development, climate change mitigation and adaptation, and green growth. Reducing trade barriers in EGS, as the arguments go, would decrease the cost of deployment of cleaner technologies. It is hoped that liberalization would then lead to improved compliance of industries with climate and environmental policies.

As the Asia-Pacific Economic Cooperation (APEC) envisions itself to be at the forefront of advancing the free trade agenda, liberalization of EGS has become a key issue as well for the region. In this light, the 21 APEC member-economies have committed to reduce applied tariffs of 54 APEC Environmental Goods (EGs) to 5 per cent or less by the end of 2015. This initiative is expected to guide the ongoing WTO negotiations on environmental goods.

Trade in environmental goods appears to exhibit an upward trend over the years where APEC member economies are seen to be big players. Kuriyama [2012] estimates the value of world trade in these products in 2011 at USD 545.6 Billion. Of this, nearly 60 per cent are from the APEC. The value of trade in APEC environmental goods is rising at annual average rate of 15.5 per cent.¹ Yet, despite the strong case for liberalizing trade in EGS, there is a dearth in studies that look at the economic impact of the APEC EGs Initiative. As the host of APEC in 2015, the Philippines can then provide guidance on this issue.

¹ For comparison, the value of trade in other goods grows by 11.5 per cent per year.

The general objective of the paper is to explore how APEC can liberalize trade in environmental goods such that its members find it economically advantageous to do so. As in Wonnacott [1994], this paper applies the concept of open regionalism and applies it in the liberalization of trade in environmental goods on an MFN basis. Specifically, the paper uses the predominant supply framework to provide member-economies evidence-based guidance as regards implementation of the APEC mandate. Theoretically, the framework addresses the problem due to free-riders, that is, those countries outside APEC that benefit from tariff reduction implemented by APEC, but do not necessarily reduce their own barriers. In practice, the paper identifies from the APEC EGs list the key candidates for sectoral liberalization. In addition, it also ranks the EGs based on APEC supply predominance and comparative advantage.

The paper proceeds as follows. Section 1 provides a brief overview of the issues regarding trade in environmental goods with a particular focus on the APEC initiative. Section 2 presents the predominant supplier approach to trade in APEC environmental goods. Section 3 attempts to identify the optimal mix of environmental goods the Philippines should liberalize. Section 4 gives the summary and conclusions.

1. Liberalizing trade in environmental goods and services

1.1 Gridlock in the WTO negotiations at the multilateral level

Environmental goods and services (EGS) are instrumental in meeting various objectives of a country that are related to environmental protection. These objectives include reduced air and water pollution, energy and resource efficiency and waste disposal, among others. Producing EGS, however, require a level of technology and know-how that is lacking in some countries, especially in developing countries. Trade policies, in this regard, can be a useful tool in environmental protection. In particular, reducing trade barriers in environmental goods facilitates the adoption of technologies necessary for a country to transition to an environment-friendly economy.

Countries, in principle, agree that there is a need for coordinated action on the environment, especially considering the adverse effects of global warming and climate change. Various multilateral environmental agreements (MEAs) have emphasized the role of trade and investment in EGS: the provisions on technology transfer stated in the Montreal Protocol and Kyoto Protocol; the Johannesburg Plan of Implementation, which was adopted in the World Summit on Sustainable Development (WSSD); and, the UN Development Goal of environmental sustainability.

Environmental goods (EGs) were first taken up as priority sector for liberalization in the 2011 WTO rounds of negotiations in the Doha. Yet, the Doha discussions did not lead to a consensus on what defines an environmental good. This has been attributed to several factors (Vossenaar [2013]; Sugathan [2013]; Yoo and Kim [2011]; ICTSD [2009]). One of which is disagreements with regard to goods that have dual or multiple end-uses that are not necessarily environmental. Some believe that such goods must be excluded outright. But there are those who contend that a single environmental end-use merits inclusion in the list.

Still another issue is the lack of products in the WTO list that are of export interest to the developing countries. Looking at the pattern of trade in environmental goods, Yu [2007] finds that despite the growing environmental industry in developing countries, the net exporters of environmental products are mostly developed countries. In fact, developing countries are campaigning for the inclusion of environmentally preferable products (EPPs) in which they have a comparative advantage (UNESCWA [2007]). Hamwey [2005] notes the potential for developing countries in environmentally preferable products (EPPs). But critics argue that just because EPPs are preferable relative to their counterparts does not mean that they are environment-friendly.

By contrast, some studies suggest that developing countries are likely to benefit from liberalizing trade in environmental goods. An empirical analysis by Jha [2008] finds that the dynamic comparative advantage in some categories of environmental goods is shifting in favor of the developing countries. Further, the estimation by Yoo and Kim [2011] reveals that the import gains from liberalizing trade in environmental goods would be higher for developing countries, since their tariffs are significantly higher. However, other constraints may limit the capacity of countries to fully adopt technology. In particular, ICTSD [2009] points to the weak institutional, financial and technological capacities of small developing countries to exploit the potential gains in trade of environmental goods.

The failure to make progress at the multilateral level suggests that environmental protection, although essential, is just one of the several objectives countries have. They also have to look after non-environmental priorities such as the economic dimension of sustainable development. Indeed, this is evident in the negotiations where the mere tabling of products eligible for sectoral liberalization is animated by mercantilist sentiments.

What remains clear is that there are economic benefits from liberalizing trade in EG. The literature supports this well. A study by the World Bank (WB [2007]), for example, provides some evidence that liberalization of trade in cleaner technologies leads to trade gains, but it points out that the effect could vary across countries given differences in technologies and existing barriers. Also, studies by Hufbauer and Kim [2010] and Yoo and Kim [2011] estimated for a number of EGs the potential benefits from the elimination of tariffs.

1.2 The APEC list of 54 environmental goods

While countries have yet to reach a common ground to defining the scope of EGs at the multilateral level, various institutions and international organizations have made much headway. The APEC, the Organization for Economic Co-operation and Development (OECD), World Bank (WB) and the International Centre for Trade and Sustainable Development (ICTSD) took to themselves the task of drawing up their own lists of environmental goods.

Sugathan [2013] classifies into two the purposes for which the lists were constructed: for trade negotiations and for research purposes. The author also draws some observations from the lists and the WTO submissions. First, it is difficult for countries to track trade in environmental goods and see whether they are used solely for environmental-end uses. Second, the lists are dominated by industrial or manufactured products; agricultural products are not considered due to the

difficulty of distinguishing them from their non-environmental counterparts. Third, the WTO submissions are predominantly on climate-friendly and low-carbon goods. The relative greenness of cleaner goods has also been called into question.

Among the initiatives, the APEC mandate to liberalize trade in environmental goods by 2015 has gained the most traction. Its beginnings can be traced all the way back from the APEC Early Voluntary Sectoral Liberalization (EVSL) initiative that was endorsed in the 1997 APEC Ministerial Meeting in Montreal, Canada.² Fifteen (15) key sectors were identified for early voluntary liberalization which included environmental goods and services, among several others. Through this initiative, the organization sought to reaffirm its role in trade liberalization, having had success with the Information Technology Agreement (ITA). The EVSL, however, did not progress. This experience demonstrated that significant trade liberalization is not easily achieved by voluntary action among members kept in check by reminders from peer group (Manzano and Bedano [2011]).

Finally, a definitive list of EGs was adopted in the APEC Ministerial Meeting in Vladivostok, Russia on 9 September 2012. The APEC member-economies committed to cut tariffs for these products to 5% or less by 2015. As indicated in a joint statement, the pledge is made within the context of promoting green growth and sustainability in the region and also addressing the effects of climate change.³ The objective of the tariff reduction is to decrease the cost of environmental technologies and thus facilitate their adoption by domestic industries. Several studies see the political significance of the APEC commitment and its role in providing impetus to the WTO multilateral agenda, such as Vossenaar [2013] and Kuriyama [2012].

Vossenaar [2013] believes that the success of the APEC initiative is partly due to the nature of the pledge as a voluntary commitment and as a tariff ceiling, and partly due to the fact that APEC did not aim for a particular definition of an environmental good. But the author notes that, in implementing the tariff cut pledge, several issues and considerations remain. Sugathan [2013], for instance, sees a need for APEC member economies to further define the scope of their voluntary commitments.

Regarding the potential impact of tariff reductions espoused by APEC, the findings are less conclusive. Vossenaar [2013] finds that the overall impact of tariff reductions is likely to be small since most MFN tariffs in APEC are already low or zero. While this is true, Kuriyama [2012] notes that MFN tariffs remain high in some countries and in some specific HS subheadings and bound tariffs, on average, are still high.

Other studies raise the possibility that tariff reduction may be accompanied by an increased use of non-tariff barriers such as domestic environmental policies and other nontariff measures. If this is the case, market access opportunities will continue to be limited even if tariffs are lowered. The study by Ratna, Kallummal and Gurung [2010] examines the non-tariff measures

² For the joint statements of the 2007 and 2012 APEC Ministerial Meeting, see http://www.apec.org/Meeting-Papers/Ministerial-Statements/Annual/2007/2007_amm.aspx and http://www.apec.org/Meeting-Papers/Ministerial-Statements/Annual/2012/2012_amm.aspx.

³ Ibid.

on WTO EG list. Another study by Kallummal and Khushwaha [2014] identifies which among the three lists (i.e., OECD, APEC and WTO lists) is embedded with the least number of non-tariff measures. Admittedly, the issue on the non-tariff barriers on environmental goods is not yet fully addressed for the APEC list. To our knowledge, other than Kallummal and Khushwaha [2014], no other study looks at a single country and the impact of liberalization of trade in environmental goods.⁴

2. The predominant supplier approach

In this section, we propose an objective approach in identifying the goods in the APEC EGs list to liberalize. To do this, two issues are taken into consideration: the free-rider problem at the APEC level and the significance of trade in EGs at the national level. To address both issues, we use the predominant supplier framework prescribed by Wonnacott [2014].

2.1 Methodology

By the Most-Favored-Nation (MFN) principle of the GATT, all tariff cuts negotiated within APEC must be extended to non-members. Since the APEC EGs initiative is a commitment to reduce tariffs, the initiative would favor free-riders in that non-members could enjoy lower tariffs without reducing their own barriers. The free-rider problem, however, must not prevent APEC from implementing the pledge, considering a strong case for trade liberalization in EGs. Instead, what must be done is to minimize the free-rider problem through the predominant supplier approach suggested by Wonnacott [2014].

The predominant supplier approach applies the principle of open regionalism to merchandise trade. Under this approach, the products that would be considered for liberalization are the ones where APEC is a dominant global supplier. In principle, if the source of the actual or prospective supply is within the APEC area, the benefit from tariff reductions on the chosen goods will accrue mostly to the APEC members.

The analysis is undertaken through a number of steps. In the first step, we identify the goods in the APEC EGs list where the concentration of supply within the APEC area is highest. In selecting the goods, we calculate the share of APEC in the world exports for each good. A large percentage share of exports indicates less free riding by non-members. As in Wonnacott [1994], we compare the export shares of APEC in total world trade with their shares in total world exports excluding intra-European Union trade. Trade between European Union member countries will be excluded, on the grounds that intra-EU trade is becoming more and more intraregional. The greater the extent that APEC as a group is a predominant supplier, the less is the free-rider problem, and presumably the less is the political opposition among APEC members to liberalize the environmental good in question.

⁴ Kallummal and Khushwaha [2014] also look into the indirect impact of liberalizing trade in EGs on the liberalization of the 14 sectors that are covered in the Non-agricultural Market Access (NAMA) negotiations.

In the second step, we measure the importance in trade of products in which APEC countries are the principal suppliers in order to assess the potential gains from liberalizing trade in these products. Given the basket of products identified in the first step, we calculate for each APEC member, the value of imports of all the other APEC countries from all sources. The value obtained is a proxy measure of the market to which that APEC member would have improved access when tariffs are reduced. However, the value is not an actual measure of the gains that the APEC member would obtain since other exporters, including both APEC and non-APEC countries, would have better access to these markets as well. The second step thus reveals the distribution of gains from an APEC-wide adoption of an environmental goods package.

The predominant supplier approach allows us to identify the products in the APEC list where the comparative advantage of each member-economy lies. Thus, from a purely economic standpoint, we can propose the mix of environmental goods that would be most beneficial for the APEC as a whole and for each member-economy as well.

For this exercise, commodities will be examined at the 6-digit level based on the Harmonized System (HS) Commodity Classification Code. We use the 2013 data available in Trade Map, a website developed by the International Trade Centre (ITC).

2.2 Findings and discussion

In order to assess the predominance of APEC in the supply of each environmental good, we estimate for each good the value of APEC exports as a percentage of world exports excluding intra-EU trade. In equation form, let the APEC supply predominance indicator be ASP . For each good i , ASP is computed as follows

$$ASP_i = \frac{APEC_i}{W_i - EU_i}$$

where $APEC_i$ is the value of exports by all APEC member economies, W_i the value of world exports and EU_i the value of intra-EU trade.

A small value of ASP means that the APEC supply of the good is small relative to world supply. In this case, the benefits of liberalizing trade for that good by APEC can spill over to non-APEC suppliers who may continue to have high tariffs for that good. Therefore, a small value of ASP indicates that the free-rider problem associated with the good is high. Conversely, a large ASP indicates less free-riding since countries that stand to benefit from tariff reduction are located within APEC.

The findings are presented in Table 1, with the last column showing the estimates for APEC's predominance in supply. In 2013, APEC member economies supply above 28 per cent of world exports of each good. On average, about 56 per cent of the goods in APEC list are sourced from APEC suppliers. For comparison, column 6 gives the estimates of APEC exports as a percentage of world exports. We see that the discrepancy between columns 6 and 7 is highest for good with product code 841919. This suggests that if APEC reduces tariffs for this good, EU countries may turn out to be significant competitors for this good.

