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The APEC list of Environmental Goods: An analysis of content and precision level

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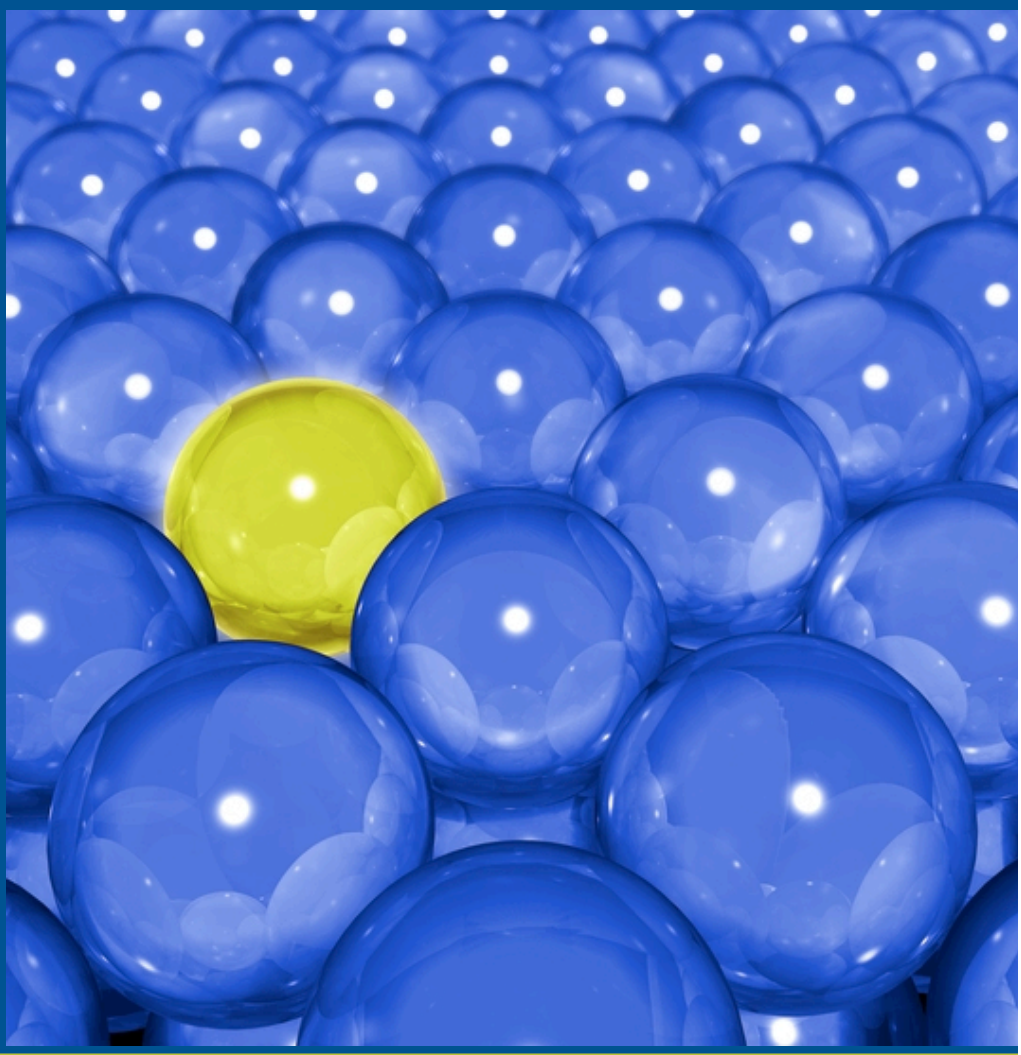

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Preface

The Norwegian Ministry of Foreign Affairs commissioned this study on the environmental properties of the so-called 'APEC list of environmental goods'. Kaja B. Edrén has been our contact at the Ministry. We thank her for valuable advice during the execution of the study. We would also like to thank the following institutions and persons for sharing information and providing their views on different aspects of the issue during the process of writing the report: APEC secretariat, OECD (Dale Andrew, Grant Ferrier, Jehan Sauvage, Ron Steenblick), ICTSD (Mahesh Sugathan, Ingrid Jegou), Norwegian Customs, and the Norwegian Ministry of Climate and Environment (Solveig Crompton, Kirsten Jacobsen). The responsibility for the final product rests with Vista Analysis.

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Content

Executive summary

This report is an assessment of the content and precision level of the APEC list of trade codes for environmental goods. The 54 codes on the APEC list cover 54 product groups and most (46) of these product groups mainly contain products that are not used primarily for environmental purposes. The APEC list contains product specifications ('ex-outs') aiming to identify specific environmental goods within the product groups. In most cases (42), ex-outs are not used sufficiently precisely to ensure that only environmental goods are targeted.

At the 20th APEC meeting in Vladivostok, Russia, September 2012, representatives of the APEC countries agreed to endorse a list of 54 six-digit trade codes for environmental goods (EGs), for which they will reduce applied tariff rates to 5% or less by the end of 2015, while taking into account the individual countries' economic circumstances and without prejudice to APEC countries' positions in the World Trade Organization. Each six-digit trade code refers to a product group that shares certain technical characteristics.

The purpose of this assignment is to determine the extent to which the 54 trade codes on the APEC list refer to environmental goods; what types of environmental goods are to be found under each code and what types of non-environmental goods are possibly also to be found there? Such a survey makes it possible to assess the quality of the APEC list as a starting point for future work to liberalize trade in environmental goods. In this report we have not assessed the potential effect of the APEC list on trade, i.e. the extent to which APEC countries have tariff rates of more than 5% for the products referred to and the implications of the initiative for trade in such goods.

We have not attempted to define environmental goods in this study, but have taken a pragmatic approach. We consider environmental goods to be products that are designed to improve the environment or products that are mainly used in a manner that contributes to improving the environment. Examples of such environmental goods are products mainly used for renewable energy generation, for waste management, for wastewater treatment, for pollution monitoring and/or control, and for smart grids or other energy efficiency technology.

The 54 APEC list codes cover a wide variety of products that usually and generally are not used for specific environmental purposes, but which in some forms or in some cases are used for environmental purposes such as renewable energy generation, waste- and wastewater management, pollution monitoring and control, and energy efficiency:

- *Machinery products: Steam/vapour boilers, auxiliary plants for boilers, gas turbines, industrial or laboratory furnaces and ovens, evaporators, machinery for liquefying air or gas, filtering or purifying machinery for liquids, centrifuges and crushing or drying machines, non-electric instantaneous or storage water heaters.*

- *Electric Machinery products: AC generators (alternators), electric transformers, static convertors, inductors, electric generating sets driven by renewable energy sources, electrical ovens and incinerators and photosensitive conductor devices.*

- *Instruments: Optical devices, certain surveying instruments and appliances, certain instruments for measuring variables of liquids or gases, or measuring or checking pressure, gas or smoke analysis apparatus, chromatographs, electrophoresis instruments, spectrometers, certain instruments and apparatus using optical radiation, microtomes and "other" automatic regulating or controlling equipment.*

- *Wood Products: Multi-layered assembled flooring panels not of mosaic type.*

Generally speaking, the APEC list mainly (60%) covers peripheral product categories such as "other types of products in this category" and "parts", and only to a limited extent targets main categories of environmental goods. Products related for instance to renewable energy generation from hydro or wind energy sources are largely absent from the list (but the more polluting gas turbines are included). Pollution monitoring and control, wastewater and waste management, and various forms of energy efficiency are frequently referred to, but it is unclear to what extent the list covers the most important codes related to such fields.

The APEC list contains 54 HS Codes and we have found that the product universe covered by these codes mainly consists of products that are not environmental goods:

- *46 of the 54 HS Codes on the APEC list mainly cover products that are not used primarily for environmental purposes.*
- *5 of the codes on the list cover both environmental goods and non-environmental goods in fair amounts.*
- *2 of the codes cover mainly environmental goods.*
- *1 code refers exclusively to environmental goods.*

The APEC list contains at least 9 codes including products that may be considered environmentally controversial; products used in the mining industry, the petroleum industry, in the nuclear industry and in the automobile industry.

In order for the APEC list to encourage liberalisation of trade in environmental goods in a targeted manner, it is important to employ and commit to ex-outs (specification of products within the broader six-digit code). The APEC list is in general does not use ex-outs sufficiently precisely to ensure that environmental goods are specifically targeted:

- *For 42 of the codes on the APEC list, the ex-outs are not sufficiently precise to ensure that liberalization only will pertain to environmental goods.*
- *For 12 of the codes on the APEC list, the ex-outs are sufficiently precise to ensure that liberalisation will only pertain to environmental goods (if ex-outs are applied).*
- *For at least 3 of the codes on the APEC list, there are environmental goods not mentioned by ex-outs.*

The APEC list illustrates that if one wants to liberalize trade only in environmental goods, it is often not enough to use the most detailed HS code level of six-digits. In the current system, identification of the relevant six-digit HS codes must be the starting point and mandatory ex-outs must also often be in place in order to ensure that only environmental goods are targeted. This means that liberalization of environmental goods is closely tied to the extent

to which the HS system could be used to consistently highlight environmental goods within different categories, or to mainstreaming such identification at the national level.

Assessment of different types of technical products categories and their potential use is complicated. Please note that it has not been possible within the framework of this study to use expert groups or surveys beyond desktop research. In annex 2, we present in detail our assessments of each code and also suggest ex-outs. Table A provides an overview of the 54 APEC codes, showing the degree to which each code contains environmental goods and the precision level of the APEC ex-outs listed.

Table A: Overview of the APEC codes analysed by content and ex-out precision level

APEC	*Content of the 6-digit sub-category*					*Assessment of ex-outs*		
	Only EGs	Mostly EGs	EGs and non-EGs	Mostly non-EGs		Ex-outs ensure only EGs	Ex-outs don't ensure only EGs	Incl. EGs not mentioned
1				44.18.72			X	
2				84.02.90		X		
3				84.04.10			X	X
4				84.04.20			X	X
5				84.04.90		X		X
6				84.06.90			X	
7				84.11.82			X	
8				84.11.99			X	
9				84.12.90			X	
10				84.17.80		X		
11				84.17.90		X		
12			84.19.19			X		
13			84.19.39			X		
14				84.19.60			X	
15			84.19.89				X	
16				84.19.90			X	
17			84.21.21				X	
18				84.21.29			X	
19		84.21.39					X	
20				84.21.99			X	
21				84.74.20			X	
22			84.79.82				X	
23				84.79.89			X	
24				84.79.90			X	
25				85.01.64		X		
26	85.02.31							
27		85.02.39				X		
28				85.03.00			X	
29				85.04.90			X	
30				85.14.10			X	
31				85.14.20			X	
32				85.14.30			X	
33				85.14.90			X	
34				85.41.40		X		
35				85.43.90			X	
36				90.13.80		X		
37				90.13.90		X		
38				90.15.80			X	
39				90.26.10			X	
40				90.26.20			X	
41				90.26.80			X	
42				90.26.90			X	
43				90.27.10			X	
44				90.27.20			X	
45				90.27.30			X	
46				90.27.50			X	
47				90.27.80		X		
48				90.27.90			X	
49				90.31.49			X	
50				90.31.80			X	
51				90.31.90			X	
52				90.32.89			X	
53				90.32.90			X	
54				90.33.00			X	
Total	**1**	**2**	**5**	**46**		**12**	**42**	**3**

1 Introduction

1.1 Background

At the 20th APEC meeting in Vladivostok, Russia, September 2012, representatives of the APEC countries[1] agreed to endorse a list of trade codes for Environmental Goods (EGs), for which they will reduce applied tariff rates to 5% or less by the end of 2015, while taking into account the individual countries' economic circumstances and without prejudice to APEC countries' positions in the World Trade Organization (APEC 2012a).

The issue of liberalization of trade in environmental goods and services has been discussed for decades, and was singled out for attention in the negotiating mandate adopted at the Fourth Ministerial Conference of the World Trade Organization (WTO) in November 2001. The argument is that increasing access to environmental goods (EGs) through lower tariffs and non-tariff barriers can yield a number of benefits, such as reduced air and water pollution, improved access to clean and sustainable energy sources, increased resource-efficiency and better facilitation of waste disposal. Well-managed trade liberalization in EGs can facilitate the achievement of sustainable development goals such as the UN Millenium Development Goals and those of other multilateral environmental agreements such as the Convention on Biodiversity and the Framework Convention on Climate Change.

The lack of a universally accepted definition of EGs has meant that trade delegates at the WTO have struggled over the scope of goods and services that could be included in the trade liberalization. While many lists of EGs for liberalization have been suggested (ref. Sugathan 2013), the whole WTO membership has not been able to agree on any of them. The APEC list is the first time a large group of trading partners have been able to agree on a list of EGs for which they will liberalize trade. One reason why the APEC group succeeded was probably that the countries did not attempt to define an "Environmental good", but merely to agree on a list of product categories that could be considered EGs and for which the countries were willing to liberalize trade (Vossenaar 2013). Another important reason probably is that that the outcome is legally non-binding and the implementation voluntary, even though it is bolstered by political commitment at the highest level (Vossenaar 2013).

The international system of categorization for goods (the HS System) often makes it difficult to identify products that have an environmental function. The APEC list consists of 54 six-digit codes representing broad product categories. Each of these codes may refer to a scope of products that only contain EGs, a scope of products that include EGs as well as non-EGs, or to a scope that does not at all include EGs. In the APEC list the 54 broad product categories are often followed up with specifications (called 'ex-outs'), pointing to specific types of products within the group that are EGs. Application of such ex-outs are voluntary.

[1] Asia-Pacific Economic Cooperation (APEC) is a forum for 21 countries around the Pacific Ocean that seeks to promote free trade and economic cooperation throughout the Asia-Pacific region.

1.2 The purpose of this assignment

The purpose of this assignment is to determine the extent to which the 54 trade codes on the APEC list refer to EGs; what types of EGs are to be found under each category and what types of non-EGs are possibly also to be found there? Such a survey makes it possible to assess the quality of the APEC list as a starting point for future work to liberalize trade in EGs. Moreover, it may help APEC countries (and other countries) to liberalize national tariff lines under the 54 broad categories in a manner that precisely and only encompasses EGs.

In this report we will thus not assess the potential effect of the APEC list on trade, i.e. the extent to which APEC countries have tariff rates of more than 5% for the products referred to and the implications of the initiative for trade in such goods. This has to some extent already been done (Sugathan & Brewer 2012, Vossenaar 2013). Vossenar (2013) notes that it is hard to assess how significant eventual tariff reductions will be, as it is not yet fully known how individual APEC economies will implement the commitment and how they will define ex-outs in their national tariff systems. It seems clear, however, that at the outset there are quite few national tariff lines pertaining to the APEC codes that today have tariffs of more than 5%.[2] Sugathan & Brewer (2012) notes that the average simple average of tariffs in APEC for the 54 codes in 2012 was 2,6% and that for more than half they were zero. Some APEC economies (incl. Australia, Hong Kong, Japan, Papua New Guinea, New Zealand and Singapore) did not in 2012 have a single tariff line of more than 5%, and were as such already in compliance. In some cases the list may still make a difference; in 2012, at lest 6 APEC economies (Brunei, China, Chinese Taipei, Chile, Indonesia, and South Korea) had tariffs of more than 5% for wind-powered generators (85.02.31), and at least 4 APEC economies (China, Mexico, Thailand, Vietnam) had tariffs of more than 5% for solar water heaters (84.19.19) (Sugathan & Brewer 2012). It is apparently a relatively small number of environmental goods on the APEC list that may benefit from tariff reductions as a consequence of the APEC commitment.

1.3 Understanding the APEC list

The APEC list contains 54 HS Codes at six-digit level. These codes refer to the Harmonized Commodity Description and Coding System (HS System), which is developed and maintained by the World Customs Organization (WCO). The HS is organized in 21 sections and 96 chapters (the two-digit level), with categories (the four-digit level) and sub-categories (the six-digit level). The 54 HS Codes of the APEC list are six-digit codes that figure under 4 of the 96 chapters in the HS System (see table 1.1 below).

Each of the 54 six-digit codes on the APEC list refers to an internationally standardized sub-category that is similar in all countries. Each sub-category allows for a wide scope of goods to be classified under the sub-category, as long as the good in question falls under the generic heading of the sub-category. Each country is free to have further categorization under the six-digit sub-category, by introducing sub-divisions referred to as national Tariff Lines (in the form of 8-digit, 10-digit and 12-digit codes with increasingly detailed

[2] Vossenar mapped applied tariffs for the 54 APEC sub-categories in 20 APEC economies, amounting to a total of 1080 sub-categories. Only 25% of these (234) had a maximum MFN-applied rater greater than 5% (i.e. at least one tariff line within the sub-category had a MFN-applied tariff greater than 5%).

descriptions). The extent to which such TLs are introduced and the exact names and character of the tariff lines will normally vary between countries, as they are introduced in order to serve specific national needs for registration and documentation of trade in specific types of goods (see example comparing China and Norway below).

Table 1.1: The Chapters of the HS Code (two-digit level) and number of APEC list codes

Chapter	Content	No of APEC list codes
01-05	Animal and animal products	0
06-15	Vegetable Products	0
16-24	Foodstuffs	0
25-27	Mineral Products	0
28-38	Chemicals & Allied Industries	0
39-40	Plastics / Rubbers	0
41-43	Raw Hides, Skins, Leather, & Furs	0
44	**Wood & Articles of Wood**	**1**
45-49	Wood & Wood Products	0
50-63	Textiles	0
64-67	Footwear / Headgear	0
68-71	Stone / Glass	0
72-83	Metals	0
84	**Machinery**	**23**
85	**Electrical Machinery**	**11**
86-89	Transportation	0
90	**Instruments**	**19**
91-97	Miscellaneous	0
98-99	Service	0

This means that the APEC list of 54 six-digit HS Codes actually refer to 54 different product groups, groups that to a different extent have been further specified and broken down by the countries in the APEC group (and by other countries) in national systems. Moreover, the product group has an "open" nature, as it gives a specific yet general description of a certain type of product. As different countries may trade in different types of products due to different needs (for instance due to different climatic conditions), this allows different countries to have quite different national tariff lines lists under the same six-digit heading. The open nature of the six-digit heading also allows each country to dynamically incorporate new products that are introduced to the market and which fits the criteria of the generic six-digit heading. In 2013, the APEC countries together had more than 2,700 individual tariff lines belonging to the 54 sub-categories (Vossenaar 2013). Some of these overlap, but many do not (as we see in the example provided below). The degree of differentiation below the six-digit level also varies substantially. While Mexico was registered with 250 separate tariff lines under these 54 sub-categories, Japan was listed with 73 and Papua New Guinea with 54 (i.e. only one TL per sub-category).

