Survey on APEC Trade Liberalization in Environmental Services

APEC Group on Services
APEC Committee on Trade and Investment

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Abbreviation

ABTC	APEC Business Travel Card
APEC	Asia-Pacific Economic Cooperation
CAP	Collective Action Plans
CBD	the Convention on Biological Diversity
CPC	Central Product Classification
CTESS	Committee on Trade and Environment in Special Session
CTI	Committee on Trade and Investment
DDA	Doha Development Agenda
EBI	Environmental Business International
EGSA	Environmental Goods and Services Agreement
EVSL	Early Voluntary Sectoral Liberalization
GATS	the General Agreement on Trade in Services
GNP	Gross National Product
GOS	APEC Group on Services
IAP	Individual Action Plan
IAQ	Indoor Air Quality
ITA	Information Technology Agreement
MEAs	Multilateral Environmental Agreements
MEP	Ministry of Environmental Protection
MOFCOM	Ministry of Commerce
NAFTA	the North American Free Trade Agreement
NAICS	North American Industry Classification System
OECD	Organisation for Economic Co-operation and Development
PRCEE	Policy Research Center for Environment and Economy
TfS	Tools for Schools
UN	the United Nations
US	the United States
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	the United Nations Framework Convention on Climate Change
USEPA	the United States Environmental Protection Agency
USITC	the United States International Trade Commission
USTR	the United States Trade Representative
WHO	World Health Organization
WTO	World Trade Organization

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1. Introduction

1.1 Background of the project

Sustainable development and the inseparability of the objectives of development and environmental protection, etc., were presented in Agenda 21 and as part of the Rio Declaration on Environment and Development. They are key global principles and fundamental the United Nations'(UN) objectives. Principle 4 of the Rio Declaration states that "*in order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.*"

Asia-Pacific Economic Cooperation (APEC) follows these principles and all member economies share a commitment to sustainable development and agree that "*member economies should promote the complementary principles of reduction of poverty and improvement of the environment, consistent with Principle 5 of the Rio Declaration,*" and "*the challenge of sustainable development requires integration of an economy and its environment in all sectors and at all levels*", and many times "*affirmed the inseparable linkages between environment protection and economic growth to build enduring foundation for sustainable development in the region*".

All member economies recognize that some environmental problems and aspects of sustainable development issues such as climate change, pollution and waste, and energy consumption present a challenge to us all to cooperate more effectively in dealing with these issues. From the Rio Declaration on Environment and Development, it can also be inferred that cooperation in many fields, such as strengthening endogenous capacity-building, eradicating poverty, regional economy, ecology protection, etc., are necessary requirements for sustainable development.

One of APEC's goals is to achieve trade liberalization within the Asia-Pacific region, which has been emphasized by the leaders and ministers in various declarations and statements. An important aspect of APEC's mandate is progress on trade in services as a key factor in achieving the goal of trade liberalization. The Group on Services has also been discussing the topic of environmental services.

In 2001 in Shanghai, Ministers "*approved and endorsed the Annual Report of the Committee on Trade and Investment (CTI) and the revised/enhanced Collective Action Plans (CAPs) it contains*", and "*directed CTI to continue to give priority in its 2002 work* program, to produce tangible deliverables in CAPs, as envisaged in the Osaka Action Agenda". In 2007, leaders*review and discuss at the 2008 APEC Leader'*

s meeting the progress achieved in the World Trade Organization (WTO) Doha Development Agenda negotiations on the liberalization of trade in environmental goods and services". In the Ministerial Statement in 2007, ministers stressed "*continuing support for the WTO and the multilateral trading system*".

The negotiation of "*the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services*" is progressing in the WTO. In order to be consistent with the principles of the WTO, for many years, APEC has actively made great efforts towards the goal of trade liberalization. Trade liberalization in goods and services mainly includes three types of activities: tariff concessions, reduction and canceling of non-tariff measures, and service market access, etc.. Trade liberalization in services will gradually cut down the restrictions on access to the market for trade in services and confer most-favored-nation treatment and national treatment for service trade.

Trade liberalization and facilitation in environmental services is one of the nine areas of Early Voluntary Sectoral Liberalization (EVSL) carried out by APEC. EVSL includes tax reductions, trade facilitation and economic and technological cooperation. But the actual effects of the EVSL plan are unsatisfactory because of the problems fundamental to the APEC system itself and the voluntary basis for implementation.

In order to further improve the various approaches to liberalizing trade in environmental services within APEC region, it is important to better understand existing practices, such as good practices, facilitating of policy, foreign trade management policies and barriers to trade liberalization. However, sufficient research has not yet to be conducted on trade liberalization in environmental services in APEC region.

1.2 Aims of the project

For this purpose, China proposed a Survey on APEC Trade Liberalization in Environmental Services, which was then endorsed by APEC member economies. This project comprises a survey on trade liberalization in environmental services across APEC economies and the General Agreement on Trade in Services (GATS) modes of supply, and an analysis of the findings. Additionally, it is hoped that through the project relelvant information on trade liberalization trends in environmental services can be shared among APEC members. In the long run, it could also be regarded as a positive response to the challenges of climate change.

In the short-run, general background information could provide APEC economies with a better understanding of trade liberalization in environmental services. The final report, which would benefit both APEC economies' trade and economic development and environment, could also be beneficial to related government agencies, private sector, and academia.

As a long term target, through enhancing the understanding and sharing information of liberalizing trade in environmental services, further trade liberalization and facilitation in environmental services, will also be beneficial to APEC achieving the Bogor Goals.

1.3 Methodology of the project

Considering the difficulties in compiling sta-

tistics and the lack of data on environmental services, the inconsistencies in the definition and classification of environmental services by different economies, as well as the shortage of existing quantitative analysis models, this research project, based on the review of large amounts of literature, begins with a macro-level analysis of the trade liberalization in environmental services. It then provides an in-depth analysis of good practices and trade barriers in environmental services in micro-level research. Finally, comprehensive conclusions are given and relevant suggestions provided.

The research methods applied in this project include: literature review, a survey by questionnaire in APEC economies, and interviews with experts and case studies in China, Korea and the United States. These three economies were selected as they were considered representative of the economies in the APEC region. From an economic development level, we have both developed and developing economies. From a regional angle, we have both Asian and North American economies. Morever, the United States of America is the world's largest economy, and exports and imports environmental services to the rest of the world. Finally, a statistical analysis of the questionnaire results on trade in environmental services by APEC economies has been conducted.

The views and conclusions contained in this report (including, for example, with respect to classification of environmental services) are those of its authors and do not necessarily reflect the views of APEC economies, either individually or as a whole. The report is designed as an input into furthering the APEC Group on Services' work on environmental services.

2. Definition, classification and situation of APEC environmental services

Different APEC economies might have different understandings of environmental services and trade in environmental services. Therefore, it is very important to clarify what the environment is and what environmental services are in this report. Following this, we can begin to understand the situation of APEC environmental services.

2.1 Clarifying the meaning of environment and environmental problems

What does environment mean? In our views, this is a fundamental question that should be answered before discussing environmental services and trade in environmental services.

We propose to move away from the conventional definition of environment to a broader definition distinguishing between the micro level, or indoor-environment and the macro level,or global-environment.

From a systemic point of view, according to the size of the environmental externality in question, we have created an environment spectrum from a micro to a macro level: indoor, outdoor, local, regional, and global environments.

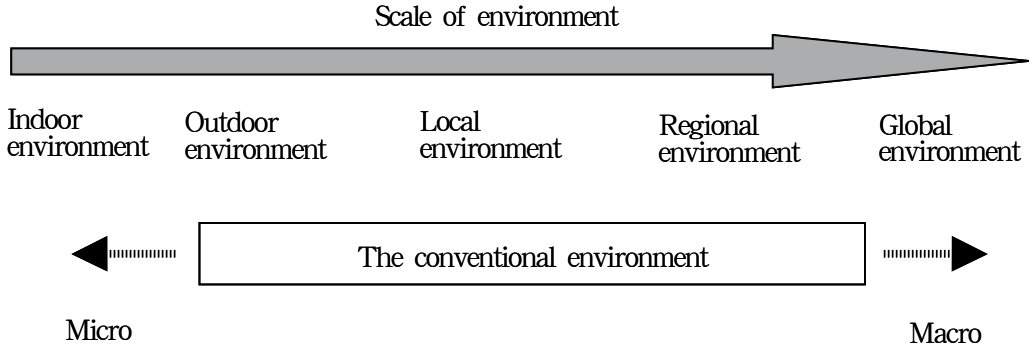

Figure 2.1 The spectrum of the environment

Some of human activities have multiple environmental effects at indoor, local and global levels. For example, coal-fired power plants can emit SO_2, NOx, particulates and CO_2. Some indoor electronic and electrical appliances can result in both indoor pollutants such as VOC as well as global pollutants such as CFC and CO_2. Deforestation can result in both ecosystem degradation and less carbon sequestration. It means indoor-environmental problems, local-environmental problems and global-environmental problems possibly could have same pollution sources of pollution, although they are different problems. Similarly, some services can solve those problems together. For example, energy-saving ventilation service can both improve smog meeting room and emit less CO_2. Renewable energy service for power plants can reduce both SO_2 and CO_2 emissions to gain so-called co-benefits of air pollution control and GHGs emissions reductions.

The spectrum of the environment is shown as the Figure 2.1 above. Based on the above spectrum, we have identified the major environmental problems below.

- Indoor-environmental problems

On average, we spend 70% of our lifetimes indoors. Our indoor-environment is thus directly affected by ourselves. The World Health Organization (WHO) reports most health problems are related to indoor-environmental quality. In this regard, indoor-environmental services can reduce, remove, recover and resolve indoor-environmental problems.

Air pollution such as SOx, NOx from fossil energy usage for cooking and heating are the major pollutants. Particles could reach upto 500mg/m^3 in living rooms and 1000mg/m^3 in kitchens. There are also some other indoor-environmental problems, such as building materials used for house renovations and decoration, furniture and decoration parts that produce VOC pollutants, smoking indoor, indoor water drinking systems and sewage, indoor trash, noise, and radiation, etc..

- Outdoor, locall environmental problems

These are normal environmental problems that we are already aware of. The major problems are air and water pollution, solid wastes and ecosystem degradation, noise and radiation.

- Global-environmental problems

Regional and global-environmental problems have only been recognized over the past few decades. The major problems are climate change, ozone depletion, biodiversity loss,

Persistent Organic Pollutants (POPs), and hazardous waste. Trans-boundary movements of hazardous waste are regulated by Basal Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal (Basal Convention) and there are other Multilateral Environmental Agreements (MEAs) which regulate various other global-environmental problems.

2.2 Redefining environmental services from demand of the environment

According to our survey of APEC economies, different economies have their own understanding and definitions of environmental services. However, most APEC economies agree that environmental services are very difficult to define. Despite different domestic definitions and classifications on environmental services, most APEC economies made their commitments to the WTO using the classification of WTO/120 or Central Product Classification (CPC), i.e., environmental services includes the following subsectors: sewage services (9401), refuse disposal services (9402), sanitation and similar services(9403), and other services (9409).

However, many economies regard the current classification for environmental services in the WTO (GATS W/120) as not adequately reflecting trade in environmental services and related activities. Considerable confusion exists about what is covered by environmental services.

For example, using industry statistics, Canada uses the North American Industry Classification System (NAICS). Though the environmental industry is not specifically defined therein, industries that can be considered environmental services are described. The following is an illustrative list of services included: water sewage and other systems (2213) , utility system construction (2371) , architectural, engineering and related services (5413) , management, and scientific and technical consultancy services (5416) , etc..

Thailand defines and classifies its industries according to the Thailand Standard Industrial Classification (TSIC). Following TSIC, environmental services have the following subsectors: sewage and refuse disposal (90000), sanitation and similar activities, refuse disposal services (90000), architectural and engineering activities, etc..

In Peru, environmental services are defined as natural resources and other environmental components that allow the sustainability of ecosystems and environmental conditions to generate benefits for society such as fresh water protection, biodiversity protection, greenhouse gas (GHG) mitigation and natural landscapes.

Based on this new spectrum of the environment and environmental problems, we therefore redefine environmental services and environmental services trade based on the demands of the environment across the whole spectrum (Please see Figure 2.2 for details):

- Indoor-environmental services: environmental services for improving indoor-environment
- Local environmental services: environmental services for improving outdoor, local and regional environments (conventional ones)
- Global-environmental services: environmental services for improving global-environment

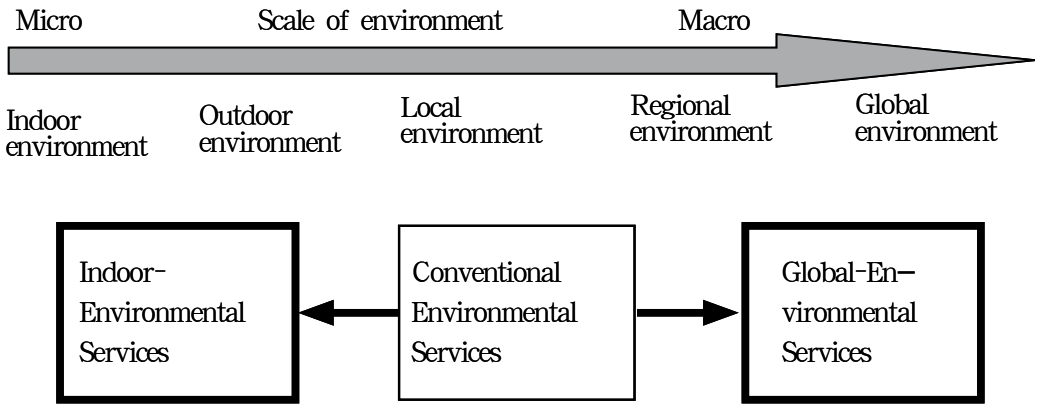

Figure 2.2 Redefining environmental services based on the scale of the environment

This definition, with two more new categories of global-environmental services and indoor-environmental services, is wider than the current definitions used by WTO GATS and CPC.[1] It clearly outlines the human being's demands for the global and indoor-environments. At a micro level, it is coherent with UN Convention on Combating Tobacco; and at a macro level, it is in line the United Nations Framework Convention on Climate Change (UNFCCC), Ozone Depletion Convention, and the Convention on Biological Diversity (CBD), etc. By definition, negotiations about trade in environmental services would also result in coherent coordination with MEAs.

According to our definition, global-environmental services not only protect the global-environment but also promote sustainable development by the means of trade measures at a global level. Local environmental services protect the local environment and promote local sustainable development through trade, the results of which are measurable at local and regional levels. Indoor-environmental services protect the indoor-environment reducing human health problems and promote sustainable development via trade measures at the micro level.

The proposed new classification of environmental services is not to take over the current classification systems of environmental services. Instead, it's a supplementary to the other existing classification systems of CPC.10, OECE/Eurostat, GATS W/120 and EU, from the perspective of demand on 3 layers of environmental service. It views environmental services from another new angle of environmental demands at different sizes and doesn't conflict with existing classification systems, as the story of the blind and elephant. Oppositely, it's compatible with existing classification systems. For example, under the item of Air Pollution Control in OECD/Eurostat classifications system, it should include indoor air pollution control, local air pollution control and global air pollution control (GHGs, brown clouds etc). For instance, under the item of CPC1.0 941 Sewage service, it should include household sewage services (toilet, kitchen sewage etc), municipal sewage services and transboundary sewage services.

Therefore, the existing CPC1.0 system with 5 digital should provide some codes to cover indoor-environmental services and global-environmental services. The proposed classification of environmental services is

1 See Annex I.

harmonious and coherent with existing classification systems. It depends our thinking of environmental services to macro and micro directions as a continuous spectrum of size of environment.

Using results from the survey, we found some member economies regarded indoor-environmental services and global-environmental services as part of environmental services.

2.3 Basic situation of APEC environmental services market

As above mentioned, there is not yet a common definition or classification of environmental services in the Asia-Pacific region or throughout the world. Statistics for environmental services in different economies are also very different, limited and cannot be compared. Therefore, there is no accurate datum about environmental services market in the APEC region or the world. According to our definition and classification, i.e. not only traditional environmental services, but also indoor-environmental services and global-environmental services should also be included. However, many economies do not collect statistics on environmental services. As such, compiling statistics on trade in environmental services is even more problematic.

Using existing data and information, we can initially draw conclusions about the characters of the environmental services market in Asia-Pacific region.

2.3.1 Rapid development of environmental services market

As estimated, the world environmental services market has been increasing at a rate of 8% per annum[1] which surpassed that of the environmental industry (5%[2]), that of gross national product growth (GNP) (2-3%) and international trade 6%.[3] According to the survey by the US Environmental Business International (EBI)[4], a strategic market research, publishing, and consulting company, and other reference materials, the value of the world environment market in 1996, 1998, 1999, 2000, 2001, 2004 was estimated to be US$ 453 billion, US$ 484 billion,[5] US$ 499 billion,[6] US$ 522 billion, US$ 540 billion,[7] and US$ 633 billion respectively, of which the services segment in 1996, 1998, 2000, 2004 accounted for a little over half, at US$ 228.6 billion, US$ 247.3 billion, US$ 262.5 billion, and US$ 316 billion.

The world environmental services market is expected to grow to US$640 billion in 2010. This would place the environment industry at roughly the same size as the pharmaceuticals or information technologies industries. In future, environmental services will have huge potential for development. Besides the issues of economic development, pollution control needs and urbanization, the main reasons for the rapid development of world environmental services include: stricter environmental regulations and pressure from consumers and the increasing number of global environmental agreements being ratified.

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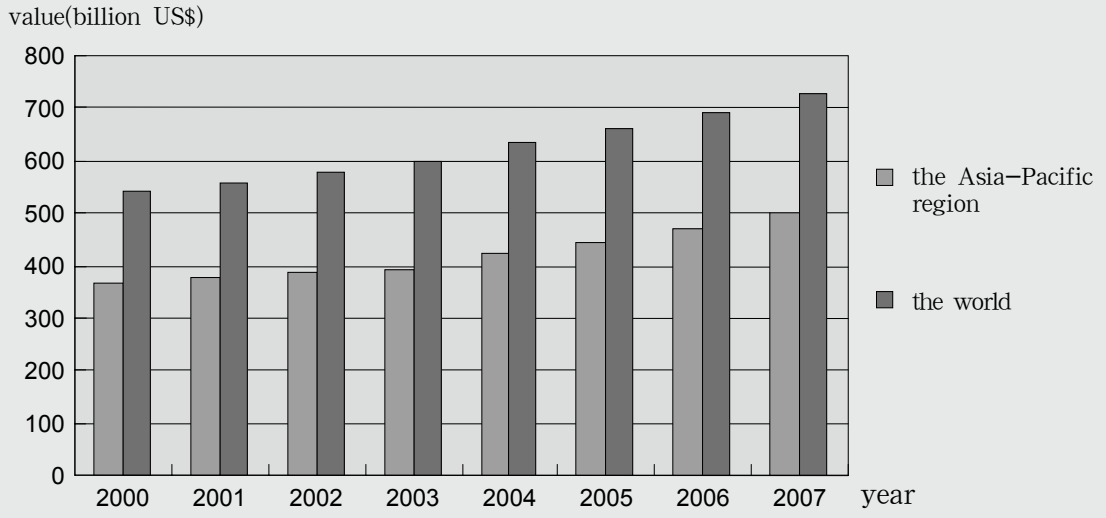
1 WTO, S/CSS/W/38.
2 WTO, WT/CTE/W/67/Add.1
3 TONG Jiadong, Trade liberalization, trade protection and economic benefit, Economic science press, 2002, P1
4 The only data source for international environmental services and the data has been cited by OECD and WTO Secretary.
5 OECD, Environmental Goods and Services: The Benefits of Further Global Trade Liberalization, 2001, Paris.
6 Environmental Business Journal，EBI (1999) .
7 WTO, WT/CTE/W/218.

Fig. 2.1 The development of environmental industry market in Asia-Pacific region and the world



Source: Environmental Business International.

The Asia-Pacific region is one of the largest environmental markets in the world. The value of the environmental industry in this region is increasing every year and accounts for about 67% of the world value. Figure 2.1 shows the share of the environmental industry in the Asia-Pacific region compared to that of the world from 2000 to 2007.

2.3.2 Regional imbalances in the development of environmental services market[1]

Regarding regional distribution, the world environmental services market is mainly concentrated in the US, Western Europe and Japan. The combined market value of these three regions was 81% of the world market value in 2007, and 85% in 2000. With the fast development in environmental services taking place in developing economies, the proportion comprised by developed economies has been declining. However, industry in developing countries has mainly comprised of small and medium-sized enterprises (especially in the field of waste management) and hardly any large-sized environmental enterprises, with the exception of state-owned water treatment companies which have appeared in the list of the world's top 50 largest companies.

In the Asia-Pacific region, characteristic regional imbalances in the development of environmental services market exist as in other international markets. The environmental services market in this area is dominated by the US and Japan. Similarly, the US and Japan's market share as a proportion of Asia-Pacific market has been decreasing gradually over the last few years. The combined market share of these two economies was 83%, 80%, 79% of the Asia-Pacific region in 2000, 2004, 2007 respectively. In comparison, the environmental services market in such developing

1 All data in this section from Environmental Business Journal, EBI.

economies or regions as other Asia economies will see a quick increase by more than 10% in the years to come.

2.3.3 Huge potential in the development of trade in environmental services

Compared with other trades in services, the world trade in environmental services was very limited before 1990s, comprising of only 0.5~1% of the total volume of trade in services. The reason is that environmental services were considered part of "public services." Water treatment and waste disposal services etc. for example were largely provided by the Government. However, with the gradual integration of pollution controls and management frameworks, the continuous raising of public environmental awareness, the stimulation of continuous privatization and liberalization of "private" demand for environmental services in recent years, the environmental services market has gradually taken shape and developed. The growth rate of environmental services reached 5~20%[1] and there is still great potential for development.

Statistics indicate that the US, Germany and Japan have been major exporters of environmental services, while Chinese Taipei, Mexico and Canada have been major net importers.[2] In 1997, China did not engage in trade in environmental services. However three year later in 2000, the value of foreign contracts in environmental services industry reached US$ 83 million. At the same time by the end of 1990s, exports of environmental services from Australia, Canada and Britain increased remarkably.

According to the consultants' predictions, on the one hand, the environmental services market in such developed economies or regions as the US, Japan and European Union, etc., is reaching saturation point. On the other hand, the growth of international trade in environmental services will be fastest in East Asia, Southeast Asia, Latin America, Middle & Eastern Europe, owing to strong economic development and the continuous raising of environmental awareness.

According to an assessment by the United Nations Conference on Trade and Development (UNCTAD) of several industrialized economies in 1994, the value of output of the environmental services industry was less than 0.5% of the total services industry. However, this figure may be far lower than the actual value, because some environmental services were included in energy and other services and the assessment less concerned about indoor-environmental services and global-environmental services.

Since 1980s, global economic development and increasingly close knit international economic exchanges have meant that globalization and integration of regional economies have become important trends. At the same time, the service industry has been developing fast and now occupies a greater share of GDP. Furthermore, liberalization and facilitation of trade has become a key goal pursued by the WTO and other regional economic organizations.

However, there are differences between the core principles, methodologies and definitions of trade liberalization and facilitation between these regional economic organiza-

1 WTO, WTO/CTE/W/67/Add.1.
2 WTO, S/C/W/46.

tions. The common objectives of the WTO and APEC have led to a mutual understanding of the basic definition and principles of an open market and the liberalization of trade in services. One of the important principles of both APEC and WTO is to exert powerful positive impacts on and offer important assistance to the future development of the world trade system.

2.4 Situational analysis of APEC trade liberalization in environmental services

One of APEC's goals is consistency between multilateral trade agreements concerning the implementing and promoting of trade liberalization. At present, WTO has been putting relatively more emphasis on the opening-up of the environmental services market. Under WTO Doha Round, negotiations have been taking place on how to reduce or eliminate tariff and non-tariff barriers on environmental goods and services (Paragraph 31(iii) of the Doha Declaration). The Committee on Trade and Environment in Special Session (CTESS) has been formed to negotiate this part of the Doha mandate. However, the level of WTO members' commitment on trade liberalization in environmental services is less than average and much lower than that of business, financial, communication, and tourism services, etc.

Up until August 2008, only 48 members of the 153 members of WTO had already made commitments on environmental services, compared to 100 members on financial service.[1] Although 48 members had made commitments on environmental services, they had not committed to all sub-sectors. For example, 48 members had made commitments on environmental sanitation, 47 members on sewage treatment. Relatively fewer members had made commitments on other environmental services. (See Annex I for details).

Of the 21 APEC members, 20 are also members of WTO. The exception is Russia which has observer status and has almost finished all necessary bilateral negotiations with WTO members. Nine economies, Australia, Canada, China, Chinese Taipei, Japan, Korea, the US, Thailand, and Viet Nam have made commitments on the concessions on trade in environmental services regarding market access and national treatment. See Annex Table for the concrete commitments made by nine economies on the market access and national treatment regarding different sectors of environmental services.

On the whole, with the exception of no limitations on the provision of consumption services, others are all partly committed concessions, among which, the concrete commitments on market access are the emphasis, focusing on two major modes as the commercial presence of (Mode 3) and presence of natural persons (Mode 4) in environmental services trade, which may involve rules on foreign investment, limitations on migration, requirements on sanitation and environment, competition policies, especially the relevant regulations on the monopoly of public business, corporation law and intellectual property.

The Individual Action Plan (IAP) is a report updated annually by each member recording its actions to help realize APEC's goal set in Bogor, Indonesia of free and open trade and investment in the APEC region by 2010 for industrialized economies and 2020 for de-

1 EU is a member here.

veloping economies. In line with the concept of concerted unilateral liberalization, APEC member economies undertake these actions on a voluntary and non-binding basis.

Trade liberalization in environmental services is one of the nine areas of the Early Voluntary Sectoral Liberalization (EVSL) carried out by APEC. The APEC economies have been giving greater attention to trade liberalization in environmental services and some real actions have also been taken. The number of economies that had made commitments increased from 5 in 2000 to 13 in 2003 and 16 by 2008. By the end of 2008, 16 members: Australia, Canada, Chile, China, Hong Kong, China, Indonesia, Japan, Korea, Mexico, New Zealand, Papua New Guinea, Singapore, Chinese Taipei, Peru, the US and Viet Nam had made concrete commitments on trade liberalization in environmental services in their IAPs (see Annex Table for details).

On the whole, the level of trade liberalization in environmental services is higher in APEC than in WTO. The proportion of commitment on environmental services in APEC is 76%, compared to 31% in WTO. Many trade barriers in environmental services still exist. On the one hand, trade in environmental services has been seriously affected by overall investment policies, visa regulations, etc., and on the other hand, there are still sectoral barriers in place.

Using operational requirements as an example, Chile's concessions to establish, construct and work public services destined to produce and distribute potable water, and to collect and dispose of waste water, will be granted to corporations only. In Viet Nam, enterprises wishing to operate in environment services industry have to meet the following requirements: business operation licenses (for domestic enterprises) or investment licenses (for foreign enterprises) in addition to following regulations on investment incentives for environment protection, environment pollution disposal, advanced technology transfer, regulations on capital, regulations relating to trading in hazardous chemicals and products containing hazardous chemicals.

3. Summary of environmental services trade survey in China

3.1 Basic situation of environmental services trade in China

As one of the potentially largest environmental services markets and APEC economies, China has been making great efforts to promote trade liberalization in environmental services both in APEC and WTO. Environmental services is just one of key fields in China's environmental industry, which although started-up relatively late, has since been developing at a fast rate.

◆ **The definition and classification of environmental service in China**

The definition of environmental services in China is "services provided for environmental protection and pollution control."[1] Environmental services are defined as comprising of six

1 "Guideline for Development of Environmental Protection Industry during the Eleventh Five Year" (Tentative), issued by the National Development and Reform Commisswion and the State Environmental Protection Administration, 2005; "Development Report on Environmental Services Industry", issued by the State Environmental Protection Administration, 2006.

categories: research and development of environmental technology and products, design and construction of environmental engineering, environmental monitoring services, and environmental consulting services, operation of pollution control facilities, environmental trade and financial services. This category system of environmental services in China is very different from the Central Product Classification (CPC) categories/ General Agreement on Trade in Services (GATS) and the definition of environmental services is based on the spectrum of environmental scale we proposed.

◆ **The development and market of environmental service in China**

Since the 1990s, the China's environmental services market has seen rapid development. From 1993 to 2004, the average annual growth rate was 25%, about two times the growth rate of the manufacturing industry of environmental protection products (10~13%) in the same period. During the period 1997-2000, the growth rate of the environmental services market reached up to 52%.

Considering that China still faces serious environmental problems and the general level of environmental conditions, potential future demand for environmental services is huge. According to the "Eleventh Five-Year Plan (2006–2010) of Ministry of Environmental Protection," during the eleventh five-year period, the investment demand for environmental pollution controls will reach RMB 1,400 billion, accounting for 1.23% of the GDP during this same period. Of which, the investment demand of the "key engineering program for environmental protection during the eleventh five-year" will reach RMB 262 billion. China's Eleventh Five-Year Plan also includes the targets of reducing total sulfur dioxide emissions by 10% and increasing energy savings by 20% from 2005 level.

On the other hand, bottleneck problems in investment and technology in environmental protection still exist, and the problem of insufficient supply is still very evident. As the biggest developing economy in APEC region, the implementation of the Eleventh Five-Year Plan in China will bring new opportunities for the development of environmental services in Asia-Pacific area. The direct impacts of the Eleventh Five-Year Plan on the environmental services market in APEC region will mainly affect environmental technology services, consultancy services and trade services correlated with environmental projects. There will be also other indirect impacts on other service sector industries. According to all previous statistics, the proportion of the total market share of these service industries to environmental investment is relatively stable.

3.2 China's regulations affecting trade in environmental services

◆ **The commitment on trade liberalization in environmental service in China**

During the negotiation of China's entry into the WTO, China made corresponding commitments on the market access and national treatment of environment services (as shown in Table 3.1) . China has opened all sub-sectors excluding environmental quality monitoring and pollution source inspection.

Table 3.1 Schedule of Specific Commitments on Environmental Services of China

Sub-sector	Limitations on Market Access	Limitation on National Treatment
(Excluding environmental quality monitoring and pollution source inspection) A. Sewage Services (CPC 9401) B. Solid Waste Disposal Services (CPC 9402) C. Cleaning Services of Exhaust Gases (CPC 9404) D. Noise Abatement Services (CPC 9405) E. Nature and Landscape Protection Services (CPC 9406) F. Other Environmental Protection Services (CPC 9409) G. Sanitation Services (CPC 9403)	(1) Unbound, except for environmental consultancy services. (2) None (3) Foreign services suppliers engaged in environmental services are permitted to provide services only in the form of joint ventures, with foreign majority ownership permitted. (4) Unbound, except as indicated in horizontal commitments.	(1) None (2) None (3) None (4) Unbound, except as indicated in horizontal commitments.

Source: S/DCS/W/CHN.

Notes: Modes of supply: (1) Cross-border supply; (2) Consumption abroad; (3) Commercial presence; (4) Presence of natural persons.

When entering the WTO, the actual degree of market openness should be close to the commitment level. For some specific fields, higher requirements are made against the entering country. (See Box 3.1)

For example, some power generating plants using garbage are now foreign-owned; some sewage pipe networks have already opened-up toward foreigner traders. Additionally, after China's entry into the WTO, foreign enterprises, in order to reduce market costs, have implemented successive localization strategies and created "commercial presence" which has gradually replaced trade in simple environmental goods and turned into a main type of market operation. Many trans-national corporations have already set up joint-ventures and entirely foreign-owned companies in China, taking up environmental projects, participating in market investment and financing, providing consultancy services, etc.

In addition, China has made further commitments to open its environmental services market in some Free Trade Agreements (FTA). For example, in ASEAN-China FTA agreement, China agreed that "*foreign services suppliers engaged in environmental services are permitted to provide services through joint ventures, with foreign majority ownership permitted, or provide services to foreign owned companies.*"

Box 3.1 Sewage Treatment Project in Jiaozuo City, Henan Province

Jiaozuo City Government in Henan province signed a contract with RB Environmental Protection Limited Company of Singapore in 3 September 2003. The contract pertained to the construction of a sewage treated program. According the contract, the Jiaozuo City Government designated RB Environmental Protection to manage the first project (the Jiaozuo City sewage treatment factory) and construct a second sewage treatment project. Specifically, it stipulated that RB Environmental Protection should purchase the current sewage treatment factory at price of RMB 109 million, invest RMB 190 million to construct the second sewage treatment factory, and finance RMB 169 million needed to construct to necessary sewage pipe network system.

The license could be held for 30 years. During this period, the Government of Jiaozuo City would be entitled to collect a service charge for sewage treatment from the project company on a monthly basis. The charge was decided upon by both sides together. When the license expires, the project company should return the sewage treating factories to the ownership of Jiaozuo City Government.

Source: Jiaozuo Daily, 5 September 2003.

◆ **Regulations affecting trade in environmental services in China**

At present, China has not established a specific policy on trade in environmental services. Such a policy would be affected by related policies such as overseas investment, government procurement, price and revenue, and environmental policies as well as other international horizontal commitments.

Taking trade and investment policy as an example, Item 15 of Chapter 3 of Foreign Trade Law prescribes that the state "permits the importing and exporting of freight and technology, except for goods prohibited by other laws and administrative rules." Item 22 of Chapter 4 prescribes that the state "promotes the development of the international service trade." From these regulations, we can see that China supports the liberalization of trade, including the trade liberalization in environmental services.

Overseas investment policy is directly relevant to entry to the environmental services market, and it directly decides the degree of trade liberalization. Key relevant overseas investment policies can be found in *The Industrial Catalogue for Overseas Investment(emended in 2006)* , *The Industrial Catalogue for Central and Western Region of Foreign Investment Advantages(amended in 2008) , A Number of Policy Measures Accelerating the Development of the Service Sector during the Tenth– Five-Year*, *About Speeding up the Municipal Utility Industry Views the Process of Market-oriented, Measures, Promoting the Urban Sewage, Waste Disposal Industrial Development* and other relevant documents.

The new edition of *The Industrial Catalogue for Overseas Investment* (amended in 2006) came into effect from January, 2007. Continuation of former policy directions is evident, with all policies, measures and regulations encouraging foreign investment remaining

unchanged. It also identifies some areas where foreign investment projects are encouraged, such as resources regeneration and comprehensive utilization techniques, energy conservation and exploitation techniques, environmental pollution treatment and monitoring techniques, the construction and operation of sewage and garbage disposal factories, factories treating hazardous waste (including burning factories and burying fields etc.), the construction and management of environmental treatment facilities, consultancy services for environmental protection, regeneration technique exploitation and the application of companies' emissions.

Simultaneously, it widened the scope of fields in which foreign investment is permitted and has sped up development of policy permitting foreign investment in the service industry.

International horizontal commitment may have effects on opening the environmental services market in China.

It is stated in China's Schedule of Specific Commitments on Services "unbound, with the exception of the entry and temporary stay of natural persons who fall into one of the following categories: managers, executives and specialists defined as senior company employees of WTO member, employed by a foreign-invested enterprise and conducting business in the territory of the People's Republic of China, who shall be granted a long-term stay permit as stipulated in the terms of contracts concerned or an initial stay of three years, whichever is shorter." There are other conditions for service salespersons, etc.. We can also see that some favorable conditions for senior employees, but not for more junior positions. Such rules will obviously restrict the activities of environmental services providers.

The Schedule of Specific Commitments on Services of China also states that "representative offices of foreign enterprises are permitted to be established in China, but they shall not engage in any profit-making activities except for those stated under CPC 861, 862, 863, 865 in the sectoral specific commitments." Additionally, it is noted that "the establishment of branches by foreign enterprises is unbound, unless otherwise indicated in specific sub-sectors, as the laws and regulations on branches of foreign enterprises are under formulation".

3.3 China perceptions of trade liberalization in environmental services in APEC economies

- **Regulations limiting Chinese suppliers of cross-border environmental services among APEC**

China believes that restrictions such as requirements to obtain authorization, licenses or permits in order to market and supply services, to use specified networks of providers, and also regulations affecting the cross-border transfer of capital, uses of credit cards, or e-business and requirements for a full commercial presence, can limit the supply of environmental services in the APEC region as in other services and other regions. China also considers such requirements to be closely related to domestic regulations.