Table 1. 54 APEC EGs and the APEC predominant supplier approach, 2013

Note: Except for percentages, units are in USD million.

Product code	Product label	APEC exports	World exports	World exports excluding intra-EU trade	APEC exports as a percentage of world exports	APEC exports as a percentage of world exports, excluding intra-EU trade
901380	Optical devices, appliances and instruments, nesoi	76,982	77,742	77,742	99.02	99.02
854140	Photosensitive semiconductor devices, including photovoltaic cells and light emitting diodes	39,677	48,716	42,320	81.45	93.75
901390	Parts and accessories for optical devices, appliances and instruments, nesoi	12,334	13,389	13,389	92.12	92.12
854390	Parts of electrical machines and apparatus having individual functions, nes	7,622	9,899	8,824	77.00	86.38
840410	Auxiliary plant for use with steam or vapour generating boilers nes	949	1,321	1,120	71.84	84.75
840420	Condensers for steam or vapour power units	259	332	316	78.03	81.97
840290	Parts of steam or vapour generating boilers nes	2,528	3,897	3,403	64.88	74.29
850490	Parts of electrical transformers, static converters and inductors	6,436	10,552	8,852	60.99	72.70
841290	Parts of hydraulic & pneumatic & other power engines and motors nes	3,402	6,556	4,758	51.89	71.50
840490	Parts for auxiliary plant and condenser for steam or vapour generating unit nes	407	747	604	54.42	67.39
903290	Parts and access for automatic regulating or controlling instruments and appliances, nes	4,886	7,349	7,349	66.49	66.49
840690	Parts of steam and vapour turbines	3,130	5,475	4,811	57.17	65.05
850300	Parts of electric motors, generators, generating sets and rotary converters	8,456	18,734	13,676	45.14	61.83
847990	Parts of machines and mechanical appliances nes having individual functions	9,262	18,292	14,995	50.63	61.76
842199	Parts for filtering or purifying machinery and apparatus for liquids or gases, nes	5,826	13,024	9,609	44.73	60.63

902720	Chromatographs and electrophoresis instruments	1,101	1,822	1,822	60.42	60.42
841919	Instantaneous or storage water heaters, non-electric, nes	634	1,880	1,073	33.74	59.09
851430	Industrial and laboratory electric furnaces & ovens nes	372	744	630	49.99	59.04
847989	Machines and mechanical appliances nes having individual functions	16,670	34,566	28,895	48.23	57.69
903300	Parts and accessories for machines, appliances, instruments or app of Chapter 90	2,046	3,602	3,602	56.82	56.82
901580	Surveying, hydrographic, oceanographic, meteorological/geophysical instruments nes	3,372	5,987	5,987	56.32	56.32
841182	Gas turbines nes of a power exceeding 5000 KW	3,921	7,378	7,135	53.14	54.95
850164	AC generators, of an output exceeding 750 KVA	1,541	3,498	2,816	44.07	54.74
903289	Automatic regulating or controlling instruments and apparatus, nes	11,132	20,399	20,399	54.57	54.57
850239	Electric generating sets	2,185	4,191	4,012	52.14	54.46
841990	Parts of machinery, plant and equipment of heading No 84.19	2,876	6,748	5,333	42.62	53.93
841989	Machinery, plant /laboratory equip f treat of mat by change of temp nes	3,586	7,877	6,663	45.52	53.81
842129	Filtering or purifying machinery and apparatus for liquids nes	3,141	7,907	5,884	39.72	53.38
902780	Instruments and apparatus for physical or chemical analysis, nes	5,378	10,103	10,103	53.23	53.23
902690	Parts of instruments and apparatus for measuring or checking variables of liquid or gases, nes	2,280	4,302	4,302	53.01	53.01
842121	Filtering or purifying machinery and apparatus for water	3,029	7,118	5,720	42.56	52.96
842139	Filtering or purifying machinery and apparatus for gases nes	6,690	16,572	12,683	40.37	52.75
851410	Industrial and laboratory electric resistance heated furnaces & ovens	629	1,556	1,196	40.42	52.58
902750	Instruments and apparatus using optical radiations (UV, visible, IR), nes	3,300	6,346	6,346	52.00	52.00

902790	Microtomes; parts and accessories of instruments and appliance for physical or chemical analysis, nes	5,214	10,047	10,047	51.90	51.90
841199	Parts of gas turbines nes	9,442	21,885	19,144	43.14	49.32
841960	Machinery for liquefying air or gas	439	1,025	899	42.88	48.89
903190	Parts and accessories for measuring or checking instruments, appliances and machines, nes	2,961	6,296	6,296	47.04	47.04
851420	Industrial and laboratory electric induction o dielectric furnaces and ovens	192	478	410	40.17	46.87
841939	Non-domestic, non-electric dryers nes	720	1,961	1,542	36.73	46.69
851490	Parts of industrial or laboratory electric furnaces and ovens nes	718	1,823	1,540	39.39	46.63
902620	Instruments and apparatus for measuring or checking pressure	3,364	7,408	7,408	45.40	45.40
903180	Measuring or checking instruments, appliances and machines, nes	8,211	18,315	18,315	44.83	44.83
841790	Parts of industrial or lab furnaces and ovens including incinerators non-electr nes	906	2,430	2,043	37.28	44.33
847420	Crushing/ grinding machines for earth, stone, ores or other minerals subs, etc.	1,565	4,084	3,660	38.31	42.75
903149	Optical instruments and appliances nes	2,177	5,106	5,106	42.63	42.63
847982	Machinery for mixing/ kneading/ crushing/ grinding, etc. nes having individual function	1,338	4,211	3,237	31.77	41.32
841780	Industrial or lab furnaces & ovens, incl. incinerators non-electric nes	438	1,236	1,079	35.47	40.63
902730	Spectrometers, spectrophotometers and spectrographs using optical radiations	1,426	3,702	3,702	38.52	38.52
902710	Gas or smoke analysis apparatus	1,561	4,066	4,066	38.40	38.40
902610	Instruments and apparatus for measuring or checking the flow or level of liquids	1,838	5,227	5,227	35.17	35.17
902680	Instruments and apparatus for measuring o check variables of liquid o gases, nes	1,057	3,207	3,207	32.96	32.96
850231	Wind-powered generating equipment	931	7,413	3,216	12.55	28.94
441872	Flooring panels, multilayer, assembled, of wood (excl. for mosaic floors)	278	1,847	969	15.03	28.64

Note: The term “nes” and “nesoi” are shorthands for “not elsewhere specified” and “not elsewhere specified or indicated”.

Source of basic data: Trade Map (ITC 2015)

An alternative approach, which may be useful for analytical purposes, is to group the 54 HS subheadings into seven categories based on specific problem areas⁵: (1) air pollution control (APC), (2) environmental monitoring analysis and assessment equipment (EMAA), (3) environmentally preferable products (EPP), (4) natural risk management (NR), (5) renewable energy and clean technology production (REP & CTP), (6) waste water management and potable water treatment (WWM & PWT), and (7) management of solid and hazardous waste and recycling systems (S/H). Figure 1 shows the distribution of APEC environmental goods by category of environmental goods. Majority of the 54 APEC environmental goods fall under EMAA and REP & CTP, with 15 goods for each category. This is followed by WWM & PWT with 12 goods, and then APC and S/H with 5 goods each. Each of the categories NR and EPP has only one good.

Figure 1. Distribution of 54 APEC EGs by category of environmental goods

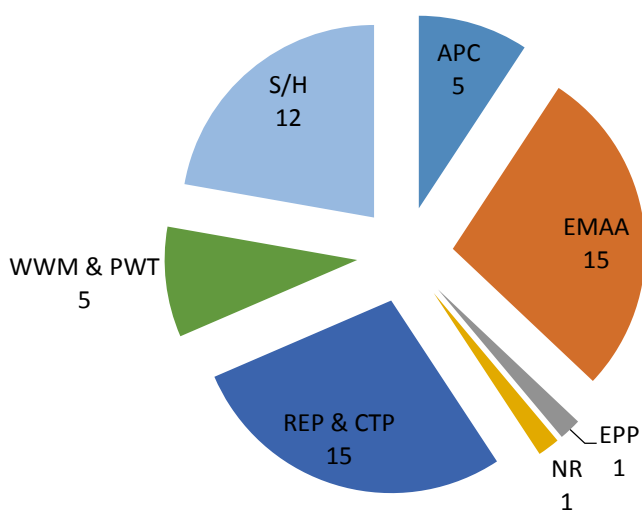


Table 2 provides the APEC predominance supply in world exports by environmental good category. Overall, the shares of APEC suppliers in total world exports among the different categories are not trivial. Ranking the categories according to the magnitude of their respective APEC shares will help us identify the categories to prioritize for liberalization. Of the categories, APEC predominance in supply is highest for products under renewable energy and clean technology production (REP & CTP) at about 64 per cent. This is followed by products under air pollution control (APC), waste water management and potable water treatment (WWM & PWT) and natural risk management (NR) at approximately 61 per cent, 60 per cent and 56 per cent, respectively.

⁵ These categories were suggested by the Friends of the Chair of the EGS Group in WTO. See WTO document JOB(07)/54.

Table 2. Categories of environmental goods and the APEC predominant supplier approach, 2013

Note: Except for percentages, units are in USD Billion.

	EG Category	No. of Sub-headings	Share in APEC EGs	APEC Exports	World Exports	World Exports Excluding Intra-EU Trade	APEC Exports as a Percentage of World Exports	APEC Exports as a Percentage of World Exports, Excluding Intra-EU Trade
APC	Air pollution control	5	9.26	11.38	26.55	21.16	52.24	60.96
EMAA	Environmental monitoring analysis and assessment equipment	15	27.78	46.80	96.90	96.90	47.92	47.92
EPP	Environmentally preferable products	1	1.85	0.28	1.85	0.97	15.03	28.64
NR	Natural risk management	1	1.85	3.37	5.99	5.99	56.32	56.32
REP & CTP	Renewable energy and clean technology production	15	27.78	183.08	254.56	228.68	54.92	64.40
S/H	Management of solid and hazardous waste and recycling systems	5	9.26	35.57	74.64	62.21	45.70	54.39
WWM & PWT	Waste water management and potable water treatment	12	22.22	20.34	39.91	31.58	48.15	60.01
TOTAL		54	100.00	301	500	447	49.34	56.06

Source of basic data: Trade Map (ITC 2015)

The previous analysis ranks the environmental products for possible liberalization from the point of view of APEC as a whole. At this point, we discuss the implications of the predominant supplier approach at the level of the individual APEC members, for which we take a closer look at the case of the Philippines.

What specific value of the APEC supply predominance (ASP) indicator should APEC use to define the subset of environmental goods where APEC is a principal supplier? In other words, how is the optimal benchmark or cutoff for *ASP* determined? There is no clear-cut answer to this question since *ASP* is, in the end, a policy variable. Hence, it is usually determined through a political process.

Yet, the predominant supplier approach gives us an objective way to indicate which level of *ASP* is best for each APEC member-economy. It allows us to identify the mix of goods where the member's highest comparative advantage lies. First, we cluster the goods into various cutoff levels based on values of *ASP* given in Table 1. The distribution of the APEC EGs across cutoff levels is provided in Table 3. For instance, there are 16 goods for which APEC supplies above 60

per cent of world exports. As the cut-off level is further increased, the less is the number of goods in the cluster.

Table 3. Distribution of the APEC EGs, by cutoff level

Cutoff (ASP in %)	25	30	35	40	45	50	55	60	65	70	75	80	85	90
No. of APEC EGs	54	52	51	48	42	35	21	16	12	9	6	6	4	3

For the combination of goods above each cutoff level, we then assess the comparative advantage of each APEC member by estimating the difference between the share of the products in exports and the share of the products in imports of the member. That is, we compute the comparative advantage of member j for goods above cutoff level i as follows

$$CA_{ij} = \left(\frac{\sum_i X_{ij}}{X_j} - \frac{\sum_i M_{ij}}{M_j} \right) \times 100,$$

where $\sum_i X_{ij}$ and $\sum_i M_{ij}$ are the summations of the value of exports and imports of APEC member j in all the goods for which APEC supplies above the cutoff level i , and X_j and M_j are the total value of exports and imports of country j . Finally, we looked at the potential benefits that members would obtain if indeed trade in these goods would be liberalized. We estimate the potential gains by getting the value of imports of all the APEC partners of the goods above various cutoff levels.