As an example of the difference of the national systems at the level below the six-digit code, we may consider China's and Norway's subdivisions of the HD code 84.79.89 "Other machines and appliances with individual functions". In the Chinese Customs Tariff, the HS

Code 84.79.89 contains national TLs such as: Air Humidifiers Or Dehumidifiers (84.79.89.20), Machines For Squeezing Radioactive Waste (84.79.89.50), and (Fan) mufflers (84.79.89.99). In the Norwegian Customs Tariff the HS code 84.79.89 is broken down into only four TLs: Steering machines and apparatus (84.79.89.01), Z-drive assemblies for boats (vessels), whether or not presented with an inboard engine (84798902), Self-propelled rotary snow cutters (84.79.89.03), and Other machines and apparatus not mentioned elsewhere (84.79.89.09). We thus see that the specification of the six-digit code may vary substantially between countries. In the Norwegian system, the three Chinese eight-digit TLs mentioned above would all fall under one eight-digit TL: Norway's 84.79.89.09.

The HS code 84.79.89 is on the APEC list. We see above that in China, it is specified that this code includes machines for squeezing radioactive waste, which we consider to be an environmental product as it is used in the treatment of (radioactive) waste. We also see above that in Norway, it is specified that this code includes self-propelled rotary snow cutters, which we don't consider to be an environmental product. This is a quite typical example, showing that six-digit HS codes often constitute categories that contain environmental products as well as products that don't have a primarily environmental function. It also shows that some countries (here China) may have specified (at least some) types of products that have an environmental function in their national systems, while other countries (here Norway) may not have specified any such products.

The example highlights two problems. The first is that since the six-digit HD code level very often represents categories that contain products that have an environmental purpose as well as products that don't, using a six-digit code is in many (if not most) cases in itself not enough to identify environmental goods. As a consequence, lowering tariffs for a certain six-digit code in order to promote trade in environmental products may often lead to also a lowering of tariffs for a number of products with no such function (such as self-propelled rotary snow cutters). The answer to this problem is to use more narrow specifications than what is provided by the six-digit codes. But this leads us to the second problem; since national specifications below the six-digit level are not harmonised and may vary greatly in the level of detail as well as the types of sub-sub-categories employed, it is difficult to identify environmental products below the six-digit code in a manner that fits with the different national systems and can be easily applied across the national subsystems.

In the APEC list, the first problem is addressed by offering so-called ex-outs for each HS codes. As the specifications refer to a more detailed level below the six-digit categorization, the specification is related to national systems. Since the national tariff codes often vary beyond the six-digit level, different countries (or groups of countries) have in the APEC list presented different (often overlapping) ex-outs in line with their national systems.

As the APEC list is not a legally binding document, it is up to each APEC country to choose how to follow up on the commitment the list represents. The ex-outs seem to indicate how the different countries or groups of countries will follow up on their commitment, i.e. how they will apply the maximum 5% tariff to their TLs in the mentioned HS sub-categories. The scope for implementation thus lies between liberalizing trade for all products within the 54 product groups on the one side, and liberalizing trade only for specified EG ex-outs within each of the 54 product groups.

1.4 A step-wise approach

Our task in this report is to assess the APEC list, by identifying the content of the six-digit codes listed plus the ex-outs and assessing the extent to which they may be considered to refer to EGs. This means that we have to apply a step-wise approach for each of the 54 HS Codes listed:

- We will *identify and describe* the scope of each of the *six-digit codes*. There is a potential for countries to use the list to lower tariffs for not-EG products that also figure within the product groups, so we need to comment on the degree to which the six-digit category covers EGs and non-EGs. We will also note if there are products in the group that may be considered problematic from an environmental point of view.
- We will *assess the ex-outs* presented by countries and country groups. The question is whether these ex-outs actually refer to EGs. In some cases, some of them may not do so according to our criteria (see below), or they may not be precise enough to exclude non-EGs. We will also note whether there are EG products in the six-digit category that are not referred to by ex-outs. These will then be product types that in our opinion ought to be referred to by ex-outs.
- We will finally *suggest ex-outs* for each APEC code, indicating how we believe the list can be implemented in a way ensuring that liberalization only covers EGs. Note that due to the open nature of many of the sub-categories, there may well be additional ex-outs that qualify as EGs and that we have not been able to identify.

In Annex 2 of this report, we present a detailed description and assessment of each of the 54 APEC codes in the manner described above. The findings are summarized in chapter 2.

We have not in this study attempted to define EGs but have taken a pragmatic approach. We consider EGs to be products that are designed to improve the environment or products that are mainly used in a manner that contributes to improve the environment. Examples of such EGs are products mainly used for renewable energy generation, for waste management, for wastewater treatment, for pollution monitoring and/or control, and for smart grids or other radical energy efficiency technology. In our comments to each code in annex 2, we explain more specifically the basis of our assessment in each case. Assessment of different types of technical products categories and their potential use is complicated. Please note that it has not been possible within the framework of this study to use expert groups or surveys beyond desk-top research.

The Wold Customs Organization has published a set of HS Explanatory Notes, which provides guidance and examples of the content of HS chapters and categories. We use this document as the basis of our description of the 54 sub-categories of the APEC list. It must be noted that as the HS Codes are open categories, we cannot be able to identify all types of products that possibly may come under each of the 54 sub-categories. Our survey will be limited by the scope covered by the HS Explanatory Notes as well as the indications the APEC ex-outs give of which types of products individual countries list under these categories. It is beyond the scope of this assignment to go through the different tariff systems of the 21 APEC countries.

2 Findings: Overall assessment of the APEC list

2.1 A negotiated list

The APEC list is the outcome of a negotiation process among the APEC countries in which the countries apparently started with a draft list of about 200 HS codes[3], and where the end product was a list of 54 codes. The present APEC list is thus not a list developed to capturing the most important, the most traded or the most valuable EGs. Rather, it could be viewed as a common denominator of a limited list of sub-categories among the APEC members. Probably as a consequence of the process behind the creation of the list, it is often quite vague and in many cases not strictly consistent or logical.

With 'vague' we mean that the list often refers to sub-categories that are difficult to define precisely. 32 (60%) of the sub-categories on the APEC list are omnibus sub-categories, that either contain "other, not mentioned specifically elsewhere" products of a previously mentioned category or sub-category (18 times), or "parts and accessories" for products of categories/sub-categories previously mentioned (14 times). In such cases the exact product universe that the listed sub-category refers to is often quite difficult to define precisely.

Different sub-categories in the HS code are often connected in different ways, for instance so that one sub-category contains a main product of a certain type, another sub-category appliances for that main product, and a third sub-category parts for that product. The APEC list is in many cases not "logical" in the sense that it may include the sub-category with parts or accessories for a certain EG, but not the sub-category for that EG itself. There are many such cases of the list containing "parts for", but not the product the parts are for.

2.2 A list which is not entirely consistent

We may also note that the list is not always consistent. The APEC list has three columns: "HS Code Description", "Ex-Out/Additional Product Specification", and "Remarks / Environmental Benefit".

The "HS Code Description" refers to the code title, which in principle is the internationally standardized 6-digit sub-category code. Different countries often have different variants of this text. More puzzling is the fact that some countries (especially China) in many cases seem to mention ex-outs in this column. This is inconsistent and we have in such cases (in annex 2) simply treated these descriptions as ex-outs, and noted in a footnote that it was listed in the "HS Code Description" column.

The "Ex-Out" column contains ex-outs. It is in general unclear to what extent the ex-outs actually commit the country/-ies that have presented them. We therefore consider them to be completely voluntary in nature. Ex-outs are described differently in different cases. Some times they are very general, with statements such as "wastewater management". In such a case the ex-out must be taken to refer to anything within the sub-category that is used in processes related to wastewater management. At other times ex-outs are very specific with

[3] Source: Personal communication with persons close to the process.

statements such as “parts for solar heliostats” or “parts for 84.21.21”. In such cases, the ex-out refers to specific products and would seem to reflect eight-digit national tariff lines of the countries that have proposed them. Sometimes the text in the “Remarks” column refers to a certain product as the reason why the sub-category has been selected, but this product is not mentioned in the ex-out column. As mentioned above, ex-outs are also sometimes listed in the “HS Code Description”-column and not in the “Ex-Out” column. The ex-outs are also presented in different ways. Usually the ex-outs are followed by a country code, but not always. It is unclear what it means when an ex-out is not followed by a country code. Does it mean that all the APEC countries support it? Sometimes the text in this column states “optional ex-outs may include …”. Is this to be understood as a suggestion? Does this apply only to the countries behind that optional ex-out, or possibly to all? Several APEC countries (for instance Indonesia, Papua New Guinea, Peru, and the Philippines) do not list ex-outs at all. Does this mean that they intend to liberalize all tariffs under the 54 codes? The various uses of ex-outs probably reflect the voluntary and flexible nature of the APEC list.

The “Remarks…” column usually has the most text and provides the justification for the choice of sub-category and ex-outs. It is sometimes vaguely formulated and sometimes very specific. As noted above, the text in this column sometimes has a wider range than the ex-outs, listing products and uses that are not covered by the text in the ex-out. In some cases the same standard phrase (such as “These instruments are used to measure, record, analyse and assess environmental samples or environmental influences”) is used for several different sub-categories.

2.3 The content and the precision level

The APEC list contains 23 codes belonging to the Machinery chapter, 11 codes belonging to the Electrical Machinery chapter, 19 codes belonging to a chapter for Instruments, and 1 code belonging to the Wood & Wood Articles chapter. As the status of ex-outs is unclear, we believe the APEC list should mainly be judged by the content of the 54 six-digit codes. We will, however, also assess the extent to which the APEC list is able to precisely capture EGs through ex-outs.

2.3.1 **The Machinery Chapter codes**

The 23 codes of the Machinery chapter refer to a wide variety of machinery most of which are not EGs. Considering the product universe covered by each code, our assessment (ref. table A and Annex 2) is that 17 of the APEC Machinery codes mainly contain non-EGs, 5 Machinery codes contain both EGs and non-EGs, and that 1 Machinery code mainly contain EGs.

The 17 mainly non-EG codes cover products such as steam/vapour boilers, auxiliary plants for boilers, gas turbines, industrial or laboratory furnaces and ovens, machinery for liquefying air or gas, filtering or purifying machinery for liquids, centrifuges and crushing or drying machines. Generally speaking these are machines that are used for a variety of industrial purposes and usually not for specific environmental purposes. At least two of these codes include machines used in the nuclear industry, and at least three include machines or parts for machines used in the mining industry. There are, however, certain types of these products that are used for environmental purposes and may be considered to be EGs. This would typically be such machinery especially designed for biomass or biogas

energy production, waste management (sludge dryers, crushing or grinding machines, filters or purification equipment), or air pollution control.

The 5 codes with both EGs and non-EGs, contain non-electric instantaneous or storage water heaters, certain types of evaporators and dryers, and filtering and purifying machinery for liquids (incl. for industrial purposes). These codes contain machinery often used for various industrial or other purposes that are not environmental in nature, but also machines designed for use in waste or wastewater management as well as solar heaters.

The 1 code mostly containing EGs is for filtering or purification machinery for gases.

With regards to the Machinery codes, to what extent is the APEC list able to precisely capture EGs through ex-outs? Our assessment (ref. table A and Annex 2) is that for 17 of the Machinery codes, the suggested ex-outs are not precise enough to ensure that only EGs are covered. In 6 cases, applying the ex-outs will ensure that only EGs are covered. In 3 cases, there are EGs within the code that is not mentioned in the ex-outs.

2.3.2 **The Electrical Machinery Chapter codes**

The 11 codes of the Electrical Machinery chapter refer to a wide variety of electrical machinery most of which are not EGs. Considering the product universe covered by each code, our assessment (ref. table A and Annex 2) is that 9 of the APEC Electrical Machinery codes mainly contain non-EGs, 1 Electrical Machinery code mainly contain EGs, and 1 Electrical Machinery code only contains EGs.

The 9 mainly non-EG codes cover products such as AC generators (alternators), electric transformers, static convertors, inductors, electrical ovens and incinerators and photosensitive conductor devices. Generally speaking these are electrical machines that are used for a variety of industrial purposes and usually not for specific environmental purposes. One of the codes includes parts for diesel engines. There are, however, certain types of these products that are used for environmental purposes and may be considered to be EGs. This would be AC generators or electric transformers, static convertors and inductors especially designed for renewable energy production, electrical ovens and incinerators especially designed for waste management, and photovoltaic cells used for solar energy generation.

The one mainly EG code is an omnibus sub-category that mainly seems to include electric generating sets used in combined heat and power systems and electric generating sets driven by renewable energy other than wind.

The one entirely EG code covers wind-powered electricity generation sets.

With regards to the Electrical Machinery codes, to what extent is the APEC list able to precisely capture EGs through ex-outs? Our assessment (ref. table A and Annex 2) is that for 7 of the Electrical Machinery codes, the suggested ex-outs are not precise enough to ensure that only EGs are covered, and that in 3 cases applying the ex-outs will ensure that only EGs are covered. In the one case where the code only refers to EGs, ex-outs are not necessary.

2.3.3 The Instrument Chapter codes

The 19 codes of the Instrument chapter refer to a wide variety of instruments most of which are not EGs. Considering the product universe covered by each code, our assessment (ref. table A and Annex 2) is that all 19 of the APEC Electrical Machinery codes mainly contain non-EGs.

This chapter contains a wide variety of precision instruments and their parts. These are instruments that are used for a wide variety of purposes and in a wide variety of industries where such instruments are useful. They are rarely exclusively designed for environmental purposes, although they may often be used for such purposes. This part of the APEC list is also difficult to assess as 12 of the 19 Instrument codes are omnibus categories consisting of "other products of this type not mentioned elsewhere" or "parts for previously mentioned products".

The 19 APEC Instrument codes covers products such as certain optical devices, certain surveying instruments and appliances, certain instruments for measuring variables of liquids or gases, or measuring or checking pressure, gas or smoke analysis apparatus, chromatographs, electrophoresis instruments, spectrometers, certain instruments and apparatus using optical radiation, microtomes and "other" automatic regulating or controlling equipment.

Generally speaking these are instruments that are used for a variety of laboratory and industrial purposes, and usually not for specific environmental purposes. One of the codes includes instruments and appliances used in mineral and petroleum exploration. One of the codes includes instruments used in nuclear physics and in signal intelligence for military purposes. One code includes test apparatus for fuels and for motors of vehicles. There are, however, certain types of these instruments that are used for environmental purposes and may be considered to be EGs. This would be instruments especially designed for pollution monitoring and control, or used in planning and production of renewable energy.

With regards to the Instrument codes, to what extent is the APEC list able to precisely capture EGs through ex-outs? Our assessment (ref. table A and Annex 2) is that for 16 of the Instrument codes, the suggested ex-outs are not precise enough to ensure that only EGs are covered, and that in 3 cases applying the ex-outs will ensure that only EGs are covered.

2.3.4 The Wood & Wood Articles Chapter code

The one APEC sub-category under this chapter refers to "multi-layered assembled flooring panels that are not of mosaic type". It includes such flooring panels of a wide variety of tropical wood. The APEC list suggests "of bamboo" as an ex-out. We consider this sub-category to be of the type "mostly non-EGs". We also consider that the ex-out is not precise enough to ensure that only EGs are covered.

This code is different from the other codes on the APEC list, as the justification provided is that this is an environmentally preferable product and not that it serves an environmental purpose. This is the only sub-category in the APEC list where such a justification is presented. We do not in this study go more deeply into the discussion of environmentally preferable products and how such may be identified. Generally speaking, we consider that

sustainability issues in the cultivation of bamboo and in the manufacturing of multi-layered flooring panels must be considered to allow for a fair judgement of the environmental benefits. While the use of bamboo in many cases may be more environmentally beneficial than the use of certain other types of wood, we do not consider "multi-layered flooring panels of bamboo" to be precise enough as an ex-out.

2.4 A few observations

As noted in the beginning of this chapter, the APEC list is not a list of the most important EGs but rather a list of the EG-related six-digit sub-categories that are considered unproblematic for trade liberalisation by the APEC countries (for reasons unknown to us).

Generally speaking, the list to a large extent covers peripheral product categories such as "other types of products in this category" and "parts", and to a limited extent target main categories of EGs. Many products related for instance to renewable energy generation from hydro-, wind- or energy sources are largely absent from the list (but the more polluting gas turbines are included). Pollution monitoring and control, wastewater and waste management, and various forms of energy efficiency is frequently referred to, but it is unclear to what extent the list covers the most important codes related to such fields.[4]

One way forward in the work to liberalize EGs, could be to first assess which parts of the HS Code (at six-digit level) that actually contains the main volumes of EGs. As an outset one could look at areas for which there is a general consensus that they are "environmental in nature", such as products related to renewable energy generation, waste and wastewater management, pollution monitoring and/or control, and energy efficiency. If one would be able to at least roughly identify where the flows of such EGs figure in the HS System, one would see what is missing even after the APEC list is employed and where to find it. It would also be interesting to identify where the main trade volumes in such EGs are occurring.

Given the difficulties with ex-outs, it would be helpful to identify six-digit codes in the HS System that predominantly refers to EGs. Liberalization of trade in products under these codes would not bring with it the problem of potentially also liberalizing trade in non-EGs. In the APEC list, code 85.02.31 'Electric generating sets: Wind powered', is a good example (and the only on the APEC list) of such an unambiguous six-digit code.

When assessing the APEC list and looking at lists of EGs previously submitted to the WTO (such as the "153 list" (WTO CTESS 2007), which overlaps to a large degree with the APEC list), we have noted that no justifications apparantly are publicly available. WTO members have suggested about 408 HS codes for EGs for trade liberalization over the last decade or so (Sugathan & Brewer 2012). What assessments have been made of each of these codes and what are the justifications for considering them important codes for EGs? To what extent are these codes primarily covering EGs and what kind of other things do they cover? This

[4] With regards to climate-friendly products, it has been noted (Sugathan & Brewer 2012) that the APEC list only contains 10 out of 43 climate-friendly products identified by the World Bank (World Bank 2007) and 10 out of 79 climate-friendly products identified by ICTSD (ICTSD 2012).

information has not been systematized and made publicly available to interested parties, something that hampers the establishment of a common ground for further progress.

Another question more directly related to the APEC list, is to what extent the national tariff systems of the different APEC countries are currently able to capture the necessary ex-outs to ensure that liberalization of the APEC list codes in a targeted manner pertains to EGs. As there are 21 APEC countries, there will be 21 different break-downs of the 54 sub-categories on APEC list, which gives a total of 1,134 sets of national TLs with a total of +2,700 TLs (ref. Vossenaar 2013). Assessing current status and what it would take to implement the APEC list in a targeted manner in the APEC group, would set a stage for a common and targeted implementation of the list within APEC and also in the wider WTO community.

The APEC list clearly shows that if one wants to liberalize trade specifically in EGs, it is often not enough to use the most detailed HS code level of six-digits. In the current system, identification of the relevant six-digit HS codes must be the starting point and mandatory ex-outs must also often be in place in order to ensure that only EGs are targeted. This means that liberalization of EGs is closely tied to the extent to which the HS system could be used to consistently highlight EGs within different categories, or to mainstreaming such identification at the national level.