- **Regulations limiting Chinese consumption of environmental services in other APEC economies**

China believes some restrictions, like visa requirements, numerical quotas, special taxation, etc., still required by mode 2— con-

sumption abroad, are necessary. For example, except for a few designated areas within the geographic boundaries of certain member economies, such as Cheju Island, Korea or for special foreign residents, for example Shanghai, China, etc., most member economies have in place visa requirements for eco-travelers. What's more, numerical quotas are also applied to environmental services. Some economies levy excessive charges, taxes or restrictions when eco-travelers leaving their country frontiers.[1] China believes that all of these restrictions, including visa requirements, numerical quotas and special taxes can limit the supply of environmental services in the APEC region.

- **Regulations limiting Chinese suppliers of environmental services with respect to commercial presence and legal form requirements among APEC**

China believes that the majority of international trade in environmental services must take place through a commercial presence. Accordingly, various regulations restrict the activities of suppliers of environmental services: approval required for foreign investment based on economic needs tests or net national benefits or for foreign equity participation as well as restrictions on the acquisition of existing businesses or establishment of new business, etc.

The requirements for some member economies in environmental services trade are the same as those pertaining to general foreign investment. We can also see such requirements in Investment Law, in such countries as New Zealand, Mexico.

But some foreign equity restrictions on environmental services trade are controlled by specific regulations, for example, in Indonesia no entry is permitted to foreign companies at present, but the future, Indonesia intends to open the market to foreign participation. Indonesia has allowed comprehensive market access under modes two and three (joint ventures with local service providers, with maximum 51% share participation, using local professional manpower, transferring know how & technology to local professional manpower) for sewage, refuse disposal and sanitation services etc. China stipulates foreign services suppliers engaged in environmental services "may only provide services through joint ventures, with foreign majority ownership permitted".

Typically, there are both generic licensing requirements which apply to all businesses and specific requirements which apply to a particular sector or activity. Additionally, there are also more specialized licensing requirements applicable to businesses in particular industries on regulated matters such as pollution control, occupational safety and hygiene, energy saving, and energy efficiency, etc.. Obviously, a major component of environmental services involves helping industrial clients to implement and comply with the terms of such licenses.

- **Regulations mostly limit Chinese suppliers of environmental services to other economies by restricting the movement of natural persons throughtout APEC region**

Besides commercial presence, China believes that movement of natural persons is another very important way to help facilitate trade in environmental services. Work per-

1 Source: WTO Secretariat.

mits are a necessary condition to residency requirements. The restrictions on land settlement and visa policy and other differing regulations also affect environmental services trade. For example, the top custodians in Hair Group can get H1 visa, the term of validity of which is only one year, and the visa holder can only stay in America for three months each time. If the holder wishes to stay longer than three months, he must exit and then re-enter the country after three months. Strict labor law makes it is difficult for ordinary sellers and other employees providing maintenance and installation services to meet any residency requirements. Such kind of barriers will have a significant affect on routine work.

Because of labor policies and the difficulties of acquiring work visas, many services such as after-sales environmental services can only be completed by way of outsourcing from local companies. This greatly increases the costs of products and services.

Due to the long processing times for visa applications, the plans of foreign service providers may be adversely affected, for example, in Latin America, a visa can take approximately three months to process. The following table shows the time period, the cost and other necessary requirements to process business visa applications for Chinese citizens who are going to other APEC economies.

Table3.2: Summary of the Requirments of APEC Economies for the Issuing of Business Visas for China Citizens

Economy	Business visa fee	Visa and processing details	General remarks
Australia	540 RMB	Validity: 12 months Maximum stay: 90 days Processing time (working days): 5 days	
Brunei		Validity: 90 days Maximum stay: 30 days Workdays of schedule: 8 days	
Canada	Single entry, 520 RMB	Validity: 90 days Maximum stay: 30 days Processing time (working days): 8 days	Certificates of deposit 1. The original Certificate of Deposit is required by the embassy, 2. Minimum deposit: 60,000RMB 3. The certificate of deposit must be typed in English using the format required by the bank. 4. The certificate of deposit expires 30 days after returning to China 5. Funds will automatically be unfrozen upon expiry.

Chile	Single entry: 30 days: 432 RMB Multiple entry: 90 days: 642 RMB		
Indonesia	Single entry: 285 RMB Work visa: 490 RMB Multiple entry: 610 RMB	Validity: 365 days Maximum stay: 60 days Processing time (working days): 10 days	
Japan	230 RMB	Validity: 90 days Maximum stay: 10 days Processing time (working days): 7 days	Certificates of deposit For certificates of deposit for amounts of more than RMB 50,000, funds are frozen for a three month period.
Korea	249 RMB for short stays; 249 RMB + 166 RMB for long stays	Validity: 30 days Maximum stay: 15 days Processing time (working days): 10 days	
Mexico	1,045 RMB	Validity: 15 days Maximum stay: 15 days Processing time (working days): 20 days	Current account deposit books 1. The account must be opened for at least 6 months and have been used frequently (it should show that the account was used no less than 3 days before the visa application is to be made). For the deposit books issued during the last 6 months, the last deposit book is also needed. Alternatively the bank should be asked to a stamped record of usage fixed with the bank's seal. 2. A minimum deposit of 50,000 RMB is required. The higher the deposit the greater the chance of a successful visa application. 3. Sudden depositing of large sums of money in the past 2 months will raise suspicions about its source .
Malaysia	80 RMB	Validity: 90 days Maximum stay: 30 days Processing time (working days): 4 days	

New Zealand	640 RMB	Validity: 30 days Maximum stay: 15 days Processing time (working days): 25 days	Certificates of deposit 1. The original certificate of deposit is required by the embassy. 2. Minimum deposit: 50,000 RMB. 3. The certificate of deposit must be typed in English using the format required by the bank. 4. The certificate of deposit expires 30 days after returning to China. 5. Funds will automatically be unfrozen upon expiry.
PNG	2,150 RMB	Validity: 90 days Maximum stay: 15 days Processing time (working days): 15 days	
Peru	270 RMB within 30 days	Validity: 90 days Maximum stay: 10 days Processing time (working days): 12 days	Certificates of deposit 1. The original certificate of deposit is required by the embassy. 2. Minimum deposit: 30,000RMB. 3. The certificate of deposit must be typed in English using the format required by the bank. 4. The certificate of deposit expires 30 day after returning to China. 5. Funds will automatically be unfrozen upon expiry.
The Philippines		Validity: 90 days Maximum stay: 30 days Processing time (working days): 10 days	
Russia		Validity: 90 days Maximum stay: 90 days Processing time (working days): 10 days	
Singapore		Validity: 35 days Maximum stay: 14 days Processing time (working days): 5 days	
Chinese Taipei			
Thailand			

The US	830 RMB	Validity: 365 days Maximum stay: 180 days Processing time (working days): 5 days	Certificates of deposit 1. The original certificate of deposit is required by the embassy, 2. Minimum deposit: 100,000 RMB. 3. The certificate of deposit must be typed in English using the format required by the bank. 4. The certificate of deposit expires 30th day after returning to China. 5. Funds will automatically be unfrozen upon expiry.
Viet Nam		Validity: 30 days Maximum stay: 30 days Processing time (working days): 6 days	

Resources: Materials provided by the economies or website.

Besides the trade barriers restricting the four abovementioned types of service supply modes, the providing of foreign services is also affected by other related domestic policies. For example, because environmental services possess the characteristics of public goods, government procurement policy greatly affects market entry.

The procurement of environmental services by the public sector would appear to be most relevant for the construction, operation and upgrading of public utilities such as water supply and wastewater treatment, sanitation and solid waste collection and disposal, installation of energy-efficient systems and clean process technologies. Based on the information compiled from the survey, the principal trade-related barriers to public procurement of environmental services include local preferences, threshold values for open bids and predetermined excluded sectors.

In summary, although APEC tries to promote trade liberalization in environmental services and many economies have made commitments as part of WTO and APEC membership requirements, trade barriers in environmental services still exist. On one hand, trade in environmental services is affected by general Government policy, including rules governing immigration, visa applications, labor, investment, public procurement, etc.. On the other hand, there are also some special requirements in environmental services sector, for example, licenses, qualification, equity limitations, etc.

4. Summary of environmental services trade survey in Korea

Based on the survey conducted in Korea and other various studies, the main purpose of this section of report is to summarize the general situation of the development of Korean environmental protection industry, environmental services industry and local regulations regard-

ing its development, and the major issues concerning trade in environmental services.

4.1 Basic situation of environmental services trade in Korea

◆ Definition of environmental services in Korea

Korea has defined “environmental industry” by Presidential Decree as "industries which design, manufacture, and install environmental facilities and environmental measurement equipment by applying and utilizing environmental technologies or provide services related to environmental technologies in order to conserve and manage the environment." In detail, the environmental industry is subdivided as follows:

1) Industries providing materials or services needed for environmental conservation activities such as measurement, prevention, minimization and recovery of environmental damage due to air, water, ecosystem or noise pollution;

2) Industries researching, developing and applying environmental technologies;

3) Industries providing facilities, materials and services needed for other environmental conservation and management. (Article 2, Enforcement Ordinance of Development of and Support for Environmental Technology Act)

Table 4.1 Scope of Environmental Services in Korea

Group	Classification	Major Areas Covered
1	Air pollution control	– Environmental administration related to air pollution prevention – Air pollution prevention activities
2	Water treatment	– Sewage water treatment – Excretion treatment – Livestock excretion treatment – Waste water treatment
3	Management of solid wastes	– Waste collection, transport and treatment (designated, general, construction, and domestic wastes) – Radioactive waste collection, transport and treatment – Cleaning of public places and similar services
4	Soil, surface water, ground water management and improvement	– Services related to soil, surface water, ground water management and improvement
5	Environmental research and development	– Research and development related to the environment – Research on environmental engineering
6	Environment related contracts and engineering	– Planning and design related engineering services – Environmental impact assessment and auditing – Environmental services related to legal affairs
7	Analysis, data collection and evaluation	– Measurement and analysis of air pollution – Measurement and analysis of environmental factors

8	Education, training and information	– Environment related education – Professional training
9	Resource management	– Agriculture, forestry, and fisheries services related to resource management – Natural disaster and other resource management services -

Source: Special classification of environmental industry (Statistics Korea).

◆ **Situation of environmental industry in Korea**

Korea has paid great attention to the development of environmental industry. In recent years, with the increasing focus on domestic environmental protection, the environmental industry has seen rapid development. By the end of December 2007, the number of environmental protection institutions in Korea reached 1,056, including 195 air and water pollution prevention enterprises, 231 air pollution prevention enterprises, 547 water treatment enterprises, and 89 noise and vibration prevention enterprises. In the period 1995-2005, the average annual growth rate of the environmental industry was 13.4%, in which the fastest growth was seen in the environmental services industry, with an average annual growth rate of 50.1%, followed by soil conservation, 22.3%, air pollution prevention, 12.3%, wastes management, 11.5%, and water environmental management, 11%.

4.2 Trade liberalization of environmental services in Korea

As the founder and one of the important members of APEC, Korea currently, has been active in promoting globalization and economic "internationalization" and further expanding its economic profits through trade liberalization, so as to push forward the economic structure adjustment.

Under the guidance of comparatively positive foreign trade strategies and relevant policies, Korea has adopted a series of incentive, preferential and supporting policies in the environmental service sector to attract excellent foreign environmental service providers and talent to enter into Korean market. Tax preferences, fund assistance, the importing of high-talented personnel and establishment of free trade zones have yielded positive effects, pushing forward the liberalization of trade in environmental services.

Following the second round of WTO concessions, the Korean domestic market is now more open. Regarding environmental services, the Korean market is currently open to most types of environmental services except those provided by the Government.

5. Summary of environmental services trade survey in the US

5.1 Basic situation of trade in environmental services in the US

◆ **The US definition of environmental service**

The United States generally follows the CPC 94 classification of environmental services. Independent of GATS scheduling issues, EBI

has developed classification codes for environmental industry segments. However, from our definition of environmental services based on the spectrum of environmental scale, we believe that there is also great demand and supply and even bigger potential supply for indoor and global-environmental services in the US, which are not well defined either in GATS classification and EBI's segments.

◆ **The US environmental services market**

Since the 1990s, the US has had a highly developed service industry with steady increased net value of international trade in services. According to EBI's report, the Asia and Pacific regions are the main regions for the US to which it export its services, including business, professional and technical services etc. With regards to environmental services in the US, there is not yet enough specific official data. Environmental services statistics are difficult to compile as with other service industries around the world. EBI, as mentioned above, has conducted various surveys on environmental goods and services and has accumulated rich experience and data in the field in the past decades.

The EBI data describes the development and current situation of the US environmental services industry. the US is a giant in environmental services market and in the world market for environmental services. According to data from EBI, the environmental services industry in the United States had revenues of US$ 127 billion in 2005 and US$ 138 billion in 2007 while the world environmental services market had revenues of US$ 345 billion in 2007. With regard to market for environmental services, equipment and resources, the US market was the largest in the world in 2006 according to EBI's ranking system, the second largest was Japan with revenues of US$ 104.2 billion in 2006.

5.2 The US regulations on trade in environmental services

The US market for environmental services is driven by a strong and comprehensive regulatory and enforcement regimes, though the market is generally open to foreign investment and participation.

The US market for environmental services is constrained by horizontal level regulations. According to the information from the US companies surveyed, as a result of horizontal level regulations and privatization progress of environmental industry in the US, we conclude that there are at least five types of environmental services in the US in terms of identification of the suppliers and property of the environmental services. Some environmental services should only be provided by Government and may be regarded as part of the Government's mandate. Supply of some environmental services is locally-oriented, and only local companies may provide those services while some other are state-oriented or domestic company-oriented. Other environmental services can be supplied by foreign suppliers. There are, as a result, limits on the kinds of environmental services foreign companies can supply in the US.

Besides which, the US visa policy, work permit and professional certification requirements exert strong impacts on both foreign and domestic environmental service suppliers as shown in Annex IV: the US Survey Report. For example, as stated by a manager at Project Resources Inc., owing to complex procedures and red tape, domestic suppliers find it difficult to obtain the US visas or work permits for their overseas employees

or to hire foreign personnel to work in the US. Consequently, the company had to hire local personnel rather than expatriates, who although accepted lower salaries, were also less skilled.

5.3 Supply of environmental services to the Asia-Pacific region by the US

According to the questionnaire responses from the US, the US businesses are active in supplying conventional environmental services across CPC 94. According to a study by the United States International Trade Commission (USITC) in 2004, the US exports of remediation services totaled US$ 460 million while imports totaled US$ 400 million in 2002. Based on EBI data, the US accounted for 60% of Mexican imports of water-pollution equipment. Little is known regarding trade in nature and landscape protection services. The CPC has no classification for “global-environmental services”, but the United States believes that the US businesses are supplying these services through consultancy services, and/or via services provided under CPC 9406.

As noted above, trade data is very difficult to come by for this sub-sector. The CPC has no classification for “indoor-environmental services” but the United States believes that the US businesses are supplying these services via services provided under CPC 9404, as well as consultancy and/or engineering services. According to a 2005 study on air pollution control services by the USITC, the US firms are the dominant suppliers of air pollution abatement services in the world market.

5.4 The US demand for environmental services

According to the questionnaire completed by the United States Trade Representative (USTR), the United States believes that all of the above environmental services are needed in an effort to protect the environment. Besides the slow growing conventional sectors, such as sewage treatment, air pollution control, in the US, the fastest growing sectors are the global-environmental and indoor-environmental sectors, based on our the US survey. Take the MEAs for examples.

There are more than 100 MEAs in the world and more are coming in the future, which are driving forces of global-environmental services. the US, as the biggest economy and a key environmental stakeholder in the world, has refused to sign some of the important and international MEAs, such as UNFCCC, Basal Convention and Hazard waste trans-boundary, and others. However, with climbing CO_2 emissions and energy demands of the US, as well as the tons of e-waste exported to less developed regions, such as India, China, and Pakistan for recovering materials, the US will have to find out a better way to deal with international pressure. As the US ratifies more MEAs and implements them at a economic level, demand for environmental services will increase. “E-waste” is piling up faster than ever, according to the US Environmental Protection Agency. Increasing domestic public concerns about health may force the US design new e-waste treatment systems, even though the US has insisted not ratifying the Basal Convention on trans-boundary hazardous waste. Regardless, there is likely to be greater demand for global-environmental services in the US in the near future.

The US demand for indoor-environmental service will be significant. People in modern societies spend more than 90% of their time in indoor environments (Leech et al. 2002) .

In the United States, average time spent at home ranged from 15.5 to 15.7 hours/day (Brasche and Bischoff 2005) . Hence, indoor-environmental quality in home environments has a significant impact on human health and well-being. Indoor air quality has been an important topic for environmental health academia as well as a concern for policy-makers since the last century.

According to the US Environmental Protection Agency (USEPA), the air inside a home can be 2-5 times more polluted than the air outside. USEPA developed some project-based indoor air quality programs, such as Indoor Air Quality (IAQ) Tools for Schools (TfS) Program, Smoke-free Homes and Cars Program, etc., to improve indoor air quality rather than establish regulations. Due to lack of policy motivation, pollutant source data and other contributing factors and complex interactions, USEPA hasn't authorized any indoor air quality standards so far. Furthermore, many housing code regulations are established locally and not federally (Felicia Wu et al. 2007) . USEPA has recommended three basic strategies to improve indoor air quality: source control, ventilation improvements, and air cleaners.

5.5 The US perceptions of trade liberalization in environmental services in APEC economies

- **Mode of supply barriers constraining trade liberalization among APEC members**

According to the answers given by USTR in the survey, the US would rank the importance of modes of supply as follows: Mode 3 (establishment of commercial presence) is the predominant mode of supply in the provision environmental services. Thus any barriers to commercial presence, especially limitations on foreign equity, can have the most significant negative impact on trade in this sector. Barriers to mode 1 and 4 (cross-border supply and temporary movement of natural persons) can also be significant in this sector, but less so than barriers in mode 3. Barriers to mode 2 (consumption abroad) are the least significant in this sector.

- **Barriers to trade erected by APEC economies**

The United States believes it is difficult to single out particular economies for erecting more barriers than others. But the US pointed out one important fact there are remarkably few APEC economies that have taken GATS commitments in environmental services. The lack of GATS commitments in this sector can contribute to uncertainty, and thus reluctance on the part of businesses to enter a market.

The US trade department has also heard specific complaints about certain APEC economies due to a variety of concerns not directly covered in this survey, which could however, adversely impact upon trade in environmental services, including: lack of adequate protection for intellectual property; nontransparent and inconsistent construction permitting processes; uneven application of standards; uneven enforcement of environmental regulations; lack of transparency in regulatory decision-making and standards-setting.

According to survey on the US companies, such as Montgomery Watson Harza, many companies had high expectation of China's environmental services market. Russia and Viet Nam were also mentioned as the econo-

mies that have erected more trade barriers than others in APEC region.

◆ **APEC economies regarded by the US as most liberal in environmental trade**

The US ranks their FTA partners as the most liberal economies for the obvious reason that they have free trade agreements with these countries that allow the US to trade more easily. Their FTA partners within APEC are: Australia, Canada, Chile, Mexico, Peru, and Singapore.

Possibly for sharing the same language as well as similar culture and legal systems with the US, Australia and New Zealand are regarded as more liberal markets than others in the APEC region by some of the companies visited. The companies holding the view above deem similar legal systems as being quite important for them to conduct overseas market exploitation. Speaking the same language reduces lingual misunderstandings which can often ruin possible cooperation opportunities with local Government or companies. Some companies showed their concerns about the culture diversity, and one of the companies regarded culture differences as one of the main reasons that stopped their plans for oversea market exploitation. The MWH we interviewed thought it may facilitate their access into those foreign markets of environmental services with lower transaction costs than into other ones under similar legal system and culture.

◆ **Regulations limiting the US suppliers of cross-border environmental services among APEC**

In its response to the questionnaire for this study, the United States noted that all of the restrictions listed in the questionnaire, such as requirements to obtain authorizations, licenses or permits in order to market and supply services, requirements to use specified networks of providers, regulations affecting the cross-border transfer of capital, uses of credit cards, or e-business and requirements for a full commercial presence, can limit the supply of environmental services in the APEC region. In addition to these, there was a lack of understanding that cross-border supply of environmental services is technically feasible, and thus the lack of GATS commitments in Mode 1, can also limit the supply of environmental services.

From our interviews with the US companies, we are informed that the online payment systems are not so developed and convenient as it is thought to be among the APEC region, causing payment problems for service providers. This problem prevents some suppliers from providing cross-border environmental services. Please refer to the US survey report for more information.

◆ **Regulations limiting the US consumption of environmental services in other APEC economies**

In its response to the questionnaire for this study, the United States noted that all of the restrictions listed in the questionnaire, such as visa requirements, numerical quotas and special taxes, can limit the supply of environmental services in the APEC region.

As an eco-tourism service supplier, the US would gain larger share of total service industrial value than at present if the tourism visa service system could be improved. Many tourists from APEC economies are only allowed to apply for group tours for a fixed number of days, on fixed routes and are even obliged to purchase from designated restaurants and shops and may not take indi-

vidual personal tours. Such policy constrains the number of tourist visitors to the US.

- **Regulations limiting the US suppliers of environmental services with respect to commercial presence and legal form requirements among APEC member economies**

In its response to the questionnaire for this study, the United States noted that all of the restrictions listed in the questionnaire can limit the supply of environmental services in the APEC region. And as mentioned above, given that the US views mode 3 as the predominant mode of supply for environmental services, restrictions such as equity limitations, can be a major barrier to establishing commercial presence.

- **Regulations mostly limit the US suppliers of environmental services to other economies due to residency requirements and restrictions on the movement of natural persons in the APEC region**

In its response to the questionnaire for this study, the United States noted that all of the restrictions listed in the questionnaire can limit the supply of environmental services in the APEC region. And based on our company interviews, we believe, in the long term and residency requirements are also a concern for American overseas companies. Besides which, visa issues were regarded by the companies we surveyed as a problem particularly during special periods, such as Beijing Olympics.

- **Measures have been taken or are being planned, by the US government to overcome barriers to trade liberalization in environmental services in other economies**

The United States believes that all of APEC mechanisms and bilateral and WTO negotiations have an important role to play in reducing barriers to trade in environmental services. The United States has co-sponsored APEC work in the area of environmental goods and services, including most recently the establishment of an APEC database to facilitate the exchange of information on environmental goods and services markets in the Asia-Pacific region.

The United States has also negotiated and implemented several bilateral and regional FTAs that reduce barriers of trade in environmental services. And the United States has been a leading advocate for an ambitious, market-opening outcome to the WTO Doha Development Agenda (hereafter as “DDA”) negotiations under paragraph 31(iii) (increased market access for environmental goods and services). Most recently, the United States co-sponsored a proposal for the negotiation of an Environmental Goods and Services Agreement (EGSA), which would reduce trade barriers in this important sector, similar to the WTO Information Technology Agreement (ITA).

6. Statistical analysis of environmental services questionnaires survey on APEC economies

We had planned to undertake a quantitative analysis of the situation of APEC trade liberalization in environmental services based on a survey of APEC economies. Unfortunately, to date we have only received 13 completed questionnaires from Australia, Brunei Darussalam, Canada, Chinese Taipei, Korea, New Zealand, China, Japan, Peru, The Philippines, Singapore, Thailand, and the US respectively. In any case, we can draw some

conclusions based on the questionnaires filled out by APEC economies.

The questionnaire comprised of four main sections: basic information on environmental services in your economy; environmental regulatory and administrative policies and practices in your economy; perceptions of trade liberalization in environmental services in APEC economies; and suggestions for APEC trade liberalization in environmental services.

According to the 13 filled questionnaires, most economies stated that they have no idea or no information about the third party perceptions of trade liberalization in environmental services in APEC economies. The first part, basic information on environmental services in your economy has been analyzed in the former. And the fourth part, suggestions for APEC trade liberalization of environmental services will be analyzed and used in the latter. Therefore, here we only focus on the second part, environmental regulatory and administrative policies and practices in your economy. It is hoped that it can reflect the situation of APEC trade liberalization of environmental services.

We can found from Table 6.1 that about 50% of APEC economies use licenses or permits to limit the activities of foreign services providers via cross-border controls and not dedicated network of providers, policies on e-business, cross-border transfers of capital, uses of credit cards, etc. which are less often used via this supply mode. Also, some economies thought that foreign companies must have commercial presence and that domestic regulations would have limitations on that.

The only policy used for foreign services via consumption abroad was the visa requirement. Numerical quotas and special taxes seemed to be less frequently employed here. Specifically, about one third APEC economies agreed that visa requirements would have an effect on consumption abroad. Two of the thirteen economies thought that consumption abroad was not applicable. Another three thought that there were no barriers to market access here.

As for market access via commercial presence, it was less effective than other supply modes. Six of thirteen economies filled in “none” here. However, some thought that more restrictions were imposed by domestic regulations, especially, foreign investment policy. For example, Australia, Canada and Peru responded “none, except for the Investment Act which applies to all sectors” or other similar responses. In addition, some of economies required joint ventures, such as Brunei Darussalam, Korea.

Last but not the least, some economies had policies on the movement of natural persons, like visa restrictions, requirements for further training, local professional qualification examinations, labor permits, etc.. This has had more of limiting effect than other supply modes. The most common restrictions among APEC economies on this mode have been visa restrictions, professional qualification examinations and labor permits. About 50% of economies have visa restrictions policies on movement of natural persons. While the proportion of economies which professional qualification examinations and labor permits are 33% and 25% respectively. Two of the twelve economies applied further training and labor quotas. One economy thought that prevailing work permit requirements needed to be met. Another thought that this was related to horizontal commitments.

Table 6.1 Summary of Environmental Regulatory and Administrative Policies and Practices in some APEC Economies								
	Which kinds of policies and practices are used to limit the activites of foreign suppliers of environmental services with reference to cross-border supply?				Which kinds of policies and practices are used to limit the activities of foreign suppliers of environmental services with reference to consumption abroad?			
	Licenses or permits	Dedicated network of providers	Polices on e-business, cross-border transfers of capital, uses of credit cards	Other	Visa requirements	Numerical quotas	Specia taxation	Other
Australia	None. No market access barriers				None. No market access barriers			
Brunei Darussalam	X	X			X	X		
Canada	X				Not applicable			
Chinese Taipei	Unbound				None			
China	X				X			
Japan	Under Central Product Classification (CPC) of WTO, Japan commits all environment services at 4 digits level for PC9401, 9402, 9403, 9404, 9405, 9406 and 9409. For these CPC numbers, there are no commitments for foreign suppliers of cross-border supply on market access and national treatment due to lack of technical feasibility.				Under Central Product Classification (CPC) of WTO, Japan commits all environment services at 4 digits level for PC9401, 9402, 9403, 9404, 9405, 9406 and 9409. For these CPC numbers, there are no requirements for foreign suppliers of consumption abroad on market access and national treatment.			
Korea	X	X	X		X			X
New Zealand								
Peru	X				X			
The Philippines								
Singapore				Foreign companies must have commercial presence	Not applicable			
Thailand	X		X	X				X
The US	X			Domestic regulations				regulation

Table 6.1 Summary of Environmental Regulatory and Administrative Policies and Practices in some APEC Economies(Cont.)

	Which kinds of policies and practices are used to limit the activites of foreign suppliers of environmental services with reference to a commercial presence in your economy?								Which kinds of policies and practices are used to limit the activites of foreign suppliers of environmental services with reference to the movement of human resources						
	Policy privileges	Env. Economic or employment needs tests	Joint ventures	Foreign investment limitation	Numerical quotas	Nationality requirements	Sectoral restrictions	Other	Visas	Local labor market tests	Further training	Professional qualification examinations	Work permits	Labor quotas	Other
Australia	None, other that the Australia's Foreign Investment Review Board, which applies to all sectors								Australia's commitments on the movement of natural persons in the Uruguay Round describe the temporary entry conditions for skilled services suppliers, including environmental professionals and specialists.						
Brunei Darussalam		X	X	X		X			X			X	X	X	
Canada	None, other that the Investment Canada Act which applies to all sectors								X			X			
Chinese Taipei	None								Unbound, except as indicated in the horizontal section						
China	None								X						

Japan	Under Central Product Classification(CPC) of WTO, Japan commits all environment services at 4 digits level for PC9401, 9402, 9403, 9404, 9405, 9406 and 9409. For these CPC numbers, there are no requirements for foreign suppliers of commercial presence on market access and national treatment.								Under Central Product Classification (CPC) of WTO, Japan commits all environment services at 4 digits level for PC9401, 9402, 9403, 9404, 9405, 9406 and 9409. For these CPC numbers, there are no commitments for foreign suppliers except as indicated in Horizontal commitments						
Korea			X				X								
New Zealand															
Peru	There are no restrictions for supplying environmental services under commercial presence. However, domestic regulation is applicable, including licenses, registry requirements, city hall regulations, among others. In addition, there is a horizontal restriction for hiring foreign nationals, which is applicable								X		X	X	X	X	
The Philippines															
Singapore								Foreign companies must be incorporated	X				X		Need to meet prevailing work premit requirements
Thailand	X	X	X	X		X	X		X			X	X		
The US									X		X	X			

7. Major trade issues in environmental services in APEC economies

One of APEC's main goals is to promote trade liberalization. It is a message always emphasized by the leaders in their declarations and has made a substantive contribution to the process of liberalization and facilitation of trade. Governments support an open, rules-based multilateral trading system under the WTO and promote negotiation within in WTO framework. They have also noted also the dynamic and facilitating role that APEC plays by virtue of its broad membership, embracing both developed and developing economies, and its continuing commitment to liberalization.

Be it the scheduled commitments of WTO, or the Individual Action Plans of APEC, most economies have made concrete commitments and established specific measures to promote trade liberalization of environmental services, developing a range of solutions and policy measures, which have facilitated business travel and created good practices on trade liberalization.

For example, in response to the need for business people to gain more streamlined entry to the economies of the Asia-Pacific region or move more easily and quickly throughout the region, APEC Business Travel Card (hereafter as "ABTC") was developed. This enables business people to move freely thoroughly the region to explore new business opportunities, attend meetings and conduct trade and investment activities. 19 economies currently participate in the ABTC scheme. APEC Business Travel Handbook is another practical tool which provides a quick reference guide to the visa and entry requirements of APEC member economies. It lists the basic eligibility criteria and procedures for applying for visas and the terms and conditions that apply to business travelers.

However according to the field survey and survey, trade barriers for environmental services still commonly exist in APEC economies, which are similar to the barriers for other trades in services. What's more, the existence of trade barriers in all four kinds of services supply modes was identified. Trade barriers in environmental services have their own peculiarities in addition to the attribute of public goods found in environmental services and the characteristics of services trade liberalization. The main barriers are as follows:

7.1 Licenses or permits: issues in Mode 1 (cross-border supply)

Requirements to obtain authorization, licenses or permits in order to market and supply services are regarded as a major limitation of the cross-border supply of environmental services in the APEC region. Typically there are more specialized licensing requirements applicable to businesses in particular industries regarding regulated issues such as pollution control, and the handling and disposal of specified hazardous substances.

According to the results of the questionnaire, about half of APEC economies have made regulations on licenses or permits to limit the activities of foreign environmental services providers. Most of them lack also the understanding that cross-border supply of environmental services is technically feasible. They seem to assume environmental services, like maintenance and installation of environmental equipment has be done on-site and online

payment is also a big problem.

7.2 Tourist visa requirement: issues in Mode 2 (consumption abroad)

Based on WTO GATS, eco-tourism and similar activities are some of the key elements for mode 2 of environmental services. In this regard and considering the survey, the tourist visa requirement is the biggest issue in mode 2 equivalent to licenses or permits in mode 1. In the Asia-Pacific region, only specific eco-cities or places environmentally are open to trade with and tourists from other specific economies, such as Cheju Island of Korea. However, many tourists from APEC economies are only allowed to take group tours for a fixed number of days, on specified routes and not personal trips. Some economies levy excessive charges or taxes or restrictions when eco-travelers leave country frontiers. Such policy constrains the number of visitors and the volume of trade in environmental services.

7.3 Qualification requirements and equity limitation: issues in Mode 3 (commercial presence)

In general, based on our survey and study, trade barriers in APEC economies exist ubiquitously through out the region. However, there are differences between developing and developed economies. Most developed economies have qualification requirements in place, while most developing economies have imposed equity limitations.

- Qualification requirements

Lack of a mechanism allowing for the mutual recognition of professional qualifications among the region's economies creates barriers for environmental services trade.

At the company level, nationality and/or residency is always required for the establishment of or investment in a foreign company, i.e. for companies operating public utilities or trying to gain the right to practice professional services such as architecture and/or engineering. At the personal level, in the US one has to take professional engineering certification before applying for a job in this field. Many companies insist on such professional certification requirements. Constrained by whch, suppliers providing cross-border environmental services have to hire state-certified personnel or professional employees, pushing up management and operational costs etc as a result.

- Equity limitation

Equity limitation was brought up in the interviews we conducted in the US and was also reflected in the results of our questionnaire analysis. Some economies also indicated it in their WTO schedule commitments or incorporated it into foreign investment policies. For example, Indonesia made comprehensive market access under Modes 2 and 3 (i.e. join ventures with local services with maximum 51% share participation, using local professional manpower, transferring know-how & technology to local professional manpower) for sewage, refuse disposal and sanitation services etc..

7.4 Work permits and visa requirements: issues in Mode 4 (natural person movement)

Work permits and visa requirements are other regulations being used by APEC economies, which also strongly restrict the liberal trade of environmental services in the Asia-Pacific region. Specifically, work permits and visa requirements, which were frequently mentioned in the questionnaire

feedback, were used by both developing and developed economies. Some of them had work permits and visa quotas to limit foreign services providers. As a result, many foreign businesses have had to hire specified ratios of domestic employees.

8. Suggestions for APEC trade liberalization in environmental services

The following suggestions are made by the researchers, as an input into the APEC Group on Services' further work on environmental services. They do not necessarily represent the views of APEC economies.

As one of the world's most important regional organizations, APEC should take the lead in addressing these global problems and find solutions in line with the global consensus reached, the objective of which being sustainable development and integration economic growth and environment protection.

From the survey, we found that most of economies hoped and would be willing to support APEC to further promote sustainable development and trade liberalization in environmental services. Unitl now, while APEC generally promotes trade liberalization in environmental services with consensus-building, such as declarations, compiling IAP reports, workshops, etc., it nevertheless takes only a non-binding, and "soft law" approach to international cooperation. However, given the role of trade liberalization for environmental services in improving general environmental protection, raising economic efficiency and creating development, there is great potential for a "win-win" situation.

Therefore, in general, in order to realize the objective of trade liberalization, APEC should

[1] Recognize that other service sector industries are highly relevant and linked to the provision of environmental services, such as architecture and engineering, construction, and energy services, and ensure that liberalization is promoted in these other "cluster" sectors as well;
[2] Initiate the Environmental Goods and Services (EGS) Work Program Framework;
[3] Promote trade liberalization in environmental services;
[4] Actively participate in developing the MAG's environmental goods and services work program;
[5] Work with environmental regulators to better understand current regulatory drivers and market access conditions in individual APEC economies, and help these regulators better understand the GATS;
[6] Promote strong, science-based, consistent and transparent environmental regulation in the APEC region;
[7] Work closely with environmental services businesses, and related businesses (e.g. architecture and engineering, energy, construction), to better understand their market access concerns;
[8] Work to ensure that GATS offers reflect current levels of market access and national treatment in the environmental services sector in individual APEC economies, and provide new market access and national treatment in subsectors and modes of supply where trade impediments remain; and
[9] Support the proposal in the WTO to negotiate an Environmental Goods and Services Agreement (EGSA).

In addition, APEC should also take more

specific actions to liberalize trade in environmental services, as follows:

Firstly, APEC should play an important role in developing a classification of environmental services

Environmental services is a new term for many people and organizations alike. From the surveys both in field and the results of questionnaires, we found different economies have different understandings though some of them use WTO or Central Product Classification (CPC) classification systems.