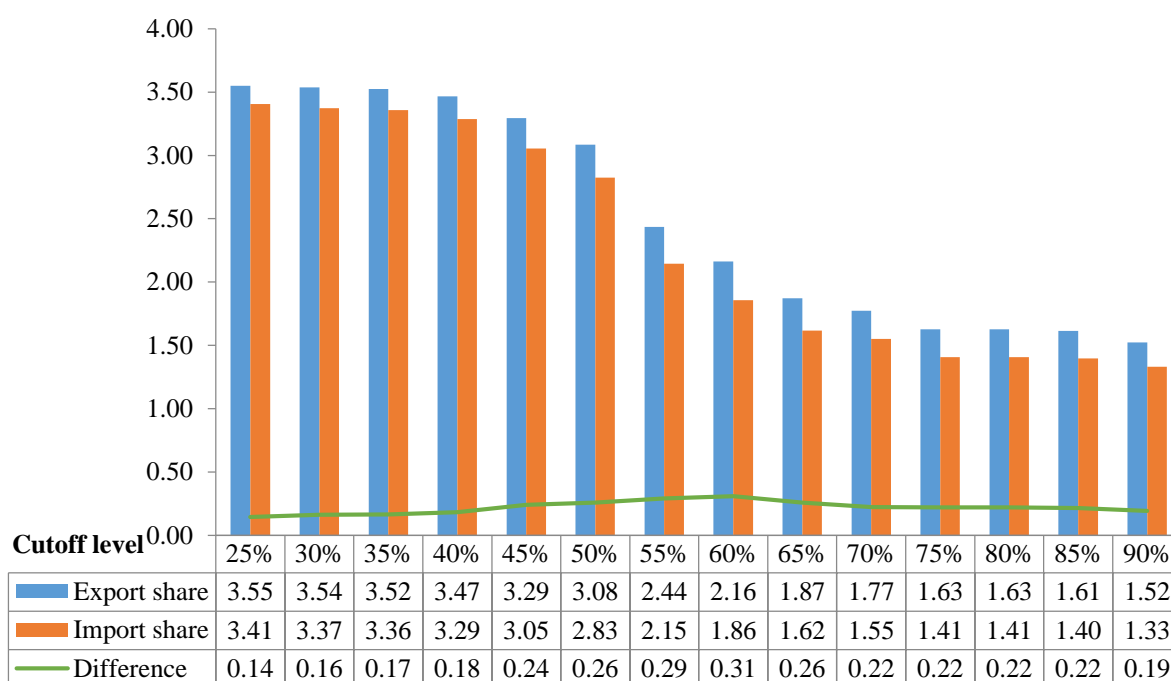
Table 4 provides the trade balance scenario and trade significance of the environmental goods in 2013 for each APEC member. Panels A and B give the share of products in total exports and total imports of the country. The net export shares are given in Panel C. Finally, Panel D gives the estimates of the value of the market that APEC would have improved access to as measured in terms of imports by APEC partner economies.

To illustrate, consider the goods that APEC supplies above the lowest cutoff level, that is, 25 per cent or more of world exports (excluding intra-EU trade). In 2013, these products are worth 4.25 per cent of the total exports and 2.20 per cent of the total imports of the Philippines. The difference is 2.04 per cent which suggests that the Philippines has some comparative advantage in this mix of goods. As shown in Panel D, the APEC partners of the Philippines imported a total of USD 318 Billion in 2013 at this cutoff level. This means that if tariffs imposed on this group of products are reduced, the Philippines would have improved access to APEC markets that are worth USD 318 Billion. But this does not mean that the Philippines will certainly gain by this full amount. If tariffs are liberalized, other countries would also have improved access to APEC markets and therefore would share in the gains from trade liberalization.⁶

⁶ In addition, the extent of benefits arising from enhanced market access depends on the magnitude of the change in tariff levels after liberalization. Also, the presence of non-tariff barriers to trade may also thwart the effects of tariff reduction.

Interestingly, APEC as a whole has some comparative advantage in environmental goods across cutoff levels. This is evident in Figure 2 in which trade shares are presented in column bars and the differences across cutoff levels are marked with a green curve. Notice that at the 60 per cent cutoff level, the difference between export and import shares is highest. Further, for each cutoff level, the difference is positive but not large, suggesting that not only is APEC a predominant exporter of the environmental goods but is an importer as well.

Figure 2. Importance of the 54 APEC EGs in 2013 APEC trade, by cutoff level

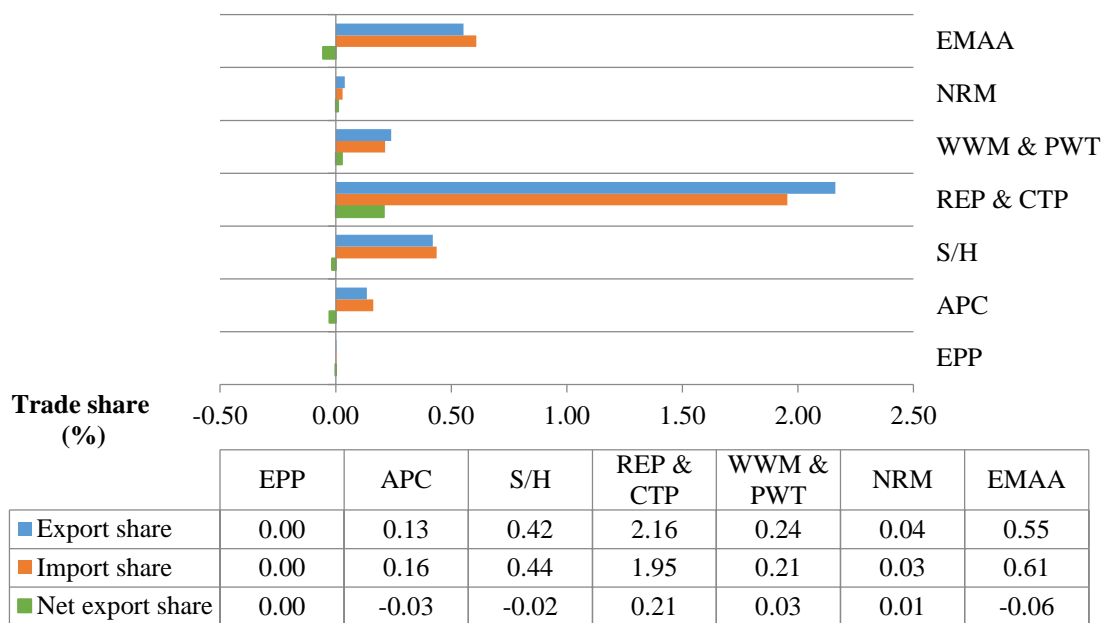


Source of basic data: Trade Map (ITC 2015)

In Table 5, we look at the trade balance scenario and potential market by categories of environmental goods. To simplify discussion, we present the trade shares for the case of the entire APEC in Figure 3. As indicated by the difference between the export and import shares, the category that holds the most potential for the entire APEC region is renewable energy and clean technology production (REP & CTP).⁷ For this category, the comparative advantage of the APEC is at 21 per cent. There is also some comparative advantage with reference to goods under the categories waste water management and potable water treatment (WWM & PWT) and natural risk management (NR), for which the net export shares are 0.03 per cent and 0.01 per cent, respectively. However, there are three categories of goods in which the APEC turns out to be a net importer: environmental monitoring analysis and assessment equipment (EMAA), air pollution control (APC) and management of solid and hazardous waste and recycling systems (S/H). Finally, the extent of APEC trade in the sole environmentally preferable product (EPP) appears rather marginal.

⁷ Recall from Table 2 that among the different categories, it is in REP & CTP where the share of APEC exports in the world is highest.

Figure 3. Importance of the 54 APEC EGs in 2013 APEC trade, by category



Source of basic data: Trade Map (ITC 2015)

Table 4. Importance of environmental goods in APEC trade, by cutoff level

Products above*	Australia	Brunei	Canada	Chile	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Mexico	New Zealand	Papua New Guinea	Peru	Philippines	Russia	Singapore	Taiwan	Thailand	USA	Viet Nam	APEC
Panel A. Share of products in country's exports, 2013 (per cent)																						
25%	0.51	0.30	1.68	0.17	3.86	1.82	0.39	5.66	7.43	3.01	2.34	0.60	0.07	0.04	4.25	0.34	3.45	8.31	1.67	3.67	0.62	3.55
30%	0.51	0.30	1.68	0.17	3.84	1.82	0.34	5.66	7.43	3.01	2.34	0.60	0.07	0.04	4.25	0.33	3.45	8.31	1.67	3.64	0.61	3.54
35%	0.50	0.30	1.67	0.17	3.83	1.81	0.34	5.65	7.43	2.99	2.32	0.59	0.07	0.04	4.25	0.33	3.43	8.30	1.67	3.61	0.59	3.52
40%	0.48	0.28	1.61	0.17	3.81	1.79	0.34	5.60	7.40	2.96	2.26	0.58	0.07	0.04	4.24	0.32	3.35	8.29	1.65	3.44	0.56	3.47
45%	0.42	0.28	1.42	0.16	3.65	1.71	0.32	5.24	7.15	2.86	2.19	0.51	0.06	0.03	4.00	0.27	3.24	8.12	1.57	3.19	0.55	3.29
50%	0.40	0.22	1.28	0.14	3.57	1.64	0.26	4.86	7.07	2.62	1.81	0.50	0.06	0.02	3.90	0.25	2.93	8.04	1.46	2.69	0.50	3.08
55%	0.26	0.15	0.75	0.10	3.22	1.40	0.20	3.51	6.51	2.25	0.91	0.26	0.02	0.01	3.68	0.13	2.17	7.76	1.09	1.34	0.41	2.44
60%	0.14	0.03	0.47	0.03	3.11	1.20	0.16	2.84	5.97	2.04	0.67	0.18	0.01	0.00	3.61	0.10	1.77	7.49	0.92	0.94	0.34	2.16
65%	0.07	0.01	0.27	0.01	2.85	1.03	0.13	2.34	5.53	1.84	0.49	0.15	0.01	0.00	2.28	0.07	1.24	7.28	0.74	0.54	0.26	1.87
70%	0.06	0.01	0.24	0.00	2.76	0.99	0.11	1.84	5.47	1.66	0.39	0.13	0.01	0.00	2.19	0.06	1.16	7.27	0.68	0.48	0.24	1.77
75%	0.03	0.00	0.16	0.00	2.51	0.88	0.06	1.67	5.28	1.60	0.34	0.08	0.00	0.00	1.92	0.03	1.00	7.21	0.62	0.35	0.17	1.63
80%	0.03	0.00	0.16	0.00	2.51	0.88	0.06	1.67	5.28	1.60	0.34	0.08	0.00	0.00	1.92	0.03	1.00	7.21	0.62	0.35	0.17	1.63
85%	0.02	0.00	0.16	0.00	2.48	0.88	0.05	1.67	5.26	1.60	0.34	0.07	0.00	0.00	1.92	0.03	1.00	7.17	0.62	0.34	0.17	1.61
90%	0.01	0.00	0.13	0.00	2.44	0.79	0.03	1.56	5.18	1.51	0.31	0.01	0.00	0.00	1.91	0.02	0.41	7.10	0.27	0.24	0.11	1.52
Panel B. Share of products in country's imports, 2013 (per cent)																						
25%	3.01	2.97	2.60	2.38	5.37	4.91	2.32	2.25	3.81	3.13	4.27	1.58	3.11	2.75	2.20	3.67	2.90	2.69	2.79	2.06	4.12	3.41
30%	2.93	2.96	2.45	2.01	5.37	4.91	2.32	2.25	3.81	3.13	4.19	1.57	3.11	2.56	2.20	3.30	2.90	2.67	2.78	2.05	4.12	3.37
35%	2.90	2.92	2.43	1.96	5.36	4.90	2.30	2.24	3.80	3.11	4.17	1.55	3.04	2.56	2.20	3.27	2.89	2.65	2.76	2.04	4.11	3.36
40%	2.80	2.81	2.32	1.87	5.27	4.87	2.25	2.20	3.70	3.06	4.09	1.48	2.96	2.49	2.16	3.17	2.82	2.59	2.70	1.97	4.06	3.29
45%	2.56	2.69	2.13	1.60	4.92	4.76	1.97	2.07	3.43	2.80	3.76	1.29	2.62	2.13	2.05	2.65	2.73	2.40	2.36	1.80	3.79	3.05
50%	2.26	1.58	1.88	1.34	4.77	4.69	1.57	1.89	3.13	2.53	3.38	1.09	2.32	1.68	1.91	2.45	2.34	2.17	2.10	1.55	3.57	2.83
55%	1.04	0.77	0.97	0.75	4.09	4.48	0.91	1.42	2.26	2.03	2.39	0.58	1.26	0.95	1.65	0.93	1.67	1.70	1.07	0.93	3.09	2.15
60%	0.63	0.28	0.71	0.56	3.73	4.34	0.70	1.30	1.79	1.57	1.91	0.32	0.92	0.71	1.29	0.35	1.34	1.37	0.75	0.74	2.54	1.86
65%	0.40	0.08	0.46	0.34	3.54	4.18	0.48	1.14	1.43	1.12	1.52	0.17	0.38	0.28	0.55	0.19	0.87	1.15	0.55	0.52	2.05	1.62
70%	0.35	0.05	0.39	0.31	3.50	4.14	0.37	1.05	1.29	0.98	1.42	0.13	0.36	0.27	0.41	0.15	0.77	1.09	0.48	0.49	1.82	1.55
75%	0.30	0.01	0.19	0.24	3.32	3.75	0.24	0.99	1.20	0.81	1.29	0.09	0.10	0.03	0.23	0.11	0.61	1.05	0.44	0.38	1.52	1.41
80%	0.30	0.01	0.19	0.24	3.32	3.75	0.24	0.99	1.20	0.81	1.29	0.09	0.10	0.03	0.23	0.11	0.61	1.05	0.44	0.38	1.52	1.41
85%	0.30	0.01	0.18	0.23	3.32	3.75	0.10	0.99	1.18	0.79	1.29	0.09	0.10	0.03	0.14	0.09	0.60	1.04	0.41	0.37	1.46	1.40
90%	0.28	0.00	0.16	0.17	3.26	3.59	0.09	0.96	1.11	0.74	1.23	0.07	0.04	0.03	0.12	0.09	0.29	0.97	0.38	0.32	1.27	1.33
Panel C. Difference between product shares in country's exports and imports, 2013 (per cent)																						
25%	-2.50	-2.68	-0.92	-2.20	-1.51	-3.09	-1.93	3.41	3.62	-0.13	-1.93	-0.98	-3.04	-2.71	2.04	-3.33	0.55	5.62	-1.11	1.61	-3.50	0.14
30%	-2.42	-2.67	-0.78	-1.84	-1.54	-3.09	-1.98	3.42	3.62	-0.13	-1.85	-0.98	-3.03	-2.52	2.04	-2.97	0.55	5.64	-1.11	1.59	-3.51	0.16
35%	-2.39	-2.62	-0.76	-1.79	-1.53	-3.08	-1.96	3.41	3.63	-0.12	-1.85	-0.96	-2.97	-2.52	2.05	-2.94	0.55	5.65	-1.09	1.57	-3.53	0.17
40%	-2.32	-2.53	-0.71	-1.71	-1.46	-3.07	-1.91	3.40	3.70	-0.10	-1.83	-0.90	-2.88	-2.45	2.08	-2.85	0.53	5.70	-1.06	1.48	-3.50	0.18
45%	-2.14	-2.41	-0.71	-1.45	-1.27	-3.05	-1.65	3.16	3.72	0.06	-1.58	-0.79	-2.55	-2.10	1.96	-2.39	0.51	5.72	-0.80	1.39	-3.25	0.24
50%	-1.86	-1.37	-0.59	-1.19	-1.20	-3.05	-1.31	2.97	3.93	0.09	-1.57	-0.60	-2.26	-1.66	1.99	-2.20	0.59	5.88	-0.64	1.14	-3.07	0.26
55%	-0.78	-0.62	-0.23	-0.65	-0.87	-3.08	-0.71	2.09	4.25	0.23	-1.48	-0.31	-1.24	-0.93	2.02	-0.80	0.50	6.06	0.02	0.41	-2.68	0.29
60%	-0.48	-0.25	-0.24	-0.53	-0.62	-3.14	-0.54	1.53	4.18	0.46	-1.24	-0.14	-0.91	-0.71	2.32	-0.25	0.43	6.12	0.18	0.20	-2.20	0.31
65%	-0.33	-0.07	-0.19	-0.34	-0.70	-3.14	-0.34	1.20	4.10	0.72	-1.03	-0.01	-0.37	-0.28	1.74	-0.11	0.37	6.13	0.19	0.02	-1.79	0.26
70%	-0.29	-0.04	-0.14	-0.30	-0.73	-3.15	-0.26	0.78	4.18	0.68	-1.03	0.00	-0.35	-0.27	1.79	-0.09	0.40	6.18	0.20	-0.01	-1.58	0.22
75%	-0.27	-0.01	-0.03	-0.24	-0.81	-2.87	-0.18	0.68	4.08	0.79	-0.95	-0.01	-0.10	-0.03	1.69	-0.08	0.39	6.16	0.18	-0.03	-1.36	0.22
80%	-0.27	-0.01	-0.03	-0.24	-0.81	-2.87	-0.18	0.68	4.08	0.79	-0.95	-0.01	-0.10	-0.03	1.69	-0.08	0.39	6.16	0.18	-0.03	-1.36	0.22
85%	-0.27	-0.01	-0.03	-0.23	-0.84	-2.87	-0.05	0.68	4.07	0.81	-0.95	-0.01	-0.10	-0.03	1.78	-0.07	0.39	6.13	0.21	-0.03	-1.29	0.22
90%	-0.27	0.00	-0.03	-0.17	-0.83	-2.80	-0.07	0.60	4.07	0.77	-0.91	-0.06	-0.04	-0.03	1.79	-0.07	0.12	6.14	-0.12	-0.08	-1.16	0.19