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Annex 1: Overview of the APEC codes at four-digit level

Each of the 99 chapters in the HS Code consists of a number of categories (four-digit level) for product groups. The 54 APEC six-digit APEC codes figure within 25 of these categories.

Chapter	Name	No of APEC codes
44	**Wood – "Wood and articles of wood; wood charcoal"**	**1**
44.18	*Builders' joinery and carpentry of wood, including cellular wood panels, assembled flooring panels, shingles and shakes.*	*1*
84	**Machinery - "Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof."**	**23**
84.02	*Steam or other vapour generating boilers (other than central heating hot water boilers capable also of producing low pressure steam); super-heated water boilers.*	*1*
84.04	*Auxiliary plant for use with boilers of heading 84.02 or 84.03 (for example, economizers, super-heaters, soot removers, gas recovers); condensers for steam or other vapour units.*	*3*
84.06	*Steam turbines and other vapour turbines.*	*1*
84.11	*Turbo-jets, turbo-propellers and other gas turbines.*	*2*
84.12	*Other engines and motors.*	*1*
84.17	*Industrial or laboratory furnaces and ovens, including incinerators, non-electric.*	*2*
84.19	*Machinery, plant or laboratory equipment, whether or not electrically heated (excluding furnaces, ovens and other equipment of heading 85.15), for the treatment of materials by a process involving a change of temperature such as heating, cooking, roasting, distilling, rectifying, sterilizing, pasteurizing, steaming, drying, evaporating, vaporizing, condensing or cooling, other than machinery or plant used for domestic purposes; instantaneous or storage water heaters, non-electric.*	*5*
84.21	*Centrifuges, including centrifugal dryers; filtering or purifying machinery and apparatus, for liquids or gases.*	*4*
84.74	*Machinery for sorting, screening, separating, washing, crushing, grinding, mixing or kneading earth, stone, ores or other mineral substances in solid (including powder or paste) form; machinery for agglomerating, shaping or molding solid mineral fuels, ceramic paste, unhardened cements, plastering materials or other mineral products in powder or paste form; machines for forming foundry molds of sand.*	*1*
84.79	*Machines and mechanical appliances having individual functions, not specified or included elsewhere in this Chapter.*	*3*

85	**Electrical Machinery - "Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles."**	**11**
85.01	*Electric motors and generators (excluding generating sets).*	*1*
85.02	*Electric generating sets and rotary converters.*	*2*
85.03	*Parts suitable for use solely or principally with the machines of heading 85.01 and 85.02*	*1*
85.04	*Electrical transformers, static converters (for example, rectifiers) and inductors.*	*1*
85.14	*Industrial or laboratory electric furnaces and ovens (including those functioning by induction or dielectric loss); other industrial or laboratory equipment for the heat treatment of materials by induction or dielectric loss.*	*4*
85.41	*Diodes, transistor and similar semiconductor devices; photosensitive semiconductor devices, including photo-voltaic cells whether or not assembled in modules or made up into panels; light emitting diodes; mounted piezo-electric crystals.*	*1*
85.43	*Electrical machines and apparatus, having individual functions, not specified or included elsewhere in this chapter.*	*1*
90	**Instruments – "Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments; parts and accessories thereof."**	**19**
90.13	*Liquid crystal devices not constituting articles provided for more specifically in other headings; lasers, other than laser diodes; other optical appliances and instruments, not specified or included elsewhere in this Chapter.*	*2*
90.15	*Surveying (including photogrammetrical surveying), hydrographic, oceanographic, hydrological, meterological or geophysical instruments and appliances, excluding compasses; rangefinders.*	*1*
90.26	*Instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases (for example, flow meters, level gauges, manometers, heat meters), excluding instruments and apparatus of heading 90.14, 90.15, 90.28 or 90.32.*	*4*
90.27	*Instruments and apparatus for physical or chemical analysis (for example, polarimeters, refractometers, spectrometers, gas or smoke analysis apparatus); instruments and apparatus for measuring or checking viscosity, porosity, expansion, surface tension or the like; instruments and apparatus for measuring or checking quantities of heat, sound or light (including exposure meter); microtomes.*	*6*
90.31	*Measuring or checking instruments, appliances and machines, not specified or included elsewhere in this Chapter; profile projectors.*	*3*
90.32	*Automatic regulating or controlling instruments and apparatus.*	*2*
90.33	*Parts for machines, appliances, instruments or apparatus of Chapter 90.*	*1*

Annex 2: The content of the 54 APEC list codes (six-digit level)

Approach

In the tables below we describe and assess each of the 54 APEC list codes. The table is built up in the following manner:

- The two-digit Chapter heading is the standardized text from the HS System
- The four-digit category heading is the standardized text from the HS System
- The six-digit sub-category heading is the standardized text from the HS System
- The 'Description' row consists of our summary of the description of this sub-category in the HS Explanatory Notes issued by World Customs Organization (ref. Norwegian Customs). In some cases we have also supplemented with even more detailed information about the scope, which is indicated by the APEC list ex-outs. We have aimed to demonstrate the often quite large variety of products and uses within each code.
- The 'Assessment of sub-category' row shows our assessment of the extent to which the code contains EGs. We here differentiate between 'Mainly EGs', 'Mainly non-EGs' and 'EGs as well as non-EGs' (indicating that it has a fair amount of both).
- The 'Ex-out' row lists the ex-outs mentioned in the APEC list for the code in question. The text is here identical to the text in the APEC list. To highlight this, we have put this text in *italics*.
- The 'Justification' row lists the justification provided in the APEC list for the code in question. The text is here identical to the text in the APEC list. To highlight this, we have put this text in *italics*.
- The 'Comment' row provides our comments to the product scope and assessment of the need for ex-outs in the code in question, and also our view of the ex-outs suggested in the APEC list. We also here suggest ex-outs that can ensure that EGs are precisely identified.
- The 'Assessment of APEC ex-out' category consists our assessment of whether the six-digit code with APEC ex-outs refers precisely and only to EGs. When we say that we believe the APEC ex-outs do ensure that only EGs will be targeted, we suppose an ideal situation where APEC countries apply the ex-outs put forth in the list.

It must be noted that the detailed assessments in the tables below have been carried out in a pragmatic manner in order to provide a basic and common understanding of the scope of the codes presented in the APEC list and to what extent they refer to EGs. As national tariff systems vary, it is impossible in a study with a limited scope such as this one, to properly reflect all nuances and details in terms of what each sub-category may potentially contain. We believe, however, that a consistent assessment at the level suggested here provides added value in order to enable a common and fairly nuanced understanding of the content of the APEC list. The transparency in methodology should also allow others to use our assessment as a basis for more refined assessments.

The content of the "Wood & Articles of wood" code (1)

44	***Wood - "Wood and Articles of wood; Wood charcoal"***
44.18	*Builders' joinery and carpentry of wood, including cellular wood panels, assembled flooring panels, shingles and shakes*
44.18.72	**Assembled flooring panels: Other, multilayer**
Description	This sub-category consists of assembled flooring panels that are multilayer and that are not for mosaic floors (84.18.71). This includes multi-layered flooring panels of "tropical wood" and other types. "Tropical wood" means one of the following types of wood: Abura, Acajou d'Afrique, Afrormosia, Ako, Alan, Andiroba, Aningré, Avodiré, Azobé, Balau, Balsa, Bossé clair, Bossé foncé, Cativo, Cedro, Dabema, Dark Red Meranti, Dibétou, Doussié, Framiré, Jongkong, Kapur, Kempas, Keruing, Kosipo, Kotibé, Koto, Light Red Meranti, Limba, Louro, Maçaranduba, Mahogany, Makoré, Mandioqueira, Mansonia, Mengkulang, Meranti Bakau, Merawan, Merbau, Merpauh, Mersawa, Moabi, Niangon, Nyatoh, Obeche, Okoumé, Onzabili, Orey, Ovengkol, Ozigo, Padauk, Paldao, Palissandre de Guatemala, Palissandre de Para, Palissandre de Rio, Palissandre de Rose, Pau Amarelo, Pau Marfim, Pulai, Punah, Quaruba, Ramin, Sapelli, Saqui-Saqui, Sepetir, Sipo, Sucupira, Suren, Tauari, Teak, Tiama, Tola, Virola, White Lauan, White Meranti, White Seraya, Yellow Meranti.
Assessment of sub-category	Mostly non-EGs
Ex-outs (APEC text)	*Other Assembled Flooring Panels, Multilayer, of Bamboo (44187210)*[5]
Justification (APEC text)	*Renewable bamboo-based products are substitutions of wooden necessities. Since bamboo is characterized by short growing cycle, these environment-friendly products can save a great deal of water, soil and air resources.*
Comment	This sub-category refers to multi-layered assembled flooring panels that are not of mosaic type. It includes such flooring panels of a wide variety of tropical wood. The APEC list suggests "of bamboo" as an ex-out. We do not in this report go into the discussion of environmentally preferable products. (This is the only sub-category in the APEC list where such a justification is presented.) The production process involved in the manufacturing of multi-layered flooring panels of bamboo will also be important to consider when considering environmental benefits of using this product. While the use of bamboo in many cases may be more environmentally beneficial than the use of certain other types of wood, we do not consider multi-layered flooring panels of bamboo as such to be an EG. One way to specify ex-outs in this and similar sub-categories covering biological products, could be to specify that it only applies to products that are environmentally certified by an independent third party recognized by national governments.
Assessment of APEC ex-out	APEC ex-out does not ensure only EGs.

[5] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

The content of the 'Machinery' codes (23)

84	***Machinery - "Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof."***
84.02	*Steam or other vapour generating boilers (other than central heating hot water boilers capable also of producing low pressure steam); super-heated water boilers.*
84.02.90	**Parts for steam or other vapor generating boilers (other than central heating hot-water boilers capable also of producing low pressure steam); super-heated water boilers.**
Description	Steam or other vapour generating boilers refer to machines that produces steam or other vapours (for example mercury vapour) for the powering for running power machines (for example steam turbines) or other steam powered machines (for example steam hammers or steam pumps), or delivers steam to machines for heating, boiling, sterilizing etc. incl. steam boilers for central heating. Steam or other vapour generating boilers can be heated by different energy sources (oil, gas, bio pellets) or by electricity. Super-heaters are high-pressure boilers with water temperatures well above the normal point of evaporation. Super-heaters are used to deliver heat, usually over longer distances for industrial use (for example for drying-tunnels for newly lacquered cars) or for district heating.
Assessment of sub-category	Mainly non-EG products.
Ex-outs (APEC text)	*Parts for 840219x. [Ca, J, NZ, K, Au]* *Parts for biomass boilers [US]* *Management of solid and hazardous waste [BD]*
Justification (APEC text)	*Parts for the biomass boilers described above. [Ca, J, NZ, US, K, HK, Au]* *Parts for the boilers for the production of heat and power on the basis of (renewable) biomass fuels. [HK]* *Part for biomass boilers for the production of heat and power on the basis of renewable biomass fuels. This product should be seen in relation to HS840219, biomass boiler. Biomass in heating systems uses agricultural, forest, urban and industrial residues and waste to produce heat and electricity with less effect on the environment than fossil fuels. This type of energy production has a limited long-term effect on the environment because the carbon in biomass is part of the natural carbon cycle. [S, BD]*
Comment	This code refers to parts for different kinds of steam/vapour and water boilers. The boilers (and their parts) may be considered EGs if they are designed to be using renewable energy sources such as biomass. We are uncertain how to interpret BD's ex-out. It may refer to super-heaters used to treat hazardous waste, which clearly is an important environmental function. However, such heaters may often use fossil fuels. We would still be inclined to consider such super-heaters as EGs, since they perform an important environmental function. Suggested ex-outs: - Parts for boilers using renewable energy sources such as biomass. - Parts for super-heaters used for waste treatment.
Assessment of APEC ex-out	APEC ex-out ensures only EGs.
84.04	*Auxiliary plant for use with boilers of heading 84.02 or 84.03 (for example, economizers, super-heaters, soot removers, gas recovers); condensers for steam or other vapour units.*

84.04.10	**Auxiliary plant (e.g. economisers, super-heaters, soot removers, gas recovers') for use with boilers of heading 84.02 or 84.03 (boilers for steam and other vapor power units)**
Description	The category includes 11 types of auxiliary plants for boilers, such as feed-water heaters (2 types), super-heaters, coolers for super-heaters, steam collectors/drums, steam accumulators, heat accumulators, soot removers and gas recovery units. The auxiliary plants consist of equipment optimizing the functioning of the boilers and does not have a mainly environmental purpose, possibly with the exception of gas recovery units. Gas recovery units capture smoke gas in order to ensure full consumption of particles.
Assessment of sub-category	Mainly contains non-EG products
Ex-outs (APEC text)	*Auxiliary plant for use with 840219x. [Ca, J, NZ, K, Au]* *For central heating boilers of heading 84.03 [M, BD]*
Justification (APEC text)	*Components of industrial air pollution control plant which minimise the release of pollutants into the atmosphere. This equipment is also used to support waste heat recovery processes in waste treatment, or renewable energy resource recovery applications. [Ca, J, NZ, K, Au, BD]* *Components of industrial air pollution control plant which minimise the release of pollutants into the atmosphere. This equipment is also used to support waste heat recovery processes in waste treatment, [biomass energy generation - US only] and other renewable energy resource recovery applications. [US, HK, M]* *These are soot removers and components of industrial air pollution control plant, which minimise the release of pollutants into the atmosphere. This equipment is also used to support waste heat recovery processes in waste treatment or renewable energy resource recovery applications. [S]*
Comment	This category seems to largely contain non-EGs, but it also contains EGs such as gas recovery units, auxiliary equipment for use with biomass boilers (ref. 84.02.19), heat recovery in waste treatment and other heat recovery units. For this code to refer specifically and only to EGs it should be followed by ex-outs specifying that it only pertains to these types of products. One ex-out refers to central heating boilers of heading 84.03, which contains boilers using all kinds of fuel (such as biofuels, coal, coke, gas, or oil). We do not consider such boilers as EGs, as they often use fossil fuels. Suggested ex-outs: - Gas recovery units. - Auxiliary plant for use with boilers fuelled with biomass.
Assessment of APEC ex-out	APEC ex-out does not ensure only EGs. Sub-category contains EGs not mentioned in ex-outs.
84.04.20	**Condensers for steam or other vapour power units.**
Description	The main purpose of the condensers is to reduce counter-pressure (by cooling and condensation) and thereby increase the power. The cooling also allows for removal of contaminants, but this is not the main purpose. The category does not comprise apparatus for filtering or cleansing of water, gases etc. (which are covered by 84.21), although they may be used in boiler rooms.
Assessment of sub-category	Mainly contains non-EG products.
Ex-outs (APEC text)	-
Justification (APEC text)	*Used to cool gas streams to temperatures that allow the removal of contaminants, e.g. volatile organic compounds (VOC) like benzene.*

Comment	This code refers to condensers that do not primarily have an environmental purpose, but in some cases they function in a way that also allows for removal of contaminants. We do not consider these products to be EGs, as they do not mainly have an environmental function. Suggested ex-outs: - Condensers for steam/vapour power units designed to allow the removal of contaminants.
Assessment of APEC ex-out	APEC ex-out does not ensure only EGs. Sub-category contains EGs not mentioned in ex-outs.
84.04.90	**Parts for auxiliary plant for use with boilers of heading 84.02 or 84.03 (840410) and for boilers for steam and other vapor power units (840420).**
Description	This is parts for 84.04.10 and 84.04.20, see above.
Assessment of sub-category	Mainly contains non-EG products.
Ex-outs (APEC text)	*Air pollution control [BD]* *Parts for subheading 840410100 [M, BD].*[6]
Justification (APEC text)	*These parts are used in the repair and maintenance of the equipment classified under 840410 above. This secondary equipment is also used to support waste heat recovery processes, such as boilers mentioned above, in waste treatment, or renewable energy resource recovery applications. [C*[7]*, J, NZ, US, Au, R, Th, M]* *Components of industrial air pollution control plant which minimise the release of pollutants into the atmosphere. This equipment is also used to support waste heat recovery processes in waste treatment, or renewable energy resource recovery applications. [BD]*
Comment	For the code to refer specifically and only to EGs, it should be followed by ex-outs specifying that it only pertains to auxiliary plant for use with biomass boilers (ref. 84.02.19), for central heating boilers using biofuels, for gas recovery units, and to condensers designed to allow the removal of contaminants. Suggested ex-outs: - Parts for auxiliary plant for use with biomass boilers (ref. 84.02.19) - Parts for central heating boilers using biofuels - Parts for gas recovery units - Parts for condensers for steam/vapour power units designed to allow the removal of contaminants.
Assessment of APEC ex-out	APEC ex-outs ensure only EGs. Sub-category contains EGs not mentioned in ex-outs.
84.06	*Steam turbines and other vapour turbines.*
84.06.90	**Parts for steam and other vapour turbines**
Description	This category consists of parts for turbines for marine propulsion (84.06.10), parts for other turbines of an output exceeding 40 MW (84.06.81) and parts for other turbines of an output not exceeding 40 MW (84.06.82). The APEC list does not include 84.06.10, 84.06.81 and 84.06.82, for which this category provides parts. A steam turbine is a device that extracts thermal energy from pressurized

[6] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

[7] We have been informed by the APEC secretariat that this is a typo and that the text here should read 'Ca' (for Canada) and not 'C'.

	steam and uses it to do mechanical work on a rotating output shaft. Because the turbine generates rotary motion, it is suited for driving an electrical generator and it is widely used for electricity generation.
Assessment of sub-category	Mainly non-EGs.
Ex-outs (APEC text)	*Optional ex-outs may include parts suitable for use with stationary steam turbines over 40MW, stationary steam turbines not over 40MW, other vapour turbines; parts for 840681x and 840682x [Ca, J, NZ, K, Au]* *Parts for 840681x and 840682x [US]* *Renewable energy plant [BD]* *Only for stator blades, rotors and their blades [R]*
Justification (APEC text)	*Parts used for repair and maintenance of energy recovery turbines listed in 840681 and 840682 above. [Ca, J, NZ, K, Au]* *Parts for the aforementioned ex-outs/goods of 8406 [US]* *Turbines designed for the production of geothermal energy (renewable energy) and co-generation ((CHP) which allows for a more effective use of energy than conventional generation) [BD]*
Comment	This category refers to a range of products, some of which (e.g. turbines used for marine propulsion) are not used for environmental purposes, and most of which may be used for environmental as well as non-environmental purposes. Steam turbines are neutral in terms of energy source and thus not EGs in themselves. Production of geothermal energy may in some cases require specific types of steam turbines. Cogeneration is often considered an environmental improvement as it significantly improves energy efficiency, and thus steam turbines that are mainly used for this purpose may be considered EGs. We are, however, uncertain whether it is possibly to distinguish between steam turbine used for this purpose and other steam turbines. While the reference to 'stator blades, rotors and their blades' is a precise reference to parts that only can be used for steam turbines, we cannot see that they have any specific environmental function. For the code to refer specifically and only to EGs, it should be followed by ex-outs specifying that it only pertains to parts for turbines mainly used in renewable energy production and cogeneration. Suggested ex-outs: - Parts for steam/vapour turbines mainly used in renewable energy production - Parts for steam/vapour turbines mainly used in cogeneration.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.11	*Turbo-jets, turbo-propellers and other gas turbines.*
84.11.82	**Other gas turbines of a power exceeding 5,000 kW.**
Description	This category includes industrial gas turbines that are designed for industrial use, and also turbojet or turboprop driven motors adapted to other use than propulsion of airplanes. These gas turbines are mainly used in ships and locomotives, for electric generators and for mechanical operations in oil and gas pipelines and in petrochemical industry.
Assessment of sub-category	Mainly contains non-EGs.
Ex-outs (APEC text)	*Possible ex-out may include gas turbines that burn natural gas [Au]* *Gas turbines for electrical generation from recovered landfill gas (exceeding 5,000 kW) [BD]* *Of a power exceeding 5000 kW but not exceeding 50 000 kW [R]*