For example, Canada uses the North American Industry Classification System (NAICS). Thailand defines and classifies its industries according to the Thailand Standard Industrial Classification (TSIC). Classification systems are also a hot topic both in the trade and environment negotiations and trade in services negotiations in WTO. The current classification at WTO may appear limited because it does not include all the services which may benefit the environment. The environmental industry has evolved quickly and now incorporates a much broader range of new services, such as cleaner energy technology, and indoor clean air services, etc..

In this sense, improving the classification of environmental services is very necessary and will further promote the benefits of the current trend towards liberalization. A more accurate and updated definition of services covered in the sector, in line with the actual economic situation and prevailing trends, would broaden the coverage and the commitments of economies. Once the classification of environmental services is clearer, APEC can take real action to promote liberalization in this sector, along with other work undertaken at WTO. For example, APEC can build on current work related to the measurement of trade in services in order to develop more consistent statistics in the region.

The work that APEC should now do is organize an international workshop on creating a common definition and classification system for environmental services. The outputs of such a workshop would include a proposed draft definition and classification system to be submitted to APEC Group on Services (hereafter as “GOS”). After confirmation from GOS, it could be proposed in the WTO CTE negotiations and then applied to APEC economies IAP reports. On the basis of which, APEC could develop detailed measures to liberalize environmental services trade and work toward promoting consistency between members’ environmental regulations and guidelines.

Our suggestion of a definition and classification of environmental services breaks down environmental services into three categories to meet the different environmental challenges: indoor, outdoor/local/regional, and global. Specifically, in order to better meet the demands of environmental services, we propose an environmental service classification system denoting the respectivie trade modes in place. The following table shows the possible kinds of environmental services.

Table 8.1 Definition and Classification of Environmental Services

Mode of service	Indoor-environmental service	Conventional environmental service	Global-environmental service
Mode 1			
Mode 2			
Mode 3			
Mode 4			

Secondly, APEC should promote mutual, multiple and regional recognition of professional qualifications for environmental services among APEC economies

Based on the field survey, certification is one of the most serious barriers to entry in the trade of environmental services. Environmental services is very broad sector and by nature has technical characters. Different sub-sectors also have their own standards and certification systems Companies or persons engaged in environmental services in each economy have to achieve the standards and acquire certification accordingly.

Taking into account its characteristics as a forum for discussion on the basis of open regionalism, APEC can play an important role in enhancing transparency regarding regulations and measures for these services. APEC also should encourage and promote the mutual recognition of professional certification in environmental services across APEC economies.

The specific measures and actions should be as follows: 1) to conduct a co-research project on promoting and looking for effective means to facilitate the mutual recognition of professional qualifications; 2) to have a special open forum or workshop on promoting the mutual recognition of professional qualifications in the environmental services field, the findings of the forum or workshop would be presented as policy recommendations to decision-makers; 3) to mention or recognize such a system in the APEC Regional Free Trade Agreement; 4) to gain relevant experience through the conducting of several pilot studies in environmental services sub-sectors in Early Voluntary Sectoral Liberalization (EVSL).

Thirdly, APEC should strengthen capacity building on trade in environmental services

It is very important to set up a website on environmental services and improve information sharing among APEC economies. Actually, in many cases it has been shown that environmental services suppliers do not know who needs their services, and conversely that demanders of environmental services do not know where they can source the suppliers they need. Therefore, setting-up a website on environmental services and opening it up to all economies and even all WTO members would help facilitate trade in environmental services.

The website recently established by APEC would be a good platform through which the exchange of information on environmental services markets in the Asia-Pacific region could be facilitated. Information on environmental services should be as comprehensive

as possible and should for example include introductions about the companies, information about demand, supply, visa application procedures, required licenses, qualifications, equities, and quotas, etc..

More specifically, APEC should set up a kind of mechanism and/or platform to supervise APEC economies' actions through the promoting of open information. it should make understood that cross border supply of environmental services is feasible and ensure that their GATS offers, and ultimately their GATS and FTA commitments, reflect this fact as well as the current level of market access. This would make the market in environmental services more transparent and open.

It is also important to provide further support to research on environmental services. As we all know, APEC has conducted several studies on environmental services and related research, like this project. However, trade liberalization in environmental services is an integrated problem, and cannot be resolved by a few research projects. Possible solutions need to take into account long run issues. Research on environmental services should not only focus on trade barriers, but also trade policies and the relationship between trade and environment, etc..

Besides which, of course, APEC should act as a platform for discussion and training on environmental services. In addition to which, APEC should support the holding of more workshops and training courses on trade in environmental services and other related services.

Fourthly, APEC should promote trade facilitation and simplify the procedures

APEC has already taken some measures to promote and facilitate trade in environmental services and simplify procedures. To take the visa application process as an example, APEC has implemented the APEC Business Travel Card scheme, facilitated visa free or visa waver arrangements, introduced 3-year multiple entry visas for short term business visitors such as those engaged in the negotiation of the sale of goods or services, making cross-border investments or participating in business-related conferences, seminars or workshops. APEC has also compiled visa application forms and other relevant information including the APEC Business Travel Handbook and made them readily available online. These measures have facilitated the movement of persons within Asia-Pacific region.

In order to further promote trade facilitation and simplify the procedures in trade in environmental services in the APEC region, with respect to the visa issue, we suggest: the participation of the APEC Business Travel Card and/or other visa free arrangements be broadened; special APEC lanes be designated and clearly signposted so that ABTC holders to enjoy fast track entry/exit; restrictions listed by member economy should be identified in their IAPs (Foreign Entry, Discriminatory Treatment/ Most-Favored-Nation) and a follow-up procedure be established; member economies are urged to provide substantial visa information through their embassies/ consulate to be included in the APEC Business Travel Handbook and provide regular updates; member economies are asked to ensure streamlined arrangements for intra-company transferees in accordance with the agreed APEC 30-day processing requirement, and finally that e-lodgment arrangements for temporary residency applications etc. be introduced.

Besides which APEC should also look to strengthen the facilitation of work permit and professional certification processing as visa issues.

Fifthly, APEC should strengthen coordination of and cooperation in trade in environmental services

As analyzed above, trade barriers in environmental services are closely related to overall trade policies. Considering that APEC is an important open regional organization, and has as its objectives: trade liberalization, trade facilitation and technology cooperation, it is not enough to simply liberalize environmental services trade in Asia-Pacific area as a means to solve the problem. APEC must also strengthen coordination and cooperation broadly and at different levels.

At an international level, APEC should further support the multilateral trading system to facilitate trade in services through specific actions. For example, APEC could strengthen the communication and coordination with WTO Committee on Trade and Environment. APEC could also actively participate in negotiations and provide suggestions and technical support to the negotiations on trade in environmental services. In addition, APEC should learn from the experiences of other regional organizations like the North American Free Trade Agreement (NAFTA), and foster cooperation opportunities in environmental services trade and promote high quality Regional Trade Agreements. APEC economies should strengthen cooperation on trade in environmental services.

APEC should actively try to adopt specific types of cooperation, technical cooperation being more important than types. APEC should encourage and promote technical cooperation on environmental services. APEC economies should cooperate to develop environmental and climate friendly technologies. Moreover, cooperation on environmental services among enterprises in all APEC economies is also very important.

9. Conclusions

The survey on APEC trade liberalization in environmental services has uncovered several new findings. The following are the key points:

- Environmental service (and goods) can be defined from the demand side, based on the whole spectrum of environment issues by scale and should comprise 3 overall types of environmental services:
  - Environmental services for improving the indoor-environment
  - Environmental services for improving outdoor, local and regional environments (conventional ones)
  - Environmental services for improving the global-environment

  So far, indoor and global-environmental services are far beyond the capacity of economies of APEC to realize.

- Although environmental services currently comprises a small proportion of the service sector as a whole, the industry has significant potential, especially in health related indoor-environmental services and MEA-driven global-environmental services, such as services in the sectors of climate change, biodiversity, ozone depletion, POPs etc..

◆ Public utility-related environmental services, such as sewage treatment, solid waste management etc. are strongly influenced by the regulations and policies of local governmental public procurement.

◆ Like other service sectors, there exists trade barriers in environmental services in APEC region, including:
- ■ Lack of mutual recognition of professional qualifications
- ■ Work permit requirements
- ■ Equity limitations
- ■ Visa requirements and restrictions
- ■ Government public procurement discrimination

◆ We, the research team based on our survey, recommend that APEC should
- ■ Play an important role on developing classification of environmental services
- ■ Promote mutual, multiple and regional recognition of professional certificates for environmental services among APEC economies
- ■ Strengthen capacity building on trade in environmental services
- ■ Promote trade facilitation and simplify procedures
- ■ Strengthen coordination of and cooperation in trade in environmental services

Annex I: Situation of APEC trade liberalization in environmental services

Table I-1 Trade liberalization in Environmental Services of APEC Economies

Economies	Section	Current Entry Requirements
Australia	Operational Requirements	There is no industry-specific regulator in the environmental services sector in AustraliA. The activities of the environmental services sector are regulated by several cross-sectoral regulatory bodies of the Australian Government and State and Territory governments. The Australian Government, through its Department of the Environment and Heritage, administers the *Environment Protection and Biodiversity Conservation Act*. This legislation applies to all organisations (foreign and Australian) proposing to undertake activities, including environmental services, which may have an impact on a matter of environmental significance. If an organisation believes its activity may impact on a matter of environmental significance, it must refer its project proposal to the Minister for Environment and Heritage, through his Department. The website for the Department of Environment and Heritage, http://www.environment.gov.au/, provides further information on the Act and how to make a referral. Each Australian State and Territory has an environmental protection agency that advises on the application of general environmental protection legislation to company activities. Environment protection agencies examine major projects on a case-by-case basis, and advise if licenses (e.g., for waste treatment) are requireD. It should be noted, however, that most projects do not require such licenses. At the local government level, town and shire councils make decisions about urban planning, such as the location of waste treatment facilities.

	Licensing and Qualification Requirements of Service Providers	Specific licensing requirements are regulated by the governments of the Australian States and Territories. For further details, contact the relevant State or Territory environmental protection agency.
	Foreign Entry	In the WTO context, Australia made comprehensive market access commitments in the GATS under modes two and three for sewage services, refuse disposal services and sanitation and similar services. In the same sub-sectors, mode one remains unbound due to lack of technical feasibility. Overseas-trained engineers who come to Australia to work in environmental services will find few statutory requirements for licensing or registration. Those which do exist apply only to consulting engineers in the State of Queensland and to some positions in the fields of mining, local government and construction. For more details see Chapter 3 (a:4) , Business Services – Engineering.)
	Discriminatory Treatment/ MFN	In the WTO context, Australia made comprehensive national treatment commitments in the GATS under modes two and three for sewage services, refuse disposal services and sanitation and similar services. In the same sub-sectors, mode one remains unbound due to lack of technical feasibility. Australia applies the MFN principle in the environmental services sector.
Canada	Operational Requirements	Regulations applicable to the environmental services sector exist at the federal, provincial and municipal levels. For further information see the document entitled “The Canadian Environmental Service Sector”.
	Licensing and Qualification Requirements of Service Providers	Not aware of any application.
	Foreign Entry	Specific commitments in this area are set out in Canada's GATS Schedule. Canada has made commitments on all environmental services. There are no restrictions on foreign entry.
	Discriminatory Treatment/ MFN	No restrictions exist.
Chile	Operational Requirements	There are a few minor market access limitations: Concessions to establish, construct and work public services destined to produce and distribute potable water, to collect and dispose waste water, will be granted to corporations. These legal entities must be constituted under Chilean laws for the exclusive purpose of rendering such services.

		The main regulations in this area is established in: Supreme Decree No. 121 in the Official Gazette on 27 November 1991
	Licensing and Qualification Requirements of Service Providers	
	Foreign Entry	Environmental services are completely open to competition from both, national and foreign providers. There are no foreign ownership restrictions in this activity
	Discriminatory Treatment/ MFN	No restrictions.
Hong Kong, China	Operational Requirements	In general, there are no specific operational requirements applicable to the service providers in the environmental services sector. However, the registered asbestos consultants, registered asbestos contractors and registered asbestos contractors and registered asbestos laboratories operation are governed by Sections 51 to 80 of the Air Pollution Control Ordinance and the Code of Practice on Asbestos Control issued by the Environmental Protection Department.
	Licensing and Qualification Requirements of Service Providers	There is generally no special statutory requirement on service providers in the environmental services sector, except for providing collection and disposal services for chemical waste and for handling materials containing asbestos. Collection or disposal of chemical waste requires a licence issued under the Waste Disposal Ordinance. For asbestos, apart from the control under the said Ordinance, the asbestos consultants, asbestos contractors and asbestos laboratories are required to be registered under Air Pollution Control Ordinance separately.
	Foreign Entry	There are no additional regulatory requirements for foreign entry into this service sector.
	Discriminatory Treatment/ MFN	There are no additional regulatory requirements for operation which discriminate between domestic and foreign service suppliers.
Indonesia	Operational Requirements	There is no specific regulator for the Environmental Services sector in Indonesia. The activities of the environmental services sector are regulated by cross sector regulatory bodies at central and provincial level.

		The Environmental Impact Management Agencies in central and provincial level provide advise on the application of general environmental protection legislation to company activities. According to Act No. 23 year 1997 on Environmental Management, at the central level, the State Ministry for Environmental determines decision on site disposal of waste. While according to the Government Regulation No. 18 year 1999 jo. No. 85 year 1999 the Head of the Environmental Impact management Agency determines decision on management of hazardous and toxic waste. At the provincial level, local authority makes decision on spatial plan including sites of facilities for hazardous and toxic waste treatment.
	Licensing and Qualification Requirements of Service Providers	Indonesia made comprehensive market access under modes two and three (join venture with local services with max. 51% share participation, using local prof. Manpower, transferring know how & technology to local prof. Manpower) for sewage services, refuse disposal services and sanitation and similar services. Overseas-trained engineers who come to Indonesia to work in environmental services will find that there are few statutory requirements for registration.
	Foreign Entry	Indonesia made comprehensive market access under modes two and three (join venture with local services with max. 51% share participation, using local prof. Manpower, transferring know how & technology to local prof. Manpower) for sewage services, refuse disposal services and sanitation and similar services. Overseas-trained engineers who come to Indonesia to work in environmental services will find that there are few statutory requirements for registration
	Discriminatory Treatment/ MFN	The Act number 23 of 1997 regarding Environmental Management prohibits disposal of waste which originates form outside Indonesian territory to an Indonesian environmental medium. Indonesian made comprehensive national treatment under modes two and three for sewage services, refuse disposal services and sanitation and similar services.

Japan	Operational Requirements	Environment Service operators have to get authorization from central or local government. The technical standards and absence of a dishonest act are mainly required.
	Licensing and Qualification Requirements of Service Providers	Licensing and qualification requirements are regulated by the relevant laws at the central government level.
	Foreign Entry	No restrictions exist except for the Horizontal Commitment in national treatment listed for the 3rd mode of supply. But no commitment in mode 4 except as indicated in the Horizontal Commitment in market access and national treatment listed for the 4th mode of supply
	Discriminatory Treatment/ MFN	There is no restriction inconsistent with Most-Favored-Nation treatment.
Mexico	Operational Requirements	In Mexico, the legal framework for water issues is contained in the following laws and rules: • The Mexican Constitution, articles 27, 28 and 115. • Law of Waters and its regulations. • Law of Federal Rights. • Law of Improvements in the Hydraulic Infrastructure. • Several laws issued at state level. • General Law of Ecological Balance and Environmental Protection. This law regulates the atmosphere issues in the following areas: chemical, petroleum and petrochemistry, paper, electricity generation, cement, glass, metallurgic, hazardous materials, among others. www.semarnat.gob.mx/marco_juridico/index.shtml www.semarnat.cob.mx/tramites (only spanish) The National Commission of Water (CNA) has carried out a very important effort in order to grant legal security for the users of waters. The CNA has developed a process which includes a register of users.
	Licensing and Qualification Requirements of Service Providers	In the Federal Environmental Protection Offices, the environmental audit program has widened its goals to include other sectors besides industry, such as tourism, forestry, SME, etc. Also, the accreditation of professional consultants by the Mexican Entity of Accreditation has started with more than 250 applicants. With the purpose of incorporating a greater number of companies to the National Program of Environmental Audit (PNAA), 2.839 visits of promotion and 291 industrial meetings were made.

		The Ministry of the Environment and Natural Resources, along with the Ministry of Finance and Public Credit and the Ministry of Energy have promoted the implementation of fiscal incentives with environmental purposes. These incentives included accelerated depreciation and zero tariffs, which are aimed at supporting the installation of anti-pollution equipment that translates into benefits for the environment. In Mexico, the exploitation and use of waters are granted through concessions in which companies or people can participate. To grant a concession it is important to take into account the regulations set up in the Public Register of Water Rights. Applications for the water rights are for a period no less than 5 years and no more than 50 years, with the possibility to extend the period under the same terMs A concession has the following uses: public-urban, agriculture, electricity generation, industrial activities, tourism, services, and for the environmental conservation.
	Foreign Entry	The Foreign Investment Law, Chapter 1, Article 10 stipulates the main rules for the exploitation or use of waters.
	Discriminatory Treatment/ MFN	There is no discriminatory treatment.
New Zealand	Operational Requirements	All sectors are subject to the measures outlined in the “General Approach to Trade in Services” section. The following Acts and associated regulations apply to all services sectors and establish parameters for general business practice in New Zealand. The Companies Act 1993 Employment Relations Act 2000 Health and Safety in Employment Act 1992 Commerce Act 1986 Consumer Guarantees Act 1993 Fair Trading Act 1986 Resource Management Act 1991 Local Government Act 1974 The Resource Management Act 1991, the Conservation Act 1987, the Health Act 1956, Toxic Substances Act 1979, Hazardous Substances and New Organisms Act 1996, Maritime Transport Act 1993 and various pieces of local government legislation govern the environmental services sector.

	Licensing and Qualification Requirements of Service Providers	Licensing, qualification and certification requirements are contained in the above legislation.
	Foreign Entry	Foreign investment in New Zealand is subject to the provisions of the Overseas Investment Act 1973 and associated regulations. There are no additional regulatory requirements for foreign entry into this industry or sector.
	Discriminatory Treatment/ MFN	With the exception of the measures indicated in the horizontal section of New Zealand's GATS schedule, there are no provisions which discriminate between domestic and foreign suppliers.There are no provisions which discriminate between foreign suppliers.
Papua New Guinea	Operational Requirements	This includes: – Compliance with the Investment Promotion Act and Regulations (Registration of Overseas Company, Certification of Foreign Enterprises and observation of Reserved Activities) – In the field of Science Research – Natural History, the researchers must lodge research application three (3) months in advance before the proposed date of arrival for assessment and processing. – It is requirement when dealing with protected/threatened fauna, or bio prospecting that risk assessment or agreement are prepared and affected for the research are permitted. – Monitoring scientific research programmes in Natural History is always a difficult task, especially when the research programme goes into new areas of science and there are experts within the economy. There are experts within the economy. There also logistic problems getting to the sites for inspection (Marine research ships) Qualifications: – They basically have to be registered through – The officers must have relevant qualification and have essential work experiences in field biology.
	Licensing and Qualification Requirements of Service Providers	This are the same for any other service provider in PNG. This includes: – Compliance with the Investment Promotion Act and Regulations (Registration of Overseas Company, Certification of Foreign Enterprises and observation of Reserved Activities)

		– The Crocodile skin trade is regulated by legislation with regulatory controls on hunters, traders, and exporters, including export skin sizes and farming. – All wildlife trades (Crocodile skin trade, dried and dead insect trade including wildlife souvenir trade) are required under the Fauna, crocodile trade and International Trade Act (s) (exports require permits for both firms and individuals. Qualifications: – They basically have to be registered through – The officers must have relevant qualification and have essential work experiences in field biology
	Foreign Entry	
	Discriminatory Treatment/ MFN	
Chinese Taipei	Operational Requirements	Waste disposal businesses should follow the Waste Disposal Act and Criteria Governing Methods of and Facilities for Storage, Clearance and Treatment of Industrial Wastes.
	Licensing and Qualification Requirements of Service Providers	The employment of foreign workers or specialists should follow the Regulations for Employment of Foreign Specialists. Environmental engineers should follow the Validation of Environmental Protection Engineers.
	Foreign Entry	The target objectives are fully liberalized.
	Discriminatory Treatment/ MFN	There are no limitations on market access and on national treatment.
Peru	Operational Requirements	According to current legislation, studies for environmental impact must be carried out by registered private or public authorized organizations. All institutions must follow guidelines set by the National Environmental Commission (CONAM). Sanitary services provision, such as water and sewage, is supervised by the Supervisor of Sanitary Services (SUNASS). Firms in this service sector must be constituted under the form of anonymous association, though some exceptions apply depending on the nature of the service provided.
	Licensing and Qualification Requirements of Service Providers	For the supply of environmental services, the current legislation requests: – To conform a legal organization – To fulfill the requirements from Ministries that need a specific service

	Foreign Entry	There is no discrimination
	Discriminatory Treatment/ MFN	There is no discrimination
US	Operational Requirements	The United States maintains no restricions in this sector
	Licensing and Qualification Requirements of Service Providers	The United States maintains no restricions in this sector
	Foreign Entry	The United States maintains no restricions in this sector
	Discriminatory Treatment/ MFN	The United States maintains no restricions in this sector
Viet Nam	Operational Requirements	Enterprises wishing to operate in enviroment services, have to meet such following requirements as: – Business operation licenses (for domestic enterprises) or investment licenses (for foreign enterprises) – Regulations on investment incentives for enviroment protection, enviroment pollution disposal, advanced technology transfer. – Regulations on capital. – Regulations relating to trading in poisonous chemicals and products containing poisonous chemicals. Regulations relating to standards of transportation and burial of solid waste, destruction of some prohibited chemicals.
	Licensing and Qualification Requirements of Service Providers	No specific requirement.
	Foreign Entry	The area of environment protection falls under the category of special encouragement investment projects (in producing equipment of waste and pollution treatment, environment protection enjoys tax exemption and tax reduction (enterprise income tax is 10% in the first 15 years while the common tax rate is 25%. Income tax of enterprises in this area is exempted in their first 4 profit-making years, reduced by 50% in the next 4 years).
	Discriminatory Treatment/ MFN	No discriminatory treament in enviroment service.

Source: IAP of APEC Economies in 2000-2008.

Table I-2 Summary of Specific Commitments on Environmental Services

Members	Sewage Services	Refuse Disposal Services	Sanitation and Similar Services	Other			
				Cleaning services of exhaust gases	Noise Abatement services	Nature and landscape protection services	Other environmental protection services
Albania	X	X	X	X	X	X	X
Armenia	X	X	X	X	X	X	X
Australia	X	X	X				
Austria	X	X	X	X	X	X	X
Bulgaria	X	X	X	X	X	X	
Cambodia	X	X	X	X	X	X	X
Canada	X	X	X	X	X	X	X
Central African Rep.							X
China	X	X	X	X	X	X	X
Chinese Taipei	X	X	X	X	X	X	X
Colombia						X	X
Croatia	X	X	X	X	X	X	X
Czech Rep.	X	X	X				
Ecuador	X	X	X	X	X	X	X
El Salvador				X	X	X	X
Estonia	X			X	X	X	X
European Community	X	X	X	X		X	X
Finland		X		X	X	X	X
Gambia	X		X				
Guinea	X		X				
Hungary		X	X				
Iceland	X	X	X	X	X	X	X
Israel	X	X	X	X	X		
Japan	X	X	X	X	X	X	X
Jordan			X	X	X	X	X
Korea RP	X	X		X	X	X	X
Kuwait	X	X	X				
Kyrgyz Republic	X	X	X	X	X	X	X

Members	Sewage Services	Refuse Disposal Services	Sanitation and Similar Services	Other			
				Cleaning services of exhaust gases	Noise Abatement services	Nature and landscape protection services	Other environmental protection services
Latvia	X	X	X	X	X	X	X
Lesotho	X	X	X	X	X	X	
Liechten-stein	X	X	X	X	X	X	X
Lithuania	X	X	X	X	X	X	X
Morocco	X	X	X	X	X	X	X
Nepal	X	X	X				
Norway	X	X	X	X	X	X	X
Oman	X	X	X	X	X	X	X
Panama				X	X	X	
Poland				X	X		
Qatar	X	X	X	X	X	X	X
Romania				X	X	X	X
Rwanda			X				
Saudi Arabia	X	X	X	X	X	X	X
Sierra Leone	X	X	X	X	X	X	X
Slovak Re-public	X	X	X				
Slovenia	X	X	X			X	
South Africa	X	X	X	X	X	X	
Sweden	X	X	X	X	X	X	X
Switzerland	X	X	X	X	X	X	X
Thailand	X	X	X	X	X	X	X
Tonga	X	X	X	X	X	X	X
Turkey	X	X	X				
United Arab Emirates	X	X	X	X	X	X	X
The US	X	X	X	X	X	X	X
Viet Nam	X	X	X	X	X	X	X
Total	47	46	48	41	41	41	37

Source: WTO Secretariat, 2008.

Table I-3 Summary of Commitments on Environmental Services of APEC Economies in GATS

APEC Economies	Market Access	National Treatment	Market Access	National Treatment	Market Access	National Treatment	Market Access	National Treatment
	Cross border supply		Consumption abroad		Commercial presence		Presence of natural persons	
Australia								
Brunei Darussalam								
Canada								
Chile								
China								
Hong Kong, China								
Indonesia								
Japan								
Korea								
Malaysia								
Mexico								
New Zealand								
Papua new Guinea								
The Philippines								
Singapore								
Chinese Taipei								
The Thailand								
The United States								
Peru								
Russia								
Viet Nam								

Source: WTO Secretariat, 2008.

Note: *none* *open partly* *open*

Table I-4 Schedule of Specific Commitment of nine APEC Economies in GATS

◆ Australia[1]

Sub-sector	Limitations on Market Access	Limitation on National Treatment
A. Sewage Services (CPC 9401)	1) Unbound* 2) None 3) None 4) Unbound except as indicated in the horizontal section	1) Unbound* 2) None 3) None 4) Unbound except as indicated in the horizontal section
B. Refuse Disposal Services (CPC 9402)		
C. Sanitation and Similar Services (CPC 9403)		

◆ Canada

Sub-sector	Limitations on Market Access	Limitation on National Treatment
A. Sewage Services (CPC 9401) B. Refuse Disposal Services (CPC 9402) C. Sanitation and Similar Services (CPC 9403) D. Other Cleaning services of exhaust gases (CPC 9404) Nature and landscape protection services (CPC 9406) Other environmental services n.e.c. (CPC 9409)	1) None 2) None 3) None 4) Unbound except as indicated in the horizontal section	1) None 2) None 3) None 4) Unbound except as indicated in the horizontal section

1 Modes of supply for all economies: (1) Cross-border supply; (2) Consumption abroad; (3) Commercial presence; (4) Presence of natural persons

◆ China[1]

Sub-sector	Limitations on Market Access	Limitation on National Treatment
A. Sewage Services (CPC 9401) B. Solid Waste Disposal Services (CPC 9402) C. Cleaning Services of Exhaust Gases (CPC 9404) D. Noise Abatement Services (CPC 9405) E. Nature and Landscape Protection Services (CPC 9406) F. Other Environmental Protection Services (CPC 9409) G. Sanitation Services (CPC 9403)	(1) Unbound except for environmental consultation services. (2) None (3) Foreign services suppliers engaged in environmental services are permitted to provide services only in the form of joint ventures, with foreign majority ownership permitted. (4) Unbound except as indicated in horizontal commitments.	(1) None (2) None (3) None (4) Unbound except as indicated in horizontal commitments.

◆ Chinese Taipei

Sub-sector	Limitations on Market Access	Limitation on National Treatment
A. Sewage Services (9401) ; Refuse Disposal Services (9402) ; Sanitation and Similar Services (9403) ; Others (9404, 9405, 9409)	(1) Unbound* (2) None (3) None (4) Unbound except as indicated in the horizontal section.	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section.
B. Consulting Services Incidental to Nature and Landscape Protection (9406**)	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section.	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section.

1 excluding environmental quality monitoring and pollution source inspection

◆ Japan

Sub-sector	Limitations on Market Access	Limitation on National Treatment
A. Sewage Services (CPC 9401)	1) Unbound* 2) None 3) None 4) Unbound except as indicated in horizontal commitments	1) Unbound* 2) None 3) None except as indicated in horizontal commitments 4) Unbound except as indicated in horizontal commitments
B. Refuse Disposal Services (CPC 9402)	1) Unbound* 2) None 3) The number of licences conferred to service suppliers of waste oil disposal at sea from vessels may be limited. 4) Unbound except as indicated in horizontal commitments	1) Unbound* 2) None 3) None except as indicated in horizontal commitments 4) Unbound except as indicated in horizontal commitments
C. Sanitation and Similar Services	1) Unbound* 2) None 3) None 4) Unbound except as indicated in horizontal commitments	1) Unbound* 2) None 3) None except as indicated in horizontal commitments 4) Unbound except as indicated in horizontal commitments
D. Other Cleaning services of exhaust gases (CPC 9404) Noise abatement services (CPC 9405) Nature and landscape protection services (CPC 9406) Other environmental protection Services (CPC 9409)	1) Unbound* 2) None 3) None 4) Unbound except as indicated in horizontal commitments	1) Unbound* 2) None 3) None except as indicated in horizontal commitments 4) Unbound except as indicated in horizontal commitments

◆ Korea

Sub-sector	Limitations on Market Access	Limitation on National Treatment
A. Sewage Services Refuse Water Disposal Services (CPC 9401#13)	1) Unbound 2) None 3) The number of service suppliers is limited to twenty-five (25) . 4) Unbound except as indicated in ALL SECTORS	1) None 2) None 3) None 4) Unbound except as indicated in ALL SECTORS
B. Refuse Disposal Services Industrial Refuse Disposal Services (CPC 9402#14)	1) Unbound 2) None 3) Establishment of a commercial presence is subject to the economic needs test. Refuse collection and transport service suppliers may conduct business only within the jurisdiction of the respective Regional Environment Office which has granted them approval for operation. 4) Unbound except as indicated in ALL SECTORS	1) None 2) None 3) None 4) Unbound except as indicated in ALL SECTORS
D. Other Cleaning Services of Exhaust Gases and Noise Abatement Services (9404*, 9405*]#15	1) None 2) None 3) None 4) Unbound except as indicated in ALL SECTORS	1) None 2) None 3) None 4) Unbound except as indicated in ALL SECTORS
Environment Testing and Assessment Services (CPC 9406*, 9409*)#16	1) None 2) None 3) Establishment of a commercial presence is subject to the economic needs test. 4) Unbound except as indicated in ALL SECTORS	1) None 2) None 3) None 4) Unbound except as indicated in ALL SECTORS

◆ The United States

Sub-sector	Limitations on Market Access	Limitation on National Treatment
A. Sewage Services (contracted by private industry) B. Refuse Disposal Services (contracted by private industry) C. Sanitation and Similar Services D. Other (Cleaning services of exhaust gases; Noise abatement services; Nature and landscape protection services; Other environmental services, n.e.c.)	1) None 2) None 3) None 4) Unbound, except as indicated in the horizontal section	1) None 2) None 3) None 4) None

◆ Viet Nam

Sub-sector	Limitations on Market Access	Limitation on National Treatment	Other remarks
Access to certain geographic areas may be restricted for security reasons1.			
A. Sewage Services (CPC 9401)	(1) Unbound, except related consulting services. (2) None. (3) None, except: Confirming that services supplied in the exercise of governmental authority as defined in Article I:3(c) may be subject to public monopolies or exclusive rights granted to private operators. Upon accession joint ventures with foreign capital contribution not exceeding 51 % are allowed during 4 years after accession. After that, none. (4) Unbound, except as indicated in the horizontal section.	(1) Unbound, except related consulting services. (2) None. (3) None. (4) Unbound, except as indicated in the horizontal section.	Foreign companies are allowed to do business activities in Viet Nam in the form of build-operate-transfer (BOT) and build-transfer-operate (BTO).

B. Refuse disposal services (CPC 9402) 2	(1) Unbound, except related consulting services. (2) None. (3) None, except: Confirming that services supplied in the exercise of governmental authority as defined in Article I:3(c) may be subject to public monopolies or exclusive rights granted to private operators. Foreign ownership is limited to 51 % during 4 years after accession. After that, none. For the purpose of ensuring public welfare, foreign-invested enterprises are restricted from collecting refuse directly from households. They are only permitted to provide services at the refuse collection points as specified by local municipal and provincial authorities. (4) Unbound, except as indicated in the horizontal section.	(1) None. (2) None. (3) None. (4) Unbound, except as indicated in the horizontal section.	Foreign companies are allowed to do business activities in Viet Nam in the form of build-operate-transfer (BOT) and build-transfer-operate (BTO).
D. Other services – Cleaning services of exhaust gases (CPC 94040) and noise abatement services (CPC 94050)	(1) Unbound, except related consulting services. (2) None. (3) None, except: Confirming that services supplied in the exercise of governmental authority as defined in Article I:3(c) may be subject to public monopolies or exclusive rights granted to private operators. Foreign ownership is limited to 51% during 4 years after accession. After that, none. (4) Unbound, except as indicated in the horizontal section.	(1) Unbound, except related consulting services. (2) None. (3) None. (4) Unbound, except as indicated in the horizontal section.	
– Environmental impact assessment services (CPC 94090*)	(1) None. (2) None. (3) None, except that foreign ownership is limited to 51% during 4 years after accession. After that, none. (4) Unbound, except as indicated in the horizontal section.	(1) None. (2) None. (3) None. (4) Unbound, except as indicated in the horizontal section.	

◆ Thailand

Sub-sector	Limitations on Market Access	Limitation on National Treatment
A. Environmental Consultancy on Hazardous Waste Management, Air Pollution and Noise Management, Sanitation and Other Environmental Management Services (CPC 9401)	1) None 2) None 3) None other than that indicated in the horizontal section 4) As indicated in the horizontal section	1) None 2) None 3) No limitations as long as foreign equity participation does not exceed 49 per cent 4) None
A. Environmental Protection and Environmental Abatement Services (CPC 9401)	1) None 2) None 3) None other than that indicated in the horizontal section 4) As indicated in the horizontal section	1) None 2) None 3) No limitations as long as foreign equity participation does not exceed 49 per cent 4) None
A. Sewage Services (including industrial waste water treatment system) (CPC 9401)	1) Unbound 2) None 3) None other than that indicated in the horizontal section 4) As indicated in the horizontal section	1) None 2) None 3) No limitations as long as foreign equity participation does not exceed 49 per cent 4) None
B. Refuse Disposal Services (including hazardous waste management and incinerator)(CPC 9402)	1) Unbound 2) None 3) None other than that indicated in the horizontal section 4) As indicated in the horizontal section	1) None 2) None 3) No limitations as long as foreign equity participation does not exceed 49 per cent 4) None
C. Sanitation and Similar Services (CPC 9403)	1) Unbound 2) None 3) None other than that indicated in the horizontal section 4) As indicated in the horizontal section	1) None 2) None 3) No limitations as long as foreign equity participation does not exceed 49 per cent 4) None
D. Other Cleaning services of exhaust gases (including industrial emission abatement) (CPC 9404) Noise abatement services (CPC 9405) Nature and landscape protection services (CPC 9406) Other environmental protection services (CPC 9409)	1) Unbound 2) None 3) None other than that indicated in the horizontal section 4) As indicated in the horizontal section	1) None 2) None 3) No limitations as long as foreign equity participation does not exceed 49 per cent 4) None

Annex II: Report of survey in China on APEC trade liberalization in environmental services

1. Introduction

As one of the potential biggest environmental services markets and APEC economies, China has been making great effort to promote trade liberalization in environmental services both in APEC and WTO. In order to study the situation of APEC trade liberalization in environmental services, we select China as a case. The environmental services are one of key fields in China's environmental industry, and it is one of sections in environmental industry that had started relatively late, but developed faster.