Panel D. Potential market: Imports by APEC partner countries of specified goods, 2013 (US\$ Billions)																					
25%	313	320	308	318	215	285	315	301	300	313	303	319	320	319	318	308	309	312	313	272	314
30%	310	317	305	315	212	1617	312	298	297	310	301	316	317	316	315	306	306	310	310	269	311
35%	309	315	304	314	211	1609	311	297	296	309	299	315	315	314	314	305	305	308	308	268	309
40%	302	308	298	307	206	1574	304	290	289	302	293	308	308	308	307	298	298	301	302	263	303
45%	281	287	277	285	191	1461	283	269	269	281	272	286	287	286	285	278	277	280	281	245	281
50%	260	265	257	264	172	1342	262	249	249	260	252	265	265	265	264	257	256	259	260	229	260
55%	199	201	197	201	122	1002	200	190	190	197	192	201	201	201	200	198	195	197	199	180	197
60%	173	174	171	174	101	859	173	163	165	171	167	174	174	174	173	173	169	170	172	157	171
65%	151	152	150	151	83	736	151	163	144	149	146	152	152	152	151	151	148	149	150	139	149
70%	145	146	144	145	77	703	145	163	139	144	140	146	146	146	145	145	143	143	144	134	143
75%	131	132	131	132	67	633	132	163	126	130	127	132	132	132	132	132	130	129	131	123	130
80%	131	132	131	132	67	633	132	163	126	130	127	132	132	132	132	132	130	129	131	123	130
85%	130	131	130	131	66	628	131	163	125	130	126	131	131	131	131	131	129	128	130	123	129
90%	124	125	124	125	61	594	125	163	119	123	120	125	125	125	125	125	124	122	124	117	123

Source of basic data: Trade Map (ITC 2015)

Table 5. Importance of environmental goods in APEC trade, by category

Groups	Australia	Brunei	Canada	Chile	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Mexico	New Zealand	Papua New Guinea	Peru	Philippines	Russia	Singapore	Taiwan	Thailand	USA	Viet Nam	APEC
Panel A. Share of products in country's exports, 2013 (per cent)																						
Environmentally preferable products	0.00	0.00	0.01	0.00	0.01	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air pollution control	0.02	0.00	0.12	0.02	0.10	0.02	0.03	0.14	0.23	0.08	0.38	0.03	0.00	0.00	0.00	0.02	0.07	0.11	0.15	0.22	0.01	0.13
Management of solid and hazardous waste and recycling systems	0.14	0.07	0.33	0.08	0.27	0.29	0.06	0.99	1.00	0.34	0.24	0.08	0.01	0.01	1.28	0.07	0.61	0.42	0.10	0.49	0.09	0.42
Renewable energy and clean technology production	0.12	0.08	0.56	0.04	3.04	1.03	0.15	2.78	5.57	1.76	1.17	0.19	0.02	0.01	2.43	0.13	1.00	7.28	0.65	1.40	0.32	2.16
Waste water management and potable water treatment	0.05	0.00	0.18	0.02	0.16	0.16	0.04	0.36	0.22	0.18	0.12	0.10	0.01	0.01	0.08	0.03	0.68	0.20	0.50	0.39	0.07	0.24
Natural risk management	0.02	0.05	0.10	0.00	0.02	0.00	0.00	0.00	0.00	0.08	0.00	0.02	0.01	0.00	0.00	0.01	0.10	0.01	0.01	0.11	0.00	0.04
Environmental monitoring analysis and assessment equipment	0.16	0.09	0.40	0.02	0.26	0.32	0.06	1.39	0.41	0.57	0.43	0.18	0.03	0.00	0.46	0.07	0.98	0.29	0.27	1.07	0.12	0.55
Panel B. Share of products in country's imports, 2013 (per cent)																						
Environmentally preferable products	0.01	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00
Air pollution control	0.50	0.12	0.26	0.16	0.11	0.03	0.26	0.11	0.18	0.14	0.31	0.09	0.27	0.13	0.12	0.52	0.10	0.15	0.14	0.14	0.17	0.16
Management of solid and hazardous waste and recycling systems	0.52	0.51	0.38	0.44	0.45	0.21	0.64	0.19	0.76	0.81	0.68	0.29	0.86	0.60	1.16	0.90	0.56	0.44	0.43	0.28	1.09	0.44
Renewable energy and clean technology production	1.07	1.32	1.06	0.93	3.78	4.10	0.83	1.32	1.88	1.31	2.31	0.44	1.07	1.27	0.63	1.20	0.95	1.27	1.39	0.88	2.02	1.95
Waste water management and potable water treatment	0.27	0.19	0.22	0.31	0.19	0.19	0.25	0.12	0.23	0.25	0.26	0.19	0.44	0.39	0.12	0.33	0.45	0.23	0.20	0.18	0.38	0.21
Natural risk management	0.07	0.07	0.05	0.04	0.03	0.01	0.04	0.01	0.01	0.07	0.01	0.05	0.07	0.05	0.01	0.07	0.08	0.01	0.01	0.03	0.04	0.03
Environmental monitoring analysis and assessment equipment	0.58	0.76	0.62	0.46	0.81	0.35	0.29	0.50	0.76	0.55	0.71	0.51	0.41	0.29	0.17	0.61	0.77	0.59	0.61	0.55	0.41	0.61
Panel C. Difference between product shares in country's exports and imports, 2013 (per cent)																						
Environmentally preferable products	-0.01	0.00	0.00	-0.03	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.00
Air pollution control	-0.48	-0.12	-0.14	-0.15	-0.01	-0.01	-0.23	0.03	0.05	-0.06	0.07	-0.06	-0.27	-0.13	-0.11	-0.50	-0.03	-0.04	0.01	0.07	-0.16	-0.03
Management of solid and hazardous waste and recycling systems	-0.38	-0.44	-0.05	-0.36	-0.18	0.08	-0.58	0.80	0.24	-0.47	-0.44	-0.21	-0.85	-0.59	0.12	-0.82	0.06	-0.03	-0.33	0.21	-1.00	-0.02
Renewable energy and clean technology production	-0.95	-1.25	-0.51	-0.90	-0.74	-3.08	-0.68	1.46	3.69	0.45	-1.14	-0.25	-1.05	-1.26	1.81	-1.07	0.05	6.01	-0.74	0.53	-1.70	0.21
Waste water management and potable water treatment	-0.22	-0.18	-0.04	-0.29	-0.03	-0.03	-0.21	0.24	0.00	-0.07	-0.14	-0.10	-0.43	-0.38	-0.04	-0.30	0.24	-0.03	0.30	0.21	-0.30	0.03
Natural risk management	-0.05	-0.02	0.05	-0.03	-0.01	-0.01	-0.04	-0.01	-0.01	0.01	-0.01	-0.02	-0.06	-0.05	-0.01	-0.06	0.02	0.00	-0.01	0.08	-0.04	0.01
Environmental monitoring analysis and assessment equipment	-0.42	-0.67	-0.23	-0.44	-0.55	-0.03	-0.23	0.89	-0.35	0.02	-0.28	-0.33	-0.38	-0.29	0.29	-0.54	0.21	-0.30	-0.34	0.52	-0.29	-0.06
Panel D. Potential market: Imports by APEC partner countries of specified goods, 2013 (US\$ Millions)																						
Environmentally preferable products	346	361	321	339	348	1,976	360	343	347	360	355	360	361	359	361	271	360	360	361	239	361	
Air pollution control	14,041	15,189	13,986	15,062	12,976	81,538	14,704	14,300	14,281	14,902	13,995	15,158	15,177	15,144	15,116	13,529	14,813	14,792	14,846	11,914	14,942	
Management of solid and hazardous waste and recycling systems	39,775	40,963	39,238	40,630	32,206	220,198	39,788	39,390	37,062	39,320	38,388	40,867	40,930	40,752	40,225	38,127	38,906	39,787	39,900	34,488	39,412	
Renewable energy and clean technology production	180,893	183,320	178,453	182,625	109,568	907,362	181,810	172,347	173,677	180,666	174,578	183,194	183,304	182,885	182,960	179,549	179,815	179,920	179,885	162,978	180,458	
Waste water management and potable water treatment	19,391	20,006	19,006	19,767	16,342	107,602	19,553	19,008	18,850	19,487	19,036	19,937	19,986	19,865	19,935	18,951	18,347	19,395	19,517	15,760	19,472	
Natural risk management	2,645	2,801	2,581	2,775	2,300	14,892	2,721	2,699	2,739	2,659	2,767	2,786	2,800	2,785	2,800	2,576	2,505	2,783	2,768	2,142	2,740	
Environmental monitoring analysis and assessment equipment	55,695	57,022	54,178	56,683	41,235	298,934	56,501	52,916	53,152	55,913	54,362	56,851	57,025	56,938	56,940	55,112	54,187	55,448	55,510	44,318	56,458	

Source of basic data: Trade Map (ITC 2015)