Justification (APEC text)	*Gas turbines for electrical power generation from recovered landfill gas, coal mine vent gas, or biogas (clean energy system). Note that these turbines do "exceed 5,000 kW". [Ca, J, HK, NZ, Au, M, BD]* *Gas turbines for clean power generation including recovered landfill gas, coal mine vent gas, or biogas. [US]* *Gas turbines are used for electrical power generation from recovered landfill gas, coal mine vent gas, biogas or national gas. Lower emission of pollutants compared with traditional fire power generation methods. [S]*
Comment	This category contains turbines that are mainly non-EGs. Electricity generation from gas is less polluting than from coal and other fossil fuels, but more polluting than generation from renewable energy sources. We thus do not consider gas turbines as such to be EGs.[8] In some cases, turbines under this category may be used for environmental purposes such as electricity generation from landfill gas/biogas. A more complicated example is coal mine vent gas, including the potent greenhouse gas methane, that is often occurring in coal mines and may be used for producing on-site power. While such power generation reduces a pollutant and produces relatively clean energy, it is based on coal mining (a highly polluting activity) and the power it generates is employed for local coal mining operations. We therefore do not consider gas turbines for the use of coal mining vent gas to be environmental products. For this code to refer specifically and only to EGs, it should be followed by ex-outs specifying that it only pertains to turbines mainly used for the generation of electricity from biogas. Suggested ex-out: - Steam/vapour turbines mainly used for the generation of electricity from biogas
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.11.99	**Parts for other gas turbines**
Description	This category consists of parts for other gas turbines of a power not exceeding 5,000 kW (84.11.81) and other gas turbines of a power exceeding 5,000 kW (84.11.82). Examples are rotors for gas turbines and parts for turbojet or turboprop driven motors adapted to other use than propulsion of airplanes.
Assessment of sub-category	Mainly contains non-EGs.
Ex-outs (APEC text)	*Parts for 841181 and 841182.*
Justification (APEC text)	*Parts for gas turbines described above.*
Comment	This category contains parts for equipment that is mainly non-EG, ref. the description and comment to 84.11.82 above. Parts for turbines used for the generation of electricity from landfill gas or biogas is EG. For this code to refer specifically and only to EGs, it should be followed by ex-outs specifying that it only pertains to parts for turbines used for the generation of electricity from biogas. Suggested ex-out: - Parts for turbines used for the generation of electricity from biogas.
Assessment of	APEC ex-outs do not ensure only EGs.

[8] When discussing the relative environmental benefits of gas turbines, it is worth noting that the APEC list does not include category 84.10: *Hydraulic turbines and water wheels*, which undisputedly has an environmental benefit in the form of clean and renewable energy production.

APEC ex-out	
84.12	*Other engines and motors.*
84.12.90	**Parts for other power machines and motors**
Description	This category refers to parts for other power machines and motors (88.12.10-84.10.80), which includes seven categories: Reaction engines other than turbojet motors, Hydraulic power engines and motors, Pneumatic power engines and motors, Wind driven generators, Motors making use of springs and balances, Piston machines without boilers, Steam powered machines with boilers.
Assessment of sub-category	Mainly contains non-EGs.
Ex-outs (APEC text)	*Wind turbine blades and hubs [US]* *Only for civil aviation [R]*
Justification (APEC text)	*These blades and hubs are integral components to wind turbines. [US]* *Parts thereof wind turbines. Parts used for repair and maintenance of wind turbines with the attendant benefits. [S, BD]*
Comment	This category includes seven categories of products of which only one (wind powered generators) can be considered an EG. However, hydraulic and/or pneumatic power engines and motors are in some cases designed especially for use in wind power generation. The ex-out "Only for civil aviation" [R] does not qualify as an EG. For this code to refer specifically and only to EGs, it should be followed by ex-outs specifying that it only pertains to parts for wind driven generators (84.12.80) as well as hydraulic or pneumatic power engines and motors that are designed especially for use in wind power generation. Suggested ex-outs: - Parts for wind driven generators - Parts for hydraulic or pneumatic power engines and motors that are designed especially for use in wind power generation.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.17	*Industrial or laboratory furnaces and ovens, including incinerators, non-electric.*
84.17.80	**Industrial or laboratory furnaces and ovens, including incinerators, non-electric; Other**
Description	This category refers to non-electric industrial or laboratory furnaces and ovens except for those used for treatment of metals and minerals or for baking. This includes i) coke ovens/furnaces, ii) ovens to produce charcoal, iii) rotary kilns for cement and plaster, iv) ovens used in the glass and ceramics industry, v) enamel ovens, vi) ovens especially constructed for smelting, sintering or heat modification of fissile materials that are recovered with the intention of recycling, for separation of irradiated fuel by pyro-metallurgical process, for incineration of radioactive graphite or radioactive filters, or for burning of crockery or glass containing radioactive slag, vii) cremation ovens, and viii) ovens and furnaces used to burn waste etc. It also contains catalytic incinerators.
Assessment of sub-category	Mainly contains non-EGs.
Ex-outs (APEC text)	*Optional ex-outs may include: waste incinerators; heat or catalytic incinerators. [Ca, J, NZ, K, Au, M]* *Waste incinerators; Heat or catalytic incinerators [US]* *Waste incinerator; Flue gas treatment system for incinerator [BD]*

Justification (APEC text)	*These products are used to destroy solid and hazardous wastes. Catalytic incinerators are designed for the destruction of pollutants (such as VOC) by heating polluted air and oxidation of organic components. [Ca, J, NZ, K, Au, M, US, BD]* *Used to achieve innocent treatment and disinfection of household waste through high-temperature incineration disposal. Used for radioactive waste disposal. [Ch]*
Comment	This category includes eight types of laboratory furnaces and ovens of which two are used for mainly environmental purposes. For this code to refer specifically and only to EGs, it should be followed by an ex-out specifying that it only pertains to "Ovens especially constructed for smelting, sintering or heat modification of fissile materials that are recovered with the intention of recycling, for separation of irradiated fuel by pyro-metallurgical process, for incineration of radioactive graphite or radioactive filters, or for burning of crockery or glass containing radioactive slag", "Ovens and furnaces used to burn waste etc.", and catalytic incinerators. Suggested ex-outs: - Ovens especially constructed for smelting, sintering or heat modification of fissile materials that are recovered with the intention of recycling, for separation of irradiated fuel by pyro-metallurgical process, for incineration of radioactive graphite or radioactive filters, or for burning of crockery or glass containing radioactive slag. - Ovens and furnaces used to burn waste etc. - Catalytic incinerators.
Assessment of APEC ex-out	APEC ex-out ensure only EGs.
84.17.90	**Parts for Industrial or laboratory furnaces and ovens, including incinerators, non-electric**
Description	This category refers to parts for the categories 84.17.10 (Furnaces and ovens for the roasting, melting or other heat treatment of ores, pyrites or of metals), 84.17.20 (Bakery ovens, including biscuit ovens) and 84.17.80 (Other, including eight types of laboratory furnaces and ovens – ref. above).
Assessment of sub-category	Mainly non EG products
Ex-outs (APEC text)	*Optional ex-outs may include: parts for 841780x. [Ca, J, NZ, K, Au]* *Parts of waste incinerators and heat or catalytic incinerators. [US, BD]*
Justification (APEC text)	*These parts can help maintain and repair products that are used to destroy solid and hazardous wastes. Similarly, the parts for catalytic incinerators can help maintain and repair items that can assist in the destruction of pollutants (such as VOC) by heating polluted air and oxidation of organic components. [Ca, J, NZ, US, K, Au, R, BD]*
Comment	This category consists of parts for 84.17.10; which apparently does not contain EGs, parts for 84.17.20; which apparently does not contains EGs, and parts for 84.17.80; which mostly contain non-EGs but also contains three types of EG products (ref. description above). For this code to refer specifically and only to EGs, it should be followed by an ex-out specifying that it only pertains to parts for "Ovens especially constructed for smelting, sintering or heat modification of fissile materials that are recovered with the intention of recycling, for separation of irradiated fuel by pyro-metallurgical process, for incineration of radioactive graphite or radioactive filters, or for burning of crockery or glass containing radioactive slag", and for "Ovens and furnaces used to burn waste etc. ", plus catalytic incinerators. Suggested ex-outs: - Parts for ovens especially constructed for smelting, sintering or heat modification of fissile materials that are recovered with the intention of

	recycling, for separation of irradiated fuel by pyro-metallurgical process, for incineration of radioactive graphite or radioactive filters, or for burning of crockery or glass containing radioactive slag - Parts for ovens and furnaces used to burn waste - Parts for catalytic incinerators.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.19	*Machinery, plant or laboratory equipment, whether or not electrically heated (excluding furnaces, ovens and other equipment of heading 85.15), for the treatment of materials by a process involving a change of temperature such as heating, cooking, roasting, distilling, rectifying, sterilizing, pasteurizing, steaming, drying, evaporating, vaporizing, condensing or cooling, other than machinery or plant used for domestic purposes; instantaneous or storage water heaters, non-electric.*
84.19.19	**Instantaneous or storage water heaters, non-electric, Other**
Description	The sub-category 84.19.19 refers explicitly to non-electric hot water heaters of flow or storage type, including such that employ solar radiation for heating, irrespective of whether or not they are for household use.
Assessment of sub-category	Contains EGs as well as non-EGs.
Ex-outs (APEC text)	*Solar water heaters. [Ca, J, NZ, US, K, HK, Au, BD]* *Excluding other - - Domestic; of copper and other [M]* *Solar water heaters [S], Solar water heaters (84191910) [Ch]*[9]
Justification (APEC text)	*Uses solar thermal energy to heat water, producing no pollution. Use of solar water heating displaces the burning of other, pollution-creating fuels. [Ca, J, NZ, US, K, HK, Au, Th]* *Uses solar energy to heat water, producing no pollution. Use of solar water heating displaces the burning of other pollution-creating fuels. [S, BD]* *Used for water heating through solar energy which is regenerative and clean compared to burning fuel. [Ch]*
Comment	This sub-category refers to non-electric hot water heaters that use varying sources of energy for heating, such as solar, natural gas and oil. Of these, we only consider solar water heaters as an EG. Heat-pump based water heaters is another example of a non-electric instantaneous or storage water heaters, which we consider an EG, which may apply to this code. For this code to refer specifically and only to EGs, an ex-out specifying that it only pertains to solar water heaters or other non-electric renewable energy water heaters should follow it. Suggested ex-outs: - Solar water heaters and other non-electric renewable energy water heaters
Assessment of APEC ex-out	APEC ex-outs ensure only EGs.
84.19.39	**Dryers, other**
Description	This category refers to dryers operating at relatively low temperatures other than dryers for agricultural products (84.19.31) and dryers for products of wood, paper

[9] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	pulp, paper or cardboard (84.19.32). The only examples provided in the HS Explanatory Notes of other dryers, are machines and apparatus used for evaporation of fissile and radioactive solutions and drying of fissile or radioactive products. The APEC list shows that it also contains wastewater sludge dryers.
Assessment of sub-category	Contains non-EGs as well as EG.
Ex-outs (APEC text)	*Sludge dryers*
Justification (APEC text)	*Device used in wastewater management, which requires sludge to be treated.*
Comment	This code seems to contain sludge dryers that are used in wastewater management (an EG) as well as dryers used in the nuclear industry (not EGs). For this code to refer specifically and only to EGs, it should be followed by an ex-out specifying that it only pertains to wastewater sludge dryers. Suggested ex-out: - Wastewater sludge dryers
Assessment of APEC ex-out	APEC ex-out ensures only EGs.
84.19.60	**Machinery for liquefying air or other gases**
Description	This sub-category refers to apparatus and equipment for condensation of air or other gases to liquids, including apparatus used in the Linde and Claude processes for condensation, specially designed laboratory equipment of limited size used for different purposes (such as sterilization or drying) and apparatus and equipment for production of hot beverages or for boiling, frying or heating food.
Assessment of sub-category	Mainly contains non-EGs
Ex-outs (APEC text)	-
Justification (APEC text)	*For separation and removal of pollutants through condensation [Ca, J, NZ, US., K, Au]* *Air Pollution Control. Used in condensation to remove condense contaminants from vapour to liquid form for easier removal and storage [Th]*
Comment	This code contains machinery used for removal pollutants through condensation (EGs) as well as machinery used for liquefying air/gases for other purposes (non-EGs). For this code to refer specifically and only to EGs, an ex-out specifying that it only pertains to such equipment mainly used to used for removal pollutants through condensation should follow it. Suggested ex-out: - Machinery for liquefying air and other gases that is mainly used for removal of pollutants through condensation
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.19.89	**Industrial machinery, plant or equipment for the treatment of materials by process involving a change in temperature, not specified or included elsewhere**
Description	The category 84.19 consists of a very wide spectre of machines and equipment for the treatment of materials by a process involving a change in temperature, and where this is the main purpose. The sub-category 84.19.89 is an omnibus code referring to machinery, plant and equipment of this type, not mentioned in the sub-categories 84.19.10-84.19.60 (ref. above) and not in 81.19.81 (machinery, plant and equipment for making hot drinks or for cooking and heating food). The HS Explanatory Notes does not provide more information about the content of this

	code.
Assessment of sub-category	Contains EGs as well as non-EGs.
Ex-outs (APEC text)	*Evaporators and dryers, for water and wastewater treatment. Condensers and cooling towers. Biogas reactors; digestion tanks and biogas refinement equipment. [Ca, J, NZ, Au]* *Evaporators and dryers, for water and wastewater treatment. Condensers and cooling towers. Anaerobic biogas reactors, digestion tanks and biogas refinement equipment. PV cell coaters. [US]*
Justification (APEC text)	*For processing water and wastewater and the separation and removal of pollutants through condensation. Includes fluidised bed systems (bubbling, circulating, etc.) and biomass boilers. Can also help anaerobic digestion of organic matter. [Ca, J, NZ, Au]* *For processing water and wastewater and the separation and removal of pollutants. Includes fluidised bed systems (bubbling, circulating, etc.) and biomass boilers. Can also help anaerobic digestion of organic matter. Wet cooling towers are very efficient air scrubbers. PV cells generate renewable energy. [US]* *Used in producing chlorine dioxide.* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]* *Thermal cyclers serving multiple environmental purposes.*
Comment	The ex-outs and the justifications provided by the APEC countries show that this sub-category is used for a wide range of quite different products and in many cases EGs. The APEC ex-outs represent examples of EGs, with the exception of thermal cyclers and fluidised bed systems. Thermal cyclers may serve several environmental purposes, but are mainly used to amplify segments of DNA and to facilitate temperature-sensitive reactions of various kinds (some which may serve an environmental purpose) in laboratories. Fluidised bed systems are not mainly used for environmental purposes and are for instance widely used in the food industry. We thus do not consider these machines to primarily have an environmental function. Chlorine dioxide is widely used for water treatment and we thus consider machinery/equipment for such production to be an EG. (It should be noted, however, that chlorine is also used for other purposes such as bleaching, in which case it does not serve an environmental purpose.) For this code to refer specifically and only to EGs, ex-outs specifying that it only pertains to EGs such as cooling towers used for scrubbing air, machines and equipment specially designed to process water and wastewater and the separation and removal of pollutants through condensation, and machines/equipment designed for coating PV cells should follow it. Suggested ex-outs: - Cooling towers used for scrubbing air - Machines/ equipment specially designed to process water and wastewater and the separation and removal of pollutants through condensation - Machines/equipment designed for coating PV cells.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.19.90	**Parts of machinery, plant and equipment of 84.19**
Description	This sub-category consists of parts for category 84.19, which consists of a wide spectre of machines and equipment for the treatment of materials by a process involving a change in temperature, and where this is the main function of the product. These machines are mainly used for industrial purposes, for instance in

	the food and beverage industries.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Optional ex-outs may include: Parts for 8419.19 ex, including for solar boiler/water heater; insulation, temperature sensor for solar boiler/water heater; Differential temperature controller for solar boiler/water heater; Evacuated glass tubes for solar boiler/water heater; Heat pipes for solar boiler/water heater. Parts of 841940x, 841950x, 841960, 841989x [Ca, J, NZ, CT, Au]* *excluding 8411990100, 841990200, 841990300 [M]* *Solar water heater parts [BD]* *Parts of Water Heaters (84199010) [Ch]*[10]
Justification (APEC text)	*Parts used in the maintenance and repair of solar water heaters (etc). which use solar thermal energy to heat water, producing no pollution. Use of solar water heating displaces the burning of other, pollution-creating fuels. [Ca, J, NZ, CT, Au]* *Parts for aforementioned goods/ex-outs of heading 8419. [US]* *Parts used in the maintenance and repair of the above products. [S]* *These are parts and accessories for the solar water heater classified in 8419 and described above [BD]* *Used for water heating through solar energy which is regenerative and clean compared to burning fuel. [Ch]*
Comment	This code includes parts for a wide spectre of products of which most are non-EG. The suggested ex-outs contain parts for products already mentioned in the APEC list, such as 84.19.19 (non-electric solar water heaters), 84.19.89 (other machinery incl. wet cooling towers) and also products that are not mentioned in the APEC-list: 84.19.40 (certain Distilling and rectifying plant machinery/products) and 84.19.50 (certain Heat exchange units). While machines and equipment under 84.19.40 and 84.19.50 are generally not employed for environmental purposes, 84.19.40 does include separators for irradiated fuel or treatment of radioactive wastewater, and 84.19.50 includes units using non-electric solar water heating. Suggested ex-outs: - Parts for non-electric solar water heaters and other heaters (under 84.19.19), - Parts for separators for irradiated fuel or treatment of radioactive wastewater (under 84.19.40), - Parts for heat exchange units using solar water heating (under 84.19.50) - Parts for machinery designed to enable removal of pollutants through condensation (under 84.19.60) - Parts for cooling towers used for scrubbing air, machines and equipment specially designed to process water and wastewater and the separation and removal of pollutants through condensation, and machines/equipment designed for coating solar PV cells (under 84.19.89).
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.21	*Centrifuges, including centrifugal dryers; filtering or purifying machinery and*