2. Basic situation of trade in environmental services in China

2.1 Definition and classification of environmental services in China

In China, environmental service is one of main parts of environmental industry. The definition of environmental services is “the services provided for environmental protection and pollution control”[1]. And environmental services are defined to include six categories: research and development of environmental technology and products, design and construction of environmental engineering, environmental monitoring services, environmental consulting services, operation of pollution control facilities, environmental trade and financial services. (See Table II-1)

One can see that the category of environmental services in China is different from the CPC categories, that of GATS, which is mentioned earlier. Various types of services are not classified by environmental elements, and they are all contained in broader categories that cover all environmental elements and environmental sections.

Compared with the CPC (1.0) categories and the environmental services categories by GATS, China’ categories covers environmental trade and financial services and conceptual services, such as design, engineering and production, etc., but it does not include the waste collection services (94211, 94221) , sweeping and snow removal services (94310) , etc.

It’s very clear that the classification of environmental services is different from the categories based on the spectrum of environmental scale we proposed in this report.

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1 “Guideline for Development of Environmental Protection Industry during the Eleventh Five Year”(Tentative), issued by the National Development and Reform Commission and the State Environmental Protection Administration, 2005; “Development Report on Environmental Services Industry”, issued by the State Environmental Protection Administration, 2006.

Table II-1 Classification of Environmental Services in China

Category	Description
research and development of environmental technology and products	Including water pollution control, air pollution control, solid waste treatment, noise and vibration control, environmental monitoring, ecology protection, comprehensive utilization, cleanness manufacture and other kinds of technical product's research and development.
design and construction of environmental engineering	Including water pollution control, air pollution control, solid waste treatment, noise and vibration pollution prevention and cure, ecological environment restoration and control, and other pollution control engineering.
environmental monitoring services	Including routine monitoring, committal monitoring, analyzing service and other monitoring services.
Environmental Consulting Services	Including Environmental Impact Assessment, environmental engineering consultation, environmental monitoring, certification of environmental management system and environmental labeling products, certification of organic food, environmental technology assessment, life cycle assessment, auditing and training of cleaner production, environmental information services, etc.
operation of pollution control facilities	Including the operation and maintenance of automatic monitoring system and pollution treatment facilities for sewage, industrial waste water, desulfurizion ,industrial exhaust gas, industrial solid wastes, garbage, Hazardous Wastes (Including the management, operation and maintenance services for sewage, industrial waste water, pollution control facilities, air pollution control facilities, solid waste treatment facilities, noise pollution control facilities
Environmental Trade and Financial Services	Including the professional marketing, foreign trade, and environmental financial services etc. of relevant environmental equipments and services.

2.2 Environmental services supplying to the Asia-Pacific region by China[1]

Since the 1990s, the environmental services in China has been seen a rapid development. From 1993 to 2004, the average annual growth rate of environmental services market was 25%, about 2 times of the growth rate of the manufacturing industry of environmental protection product (10~13%) in the same period. Especially, the growth rate of environmental services market reached up to 52% during 1997-2000. The growth of the gross income of environmental services in 2000 was 6 times as much as it was in 1997; the per capita profit was 8,600 RMB, 3,400 RMB more than the average annual profit of environmental industry (5,200 RMB). In view of annual gross income, the proportion of environmental services among environmental industry rises from 34.4% in 1993 to 38.1% in 2000, increased by 3.7%. See Table II-2 and Figure II-1 for the development of environmental services in China since 1990s.

1 All datum are from Chinese statistics, which is not comparable with other economies due to different classification.

Table II-2 Status of the Environmental Services Market in China

Items	1993	1997	2000
Total Number of Engaged Companies	3401	3747	9890
Total Annual Income (100 million)	107.3	182.6	643.4
Total Annual Profit (100 million)	12.2	16.2	49.8
Profit Margin (%)	11.4	8.9	7.7
Per capita Income (10 thousand/p)	/	/	11.1
Per capita Profit (10 thousand/p)	/	/	0.857
Percentage of annual gross income of environmental services among that of environmental industry (%)	34.4	35.0	38.1
The proportion of environmental services' annual profit among environmental industry's total profit (%)	29.8	27.9	29.9

Note: the gross income of environmental services in this table includes waste reclamation industry.

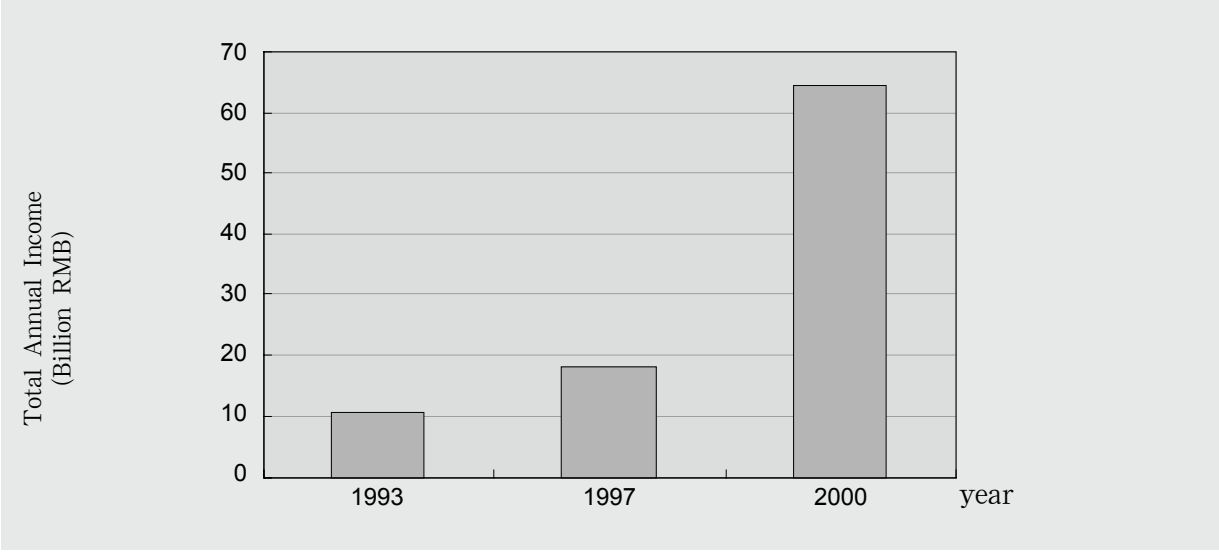

Figure II-1 Scale of Environmental Services Market in China

Nonetheless, the proportion of environmental services market among environmental industry in China is far below the average level of developed economy. Based on the above-mentioned classification of environmental services in China, and according to the investigation by State Environmental Protection Administration (SEPA) in 2000, there were 9,890 companies engaging in environmental services; the profit was 4,890 million RMB, 29.8% in proportion to the total profit of environ mental industry. Counted by the number of companies and persons, waste reclamation and environmental technology services constitute a major part of environmental services in China. However, with regard to annual gross income, the main income among environmental services is still

from the waste reclamation sector, which accounts for 79.9% of the annual gross income of the whole environmental services.

2.3 Demand of China on environmental services from the APEC region

Considering that China was still confronted with serious environmental situation and the general environmental conditions, the potential demand for environmental services is huge. According to the "Eleventh Five-Year Plan of Environmental Protection", during the "Eleventh Five-Year" period, the investment demand for environmental pollution control is 1400 billion RMB, account for 1.23% of the GDP in the same period. Thereof, the investment demand of the "Key Engineering Program for Environmental Protection during Eleventh Five-Year" at the same period is 262 billion RMB.

And the Eleventh Five-Year Plan of China includes the target of reducing total sulfur dioxide emissions by 10 percent and energy saving by 20 percent from the 2005 level. According to the environmental plan's requirements in the Eleventh Five-Year Plan, the rate of centralized treatment of urban domestic sewage shall reach 70% by 2010; the harmless treatment capability of urban garbage shall be increased by 240,000 ton per day.

Under these environmental protection objectives, undoubtedly there will be great development space for the environmental services, which is an important instrument for environmental pollution control.

On the other hand, the bottleneck problems during investment and technology in environmental protection still exist, and the insufficient supply problem is prominent. As the biggest developing economy in APEC region, the implementation of the Eleventh Five– Year Plan in China will bring new market opportunity for the development of environmental services. The direct impacts of the Eleventh Five-Year Plan on environmental services market in APEC region will mainly concentrate on environmental technology services, environmental consulting services and the trade services correlated with environmental project construction; and impacts on other services sectors are indirect. According to all previous statistics, the proportion of the total market share of these services industries to environmental investment is relatively stable.

According to all previous investigation on environmental industry, the market growth rate of internationally comparable environmental services (excluding waste reuse products) is 54.2% during1993-1997, and 27.3% during 1997-2000, and predicted to be still between 15-20% during the Eleventh Five-Year Plan period. Based on these judgments, the prediction of environmental services and various sectors is indicated in Table II-3.

Table II-3 Market Prediction of the Environmental Services in China

Category	In 2004 (billion)	Predicted Growth Rate During"Eleventh Five-Year" (%)	In 2010 (billion)
R&D of Env. Technology and products	1.3	5 ~ 10	1.74 ~ 2.3
Design and construction of env. engineering	14.37	15 ~ 25	33.24 ~ 54.82
Operation of Pollution Control Facilities	7.27	25 ~ 35	27.74 ~ 44.01
Env. monitoring	1.69	15 ~ 20	3.91 ~ 5.05
Env. consulting	1.78	20 ~ 30	5.32 ~ 8.59
Total	26.41	15 ~ 20	71.95 ~ 114.77

3. Regulations affecting trade in environmental services in China

3.1 China's commitments on trade Liberalization in environmental services upon entry into WTO and in Free Trade Agreement (FTA)

During the negotiation of China's entry into the WTO, China has made corresponding commitments on the market access and national treatment on environment services (as shown in Table II-4) . China opens all sub-sectors excluding environmental quality monitoring and pollution source inspection.

Table II-4 Schedules of Specific Commitments on Environmental Services of China

Sub-sector	Limitations on Market Access	Limitation on National Treatment
(excluding environmental quality monitoring and pollution source inspection) A. Sewage Services (CPC 9401) B. Solid Waste Disposal Services (CPC 9402) C. Cleaning Services of Exhaust Gases (CPC 9404) D. Noise Abatement Services (CPC 9405) E. Nature and Landscape Protection Services (CPC 9406) F. Other Environmental Protection Services (CPC 9409) G. Sanitation Services (CPC 9403)	(1) Unbound except for environmental consultation services. (2) None (3) Foreign services suppliers engaged in environmental services are permitted to provide services only in the form of joint ventures, with foreign majority ownership permitted. (4) Unbound except as indicated in horizontal commitments.	(1) None (2) None (3) None (4) Unbound except as indicated in horizontal commitments.

Source: S/DCS/W/CHN.

Notes: Modes of supply: (1) Cross-border supply; (2) Consumption abroad; (3) Commercial presence; (4) Presence of natural persons.

While entering into the WTO, the actual degree of market opening is close to the commitment level. Some specific fields are even higher than the commitments. (See BoxII-1)

For example, some power generating plants using garbage are totally foreign-owned; some sewage pipe networks have already been opened-up toward foreigner trader too. And, after China's entry into the WTO, the foreign enterprises, in order to reduce market costs, have implemented localization strategy one after another; and "commercial presence" gradually replaces simple environmental goods export trades, turning into a main type of market operation at present. Many international corporations have already set up joint-ventures and foreign-owned companies in China, which have been taking up environmental projects, participating in the market investment and financing, and information consultation, etc.

Box II-1 Sewage Treatment Project in Jiaozuo, Henan Province

The government of Jiaozuo City in Henan province signed a contract with RB Environmental Protection Limited Company of Singapore on 3 September 2003. The contract is about cooperation of constructing sewage treatment program.

According to the contract, the RB Company can enroll a solely foreign-owned company in Jiaozuo, and the government of Jiaozuo gave it the authority to manage the first project (the Sewage Treating Factory of Jiaozuo City) and the second sewage treatment project. Specifically, it included: the RB Company should purchase the current sewage treating factory with 109 million RMB, invest 190 million RMB to construct the second sewage treating factory, and finance 169 million RMB to construct matching pipe network. The license can be kept for 30 years, during this period, the government of Jiaozuo city should afford service charge about sewage treating to the project company monthly. The charge was decided together by both sides. When the license expired, the project company should relegate the sewage treating factories to the government of Jiaozuo.

Source: Jiaozuo Daily, Sep. 5, 2003.

In addition, China made further commitment to open its environmental services market in some FTAs. For example, Chinese offer in ASEAN-China FTA said "*Foreign services suppliers engaged in environmental services are permitted to provide services only in the form of joint ventures, with foreign majority ownership permitted, or provide services with foreign owned company.*" (See table II-5)

Table II-5 Schedules of Specific Commitments on Environmental Services of China in ASEAN-China FTA

Sub-sector	Limitations on Market Access	Limitation on National Treatment
(excluding environmental quality monitoring and pollution source inspection) A. Sewage Services (CPC 9401) B. Solid Waste Disposal Services (CPC 9402) C. Cleaning Services of Exhaust Gases (CPC 9404) D. Noise Abatement Services (CPC 9405) E. Nature and Landscape Protection Services (CPC 9406) F. Other Environmental Protection Services (CPC 9409) G. Sanitation Services (CPC 9403)	(1) Unbound except for environmental consultation services. (2) None (3) Foreign services suppliers engaged in environmental services are permitted to provide services only in the form of joint ventures, with foreign majority ownership permitted, or provide services with foreign owned company. (4) Unbound except as indicated in horizontal commitments.	(1) None (2) None (3) None (4) Unbound except as indicated in horizontal commitments.

Source: ASEAN-CHINA FTA.

Notes: Modes of supply: (1) Cross-border supply; (2) Consumption abroad; (3) Commercial presence; (4) Presence of natural persons.

3.2 Regulations affecting trade in environmental services in China

At present, China hasn't established special environmental services trade policyl. It may be affected by some related policies, such as overseas investment policies, government procurement policies, price policy and revenue policy, environmental policies and other related polices.

3.2.1 Trade and investment policy

Item 15 in Chapter 3 of Foreign Trade Law prescribes that "the state permits freight and technique importing and exporting freely, but except for the goods which stated by other law and administrative rules". Item 22 in Chapter 4 prescribes that "The state promotes the development of the international service trade". From these regulations, we can find that China support liberalization of trade, including the trade liberalization in environmental services.

The overseas investment policy is directly relevant to environmental services market admittance, and it decides the degree of environmental services trade liberalization directly. These relevant overseas investment policies mainly embodied in *The Industrial Catalog for Overseas Investment(emended in 2006)* ,*The Industrial Catalog for Central and Western Region of Foreign Investment Advantages(amended in 2008)* , *A Number of Policy Measures of Accelerating the Development of the Service Sector during the Tenth– Five-Year*, *About Speeding up the Municipal Utility Industry Views the Process of Market-oriented, Measures about Promoting*

the Urban Sewage, Waste Disposal Industrial Development and some other documents.

In addition, another two normative documents about BOT program operating depend on overseas investment have been established, which are *A Number of Provisions about Franchise Projects* and *Outside the Interim Measures for the Administration to Carry Out Project Financing.*

The new edition of *The Industrial Catalog for Overseas Investment (emended in 2006)* which came into effect from January, 2007 still remains the stability and continuity of the former policy. All the policies, measures and regulations which used to encourage foreign investment won't be changed. It also classified some items as the category of encouraging foreign investment projects, such as resources regeneration and comprehensive utilization technique, energy conservation and exploitation technique, environmental pollution treatment and monitoring technique, the construction and operation for sewage, garbage disposal factories, Hazardous Wastes treating factories (burning factories, burying fields) and the construction and management of environmental treatment facilities, the consulting service for environmental protection, the regeneration technique exploitation and the application of companies' emissions.

Simultaneously, it widened the scope of foreign investment admittance, and speeded up the service industry on the condition of unchanging the foreign investment admittance policy.

It also classified construction and management of new energy power station (including solar energy, wind energy source, magnetic energy, geothermal energy, tidal energy, wave energy, biomass energy, etc.) and city water supply factory as the category of encouraging foreign investment projects. However, the construction and management of the pipe networks in big city have been categorized as restriction investment project since 2002, and should be controlled by Chinese company.

The Industrial Catalog for Central and Western Region of Foreign Investment Advantages, which issued by the National Development and Reform Commission and Ministry of Commerce on 23 December 2008, widened the scope of overseas investment environmental services. The comprehensive utilization of coal gas' waste heat generate electricity and supply heat, the construction and management of pipe network for city's gas supply, heat supply and drain supply (controlled by Chinese company in big cities) were classified as the category of encouraging and top-priority foreign investment projects.

A Number of policy measures of Accelerating the Development of the Service Sector during the Tenth– Five-Year , which issued by the National Development and Reform Commission in December 2001, requests to broaden the qualification condition of admittance for service industry market (such as base installation in cities), simplify the procedure of examining and approving and be convenient for the market admittance. It advocates non-state economy engaging in service industry development in a more extensive field, and the non-state economy has the same treatment with state economy in several aspects, such as market admittance, use of land, credit, tax, and the finance on the market. It also encourages foreigners to invest in service industry projects.

About Speeding Up the Municipal Utility In-

dustry Views the Process of Market-oriented , issued by Ministry of Construction in December 2002, advocates social capital and foreign capital taking multiple forms, such as sole proprietorship, joint capital ,and cooperation to participate in construction of public utilities for water supply, sewage treatment and garbage disposal, and to form a multi-element investment structure. It states that the construction of running municipal utility for water supply, sewage treatment and garbage disposal should invite public bidding to choose units in operation from municipal utility companies for water supply and sewage treatment, and the government would give them the license.

Measures about promoting the urban sewage, waste disposal industrial development , issued by the National Development and Reform Commission, Ministry of Construction and the Ministry of Environmental Protection, advocates all kinds of ownership economy taking part in investment and management for sewage treatment and garbage disposal , to make the subject of investment multivariant, the subject of operation industrialization, the management market-oriented, and to form a competitive open construction operational pattern.

About Speeding up the municipal utility industry views the process of market-oriented and *Measures about promoting the urban sewage, waste disposal industrial development* both clearly prescribed the market admission conditions for enterprise and personnel's qualifications and authentication, but gave absolute national treatment to the foreign investment.

◆ **Policies on qualifications:**

The State Council and other competent authorities have promulgated policies and regulations relevant to the industry of urban environmental services. For example, the State Council issued *Methods of Administration of Licenses for the Operation of Hazardous Wastes* on 30 May 2004; the Ministry of Environmental Protection issued *Methods of Administration of the Qualifications and Licenses for Environmental Pollution Treatment Facilities* on 8 November 2004 and *Methods of Administration of Qualifications for Evaluation of the Environmental Effects of Construction Projects*; the National Development and Reform Commission issued *Several Opinions for Accelerating Industrialization of Desulfurization of Smoke from Thermal Power Plants*.

According to *Methods of Administration of Licenses for the Operation of Hazardous Wastes*, "Units engaged in the collection, storage and disposal of hazardous wastes in the territory of the People's Republic of China shall, according to the provisions of these methods, obtain the license for operating hazardous wastes." However, only technical requirements are specified for applying and obtaining the licenses for operating hazardous wastes. For example, "there should be more than 3 technical personnel of the specialty of environmental engineering or related specialties, with at least intermediary professional titles and more than 3 years of experience in the treatment of solid waste pollution; there should be vehicles of transportation up to the requirements of the division of the State Council in charge of transportation safety of hazardous cargo".

According to *Methods of Administration of the Qualifications and Licenses for Environmental Pollution Treatment Facilities*, units applying for Grade A or Grade B Qualifications Certificates for the operation of environmental pollution treatment facilities should meet

the following conditions: “the qualifications of independent corporate legal person or public utility unit legal person with enterprise-style management; specialized operating personnel for maintaining the normal operation of the facilities”; etc.

It is clearly specified in *Methods of Administration of Qualifications for Evaluation of the Environmental Effects of Construction Projects* that “institutions entrusted to provide technical services for evaluating the environmental influences of construction projects shall apply for the qualifications for evaluating the environmental influences of construction projects in accordance with these methods. They shall only engage in technical services for evaluating environmental influences within the scope as specified by the qualifications certificate after obtaining the certificate of qualifications for evaluating the environmental influences of construction projects upon being examined and approved by the Ministry of Environmental Protection.” These methods shall treat foreign institutions and domestic institutions on an equal basis and advocate the principle of national treatment.

3.2.2 The governmental procurement policy

The environmental services market is not mature because of its public res attribute, and the government still takes a large proportion in demand of environmental services. It is estimated that the public payout for environmental services of those developing members takes about 70 percent totally. Generally speaking, environmental services, like sewage treatment, waste disposal and clean industrial technique, etc. are affected by Governmental Procurement Agreement (hereafter as GPA).

At present, China is not a member of GPA and must not have related obligations. The Governmental Procurement Law in China came into effect since 1 January 2003. There are some regulations about purchasing domestic commodity, engineering and services in this law, some environmental services can also be found in the state government purchase list, for example, sewage treatment (B0301) and garbage disposal (B0302) belong to the engineering project. At the same time, The Government Procurement Law also prescribes some exceptional situations without regard to the restrictions of purchasing domestic commodity, engineering and services. These situations including: ① the commodity, engineering or the services can not be obtained in China, or can not be gained by reasonable commercial conditions; ② purchase for overseas using; ③ prescribed by other laws and administrative regulations.

The environmental services for sewage treatment and garbage disposal have been brought into government purchase list, but while we use foreign investment constructing and managing sewage treatment factories or garbage disposal field, some core components, such as instrument, meter, can not be bought from our country, or their quality can not reach to the requirements. Thus, it generally fits for the first escape clause, that is, the commodity, engineering or the services can not be obtained in China, or can not be gained by reasonable commercial conditions. In addition, more investment policies mentioned above rank these environmental services into encouraging foreign investment list with no restriction of stock ownership , so they also fit for the third escape clause.

3.2.3 Price policy

The price policy for environmental services is

the precondition and the necessary condition to ensure the trade liberalization of environmental services. According to the principle of "The user pays" and "The polluter pays", China has established a series of policies about charging for sewage and garbage.

Notice on Strengthening collection for sewage treatment, establishing virtuous mechanisms for urban sewage discharge and Centralized Treatment issued by former National Planning Board, Ministry of Construction and former State Administration for Environmental Protection in May 1999, prescribes that to add sewage treatment fee on the original water supply price, and establish regular monitoring restrictive mechanisms for management of collecting sewage treatment fees and operating situation of sewage treatment factory.

According to *Notice on the Strengthening of Urban Water-saving, Water Supply and Water-pollution Control Work*, which was issued by the State Council in November 2000, all cities should collect sewage treatment fee in accordance with relevant regulations; the collecting criterion for sewage treatment should be adjusted to the low-profit level while adjusting the price of water supply and sewage treatment, in order to meet the need of constructing and managing sewage treatment facilities; accelerate the depreciation of facilities for urban water supply and sewage treatment projects.

According to *Notice on Charging for Urban Garbage Disposal, Promoting Waste Disposal Industrialization* issued by former National Planning Board, Ministry of Construction and the former State Administration for Environmental Protection in June 2002, reasonable charging criterion should be established; scientific planning and collecting method should be constituted; management for charging should be strengthened; operation mechanism for garbage disposal should be reformed.

According to *Measures About Promoting the Urban Sewage, Waste Disposal Industrial Development*, issued by former National Planning Board, Ministry of Construction and the former State Administration for Environmental Protection in September 2002, all the cities with sewage, garbage disposal treatment facilities should collect fees for sewage and garbage disposal promptly, and other cities should begin to collect it at the end of 2003; should speed up the reform of price, and establish charging system which suit for market economy rule; the collection of sewage treatment fees should equalize the cost for managing urban sewage treatment factory and logical returns, qualified cities can consider the construction expense for sewage pipe networks; etc.

3.2.4 Tax policy

To promote social investments and full foreign-owned enterprises to join in environmental protection industry, especially the sewage treatment and garbage disposal, China has established many preferential tax policies:

Firstly, derate the income tax. For example, according to *Notice on the Preferential Policies of Business Income Taxes* issued by the Ministry of Finance and the National General Revenue, the businesses in the development zone are imposed the income tax with the tax rate of 15%. The newly-built businesses and other tertiary occupation business in the development zone are derated the income tax within the certain period under the industrial policy. The businesses, which make use of waste water, gas and slag to produce, could

be derated the income tax within five years. Actually, we usually implement the policy of "Two Exemptions and Three Halving", namely, the income tax is derated in the first two years and is halved in the following three years.

Secondly, the VAT is exempted. For example, according to *Notice on the Resources' Complex Utilization and Other Products' VAT Policies* issued by the Ministry of Finance and the General Revenue, to the businesses which make use of the garbage to generate electricity and mix the materials with no less than 30% of coal gangue, bone coal, fly ash and waste slag to produce the cement, the policy of instant imposition and refund of duty is carried out; to the businesses which make use of coal gangue, coal slurry, oil forming shale and wind to generate electricity, the policy of halving the income tax is carried out. According to *Notice on the VAT Policy in Services of Retrieving the Waste and Old Materials*, to the businesses which retrieve the waste and old materials, the VAT is exempted

Thirdly, the sales tax is exempted. For example, according to the first three periods' *The Charge Funding Program of Exempting the Business Tax* issued by the Ministry of Finance and the General Revenue, to the funds of governing the pollutant source, the fees of the waste water disposal, the charge for evaluating the effects report of the construction programs and the fees for monitoring the environment, the sales tax is exempted. Fourthly, the policy is export rebate.

In addition, there are some other preferential policies. For example, according to the rules of the Development of the Western Regions, the environmental industries' tax drops from 33% to 10%, and this policy will last for ten years form 2001. Another example is the urban waste water disposal project. The construction land is given by the administration or the land use right is provided with payment. The complement fee of the urban basic infrastructure is exempted in the urban waste water disposal project, and the land use tax is exempted in the construction land.

3.2.5 International horizontal commitment

International horizontal commitment may have effects on opening the environmental services market in China.

It says in *Schedule of Specific Commitments on Services of China* that "Unbound except for measures concerning the entry and temporary stay of natural persons who fall into one of the following categories: Managers, executives and specialists defined as senior employees of a corporation of WTO Members, being engaged in the foreign invested enterprises in the territory of the People's Republic of China for conducting business, shall be granted a long-term stay permit as stipulated in the terms of contracts concerned or an initial stay of three years, whichever is shorter". And other conditions for service salespersons. etc. We can see that some favorite conditions only for senior persons, but not for junior persons, like workers. Obviously, it will restrict the environmental services providers.

Besides, Chinese visa policy, working permit and professional certification requirements exert impacts on foreign environmental service suppliers.

It also says in *Schedule of Specific Commitments on Services of China* that "Representative offices of foreign enterprises are permitted to be established in China, but they shall not engage in any profit-making activities except

for the representative offices under CPC 861, 862, 863, 865 in the sectoral specific commitments." "The establishment of branches by foreign enterprises is unbound, unless otherwise indicated in specific sub-sectors, as the laws and regulations on branches of foreign enterprises are under formulation".

4. China Perceptions of trade liberalization in environmental services in APEC economies

The persistent tenet of APEC is to promote trade liberalization in environmental services, and all the economies respond and support it actively. Whether in the schedule commitment of WTO, or in the Individual Action Plan of APEC, most economies made out concrete commitments and established specific measures to promote trade liberalization of environmental services with actual action, which produced a certain effect. However, for the attribute of public goods in environmental services and the characteristics of services trade liberalization, the trade barrier for environmental services exist in APEC economies commonly, which is similar to the barriers for other services trade, according to the field survey and study in China.

What's more, the trade barriers existed by all four kinds of services supply modes. The trade barrier in environmental services has its own peculiarity besides the universalism for general services trade.

4.1 Issues related to cross-border supply—mode 1

Some environmental services, such as environmental consultation, environmental education, environmental quality testing and analysis results, computer modeling simulations, etc., are provided through cross-border supply, generally via fax, post, telephone, as well as Internet. However, many environmental services are in situ activities for which cross-border supply is generally not technically feasible (e.g. the processes for water treatment, waste disposal, emergency cleanup services, construction and installation of environmental equipment, etc.).

Limitations registered in various GATS schedules indicate that the principal restrictions on cross-border supply of traditional environmental services are regulatory measures such as: requirements that the services so supplied be certified or authenticated by locally registered service providers (in effect, this requires supply through established professional networks or partnership arrangements).

The rise of the Internet in the past few years as an open platform for international provision of information, reports, designs, etc., which is independent from existing "closed" leased-line networks between affiliated companies, greatly increases the scope for cross-border supply of certain services. While it would prove difficult to prohibit or severely restrict cross-border supply of such services via the internet, short of blocking access or mounting costly checking procedures, supply may be inhibited by government-mandated regulations, including maintenance of monopoly or exclusive Internet service provider (ISP) rights (typically through a state-owned telephone company) or unduly restrictive requirements on the exchange of data by companies using the Internet to supply their services.

4.2 Issues related to consumption abroad– mode 2

In general, environmental services, which are provided through consumption abroad, refer to eco-tourism. In GATS commitments, mode 2– consumption abroad for environmental services related services are usually as "none" or no restriction. However, based on our field survey and questionnaire in China, some restrictions, like visa requirements, numerical quotas, special taxation, etc., still existed.

Except for a few special places of some member economies for special foreign residents, such as Cheju Island of Korea for Shanghai of China residents, etc., most places of most member economies have visa requirements to eco-travelers. And visa application need assess and assessment. Furthermore, numerical quotas are applied in environmental services. Some economies levy excessive charge or taxation or restriction while eco-travelers leaving country frontier[1] .

4.3 Issues related to commercial presence– mode 3

The majority of international trade in environmental services must take place through commercial presence. Thus, general foreign investment requirements, as well as sector-specific features, are very relevant to international trade in environmental services. These can include conditions for approval of foreign investment and limitations on the level of foreign ownership, on the type of legal entity required, on the ownership of specific assets and on the scope of a foreign company's operations. Box II-2 summarizes the general foreign investment provisions and requirements applicable to environmental services and lists the main sector-specific restrictions affecting foreign investment to establish commercial presence for environmental services.

4.3.1 Foreign equity limitation

In general, foreign equity restrictions are as the following: only one legal form permitted (e.g., joint-stock company, private limited liability corporation, joint venture); incorporation required with foreign equity participation ceiling and mandatory local partnership; only sole proprietorships or partnerships permitted. Direct establishment of branches of foreign companies not permitted; branching permitted subject to quotas on number and/or geographic location of branches. Only representative office permitted (i.e., promotional work and research for head office).

The requirements for some member economies in environmental services trade are the same to that of general foreign investments, and we can see the main requirements in *Investment Law*, such as New Zealand, Mexico. But some foreign equity restrictions for environmental services trade are regulated specifically, for example: No foreign companies' entry at present, in the future, Indonesia intends to open the opportunity for foreign participation. Indonesia made comprehensive market access under modes two and three (join venture with local services with max 51% share participation, using local prof. Manpower, transferring know how & technology to local prof. Manpower) for sewage services, refuse disposal services and sanitation and similar services. China requires "Foreign services suppliers engaged in environmental services are permitted to provide services only in the form of joint ventures, with foreign majority ownership permitted".

1 Source: WTO Secretariat.

Box II-2: Environmental Services: Requirements and Restrictions in WTO Members

General ("horizontal") Foreign Investment Provisions and Requirements that May be Applicable

No general screening, prior authorization or registration of proposed foreign investment, or other restrictions. Uniform screening of investment applications by both domestic and foreign investors according to the same criteria. Screening of foreign investment proposals:

- Automatic approval except for security screening.
- Automatic approval below certain value thresholds, but subject to approval above certain value thresholds.
- Approval based on policy guidelines and overall interest considerations but without an economic needs test or local participation requirements.
- Automatic approval except for specific authorization or concession requirement for foreign investment in public entities or public works, newly privatized companies or government-contracted services.
- Approval based on economic needs test or "net national benefit " criteria.
- Approval subject to the foreign investor agreeing to specific performance requirements, e.g. export achievements, use of local goods, services or personnel, formal transfer of technology.
- Approval required for full or majority foreign ownership.

Full foreign ownership not permitted, joint venture with local partner mandatory.
Majority foreign ownership not permitted, joint venture in which local partner has majority stake mandatory.
Only acquisition of existing companies permitted, no new establishment permitted.
Only acquisition of existing companies permitted, with foreign equity participation limited to minority stake.
Case-by-case authorization at political level with ceilings on foreign equity participation varying by sector or within sectors.
Reservation of some sectors or activities, state-owned enterprises to be privatized or government-contracted services, for investment only by residents.

Sector-specific Restrictions on Foreign Establishment/Investment

Economic needs test for approval of foreign investment in solid waste management services, air pollution services and technical testing and analysis services.
Numerical quotas for the number of operating licenses available for providers of industrial waste-water treatment services; applies to local and foreign investors.
Only joint ventures permitted for supply of environmental, architectural and engineering, construction and related engineering services.
Regulation of contracts by value and number through an annual licensing system in the construction and engineering sector.
Nationality and/or residency requirements for foreign establishment/investment. E.g. for companies operating public utilities or to gain the right to practice professional services such as architecture and/or engineering.
Requirement that foreign businesses hire specified ratios of domestic staff to foreign staff.
Reservation of some service sector or activities for residents.
Source: GATS schedules.

Box II-3: Owing to Licenses Barrier, it Needs Expensive Authentication Costs While Exporting Energy Saving Products and Related Services of Chinese Midea Group

Midea Group is the largest production and export base for white household appliances manufacture. It has set up powerful marketing network all over the world, and it has set up 21 overseas establishments in America, Canada, Japan, Korea, the Philippines, Singapore, Thailand, Viet Nam and other countries. The overseas Pingyang Base in Viet Nam has also been built and gone into operation. In 2007, the proceeds of sale of Midea Group reached to 75 billion in all and increased 30% over the same period last year, of which the export amount was 3.12 billion dollars and increased 40% over the same period last year. Midea Group has about 80,000 employees, and own more than 10 brands, including Midea and Weiling.

Each economy has its own energy efficiency standard and needs licenses, and most economies just admit their own economies' but not others. What's more, not only the hardcore needs licenses, many components should also reach to sole standard, for example, the licenses for material's burning-resist property is quite complicated. It usually takes more than 3 months to authenticate a new product in America. Many tests need the authentication of the organizations which gained overseas authentication qualification, so it will be very difficult for them to obtain the authentication. Or else, the products can be delivered to the qualified lab, which is difficult to be allowed to build in other countries, still, it may also meet some risks, such as damage and unsuitable circumstance during the delivery.

In this way, in order to obtain overseas energy efficiency standard licenses and sell energy-saving air-conditions and other products abroad, Midea Group can only deliver its products abroad to get overseas authentication company's authentication. To get the authentication for commercial air-conditions need more than 2.2 million each year, and the total expense for authentication is about 100 million, which will be about 10% of the research and develop cost.

4.3.2 Licenses and qualification

Licenses and qualifications are a pervasive feature of business regulation in most economies, in that most jurisdictions require a broad range of business activities and professions to obtain licenses for establishment, expansion and ongoing operation. Typically, there are both generic licensing requirements which apply to all businesses and specific requirements which apply to a particular sector or activity. Typically there are also more specialized licensing requirements applicable to businesses in particular industries regarding regulated matters such as pollution control, worker safety and hygiene, energy saving, energy efficiency, etc.. Obviously, a major component of environmental services involves helping industrial clients to implement and comply with the terms of such licenses.

But this licenses function sometimes been overused, which result in trade barrier. For example, while exporting Chinese energy-saving household appliances products, like Hair Group, often encountered detection, closed authentication agency, no authorization, test method's opacity. Variety of restric-

tions for Chinese household appliances corporations have been made by relevant ordinance and regulations, but special preferential policies were made to their own regional corporations. This became the trade barrier for Chinese household appliances products and related services entering the international market.

4.3.3 Residency requirements

The requirements to the residency of service providers will decrease the chances of providing services from foreign services providers. The residency requirements to the environmental service providers by the APEC economies can be shown in the horizontal commitments as China made its commitment in WTO schedule in environmental services. In general, the detailed requirements include:

Requirement that CEO, or all or more than 50% of directors, be residense of host country; Requirement that local agents of foreign companies be permanent residents; Requirement that providers established in one part of a country have a minimum number of resident providers or agents for provision in another part of a country; Prior residency required to obtain operating license; residency not permitted without license, etc..