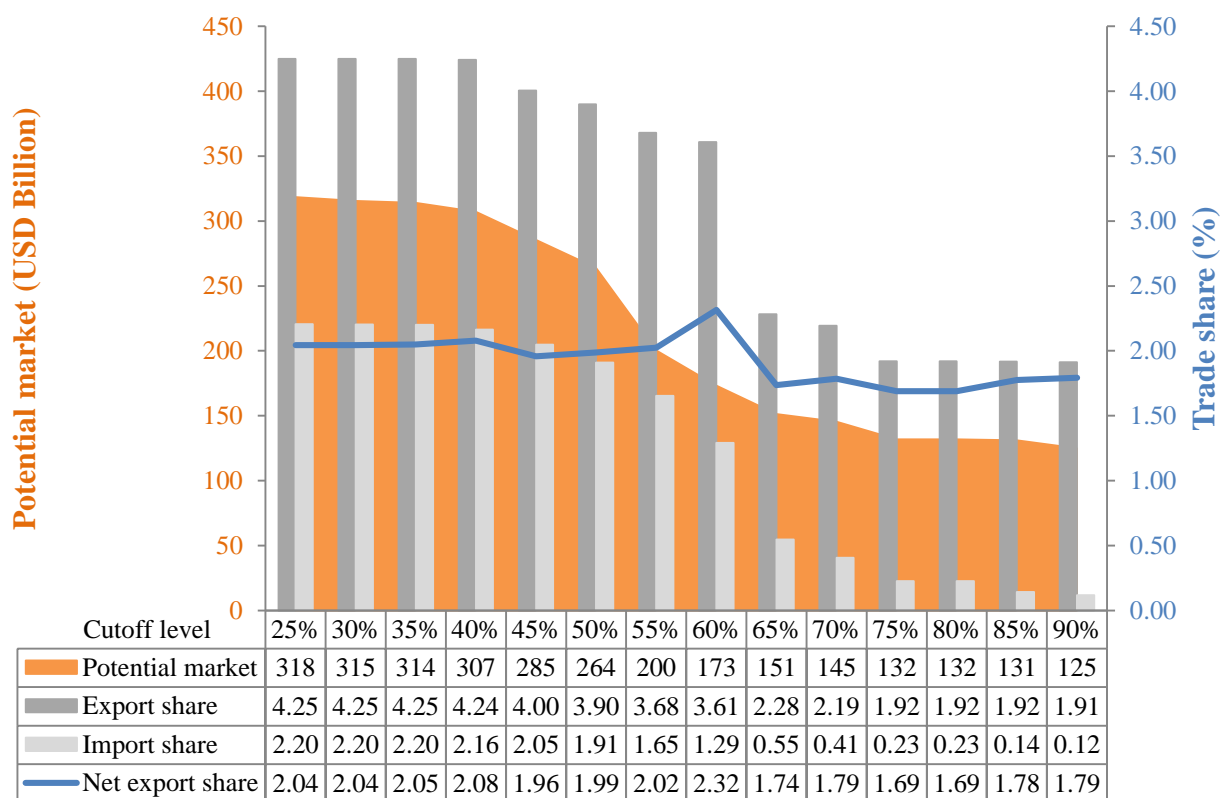
3. The optimal mix of environmental goods for the Philippines

Determining the optimal mix of environmental goods in the APEC list that the Philippines should liberalize is a political economy issue for which no definitive answer can be provided. However, the foregoing analysis based on the predominant supplier approach offers an objective way to identify the cutoff level that works best for each member-economy. The outcome of this exercise could serve as a springboard from which reasonable trade policies as regards trade liberalization in EGS can be crafted.

One way to define the optimal mix for the Philippines is to determine which cutoff level contains the mix of goods where the country has the greatest comparative advantage. In Figure 4, we present the trade shares of and the potential market faced by the Philippines across cutoff levels. Note that as the level of cutoff benchmark increases, the corresponding share of these products in total export and import of the Philippines diminishes. We see that at the 60% cutoff level, the difference in export and import shares is highest at 2.32 per cent.

This suggests that from the point of view of the Philippines, it is rational to set the ceiling of the trade negotiations at the level where APEC principally supplies 60 per cent of exports. This corresponds to a basket of 16 environmental goods, which are worth 3.61 per cent of Philippine exports and 1.29 per cent of Philippine imports in 2013. At this cutoff level, the Philippines could have an improved access to a market worth USD 173 Billion. Incidentally, comparative advantage for APEC as a whole is also highest at the 60 per cent cutoff level.

Figure 4. Importance of the 54 APEC EGs in 2013 Philippine trade, by cutoff level

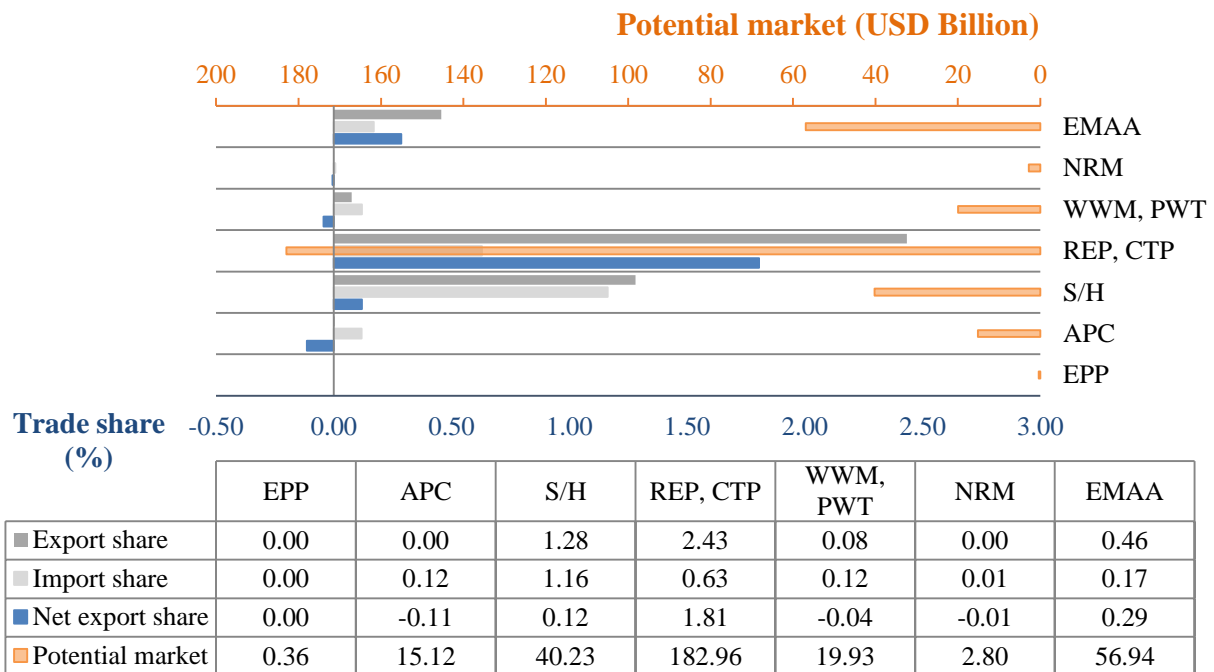


Source of basic data: Trade Map (ITC 2015)

As in the APEC-wide analysis, we also identify the category of environmental goods the comparative advantage of the Philippines lies the greatest. Figure 5 presents the trade shares and the value of the potential market across categories of environmental goods. Interestingly, what's promising for the APEC as a whole holds as well for the Philippines. That is, the country's comparative advantage peaks under renewable energy and clean technology production (REP & CTP) at 1.81 per cent. In 2013, the potential market for the Philippines in these products is worth USD 182.96 Billion.

Other promising categories include environmental monitoring analysis and assessment equipment (EMAA) with net export shares at 0.29 per cent, and management of solid and hazardous waste and recycling systems (S/H) at 0.12 per cent. These goods are equivalent to USD 56.94 Billion and USD 40.23 Billion worth of potential market, respectively. But less promising for the Philippines, in the commercial sense, are the following categories: air pollution control (APC), waste water management and potable water treatment (WWM & PWT) and natural risk management (NRM). For these environmental goods, the country is a net importer. Finally, the Philippines neither exports nor imports the environmentally preferable product.

Figure 5. Importance of the 54 APEC EGs in 2013 Philippine trade, by category



Source of basic data: Trade Map (ITC 2015)

4. Summary and conclusions

Issues regarding climate change, the environment and sustainable development continue to be hotly debated in academic and development circles. Because these issues span national borders, solutions must be devised through means of international cooperation. To aid in the mitigation and prevention of the adverse effects of environmental degradation, there have been proposals to promote trade in environmental goods at the multilateral and regional levels. One of APEC's contributions in this regard is to put forward its own list of 54 environmental goods slated for sectoral liberalization.

The APEC EGs initiative calls for a reduction of tariffs of these goods within the range 0 to 5% – a target less ambitious as that of the Information Technology Agreement (ITA). How will this initiative impact APEC's interests? How would the benefits be distributed among the APEC members? To what extent does the APEC mandate serve the Philippine interest?

If we consider liberalization of the items in the list on an MFN basis, one of the central issues is the free-rider problem. To address this, this paper employs the dominant supplier approach in ranking the elements in the APEC list according to APEC supply predominance (*ASP*). By and large, we find a considerable share of APEC environmental products exports to world exports, with *ASP* values ranging from 28 to 99 per cent. If APEC were to choose a cutoff benchmark with which it could consider items to be liberalized on an MFN basis, what would the cutoff benchmark be? This is a policy variable and would most likely be a negotiated outcome. However, if one were to consider commercial viability consideration, an *ASP* cutoff of 60% would be a good starting point. This particular benchmark corresponds to the greatest comparative advantage and covers around 16 products.

Alternatively, the 54 items in the APEC EGs list can be grouped into seven (7) functional categories. We find that the list is dominated by the following categories: (a) environmental monitoring analysis and assessment equipment (EMAA), (b) renewable energy and clean technology production (RE & CTP), and (c) waste water management and potable water treatment (WWM & PWT). Under this system of classification, the most promising category is the one that has the highest share of exports relative to world exports, namely, RE & CTP.

Of course, the benefits of MFN liberalization of the APEC list is not distributed uniformly across the APEC member-economies. Those that specialize on exports of the EGS would more likely benefit from liberalization. Looking at the impact of the APEC list on the Philippines, we find that a cutoff of 60% seems to be promising benchmark for which the measure for comparative advantage for the Philippines is greatest. If the country is to choose a subset of environmental products to liberalize ahead of the others, the products falling within the 60% cluster are promising candidates for the Philippines. Under this condition, the potential export market in APEC is worth USD 173 Billion for the country.

If we consider picking categories for accelerated liberalization, then the category that holds most potential is renewable energy and clean technology production (RE & CTP). In 2013, the Philippines faces a potential APEC market for these products worth USD 182.9 Billion.

The APEC environmental initiative is a positive contribution to the global effort to foster sustainable development. Of course, the most promising approach, taken from the global welfare standpoint, is sectoral liberalization at the multilateral level. However, the multilateral agenda is

stymied by the presence of different sensitivities such as the free-rider problem. It is hoped that by using the predominant supplier approach, this study could get around this issue, thereby providing stimulus necessary to advance free trade in environmental goods and services.

Annex 1. Implications on the trade interests of the Philippines

In the main paper, we used the Wonnacott approach to assess the predominance of APEC member-economies in the world supply of each environmental good. The values of *ASP* obtained approximate the extent of the free-rider problem afflicting the APEC initiative. Further, we ranked the goods in terms of the comparative advantage of the Philippines.

However, the comparative advantage analysis employed thus far is far from sufficient since potential gains from liberalizing trade in APEC EGs do not depend only on the volume of trade but also on existing trade barriers. Considering that goods demanded and supplied by APEC member economies are subject to varying tariff rates, it is imperative that we also evaluate whether the APEC tariff cut pledge aligns with the trade interests of the Philippines. This analysis would better inform policymakers on the negotiating stance of the country as regards identifying the goods to prioritize, devising the timetable for implementing the tariff cuts, specifying the magnitude of tariff cuts, among other concerns.

Philippine trade in APEC EGs relative to APEC partners

How does Philippine trade in APEC EGs compare with those of the other APEC member-economies? To answer this, we present in Table 6 the total value of exports and imports of the Philippines and their corresponding shares in APEC for each APEC EG. In 2013, the country is a net importer of APEC EGs with exports of about USD 54 Billion and imports of about USD 65 Billion. These account for 0.64 per cent of exports and 0.69 per cent of imports in the APEC region.

Table 6. Philippine trade in APEC EGs relative to APEC partners, 2013

Note: Except for percentages, units are in USD thousand.

APEC EGs	Philippine exports	Philippine exports as a percentage of APEC exports	Philippine imports	Philippine imports as a percentage of APEC imports
ALL	53,978,268	0.64	65,097,369	0.69
441872	-	0.00	-	0.00
840290	230	0.01	27,818	2.27
840410	592	0.06	39,053	5.15
840420	-	0.00	16,635	8.88
840490	1,255	0.31	35,390	6.57
840690	16	0.00	52,939	2.69
841182	-	0.00	11,067	0.39

841199	20,019	0.21	63,111	0.62
841290	5,841	0.17	6,494	0.18
841780	1,163	0.27	2,204	0.31
841790	569	0.06	4,150	0.70
841919	44	0.01	1,793	0.26
841939	101	0.01	5,449	0.48
841960	1	0.00	146	0.02
841989	341	0.01	15,121	0.29
841990	8,137	0.28	33,674	1.17
842121	8,887	0.29	16,168	0.49
842129	8,937	0.28	5,984	0.16
842139	48	0.00	9,487	0.11
842199	19,940	0.34	35,287	0.63
847420	66	0.00	36,730	1.63
847982	33	0.00	10,902	0.49
847989	33,370	0.20	215,889	1.00
847990	655,270	7.08	404,240	4.69
850164	165	0.01	3,138	0.22
850231	1	0.00	275	0.01
850239	132	0.01	10,985	0.35
850300	39,358	0.47	40,940	0.62
850490	141,571	2.20	81,606	0.93
851410	9	0.00	2,228	0.18
851420	3	0.00	3,444	0.86
851430	2	0.00	5,174	0.77
851490	48	0.01	4,755	0.80
854140	1,029,888	2.60	76,082	0.20
854390	2,806	0.04	14,856	0.24
901380	918	0.00	1,236	0.00
901390	1,522	0.01	671	0.01
901580	97	0.00	4,403	0.16
902610	3,915	0.21	10,012	0.40
902620	54	0.00	4,961	0.12
902680	8	0.00	2,192	0.15
902690	22,812	1.00	2,820	0.11
902710	9	0.00	8,110	0.33
902720	-	0.00	4,100	0.24
902730	2	0.00	6,239	0.32
902750	2,320	0.07	2,355	0.07
902780	517	0.01	14,306	0.21
902790	186	0.00	13,756	0.27

903149	133	0.01	6,583	0.18
903180	126,162	1.54	15,167	0.12
903190	37,377	1.26	7,881	0.17
903289	65,920	0.59	24,945	0.18
903290	47,576	0.97	3,089	0.09
903300	5,178	0.25	9,018	0.66

Source: Trade Map (ITC 2015)

Table 7 presents Philippine trade in APEC EGs and its corresponding shares in APEC by categories of environmental goods. In 2013, the country has fairly significant export shares in S/H, REP & CTP and EMAA and fairly significant import shares in S/H, APC and WWM&PWT.