[10] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	apparatus, for liquids or gases.
84.21.21	**Filtering or purifying machinery and apparatus, for liquids or gases; For filtering or purifying water.**
Description	This category contains a wide variety of filters and apparatus for purification of water; filters to produce household drinking water, filters to produce clean boiler feed water, chemical and electromagnetic water purification equipment, and dialyzers using a membrane.
Assessment of sub-category	Contains EGs as well as non-EGs.
Ex-outs (APEC text)	*Waste water management [BD]* *Household filtering or purifying water machinery and equipment (84212110), Device for the removal of Heavy metal ions for industry uses; Membrane bioreactor; High rate anaerobic reactors; reverse osmosis filters for industry uses; Water purification Machine; EDI ultra-pure water equipment (ex-84212190) [Ch]*[11]
Justification (APEC text)	*Used to filter and purify water for a variety of environmental, industrial and scientific applications, including water treatment plants and wastewater treatment facilities. [Ca, J, NZ, K, Au]* *Used to filter and purify water for a variety of environmental, industrial and scientific applications, including water treatment plants and wastewater treatment facilities. This line also includes newer water/wastewater filtration technologies like ozone and ultraviolet disinfection equipment. [US]* *For wastewater. Used to filter and purify water for a variety of environmental, industrial and scientific applications including water treatment plants and wastewater treatment facilities. For instance, membrane systems can be used to produce water from wastewater, seawater or brackish groundwater, either through purification or filtration; [S]* *Such devices are essential components for filtration and purification of drinking water. [Ch]*
Comment	This code refers to a product group that contains filters and purifying apparatus that has an environmental purpose (producing drinking water, water treatment plants, treating wastewater), but also such products used for industrial purposes. We generally don't consider the latter to be EGs as their function is not to improve the environment. Suggested ex-outs: - Filters and purification equipment used for making drinking water - Filters and purification equipment mainly used in wastewater treatment plants - Filters and purification equipment mainly used for treating wastewater.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.21.29	**Filtering or purifying machinery and apparatus for liquids: Other.**
Description	This sub-category contains filtering or purifying machinery and apparatus for liquids that are not for filtering/purifying water (84.21.21), not for filtering/purifying beverages other than water (84.21.22), and not oil or petrol filters for internal combustion engines. This includes filters used for producing synthetic textiles, press filters which for instance is commonly used to dewater high-solid slurries in metal processing, chemicals industry and in agricultural production (sugar, brewing of

[11] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	beer, wine making), rotary drum filters and intermittent vacuum filters for fluids, as well as ion exchange apparatus (including those working by electro-dialysis) and separators (for instance used for determining the sulphate content of ground water and aqueous soil extracts) and chemical separators (used for irradiated fuel and wastewater treatment).
Assessment of sub-category	Mostly contain non-EGs.
Ex-outs (APEC text)	*Refrigerant recovery and recycling units. [US]* *Excluding oil filter and for use in oil drilling operation [M]* *Press Filters (84212910); etching solution recycling equipment for printed circuit board; equipment for the recycling and treatment of reclaimed water; ion exchanger; complete sets of equipment for alkali recovery of black liquor; aerator; electrodialysis device (ex-84212990) [Ch]*[12]
Justification (APEC text)	*Used to remove contaminants from wastewater, by chemical recovery, oil/water separation, screening or straining. [Ca, J, NZ, K]* *These units recover both liquid and gaseous refrigerants from refrigeration and air conditioning equipment and purify the refrigerant after its recovery. This process prevents the emission of a variety of air pollutants. [US]* *Excluding other filters of a kind used as components in motor vehicles. [Au]* *Used for filteration by injecting mechanical force on filtering media. [Ch] Etching solution is an essential component of PCB etching but is on kind of high pollutant. These equipment are designed for recycle-processing-reuse of etching solution through solvent extraction, membrane treatment and electrode method. [Ch] These equipment are used to turn wastewater into nonpotable water, which can be widely applied in irrigation, afforestation, flushing supply, etc. [Ch] These equipments are designed for water softening, alkali removal and desalination by ion exchange resins swaping bits of themselves with ions which have same electrical property in the pre-treated water under certain conditions. [Ch] These equipment, designed for the purification and recycling of black liquor, effectively eliminate pollution and improve resource utilization. Applications include pulp washing machine, pre-hung filter, putting-down machine, causticizer, etc. [Ch] Aerators both above and below the water's surface are essential components of oxygenic aeration of drainage. [Ch] Electrodialyzers exploit ion exchange membrane and DC electric field, making electrolytes develop migration selectivity, thereby desalinate the water. [Ch]*
Comment	This sub-category refers to many types of filtering/purification equipment, many of which are not EGs. The ex-outs refer to equipment used to recover refrigerants (many refrigerants are important ozone depleting and global warming inducing compounds that are the focus of worldwide regulatory scrutiny), equipment to remove contaminants from wastewater, and equipment for recycling of liquids with an environmental purpose (such as equipment for alkali recovery of black liquor). We consider these to be EGs. The ex-outs also refer to press filters (which are used for a wide variety of industrial purposes that are not environmental - ref. description above), and to aerators, (which covers various devices used for mixing air with another substance such as water, soil or wine, and sometimes has an environmental purpose. We do not consider press filters and aerators to be EGs, unless they are designed for environmental purposes. Ion exchange apparatus/separators and electrodialysis devices may be used for water treatment

[12] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	but such equipment belonging to this code would appear to be used for treatment of liquids other than water, in case of which we don't consider them to be EGs. Suggested ex-outs: - Filtering or purifying machinery and apparatus designed to recover refrigerants - Press filters designed to be used for environmental purposes such as waste management - Aerators designed to be used for environmental purposes, such as providing aeration to promote the biological oxidation of wastewaters - Filtering or purifying machinery and apparatus designed to recycle etching solutions for printed circuit boards - Filtering or purifying machinery and apparatus designed to remove contaminants from wastewater / reclamation of water - Filtering or purifying machinery and apparatus designed for recycling of liquids with an environmental purpose (such as equipment for alkali recovery of black liquor)
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.21.39	**Filtering or purifying machinery and apparatus for gases: Other**
Description	This sub-category refers to filtering or purifying machinery and apparatus for gases that are not intake air filters for internal combustion engines (84.21.31). This is apparatus that is used to isolate/separate solid or liquid particles in order to either recover substances of value (such as coal dust or metal particles from the smoke gas of ovens) or to remove harmful substances (such as dust, tar, etc. from gases or smoke, or oil from the steam of steam engines). This includes filtering or purification machinery with a mechanical or physical function, such as fabric filters, grid filters, rotary drum filters, dust separators, smoke filters and cyclone filters. It also includes electrostatic filters for air and gases (removing dust), scrubbers or absorption towers (flue-gas desulphurization, used for purification of generator gas, coal gas etc.), and other chemical filtering and purification apparatus for air or other gases (such as catalytic converters converting carbon-monoxide in exhaust from motor vehicles). This category also contains filtering or purifying machines and apparatus that are used for filtering or purifying air and gases in the nuclear power industry, including separators for irradiated fuel or for treatment of wastewater.
Assessment of sub-category	Mostly EGs.
Ex-outs (APEC text)	*Optional ex-out may include: Catalytic converters / Gas separation equipment / Pneumatic fluid power filters rated at 550 kPa or greater / Industrial gas cleaning equipment / Electrostatic filters (precipitators). [Ca, J, NZ, K]* *Excluding other filters of a kind used as components in motor vehicles. [Au]* *Catalytic converters / Dust collection and air purification equipment / Gas separation equipment / Pneumatic fluid power filters rated at 550 kPa or greater / Industrial gas cleaning equipment / Electrostatic filters (precipitators) / Ozone disinfection equipment. [US]* *possible ex-out: air purifier and laminar flow units [M]* *Laminar flow units, catalytic converter and carbondyoxide removal unit imported to use at natural gas service station [Th]* *Filtering Purifying Machines For Gases Nes, Househ (84213910); Electrostatic Dust Collectors For Industry Uses (84213921); Baghoused Dust Collectors For Industry Uses (84213922); Cyclone Dust Collectors For Industry Uses (84213923); Other Dust Collectors for Industry Uses (84213929); Flue Gas Desulfurization Apparatus*

	(84213940); Spraying Saturator; Concentrated adsorption - catalytic combustion equipment; Activated carbon fiber - granular activated carbon equipment; (ex-84213990) [Ch][13]
Justification (APEC text)	*Physical, mechanical, chemical or electrostatic filters and purifiers for the removal of COV, solid or liquid particles in gases, etc. [Ca, J, NZ, K, Au]* *Catalytic converters convert harmful pollutants, like carbon monoxide, into less harmful emissions. Other technologies in this line include physical, mechanical, chemical and electrostatic filters and purifiers for the removal of VOCs, solid or liquid particles in gases, etc. [US]* *For wastewater. Used to filter and purify water for a variety of environmental, industrial and scientific applications including water treatment plants and wastewater treatment facilities. For instance, membrane systems can be used to produce water from wastewater, seawater or brackish groundwater, either through purification or filtration. [S]* *Air Pollution Control [Th]* *Indoor hazardous gas purification equipment, especially for formaldehyde and benzene. [Ch]*
Comment	This sub-category contains products that are non-EG as well as EG products such as scrubbers and separators for treatment of irradiated fuel or wastewater. Regarding the suggested ex-outs, we have not been able to identify any specific carbon dioxide removal units specifically to be used at natural gas service stations. Suggested ex-outs: - Catalytic converters used in air pollution control. - Dust collection and air purification equipment used in air pollution control. - Gas separation equipment used in air pollution control. - Pneumatic fluid power filters used in air pollution control. - Industrial gas cleaning equipment used in air pollution control. - Electrostatic filters (precipitators) used in air pollution control. - Ozone disinfection equipment used in the production of potable water – and to prevent spreading of diseases
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.21.99	**Parts; Filtering or purifying machinery and apparatus, for liquids and gases**
Description	This sub-category consists of parts for filtering or purifying machinery and apparatus for liquids and gases, including machinery/apparatus for filtering or purifying water (84.21.21), for filtering or purifying beverages other than water (8.421.22), oil or petrol-filters for internal combustion engines (84.21.23), other filtering or purifying machinery/apparatus for liquids (84.21.29), filtering or purifying machinery/apparatus for intake air filters for internal combustion engines (84.21.31), and other filtering or purifying machinery/apparatus for gases (84.21.39).
Assessment of sub-category	Mostly non-EGs
Ex-outs (APEC text)	*Parts for 842121 and 842129 [Ca, J, NZ, K], excluding parts for other filters of a kind used as components in motor vehicles [Au].* *Parts for 842121, 842129x and 842139 [US].*

[13] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	Excluding for subheadings 842123100, 842129510 [M, BD]. *Parts Of Household Filtering and Purifying Machines For Gases (84219910) [Ch]*[14]
Justification (APEC text)	*Including sludge belt filter presses and belt thickeners [Ca, J, NZ, K, Au].* *Parts for aforementioned goods/ex-outs of heading 8421. [US]*
Comment	This sub-category consists of parts for a number of product categories of which some as a whole do not contain EGs (84.21.22, 84.21.23, 84.21.31) and other partly contain EGs (84.21.21, 84.21.29, 84.21.39 - as we have described above). Suggested ex-outs: - Parts for filters and purification equipment used for making drinking water - Parts for ion exchange separators for production of freshwater. - Parts for electrodialysis devices for production of freshwater. - Parts for filters and purification equipment mainly used for treating wastewater. - Parts for aerators designed to be used for environmental purposes, such as providing aeration to promote the biological oxidation of wastewaters - Parts for filtering or purifying machinery and apparatus designed to recover refrigerants - Parts for press filters designed to be used for environmental purposes such as waste management - Parts for filtering or purifying machinery and apparatus designed to recycle etching solutions for printed circuit boards - Parts for filtering or purifying machinery and apparatus designed for recycling of liquids with an environmental purpose (such as equipment for alkali recovery of black liquor) - Parts for catalytic converters used in air pollution control. - Parts for dust collection and air purification equipment used in air pollution control. - Parts for gas separation equipment used in air pollution control. - Parts for pneumatic fluid power filters used in air pollution control. - Parts for industrial gas cleaning equipment used in air pollution control. - Parts for electrostatic filters (precipitators) used in air pollution control.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.74	*Machinery for sorting, screening, separating, washing, crushing, grinding, mixing or kneading earth, stone, ores or other mineral substances in solid (including powder or paste) form; machinery for agglomerating, shaping or molding solid mineral fuels, ceramic paste, unhardened cements, plastering materials or other mineral products in powder or paste form; machines for forming foundry molds of sand.*
84.74.20	**Crushing or grinding machines**
Description	This category contains crushing or grinding machines for earth, stone, ores or other mineral substances in solid (including powder or paste) form. Crushers may be used to reduce the size, or change the form, of waste materials so they can be more easily disposed of or recycled, or to reduce the size of a solid mix of raw materials (as in rock ore), so that pieces of different composition can be differentiated. Crushing or grinding machines covered by the category include jaw crushers (mainly used for heavy mining, quarried materials, sand and gravel, recycling), gyratory

[14] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	crushers (mainly used for heavy mining, quarried materials), cone crushers (mainly used for quarried materials, sand and gravel), impact crushers (mainly used for quarried materials, sand and gravel, recycling), roll crushers (used in the cement, chemistry, power station, mines, metallurgy, building materials, refractory and coal mines and other industries), hammer mills (used to shred or crush aggregate material, used in many industries such as fruit juice production, milling of grain, shredding of scrap automobiles, and in waste management), stamping mills (a type of mill machine that crushes material by pounding rather than grinding, either for further processing or for extraction of metallic ores), ball grinders (used to grind materials into extremely fine powder for use in mineral dressing processes, paints, pyrotechnics, ceramics and selective laser sintering), and other machines for crushing or kneading clay for further processing in the ceramics industry.
Assessment of sub-category	Mostly non-EGs
Ex-outs (APEC text)	*Excluding concrete or mortar mixers [M, Au]*
Justification (APEC text)	*Used for solid waste treatment or recycling.* *Waste compactor machines. Used for solid waste treatment or recycling. [S]*
Comment	This sub-category contains a large number of crushing or grinding machines, most of which are used for non-environmental purposes. The ex-out excludes concrete or mortar mixers, but this seems to fall under another sub-category in the HS Code (84.74.30). For this code to refer specifically and only to EGs, it should be followed by ex-outs specifying that it only pertains to crushers, grinders and mills that are designed for waste management purposes. Suggested ex-outs: - Crushing or grinding machines designed for waste management purposes
Assessment of APEC ex-out	APEC ex-out does not ensure only EGs.
84.79	*Machines and mechanical appliances having individual functions, not specified or included elsewhere in this Chapter.*
84.79.82	**Mixing, kneading, crushing, grinding, screening, sifting, homogenising, emulsifying or stirring machines, not elsewhere specified in chapter 84**
Description	This category refers to mixing, kneading, crushing, grinding, screening, sifting, homogenising, emulsifying or stirring machines functioning independently and not mentioned elsewhere in chapter 84 (incl. in 84.74.20, described above). This includes mixing, kneading, crushing, grinding, screening, sifting, homogenising, emulsifying or stirring machines that are not designed for treatment of specific goods or for use in specific industries.
Assessment of sub-category	Mostly non-EGs
Ex-outs (APEC text)	*Waste sorting, screening, crushing, grinding, shredding, washing and compacting devices. Agitator for wastewater treatment; flash mixer and flocculator. [Ca, J, NZ, K, US, CT]* *Other machines and mechanical appliances: Mixing, kneading, crushing, grinding, screening, sifting, homogenising, emulsifying or stirring machines. [Au]*

	Waste compactor machines [BD] *Waste sorting, screening, crushing, grinding, shredding, washing and compacting devices. Agitator for wastewater treatment; flash mixer and flocculator. [Au]*[15] *Dosing and mixing equipment for water treatment (ex-84798200); Recycling equipment for waste plastics /rubber /broken tire (84798200) [Ch]*[16]
Justification (APEC text)	*Used to prepare waste for recycling; mixing of wastewater during treatment; preparing organic waste for composting; (composting can minimise the amount of waste going to landfill as well as recovering the valuable nutrient and energy content of the waste). [Ca, J, NZ, K, CT, Au]* *Used to prepare waste for recycling; removing or shredding the rags and debris typically found in wastewater; mixing of wastewater during treatment; preparing organic waste for composting (composting can minimise the amount of waste going to landfill as well as recovering the valuable nutrient and energy content of the waste). [US, BD]* *Waste separator machines. Prepares waste for recycling; separating waste allows for more efficient treatment of each type; for example, separating organic waste allows for composting, which minimises the amount of waste going to landfill as well as recovering the valuable nutrient and energy content of the waste). [S]* *These equipments are used to release and mix medicament, which is an essentical step of putting flocculant in wastewater in water treatment industry. These equipments are designed for recycling waste tires. [Ch]*
Comment	This category contains a large number of machines not designed for environmental purposes, but some of which may be primarily used for environmental purposes as exemplified in the ex-outs. Suggested ex-outs: - Waste sorting, screening, crushing, grinding, shredding, washing and compacting devices. - Agitator for wastewater treatment; flash mixer and flocculator. - Waste compactor machines. - Waste sorting, screening, crushing, grinding, shredding, washing and compacting devices. - Dosing and mixing equipment for water. - Recycling equipment for waste plastics /rubber /broken tire.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.79.89	**Other machines & mechanical appliances with individual functions, not specified or included elsewhere in this chapter.**
Description	This sub-category refers to machines and mechanical appliances having individual functions not mentioned elsewhere in chapter 84, category 84.79, and the sub-categories 84.79.81 (other machines and mechanical appliances for treating metal incl. electric wire coil-winders) and 84.79.82 (other mixing/ kneading/ crushing/ grinding/ screening/ sifting/ homogenising/ emulsifying/ stirring machines – ref. above). The content of this omnibus sub-category may vary substantially between different countries. The APEC-list shows that in the Chinese Customs Tariff, this sub-category *inter alia* contains Air Humidifiers Or Dehumidifiers (84.79.89.20), Machines For Squeezing Radioactive Waste (84.79.89.50), Suction Machines, Mud

[15] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.
[16] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	Scrapers, Sand suction machines, Trash compactors, Vacuum extruders for making hollow brick with gangue and fly ash, and (Fan) muffler (ex-84.79.89.99). In the Norwegian Customs Tariff, this sub-category is broken down into four items; Steering machines and apparatus (84.79.89.01), Z-drive assemblies for boats (vessels), whether or not presented with an inboard engine (84.79.89.02), Self-propelled rotary snow cutters (84.79.89.03) and Other machines and apparatus not mentioned elsewhere (84.79.89.09).
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Optional ex-outs may include; trash and other waste presses; shredders; dust collection and storage devices; water and wastewater collecting and sampling equipment; chlorine generators; equipment for solid/liquid separation; flocculation or thickening of sewage sludge; machinery and apparatus for landfill gas monitoring; anaerobic digesters for treatment of organic waste including production of biogas; machinery and apparatus for landfill leachate treatment; machinery, apparatus and vehicles for composting; soil sampling equipment; soil remediation equipment; machines and appliances for oil spill recovery; and aquatic weed harvesters. [US, CT]* *Excluding machines and mechanical appliances used as components in motor vehicles. [Au]* *Air Humidifiers Or Dehumidifiers (84798920); Machines For Squeezing Radioactive Waste (84798950); Suction Machine; Mud Scraper; Sand suction machine; Trash compactor; Vacuum extruder for making hollow brick with Gangue and fly ash; (Fan) muffler (ex-84798999) [Ch]*[17]
Justification (APEC text)	*Machines and appliances designed for a wide range of areas of environmental management including waste, waste water, drinking water production and soil remediation. In-vessel composting systems can handle large amounts of waste and speed up decomposition. Trash compactors reduce the volume of solid waste, allowing more efficient transport and disposal.* *Very broadly, products under HS847989 are machines and appliances designed for a wide range of areas of environmental management, including waste, waste water, drinking water production and soil remediation. [S]* *Parts to ensure the balance of indoor humidity. Travelling suction dredgers are designed for sevage treatment plants and horizontal sedimentation tanks of waterworks. These machines can scrape and assemble the sludge to the mouths of their pumps and remove it from sewage tank whithout stop. [Ch]*
Comment	84.79.89 is an open omnibus item containing machines and mechanical appliances not mentioned elsewhere in chapter 84 of which some may be considered to be EGS and others may not. Suggested ex-outs: - Trash and other waste presses; shredders; dust collection and storage devices. - Water and wastewater collecting and sampling equipment. - Chlorine generators - Equipment for solid/liquid separation; flocculation or thickening of sewage sludge. - Machinery and apparatus for landfill gas monitoring.