Labor visa is the premise and necessary condition of residency requirements. The restrictions for land settlement policy and visa policy and different regulations both affect environmental services trade. For example, the top custodians in Hair Group can get H1 visa, the term of validity of which is only one year, and the visa owner can only stay in America for three months each time. If longer than three months, the owner has to leave the frontier and go to America again. Ordinary, sellers and other staff, who provide maintain and installation services, are very difficult to get any residency requirements because of the labor criterion. Such kind of barrier will affect normal work to a great extent.

In addition, sector-specific restrictions on mode 3 also include limits on the number of foreign companies allowed and on the value of their services, foreign equity restrictions, and jurisdictional limitations, among others quotas on the number of operating licenses, conditions relating to government monopoly, economic needs tests, limitation on purchase or rental of real estate, and differential treatment of foreign service providers in the case of taxes and subsidies.

4.4 Issues related to temporary entry/stay of service providers—mode 4

Mode 4 is mainly affected by horizontal restrictions or an economy's overall immigration regime, or specific labor market conditions. The key horizontal limitations in this mode include quotas on entry by foreign service providers, limitations on the duration of their stay, limited coverage of service provider categories (restricted to only business visitors, certain categories of intra-company transferees, managers, executives, and specialists), quality and licensing requirements for professional environmental service providers, domicile requirements in some sub-sectors like refuse collection, and requirement of a local representative body (or commercial presence) to allow entry by foreign service providers. There are no commitments on lower level staff under mode 4. Common examples of specific conditions for approval of entry and temporary of service suppliers are summarized in Box II-4 below.

Because of labor policies and hard getting of work visa, many services such as after-sales environmental service can be accomplished only by local companies in the way of out-sourcing, which greatly increases the cost of products and services.

As a result of some reasons such as a long period of visa application, the plan of foreign service providers is affected. For example, to the economies in the Latin America, a visa confirming period is about three months. So the plan and the schedule of the company' s service output are affected. The following table shows the time period, the money and other necessary terms of commercial visa application for Chinese citizens who are going to other APEC economies.

Box II-4: Conditions Typically Placed on Supply of Services by Intra-corporate Transferees and other Professionals

- Approval and labor market testing required for technicians, highly qualified professionals, managers and specialists.
- Residency requirement for intra-corporate transferees and requirement that the foreign companies employ specified numbers of local staff.
- Requirement that nine out of ten staff employed by a foreign company must be host country citizens.
- Authorization is subject to economic needs test for foreign managers and technical experts.
- Only intra-corporate transferees permitted, subject to a limit of two foreign transferees per operation and training of local staff.
- Authorization is subject to the non-availability of local personnel and training requirements.
- Residency requirement for at least on director of a foreign company, local manager and resident agent requirements.
- Authorization of intra-corporate transferees subject to performance requirements(employment creation, transfer of technology, ongoing level of investment.

Source: GATS schedules.

Table II-6: Summary of APEC Economies Business Visa Issuing for China Citizens

Economy	Visa fee for business	Days needed to issue	General remarks
Australia	540RMB	Period of validity: 12 months The maximum of stay: 90 days Workdays of schedule: 5 days	
Brunei		Period of validity: 90 days The maximum of stay: 30 days Workdays of schedule: 8 days	

Canada	520RMB once	Period of validity: 90 days The maximum of stay: 30 days Workdays of schedule: 8 days	Certification of Deposit 1. The original script of Certification of Deposit of no less than 60,000RMB is needed. 2. Certification of Deposit is written in the reference format of the bank, with the right version of English and no handwriting. 3. The expiry of the Certification of Deposit is frozen to the 30th day after coming back from abroad 4.The original script of the Certification of Deposit must be delivered to the embassy which doesn't send it back, and it is unfrozen automatically as scheduled.
Chile	Once 30 days: 432RMB More times 90 days: 642RMB		
Indonesia	285RMB once 490RMB for work 610RMB for more times	Period of validity: 365 days The maximum of stay: 60 days Workdays of schedule: 10 days	
Japan	230RMB	Period of validity: 90 days The maximum of stay: 10 days Workdays of schedule: 7 days	Certification of Deposit For the Certification of Deposit of more than 50,000RMB, the freezing period is three months.
Korea	249RMB for short term 249RMB plus 166RMB for a long term	Period of validity: 30 days The maximum of stay: 15 days Workdays of schedule: 10 days	
Mexico	1045RMB	Period of validity: 15 days The maximum of stay: 15 days Workdays of schedule: 20 days	Current Deposit Book 1. The Deposit Book must be opened before 6 months and be used frequently (with the using record of 3 days before providing materials). For the deposit changed within a half year, the used deposit book script is needed, or please ask the bank to print the using record before the change of deposit certificate with the seal of confirmation.

			2. All the remaining sum is at least 50,000RMB. The more the remaining sum is, the more possibility of success for you to apply the visa. 3. If you suddenly deposit a large sum in the recent 2 months, the manager of visa will doubt the source of this sum.
Malaysia	80RMB	Period of validity: 90 days The maximum of stay: 30 days Workdays of schedule: 4 days	
New Zealand	640RMB	Period of validity: 30 days The maximum of stay: 15 days Workdays of schedule: 25 days	Certification of Deposit 6. The original script of the Certification of Deposit of no less than 50,000RMB, the more the better. 7. Certification of Deposit is written in the reference format of the bank, with the right version of English and no handwriting. 8. The expiry of the Certification of Deposit is frozen to the 30th day after coming back from abroad 9. The original script of the Certification of Deposit must be delivered to the embassy which doesn't send it back, and it is unfrozen automatically as scheduled.
Papua new Guinea	2150RMB	Period of validity: 90 days The maximum of stay: 15 days Workdays of schedule: 15 days	
Peru	270RMB within 30 days	Period of validity: 90 days The maximum of stay: 10 days Workdays of schedule: 12 days	Certification of Deposit 1. The original script of the Certification of Deposit of no less than 30,000RMB. 2. Certification of Deposit is written in the reference format of the bank, with the right version of English and no handwriting. 3. The expiry of the Certification of Deposit is frozen to the 30th day after coming back from abroad 4.The original script of the Certification of Deposit must be delivered to the embassy which doesn't send it back, and it is unfrozen automatically as scheduled.
The Philippines		Period of validity: 90 days The maximum of stay: 30 days Workdays of schedule: 10 days	

Russia		Period of validity: 90 days The maximum of stay: 90 days Workdays of schedule: 10 days	
Singapore		Period of validity: 35 days The maximum of stay: 14 days Workdays of schedule: 5 days	
Chinese Taipei			
Thailand	400RMB	Period of validity: 90 days The maximum of stay: 30 days Workdays of schedule: 5 days	
The US	830RMB	Period of validity: 365 days The maximum of stay: 180 days Workdays of schedule: 5 days	Certification of Deposit 1. The original script of the Certification of Deposit of no less than 100,000RMB. 2. Certification of Deposit is written in the reference format of the bank, with the right version of English and no handwriting. 3. The expiry of the Certification of Deposit is frozen to the 30th day after coming back from abroad 4.The original script of the Certification of Deposit must be delivered to the embassy which doesn't send it back, and it is unfrozen automatically as scheduled.
Viet Nam		Period of validity: 30 days The maximum of stay: 30 days Workdays of schedule: 6 days	

Besides the trade barrier by four kinds of services supply modes mentioned above, the providing of foreign services is also affected by the relevant domestic policies. For example, because of the attribute of the public goods in the environmental services, the principle of entering the trade market of the environmental services is to a great extent affected by the government procurement policy.

The reason is as the following:

First, the plural lateral of the Agreement on Government Procurement, GPA, (involving 26 WTO Members) that includes commitments by government departments, public entities and state-owned enterprises in each Party to the GPA to procure goods and services in accordance with the disciplines established in the GPA.

Second, a mandate of the Working Group on Transparency in Government Procurement established at the 1996 Ministerial Conference (involving all WTO Members) to study the transparency in government procurement practices taking into account the members policies, and to develop elements for inclusion in an eventual agreement.

Third, Article XIII of the GATS provides for

multilateral negotiations on government procurement in services (conducted within the Working Party on GATS Rules). The purpose of these negotiations is to explore the possibility of applying multilateral disciplines to government procurement covering all sectors of services. (WTO 1998b)

The procurement of environmental services by the public sector would appear to be most relevant for the construction, operation and upgrading of public utilities such as water supply and wastewater treatment, sanitation and solid waste collection and disposal, installation of energy-efficient systems and clean process technologies. Based on the information collated from survey, the principal trade-related barriers to public procurement of environmental services include local preferences, threshold values for open bids and excluded sectors.

In summary, though APEC tries to promote trade liberalization in environmental services, and many economies made commitments both in WTO and APEC, trade barriers in environmental services still exist. On one hand, trade in environmental services is affected by overall polices, like immigration, visa application, labor, investment, public procurement, etc., on the other hand, indeed, there are some special limitations in environmental services sector, like licenses, qualification, equity, etc..

5. Conclusions

To sum up the study above, the report is concluded that: from the description of basic situation of trade in environmental services and introduction of the administrative policies and good practices affecting trade in environmental services in China, by field survey and interview, the perceptions of trade liberalization in environmental services in APEC Economies are made from 4 modes of services trade supply. Specifically, there are some key points drawn from the report as below:

- ✓ China supports liberalization of trade, including the trade liberalization in environmental services, from the macroscopic policy. China made commitments to open environmental services market both in WTO and bilateral Free Trade Agreements. Some specific fields are even higher than the commitments. And domestic policies, such as overseas investment policies, government procurement policies, price policy revenue policy, and international horizontal commitments, may have effects on the environmental service market open to the outside world.

- ✓ From China's view, Asia-Pacific region has huge potential environmental services market and trade. APEC has been taking great efforts on promoting trade liberalization in environmental services, however, trade barriers on environmental services still existed as other services trade. The important problem is those trade barriers have not been recognized commonly.

- ✓ According to the field survey and study in China, the trade barriers on environmental services existed by all four kinds of services supply modes. On one hand, trade in environmental services is affected by overall polices, like immigration, visa application, labor, investment, public procurement, etc., on the other hand, indeed, there are some special limitations in environmental services sector, like licenses, qualification, equity, etc.

Annex III: Report of survey in Korea on APEC trade liberalization in environmental services

1. Environmental industry and environmental service in Korea

1.1 Definition of environmental industry and environmental service in Korea

(1) OECD classifications of environmental goods and services

A joint group of OECD and Eurostat experts proposed a definition of environmental goods and services in 1990s, which had often served as a useful starting point for analysis and discussion:

"The environmental goods and services industry consists of activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco systems This includes cleaner technologies, products and services that reduce environmental risk and minimize pollution and resource use."

The OECD has made a general classification of the environmental goods and services industry[1]. Principally environmental goods can be found in the following categories:

- Air pollution control
- Water waste management
- Solid waste management
- Remediation /cleanup soil and water
- Noise/vibration abatement
- Environmental monitoring, analysis and assessment

Environmental services sector can be divided into several sub-sectors: sewage services, refuse disposal services, sanitation and similar services, cleaning services of exhaust gases, noise abatement services, nature and landscape protection services and other services.[2]

1 OECD document COM/TD/ENV(2000)86/FINAL
2 Provisional CPC Division 94

Table III-1 OECD Classifications of Environmental Services

OECD/Eurostat classifications
A. Water and waste water management sector with sub-sectors • Sewage services • Water for human use
B. Solid and hazardous waste management sector with sub-sectors • Refuse disposal and treatment services • Sanitation services • Recycling services
C. Protection of ambient air and climate
D. Noise and vibration abatement
E. Remediation and clean-up of soil, surface water and groundwater
F. Protection of biodiversity and landscape services
G. Other environmental/ancillary services • Design consulting and engineering • Preparation of sites, construction, installation, repair and maintenance • Environmental research & development • Analytical services, data collection, testing, analysis, assessment • Environmental education, training and information

Source: OECD(2000), GTAS 2000 EC submission S/CSS/W/38.

(2) Korean classifications of environmental industry

There are different kinds of classification of environmental industry in Korea, which are as follows:

Table III-2 Korean Classifications of Environmental Industry

Classifications	Sub-Classifications
Manufacturing	Manufacturing of environment-related machines and equipments
Electricity, gas, steam and water supply enterprises	Water supply enterprise
Sewage-waste treatment, material processing and environmental restoration	Sewage-wastewater and feces treatment business Wastes collection, transportation and treatment and material recycle business Environmental purification and restoration
Construction industry	Wastes treatment and pollution prevention facilities Other infrastructure construction

Scientific and technological service industry	R&D Environmental consultation and relevant project services Material composition test and analysis business
Office equipment management and support service industry	General building cleaning business Facilities and industrial supplies cleaning business
Public administration, defense and social security administration	Environmental administration

Source: "Korean Classifications of Industries", Statistic Bureau.

Based on Korean environmental laws and regulation, Korean environmental industry can be divided into the following categories:

Table III-3 Classifications Based on Environmental Laws and Regulations

Classifications	Applicable Laws	Type of Industries
Generic environment	Laws concerning development and support of environmental technologies Laws concerning experiment-test for classifications of environmental industry Law on corporate activities Laws concerning development and support of environmental technologies Basic law on construction industry Laws on process of engineering technologies	Industry of pollution prevention facilities Industry of measurement agency Industry of environmental management agency Industry of environmental consultation Industry of industry-environmental equipment, industry of sewage equipment engineering Environmental project operator
Nature	Laws concerning environmental impact assessment on environment-transportation-disasters Law on protection of wildlife Law on protection of soil environment	Industry of environmental impact assessment agency Industry of soil purification
Atmosphere	Law on protection of air environment, law on noise and vibration Law on protection of air environment, law on noise and vibration Law on protection of air environment Law on protection of air environment	Industry of vehicle regular test agency Industry of vehicle identification test agency Industry of vehicle precision test agency Industry of waste gas equipment

Water quality	Law on protection of water quality and environment	Industry of waste water treatment
Sewage pipe	Law on sewage pipe	Industry of sewage pipe cleaning Industry of environmental impact investigation agency Industry of drinking mineral water manufacturing Industry of water treatment chemical manufacturing
Sewage pipe	Laws concerning treatment of sewage-feces and urine-livestock wastewater (effective until 27 September 2007)	Industry of feces and urine treatment Industry of design and construction of sewage treatment facilities Industry of manufacturing of sewage treatment facilities
	Laws concerning treatment and utilization of livestock feces and urine (effective since 28 September 2007)	Business related to livestock feces and urine Industry of design and construction of livestock feces and urine treatment facilities
	Law on sewage pipe (effective since 28 September 2007)	Industry of design and construction of individual sewage treatment facilities Industry of manufacturing of individual sewage treatment facilities Industry of management of individual groundwater treatment facilities
	Law on groundwater	Industry of construction of groundwater development-utilization Industry of groundwater purification Authority in charge of groundwater impact investigation
Wastes	Law on wastes management Laws concerning promotion of recycling of construction wastes	Industry of wastes collection-transportation Industry of wastes transfer and treatment Industry of ultimate wastes treatment Industry of comprehensive waste treatment
Hazardous materials	Law on management of hazardous chemicals	Industry of poisonous material manufacturing Industry of poisonous material distribution Industry of poisonous material storage Industry of poisonous material transportation Industry of poisonous material usage Industry of manufacturing of objectionable substances with access limitation Industry of utilization of objectionable substances with access limitation Industry of distribution of objectionable substances with access limitation Industry of storage of objectionable substances with access limitation Industry of transportation of objectionable substances with access limitation

Source: Korea Environmental Industry Association.

(3) Classifications of environmental services in Korea

Korea has defined an environmental industry by Presidential Decree: "the industry which designs, manufactures, and installs environmental facilities and environmental measurement equipment by applying and utilizing environmental technologies or provides services related to environmental technologies in order to conserve and manage the environment." In detail, the environmental industry is subdivided as follows:

1) Industries providing materials or services needed for environmental conservation activities such as measurement, prevention, minimization and recovery of environmental damage due to air, water, ecosystem or noise pollution;

2) Industries researching, developing and applying environmental technologies;

3) Industries providing facilities, materials and services needed for other environmental conservation and management. (Article 2, Enforcement Ordinance of Development of and Support for Environmental Technology Act)

Table III-4 Scope of Environmental Services in Korea

Group	Classification	Major Content
1	Air pollution control	– Environmental administration related to air pollution prevention – Air pollution prevention activities
2	Water treatment	– Sewage water treatment – Excretion treatment – Livestock excretion treatment – Waste water treatment
3	Management of solid wastes	– Waste collection, transport and treatment (designated, general, construction, and domestic wastes) – Radioactive waste collection, transport and treatment – Cleaning of public places and similar services
4	Soil, surface water, ground water management and improvement	– Services related to soil, surface water, ground water management and improvement
5	Environmental research and development	– Research and development related to the environment – Research on environmental engineering
6	Environment related contracts and engineering	– Planning and design related engineering services – Environmental impact assessment and auditing – Environmental services related to legal affairs
7	Analysis, data collection and evaluation	– Measurement and analysis of air pollution – Measurement and analysis of environmental factors
8	Education, training and information	– Environment related education – Professional training

9	Resource management	– Agriculture, forestry, and fisheries services related to resource management _Natural disaster and other resource management services

Source : Special classification of environmental industry (Statistics Korea).

1.2 Development of environmental industry and environmental services in Korea

Environmental industry is a technology and knowledge industry that produces and provides facilities, goods or services for the disposal, prevention and recovery of pollutants. It is considered a core industry that enables development to continue by harmonizing environmental and economic needs. Recently, the international community, including the EU, has been continuously strengthening environmental regulations while reinforcing trade liaisons. This is a tactic frequently used by developed countries to constrain the growth of developing countries, and requires the reduction of environmental burdens over the entire industrial structure. At this point, environmental industry, in the short run, operates as a means of promoting Korean industrial environment, and has the power to create new wealth through environmental industry over the long run.

(1) General situation of environmental industry in Korea

Korea pays much attention to the development of environmental industry. In recent years, with the increasing strength on domestic environmental protection, the development of environmental industry has been very fast. By the end of December 2006, the number of environmental protection institutions in Korea reached 1,056, 195 air and water pollution prevention enterprises, 231 air pollution prevention enterprises, 547 water treatment enterprises, and 89 noise and vibration prevention enterprises. In the period of 1995-2005, the average annual growth of environmental industry was 13.4%, in which the fasted growth was in environmental service industry, with the average annual growth rate of 50.1%, followed by soil conservation 22.3%, air pollution prevention 12.3%, wastes management 11.5%, and water environmental management 11%. As to market size, in 2000, the market size of Korean environmental industry was 7.8 trillion WON (1,300 WON = 1 US dollar), in 2003, it was 11.8 trillion WON, and in 2005, it reached 18.6 trillion WON. That means the average annual growth rate was 15%, which was five times of that of the world's market size of environmental industry: 3%-6% (see Figure III-1 and Figure III-2) .

In 2001, Korea's GDP was 455.2 billion US dollars, and in the same year, its expenditure on water, wastewater and soil treatment accounted for 46.1% of the total environmental market, on solid wastes treatment, 35.0%, and on air pollution treatment, 15.9%.

Statistical prediction showed that by 2015, Korea's growth of environmental industry will slow down significantly, to 3% approximately, but the growth rate of environmental service industry will still be the fastest, hopefully reaching 10%.

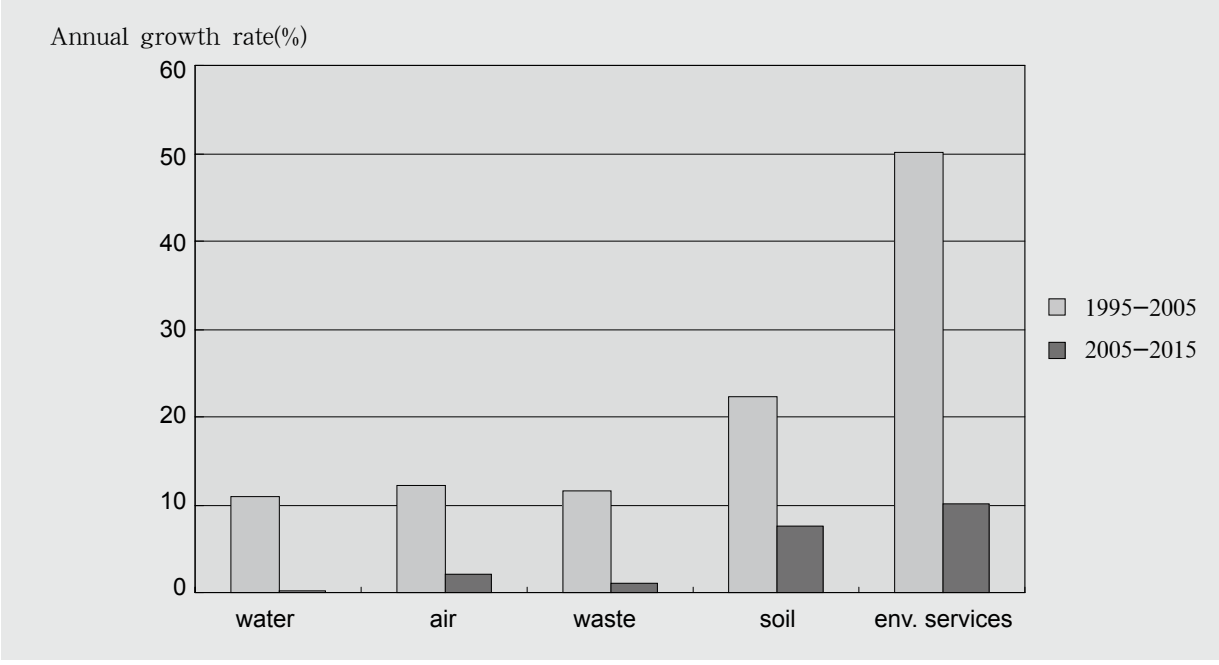

Figure III-1 Development of Korean Environmental Industry and Prediction

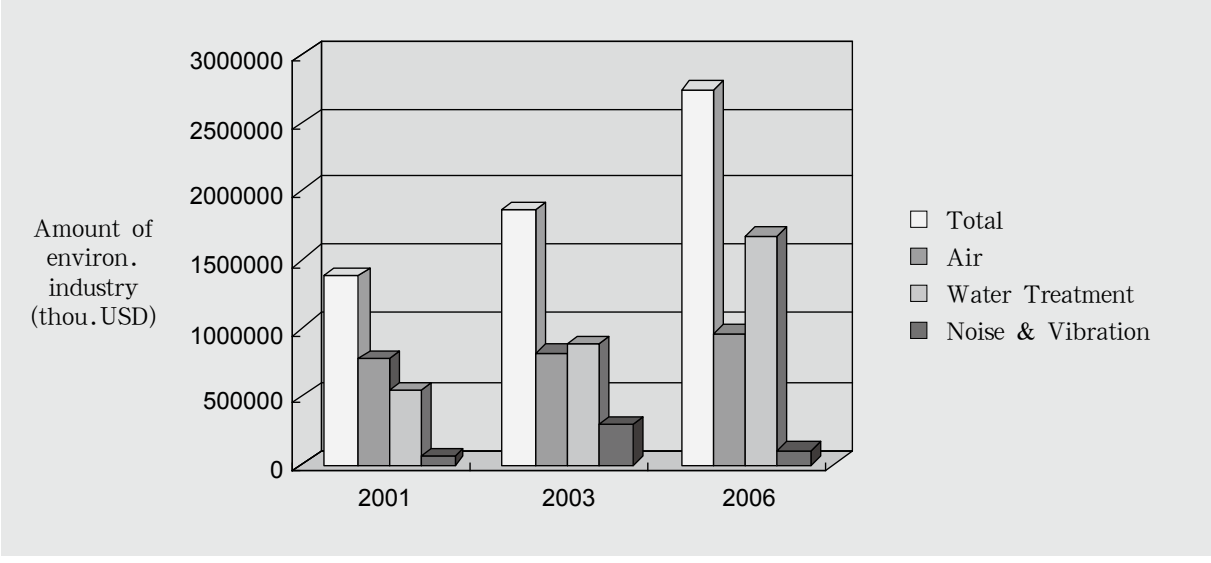

Figure III-2 Amount of Korean Environmental Industry (Pollution Prevention Industry)

Source: Ministry of Environment.

(2) Situation of major environmental services

Table III-5 Construction of Wastewater Treatment Facilities in Korea (2006)

City/County	Volume (ton/day)	Total Investment (1,000,000 WON)		2006 Budget
		reserve	Non-Government Fund	
Total (29)	526,270	630,927	30,974	126,360
Public entities	516,540	610,309	27,626	120,760

Source: "Current Situation of Terminal Wastewater Treatment (2006) ", Ministry of Environment.

Table III-6 Construction of Feces Treatment Facilities in Korea

Unit: set m^2/day

City/County/Region	Total	Sewage Treatment Facilities (set)	Purification Rate
Korea	3,103,512	351,114	2,752,398
Seoul	619,177	3,304	615,873
Pusan-si	265,842	10,722	255,120
Taegu-si	150,888	3,293	147,595
Inchon	137,867	10,999	126,868
Kwangju	84,958	3,144	81,814
Taejon-si	76,313	3,872	72,441
Ulsan-si	65,264	13,483	51,781
Kyonggi-do	486,762	94,801	391,961
Kangwon-si	139,629	28,749	110,880
Ch'ungchong-Bugdo	35,817	1,209	34,608
Ch'ungchong-Namdo	137,198	33,999	103,199
Cholla-Bugdo	129,848	22,815	107,033
Cholla-Namdo	193,654	26,667	166,987
Kyongsang-Bugdo	169,309	32,097	137,212
Kyongsang-Namdo	261,592	36,818	224,774
Cheju-do	63,827	5,002	58,825

Source: "Statistics on Sewage Pipes (2006) ", Ministry of Environment.

Table III-7 Construction of Public Infrastructure for Recycling

	2001	2002	2003	2004	2005	2006
Quantity of facilities (sets)	17	22	20	50	46	59

Source: "Korean Policies on Resources Recycle", 2007, Ministry of Environment.

1.3 Prospective strategies for environmental industry promotion

Environmental improvement and prevention-related fields of industry are highly diverse, and require meticulous promotion strategies through 'selection and concentration'.

The environmental industry promotion process involves market selection through a concentrated investment in a prospective environmental industry, the cultivation of development potential based on market autonomy and the creation of domestic consumption, and the development of international competitiveness and international markets with reserved potential through the creation of domestic consumption.

Korean government has identified the following as prospective environmental industry promotion tasks, and plans to promote related regulations.

- Promote environmental industry and develop infrastructure;
- Construct an assistance structure for the environmental industry to advance into foreign markets;
- Promote water industry;
- Promote climate change related CDM industry;
- Promote measurement instrument industry;
- Promote automobile related industry, and provide export assistance;
- Assist in the foreign advancement of waste disposal industry;
- Promote waste product energy industry;
- Promote soil pollution measurement-recovery industry.

2. Korea's regulations related to environmental services

2.1 Tariff policies

"Tariff Law" is the basic Korean law on tariff systems. The institution for formulating tariff policies in Korea is the Ministry of Strategy and Finance, and the executive institution is the Tariff Bureau and its affiliates. Korean import tariffs include basic tariff, temporary tariff and flexible tariff, etc. Temporary tariff and flexible tariff are to be regulated and levied by Korean government accordingly. Flexible tariffs play an important role in regulating the import and export and protecting relevant industries in Korea, such as anti-dumping duties, adjusting tariffs, emergency tariffs (guarantee tariffs), special emergency tariffs (special guarantee tariffs) and price balancing tariffs, etc.

In 2007, Korea made some adjustments in its tariff systems, mainly including: (1) With the increase of bilateral FTAs between Korea and other countries, Korea simplified its procedure of applying for applicable FTA tariff rates, and at the same time, it enhanced the punishment of forgery certificate of origin; (2) Korea expanded the scope of preferential tariffs given to the least developed countries by increasing the proportion of zero-tariff products into 75%.

According to Korea's "Law on Tariffs", Korean government will levy another flexible tariff not exceeding 100% on the basis of basic tariff, on the agricultural, forest and aquatic products that might result in chaotic domestic market or cause damage to the industries

due to weak competitiveness or increased import, as well as products need temporary protection for protecting the environment, the consumers' interests or the balanced development of domestic industries. List of products applicable to flexible tariffs and the tax rate will be revised annually and levied from 1 January to 31 December.

2.2 Regulations on import and export supervision

The Ministry of Knowledge and Economy is the authority formulating and implementing trade policies. According to Korean "Law on Foreign Trade", the Ministry of Knowledge and Economy may restrict the import and export of some goods when necessary for implementing treaties signed on the basis of the constitution and recognized international laws, or for protecting the biological resources. The Ministry of Knowledge and Economy will issue the "Import and Export Announcement" at certain time every year, for temporarily restricting the import and export of some products. The products listed in the "Import and Export Announcement" cannot be imported without submitting the application for import permit to relevant government departments or trade association and the approval. The Ministry of Knowledge and Economy will issue "Annual Trade Scheme" to list all special products need the Minister's approval for import.

The goods whose export are forbidden or restricted in Korea will be disclosed in "Import and Export Announcement", "Combined Import and Export Announcement" and "Additional Import and Export Announcement", mainly including important and strategic goods forbidden to be exported for protecting domestic resources and industries, goods whose export be forbidden or restricted for implementing international treaties, goods with restricted export under bilateral agreement, as well as goods that might endanger human life and health, pollute the environment or contradict to international treaties.

2.3 Regulations for managing and encouraging foreign investment

(1) Regulations on foreign investment management

Since 1998 financial crisis, Korea has been opening up its capital market and real estate market and promoting complete liberalization of the economy and attracting foreign investment based on the revised "Law on Promoting Foreign Investment". The government hoped to get away from the financial crisis, and this goal was reached successfully for the then recovery of the world economic environment. However, due to the U.S 9.11 terrorism and the break of IT bubble since 2001, foreign direct investment in Korea slipped in the period of 2000-2003, and it didn't rebound until 2004. By the year of 2006, Korea had attracted more than US$10 billion investment in a period of successive three years, with the ratio of investment in the following areas: manufacturing industry 38%, service industry 59%, and other industries 3% (see Figure III-3 and Figure III-4) . In addition, the increasing foreign direct investment in R&D Center and Distribution Center with high added-value brought larger effects on the economy.

Korean legislations related to foreign investment mainly include: "Law on Promoting Foreign Investment", "Statutes for Implementing the Law on Promoting Foreign Investment", "Regulations on Foreign Investment and

Technology Introduction", "Special Law on Taxation on Foreign Investment", "Regulations on Tax Exemption of Foreign Investment", and "Law on Administration of Land with Foreign Investment", etc. Korea adopts the declaration system for most foreign investments to know the flow of the capitals. Every year, the Ministry of Knowledge and Economy would incorporate all measures and policies on foreign investment management and publish on "Combined Foreign Investment Announcement". According to the information released in 2002 by Korean investment promotion institution, foreigners may invest in 1,058 industries among the total 1,121 (according to Korean classifications of industries) in Korea; the rest 63 industries do not allow foreign investment, such as public administration, education and military industry; and 28 of them have the regulations on investment ratio to limit foreign investment. In addition, foreign businessmen may invest in industries related to defense through the way of purchasing issued capital stocks, with the approval of the Ministry of Knowledge and Economy (after negotiation with relevant departments). List of industries forbid or restrict foreign investment will be announced according to "Regulations on Foreign Investment and Technology Introduction" or "Combined Foreign Investment Announcement".

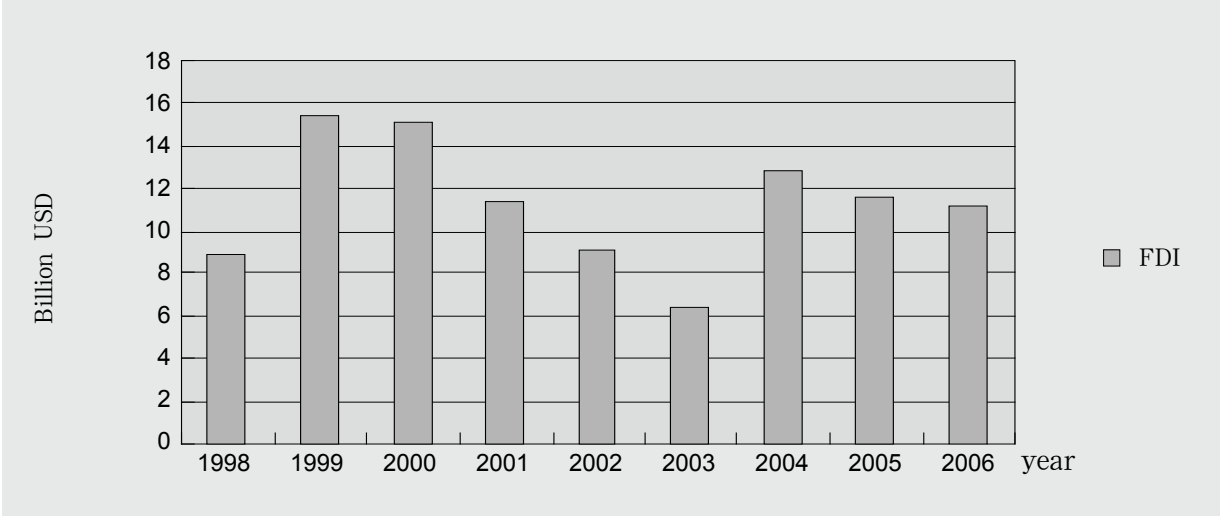

Figure III-3 Foreign Direct Investments in Korea in Recent Years (Unit: US$1,000,000,000)

Source: Ministry of Knowledge and Economy of Korea.

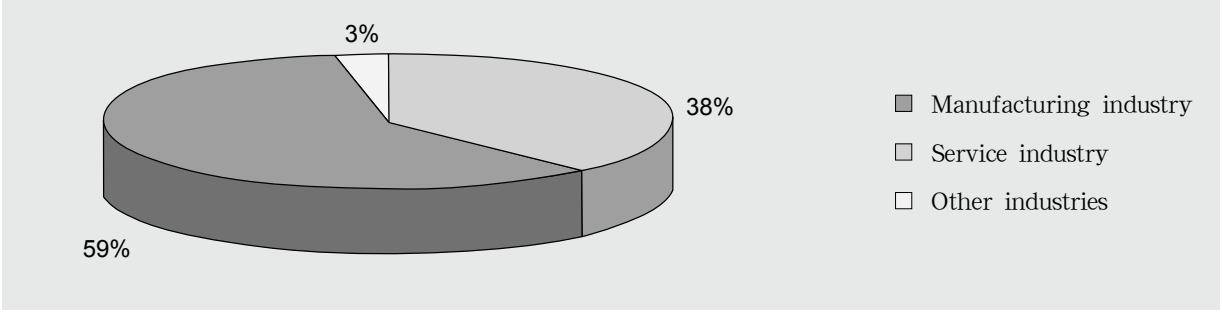

Figure III-4 Foreign Direct Investments in Korea in Different Industries (2006)

Source: Ministry of Knowledge and Economy of Korea.

(2) Preferential policies for encouraging foreign investment

1) More tax preferential policies. Tax exemption is one representative preferential policy adopted in Korea to attract foreign investment. According to the provisions of Korean "Law for Restriction of Exceptional Tax Exemption", the scope of tax exemption includes exemption from corporation tax, income tax, inheritance tax, registration tax, property tax, comprehensive land tax (local tax). The incremental investment by foreign enterprises will enjoy the same tax exemption (including tariffs) as the initial investment. In the system of temporary tax exemption for investment, cultural, environmental and communication services have been added into the scope; tax support to the service industry with investment in Jeju has increased; the scope of knowledge-based service industry with preferential tax has been expanded; the burden of trade tariffs on real estate in service industry has been reduced; and tax on technology import has been exempted, i.e., when a Korean civilian or corporation imports important hi-techs to improve the domestic industrial competitiveness, due to the technology transfer fees paid to the technology supplier, the corporation tax and income tax will be exempted for five years started from the payment day as regulated in the contract.

2) More financial support. Korea established fund for supporting small-and-medium-sized enterprises and increased the support from 60 billion WON in 2002 to 100 billion WON in 2005, and since 2002, 1 billion US dollars was paid annually by the industrial banks and corporate banks for developing knowledge-intensive industries; the applicable technologies, as well as the standards for credit scrutiny of guarantee service industry, have been improved.