Table 7. Philippine trade in APEC EGs relative to APEC partners by EG category, 2013

Note: Except for percentages, units are in USD thousand.

	EG Category	Philippine Exports	Philippine Exports as a Percentage of APEC Exports	Philippine Imports	Philippine Imports as a Percentage of APEC Imports
APC	Air pollution control	1,645	0.01	76,779	0.51
EMAA	Environmental monitoring analysis and assessment equipment	246,249	0.53	110,589	0.19
EPP	Environmentally preferable products	-	0.00	-	0.00
NR	Natural risk management	97	0.00	4,403	0.16
REP & CTP	Renewable energy and clean technology production	1,313,532	0.72	408,956	0.22
S/H	Management of solid and hazardous waste and recycling systems	691,355	1.94	756,587	1.85
WWM & PWT	Waste water management and potable water treatment	40,671	0.20	77,744	0.39
	TOTAL	2,293,549	0.76	1,435,058	0.45

Source: Trade Map (ITC 2015)

Analysis of offensive and defensive interests

National trade interests can either be offensive or defensive. Offensive interests pertain to the benefits that the country will obtain as a supplier in the world market, when trade is to be liberalized. Any fall in trade barriers is tantamount to an improvement in market access. A tariff reduction, for example, makes the good exported relatively cheaper and therefore more attractive

to consumers. The larger the incremental market access, the larger is the offensive interest served.

Defensive interests, on the other hand, pertain to two opposing forces. On one hand is the prospect that liberalization can intensify the threat of foreign competition faced by local industries. In the most extreme case, foreign competition can eliminate a domestic industry that operates inefficiently. On the other hand, liberalization may also be beneficial to consumers of imported goods and to domestic producers who source raw materials and intermediate inputs from foreign sources. In purely commercial terms, however, defensive interests pertain to the increase competitive pressure on the domestic industries brought about by the rise in imports.

The outcome of this analysis is lists of goods reflective of the country's offensive and defensive interests. Each good in the 54 APEC EGs list is screened using combinations of economic criteria. It is important to note that the lists generated are only illustrative rather than conclusive. By varying the combinations of criteria, different lists can be constructed.

Indicators for the offensive lists

The indicators used in generating the offensive lists are as follows:

1. Export capacity. This indicator refers to whether the Philippines has a record of exporting the product. If the country exports the product, then it can be said that the local industry possesses the capacity to compete globally and thus exploit the potential market access that comes with liberalization.
2. Local supply availability. This is used to assess the status of local production in the country. This is necessary in that the country can reap the gains from the tariff cut only if it has the capacity of producing the good in the first place. For this indicator, the product is classified into one of the following grades of local availability: (1) not locally produced (NLP), (2) locally produced, but not sufficient in quality (LP-NSQ), and (3) locally produced (LP).
3. Level of outstanding barriers. The level of outstanding barriers in the destination country is an indicator of the potential benefits the country can gain once trade in the good is liberalized. For this indicator, we use the level of tariffs in the destination country. The higher the tariff, the higher the potential benefits the country can obtain from tariff reduction.

Indicators for the defensive lists⁸

The following indicators are used in generating the defensive lists.

1. Presence of imports. The presence of imports indicates that some foreign source has the capacity to export the good and that local demand for that foreign-produced good exists.
2. Local supply availability. A certain good is crucial in the defensive interests of the Philippines only if there exists local production of the product and, at the same time, a threat of foreign competition is imminent. If there are no local producers of the product, then protection via import tariff would only hurt the consumers of the product. As in the

⁸ A relevant criterion for the defensive list would be the category for nondual/dual-use. If a good has dual or multiple uses, then that good, while tagged as an environmental good, may at the same time be used in activities that are not considered environmental. Because the tariff line could not distinguish among the different purposes, importation of such product may enter the country at reduced tariff, thus eroding the protection accorded to the local industry. This criterion was not included in the defensive analysis due to the difficulties in procuring a suitable indicator.

offensive lists, we classify goods by grades of local availability: (1) not locally produced (NLP), (2) locally produced, but not sufficient in quality (LP-NSQ), and (3) locally produced (LP).

3. Degree of processing. This pertains to whether the imported good is a final good or an intermediate good. If the good is a final good and local production exists even if at small scale, it would be in the interest of the Philippines to accord some level of trade protection. If the good is an intermediate good, then it is used by local firms as an intermediate input in their production. In the latter case, protection must not be too high.
4. Level of outstanding barriers. A higher tariff suggests a stronger defensive stance. For this indicator, we use import tariffs levied by the Philippines.

Data

The database summarizes Philippine trade data for the 54 APEC environmental goods for the period 2012-2013. Unlike in the APEC list where goods are specified at the 6-digit HS, the goods in the database are specified at the 8-digit level tariff lines using the 2012 ASEAN Harmonized Tariff Nomenclature (AHTN). The APEC EGs list translates to a total of 107 tariff lines at the 8-digit level in the database. For each tariff line, the database provides information on local supply availability, degree of processing and the value of trade with top three trading partners (destination/source countries) with the corresponding tariff rates (i.e. MFN and FTA tariff rates). The sources of basic data are the following: (a) Philippine Statistics Authority for the trade statistics of the Philippines; (b) Philippine Tariff Commission for the Philippine tariffs; (c) the RCEP submission through the ASEAN Secretariat for the MFN and FTA tariffs of Philippine trade partners; and, (d) the WTO Integrated Database for the MFN tariffs of non-FTA partners of the Philippines.

In constructing the offensive and defensive list, two kinds of tariffs are used: the highest MFN tariff rate and the trade-weighted tariff rate. The highest MFN tariff rate represents the non-preferential tariff imposed on each tariff line and thus would provide the most conservative estimate of trade barriers. For the offensive lists, the highest among the MFN tariffs set by the top 3 destination countries are considered for each tariff line. By contrast, the defensive lists use the highest among the Philippine MFN tariff rates of the top three (3) source countries in each tariff line. For comparison, trade-weighted tariff rates are also be used. This tariff rate accounts for the fact that the Philippines may have existing free trade agreements (FTAs) with partner countries. We assume that the trade transactions of the Philippine with its FTA partners are preferential in nature, that is, the preferential tariffs are applied instead of the MFN. Further, since the APEC initiative aims at reducing tariffs for the environmental goods to at least 5%, two tariff thresholds are defined: (1) tariffs between and including 0% and 5%; and tariffs greater than 5%.

Neutral list

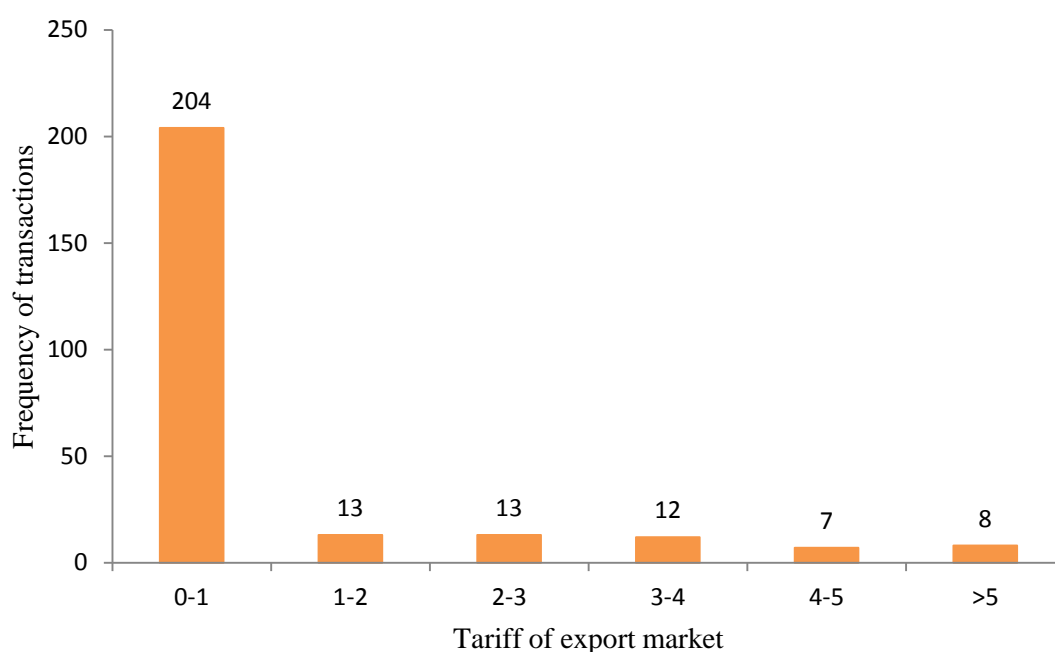
The Neutral list consists of goods in which the Philippines has neutral offensive or defensive interest. These are the goods the Philippines neither exports nor imports for the period 2012 - 2013. Two tariff lines are identified under this list: 8419.39.20 and 9027.20.20. The former is WWM & PTA; the latter is EMEA. Both are classified as final goods and are not locally

produced in the Philippines. If tariffs were to be reduced for these goods, the country would not be worse off.

Offensive lists

In Figures 6, we give the distribution of export transactions of the Philippines in 2012-2013 across tariffs levels. Note that this considers only the top 3 destination countries of Philippine exports. In general, the export markets already have low tariffs for Philippine exports. Of the export transactions in 2012-2013, only a few cases have tariffs higher than 5, which therefore are of interest for the Philippines in terms of incremental market access. The pattern is not surprising, as exports tend to flow to destinations where access is significant.

Figure 6. Philippine export transactions in APEC EGs for 2012-2013, by tariff of export market



Note: Only the top three partner countries in each tariff line were considered in generating this figure.

Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

To generate the offensive lists, we first extract the goods for which the Philippines is a *net exporter* during the period 2012-2013. Then, we classify the extracted goods into two offensive lists based on the criteria specified in Table 8 below. Both lists consist of goods in which the country exhibits productive and export capacity, regardless of whether it is available in sufficient local supply. The lists differ in the level of market access potential as estimated by the threshold level of tariffs levied on Philippine exports. List 1 considers tariffs within the APEC tariff pledge, that is, tariffs that are at most 5 per cent. List 2 includes goods with tariffs above 5 per cent.

Table 8. Criteria for generating the offensive lists

Lists by level of market access potential	Indicator		
	Net exports	Local supply availability	Export market tariff
List 1: Low	Positive	Locally produced	$0 \leq t \leq 5$
List 2: High	Positive	Locally produced	$t > 5$

The results for the 54 APEC EGs are presented in Table 9. Of the 107 tariff lines in the APEC EGs list, the Philippines has offensive interests in 27 tariff lines or 25.23 per cent of the 107 tariff lines in the APEC list. Of these, 19 tariff lines (17.76 per cent) are in List 1, and 8 tariff lines (7.48 per cent) are in List 2. The last two lists amount to exports that are worth 60.15 per cent (USD 1.40 Billion) and 35.83 per cent (USD 830 Million) of the average APEC EGs exports in 2012-2013, respectively. Notice, however, that if trade-weighted tariffs are used instead, all the tariff lines fall under the list with the low market potential. This result underscores the fact that the Philippines enjoy preferential tariff rates by virtue of its existing free trade agreements.