[17] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	- Machinery and apparatus for landfill leachate treatment - Anaerobic digesters for treatment of organic waste including production of biogas. - Machinery, apparatus and vehicles for composting. - Soil sampling equipment; soil remediation equipment. - Machines and appliances for oil spill recovery.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
84.79.90	**Parts**
Description	This sub-category consists of parts for machines and mechanical appliances of category 84.79 ("Machines and mechanical appliances having individual functions, not specified or included elsewhere in this Chapter").
Assessment of sub-category	Mostly non-EGs
Ex-outs (APEC text)	*Parts for 847982x and 847989x. [US, CT]* *Excluding machines and mechanical appliances used as components in motor vehicles. [Au]* *Parts Of Air Humidifiers Or Dehumidifiers (84799020) [Ch]*[18]
Justification (APEC text)	*See the environmental benefit under 847989 [Ca, J, NZ]* *Parts for aforementioned goods/ex-outs of heading 8479. [US]* *Parts thereof waste separator/ compactor machines. Parts used for the maintenance and repair of waste separators and compactor machines, with the attendant benefits, for example, membrane systems which can be assembled to recover resources from waste. [S]* *Parts to ensure the balance of indoor humidity [Ch]*
Comment	This sub-category consists of parts for machines and mechanical appliances of category 84.79, many of which are not EGs (ref. description of 84.79.82 and 84.79.89 above). Suggested ex-outs (parts for suggested ex-outs in .82 and .89 above): - Parts for waste sorting, screening, crushing, grinding, shredding, washing and compacting devices. - Parts for agitator for wastewater treatment; flash mixer and flocculator. - Parts for waste compactor machines. - Parts for waste sorting, screening, crushing, grinding, shredding, washing and compacting devices. - Parts for dosing and mixing equipment for water. - Parts for recycling equipment for waste plastics /rubber /broken tire. - Parts for trash and other waste presses; shredders; dust collection and storage devices. - Parts for water and wastewater collecting and sampling equipment. - Parts for chlorine generators. - Parts for equipment for solid/liquid separation; flocculation or thickening of sewage sludge. - Parts for machinery and apparatus for landfill gas monitoring. - Parts for machinery and apparatus for landfill leachate treatment. - Parts for anaerobic digesters for treatment of organic waste including production of biogas.

[18] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	- Parts for machinery, apparatus and vehicles for composting. - Parts for soil sampling equipment; soil remediation equipment. - Parts for machines and appliances for oil spill recovery.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.

The content of the 'Electrical Machinery' codes (11)

85	***Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles***
85.01	*Electric motors and generators (excluding generating sets)*
85.01.64	**AC generators (alternator): Of an output exceeding 750 kVa**
Description	An alternator is an electromechanical device that converts mechanical energy to electrical energy in the form of alternating current. The main purpose of small alternators is to charge batteries in vehicles. Large ones have a wider area of application, like wind generators, hydro power stations, conventional power production based on fossil fuels, hybrid marine propulsion systems and back pressure steam systems etc.
Assessment of sub-category	Mostly contains non-EGs
Ex-outs (APEC text)	*To be used with turbines and generators in combination to produce electricity from renewable energy fuels [BD]*
Justification (APEC text)	*Used in conjunction with boiler and turbines (also listed under 840681 and 840682) to generate electricity in renewable energy plants. Must use these turbines and generators in combination to produce electricity from renewable fuels (e.g., biomass). Size is "exceeding 750 kVA." [Ca, J, NZ, K, Au, BD]* *Used in conjunction with boiler and turbines to generate electricity in renewable energy plants. Must use these turbines and generators in combination to produce electricity from renewable fuels (e.g., biomass). [US]*
Comment	An alternator is an electromechanical device that converts mechanical energy to electrical energy in the form of alternating current. As the mechanical energy may have been generated by any type of energy source (fossile fuels, biomass, wind energy), an alternator cannot in itself by called an EG. Only alternators specifically designed to be used in renewable energy generation are EGs. Suggested ex-out: - Alternators used in renewable energy generation.
Assessment of APEC ex-out	APEC ex-out ensures only EGs.
85.02	*Electric generating sets and rotary converters*
85.02.31	**Other generating sets: Wind-powered**
Description	With 'generating sets' is to be understood combinations of an electric generator and any type of power machine (such as water- or steam turbines, steam machines, wind machines or combustion engines). This sub-category only contains wind-powered electric generating sets.
Assessment of sub-category	Only contains EGs.
Ex-outs (APEC text)	*Amorphous Transformers [BD]*

Justification (APEC text)	*Electricity generation from a renewable resource (wind). [Ca, J, NZ, US, K, HK, BD]* *For wind turbines. Used to generate electricity from wind power - a form of renewable energy. [S]* *Some heat exchanges are specifically designed for use in relation to renewable energy uses such as geothermal energy. Electricity generation from a renewable source (wind) [M]* *Used to produce electricity from wind energy. [Ch]*
Comment	We consider all wind-powered electric generating sets and rotary converters to be EGs as they make use of renewable energy. Brunei refers to 'Amorphous Transformers' as an ex-out. Amorphous transformers reduce no-load losses of electricity in power stations and thus contribute to energy efficiency. Amorphous transformers do not seem to belong under 85.02.31. - No ex-out necessary as the sub-category as a whole refers to EGs.
Assessment of APEC ex-out	APEC ex-out seems misplaced. No ex-out is needed as code only contains EGs.
85.02.39	**Other generating sets: Other**
Description	Electric generating sets that are not powered by combustion engines and not powered by wind.
Assessment of sub-category	Contains mainly EGs.
Ex-outs (APEC text)	*Optional ex-outs may include: combined heat and power systems using biomass and/or biogas; Portable solar power generation equipment; solar power electric generating sets; Small hydro powered generating plant; Wave power generating plant; and Gas turbine sets for biomass plants [Ca, J, NZ, K] and for waste heat applications [Au]* *Small hydro, ocean, geothermal and biomass gas turbine generating sets. [US]* *For heat recovery systems [BD]* *Biogas generator sets; Gas Generator (ex-85023900) [Ch]*[19]
Justification (APEC text)	*Combined heat and power systems produce usable power (usually electricity) and heat at the same time. Micro combined heat and power systems are very efficient for domestic use, particularly in places where reticulated natural gas and hot water central heating are the norm. 'Distributed generation' also minimises transmission losses through national grids, reducing the need to increase centralised generating capacity and transmission networks. [Ca, J, NZ, K, Au, BD]* *Electricity generation from renewable resources. [US]* *Used to produce electricity from methane. [Ch]*
Comment	This is an omnibus category that mainly seems to include electric generating sets used in combined heat and power systems and electric generating sets driven by renewable energy other than wind. We consider electric generating sets driven by renewable energy and electric generating sets used in combined heat and power systems where the energy source is renewable energy to be EGs. Suggested ex-outs: - Electric generating sets using renewable energy sources other than wind.
Assessment of APEC ex-out	APEC ex-outs ensure only EGs.
85.03	Parts suitable for use solely or principally with the machines of heading 85.01 or

[19] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	85.02
85.03.00	**Parts suitable for use solely or principally with the machines of heading 85.01 or 85.02**
Description	The main volume of parts under this category consists of caps and cases, stators, rotors, concentration rings, accumulators, brush holders, magnetizing coils, and electric plates that are not quadratic or rectangular.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Parts for 850231 and optional ex-out may include: 850239x. [Ca, J, NZ, K, CT, Au]* *Parts for 850231 and optional ex-out may include: 850239x. [S]*[20] *Parts for 850161, 850162, 850163, 850164, 850211x, 850212x, 850213x, 850220x, 850231 and 850239x. [US]* *Combined cycle generator parts [BD]* *Parts of Wind-Powered Electric Generating Sets (85030030) [Ch]*[21]
Justification (APEC text)	*Parts of the generators and generating sets listed under 848340 (for renewable energy systems). Relevant parts include for instance nacelles and blades for wind turbines. [Ca, J, NZ, K, M]* *See environmental benefit under 847989 [CT]*[22] *Parts for aforementioned goods/ex-outs of headings 8501 and 8502. [US]* *Parts of the generators and generating sets listed under HS 850231 (for renewable energy systems). Relevant parts include for instance nacelles and blades for wind turbines. Renewable Energy [S]* *Parts and accessories for electricity generation from renewable resource. [BD]*
Comment	This is an omnibus category of parts for machines of heading 85.01 and 85.02, of which most are not EGs. Parts for 85.02.31 (wind-powered generating sets) are EGs (ref. description above) and parts for 85.02.39 (other generating sets) are mostly EGs (ref. description above). The US ex-out mentions parts for 85.01.61-64 (AC alternators), which may be EGs with the correct ex-outs specifying renewable energy sources (re. above). The US ex-out mentions parts for 85.02.11-13, which is generating sets with compression-ignition internal combustion piston engines (diesel or semi-diesel engines) broken down in three categories according to output kVa. We do not consider these to be EGs. The US ex-out also mentions parts for 85.02.20, which is generating sets with spark-ignition internal combustion piston engines. We do not consider these to be EGs. In the justification section, countries refer to parts for 84.79.89 (Machines and mechanical appliances having individual functions, not specified or included elsewhere in this Chapter: Other machines and mechanical appliances: Other – ref. above) and 84.83.40 (Gears and gearing, other than toothed wheels, chain sprockets and other transmission elements presented separately; ball or roller screws; gear boxes and other speed changers, including torque converters). These include EGs as well as non-EGs. Suggested ex-outs:

[20] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.
[21] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.
[22] The environmental benefits (justification) listed under 84.79.89 is: *Machines and appliances designed for a wide range of areas of environmental management including waste, waste water, drinking water production and soil remediation. In-vessel composting systems can handle large amounts of waste and speed up decomposition. Trash compactors reduce the volume of solid waste, allowing more efficient transport and disposal.*

	- Parts for machines used in energy conversion processes based on renewable energy sources - Parts for machines and appliances designed for environmental management, including waste, wastewater, drinking water production and soil remediation.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
85.04	Electrical transformers, static converters (for example rectifiers) and inductors
85.04.90	**Parts**
Description	This sub-category consists of parts for a wide range of electrical transformers, static converters and inductors. A transformer is a device that transforms an alternating current (AC) input voltage into a higher or lower AC output voltage. A wide range of transformer designs is used in electronic and electric power applications. Transformers are essential for the transmission, distribution and utilization of electrical energy. A static converter is an apparatus that allows a single-phase supply to operate a three-phase motor. A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which flows in only one direction. Rectifiers have many uses, but are often found serving as components of DC power supplies and high-voltage direct current power transmission systems. An inductor, also called a coil or reactor, is a passive two-terminal electrical component that resists changes in electric current passing through it. Inductors are widely used in alternating current (AC) electronical equipment, particularly in radio equipment.
Assessment of sub-category	Mainly non-EGs
Ex-outs (APEC text)	*Parts for 850440x.* *Not magnetic ferrite memory [R]*
Justification (APEC text)	*Used to convert DC current from renewable energy generating sets into conventional AC electricity.*
Comment	While electrical transformers, static converters and inductors in some cases are used for renewable energy generation processes, they are most usually employed for other purposes. The ex-out 85.04.40 refers to 'Static converters'. We only consider parts for electrical transformers, static converters and inductors to be EGs if they refer to such apparatus that is mainly used in renewable energy generation. The ex-out 'Not magnetic ferrite memory' refers to a form of computer memory. Suggested ex-out: - Parts for electrical transformers, static converters and inductors designed to be used in renewable energy generation.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
85.14	Industrial or laboratory electric furnaces and ovens (including those functioning by induction or dielectric loss); other industrial or laboratory equipment for the heat treatment of materials by induction or dielectric loss
85.14.10	Resistance heated furnaces and ovens
Description	Electric furnaces and ovens normally consist of more or less closed spaces or compartments in which a high temperature is created. They are used for many purposes, such as smelting, annealing, hardening, enamelling, welding etc. Some of the most important types are retort furnaces, crucible furnaces, and tunnel furnaces.

Assessment of sub-category	Mainly non-EGs
Ex-outs (APEC text)	*Optional ex-outs may include: waste incinerators and heat or catalytic incinerators. [Ca, J, NZ, K, CT, Au]* *Controlled Atmosphere Heat Treatment Furnace (85141010); Industrial / Lab Electric Resistance Heated Furnace (85141090) [Ch]*[23]
Justification (APEC text)	*These products are used to destroy solid and hazardous wastes. Catalytic incinerators are designed for the destruction of pollutants (such as VOC) by heating polluted air and oxidation of organic components.* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences [Ch]*
Comment	This sub-category mainly refers to furnaces and ovens that are not primarily used for environmental purposes. Furnaces and ovens used to destroy solid and hazardous wastes, furnaces used mainly for solar PC production, and catalytic incinerators designed for the destruction of pollutants, qualify as EGs. Suggested ex-outs: - Furnaces and ovens designed for incineration of solid and hazardous waste - Controlled atmosphere furnaces for solar cell substrate heat treatment Incinerators designed for the destruction of pollutants
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
85.14.20	**Furnaces and ovens functioning by induction or dielectric loss**
Description	This includes low- and high frequency induction ovens and dielectric ovens including industrial microwave ovens. Dielectric ovens are used for drying, defrosting, moulding plastics, baking of ceramics etc. Some ovens use more than one type of heating (such as high- and low frequency induction or resistance for smelting of metals etc.). This includes ovens for baking bread, cakes or biscuits, ovens for dental use, cremation ovens, ovens of incineration of waste, and ovens for annealing or hardening of glass.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Optional ex-outs may include: waste incinerators and heat or catalytic incinerators. [Ca, J, NZ, K, CT, Au]*
Justification (APEC text)	*These products are used to destroy solid and hazardous wastes. Catalytic incinerators are designed for the destruction of pollutants (such as VOC) by heating polluted air and oxidation of organic components.* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category mainly refers to furnaces and ovens functioning by induction or dielectric loss that are not primarily used for environmental purposes. Furnaces and ovens used for incineration of waste and catalytic incinerators designed for the destruction of pollutants, qualify as EGs. Suggested ex-outs: - Furnaces and ovens designed for incineration of waste - Incinerators designed for the destruction of pollutants - Controlled atmosphere furnaces for solar cell substrate heat treatment
Assessment of	APEC ex-outs do not ensure only EGs.