3) Wider scope of tax exemption. Since 2002, the types of tax with exemption for small-and-medium-sized enterprises and start-up enterprises in service industry have increased from 6 to 18, the types with exemption of special tax amount for small-and-medium-sized enterprises have increased from 13 to 24, and the support for 49 industries has been improved; the service industry entered into the industrial parks apply the same local tax as the manufacturing industry, in addition to the exemption of property tax and comprehensive land tax.

4) System of rental exemption for state-owned or public land. According to Korean "Law for Promoting Foreign Investment", enterprises inside the special foreign enterprise park, industrial park and foreign investment zone may be given rental exemption for the rental state-owned land, not exceeding 50 years.

The specific standards are: foreign capital enterprises inside foreign investment zone and special foreign enterprise park with the investment over 1 million US dollars are hi-tech enterprises and may be given 100% tax exemption; manufacturing enterprises inside special foreign enterprise park with the investment over 5 million US dollars, as well as projects that are helpful to expanding basic public infrastructure and adjusting industrial structure and contributive to the self-sufficiency of local autonomy groups (to be decided by Foreign Investment Committee), may enjoy 75% exemption; hi-tech projects inside industrial park with the investment over 1 million US dollars, general manufacturing enterprises with 5 million US dollars, and projects that are helpful to expanding public infrastructure and defined by

Foreign Investment Committee, may be given 50% exemption for the rental of state-owned land. The term for renting state-owned land will be 50 years, within which the rental period may be renewed. The term for renting public land will also be 50 years, and the bodies and projects that may enjoy rental exemption as well as the exemption ratio for the rental public land will be defined by the local government's regulations.

5) Cash support system. According to the provisions of "Law for Promoting Foreign Investment", in order to encourage the establishment of hi-tech enterprises and R&D centers by foreign investment, Korea introduced the cash support system of "Cash-grant" in 2004, i.e., the system of rebating at least 5% of the investment amount to the investor.

The qualification is that applicant must be green-type invested (newly built or expanded) plants with the ratio of foreign investment exceeding 30% of the total investment, limited to the service industries (111) , hi-tech industries (467) and component and basic material industries supporting the development of manufacturing industry and other industries, and the large-scale foreign investment over 10 million US dollars in these industries may be given cash rebate. In order to encourage the establishment of the abovementioned service industries with the total investment over 5 million US dollars and hi-tech R&D centers with the staff of more than 20 professional researchers may also be given cash rebate.

6) Supporting policies on new-type renewable energies. In order to reach the goal of increasing the ratio of supply of new-type renewable energies to 5% by 2011, the government worked out the policies for supporting the application of new-type renewable energies.

According to the "Plan for Development of New-Type Renewable Energy Technologies and Application Popularization" promulgated by the government, by 2011, a budget of 8.3 billion US dollars will be used for supporting the R&D and popularization of new-type energies, as well as fundraising, compulsory connection to the network and merger and acquisition.

In 2007, just the tenth anniversary of the promulgation of the new policies for attracting foreign direct investment, the government set the goal of attracting high added-value foreign investment, and to improve the efficiency of attracting foreign investment and expand the infrastructure, the following action plans were worked out.

First, define key industries for attracting foreign investment, establish institution cooperation systems, and improve effective system of foreign investment attraction. Second, establish incentive mechanism to increase the support for foreign investment by providing one-stop service.

Furthermore, create the social atmosphere suitable for foreign investment and establish investment environment at international level by improving the living conditions of foreign businessmen and eliminating inconvenience for communication caused by different languages, and at the same time, the special policy favorable for construction of free trade zones and Northeastern Asian Financial Center will be actively carried out.

In 2007, the new measures adopted by Ko-

rean government to promote and attract foreign direct investment mainly include:

1) In April 2007, Korea revised the "Law for Promoting Foreign Investment", mainly based on the work of the Ministry of Knowledge and Economy:

First, incorporate the investment of non-profit foreign research corporation into the category of foreign investment and provide tax exemption or cash support, so as to attract the investment made by non-profit research institutions.

Second, decrease the standards for providing cash support for the field of R&D of foreign investment. The former standards for providing cash support to R&D institutions were too strict, with the necessary investment above 5 million US dollars and the staff over 20 people. The new regulations canceled the amount limit, and the standard number of employment was reduced to 10.

Third, the government must formulate and promulgate policies promoting foreign investment, including "the basic guideline for promoting foreign investment", "analysis on foreign investment environment related to domestic industrial structure", and "plans for supporting the executive institutions responsible for attracting foreign investment", etc.

2) In June 2007, the Ministry of Knowledge and Economy promulgated "Policies for Promoting Foreign Direct Investment (2007) ", in which FTA was regarded as the active factor for attracting and promoting foreign direct investment, in addition to some other policies promoting foreign direct investment, including the establishment of effective investment promotion mechanism, the activation of the current foreign investment support mechanism, the creation of favorable foreign investment environment, and the full utilization of special policies for foreign businessmen.

3) In July 2007, Korea established three more zones providing preferential treatment to enterprises with foreign direct investment, i.e., foreign enterprises with investment in Yosu, part of Kwonseong, and Kumi will be given 5-7 years of rental and corporate tax exemption. The local government will also provide additional tax preference to these enterprises.

2.4 Regulations on trade in service

Since 2001, to fully play the role of government departments, Korean government formulated and revised measures improving the competitiveness of the service industry and policies promoting foreign investment. In the tax system, finance and corporate burden, measure inconsistency between service industry and manufacturing industry has been rectified, and policies unfavorable to the development of service industry have been abolished.

In 2003, Korean government proposed policies for realizing high added-value of the service industry. In 2004, it canceled 43 policies impeding the development of the service market, in 2005, it worked out 26 plans for the development modern service industries, including communications, advertising, education and medicine, etc., in the end of 2006, "Comprehensive Measures for Strengthening the Competitiveness of the Service Industry" were promulgated, and in 2008, the three-phase system for promoting service trade was established.

According to the contents, the measures

may be divided into three parts: measures for ameliorating service trade environment, measures for developing advanced service trade, and measures for improving the competitiveness of adverse service industry. Korea also relaxed the regional restrictions on the service industry with foreign investment and the restrictions on the minimum amount of registration capital. The minimum registration capital of service supply business with government policy support has been reduced from 50 million US dollars to 30 million US dollars.

2.5 Foreign currency exchange management system

Korean regulations involving foreign exchange trade are divided into basic regulations and relevant regulations, the former include "Law on Foreign Exchange Trade", "Statutes for Implementing the Law on Foreign Exchange Trade" and various rules on foreign exchange management, and the latter include "Law on Foreign Trade", "Law for Promoting Foreign Investment", "Law on Tariffs" and "Law on State Tax", etc. Ministry of Strategy and Finance is responsible for formulating, revising and implementing foreign exchange policies.

Korea has planed to realize the complete liberalization of the foreign exchange market in three phases by 2011. Phase I is 2002-2005, the relaxation of the procedure required for individual and corporate trade of foreign exchange; Phase II is 2006-2008, the abolishment of the examination and approval of capital trade and the requirement for submitting balance sheet; and Phase III is 2009-2011, the replacement of "Law on Foreign Exchange Trade" by "Law on Foreign Exchange" and the complete liberalization of foreign exchange system, except for the security measures for emergencies. In order to successfully implement the abovementioned plans, in May 2006, Korea promulgated "Plan for Liberalization of Foreign Exchange", and in November 2007, the promulgation of "Measures for Establishing Market-Friendly System of Foreign Exchange Liberalization".

2.6 Visa management system

In August 2006, Ministry of Justice began to implement the revised rules for implementing "Law on Exit and Entry Supervision". According to the rules, the visa validation for foreigners with qualifications for corporate investment will be extended to five years, and a visa with five-year residence may be applied, with the fees for changing residence qualifications or time limit exempted.

In February 2007, Korean congress revised the "Statutes for Implementing the Law on Exit and Entry Management". According to the revised Statutes, Korean Ministry of Justice will change the single-entry family visiting visa "F1-4" into multiple re-entry visa "H-2", and the validation for stay will be changed from 90 days into five years, in addition to the permit for visiting and working within validation period. The immigrant needs not to go through transfer procedure from obtaining residence to employment. Within the validation period of the visa, the visiting employee may enter and exit Korea for multi times, but each term of employment in Korea must not exceed three years. The Statutes have been effective since 4 March 2007.

According to current provisions of Korean Immigration Law, foreigners can get permanent residential right only by investing over 2 million US dollars and employing 5 local

residents, and those with the investment of 500,000-2,000,000 US dollars must have been living in Korea for over three years. In 2008, Korean government submitted to the congress the application for revising Immigration Law, according to the new regulations, foreigners with the investment in Korea over 500,000 US dollars and the staff of 5 people may obtain permanent residential right.

2.7 Other regulations

1) Free trade zones

In 2008, Korean Ministry of Knowledge and Economy, Ministry of Strategy and Finance, Ministry of Education, Science and Technology, Ministry of Justice and Ministry of Public Administration and Security collaborated and worked out the “Plan for Activating Free Trade Zones” to attract more foreign investment based on the pilot work of free trade zones.

Korea has planned three free trade zones: Inchon, Pusan Chinhae and Kwangyang, with the future three more free trade zones: Kyonggi-do·Ch’ungchong-Namdo, Cholla-Bugdo, and Taegu-si·Kyongsang-Bugdo. According to the plan for free trade zones, Korea will implement investment incentive system to optimize the foreign investment enterprises, shorten the time for project approval, reduce the industry use land rental, extend the rental term, and simplify the procedure for the entrance and exit of foreign investors and employees, so as to provide convenience for foreign enterprises to get into the free trade zones.

2) Policies for attracting foreign hi-tech enterprises and talents

In order to improve its international competitiveness, Korean government formulated a series of tax policies in purpose of providing more tax preferences to foreign hi-tech enterprises.

Korean government ordered to extend the term of tax exemption for foreign hi-tech enterprises with top-notch technologies to seven years. And within five years after the seven-year tax exemption, they may enjoy 50% tax preference. In parallel with the tax exemption for foreign hi-tech enterprises, Korea has the policy to reduce the individual income tax from 25.7% to 21.7% for foreign employees with the annual salary exceeding 500,000 US dollars, as to the projects with foreign investment over 50 million US dollars, a plan of seven-year income tax exemption for corporations and individuals will be carried out, with 50% tax preference after seven years, so as to further improve the contribution rate of foreign investment to GDP.

Annex IV: Report of survey in the US on APEC trade liberalization in environmental services

1. Introduction

One of the goals of APEC is to realize the liberalization of trade within the Asian Pacific region. In order to improve various approaches to the liberalization of trade in environmental services within APEC economies, it is important to have a better understanding of existing practices, including facilitating policies, foreign trade management policies and barriers to trade liberalization.

For this purpose, China proposed a Survey on APEC Trade Liberalization in Environmental Services, which was then endorsed by APEC member economies. Questionnaire and interview have been utilized in the survey to disclose barriers for the US environmental services in trade among the APEC regions. The questionnaire is an important part of the proposal. The questionnaire for the US is filled out by United Stated Trade Representatives (USTR) and other related departments of the US.

Besides Korea and China, the survey delegation visited five the US companies which are recommended by officials from USTR and expert at supplying environmental services in the US and/or in the world. Those companies include Environmental Business International, Inc., Project Resources, Inc., Hargis and Associates, Inc., Tetra Tech and Montgomery Watson Harza Global, Inc.

The survey delegation also interviewed officials from the United Stated Trade Representatives (USTR), the United States Department of Commerce (USDOC), the United States Trade and Development Agency (USTDA), the United States International Trade Commission (USITC) and the United States Environmental Protection Agency (USEPA) to gain more detailed and comprehensive information on the US barriers existed in the trade the research focuses on.

In addition, the survey delegation paid visits to Woodrow Wilson International Center for Scholars, Council on Foreign Relations, Delaware Environmental Protection Agency for diverse information and opinions on the theme.

The report is written by Dr HU Tao, Ms WANG Zhuoni and Ms LI Liping, and is based on information extracted from the questionnaire by the US officials as well as interview summaries for the companies, research institutes and the US officials. The data cited in the report are mainly provided by USDOC, USITC and Environmental Business International, Inc. The report only reflects the view of 3 researchers and does not represent views of any organizations.

2. Basic situation of the US environmental services in trade

This chapter is to describe the basic situation of the US environmental services in trade, including definition and classification of environmental services, current development of environmental services, policies affecting environmental services, the US environmental service suppliers to APEC region and the US demand of environmental service.

2.1 Definition and classification of environmental services in the United States

The United States officially follows the CPC 94 classification of environmental services:

- **9401:** Sewage removal, treatment and disposal services.
- **9402:** Refuse collection and disposal services.
- **9403:** Other sanitation and other environmental protection services n.e.c. similar services including outdoor sweeping services and snow–and ice-clearing services.
- **9404:** Emission monitoring and control services of pollutants into the air, whether from mobile or stationary sources, mostly caused by the burning of fossil fuels.
- **9405:** Noise pollution monitoring, control and abatement services.
- **9406:** Ecological system protection services.
- **9409:** Other environmental protection services not elsewhere classified

In World Trade Organization's (WTO), the US follows WTO's *Services Sectoral Classification List* (also known as the W/120), which is used by most signatories to the General Agreement on Trade in Services (GATS) as a basis for their schedules of specific commitments. The W/120 divides environmental services into four subgroups, most of which are identified by corresponding Central Product Classification (CPC) codes:

- sewage services, CPC 9401;
- refuse disposal services, CPC 9402;
- sanitation and similar services, CPC 9403;
- and other environmental services, which is often presumed to include, *interalia,* cleaning services of exhaust gases (CPC 9404) and noise abatement services (CPC 9405) .

In practice, Environmental Business International (EBI), a strategic market research, publishing, and consulting firm that focuses on the environmental products and services industry, has developed its own classification codes for environmental industry segments. EBI defines the environmental industry as all revenue generation associated with environmental assessment, compliance with environmental regulations, pollution control, waste management, remediation of contaminated property and the provision and delivery of environmental resources.

Within the scope of this definition, EBI has identified fourteen segments of business activity in the environmental industry (see Figure IV-1 in detail below), which it divides into three broad categories: services, equipment and resources. These segments are neither classifications of environmental problems in a media sense, such as air pollution

or solid waste, nor are they market segments centered around solutions like the cleanup of contaminated sites that typically involve the contributions of many types of companies. EBI's environmental industry segments are classifications of types of businesses from the perspective of what the companies themselves typically offer along the lines of the SIC system, whether it be engineering services or environmental laboratory services relating to any number of environmental problems, or specific equipment manufacturers, or resource providers.

However, from our definition of environmental goods and services based on the spectrum of environmental scale, there are also great demands and supplies and even bigger potential supplies for indoor-environmental services and global-environmental services in the US, which are not well defined either in GATS classification and EBI's segments.

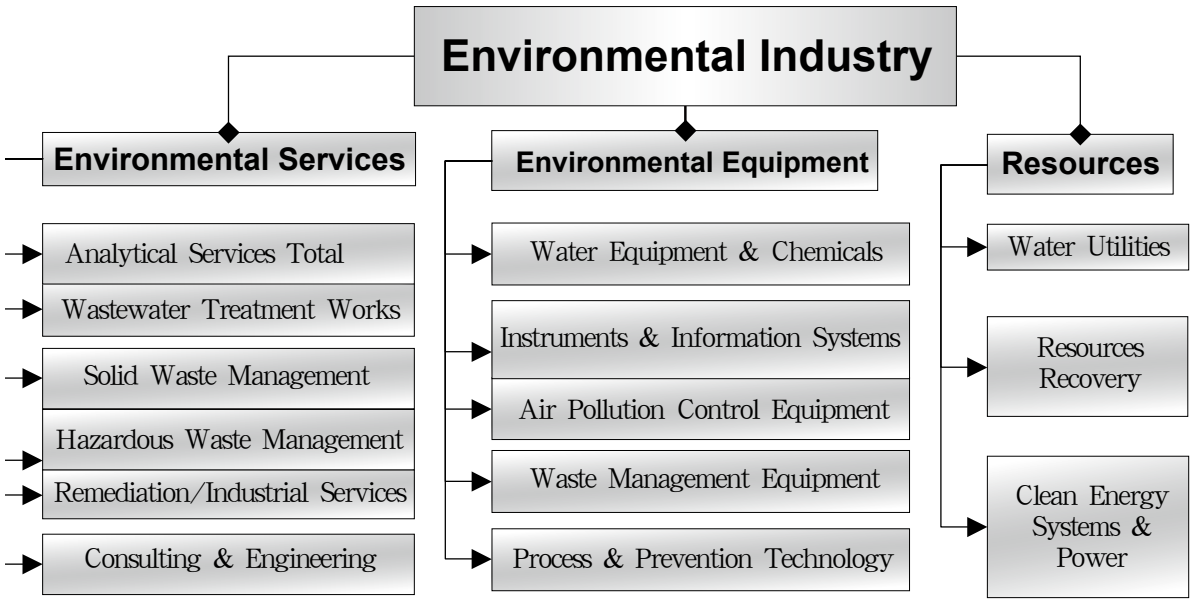

Figure IV-1 Classification System of Environmental Industry by EBI

Source and note: For more detailed information about segments, see EBI Market and Industry Research Methods, found at http://www.ebiusa.com/Surveys/EBI_ResearchMethods.pdf, retrieved Dec. 7th, 2008.

2.2 Development of environmental services in the US

The US has highly developed its service industry since the 1990s with steadily increased net value of international trade in services. According to data from Bureau of Economic Analysis, the US Department of Commerce, the international services of the US had exports of $497 billion and imports of $378 billion in 2007, with a balance of $119 billion in 2007. As shown in the following table

Table IV-1, though net balance of the US international trade in goods was negative during the year 1992 to 2007, the balance in services was always positive all the time.

The Asia and Pacific regions is one of the main regions for the US to export its serv-

ices, including business, professional and technical services and etc. According to data from the US Department of Commerce, the international services of business, professional and technical services, had exports of $108 billion and imports of $69 billion in 2007. In the Asia and Pacific regions, the international services in the US had exports of $25 billion and imports of $19 billion in 2007.

With regard to environmental services in the US, there is no enough specific data from the US officials. Environmental service statistics is difficult as the same as other service industries in the world. EBI, as mentioned above, has conducted various surveys in environmental goods and services and has accumulated rich experiences and data in the field in the past decades. The EBI data describes the development and current situation of the US environmental service industry. Figure IV-2 shows that environmental market growth compared with the US GDP. It can be concluded that the environmental market in the US has developed well along with the domestic environmental needs since the 1970s. In the year 2006, the revenue of environmental market took about 2.45% of the US GDP.

Table IV-1 The US International Trade in Services (Exports, Imports, and Balances)

Unit: million of US dollars

Year	Total1	Goods	Services	Exports Services	Imports Services
1992	-39,212	-96,897	57,685	177,251	119,566
1993	-70,311	-132,451	62,141	185,920	123,780
1994	-98,493	-165,831	67,338	200,395	133,057
1995	-96,384	-174,170	77,786	219,183	141,397
1996	-104,065	-191,000	86,935	239,489	152,554
1997	-108,273	-198,428	90,155	256,087	165,932
1998	-166,140	-248,221	82,081	262,758	180,677
1999	-265,090	-347,819	82,729	281,919	199,190
2000	-379,835	-454,690	74,855	298,603	223,748
2001	-365,126	-429,519	64,393	286,184	221,791
2002	-423,725	-484,955	61,230	292,299	231,069
2003	-496,915	-550,892	53,977	304,342	250,365
2004	-607,730	-669,578	61,848	353,072	291,224
2005	-711,567	-787,149	75,582	389,122	313,540
2006	-753,283	-838,270	84,987	433,905	348,918
2007	-700,258	-819,373	119,115	497,245	378,130

Note: 1. the total includes goods and services.

Source: Bureau of Economic Analysis, the US Department of Commerce.

http://www.bea.gov/newsreleases/international/trade/trad_time_series.xls

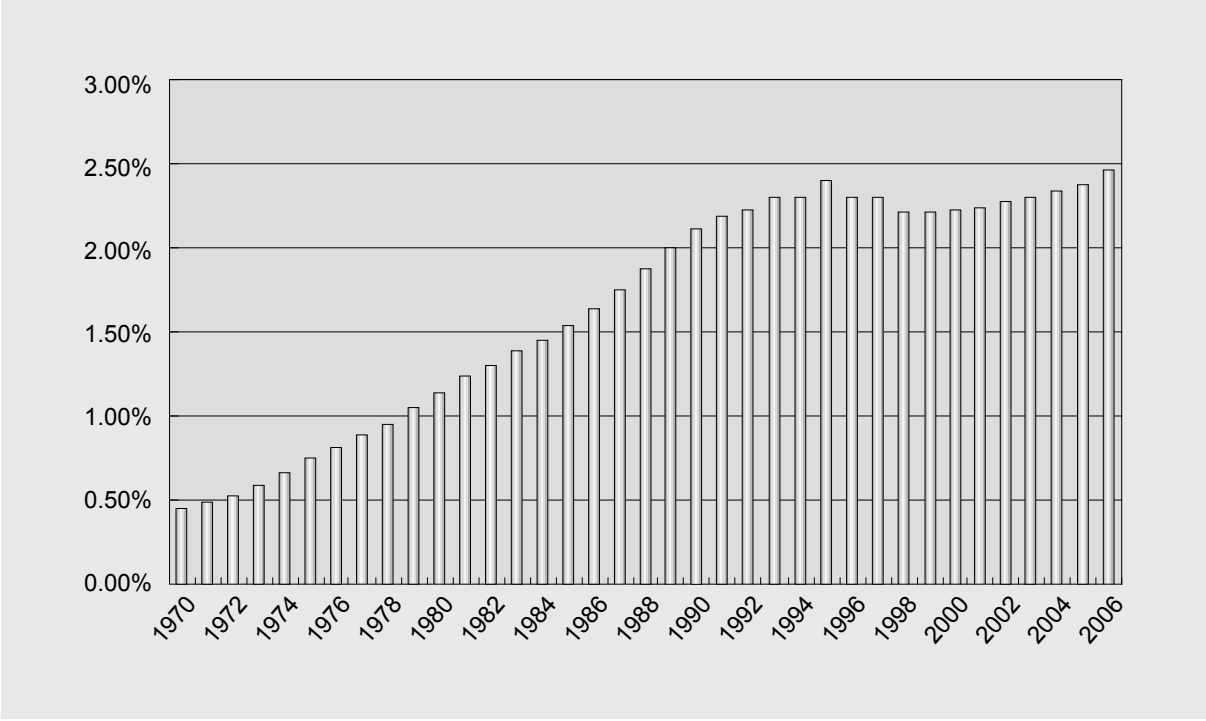

Figure IV-2 Environmental Market as % of GDP in the US

Source: Environmental Business International Inc., San Diego, derived from compiled analysis of the environmental market in Mexico performed by EBI from 1987-2008.

Table IV-2 The US Environmental Services Industry Revenues: 2006-2007 Segment Detail

Unit: billion of US dollars

Environmental Services	2006	2007
Analytical Services Total	1.84	1.89
Wastewater Treatment Works	37.49	36.06
Solid Waste Management	50.6	53.2
Collection	*28.7*	*30.7*
disposal/processing	*21.9*	*22.5*
Hazardous Waste Management	8.99	9.09
industrial hazardous waste	*2.93*	*2.88*
medical waste	*1.64*	*1.72*
utility/commercial nuclear	*0.96*	*0.98*
federal waste (DOE&DOD)	*3.46*	*3.51*
Remediation/Industrial Services	11.55	12.18
site remediation construction	*4.58*	*4.84*
industrial services	*4.82*	*5.21*
building abatement	*2.15*	*2.13*

Environmental Services	2006	2007
Consulting & Engineering	23.98	25.61
TOTALS	**134.45**	**138.03**

Source: Environmental Business International Inc.

Note: EBI data are largely based on industry surveys and reports from publicly traded companies. Basically, EBI "adds up" the revenues generated by companies/entities in each of the 14 environmental business sectors outlined above to determine individual segment and then total industrial size. It does this in four distinct steps: 1. Generation and Maintenance of Company Databases; 2. Development of Survey Instruments; 3. Response Data Compiling; 4. Margin Analysis Modeling. See EBI Market and Industry Research Methods, found at http://www.ebiusa.com/Surveys/EBI_ResearchMethods.pdf, retrieved Dec. 7th, 2008, for more detailed information.

Nowadays, the US market is a giant in environmental market and in environmental service market of the world. According to data from the Environmental Business International, the environmental services industry in the United States had revenues of $127 billion in 2005 and $138 billion in 2007 while the world environmental services market had revenues of $345 billion in 2007. With regard to environmental market of environmental services, environmental equipment and environmental resources, the US market was the largest all over the world in 2006 according to EBI's ranking system while the second largest market was Japan with revenues of $104.2 billion in 2006, less than 40% of the US ones (See Table IV-4) .

Among six segments of environmental services, the segments of solid waste management and wastewater treatment works take larger shares of both the US industry and the US market; however, the surpluses in both segments were negative in 2007 (See Table IV-3) .

Table IV-3 The US Environmental Services Trade Balance in 2007

Unit: Billion of US dollars

Environmental Services	The US ind	The US mkt	Surplus	exports	imports	%exports
Solid Waste Management	53.2	53.7	-0.5	0.16	0.7	0.3%
Hazardous Waste Management	9.1	9.1	0.0	0.10	0.1	1.0%
Consulting & Engineering	25.6	23.9	1.7	3.14	1.4	12.0%
Remediation/Industrial Services	12.2	12.0	0.2	0.71	0.5	6.0%
Analytical Services Total	1.9	1.8	0.1	0.16	0.0	8.0%
Wastewater Treatment Works	39.1	39.9	-0.8	0.23	1.1	1%
Total	141.1	140.4	0.7	4.50	3.8	

Source: EBI Inc., San Diego CA.

Note: 1. The US ind is revenues generated by the US cos worldwide.

2. The US mkt is revenues from the US customers.

3. Exports do not include ownership of overseas companies but do include repatriated profits.

Table IV-4 World Environmental Market by Region in Revenues

Unit: billion of US dollars

By Region	2000	2001	2002	2003	2004	2005	2006	2007
The US	212.3	217.0	224.6	232.4	245.2	256.3	271.4	289.6
Western Europe	157.8	160.8	166.9	172.4	180.0	185.0	189.1	194.2
Japan	93.7	93.3	93.9	96.1	98.8	100.0	102.6	105.3
Rest of Asia	24.0	27.1	30.1	33.6	38.0	42.1	46.7	51.8
Mexico	3.57	3.61	3.77	4.03	4.38	4.73	5.10	5.50
Rest of Latin America	9.2	9.6	10.3	11.0	12.1	13.0	14.0	15.1
Canada	15.1	15.3	16.0	16.5	17.2	18.0	18.9	19.8
Australia/NZ	8.4	8.6	9.1	9.6	10.1	10.5	10.8	11.2
Central & Eastern Europe	9.2	9.9	10.9	11.8	13.0	14.5	15.7	17.0
Middle East	6.8	7.0	7.5	8.3	9.4	10.5	11.3	12.6
Africa	3.4	3.6	3.8	4.6	5.5	5.8	6.2	6.8
Total	544.00	555.87	576.82	600.22	633.54	660.60	691.75	728.70

Source: Environmental Business International, Inc.

Note: Environmental market/industry refers to environmental services market, environmental equipment market and environmental resources market.

2.3 Policies affecting environmental services in trade

The United States' market for environmental services is generally open to foreign investments and participation. In addition, the US market is driven by a strong and comprehensive environmental regulatory and enforcement regime. For example, the US market in CPC 9404 – protection of ambient air and climate/cleaning services of exhaust gases – is largely driven by requirements under the US Clean Air Act, which limits emissions on a range of air pollutants. However, the US market of environmental services is constrained by horizontal level regulations.

As a result of horizontal level regulations and privatization of environmental industry in the US, there are various types of environmental service supply mode in the US. Some environmental service should be only provided by governments and regarded as a mandate for governments or governmental purchases. Some environmental service supply is local-oriented, for example trash collections, and only can local companies provide those services while some others are state-oriented or domestic company-oriented. Then other environmental services can be supplied by foreign supplier. Therefore, foreign companies are actually limited to supply all kinds of environmental services to the US.

Besides, the US visa policy, work permit and professional certification requirements constrain both foreign and domestic environmental service suppliers as shown in the an-

nex. Owning to complex procedures and lots of paperwork, domestic suppliers find it difficult to get the US visas or work permits for their overseas employees or to hire foreign personnel to work in the US.

The main policies affecting foreign environmental service provides are as below.

2.3.1 Mode 2 – tourism visa issues

As an eco-tourism service supplier, the US would gain larger service industrial value than the current one if tourism visa service system could be better improved, for example, individual tourism visas are issued.

Under the US law, applicants for visitor visas must qualify on their own for visas to visit the United States. This is what applicants must do when they apply for visitor visas:

- Complete and sign the required application forms;
- Bring evidence that their visit is temporary and that they will leave the United States after their legally authorized stay; and
- Undergo security clearance procedures

All visa applicants, even babies in their parents' passports, must have these things done:

- Application Form DS-156, completed and signed
- Current, valid passport or travel document
- Photograph. Requirements are strict for photograph size, type and quality. Please check with your nearest consulate for specifications before you get your picture taken.
- Application fees. All applicants must pay the application fee. Some applicants, according to type of visa, must also pay an issuance fee.
- Evidence of funds to cover your expenses in the United States
- Evidence of compelling social and economic ties abroad

For men between 16 and 45 years of age

- Supplemental visa application Form DS-157

The requirements are so many that the procedures for the US visitor visas are complicated that it costs long time to go through. Many applicants are refused to be issued the US visas due to financial issue.

Many tourists from some APEC economies are only allowed to have group tours in a certain amount of days and fixed route, but free individual personnel tours. Such policy brings inconveniences or even constrains for foreign visitors to come to the US as tourists. For this sake, those requirements could be considered as obstacles for development of eco-tourism services in the US.

2.3.2 Mode 3 and 4 – business visa issues[1]

International travelers come to the US for a wide variety of reasons, including tourism, business, medical treatment and certain types of temporary work. The type of visa needed is defined by immigration law, and relates to the principal purpose of your travel. Nonimmigrant visas are for international travelers, (citizens of other countries), coming to the US temporarily. This kind of visa allows a traveler

1 The information in this section is from the official web sites of US State Department and US citizenship and immigration services.

to travel to a the US port-of-entry (airport, for example) and request permission of the Department of Homeland Security immigration inspector to enter the US. Nonimmigrant visas are categorized at least 46 types by Bureau of Consular Affairs, the US Department of State. The visa requirements are very different and request complex procedures for applicators to finally get their visas. Further, as it's stated on the official website, a visa does not guarantee entry into the United States for other sakes, such as security issues.

H-1B classification applies to persons in a specialty occupation which requires the theoretical and practical application of a body of highly specialized knowledge requiring completion of a specific course of higher education. This classification requires a labor attestation issued by the Secretary of Labor (65,000 per year is the current quota amount). H-1B visa is valid for 3 years initially and can be extended to 6 years. the US employers may begin applying for the H-1B visa six months before the actual start date of the visa. Candidate of H-1B must have secured job offer from a the US source. In order to get an H1B visa, the applicant will need the equivalent of a the US college or university degree in a relevant subject. If the applicant has been educated outside the US, this requirement can often be met by:

EITHER — A non-US and/or only partly relevant degree, followed by three or more years work experience.
OR — Twelve years of high-level work experience.

If the applicant wishes to practice a profession such as law, medicine, or accountancy, etc, the applicant will also need to obtain the relevant State or Federal license to practice in the place of intended employment. New H1B legislation requires certain employers, called "H-1B dependent employers" to advertise positions in the US before petitioning to employ H-1B workers for those positions. H-1B dependent employers are defined as those having more than 15% of their employees in H-1B status (for firms with over 50 employees – small firms are allowed a higher percentage of H-1B employees before becoming "dependent"). In addition, all new H-1B petitions and 1st extensions of H-1B's now require a fee (in addition to the usual filing fees) of US$1,000 to be paid, which will be used to fund a training program for resident the US workers.

This classification also applies to Government-to-Government research and development, or co-production projects administered by the Department of Defense (100). The United States Citizenship and Immigration Services (USCIS) conducted two random selections, first on petitions qualifying for the 20,000 "master's or higher degree" (advanced degree) exemption, and second on the remaining advance degree petitions together with the general H-1B pool of petitions, for the 65,000 cap. The random selection process of H-1B visa system adds uncertainty of acquiring H-1B visas. As a result, many foreign skilled employees are unable to come to or to stay in the US so as to supply environmental services.

Besides, H-2B and H-2A visas only apply to limited APEC economies but all. Such visa holders obviously can provide various environmental services.

As we surveyed in the companies, visa problems are often mentioned. Therefore, companies would hire less skilled local personnel rather than fail the project which required

those foreign employees. In that case, it not only added operational cost to the project and the company but also frustrated the company's overseas market exploration and cooperation opportunity.

Visa is also a problem even within the NAFTA, though most Canadian citizens and many citizens from Visa Waiver Program countries can come to the US without a visa, they should meet certain requirements. Visa waiver travelers from ALL 27 Visa Waiver Program countries must present a machine-readable passport at the US port of entry to enter the US without a visa, otherwise a the US visa is required.

Table IV-5 Types of the US Nonimmigrant Visas

Purpose of Travel to the US and Nonimmigrant Visas	Visa Type	Required: Before Applying for Visa*
Athletes, amateur & professional (compete for prize money only)	B-1	(NA)
Au pairs (exchange visitor)	J	SEVIS
Australian professional specialty	E-3	DOL
Border Crossing Card: Mexico	BCC	(NA)
Business visitors	B-1	(NA)
Diplomats and foreign government officials	A	(NA)
Domestic employees or nanny -must be accompanying a foreign employer	B-1	(NA)
Employees of a designated international organization, and NATO	G1-G5, NATO	(NA)
Exchange visitors	J	SEVIS
Foreign military personnel stationed in the US	A-2, ATO1-6	(NA)
Foreign nationals with extraordinary ability in Sciences, Arts, Education, Business or Athletics	O	USCIS
Free Trade Agreement (FTA) Professionals: Chile, Singapore	H-1B1	DOL
International cultural exchange visitors	Q	USCIS
Intra-company transferees	L	USCIS
Medical treatment, visitors for	B-2	(NA)
Media, journalists	I	(NA)
NAFTA professional workers: Mexico, Canada	TN/TD	(NA)
Nurses coming to health professional shortage areas	H1-C	USCIS
Performing athletes, artists, entertainers	P	USCIS
Physician	J, H-1B	SEVIS
Professor, scholar, teacher (exchange visitor)	J	SEVIS

Purpose of Travel to the US and Nonimmigrant Visas	Visa Type	Required: Before Applying for Visa*
Religious workers	R	(NA)
Specialty occupations in fields requiring highly specialized knowledge	H-1B	DOL then USCIS
Students: academic, vocational	F, M	SEVIS
Temporary agricultural workers	H-2A	DOL then USCIS
Temporary workers performing other services or labor of a temporary or seasonal nature.	H-2B	DOL then USCIS
Tourism, vacation, pleasure visitors	B2	(NA)
Training in a program not primarily for employment	H-3	USCIS
Treaty traders/treaty investors	E	(NA)
Transiting the United States	C	(NA)
Visa Renewals – Available in the US		(NA)

Note: More detailed information available at website of Bureau of Consular Affairs, the US Department of State http://travel.state.gov/news/news_1735.html

Source: http://travel.state.gov/news/news_1735.html

2.3.3 Mode 3 and 4 — professional certification/ license[1]

Another issue that the US environmental service suppliers concern much is professional certification requirements. Lack of mutual recognition mechanism of professional certifications among states brings barriers for environmental services trade in domestic markets, not to mention the trade between the US and foreign countries. Driving, as a basic skill of survival and service, is a simple example. The US states have their own drive license certifications and state driver manuals. If Oregonians want to drive in California for over a month, they have to take California drive license, and visitors who don't get Oregonian drive licenses can drive vehicles in Oregon for only one year; otherwise they will be fined. Another example is professional engineer (PE) license. In the United States, registration or licensure of Professional Engineers is performed by the individual states. Each registration or license is valid only in the state in which it is granted. The licensing procedure varies among states.