Table 9. Offensive lists for the 54 APEC EGs

	No. of tariff lines	Share in total APEC EGs tariff lines (%)	Value of exports, Ave. 2012-2013 (USD Billion)	Share in APEC EGs exports, Ave. 2012-2013 (%)	Value of imports, Ave. 2012-2013 (USD Billion)	Value of net exports, Ave. 2012-2013 (USD Billion)
54 APEC EGs	107	100.00	2.33	100.00	0.73	1.60
OFFENSIVE	27	25.23	2.24	95.98	0.19	2.05
LISTS BY MARKET ACCESS POTENTIAL						
<i>A. Highest MFN tariffs</i>						
List A1: Low	19	17.76	1.40	60.15	0.08	1.32
List A2: High	8	7.48	0.83	35.83	0.11	0.73
<i>B. Trade-weighted tariffs</i>						
List B1: Low	27	25.23	2.24	95.98	0.19	2.05
List B2: High	0	-	-	-	-	-

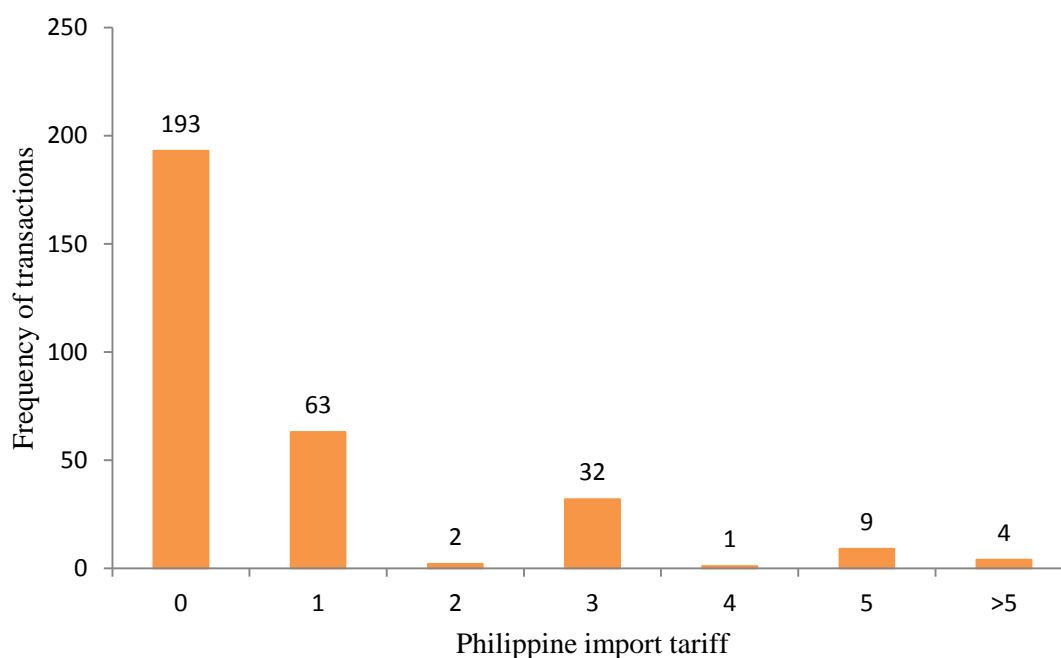
Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

The findings indicate that, given the profile of net exports, the offensive interest is rather weak. If we factor in the preferential tariffs, then the offensive interest is even weaker. Of course, in a dynamic setting, the lower tariff may induce export expansion that is not evident in the current data. The offensive interest can be better served if the APEC commitment is to go for a zero tariff rate rather than the current tariff ceiling of 5%.

Defensive lists

In Figure 7, we present the distribution of Philippine imports across various levels of Philippine import tariffs. In generating the figures, we only account for the import transactions of the Philippines with the top three (3) source countries for each tariff line. In general, the Philippines already levies low import tariffs for the 54 APEC EGs. One can find 300 cases where tariffs are at 0-5%. By contrast, there are 4 instances where the Philippine import tariffs are above 5%. Again, the pattern is not surprising because imports flow to sectors where there are lower trade barriers. The presence of preferential trade arrangements would lower existing barriers even further, thus driving more imports.

Figure 7. Philippine import transactions in APEC EGs for 2012-2013, by Philippine import tariff



Note: Only the top three partner countries in each tariff line were considered in generating this figure.

Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

The master defensive list is generated by extracting the tariff lines for which the Philippines is a *net importer* during the period 2012-2013. Then, four lists with increasing levels of sensitivity are constructed using various combinations of criteria. The criteria for the defensive lists are summarized in Table 10. The goods in List 1 are those that have been imported and are not produced locally. Both Lists 2 and 3 consist of intermediate goods that can be obtained locally; whereas, lists 4 and 5 consist of final goods. The two pairs differ in the threshold level of Philippine import tariffs. Lists 2 and 4 are subject to tariffs between and including 0% and 5%; whereas, lists 3 and 5 face tariffs above 5% .

Table 10. Criteria for generating the defensive lists

Lists by degree of sensitivity	Indicators			
	Net imports	Local supply availability	Degree of processing	Philippine import tariff
<i>List 1: Very Low</i>	Positive	Not locally produced		
<i>List 2: Low</i>		Locally produced	Intermediate	$0 \leq t \leq 5$
<i>List 3: Medium</i>				$t > 5$
<i>List 4: High</i>		Final	$0 \leq t \leq 5$	
<i>List 5: Very High</i>			$t > 5$	

Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

The results for the 54 APEC EGs are presented in Table 11. The Philippines has defensive interest in about 73 per cent or 78 of the 107 tariff lines in the APEC EGs. In terms of value, this is equivalent to USD 446.25 Million of average net imports during 2012-2013. Majority of these are concentrated in the lists with low and high sensitivity – the lists with tariff threshold that is within the APEC pledge. A small number of goods have been shortlisted in lists 3 and 5 – the specifications with the higher tariff threshold. When trade-weighted tariffs are used instead of the highest MFN tariffs, the aforesaid pattern also holds. However, for the lists with tariffs above 5 per cent, there are no zero tariff lines at all. Again, this is not surprising because tariffs are generally within the 0-5% range, when FTAs are taken into account.

Table 11. Defensive lists for the 54 APEC EGs

	No. of tariff lines	Share in total APEC EGs tariff lines (%)	Value of exports, Ave. 2012-2013 (USD Million)	Value of imports, Ave. 2012-2013 (USD Million)	Share in APEC EGs imports, Ave. 2012-2013 (%)	Value of net imports, Ave. 2012-2013 (USD Million)
54 APEC EGs	107	100.00	2,329.99	728.85	100.00	(1,601.14)
DEFENSIVE	78	72.90	93.67	539.92	74.08	446.25
LISTS BY DEGREE OF SENSITIVITY						
<i>A. Highest MFN tariffs</i>						
List 1: Very Low	6	5.61	-	17.83	2.45	17.83
List A2: Low	25	23.36	82.14	318.20	43.66	236.06
List A3: Medium	0	-	-	-	-	-
List A4: High	41	38.32	6.76	177.69	24.38	170.92
List A5: Very High	6	5.61	4.76	26.20	3.59	21.43
<i>B. Trade-weighted tariffs</i>						
List 1: Very Low	6	5.61	-	17.83	2.45	17.83
List B2: Low	25	23.36	82.14	318.20	43.66	236.06

List B3: Medium	0	-	-	-	-	-
List B4: High	47	43.93	11.53	203.88	27.97	192.36
List B5: Very High	0	-	-	-	-	-

Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

The profile of the current Philippine imports of the environmental goods indicate that the bulk of the defensive interests lie in the *low* and *high* cases in both cases where the tariffs are specified at the MFN and preferential rates. From the point of view of defensive interest, the area of concern is the *very high* case. Because the APEC calls for a reduction of tariffs within the range from zero to five percent, the current tariff levels in the *high* case (less than 5%) need not be adjusted downwards. Note that if the specification of tariff should include the preferential tariffs, as in the trade-weighted tariffs, then the defensive interests are even better served, since there is no tariff line among the sectors in the APEC EGs that fall within the *very high* case.

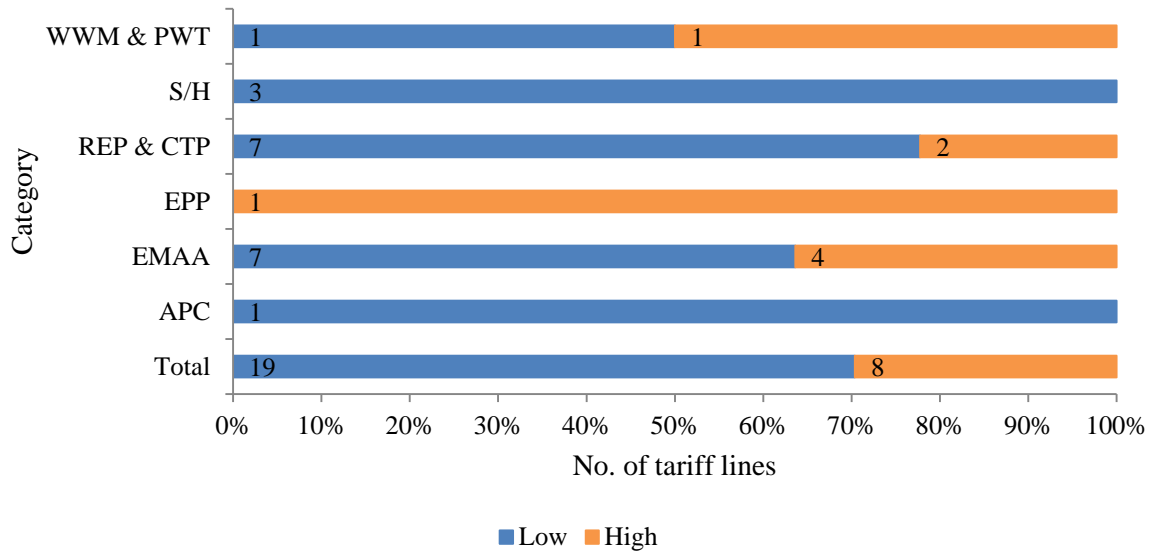
In summary, the analysis of the offensive and defensive interest of the Philippines with regard to the APEC EGs reveals a rather neutral situation. Given the current profile of trade, the offensive list of the Philippines in terms of market access is weak, as the bulk of Philippine exports are already in the low tariff brackets. The presence of free trade agreements already serves the offensive interests well.

Similarly, the defensive interest is also weak. Most of the Philippine imports are already in the low-tariff categories. The fact that APEC does not specifically call for zero tariff, but rather proposes a range of tariffs, soften the competitive impact of liberalization on an MFN basis for the members. Besides, the different preferential trading arrangements of the Philippines also have reduced the tariffs even prior to this APEC initiative. Of course, the picture may be different if one were to analyze the change in trading behavior given if the APEC EGs is carried out. All told, the impact of APEC EGs on the Philippine interest – both offensive and defensive – is rather benign.

Annex 2. Analysis of offensive/ defensive interests by environmental good category

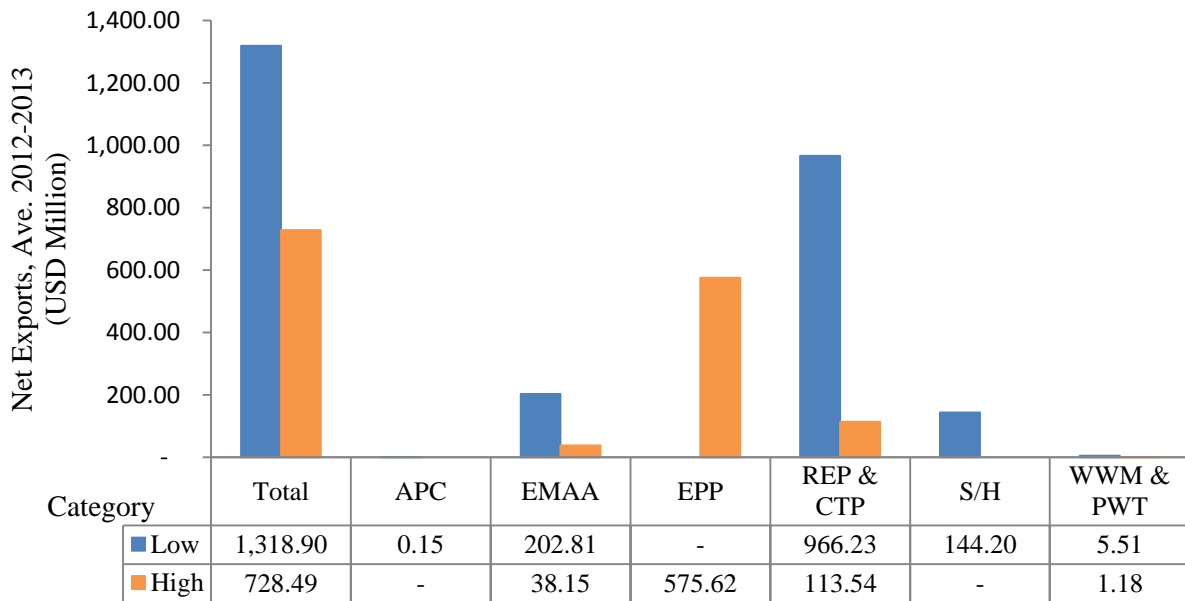
This annex provides the analysis of offensive/defensive interests using categories of environmental goods. In Figures 7 and 8, we present the distribution of the tariff lines and the value of offensive interest by category. Ideally, it would be in the environmentally preferable product (EPP) where the Philippines could have better prospects of gains in the offensive interest. Unfortunately, the country is not an exporter of the sole EPP in the APEC list. In the renewable energy and clean technology production (REP & CTP), the potential for enhanced exports, given current trade figures, is lower since most of the Philippine exports in REP & CTP are already in the low tariff brackets.