[23] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

APEC ex-out	
85.14.30	**Other furnaces and ovens**
Description	This includes inductive or dielectric apparatus for heating (such as microwave equipment), even if they don't have the shape of an oven. This is mainly electric equipment employing high frequencies usually employed for heat treatment of smaller articles, fixed to sheets and reels customized to the articles that are to be treated. This includes for instance, machines for hardening of crankshafts, cylinders, gear wheels, and machines for drying of wood. This sub-category also includes ovens and other apparatus especially constructed for pyro-metallurgical separation of irradiated fuel, apparatus for treatment of radioactive waste, and apparatus used for slagging or heat treatment of fissile material recovered for recycling.
Assessment of sub-category	Mainly non-EGs.
Ex-outs (APEC text)	*Optional ex-outs may include: waste incinerators and heat or catalytic incinerators. [Ca, J, NZ, US, K, CT, Au]*
Justification (APEC text)	*Catalytic incinerators are designed for the destruction of pollutants (such as VOC) by heating polluted air and oxidation of organic components. [Ca, J, NZ, K, CT, Au]* *These products are designed for the destruction of pollutants (such as VOCs) embedded in solid and hazardous wastes. Pollutants are destroyed by heating polluted air and oxidizing organic components. [US]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category mainly refers to furnaces and ovens that are not primarily used for environmental purposes. Furnaces and ovens used for incineration of waste, catalytic incinerators designed for the destruction of pollutants. Furnaces and ovens especially constructed for pyro-metallurgical separation of irradiated fuel, apparatus for treatment of radioactive waste, apparatus used for slagging or heat treatment of fissile material recovered for recycling, qualify as EGs. Furnaces and ovens used for incineration of waste and catalytic incinerators designed for the destruction of pollutants, which apparently may occur in this category according to APEC, also qualify as EGs. Suggested ex-outs: - Furnaces and ovens especially constructed for pyro-metallurgical separation of irradiated fuel. - Apparatus for treatment of radioactive waste. - Apparatus used for slagging or heat treatment of fissile material recovered for recycling. - Furnaces and ovens designed for incineration of waste. - Incinerators designed for the destruction of pollutants.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
85.14.90	**Parts**
Description	Parts for industrial or laboratory electric furnaces and ovens (including those functioning by induction or dielectric loss); other industrial or laboratory equipment for the heat treatment of materials by induction or dielectric loss. Examples of parts are fittings, doors, inspection hatches, tables, glass cases, electrode holders, and metal electrodes.
Assessment of sub-category	Mainly non-EGs.
Ex-outs (APEC text)	*Optional ex outs include: Parts for 851410x, 851430x and 851430x. [Ca, J, NZ, K, CT, Au]*

	Parts for 851410, 851420 and 851430. [US]
Justification (APEC text)	*Parts for the equipment listed will facilitate the destruction of pollutants (such as VOC) by heating polluted air and oxidation of organic components. [Ca, J, NZ, K, CT, Au]* *Parts for aforementioned goods of heading 8514. [US]*
Comment	This sub-category mainly refers to parts for furnaces and ovens (incl. those functioning by induction or dielectric loss) that are not primarily used for environmental purposes. Pats for the ex-outs specified for 85.14.10, 85.14.20, and 85.14.30 specified above, qualifies as EGs. Suggested ex-outs: - Parts for furnaces and ovens especially constructed for pyro-metallurgical separation of irradiated fuel, - Parts for apparatus for treatment of radioactive waste, - Parts for apparatus used for slagging or heat treatment of fissile material recovered for recycling, qualify as EGs. - Parts for furnaces and ovens designed for incineration of waste - Parts for incinerators designed for the destruction of pollutants - Parts for controlled atmosphere furnaces for solar cell substrate heat treatment
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
85.41	Diodes, transistor and similar semiconductor devices; photosensitive semiconductor devices, including photo-voltaic cells whether or not assembled in modules or made up into panels; light emitting diodes; mounted piezo-electric crystals.
85.41.40	Photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes
Description	The main types of photosensitive semiconductor devices are: Photoconductive cells (used in cameras, for precision measurements, automatic door opening systems etc.) and photovoltaic cells (often used in light measurement equipment and in communication systems using fibre optics etc.). There are several sub-categories of photovoltaic cells, one of which is silicon-based solar cells. Light emitting diodes are components transforming electric energy into visible, infrared or ultraviolet rays. They are for instance used to show or send data in control systems. Light emitting diodes also include laser diodes, which are used for measuring height and distance, and in communication systems with fibre optics. By volume, light emitting diodes (LEDs) main use today is for a variety of energy efficient lighting purposes.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Photovoltaic cells, modules and panels. [Ca, J, NZ, US, K, HK, CT, Au, BD]* *Photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes [M]* *Solar Cells (85414020) [Ch]*[24]
Justification (APEC text)	*Solar photovoltaic cells generate electricity in an environmentally benign manner (with no emissions, noise or heat generated). They are particularly suited to electricity generation in locations remote from an electricity grid. [Ca, J, NZ, US, K, CT, Au, Th. M, BD]*

[24] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	Generate electricity in an environmentally sound manner (with no emissions or noise generated). [S] *Solar batteries are eco-friendly (emission-free, noiseless, non-hear generation) and are especially applicable for power supply in remote area. [Ch]*
Comment	This sub-category contains a wide variety photosensitive semiconductor devices and light emitting diodes, most of which are not EGs. One sub-category of photosensitive semiconductor device is silicon-based solar cells, which qualifies as an EG as it enables solar energy production. A (large) subcategory of light emitting diodes is used for very energy efficient lighting purposes, and can, as such, be considered a category of EGs. Suggested ex-outs: - Silicon-based solar cells. - Light emitting diodes for ordinary lighting purposes
Assessment of APEC ex-out	APEC ex-outs ensure only EGs.
85.43	Electrical machines and apparatus, having individual functions, not specified or included elsewhere in this Chapter
85.43.90	**Parts**
Description	This is parts for electrical machines and apparatus with individual functions not mentioned elsewhere in Chapter 85. This includes parts for i) particle accelerators (mainly used in nuclear research), ii) signal generators, iii) mine detectors, iv) mixing units used in recording, v) silencers, vi) defrosters and mist removers with electric resistance, vii) synchronizers, viii) electric ignition apparatus for mines, ix) high- or medium frequency amplifiers, x) machines and apparatus for galvanization or electrolysis, xi) equipment for ultraviolet radiation for industrial use, xii) electric apparatus for production and dispersal of ozone (for instance for industrial use), xiii) electronic musical modules that are built into different products, xiv) impulse units for electrical fences, xv) wireless infrared equipment for remote control of electrical equipment, xvi) electro-luminescent equipment, xvii) digital flight recorders.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Parts for 854389x. [Ca, Ja, NZ, K, CT, Au]*
Justification (APEC text)	*Water disinfection.* *Parts thereof UV disinfection ozonisers. Parts used in maintenance and repair of the UV disinfection instruments.* *UV light is extremely effective in killing and eliminating bacteria, yeasts, viruses, moulds and other harmful organisms. UV systems can be used in conjunction with sediment and carbon filters to create pure drinking water. Water disinfection Ozone (O3) can be used as an alternative to chlorine for water disinfection. [S]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category consists of parts for equipment that is mainly non-EGs. The ex-out code 85.43.89 simply refers to 'Other' (than the ones listed already in category 85.43). The APEC list indicates that APEC countries under this heading include parts for apparatus for UV disinfection (where ultraviolet light is used to kill microorganisms) that can be used for food, air and water purification. This qualifies as an EG. Suggested ex-out:

	- Parts for apparatus using UV light for disinfection
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.

The content of the 'Instrument' codes (19)

90	*Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments, parts and accessories thereof*
90.13	*Liquid crystal devices not constituting articles provided for more specifically in other headings; lasers, other than laser diodes; other optical appliances and instruments, not specified or included elsewhere in this Chapter*
90.13.80	**Other devices, appliances and instruments**
Description	This sub-category consists of devices, appliances and instruments that belong to 90.13 and that are not 90.13.10 (telescopic sights for fitting to arms; periscopes; telescopes) and not 90.13.20 (lasers, other than laser diodes). This includes liquid crystal displays (often used in computer monitors, televisions, instrument panels etc.), magnifying glasses, peepholes for doors, binoculars that are parts of instruments belonging to other sub-categories in this chapter (such as instruments for land surveying), fiberscopes for industrial use, stereoscopes, kaleidoscopes (not toys), special glass mirrors that have been optically adapted (for instance certain types of rear-view mirrors, mirrors for inspection of chimneys or pipes), optical signal apparatus using rays of light (for instance used for sending in Morse code over longer distances), apparatus for viewing slides that includes a simply magnifying lense.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Solar heliostats.*
Justification (APEC text)	*Heliostats orient mirrors in concentrated solar power systems to reflect sunlight on to a CSP receiver.*
Comment	This sub-category mostly consists products that are not used for environmental purposes, but in some cases this type of products may be especially designed for use in processes that can be considered environmentally friendly (such as solar energy production). Suggested ex-outs: - Solar heliostats: mirrors with solar tracking mechanism.
Assessment of APEC ex-out	APEC ex-out ensures only EGs.
90.13.90	**Parts and accessories**
Description	This sub-category consists of parts and accessories for 90.13.10 (telescopic sights for fitting to arms; periscopes; telescopes), 90.13.20 (lasers, other than laser diodes), and 90.13.80 (described above).
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Parts for solar heliostats*
Justification (APEC text)	*Heliostats orient mirrors in concentrated solar power systems to reflect sunlight on to a CSP receiver.*
Comment	This category mostly consists products that are not used for environmental purposes, but in some cases this type of products may be especially designed for use

	in processes that can be considered environmentally friendly (such as solar energy production). Suggested ex-outs: - Parts for solar heliostats (mirrors with solar tracking mechanism). - Parts for appliances and instruments especially designed to be used for environmental purposes (such as renewable energy production or waste management).
Assessment of APEC ex-out	APEC ex-out ensures only EGs.
90.15	Surveying (including photogrammetrical surveying), hydrographic, oceanographic, hydrological, meterological or geophysical instruments and appliances, excluding compasses; rangefinders
90.15.80	Other instruments and appliances
Description	This sub-category consists of instruments and appliances that belong to 90.15 and that are not 90.15.10 (rangefinders), 90.15.20 (theodolites and tachymeters), 90.15.30 (levels), 90.15.40 (photogrammetraical surveying instruments and appliances). This includes certain oceanographic or hydrological instruments (with (blade) wheels for measuring the speed of currents, instruments for registering high- or low tide), and certain meteorological instruments of a number of types: i) wind direction indicators, ii) wind speed measurement apparatus – not anemometers (using fans and employed for measuring air currents in tunnels etc.), iii) evaporation measurements instruments, iv) appliances for registering sunshine (with glass bowl, light sensitive paper etc.), v) instruments for measuring the speed and movement of clouds, vi) instruments for measuring the hight-above-ground of clouds, vii) instruments for measuring visibility, viii) appliances for measuring rainfall, ix), instruments for measuring the intensity of solar and other atmospheric radiation, x) measuring instruments and appliances that are used in a way where they are fixed to a balloon or parachute, xi) theodolites for registration of the position of balloons used for registration and measurement purposes. It also includes geophysical instruments: i) Seismometers and seismographs (used for registration of earthquakes and when surveying for oil), ii) magnetic or gravimetric geophysical instruments used when surveying for mineral ores or oil, electronic magnetic gradiometers that measures the magnetic field of the earth, acoustic scanning equipment used for measuring drilling holes, v) apparatus used for assessing the gradient of a drilling hole.
Assessment of sub-category	Mostly contains non-EGs.
Ex-outs (APEC text)	
Justification (APEC text)	*Includes instrument and appliances necessary for measuring the ozone layer and to monitor, measure and assist planning for natural risks such as earthquakes, cyclones, tsunamis etc.*
Comment	This sub-category includes a wide variety of instruments and appliances used for surveying that generally are not used specifically for environmental purposes. The instruments provide data about the natural environment, and this data may be used for environmentally beneficial or harmful purposes. Unless instruments in this category are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as monitoring of the ozone layer or renewable (e.g. hydro, wind, solar, tidal, wave) energy production), we do not consider them to be EGs. While instruments used in forecasting and planning for

	natural disasters are certainly important, we do not consider them to be EGs in a strict sense. The sub-category contains instruments and appliances that are used in mineral and petroleum exploration. Suggested ex-outs: - Instruments and appliances used mainly for measuring pollution. - Instruments and appliances used mainly in connection with renewable energy generation.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.26	Instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases (for example flow meters, level gauges, manometers, heat meters), excluding instruments and apparatus of heading 90.14, 90.15, 90.28 0r 90.32
90.26.10	For measuring or checking the flow or level of liquids
Description	The flow measuring apparatus is used for measuring the speed of currents (in volume or weight per time unit) in open systems (rivers, canals etc.) or in closed systems (pipes etc.). This sub-category does not include such instruments with (blade) wheels, which are included in 90.15.80 (ref. above). The level measurement apparatus comes in many types; flotation measurement appliances, pneumatic or hydrostatic instruments measuring the level in pressure tanks, level indicators for steam boilers that show the levels for the water and the stream, and electric level measurement instruments.
Assessment of sub-category	Mostly contains non-EGs.
Ex-outs (APEC text)	*Air quality monitors; and dust emissions monitors. [Ca, J, NZ, K]* *Excluding gauges of a kind used as components in motor vehicles. [Au]* *Air quality monitoring; automated air quality monitoring [BD]*
Justification (APEC text)	*Monitors to measure air pollution; basis for possible correcting measures (notably in view of health effects). [Ca, J, NZ, K]* *Meters, which check and record the level and/or flow of liquids or gases, are routinely used during complex auditing and testing to ensure the efficient operation of environmental systems such as water and wastewater treatment plants, air pollution control systems, and hydroelectric facilities. [US, CT, Au, BD]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category includes a wide variety of instruments and appliances used for measuring the flow or level of liquids, which generally are not used specifically for environmental purposes. Unless instruments in this category are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as air pollution monitoring, wastewater management or hydrological energy production), we do not consider them to be EGs. Suggested ex-outs: - Instruments and apparatus used for measuring pollution - Instruments and appliances used mainly for wastewater management - Instruments and apparatus used mainly for hydroelectric energy generation.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.26.20	**For measuring or checking pressure**
Description	This sub-category includes liquid manometers (containing mercury, water or other

	fluids that does not mix), metal manometers (containing elements that are pressure sensitive, such as membranes), piston manometers, electric manometers, and vacuum measurers. It also includes maximum and minimum manometers, as well as differential manometers.
Assessment of sub-category	Mostly contains non-EGs.
Ex-outs (APEC text)	*Excluding gauges of a kind used as components in motor vehicles. [Au]*
Justification (APEC text)	*Manometers (devices that measure pressure) are used in power plants, water delivery systems, and other applications such as monitoring indoor air. There are two principal types: digital manometers and tube manometers, both of which have important environmental applications. [Ca, J, NZ, US, K, CT, Au]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category includes a wide variety of instruments and apparatus used for measuring or checking pressure, which generally are not used specifically for environmental purposes. Unless instruments in this category are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as pollution monitoring, wastewater management or renewable energy production), we do not consider them to be EGs. Suggested ex-outs: - Instruments and apparatus used mainly for measuring pollution - Instruments and apparatus used mainly for wastewater management - Instruments and apparatus used mainly for renewable energy generation.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.26.80	Other instruments and apparatus
Description	This sub-category contains instruments and apparatus that are part of category 90.26 and are not included in 90.26.10 and 90.26.20 (ref. above). This includes heat measurers, such as used in hot water facilities and small heat measurers installed on radiators in compartment buildings in order to ensure a just division of costs.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Excluding gauges of a kind used as components in motor vehicles. [Au]*
Justification (APEC text)	*These instruments include heat meters that are used to monitor and measure the distribution of heat from geothermal or biomass district heating systems. [Ca, J, NZ, US, K, CT, Au]*
Comment	This sub-category includes instruments and apparatus used for measuring heat, which generally are not used specifically for environmental purposes. Unless instruments in this category are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as district heating from renewable energy sources such as biomass or geothermal), we do not consider them to be EGs. Suggested ex-outs: - Instruments and apparatus used in district- and domestic heating systems, which encourage energy saving.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.26.90	Parts and accessories
Description	This sub-category contains parts and accessories for 90.26.10, 90.26.20 and

	90.26.80, which are described above. It also includes special types of registration devices to be used with such products. It also includes anemometers, air current measurement appliances using fans, employed for measuring air currents in tunnels etc.).
Assessment of sub-category	Mostly contains non-EGs.
Ex-outs (APEC text)	
Justification (APEC text)	*These are parts for the instruments and devices in 9026.10, 9026.20, and 9026.80. [Ca, J, NZ, US, CT, Au, K]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category includes parts and accessories for a vide variety of instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases. Unless the instruments and apparatus are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as air pollution monitoring, wastewater management, renewable energy production or district heating systems using renewable energy sources), we do not consider them to be EGs. Suggested ex-outs: - Parts and accessories for instruments and appliances mainly used for measuring pollution - Parts and accessories for instruments and appliances mainly used for wastewater management - Parts and accessories for instruments and appliances mainly used for renewable energy generation. - Parts and accessories for instruments and appliances mainly used for district heating systems using renewable energy sources.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.27	Instruments and apparatus for physical or chemical analysis (for example, polarimeters, refractometers, spectrometers, gas or smoke analysis apparatus); instruments and apparatus for measuring or checking viscosity, porosity, expansion, surface tension or the like; instruments and apparatus for measuring or checking quantities of heat, sound or light (including exposure meter); microtomes.
90.27.10	**Gas or smoke analysis apparatus**
Description	This sub-category includes a wide variety of gas or smoke analysis apparatus used for analysing inflammable gases (or burnt gases) in coke ovens, gas generators, blast furnaces etc., primarily in order to assess the content of carbon dioxide, carbon monoxide, oxygen, hydrogen, nitrogen, and hydrocarbons. The electric gas or smoke analysis apparatus is mostly used to measure the content of carbon dioxide, carbon monoxide, hydrogen, oxygen, hydrogen, sulphur dioxide and ammonia. This is gas or smoke analysis apparatus used for industrial use (in direct connection with furnaces and gas generators) and not for use in laboratories (which belong to HS category 70.17). This sub-category also includes electronic smoke detectors used in fireplaces and ovens, gas detectors for use in mines and other detectors incl. portable devices for detecting gas in mines and tunnels or detecting leaks in pipes, and apparatus for measuring the dust content in gases.
Assessment of sub-category	Mostly contains non-EGs.