Accumulating a certain amount of engineering experience under the supervision of a PE is generally the third step of the procedure. In most states the requirement is four years, but in others the requirement is less than four years. In a few states it is still possible for an individual to bypass Step 1, that is to graduate with a degree from an accredited four-year university program in engineering, and apply to take the registration examinations as long as a PE will sponsor the applicant, and work experience can be substituted for academic experience.

1 The information in this section is from official web sites of US Labor's Department, USCIS and various State Governments

The years of experience may also vary; for instance, in California it is possible to take a Principles and Practice in Engineering examination with only two years of experience after a bachelor's degree, or one year of experience after graduate school. In Nevada, college graduates are eligible to take the Principles and Practice exam immediately after graduation and passing the EIT, before acquiring the required experience. Some states also have state-specific examinations, most notably California where there is a state-specific structural engineering exam and two additional exams in land surveying and earthquake engineering for civil engineering candidates.

Some states issue generic Professional Engineering licenses. Others, known as "discipline states", issue licenses for specific disciplines of engineering, such as Civil Engineering, Mechanical Engineering and Electrical Engineering. In all cases, however, engineers are ethically required to limit their practice to their area of competency, which is usually a small portion of a discipline. While licensing boards do not often enforce this limitation, it can be a factor in negligence lawsuits.

Since regulation of the practice of engineering is performed by the individual states in the US, areas of engineering involved in interstate commerce are essentially unregulated. These areas include much of Mechanical Engineering, such as Automotive Engineering, Aerospace Engineering, and Chemical Engineering, and may be specifically exempted from regulation under an "Industrial Exemption".

Therefore, many Professional Engineers maintain licenses in several states for this reason, though comity between states can make it easy to obtain a license in one state based on licensure in another state without going through the full application process. In the law of the United States, comity may refer to the Privileges and Immunities Clause (sometimes called the Comity Clause) in Article Four of the United States Constitution, and this clause provides that "The Citizens of each State shall be entitled to all Privileges and Immunities of Citizens in the several States." However, many companies insist that professional certification requirement be an important barrier for them to conduct interstate business and overseas as well.

Besides professional engineer licenses, usually, it requires professionals at other specialties to get their certifications or licenses in different states so that they can work on interstate projects. As mentioned, if the visa applicant wishes to practice a profession such as law, medicine, or accountancy, etc, the applicant will also need to obtain the relevant State or Federal license to practice in the place of intended employment.

Constrained by those requirements, the suppliers who provide environmental service in foreign states have to hire state-certified personnel or professional employees, as a result of which increases management cost, operational cost and others. It pushes an environmental service supplier into an awkward situation when the company fails to hire qualified and appropriate professionals in face of its limit budget and desired expertise, especially for small-scale companies. The company will have to give up the project even the whole market in the state.

2.3.4 Mode 4 — work permit[1]

Work permit is another regulation being used by the US, which also strongly restricts the liberal trade of environmental service in the APEC region. USCIS requires the US employers check to make sure all employees, regardless of citizenship, are allowed to work in the United States. If the person who is going to be employed is not a citizen or a lawful permanent resident in the US, he/she may need to apply for an Employment Authorization Document (EAD) to prove he/she may work in the United States. USCIS issues Employment Authorization Documents (EAD) in the following categories: New EAD, Renewal EAD and Replacement EAD.

Again, owning to lots of paperwork for work permit, many companies would rather hire local labor rather foreign labor, though the requested payment by foreign labor is lower than the local. The additional payment for the local labor increases operational cost of the company, which inevitably reduces competitiveness of the company to supply environmental service in the global market.

2.4 Environmental services supplying to the Asia-Pacific area by the US

According to the questionnaire responses from the US, the US businesses are active in supplying conventional environmental services across CPC 94. According to a study by the USITC in 2004, the US exports of remediation services totaled $460 million while imports totaled $400 million in 2002. Based on EBI data,the US accounted for 60% of Mexican imports of water-pollution equipment. Little is known regarding trade in nature and landscape protection services. The United States has no classification “global-environmental services”, but believes that the US businesses are supplying these services via consulting services, and/or via services provided under CPC 9406.

As noted above, trade data is very difficult to come by for this sub-sector. The United States has no classification “indoor-environmental services” but believes that the US businesses are supplying these services via services provided under CPC 9404, as well as consulting and/or engineering services. According to a 2005 study on air pollution control services by the USITC, the US firms are the dominant suppliers of air pollution abatement services in the world market.

Table IV-6 demonstrates the environmental markets in the part of Asia-Pacific regions. According to the USITC studies previously referred to, Asia has the most rapidly developing markets for environmental services due to growing populations and incomes and rapidly developing regulatory and enforcement regimes. Japan had the largest market during 2000-2006 among those economies. However, the United States had much bigger revenues than Japan in the same period (see Table IV-4 and Table IV-6) .

EBI assessed globalization of the environmental market maturity in the world based on seven stages of market evolution. Those stages are 1) public awareness and pressure, 2) government policy stated, 3) legislation enacted, 4) regulations promulgated and agency empowered, 5) enforcement creates

1 The information in this section is from the official web site of US Citizenship and Immigration Services.

market for environmental firms (pollution control, cleanup & waste management), 6) proactive effort to circumvent regulation & liability (pollution prevention), as well as 7) internalization and integration of environmental efforts (sustainable development).

Apparently, the US market is the most developed in the world since the assessment outcomes showed that the United States market has been substantially undergoing Stage 6 and partially experiencing Stage 7. It can be concluded that the US has absolute advantages to supply environmental goods and associated with services to the APEC economies and other regions in the world. As shown in the tables of this report, developing countries' markets are growing more rapidly, especially in Asia. This represents an opportunity for firms worldwide, particularly the US firms

Table IV-6 Environmental Markets in the Part of Asia-Pacific: 2000-2006 Revenues

Unit: billion of US dollars

By Region	2000	2001	2002	2003	2004	2005	2006
Japan	93.7	93.3	93.94	96.08	98.77	101.46	104.22
Australia	7.1	7.3	7.67	8.04	8.42	8.76	9.12
New Zealand	1.3	1.3	1.42	1.53	1.66	1.73	1.80
Hong Kong	1.7	1.8	1.8	1.9	2.0	2.1	2.1
Singapore	1.2	1.3	1.4	1.4	1.5	1.6	1.7
Korea	5.6	5.9	6.6	7.0	7.7	8.1	8.5
Chinese Taipei	3.4	3.6	3.9	4.0	4.5	4.7	5.0
Indonesia	0.9	1.0	1.2	1.3	1.4	1.6	1.7
Malaysia	0.8	0.9	1.0	1.1	1.3	1.4	1.5
The Philippines	0.4	0.5	0.6	0.6	0.7	0.7	0.8
Thailand	1.2	1.3	1.4	1.6	1.7	1.9	2.0
China	5.7	6.9	8.1	9.6	11.4	13.4	15.8
India	2.4	2.9	3.3	4.0	4.7	5.4	6.2
Rest of Asia	0.7	0.8	0.9	1.0	1.1	1.2	1.4
Total	126.1	128.8	133.23	139.15	146.85	154.05	161.84

Source: EBI, Inc., San Diego, California.

As mentioned, the US market is largely driven by a strong and comprehensive environmental regulatory and enforcement regime. Defense Environmental Restoration Program (DERP), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), Resource conservation and Recovery Act (RCRA), Superfund Technical Assessment and Response Team (START) and etc., initially created environmental service needs. After years of evolution and privatization of environmental services, the US suppliers involve in and excel at those actions, responses and developed their specialized management and

operation modes.

Regarded as a representative company in the US, Project Resources, Inc. (PRI), handles with environmental restoration and provides rapid response/immediate response (RR/IR) services at confirmed or suspected Hazardous, Toxic, and Radioactive Waste and Ordnance and Explosive Waste sites anywhere in the US. PRI also managed Munitions of Explosives Concern (MEC) surface removal actions of beaches, roadways, trails, and locations within the property boundaries of the former the US Naval Ammunition Support Detachment closed in May 2003. Those environmental issues are to some extent also concerned by other governments in the APEC economies. The US suppliers not only can provide the environmental technology to potential markets in the APEC, but also can propose training programs about those issues for foreign government officials in those fields.

Advantages of the US environmental service industry can be also demonstrated in global and indoor environmental service supply by the US businesses. Honeywell International, Inc., dedicated to protecting the environment with a comprehensive and contemporary commitment, embraces its obligation of environmental stewardship through the pursuit of technology. The company designs products that help conserve energy, reduce waste, and protect homes and offices and help other companies become more efficient and productive with their products and solutions. Honeywell assists communities and companies in meeting the challenges posed by climate change policies and requirements by reducing the consumption of fossil fuels. Honeywell has solutions to help homeowners maximize home's efficiency and can save up to 33% on energy bills. More importantly, the company emphasized clean energy as well as efficiency.

Besides, Honeywell participate in the US Environmental Protection Agency's Climate Leaders program, a public-private partnership program that works to measure progress toward reaching corporate greenhouse gas reduction commitments. Attention should be paid to indoor air quality solutions that Honeywell developed to improve the air quality in homes. Their indoor air quality products meet or exceed American Lung Association Health House guidelines. It's believed that Honeywell is one of such excellent indoor and global-environmental service suppliers in the US.

It's important to recognize the fact that environmental services associate with environmental products. With regard to clean technology, the United States is the biggest exporter and importer of IGCC technology components. At the same time, developing countries are net importers of clean technology. The import countries have great demand of technical personnel to diffuse technology, to train local workers as well as to maintain technical facility after imported clean technology.

Table IV-7 Top 10 Trading Countries for IGCC (Clean Coal) Technology Components

No.	Exporters	Importers
1	The United States	The United States
2	The United Kingdom	Germany
3	Germany	The United Kingdom
4	Italy	Iran, Rep. of
5	Switzerland	China
6	Japan	Saudi Arabia
7	France	Italy
8	Mexico	Japan
9	Netherlands	France
10	Hungary	Norway

Source: WITS database. ICTSD (International Center for Trade and Sustainable Development). "Trade in Climate Mitigation Goods and Services: Opportunities and Challenges", presented in APEC Environmental Goods Workshop in Arequipa at 20 May 2008.

2.5 Demand of the US on environmental services

According to the questionnaire answered by USTR, the United States believes that all of the above environmental services are needed in an effort to protect the environment. Besides the slow growing conventional sectors, such as sewage treatment, air pollution control, in the US, the most fast-growing sectors are the global-environmental and indoor-environmental sectors, based on our survey in US.

2.5.1 Global-environmental services

There are more than 100 Multilateral Environmental Agreements (MEAs) in the world and more are coming in the future. They are driving forces of global-environmental services. the US, as the biggest economy in the word and key environmental stakeholder, has signed some of the MEAs. To implement the MEAs at an economy level, it will create demands of environmental services.

◆ **UNFCCC, Kyoto Protocol (KP) and relevant treaties**

In the future, Climate change and energy-related environmental services (global-environmental services) will probably be highly demanded from the US under environmental policy of Obama's Administration and new protocols of UNFCCC in COP15 Copenhagen 2009 and beyond. Wind power and solar energy would be the fast-growing sectors.

Power, especially wind power and solar photovoltaics, is regarded as a kind of environmental service associated with products. The wind power is of great demand in the US to meet its ambitious goal of the year 2030. In 2006, President Bush emphasized the need for higher energy efficiency and a more diversified energy portfolio. This led to a collaborative effort to explore a modeled energy scenario in which wind provides 20% of the US electricity by 2030.

In 2008, the US Department of Energy (DOE) published a report that examines the technical feasibility of using wind energy to generate 20% of the electricity demand by 2030. In its Annual Energy Outlook 2007, the US Energy Information Administration (EIA) estimates that the US electricity demand will grow by 39% from 2005 to 2030, 20% Wind Energy by 2030 reaching 5.8 billion megawatt-hours (MWh) by 2030. To meet 20% of that demand, the US wind power capacity would have to reach more than 300 gigawatts (GW) or more than 300,000 megawatts (MW). This growth represents an increase of more than 290 GW within 23 years. However, by early 2007, global wind power capacity just exceeded 74 GW, and the US wind power capacity totaled 11.6 GW. This domestic wind power has been installed across 35 states and delivers roughly 0.8% of the electricity consumed. The wind power capacity gap in the US would present huge potential environmental service market in the domestic and the global in the coming decades.

And, China and India have emerged as leading producers of wind energy as well as wind energy manufacturing equipment, such as fluorescent lamps industry in China and Indonesia while Brazil is a world leader in the manufacture of bio-fuel equipment. In efficient lighting for instance, strong market growth in developed countries has been fuelled by imports mostly from developing countries.

Additionally, Japan, China and seven other developing countries including India, the Philippines, Thailand and Malaysia are acting as leading producers of solar photovoltaics in recent years, such as alone-solar cell PV. PV cells account for more than half the cost of an installed solar electricity system, so trade liberalization among APEC economies will be important here.

Table IV-8 Top 10 Trading Economies in Wind Energy and Solar Photovoltaics

Wind Energy		No.	Solar Photovoltaics	
Exporters	**Importers**		**Exporters**	**Importers**
Germany	*The United States*	1	Japan	Germany
Japan	China	2	China	*The United States*
Italy	Germany	3	Germany	China
Denmark	The United Kingdom	4	*The United States*	Hong Kong, China
Belgium	France	5	Chinese Taipei	Japan
The United States	Canada	6	Malaysia	Korea, Rep. of
Spain	Belgium	7	France	France
France	Korea, Rep. of	8	Korea, Rep. of	The United Kingdom
The United Kingdom	Italy	9	Spain	Canada
China	Mexico	10	Netherlands	Italy

Source: WITS database. ICTSD (International Center for Trade and Sustainable Development). "Trade in Climate Mitigation Goods and Services: Opportunities and Challenges", presented in APEC Environmental Goods Workshop in Arequipa at 20 May 2008.

Under the 20% Wind Scenario in the plan mentioned, a cumulative total of 7,600 million metric tons of CO_2 emissions would be avoided by 2030, and more than 15,000 million metric tons of CO_2 emissions would be avoided through 2050. There is lots of work to be done with GHGs reduction cooperation under the UNFCCC and other international protocols.

As early as the report "Reducing the US Greenhouse Gas Emissions: How Much at What Cost?", published in Nov, 2007 jointly by McKinsey & Company, the management consulting firm, and The Conference Board, the business research organization, shows a reduction of 3.0 to 4.5 gigatons in 2030 is achievable at manageable cost less than $50 per ton using proven and emerging high-potential technologies — but only if the US pursues a wide array of options and moves quickly to capture gains from energy efficiency. As the report estimated, cumulative net new investment through 2030 would be $1.1 trillion, or roughly 1.5 percent of the $77 trillion in real investment the US economy is expected to make over this period.

On the present path, annual the US greenhouse gas emissions will increase by 35 percent to reach 9.7 gigatons of carbon dioxide equivalent (CO_2e) in 2030, according to an analysis of government forecasts. At this level, emissions would overshoot by 3.5 to 5.2 gigatons the targets implied by economy-wide climate change bills introduced in Congress. If the US were committed to have a big cut of GHGs in Copenhagen during the COP15 or afterwards, the GHGs reduction investment would be huge from the US.

Although the US still stays out of the Protocol, there is still potential demand of the US energy-related environmental services. Environmental services associated with environmental products are important to the US as the liberalization trade to other APEC economies. As the Report suggested, a concerted, nationwide effort to reduce GHG emissions would almost certainly stimulate economic forces and create business opportunities that may accelerate the rate of abatement can achieve, thereby reducing the overall cost.

The solar photovoltaics industry is rapidly growing with industry quadrupled in production to 4 GW between 1994 and 2000. In 2004, the annual production exceeded 1100MW (Source: WITS database). The US market share of world photovoltaics has changed dramatically since the 1980s. From 1980 to 1985, the US industry dominated the world market contributing 50% or more of world production. In 1985, however, that relative share declined and has varied significantly since then. The US share shrank till less than 10% in 2005.

However, the solar photovoltaics industry is blooming in other side of the world. It is useful to note that world shipments increased to a record high of 1727 MW during 2005. The largest annual increase of 35% in the US production since data collection began occurred between 2003 and 2004. the US production reached a record of more than 153 MW in 2005 (See Figure IV-3) . It's shown in Table 8, the United States is the second largest importer of solar photovoltaics and ranks fourth as an exporter in the world nowadays.

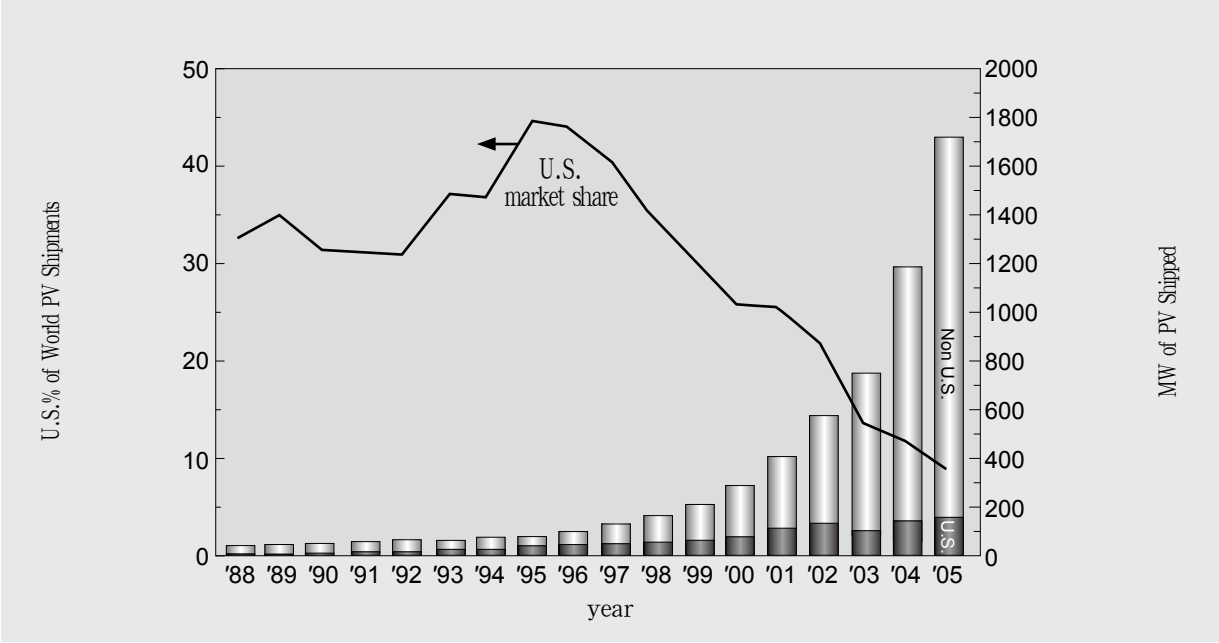

Figure IV-3 US Market Share & World PV Cell/Module Production (MW)

Source: US DOE Solar Program's PV Manufacturing R&D Project, National Renewable Energy Laboratory website, http://www.nrel.gov/pv/pv_manufacturing/market_share.html, retrieved Jan. 12th, 2009.

◆ Basal Convention and Hazard waste trans-boundary

The Basal Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (1989) entered into force in 1992 to ensure that trans-boundary movement of hazardous wastes are consistent with the protection of human health and the environment. In 1994, the Basal Convention was strengthened, outlawing export of hazardous waste for final disposal from OECD to non-OECD countries. The revised Convention agreed to phase out transnational shipments of waste destined for recycling by 1998. So far, due to the US government refusing to ratify the Basal Convention, the US government connives at hazard waste export.

"E-waste" or electronics trash, is piling up faster than ever, according to the US Environmental Protection Agency. Americans discarded 47 million computers in 2005, up from 20 million in 1998. Factor in other forms of electronics, and the member now dumps between 300 million and 400 million electronic items per year, according to estimates from the EPA and the TakeBack Coalition (San Francisco-based advocacy group). In the US there is very little regulation of e-waste. Less than 20 percent of the US e-waste is recovered for recycling, and the rest ends up in landfills. The recycling percentages for PCs (10 percent) and TVs (14 percent) are even lower. The imminent switch to digital TVs in the US and elsewhere will lead to a massive increase in the amount of redundant analog TV's.

US law (unlike Europe's) permits the export of electronic waste to developing members. According to the Basel Action Network, a Seattle-based non-profit, much of the e-waste

generated in the US today ends up in China, Pakistan and India, where children and women often do the sorting and toxic circuit boards are burned in residential neighborhoods. It's clearly that recovering certain types of plastics and other materials is too labor-intensive to be practical in the US, where labor rates are substantially higher than in countries such as India and so on. The EPA also disclosed that solid waste landfills are not regarded as safe as it should be because not all landfills are modern and properly managed. Additionally, e-waste in landfills poses risks to groundwater and human health and the environment.

Both solutions for the US don't seem to be sustainable in the future, so the EPA is developing a set of voluntary certification standards for electronic recyclers. However, it takes time to go through the legislation and it' s uncertain how manufacturers are response to those standards. E-waste is still a big issue in front of the US, especially when the US is required to join in Basel Convention in the future in line with international responsibility and public concern; at that time e-waste trans-boundary dump would be illegal. A new e-waste treatment is demanded and effective solutions had better be worked out as early as possible.

◆ **Other MEAs**

The Convention on Biological Diversity (CBD) is the only comprehensive agreement dedicated to the conservation and sustainable use of biodiversity. The CBD's 24 work programs — ranging from agricultural biodiversity to forests, climate change to island issues, and plant conservation to ecotourism — set the agenda for key conservation and sustainable use activities around the world. It is a 16 year-old treaty with 191 parties. Only four members in the world are non-parties: Andorra, Iraq, Somalia, and the US. During 1995-2008, the US still sent large delegations of governmental officials and representatives from environmental and industry groups to all CBD meetings. Nevertheless, as a CBD "observer," the US delegations have no official voice.

There are indirect benefits and potential cooperation for the US and the CBD parties if the US ratifies the convention. Conservation and sustainable use of biodiversity and habitats such as the tropical forests are integral to tackling the impacts of global warming. Biological diversity protection not only relates to global warming, also to local ecosystem services. Biodiversity and bio-safety have been always issues for international round-table meetings involving in trade and the environment of WTO-MEA negotiations. Besides, the US membership could significantly aid the molding of fair, workable access and benefit-sharing policies and those policies.

So far, there are now about 200 MEAs on the books, about twenty of which contain some form of trade provisions. Besides UNFCCC, Kyoto Protocol, CBD, other key multilateral environmental agreements (MEAs), such as Montreal Protocol on Substances that Deplete the Ozone Layer, Stockholm Convention on Persistent Organic Pollution, Cartagena Protocol on Bio-safety to the CBD and so on, might suggest ban the import of controlled goods and services (i.e, ozone-depleted substances) from non-parties. Under both international and domestic stress from civil society, the US should consider and would become more involved in the WTO-MEAs negotiations in order to facilitate environmental goods and services in trade and take advantage of advance technologies and

leadership in international relations in the near future.

2.5.2 Indoor-environmental services

Indoor-environmental service demand of the US will be also very large. People in modern societies spend more than 90% of their time in indoor environments (Leech et al. 2002) . In the United States, residence times in the home range from 15.5 to 15.7 hr/day (Brasche and Bischoff 2005) . Hence, indoor environmental quality in households has a significant impact on public health and well-being. Indoor air quality has been an important theme for environmental health academia as well as a concern for policy-makers since last century.

According to the US Environmental Protection Agency, the air inside a home can be 2-5 times more polluted than air outside. USEPA developed some project-based indoor air quality programs, such as IAQ (Indoor Air Quality) Tools for Schools (TfS) Program, Smoke-free Homes and Cars Program and etc., to improve indoor air quality rather than establish regulations. Lack of policy motives, pollutant source data and other contributing factors and complex interactions, USEPA hasn't authorized any indoor air quality standards so far. Further, many housing code regulations are established locally and not federally (Felicia Wu et al. 2007) . USEPA recommended three basic strategies to improve indoor air quality that are source control, ventilation improvements and air cleaners.

Usually the most effective way to improve indoor air quality is to eliminate individual sources of pollution or to reduce their emissions. In many cases, source control is also a more cost-efficient approach to protecting indoor air quality than increasing ventilation because increasing ventilation can increase energy costs. But, in some cases when ventilation improvements or air cleaners become the choices rather than source control, smoking corners in buildings or outside, painting, heating with kerosene heaters, cooking for instance, energy-efficient ventilation and heat recovery ventilators could be necessary.

As predicted by a new market research report related to the American heating industry on Nov. 16th 2007, HVAC (heating, ventilation and air conditioning) equipment market in the US is forecast to increase 3.2 percent per year to $16.8 billion in 2011. Advances will be primarily driven by strong gains in nonresidential construction, along with ongoing growth in the residential replacement market. Although gains will be restrained by projected declines in new single unit housing completions between 2006 and 2011, nearly three quarters of HVAC demand is attributable to replacements (Business Wire, 2007) . Such demands may create business opportunities for other APEC economies to provide relevant services.

Smoking bans in the United States are a product of state and local criminal and occupational safety and health laws. More than 700 state and local governments have passed laws restricting outdoor smoking at playgrounds, building entrances and other public areas, according to the American Nonsmokers' Rights Foundation. Stanford professor's findings show that a person sitting or standing next to a smoker outdoors can breathe in wisps of smoke that are many times more concentrated than normal background air pollution levels (Mark Shwartz 2007) . Smokers have to smoke outdoor, but still smokes also do harm to walkers.

Ventilation indoor and outdoor is becoming a concern for non-smokers in the US. The suggestion is smokers smoke in a room with well-designed ventilation system and air clean filters. For example, Japan has very good quality ventilation equipment and air-filtering materials such as bamboo charcoal products.

Another demand comes from house re-painting with non-lead paint. As known, housing built before 1978 may contain lead-based paint. Lead from paint, paint chips and dust can pose health hazards if not taken care of properly. Lead exposure is especially harmful to young children and pregnant women.

In 1998-2000 HUD sponsored a survey of a naturally representative sample of housing in the US in which children could reside. Some lead-related findings from The National Survey of Lead and Allergens in Housing (NSLAH) include the following: 38 million housing units (40%) had lead-based paint and 24 million (25%) had significant lead-based paint hazards. 1.2 million dwellings with at least one significant lead-based paint hazard housed low income families with a child under the age of 6. 14% of housing units had significantly deteriorated lead-based paint, 16% had dust-lead hazards, and 7% had soil-lead hazards (USDHUD 2008) . In 2004, the National Center for Healthy Housing conducted a National Evaluation of OHHLHC (Office of Healthy Homes and Lead Hazard Control) grant prograMs

In order to push forward the lead hazard reduction movement and assist in achieving their mission, up to $165 million will be annually granted to qualified applicants in line with 7 different prograMs Better availability of lead-free and environment-friendly products for buildings and construction in the US market associated with environmental services will benefit American households and facilitate the prograMs The lead-free coatings and paints are utilized in the household in the Asia, especially in Japan. Nipponpaint Inc., a Japanese corporation, has endeavored to develop and promote environment-friendly fine coatings and paints for building and construction applications since 1999. The “Fineness Series” of Nippon paints, contain less amounts of harmful substances such as organic solvents and heavy metal, and features easy recyclability for reduced volume of waste than the regular.

3. The US perceptions of trade liberalization in environmental services in APEC economies

The following information mostly was abstracted from the responses by USTR to questionnaire designed by our research team.

3.1 Barriers from modes of supply contain to trade liberalization among APEC

According to the questionnaire answered by USTR, the US would rank the modes as follows:

Mode 3 (establishment of commercial presence) is the predominant mode of supply in providing environmental services. Thus any barriers to commercial presence, especially limitations on foreign equity, can have the most significant negative impact on trade in this sector.

Barriers to Modes 1 and 4 (cross-border supply and temporary movement of natural persons) can also be significant in this sector, but less so than barriers in Mode 3.

Barriers to Mode 2 (consumption abroad) are the least significant in this sector.

3.2 Barriers for the US to trade erect by APEC economies

It is difficult to single out particular economies for erecting more barriers than others. But the US pointed out one important fact: there are remarkably few APEC economies that have taken GATS commitments in environmental services. The lack of GATS commitments in this sector can contribute to uncertainty, and thus reluctance on the part of businesses to enter a market.

The US trade departments have also heard specific complaints about certain APEC economies due to a variety of concerns not directly covered in this survey, but which can adversely impact trade in environmental services, including: lack of adequate protection for intellectual property; non-transparent and inconsistent construction permitting processes; uneven application of standards; uneven enforcement of environmental regulations; lack of transparency in regulatory decision-making and standards-setting.

According to surveys on companies, many companies had high expectation on China market of environmental services, and also mentioned Russia and Viet Nam as the economies that erect more trade barriers than others in the APEC region.

3.3 More liberal economies regarded by the US in the APEC environmental trade

The US would rank their FTA partners as the most liberal economies for the obvious reason that they have free trade agreements with these countries that allow the US to trade more easily. Their FTA partners within APEC are: Australia, Canada, Chile, Mexico, Peru and Singapore.

Possibly for sharing the same language as well as similar culture and legal system with the US, Australia and New Zealand are regarded as more liberal market than others in the APEC region by some of the companies visited.

3.4 Regulations limiting the US suppliers of Cross-border environmental services among APEC

The United States believes that all of these restrictions, such as Requirements to obtain authorizations, licenses or permits in order to market and supply services, Requirements to use specified networks of providers, Regulations affecting the cross-border transfer of capital, uses of credit cards, or e-business and Requirements for a full commercial presence, can limit the supply of environmental services in the APEC region. In addition to these, the lack of understanding that cross-border supply of environmental services is technically feasible, and thus the lack of GATS commitments in mode 1, can also limit the supply of environmental services.

The online payment system is not so developed and convenient as it is thought to be among the APEC region so as to cause the

payment problem for service providers. The problem blocks some suppliers to provide cross-border environmental services.

3.5 Regulations limiting the US consumption of environmental services in other APEC economies

The United States believes that all of these restrictions, including visa requirements, numerical quotas and special taxation can limit the supply of environmental services in the APEC region.

As an eco-tourism service supplier, the US would gain larger service industrial value than the current one if tourism visa service system could be improved. Many tourists from APEC economies are only allowed to have group tours in a certain amount of days, fixed route and even fixed restaurants and shops, but free individual personnel tours. Such policy constrains the number of visitors to be in the US as a tourist.

3.6 Regulations limiting the US suppliers of environmental services with respect to commercial presence and legal form requirements among APEC

The United States believes that all of these restrictions listed below can limit the supply of environmental services in the APEC region. And as mentioned above, given that mode 3 is the predominant mode of supply for environmental services, restrictions such as equity limitations, can be a major barrier to establishing commercial presence.

1. Approvals based on policy guidelines and overall interest considerations, but without needs tests or local participation requirements
2. Approvals of foreign investment based on economic needs tests or net benefits
3. Approvals required for foreign equity participation, including in joint ventures with local partners
4. Equity limitation on ownership by foreign partners in joint ventures
5. Restrictions on acquisition of existing businesses or establishment of new businesses
6. Where the establishment of new businesses are not permitted, requirements for numerical quotas for operating licenses
7. Existence of local monopolies excluding foreign providers
8. Set-asides for state owned enterprises or for enterprises owned by permanent residents

Malaysia usually posts an equity limitation of 30% but a high equity limitation of 70% for foreign water supplier and energy supplier. However, there are also investment tax allowance and reinvestment allowance in Malaysia for some certain sectors such as manufacture.

Many American companies and official thought equity limitation on the ownership in China was the key constraint among APEC. Actually, China only requests joint venture based on China's WTO accession commitment of GATS. Even, China has no more requirements for Singapore and ASEAN countries according to the new bilateral FTAs.

According to interviews with environmental service suppliers, the US corporate operation in China has difficulties in recognition of culture, language and legal system, but those difficulties could hardly be deemed as trade

barriers. Besides, the US companies also mentioned that requirement of environmental professional certification in China also is a barrier for them to conduct environmental services in China.

With respect to legal form requirements among APEC, the United States believes that all of these restrictions listed below can limit the supply of environmental services in the APEC region; however, the US regards No.1, 3, 4, and 5 as the most problematic.

1. Only one legal form permitted. Incorporation required with a ceiling on foreign equity participation and mandatory local partnership. Only soul proprietorships or partnerships permitted
2. Direct establishment of branches of foreign companies not permitted; branches permitted subject to quotas and/or geographic distribution of branches
3. Only joint ventures or representative offices permitted
4. Only joint ventures as limited liability companies permitted
5. Only representative offices permitted for promotional reasons or for undertaking research for the head office

3.7 Regulations most limit suppliers from your economy from providing environmental services to other economies with respect to residency requirements and movement of natural persons among APEC

1. Persons designated as local agents of foreign companies must be permanent residents
2. Requirements that foreign established companies have a least one local resident director
3. Requirements for geographical distribution of resident providers.
4. Requirements that the CEO be a citizen of the host country
5. Requirements that some or all of the directors are recident of the host economy
6. Requirements that all directors are residents of host economy
7. Prior residency required to obtain operating license: residency not permitted without license

The United States believes that all of these restrictions above can limit the supply of environmental services in the APEC region.

In Malaysia, the CEO or senior manager should be a local resident. It is a limit to the US environmental service suppliers who conduct overseas business there.

For a long term, residency requirements are also a concern by American overseas companies. Besides, visa issue is regarded as a problem during special period, such as Beijing Olympics.

With reference to the movement of natural persons among APEC, the United States believes that all of these restrictions listed below can limit the supply of environmental services in the APEC region.

1. Only certain types of personnel are permitted, with time limits and/or conditions not specified
2. Requirements for further training or local examinations in the host economy for professional recognition

3. Permission for intra-corporate transfers subject to labor market testing/ economic needs tests; non-availability of local staff decided by host authorities without input from a foreign company concerned
4. Requirements that a significant proportion of the staff of a foreign established company be residents of the host economy; numerical limitations on foreign resident in senior positions
5. Provision of services by self-employed persons not permitted

3.8 Measures have been taken, or are being planned, by the US government to overcome barriers to trade liberalization in environmental services in other economies

The United States believes that all of APEC mechanisms and bilateral and WTO negotiations have an important role to play in reducing barriers to trade in environmental services. The United States has co-sponsored APEC work in the environmental goods and services area, including most recently the establishment of an APEC database to facilitate the exchange of information on environmental goods and services markets in the APEC region.

The United States has also negotiated and implemented several bilateral and regional FTAs that reduce barriers to environmental services. And the United States has been a leading advocate for an ambitious, market-opening outcome to the WTO DDA negotiations under paragraph 31(iii) (increased market access for environmental goods and services). Most recently, the United States co-sponsored a proposal for the negotiation of an Environmental Goods and Services Agreement (EGSA), which would reduce trade barriers in this important sector, similar to the WTO Information Technology Agreement (ITA).

4. Conclusions

✓ US is one of 3 surveyed APEC economies. After the survey, the following are key findings:

✓ US definition of environmental service
The United States officially follows the CPC 94 classification of environmental services. In practice, Environmental Business International (EBI), a strategic market research, publishing, and consulting firm that focuses on the environmental products and services industry, has developed its own classification codes for environmental industry segments. However, from our definition of environmental goods and services based on the spectrum of environmental scale, there are also great demands and supplies and even bigger potential supplies for indoor-environmental services and global-environmental services in the US, which are not well defined either in GATS classification or EBI's segments.

✓ US environmental service market
The US has highly developed its service industry since the 1990s with steadily increased net value of international trade in services. The Asia and Pacific region is one of the main regions for the US to export its services, including business, professional and technical services and etc.

With regard to environmental services in the US, there is no enough specific data from

the US officials. Environmental service statistics is difficult as the same as other service industries in the world. EBI, as mentioned above, has conducted various surveys in environmental goods and services and has accumulated rich experiences and data in the field in the past decades.

The EBI data describes the development and current situation of the US environmental service industry. The US market is a giant in environmental market and in environmental service market of the world. According to data from the Environmental Business International, the environmental services industry in the United States had revenues of $127 billion in 2005 and $138 billion in 2007 while the world environmental services market had revenues of $345 billion in 2007. With regard to environmental market of environmental services, environmental equipment and environmental resources, the US market was the largest all over the world in 2006 according to EBI's ranking system while the second largest market was Japan with revenues of $104.2 billion in 2006.