Figure 7. Distribution of goods in the offensive lists, by category



Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

Figure 8. Value of offensive interests, by category



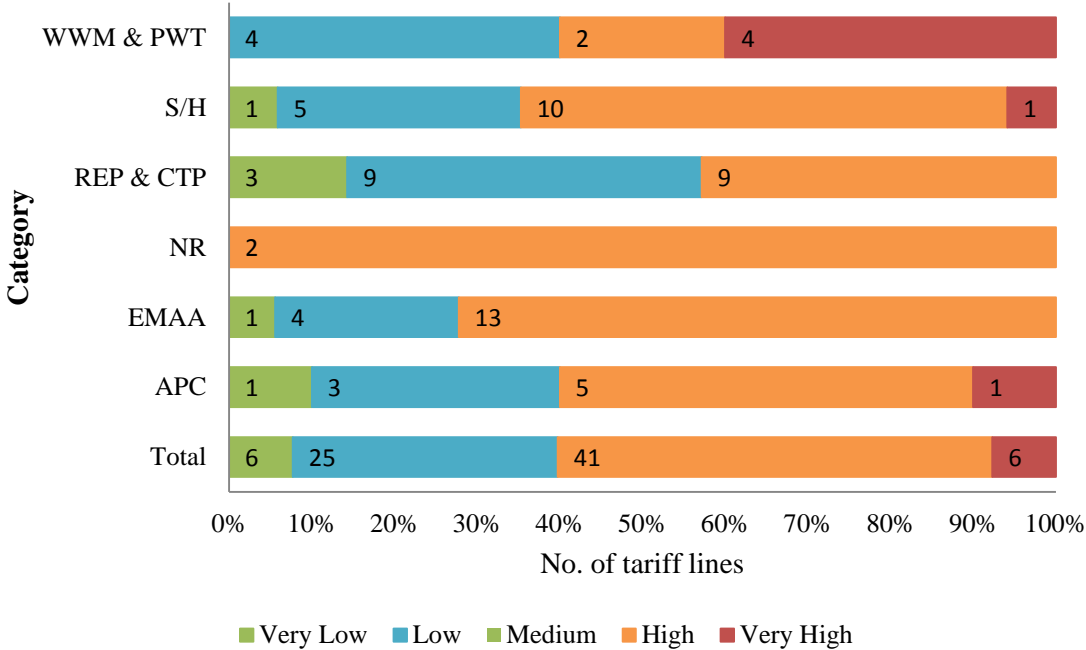
Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

In Figures 9 and 10, we present the distribution of the tariff lines and the value of defensive interest, by category of environmental goods. Similar to the product by product analysis in Annex 1, the distribution of the defensive interests among the different categories clusters around the *low* and *high* cases. This indicates that, by and large, the defensive interests of the Philippines across categories are not very intense. Of course, there is an exception in the waste water management

and potable water treatment (WWM & PWT) category where the *very high* case is predominant. However, this involves only four (4) HS subheadings at the 6-digit level, for which import values are not so high. Again, the analysis finds that the defensive interest of the Philippines, on the basis of the categories of EGs, is manageable.

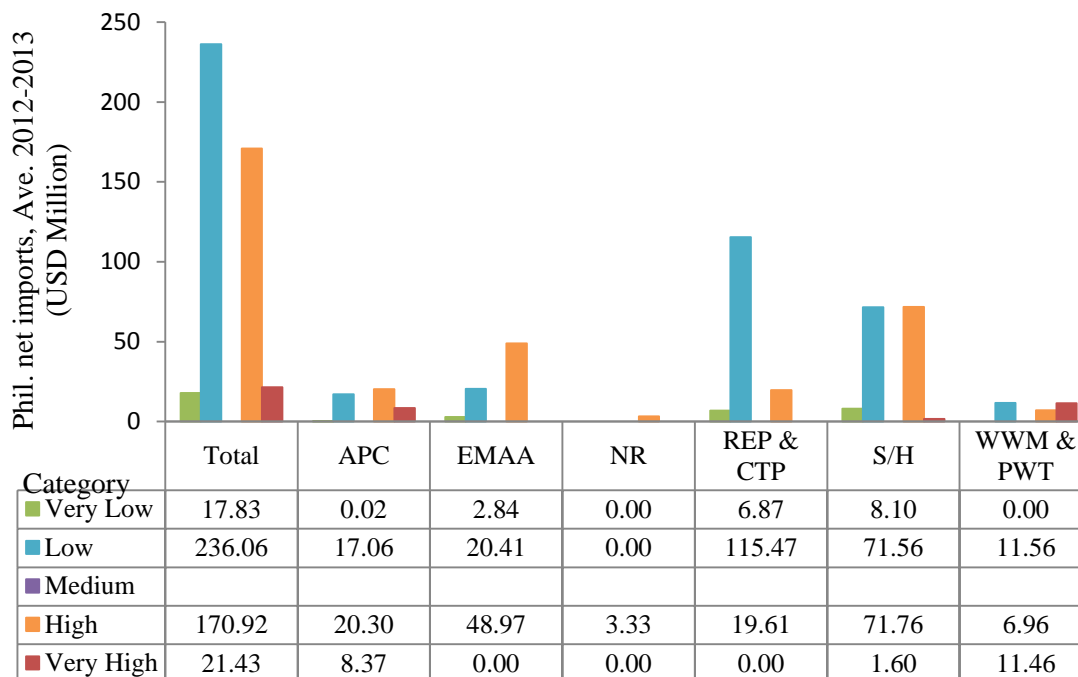
The offensive-defensive framework is an aid to the decision-making of Philippine negotiators. Its main purpose is to rank products according to the extent liberalization could serve the national interests. It does not aim to define what ought to be the final negotiating position for each of the products in the APEC list. As mentioned earlier, those decisions have a political-economic dimension. Yet, the framework only takes into account the economics of the liberalization move. Thus, based on purely economic reasoning, all products in the offensive list should be covered in the liberalization on an MFN basis. Those items falling in the *low to medium* lists in the defensive scenario can likewise be liberalized. Finally, those goods in the *high* defensive category should be reviewed using the various consultative mechanisms of the government.

Figure 9. Distribution of tariff lines in the defensive lists, by category



Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

Figure 10. Value of defensive interests, by category



Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

Annex 3. Analysis of offensive/ defensive interests of other EGs list

This annex explores the possibility of expanding the APEC EGs list. As mentioned in the literature review, the APEC EGs Initiative is just one among many initiatives advocating for the advancement of free trade in environmental goods. Various international organizations such as OECD, WTO, ICTSD and UNCTAD have produced their own lists of EGs. At this point, we examine some of the goods as to the extent these goods serve the offensive and defensive interests of the Philippines. Two lists are considered for this purpose: the *OECD EGs list* and another list which contains additional tariff lines not covered in the APEC list. Henceforth, we refer to the latter list as *the Other list*.

The OECD EGs list

Unlike the APEC list, the OECD list was not specifically designed for trade negotiations but rather for analytical purposes. Its primary purpose is to assist in estimating the size of the environmental industry in OECD (Steenblik [2005]; Sugathan [2013]). In doing the analysis, we use the list consisting of 164 total HS subheadings or 132 unique HS subheadings that is cited in Steenblik [2005]. This is equivalent to 494 Philippine tariff lines at the 8-digit level.

The analysis shows that the Philippines has neutral interests in only 12 tariff lines in the OECD list. The country has no record of exporting and importing these goods in 2012-2013. For the offensive interests, the results of the analysis are summarized in Table 12 below. As shown, the goods for which the Philippines has offensive interests account for 14 per cent or 68 of the 494 tariff lines in the OECD list. This is worth approximately USD 2 Billion of net exports in 2012-

2013. Considering the highest MFN tariff for each tariff line, the market access potential is low for 35 tariff lines (7.09 per cent) and high for 33 tariff lines (6.68 per cent). But with the preferential tariff rates taken into account, the *high* case reduces to 10 tariff lines (2.02 per cent). The discrepancy in the offensive profile between the scenarios using the MFN and the preferential rates implies that our current FTA arrangements have already been serving part of Philippine offensive interests in the subset of goods under study.

Table 12. Offensive lists for the OECD EGs

	No. of tariff lines	Share in total OECD EGs tariff lines (%)	Value of exports, Ave. 2012-2013 (USD Million)	Share in OECD EGs exports, Ave. 2012-2013 (%)	Value of imports, Ave. 2012-2013 (USD Million)	Value of net exports, Ave. 2012-2013 (USD Million)
OECD EGs	494	100.00	2,517.16	100.00	1,633.32	883.84
TOTAL OFFENSIVE	68	13.77	2,326.09	92.41	256.46	2,069.63
LISTS BY MARKET ACCESS POTENTIAL						
<i>A. Highest MFN tariffs</i>						
List A1: Low	35	7.09	1,693.72	67.29	100.42	1,593.30
List A2: High	33	6.68	632.37	25.12	156.05	476.32
<i>B. Trade-weighted tariffs</i>						
List B1: Low	58	11.74	2,044.60	81.23	192.06	1,852.54
List B2: High	10	2.02	281.49	11.18	64.40	217.08

Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

However, the bigger bulk of the OECD list are net importables. As Table 13 indicates, 414 tariff lines or 83.81 per cent of the OECD EGs make up the defensive list of the Philippines. This is worth USD 1.19 Billion of net imports in 2012-2013.

In terms of sensitivity, majority of the goods are in the defensive lists characterized by the lower-tariff threshold (0-5%). Only 1.82 per cent of the goods classified as raw materials or intermediate goods (*medium* case) and 8.50 per cent of the final goods (*very high* case) exceed the 5% tariff ceiling of the APEC mandate. If preferential tariff rates are used instead, the numbers of goods in these lists are much lower.

Table 13. Defensive lists for the OECD EGs

	No. of tariff lines	Share in total OECD EGs tariff lines (%)	Value of exports, Ave. 2012-2013 (USD Million)	Value of imports, Ave. 2012-2013 (USD Million)	Share in OECD EGs imports, Ave. 2012-2013 (%)	Value of net imports, Ave. 2012-2013 (USD Million)
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OECD EGs	494	100.00	2,517.16	1,633.32	100.00	(883.84)
TOTAL DEFENSIVE	414	83.81	191.07	1,376.85	84.30	1,185.79
LISTS BY DEGREE OF SENSITIVITY						
<i>A. Highest MFN tariffs</i>						
List 1: Very Low	115	23.28		55.71	0.03	55.71
List A2: Low	96	19.43	83.13	444.97	27.24	361.84
List A3: Medium	9	1.82	1.90	78.11	4.78	76.21
List A4: High	152	30.77	51.22	614.33	37.61	563.11
List A5: Very High	42	8.50	54.82	183.73	11.25	128.91
<i>B. Trade-weighted tariffs</i>						
List 1: Very Low	115	23.28		55.71	0.03	55.71
List B2: Low	100	20.24	83.66	456.68	27.96	373.03
List B3: Medium	5	1.01	1.37	66.39	4.06	65.02
List B4: High	176	35.63	80.13	720.88	44.14	640.75
List B5: Very High	18	3.64	25.91	77.18	4.73	51.27

Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

The Other list

This list contains additional 46 tariff lines at the 6-digit level which corresponds to 84 national tariff lines at the 8-digit level. Of this, 8 tariff lines have been classified into the neutral list. The findings for the offensive interests are reported in Table 13. Only 12 tariff lines in the Other list figure in the defensive list. The Philippines exported an average of USD 126 Million of these goods in 2012-2013. Close to 64% of the value of these exports face high (more than 5 %) tariffs, indicating a considerable level of offensive interests. However, if preferential tariff rates were to be used in assessing the tariff barriers, only 22% of the value of the average exports face relatively high tariff. Thus, the offensive interest of the *Other list* is not very significant.

Table 14. Offensive lists for the Other EGs

	No. of tariff lines	Share in total tariff lines (%)	Value of exports, Ave. 2012-2013 (USD Million)	Share in exports of 46 additional EGs, Ave. 2012-2013 (%)	Value of imports, Ave. 2012-2013 (USD Million)	Value of net exports, Ave. 2012-2013 (USD Million)
OTHER EGs	84	100.00	174.19	100.00	269.03	(94.83)
OFFENSIVE	12	14.29	144.12	82.74	18.05	126.08
LISTS BY MARKET ACCESS POTENTIAL						
<i>A. Highest MFN tariffs</i>						
List A1: Low	8	9.52	33.09	19.00	9.49	23.60
List A2: High	4	4.76	111.03	63.74	8.56	102.47
<i>B. Trade-weighted tariffs</i>						

List B1: Low	10	11.90	121.28	69.62	17.22	104.06
List B2: High	2	2.38	22.84	13.11	0.82	22.02

Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

We now turn to analyzing the defensive interest of the Philippines in the Other list. Table 14 gives the results of analysis for the total subset of 84 tariff lines. Notice that 66 tariff lines or close to 80 per cent are net importables. Given the criteria on the classification of defensive intensity, around 40 per cent of tariff lines are in the *high* and *very high* lists. This suggests that Philippine policymakers should examine further the 34 tariff lines (at 8 digit level) in these lists to evaluate the impact of trade liberalization on these sectors. For the remaining 32 tariff lines, there should be less concern in reducing tariffs.

When the analysis is adjusted for preferential tariff rates, we find the number of tariff lines and value of imports in the *high* category expanding. The presence of preferential trade has decreased the number of tariff lines in the *very high* case, implying a reduction in the magnitude of defensive interest. Yet, the *high* and *very high* categories continue to account for more than 50 per cent of total imports of the Other EGs. This calls for closer scrutiny of policymakers on the impact of liberalizing trade in these goods.

Table 15. Defensive lists for the Other EGs

	No. of tariff lines	Share in total subset tariff lines (%)	Value of exports, Ave. 2012-2013 (USD Million)	Value of imports, Ave. 2012-2013 (USD Million)	Share in subset EGS imports, Ave. 2012-2013 (%)	Value of net imports, Ave. 2012-2013 (USD Million)
OTHER EGs	84	100.00	174.19	269.03	100.00	94.83
DEFENSIVE	66	78.57	30.07	250.98	93.29	220.91
LISTS BY DEGREE OF SENSITIVITY						
<i>A. Highest MFN tariffs</i>						
List 1: Very Low	20	23.81		17.94	6.67	17.94
List A2: Low	10	11.90	20.48	84.18	31.29	63.70
List A3: Medium	2	2.38	0.42	10.67	3.96	10.24
List A4: High	21	25.00	7.92	87.37	32.48	79.45
List A5: Very High	13	15.48	1.25	50.82	18.89	49.57
<i>B. Trade-weighted tariffs</i>						
List 1: Very Low	20	23.81		17.94	6.67	17.94
List A2: Low	11	13.10	20.52	84.80	31.52	64.29
List A3: Medium	1	1.19	0.39	10.04	3.73	9.66
List A4: High	30	35.71	8.96	129.28	48.06	120.32
List A5: Very High	4	4.76	0.21	8.91	3.31	8.70

Source of basic data: PSA, Philippine Tariff Commission, ASEAN Secretariat and WTO Integrated Database

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