Ex-outs (APEC text)	*Air pollution emission monitoring systems* *Automatic NOX and NO2 sampler and measuring apparatus; Automatic SO2 sampler and measuring apparatus (ex-90271000) [Ch]*[25]
Justification (APEC text)	*Gas analysers are designed to continuously monitor single or multiple gas components, and such an instrument is used to analyse air emissions from automobiles.* *To be used for monitoring / analysing environmental pollution. ii. Gas analysers are designed to continuously monitor single or multiple gas components and such an instrument is used to analyse air/gas emissions. Equipment used in the measurement, recording, analysis and assessment of environmental samples or environmental impact. iv. This Facility can take precautionary measures to control air pollution. [M]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category includes a wide variety of gas and smoke analysis apparatus, which generally are not used specifically for environmental purposes. Unless apparatus in this category is especially designed for use in specific types of process that are generally considered environmentally beneficial (such as pollution monitoring), we do not consider them to be EGs. Some smoke or gas analysis apparatus are likely mainly used in industries with huge environmental impact, such as the mining industry. Suggested ex-out: - Gas or smoke sampler and/or analysis apparatus especially designed for measuring environmental pollution.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.27.20	**Chromatographs and electrophoresis instruments**
Description	Chromatographs are instruments used to separate and analyse the contents of gases or liquids. Chromatographs can be used for many different purposes, such as to determine the level of pollutants in water supplies, to purify chemicals needed to make a product in a manufacturing plant, a pharmacist may use it to determine the amount of each chemical found in each product, it can be used in hospitals to detect alcohol levels in a patient's blood stream, and it may be used in crime scene investigations. Electrophoresis instruments are used to analyse different solutions (proteins, amino acids etc.), to investigate substances (such as plasma, hormones, enzymes, viruses etc.) or to study polymerisation phenomena.
Assessment of sub-category	Mainly non-EGs.
Ex-outs (APEC text)	
Justification (APEC text)	*Gas and liquid chromatographs use an analytical method where a physical separation of the sample components occurs prior to detection. These instruments can be use to monitor and analyse air pollution emissions, ambient air quality, water quality, etc. Electrophoresis instruments can be used to monitory and analyse materials such as particulates emitted from incinerators or from diesel exhaust.* *DNA Sequencers, Polymerase Chain Reaction (PCR) Systems. Thermal cyclers serving*

[25] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	multiple environmental purposes, for example: Environmental Monitoring, Waste Management, Water Treatment, Pollution Remediation, Renewable Energy, Natural Resources Protection, Endangered Species Protection, Genetically Modified Organisms (GMO) Detection [S]
Comment	This sub-category includes advanced instruments, which generally are not used specifically for environmental purposes. Unless instruments in this category are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as pollution monitoring, wastewater treatment, waste management, renewable energy production etc.), we do not consider them to be EGs. According to our knowledge, there are no such instruments specifically designed to be used for protection of natural resources (other than monitoring pollution) of for protection of endangered species. Suggested ex-outs: - Chromatographs and electrophoresis instruments designed for use in monitoring of pollutants - Chromatographs and electrophoresis instruments designed for use in wastewater treatment - Chromatographs and electrophoresis instruments designed for use in waste management
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.27.30	**Spectrometers, spectrophotometers and spectrographs using optical radiations (UV, visible, IR)**
Description	A spectrometer (spectrophotometer, spectrograph or spectroscope) is an instrument used to measure properties of light over a specific portion of the electromagnetic spectrum, typically used to identify materials. These instruments operate over a very wide range of wavelengths, from gamma rays and X-rays, ultraviolet (UV) light and into the far infrared (IR). If the instrument is designed to measure the spectrum in absolute units rather than relative units, it is typically called a spectrophotometer. Spectrometers are used in scientific research in many research fields, such as astronomy (where it the most used equipment beside the telescope), biology, physics, chemistry, medicine, forensics, and also in many industries.
Assessment of sub-category	Mostly contains non-EGs.
Ex-outs (APEC text)	
Justification (APEC text)	*Spectrometers are used in a wide range of environmental applications, including to identify and characterise unknown chemicals and in environmental applications to detect toxins and identify trace contaminants. They are also used for qualitative and quantitative analysis inter alia in quality control departments, environmental control, water management, food processing, agriculture and weather monitoring.* *Used in a wide range of environmental applications, including identification of unknown chemicals, toxins and trace contaminants. Also used for qualitative and quantitative analysis in quality control departments, environmental control, water management, food processing, agriculture and weather monitoring. [S]*
Comment	This sub-category includes advanced instruments that generally are not used specifically for environmental purposes. Unless instruments in this category are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as pollution monitoring), we do not consider them

	to be EGs. We do not consider spectrometers used in various quality control processes that are not explicitly environmental to be EGs. We don't consider spectrometers used in weather monitoring to be EGs. Suggested ex-outs: - Spectrometers, spectrophotometers and spectrographs designed especially for use in environmental monitoring
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.27.50	**Other instruments and apparatus using optical radiations (UV, visible, IR)**
Description	This sub-category includes *inter alia* polarimeters and photometers. Polarimeters are used to identify specific molecular properties, mainly in the chemical industry and in food, beverage and pharmaceutical industries. Photometers are instruments for measuring light intensity. Photometers are widely used for different optical processes and analyses, such as for determining the degree of colour concentration, the degree of transparency or brightness, the exponential levels of photographic plates or films (densitometers), the colour intensity of different transparent or non-transparent substances or solutions.
Assessment of sub-category	Mainly non-EGs.
Ex-outs (APEC text)	*Automatic on-line monitor on UV absorption water quality; Automatic infrared oil content analyzer (ex-90275000) [Ch]*[26]
Justification (APEC text)	*These instruments can be used for chemical, thermal, or optical analysis of samples, including water quality photometers which are used to determine the concentration of a solution from its colour intensity. [Ca, J, NZ, CT, Au, K]* *These instruments can be used for chemical, thermal, or optical analysis of samples, including water quality photometers which are used to determine the concentration of a solution from its colour intensity. Exposure meters are used, inter alia, to control light sources and for measurements in agriculture, horticulture, and other natural resources applications. [US]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]* *DNA Sequencers, Polymerase Chain Reaction (PCR) Systems.*
Comment	This sub-category includes advanced instruments using optical radiation that generally are not used specifically for environmental purposes. Unless instruments in this category are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as pollution monitoring), we do not consider them to be EGs. We do not consider such instruments designed to be used in agricultural or horticultural processes and other natural resources applications, to be EGs. We do not consider such instruments designed for use in DNA analysis to be EGs. Suggested ex-outs: - Photometers used for monitoring of pollution/environmental monitoring.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.27.80	**Other instruments and apparatus**

[26] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

Description	This sub-category includes a wide selection of instruments, including instruments for chemical wet analysis assessing organic and inorganic contents of liquids (incl. environmental parameters such as Chemical Oxygen Demand and Total Organic Carbons), apparatus for analysing mineral oils incl. derivates (tar, bitumen), pH measuring instruments, dilatometers (measuring volume changes), refractometers, mass spectrometers and magnetic resonance instruments. A refractometer is a laboratory or field device for the measurement of an index of refraction, and is used for instance in veterinary medicine (to measure plasma protein in a blood sample), in drug diagnostics, in gemology (to help identify gem materials), in home brewing, in the automobile industry (for instance to measure Ph value of coolant oils), and in marine aquariums (to measure the salinity and specific gravity of water). A mass spectrometer is used to determine the elemental or isotopic signature of a sample, the masses of particles and molecules, and to elucidate the chemical structures of molecules. It is used to identify unknown compounds, quantifying the amount of a compound in a sample or studying the fundamentals of gas phase ion chemistry. It is widely used in analytical laboratories that study physical, chemical, or biological properties of compounds. Magnetic resonance instruments are used to retrieve information about the nature and behaviour of materials and products. Using magnetic resonance instruments can provide answers to questions such as "is the fluoride in this toothpaste within regulatory limits?", "how fast can oil be extracted from this rock?", "will this chocolate melt in the mouth?".
Assessment of sub-category	Mostly contains non-EGs.
Ex-outs (APEC text)	*Optional ex-out may include: For analysing noise, air, water and hydrocarbons and heavy metals in soil. [Ca, J, NZ, CT, Au, K]* *Other Mass Spectrograph (90278019); PM10 automatic sampler and measuring apparatus; Automatic ammonia online monitor; Automatic TOD online monitor; Automatic BOD online monitor; Noise spectrum analyzer; Environmental noise monitor (ex-90278099) [Ch]*[27]
Justification (APEC text)	*These instruments include: magnetic resonance instruments which are used in biologic and geologic analysis; and mass spectrometers which are used to identify elements and compounds.* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category includes advanced instruments that generally are not used specifically for environmental purposes. Unless instruments in this category are especially designed for use in specific types of process that are generally considered environmentally beneficial (such as pollution or noise monitoring), we do not consider them to be EGs. Instruments for chemical wet analysis seem to be widely used for environmental monitoring purposes. Suggested ex-outs: - Instruments designed specifically to be used for monitoring of pollution.
Assessment of APEC ex-out	APEC ex-outs ensure only EGs.
90.27.90	**Microtomes; parts and accessories**
Description	This sub-category consists of microtomes as well as parts and accessories for the

[27] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	instruments of category 90.27 (described above). A microtome is a tool used to cut extremely thin slices of material. Important in science, microtomes are used in microscopy, allowing for the preparation of samples for observation under transmitted light of electron radiation.[28]
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Optional ex-outs may include: Parts for 902710 and 902780x. [Ca, J, NZ, K, CT, Au]*
Justification (APEC text)	*These instruments include microtomes which are devices that prepare slices of samples for analysis. Also included here are parts of the instruments classified in 9027 and described above.* *For use with Thermal Cyclers, DNA Sequencers, Polymerase Chain Reaction (PCR) Systems, etc. Thermal Cyclers, Serving multiple environmental purposes, for example: Environmental Monitoring - fast, cost-effective standard for pathogen detection from a broad range of sample types including water, soil, and food; detects pathogen contaminations of both food and environmental surface samples to minimize risks of food borne pathogens to public health; fundamental equipment for surveillance programs monitoring pathogens or viruses that can pose a significant risk to both human and animal health, including both naturally occurring viruses such as strains of influenza or organisms that have potential to be used in bio-terrorism activities, such as anthrax [S]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category includes microtomes and parts and accessories for the advanced instruments of category 90.27, which generally are not used specifically for environmental purposes. Unless the parts and accessories are for instruments that are especially designed for use in processes that are generally considered environmentally beneficial (such as pollution or noise monitoring), we do not consider them to be EGs. We do not consider microtomes to be EGs, unless they are especially designed for use related to environmental analysis and/or pollution monitoring. Suggested ex-outs: - Microtomes especially designed for use related to environmental analysis and/or monitoring of pollution and bio-hazards related to pollution. - Parts and accessories for instruments designed especially to be used for monitoring of pollution and bio-hazards related to pollution.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.31	**Measuring or checking instruments, appliances and machines, not specified or included elsewhere in this Chapter; profile projectors**
90.31.49	**Other optical instruments and appliances; Other**

[28] Vietnam lists the following description in the "HS Code Description" column: *Instruments and apparatus for physical or chemical analysis (for example, polarimeters, refractometers, spectrometers, gas or smoke analysis apparatus); instruments and apparatus for measuring or checking viscosity, porosity, expansion, surface tension or the like; instruments and apparatus for measuring or checking quantities of heat, sound or light (including exposure meters); microtomes: microtomes; parts and accessories [V]*

Description	This sub-category refers to optical instruments and appliances that are not mentioned elsewhere and that are not "for inspecting semiconductor wafers or devices or for inspecting photomasks or reticles used in manufacturing semiconductor services" (90.31.41). This includes instruments such as appliances assisting in improvement of sight, optical comparators (used to inspect manufactured parts), interferometers (used in astronomy, fibre optics, metrology, oceanography, seismology, quantum mechanics, nuclear and particle physics, surface profiling etc.), optical surface testers, apparatus for photographic registration and measurement of profiles and surfaces, optical instruments used for alignment, optical rulers, optical goniometers (instruments that either measures an angle or allows an object to be rotated to a precise angular position – used for instance for direction finding in signals intelligence for military and civil purposes, and among medical practitioners), and profile projectors (used to control the form and dimensions of different products by quality control assessment staff).
Assessment of sub-category	Mostly contains non-EGs.
Ex-outs (APEC text)	*Optional ex-outs include: Profile projectors; Vibrometers; Hand vibration meters. [US] Optical Grating Measuring Device (90314920); Other Optical Instruments & Appliances (90314990) [Ch]*
Justification (APEC text)	*Equipment used in the measurement, recording, analysis and assessment of environmental samples or environmental impact. [Ca, J, NZ, K, CT, Au]* *Profile projectors are used for critical tasks in engineering such as measuring and inspecting high precision, complex parts in many applications and industries.* *Equipment used in the measurement, recording, analysis and assessment of environmental samples or environmental impact. These products include inter alia, items such as vibrometers (that measure vibrations and assess structural and other effects of such vibrations) [US]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This sub-category includes a wide variety of optical instruments and appliances used for measuring and control function, which generally are not used specifically for environmental purposes. Unless these instruments and appliances are especially designed for use in processes that are generally considered environmentally beneficial (such as environmental analyses of samples or pollution monitoring), we do not consider them to be EGs. We do not consider vibrometers, hand vibration meters, grating measuring devices or profile projectors to be EGs, unless they are especially designed for use related to environmental analysis and/or pollution monitoring. Suggested ex-outs: - Optical instruments and appliances for measuring or checking that are especially designed for environmental analysis/pollution monitoring.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.31.80	**Other instruments, appliances and machines**
Description	This is an omnibus category including *inter alia* electrical instruments, appliances and machines used for measurement of ball surfaces, conformators (for use in hat-shops or to conform other shapes), laboratory test apparatus for fuel (especially for gasoline or diesel oil), apparatus for testing of motors for vehicles, sinus-rulers or adjustable tables with sinus-rulers for controlling angles, carpenter's levels, and plumb lines.

Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Optional ex-out may include: Vibrometers, hand vibration meters. [Ca, J, NZ, K, CT, Au]* *Instruments for measuring oxygen in oxygen censer operating with catalytic convertor [Th]*
Justification (APEC text)	*These products include inter alia, items such as vibrometers (that measure vibrations and assess structural and other effects of such vibrations) and electron microscopes for laboratory and testing applications. [Ca, J, NZ, K, CT, Au]* *Air Pollution Control [Th]*
Comment	This omnibus sub-category includes a variety of instruments, appliances and machines used for measuring and control functions, which generally are not used specifically for environmental purposes. Unless these instruments, appliances and machines are especially designed for use in processes that are generally considered environmentally beneficial (such as environmental analyses of samples or pollution monitoring), we do not consider them to be EGs. Test apparatus for fuel or for motors of vehicles, are likely mostly employed for optimization purposes and not for environmental purposes (but the distinction may be difficult to make). We do not consider vibrometers, hand vibration meters, or electron microscopes for laboratory or testing applications to be EGs, unless they are especially designed for use related to environmental analysis and/or pollution monitoring. Generally instruments for measuring oxygen in oxygen censors are used for a variety of purposes, such as in anaesthesia monitors, respirators, in divers' breathing tubes, and in hypoxic air fire prevention systems. We don't consider such oxygen censors EGs. A catalytic convertor is a vehicle emissions control device that converts toxic pollutants in exhaust gas to less toxic pollutants. We thus consider instruments for measuring oxygen in oxygen censers *operating with catalytic convertors*, to be EGs. Suggested ex-outs: - Instruments, appliances and machines that are designed for measuring and control functions related to pollution control.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.31.90	**Parts and accessories**
Description	This sub-category consists of parts and accessories for category 90.31, including the sub-categories described above (90.31.49, 90.31.80), 90.31.10 (Machines for balancing mechanical parts), and 90.31.20 (Test benches). Accessories may be arms for planimeters, racks, or control tables with an indicator board.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Optional ex-out may include: Parts for 903180x. [Ca, J, NZ, US, K, CT, Au]*
Justification (APEC text)	*These are parts for the equipment classified in 9031 and described above. [Ca, J, NZ, K, CT, Au]* *Parts for 903110, 903120, 903149x. [US]* *These instruments are used to measure, record, analyse and assess environmental samples or environmental influences. [Ch]*
Comment	This is a sub-category containing parts and accessories for category 90.31, which contains a variety of instruments, appliances and machines used for measuring and control functions that generally are not used specifically for environmental purposes. We only consider parts and accessories for such instruments, appliances

	and machines that are especially designed for use in processes that are generally considered environmentally beneficial (such as environmental analyses of samples or pollution monitoring) to be EGs. Suggested ex-outs: - Parts and accessories for instruments, appliances and machines that are especially designed for environmental analysis/pollution monitoring/ pollution control.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.32	**Automatic regulating or controlling instruments and apparatus**
90.32.89	Other instruments and apparatus: Other
Description	This sub-category consists of automatic regulating or controlling instruments and apparatus that are not thermostats (90.32.10), manostats (90.32.20) or hydraulic or pneumatic (90.32.81). This includes *inter alia* instruments and apparatus for automatic regulation of flow and depth (of floatation type or with an electrode system), humidistats (controlling humidity), temperature regulators (used in kitchen stoves and percolators), and flow regulators.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Optional ex-outs may include: Heliostats, temperature sensor for solar boiler/water heater; Differential temperature controller for solar boiler/water heater. [Ca, J, NZ, K, Au]* *Light sensor; Sensor (elevators, escalators, etc.) [BD]*
Justification (APEC text)	*These include other automatic voltage and current regulators which have renewable energy applications as well as other process control instruments and apparatus for temperature, pressure, flow and level, and humidity applications. [Ca, J, NZ, K, Au]* *Includes other automatic voltage and current regulators which have renewable energy and smart grid applications, process control instruments and apparatus for temperature, pressure, flow and level, and regulators for humidity applications that help increase energy efficiency. [US, BD]*
Comment	This is a sub-category for automatic regulating or controlling devices not used for measuring temperature (thermostats), pressure (manostats) and that are not hydraulic or pneumatic. This is an omnibus category of devices that are not primarily used for environmental purposes. We only consider the automatic control devices (incl. automatic current and voltage regulators) of this sub-category to be EGs if they are especially designed for use in processes that are generally considered environmentally beneficial (such as renewable energy generation or smart grids - modernized electrical grids integrating information and communications technology). We do not consider light sensors for use in elevators, escalators etc. to be EGs. Suggested ex-out: - Automatic regulating or controlling instruments and apparatus that is especially designed for renewable energy generation or smart grids.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.32.90	**Parts and accessories**
Description	Parts and accessories for automatic regulating or controlling instruments and apparatus of category 90.32, described above.
Assessment of	Mostly non-EGs

sub-category	
Ex-outs (APEC text)	
Justification (APEC text)	*These are the parts for the automatic regulating and control instruments classified in 9032 and described. [Ca, J, NZ, K, CT, Au]* *Parts for aforementioned goods of headings 9032. [US]*
Comment	This is an omnibus category of parts and accessories for automatic regulating or controlling instruments and apparatus that are not primarily used for environmental purposes. We only consider such parts and accessories to be EGs, if they are for automatic control devices that are especially designed for use in processes that are generally considered environmentally beneficial (such as renewable energy generation or smart grids - modernized electrical grids integrating information and communications technology). Suggested ex-outs: -Parts and accessories for automatic regulating or controlling instruments and apparatus that are especially designed for renewable energy generation or smart grids.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.
90.33	**Parts and accessories (not specified or included elsewhere in this Chapter) for machines, appliances, instruments or apparatus of chapter 90**
90.33.00	**Parts and accessories (not specified or included elsewhere in this Chapter) for machines, appliances, instruments or apparatus of chapter 90**
Description	This is an omnibus sub-category of parts and accessories not included elsewhere in this chapter, for the machines, appliances, instruments and apparatus of chapter 90. No positive description of content is provided in the HS Explanatory Notes.
Assessment of sub-category	Mostly non-EGs.
Ex-outs (APEC text)	*Parts of the CH 90 products above, not elsewhere specified. [US]* *For subheading 902140 and 902150 and other [M]*[29]
Justification (APEC text)	*These are the parts and accessories for the products described above. [Ca, J, NZ, CT, Au, M]* *Parts of the CH 90 products above, not elsewhere specified [US]* *Parts used in maintenance and repair of the liquid, electricity, radiation and measurement instruments listed above with the attendant environmental benefits. [S]*
Comment	This is an omnibus sub-category for parts and accessories of optical, photographic, cinematographic, measuring, checking, precisions, medical or surgical instruments and apparatus, clocks and watches, and musical instruments, that are not mentioned elsewhere in chapter 90. We only consider such parts and accessories to be EGs, if they are for machines, appliances, instruments and apparatus that are especially designed for use in processes that are generally considered environmentally beneficial (such as renewable energy generation, waste management, wastewater treatment, pollution monitoring or control, smart grids). Suggested ex-out:

[29] Listed in the column "HS Code Description", but referring to an ex-out and we have therefore placed it here.

	- Parts and accessories (not specified or included elsewhere in this Chapter) ,for machines, appliances, instruments and apparatus in chapter 90, that are especially designed for use in renewable energy generation, waste management, wastewater treatment, pollution monitoring or control, or smart grids.
Assessment of APEC ex-out	APEC ex-outs do not ensure only EGs.

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