- ✓ US regulations on foreign environmental service providers

  The United States' market for environmental services is generally open to foreign investment and participation. In addition, the US market is driven by a strong and comprehensive environmental regulatory and enforcement regime. However, the US market of environmental services is constrained by horizontal level regulations. As a result of horizontal level regulations and privatization progress of environmental industry in the US, there are at least five types of environmental service supply mode in the US. Some environmental service should be only provided by government and regarded as a mandate for governments. Some environmental service supply is local-oriented, and only can local companies provide those services while some other are state-oriented or domestic company-oriented. Then other environmental services can be supplied by foreign supplier. Therefore, foreign companies are actually limited to supply all kinds of environmental services to the US.

Besides, the US visa policy, work permit and professional certification requirements constrain both foreign and domestic environmental service suppliers as shown in the annex. Owning to complex procedures and lots of paperwork, domestic suppliers find it difficult to get the US visas or work permits for their overseas employees or to hire foreign personnel to work in the US. Visa requirements, professional certification/ license and work permit are three major management tools for regulate foreign environmental service providers.

- ✓ Environmental services supplying to the Asia-Pacific area by the US

  According to the questionnaire responses from the US, the US businesses are active in supplying conventional environmental services under CPC 94. According to a 2004 study by the USITC, the US exports of remediation services totaled $460 million while imports totaled $400 million in 2002. Based on EBI data, the US accounted for 60% of Mexican imports of water-pollution equipment. Little is known regarding trade in nature and landscape protection services. The United States has no classification "global-environmental services", but believes that the US busi-

nesses are supplying these services via consulting services, and/or via services provided under CPC 9406.

As noted above, trade data is very difficult to come by for this sub-sector. The United States has no classification "indoor-environmental services" but believes that the US businesses are supplying these services via services provided under CPC 9404, as well as consulting and/or engineering services. According to a 2005 study on air pollution control services by the USITC, the US firms are the dominant suppliers of air pollution abatement services in the world market.

✓ Demand of the US on environmental services

According to the questionnaire answered by USTR, the United States believes that all of the above environmental services are needed in an effort to protect the environment. Besides the slow growing conventional sectors, such as sewage treatment, air pollution control, in the US, the most fast-growing sectors are the global-environmental and indoor-environmental sectors, based on our survey in US.

There are more than 100 Multilateral Environmental Agreements (MEAs) in the world and more are coming in the future, which are driving forces of global-environmental services. the US, as the biggest economy in the word and key environmental stakeholder, has signed some of the MEAs. To implement the MEAs at an economy level, it will create demands of environmental services, such as UNFCCC, Basal Convention and Hazard waste trans-boundary, and other MEAs

Indoor-environmental service demand of the US will be also very large. People in modern societies spend more than 90% of their time in indoor environments (Leech et al. 2002) . In the United States, residence times in the home range from 15.5 to 15.7 hr/day (Brasche and Bischoff 2005) . Hence, indoor environmental quality in households has a significant impact on public health and well-being. Indoor air quality has been an important theme for environmental health academia as well as a concern for policy-makers since last century.

According to the US Environmental Protection Agency, the air inside a home can be 2-5 times more polluted than air outside. USEPA developed some project-based indoor air quality programs, such as IAQ (Indoor Air Quality) Tools for Schools (TfS) Program, Smoke-free Homes and Cars Program and etc., to improve indoor air quality rather than establish regulations. Lack of policy motives, pollutant source data and other contributing factors and complex interactions, USEPA hasn't authorized any indoor air quality standards so far. Further, many housing code regulations are established locally and not federally (Felicia Wu et al. 2007) . USEPA recommended three basic strategies to improve indoor air quality that are source control, ventilation improvements and air cleaners.

✓ US Perceptions of Trade Liberalization in Environmental Services in APEC Economies are summarized in the following aspects:

- Barriers from modes of supply contain to trade liberalization among APEC
- Barriers for the US to trade erect by APEC economies
- More liberal economies regarded by the US in the APEC environmental trade
- Regulations limiting the US suppliers

of Cross-border environmental services among APEC
- Regulations limiting the US consumption of environmental services in other APEC economies
- Regulations limiting the US suppliers of environmental services with respect to commercial presence and legal form requirements among APEC
- Regulations most limit suppliers from your economy from providing environmental services to other economies with respect to residency requirements and movement of natural persons among APEC
- Measures have been taken, or are being planned, by the US government to overcome barriers to trade liberalization in environmental services in other economies

5. Field survey information

5.1 Survey on Project Resources Inc.

5.1.1 Background

PRI was formed in 1989 in San Diego, California by Shari Walden (an Asian-Pacific Islander) as a provider of property assessment services for commercial entities. The revenue averaged about $1 million annually through the year 1998. In 1999, PRI expanded both its services and client base to include environmental remediation, design-build construction, and facilities management for the US Federal Government. Since 1999, the revenue has increased to about $50 million in 2007. The work has been performed primarily in the contiguous the US, with a few projects in Puerto Rico. The primary client today is the US Federal Government (98 percent of the revenue).

In 2007, PRI launched an initiative to expand its services internationally, including an emphasis to work in the Asia-Pacific region. The recent activities to support the initiative include:

- Obtaining global-environmental and construction contracts: PRI was awarded the $6 billion Heavy Engineering Repair and Construction (HERC) contract with the US Air Force in 2006. This contract requires PRI to perform environmental and construction worldwide for the US government, including bases in the Asia-Pacific region.
- Securing a subcontract to provide environmental services in Guam. Earlier this year, PRI was awarded a subcontract to provide environmental services to a large, civil engineering firm in Guam. They are preparing to mobilize on the first task order.
- Securing a joint venture with a Native Hawaiian Organization (NHO). Earlier this year, PRI secured a mentor-protégé agreement with an NHO under the US Small Business Administration's Mentor-Protégé Agreement (MPA) program. They are awaiting award of the first contract, which will include the US, Hawaii, and Alaska.

5.1.2 Interview summary

Possible barriers lie on different regulations, standards, culture and languages among different regions, and the especial concern about hiring local labor resources (payment and contracts).

Natural personnel movement:
According to the Davis-Bacon Act, payment for foreign workers and local workers are almost the same, leading to no strongly willingness for the company to hire foreign workers. The lowest payment in San Diego is $18/h. The payment is different by cities, but lowest payment happens in Louisianan State as known. Legal workers from foreign countries can be employed, but illegal workers can not. Even for legal workers, lots of paper work is required by the US regulations.

The payment from the company to workers in Guam and Afghanistan should accord to the US regulations.

The company is eager to enter the Chinese markets, but they don't know how. That's the issue that the company concerns most.

5.1.3 Contact information

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5.2 Survey on Hargis and Associates, Inc.

5.2.1 Background

Hargis + Associates, Inc. provides groundwater resource protection and restoration services to companies, municipalities, and governmental agencies in the United States of AmericA. Hargis + Associates on occasion provides expert witness testimony for international companies in foreign markets; however, given the limited nature of these engagements Hargis + Associates has not established formal or informal business relations in respective markets.

Hargis + Associates, Inc. is a privately owned consulting firm specializing in hydrogeologic and engineering services for private and public sector clients. Headquartered in San Diego, California, the firm has branch offices in Mesa and Tucson, ArizonA. H+A employs a total staff of approximately 60 hydrogeologists, geologists, engineers, industrial hygienist, and project support personnel.

H+A was established by David R. Hargis, PhD, RG, in 1979. With an initial client base of mining and energy related companies, H+A soon became a recognized leader in mine dewatering, water supply, and water quality assessments. Recognizing a changing marketplace involving environmental regulations, H+A expanded its expertise involving soil and groundwater quality assessments, especially those associated with the Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) involving Superfund sites.

Engineering services were added in 1986 to complement H+A's hydrogeologic expertise. These services include feasibility studies; technology evaluation and design; treatability testing; permitting; construction management; and design optimization, operation, and maintenance of groundwater and wastewater treatment systems With an integrated approach from assessment to remedial action strategies, H+A offers innovative and

cost effective solutions for site restoration; remediation of groundwater and soil; development of water resources; and engineering services for mining operations.

Since its founding, H+A has developed special expertise involving hydrogeologic assessments, water resource development, environmental permitting, groundwater modeling, contaminant characterization, and remediation of groundwater and soil that has been impacted by chlorinated solvents, pesticides, hydrocarbons, dense nonaqueous phase liquids, and metals. Dr Hargis and other H+A principals are regularly called upon for expert witness testimony and technical consultation by clients, attorneys, and potentially responsible party groups (PRPs) concerning water quality assessments, groundwater resource management, contaminant source evaluation, PRP identification, cost allocation, and cost recovery issues.

Less than 1% of Hargis + Associates, Inc business involves international business and given the limited number of international projects and nature of engagements, Hargis + Associates, Inc does not have relevant experience with APEC economics.

5.2.2 Interview summary

Domestic barriers mainly come from local and federal regulations.

- **Local regulations — It's normal that local firms can bid the projects, especially local projects, more easily than firms from the other states.**
- **Federal regulations — For federal projects, there are some special terms for firms For example, federal regulations require the bidding firms with the special capability.**

The reason why H+A does not explore international markets is as follows:

- **H+A gains good revenue from domestic business, but has limited knowledge about international markets, such as risk, potential turn-over and so on. So they have not pursued international markets.**

5.2.3 Contact information

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Fax: 619-521-8580 Fax
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5.3 Survey on Environmental Business International, InC.

5.3.1 Background

Beginning with the publication in 1988 of the world renowned Environmental Business Journal, Environmental Business International offers strategic business information in the form of newsletters and comprehensive research reports. EBI principals and analysts have nearly 200 years combined experience in the environmental industry in strategy development, planning, management, finance, marketing and technology assessment. EBI has also completed major studies on environmental markets and export opportunities for environmental technology and services on behalf of government agencies at the federal and state levels. Quickly recognized as the leading provider of strategic information for the environmental industry, EBI's segmentation and quantification was adopted by

the US Department of Commerce's Statistical Abstract, OECD, and many other government and private sources. EBJ data and analysis have been published in numerous business plans, in addition to The Wall Street Journal, The New York Times, The Economist, Fortune and other leading trade and business periodicals.

In 1996 EBI applied its business research model to the highly successful Nutrition Business Journal (nutritionbusiness.com), which defined the emerging natural products industry from a disparate group of sectors, including health food retailers, multilevel marketers, manufacturers of dietary supplements, natural & organic foods, functional foods and ingredient suppliers.

Climate Change Business Journal® newsletter builds on the successful research model applied to these two internationally recognized journals to serve what we believe is the most compelling industry to emerge in the 21st century — the Climate Change Industry.

5.3.2 Interview summary

The barriers mainly are policy inconsistence, public procurement, joint venture requirements, visa requirement, intellect property rights protection issues and others.

1. Policy inconsistence
It's difficult for companies to adapt the changes of policy, including trade policy, environmental policy and so on.

2. Public procurement
Some environmental services are privatized in the US but not in other countries which include those environmental services that are deemed as responsibility of government as well as part of public procurement. The companies who are expert at those services will not take risk to conduct business in those countries.

In some countries, local constraints, in form of policy and regulations such as public procurement, set up for domestic manufacture purchase, to some extent indirectly affect environmental service trade among regions. Regarding policy and regulations such as custom procedures, some requirements also exclude foreign companies from bidding state or local projects.

3. Regulations and policy — banking regulations, etc.
In Central American countries, foreign companies who would like to take participation in bidding projects need accounts in a local bank, however, it's not easy for a company to meet all requirements so as to open a local bank account, and it also adds operational cost for the foreign companies to bid the project. Even worse, there are currency rate regulations in Costa Rica for foreign companies. Besides banking regulations, there are requirements for tender documents. Nonetheless, all those barriers seem to be market-access ones rather than trade ones.

4. Professional certification requirements
Occupational Safety and Health Administration (OSHA) maintains a list of approved testing laboratories, known as Nationally Recognized Testing Laboratories. Underwriters Laboratories, a the US non-profit privately owned and operated product safety testing and certification organization, is one of several companies approved for such testing by the US federal agency OSHA. Therefore, many products and materials, used by foreign companies who provide environmental service in the US, should be tested and approved by one of those organizations before put into use.

Even within NAFTA (North American Free Trade Agreement), there are some professional certification requirements as trade barriers in the region. For instance, if Canadian geothermal service company provides environmental service to the US households, such as drilling on the ground for installation of geothermal utility facility. Canadian specific labor, such as technical personnel for drilling, should be required to have professional certifications in the US. Additionally, technical personnel can provide service in the US but labor should not work in the US without permits and paper work procedures. Also, Drilling Associates in the US try to exclude foreign specific labor from work in the US.

5. Joint venture/ Partnership/ownership
Many companies deem it's a barrier for them to do international business. USTR also deems it's an important barrier in countries, like China. the US companies conduct project-based business overseas so as to save joint venture costs. When the project is accomplished, the team will go back the US.

6. Visa issues
Visa issues are not regarded as problems for the US companies as well as in developed countries.

7. IPR (Intellect property rights) protections
It's the reason why the US companies don' t go to China for business. Lots of work to do with IPR issue in China, Chinese Taipei and Korea.

8. Mode 1 cross-board supply
Credit card payment problem is another barrier for cross-board service supply. Some overseas subscribers can't use their domestic credit cards for cross-board payment.

5.3.3 Contact information

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Contact: Mr Jim Hight, Project manager
Telephone: 707-822-2628
Email: jhight@climatechangebusiness.com

5.4 Survey on Tetra Tech

5.4.1 Background

Tetra Tech is a leading provider of consulting, engineering, and technical services worldwide. They are a diverse company, including individuals with expertise in science, research, engineering, construction, and information technology. Their strength is in collectively providing integrated services — delivering the best solutions to meet the clients' needs. So far, Tetra Tech has as many as 8,500 employees and 275 offices worldwide. The revenue has reached $1.55 billion in the financial year 2007.

Tetra Tech provides responsible resource management and sustainable infrastructure services that encompass the full life cycle of solutions, in various fields, such as water resources, watershed management, environmental management, groundwater services, mining and geotechnical, modeling and so on.

5.4.2 Interview summary

Barriers and suggestions:

1. Protection of intellectual property

rights is the first issue that Tetra Tech concerned about trade barriers. They deem it should be more respected by APEC economies.

2. The second concern of Tetra Tech lies on joint venture requirement. They found it not easy for them to adapt equity limitation on ownership by foreign partners in joint ventures.
3. The third issue is about business environments. Overseas environmental services supply often can't be paid because of business bribe, unreasonable dissatisfaction of services supply and so on. That's also the reason that they don't conduct business in some APEC countries.

5.4.3 Contact information

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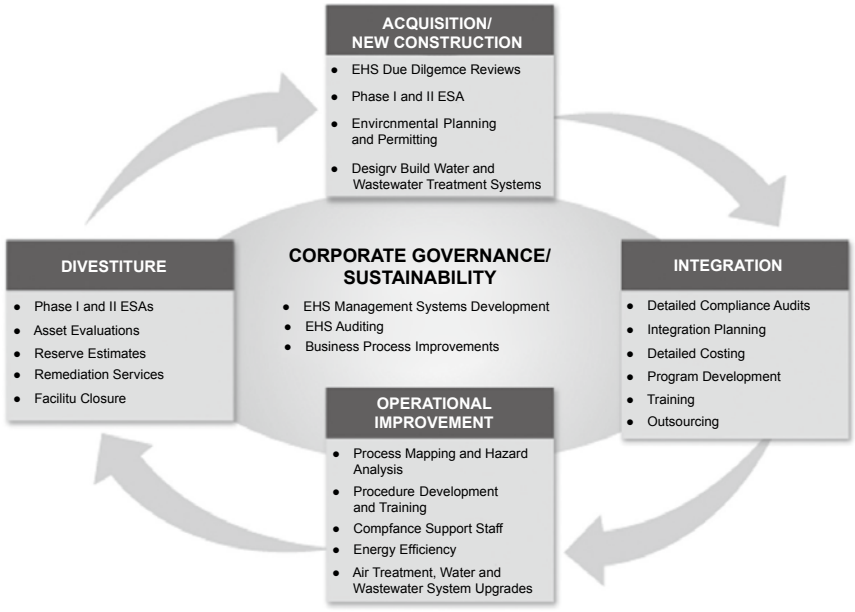
5.5 Survey on Montgomery Watson Harza

5.5.1 Background

MWH helps multi-national industrial corporations with EHS services during each stage of the business lifecycle.

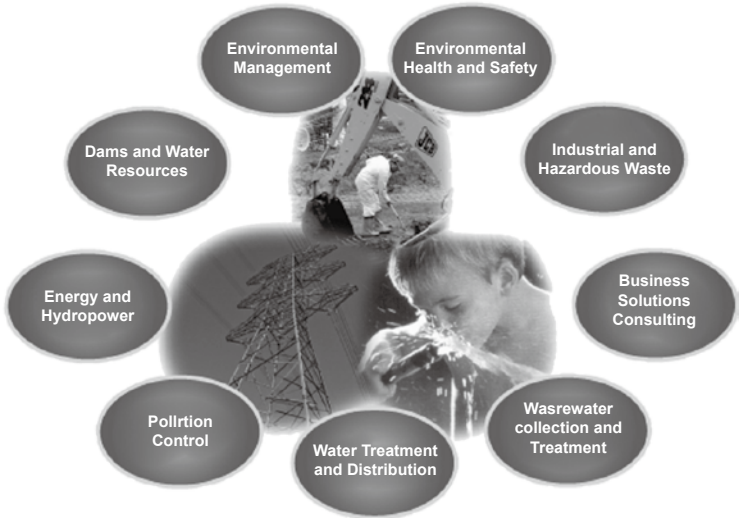


Current, diverse service offerings of our Environmental, Health and Safety professionals include:

- Sustainable development and environmental management systems
- Storm water management consulting
- Water resources planning and groundwater management
- Water treatment design and construction
- Environmental liability assessment in support of FASB and SEC filings
- Environmental due diligence in support of business transactions
- Environmental compliance auditing and consulting
- Solid waste management unit and surface impoundment engineering

- Investigation and remediation of contaminated land
- Industrial wastewater treatment, including recycling/reuse and waste minimization
- Health and safety compliance auditing and consulting
- Environmental permitting and review in support of various types of development and capital improvement programs
- Environmental and safety construction management support services
- Energy efficiency and related services
- Mine reclamation and restoration
- Ecological modeling, evaluation, and consulting
- Ecological and human health risk assessment and management

MWH is recognized as one of the world' s leading environmental engineering firms Over the decades, they have expanded core competencies from water and wastewater into a wide range of environmental and business services — from mining engineering, power and industrial treatment to solid waste management, air quality control and soil reclamation.



Headquartered in Broomfield, Colorado, MWH is an employee-owned firm with approximately 7,000 employees worldwide. They provide water, wastewater, environmental, energy, natural resource, program management, consulting and construction services to industrial, municipal and government clients in the Americas, Europe, Middle East, India, Asia and the Pacific Rim. These broad capabilities allow the company to provide comprehensive one-stop service on engineer-procure-operate and design-build-construct projects around the world.

MWH company revenues exceeded the one billion dollar mark in 2007 and have already exceeded that number for 2008. MWH has completed billions of dollars of environmental and civil projects for private and public companies, as well as government agencies throughout the world. Through this experience, they have developed the expertise and project management systems to ensure that quality, safety, budget, and schedule goals are met on our projects. They offer the clients a global network of local resources, responsiveness, advocacy, innovative techni-

cal solutions, a broad range of services and products, and flexible project delivery systems and approaches.

MWH is the product of three key lineages of engineering firms with long and successful histories. James M. Montgomery Consulting Engineers (JMM) was formed in 1945 in southern California and has long been noted for excellence and specialization in water and wastewater engineering. In the early 1990s, JMM merged with an English firm, Watson Hawksley, Ltd of High Wycombe, UK, which had originated in London in the 1850s. This created a company of global scope known as Montgomery Watson. In 2001, Montgomery Watson merged with Harza Engineering Company to form Montgomery Watson Harza, and the firm name was shortened to MWH.

MWH provides professional technical and consulting services and establishes offices in a number of APEC countries and work on a project basis in a number of other countries, as shown below.

1. Australia – MWH Offices
2. Brunei Darussalam – MWH Office
3. Canada – MWH Offices
4. Chile – MWH Offices
5. China Mainland – MWH Office
6. Hong Kong, China – Projects
7. Indonesia – Projects
8. Japan – Projects
9. Republic of Korea – Projects
10. Malaysia – Projects
11. Mexico – Projects
12. New Zealand – MWH Offices
13. Papua New Guinea
14. Peru – MWH Offices
15. The Philippines – Projects
16. Russia – Projects
17. Singapore – MWH Offices
18. Chinese Taipei – MWH Offices
19. Thailand – Projects
20. The United States – MWH Offices
21. Viet Nam – Projects, office planned

MWH supplies water and wastewater system compliance and upgrades as well as air quality to the Asia-Pacific area. MWH provides environmental services through multinational and bilateral aid agencies, such as the World Bank, the European Union, USAID, the Asia Development Bank and others.

5.5.2 Interview summary

The most major barrier within the four modes of supply to trade liberalization in environmental services among APEC for the company is commercial presence, with the second major movement of personnel, the third consumption abroad, and the last cross-border supply. On movement of personnel, the barrier lies on the US visa available for the employees who work in foreign countries. Since H1B visa is random with limited quotas, sometimes, the overseas staff who need the US visas can't get their visas. In the long term, since supervisors from the US also have difficulties in obtaining permanent right of abode in trading country, it is also a concern of the US companies.

Based on project experiences in APEC economies, the company highlights the barriers encountered in Russia, China and Viet Nam while deems the United States, Australia and New Zealand as the top three free market economies in the APEC economies. Challenges in Russia are tied to country risk issues. Challenges in Peoples Republic China involve the implications of needing to work with the Design Institutes and the challenges with project delivery to the US customer ex-

pectations. Challenges in Viet Nam involve the requirements to have a local office to do business (limiting ability to do project based work).

- ✧ With respect to cross-border supply among APEC, requirements to use specified networks of providers limit the company to supply environmental services the most.
- ✧ With respect to consumption abroad among APEC, visa requirements most limit suppliers from the company providing environmental services to other economies in the APEC region.
- ✧ With respect to commercial presence among APEC, set-asides for state owned enterprises or for enterprises owned by permanent residents most limit suppliers from the company providing environmental services to other economies in the APEC region.
- ✧ With respect to legal form requirements among APEC, direct establishment of branches of foreign companies not permitted, branches permitted subject to quotas and/or geographic distribution of branches, most limit from operating in other economies.
- ✧ With respect to residency requirements among APEC, requirements that all directors are residents of host economy most limit the company from providing environmental services to other economies.

With reference to the movement of natural persons among APEC, requirements that a significant proportion of the staff of a foreign established company be residents of the host economy; numerical limitations on foreign residents in senior positions most effect the provision of environmental services and other economies.

Suggestions for trade liberalization of environmental services in the APEC economies:

Minimize issues identified as challenges, above. Enhance free markets, facilitate ease of licensing, deregulate the labor markets, etc.

In summary, the issues MWH concerns most about barriers for their environmental services supply in the APEC economies lie on ease of licensing and free movement of people.

5.5.3 Contact information

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5.6 acknowledgements

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We acknowledge Mr Grant Ferrier and Mr Jim Hight from Environmental Business International, Inc., who provided their precious data about environmental industry with us for our research. We acknowledge Mr Frank Loscavio, Mr Jeff Clark and Ms Shari Walden fromo Project Resources, Inc., Mr Christopher Ross from Hargis Associates, Inc., Mr Simon Bluestone and Ms Liping Liu from Montgomery Watson Harza Americas, Inc., and Dr Eddy Huang from Tetra Tech, Inc. They warmly host meetings with us and shared their years of experience in environmental services in domestic the US and overseas.

We acknowledge Mr Andrew Yager, Mr David O'Connor and Mr Mohan Peck from Department of Economic and Social Affairs of United Nations, Ms Elizabeth Economy from Council on Foreign Relations, Prof. Richard Pete Suttmeier from University of Oregon, Mr Jerry Warford from World Bank, Ms Jennifer Turner and Ms Linden Ellis from Woodrow Wilson International Center for Scholars, Mr Fang GAO and Ms Xia XIE from Delaware Environmental Authority.

Annex V: Questionnaire on APEC trade liberalization in environmental services

Dear Sir or Madam,

One of the goals of APEC is to realize the liberalization of trade within the Asian Pacific region. In order to improve the various approaches to the liberalization of trade in environmental services within APEC economies, it is important to better understand existing practices, including facilitating policies, foreign trade management policies and barriers to trade liberalization.

For this purpose, China proposed a Survey on APEC Trade Liberalization in Environmental Services, which was then endorsed by APEC member economies. The following questionnaire is an important part of the proposal. It will be appreciated if you could take a few minutes to fill it out and return it to Ms Liping Li or Ms Huiting Wu at the following address by 12 March 2009.

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Thank you in advance for your time and cooperation in this endeavor.

LI Yihong
Project Overseer
Department of International Trade and Economic Affairs,
Ministry of Commerce (MOFCOM)
People's Republic of China

Questionnaire on APEC trade liberalization of environmental services

I. Basic information on environmental services in your economy

A. How are environmental services defined and classified in your economy for the purposes of domestic regulation or industry statistics?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

B. Please describe the development of environmental services in your economy, including revenue, trade (exports and imports), structure, investment, employment, etc., as follows:_____
_____
_____
_____
_____

C. Please describe the policies affecting environmental services in your economy, including foreign investment policies, government procurement, environmental, and macro economic policies, etc., as follows:_____
_____
_____
_____
_____

D. Please indicate the kinds of environmental services you are supplying to the Asia-Pacific area:

1. Conventional environmental services (sewage treatment, local air quality improvement, solid waste management, ecosystem conservation, etc.)
2. Global environmental services (services for improving global environmental quality and promoting the implementation of multilateral environmental agreements (MEAs), such as UNFCCC, CBD etc).
3. Indoor environmental services (services for improving indoor environmental quality, such as ventilation, tap water filtration, appliance radiation control etc)
4. Other (please specify)_____
_____

E. Please indicate the kinds of environmental services your economy most needs from the APEC region:

1. Conventional environmental services

2. Global environmental services

3. Indoor environmental services.

4. Other (please specify)_____

_____

II. Environmental services regulatory and administrative policies and practices in your economy.

A. Which kinds of policies and practices are used for foreign suppliers of environmental services with reference to **cross-border supply**? (Choose as many as appropriate)

1. Licenses or permits

2. Dedicated network of providers

3. Policies on e-business, cross-border transfers of capital, uses of credit cards, etc.

4. Other (please specify)_____

_____

B. Which kinds of policies and practices are used for foreign suppliers of environmental services with reference to **consumption abroad**? (Choose as many as appropriate)

1. Visa requirements

2. Numerical quota

3. Special taxation

4. Other (please specify)_____

_____

C. Which kinds of policies and practices are used for foreign suppliers of environmental services with reference to a commercial presence in your economy?

1. Policy privileges

2. Environmental, economic, or employment needs tests

3. Joint ventures

4. Foreign investment limitation [capped at %]

5. Numerical quotas for operating licenses

6. Residents requirements

7. Sectoral restrictions

8. Other (please specify)_____

_____

D. Which kinds of policies and practices are used for foreign suppliers of environmental services with reference to the **movement of human resources**?

1. Visa restrictions

2. Local labor market tests

3. Requirements for further training

4. Local professional qualification examinations

5. Labor permits

6. Labor quotas

7. Other (please specify)_____

_____

III. Perceptions of trade liberalization in environmental services in APEC economies.

A. With reference to your economy, which modes of supply contain the most major barriers to trade liberalization in environmental

services among APEC? (Choose and rank from major to minor barriers)

- Cross-border supply
- Consumption abroad
- Commercial presence
- Movement of personnel

B. With reference to your economy, which economies erect more barriers to trade than others? (Please rank the top three economies, or more, if applicable) And please indicate the reason(s) why you rank other economies as you do.

_____
_____
_____
_____
_____
_____

C. With reference to your economy, which economies are more liberal than others? (Please rank the top three economies, or more, if applicable) And please indicate the reason(s) why you rank other economies as you do.

_____
_____
_____
_____
_____
_____

D. With respect to **cross-border supply** among APEC, which kinds of regulations limit your suppliers of environmental services the most?

1. Requirements to obtain authorizations, licenses or permits in order to market and supply services
2. Requirements to use specified networks of providers
3. Regulations affecting the cross-border transfer of capital, uses of credit cards, or e-business
4. Requirements for a full commercial presence
5. Other (please specify)_____

_____

Your general remark score is:
(The score is ranged from 0-10. The score 0 = no restrictions at all; 10 = closed market)

E. With respect to **consumption abroad** among APEC, which kinds of regulations most limit suppliers from your economy providing environmental services to other economies in the APEC region?

1. Visa requirements
2. Numerical quotas
3. Special taxation
4. Other (please specify)_____

_____

Your general remark score is:
(The score is ranged from 0-10. The score 0 = no restrictions at all; 10 = closed market)

F. With respect to **commercial presence** among APEC, which kinds of regulations most limit suppliers from your economy providing environmental services to other economies in the APEC region?

1. Approvals based on policy guidelines

and overall interest considerations, but without needs tests or local participation requirements

2. Approvals of foreign investment based on economic needs tests or net benefits
3. Approvals required for foreign equity participation, including in joint ventures with local partners [approval required for foreign equity above ____%]
4. Equity limitation on ownership by foreign partners in joint ventures [capped at ____%]
5. Restrictions on acquisition of existing businesses or establishment of new businesses
6. Where the establishment of new businesses are not permitted, requirements for numerical quotas for operating licenses
7. Existence of local monopolies excluding foreign providers
8. Set-asides for state owned enterprises or for enterprises owned by permanent residents
9. Other (please specify)_____

_____

Your general remark score is:
(The score is ranged from 0-10. The score 0 = no restrictions at all; 10 = closed market)

G. With respect to legal form requirements among APEC, which kinds of regulations most limit suppliers from your economy from operating in other economies?

1. Only one legal form permitted. Incorporation required with a ceiling on foreign equity participation and mandatory local partnership. Only soul proprietorships or partnerships permitted
2. Direct establishment of branches of foreign companies not permitted; branches permitted subject to quotas and/or geographic distribution of branches
3. Only joint ventures or representative offices permitted
4. Only joint ventures as limited liability companies permitted
5. Only representative offices permitted for promotional reasons or for undertaking research for the head office
6. Other (please specify)_____

_____

Your general remark score is:
(The score is ranged from 0-10. The score 0 = no restrictions at all; 10 = closed market)

H. With respect to residency requirements among APEC, which kinds of regulations most limit suppliers from your economy from providing environmental services to other economies?

1. Persons designated as local agents of foreign companies must be permanent residents
2. Requirements that foreign established companies have a least one local resident director
3. Requirements for geographical distribution of resident providers.
4. Requirements that the CEO be a citi-

zen of the host country

5. Requirements that some or all of the directors are residents of the host economy [____ %, or _____ number, of directors]
6. Requirements that all directors are residents of host economy
7. Prior residency required to obtain operating license: residency not permitted without license
8. Other (please specify)_____

_____

Your general remark score is:
(The score is ranged from 0-10. The score 0 = no restrictions at all; 10 = closed market)

I. With reference to the **movement of natural persons** among APEC, in your view, which regulations in actual practice most effect the provision of environmental services and other economies?

1. Only certain types of personnel are permitted, with time limits and/or conditions not specified
2. Requirements for further training or local examinations in the host economy for professional recognition
3. Permission for intra-corporate transfers subject to labor market testing/ economic needs tests; non-availability of local staff decided by host authorities without input from a foreign company concerned
4. Requirements that a significant proportion of the staff of a foreign established company be residents of the host economy; numerical limitations on foreign residents in senior positions
5. Provision of services by self-employed persons not permitted
6. Other (please specify)_____

_____

Your general remark score is:
(The score is ranged from 0-10. The score 0 = no restrictions at all; 10 = closed market)

J. What kinds of measures have been taken, or are being planned, by your government to overcome barriers to trade liberalization in environmental services in other economies? (Choose more than one as appropriate)

1. Use of APEC mechanisms
2. Bilateral negotiations
3. WTO negotiations
4. Other (please specify)

IV. Suggestions for APEC trade liberalization of environmental services.

A. What measures should be taken by APEC to promote liberalization of trade in environmental services?

B. With reference to **cross-border supply**, what measures should be taken to reduce or eliminate environmental services trade barriers in APEC economies?

C. With reference to **consumption abroad**, what measures should be taken to reduce or eliminate environmental services trade barriers in APEC economies?

D. With reference to **commercial presence**, what measures should be taken to reduce or eliminate environmental services trade barriers in APEC economies?

E. With reference to the **movement of natural person**, what measures should be taken to reduce or eliminate environmental services trade barriers in APEC economies?

Please provide the following information:

1. Your economy:
2. Your organization:
3. Your name:
   title:
   e-mail:
   telephone:
   fax:
   Skype:
   Web:

4. Key contact person (if different with you):
   title:
   e-mail:
   telephone:
   fax:
   Skype:
   Web:

Many thanks for your kind cooperation!

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Acknowledgements

This report is the final result and output of the project "**Survey on APEC Trade Liberalization in Environmental Services** (CTI 31/2008T)" which is supported by Committee on Trade and Investment/Group on Services, Asia-Pacific Economic Cooperation (APEC). This project is designed to conduct a survey on trade liberalization in environmental services across APEC economies and GATS modes of supply, and make analysis of the findings for the purpose of sharing information of trade liberalization trends in environmental services for APEC economies. In the long run, it could also be regarded as a positive response to meeting the challenges of the climate change.

In order to reach the objectives of this project, large amounts of literature have been reviewed; surveys by questionnaires have been conducted among APEC economies and enterprises in China. Many officials and experts have been interviewed, and three case studies have been conducted in China, Korea and the United States.

This project was implemented by Policy Research Center for Environment and Economy (PRCEE) of Ministry of Environmental Protection (MEP) and overseen by Department of International Trade and Economic Affairs, Ministry of Commerce (MOFCOM), China. The project manager was Mr PARK Yung-suh from APEC Secretariat. And the Program Assistants were Belinda CHOK and TRAN Le Kha.

The three contracted consultants of this project with APEC Secretariat were Dr HU Tao, Ms LI Liping and Ms SHEN Xiaoyue of PRCEE. Dr Hu Tao was the director and Ms Li Liping was the technical director of the project team. Other project team members were Dr ZENG Xiangang and Dr WANG Zhuoni of Renmin University of China and Ms WU Huiting, who were by APEC Secretariat as secretariat of the project, also from Renmin University. Ms FANG Li, Division director of MEP, Ms Cui Dandan, deputy division director and Ms HUANG Miao, Ms DONG Yao also from MEP, and Dr Xia Guang, Dr Ren Yong, from PRCEE, gave some important suggestions and much needed support to the consultants.

Based on the study, Dr HU Tao and Ms LI Liping developed the outline of the study report through discussion with all team members. The study report is structured into nine chapters as listed in Contents. Then draft version of the study report is written by project team members with their responsibilities as follows: Chapter One was written by Ms LI Liping; Chapter Two by Dr HU Tao and Ms LI Liping; Chapter Three by Ms LI Liping; Chapter Four by Ms SHEN Xiaoyue, Chapter Five was written by Dr HU Tao, Dr Wang Zhuoni and Ms LI Liping; Chapter Six, Seven and Eight by Ms LI Liping; and finally Chapter Nine by Dr HU Tao. Based on the study report, Ms LI Liping and Dr HU Tao compiled the draft version and modified it into the final

version according to comments from overseers of the project and APEC economies.

The US was the co-sponsor of the project. The United States Trade Representative (USTR) gave the consultants' invitation letters for field surveys in the US and set up meetings for them.

To date, 13 APEC economies: Australia, Brunei Darussalam, Canada, Chinese Taipei, Korea, New Zealand, China, Japan, Peru, The Philippines, Singapore, Thailand and The US, completed the questionnaire, which was essential part of the project.

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