

Chapter 3 Case Study on Environmental Impact Assessment of an EPA/FTA (Japan-Republic of Korea example)

3.1 Background and process of conducting impact assessments

3.1.1 Background of an EPA/FTA and trade liberalization between Japan and ROK

(1) Background of an EPA/FTA between Japan and ROK

30. Trade between Japan and ROK grew dramatically after the normalization of relations in 1965. Over time, however, the friction between the two countries intensified, and in particular, ROK's chronic trade deficit with Japan became an issue. While Japan was urged to improve the situation, ROK took measures, such as implementing an import diversification program and imposing import restrictions on certain Japanese products.

31. Given these circumstances, the discussion on the concept of a Japan-Republic of Korea FTA was brought forth in the Action Plan for a New Japan-ROK Partnership Toward the 21st Century (October 1998). Discussions were also held at the first Japan-ROK Ministerial Meeting in November 1998. In December of the same year, as a result of such those discussions, joint research began with the establishment of the 21st Century Japan-Korea Economic Relations Study Team between the Japan External Trade Organization (JETRO), Institute of Developing Economies (IDE) and the Korea Institute for International Economic Policy (KIEP). The achievements of this Study Team were released as a research report in May 2000.

32. At the Japan-ROK Summit Meeting in September 2000, it was agreed that the Japan-ROK FTA Business Forum would be established, as officially proposed by President Kim Dae Jung, and in March 2001 discussions on this forum also began on the Japan side. Moreover, a joint meeting between Japan and ROK was held at this forum in September 2001. At the Japan-ROK Summit Meeting in March 2002, agreement was made on the establishment of a research group, comprised of representatives of industry, government and academia from both countries (industry-government-academia joint research group on EPA/FTA). As for recent developments, the report of the Japan-Korea EPA/FTA Joint Study Group was released in November 2003 and inter-governmental negotiations were launched.

3.1.2 Procedure of the case study

33. This case study was conducted subject to the guideline in previous chapter. However, given the nature of the case study, no formalities involving the public sector have been completed. Therefore, the Study Group on Environment and Economic Partnership Agreements/Free Trade Agreements, which also took into account the opinions of experts,

was substituted as a matter of convenience. It has been recognized that it is crucial to conduct impact assessments while extensively soliciting opinions from the public. In addition, it is understood that soliciting opinions from the public is important in conducting socially acceptable impact assessments that integrate consensus-building starting from the early stage, identification of issues in various aspects that should be considered, as well as numerous viewpoints.

3.2 Screening

3.2.1 Creating screening sheets and the necessity of assessment

(1) Creating screening sheets

34. Two types of **screening sheets** were created (see below) and the areas with a great need for environmental impact assessments were selected. The screening sheet, “Details of the EPA/FTA Discussed at the Joint Study Group”, includes items that consider whether they need to be incorporated into the text of the agreement (status). Furthermore, the screening sheet, “the Relationship Between Trade Liberalization and Environmental Impacts”, includes items that consider clarifying the differences in the environmental policy situation in Japan and ROK.

Table 3.1 Screening Sheet: Details of the EPA/FTA Discussed at the Japan-Korea Joint Study Group

Aspect to check point	Item to check point	Result
Purpose of trade liberalization	➤ What is the type of trade liberalization?	● Trade liberalization through conclusion of a regional trade agreement between two countries.
	➤ What is the goal of trade liberalization?	● It is anticipated that deepening of economic relations between Japan and ROK will strengthen both the international competitiveness of companies in both countries and improve the international presence of their markets. ● The stable strengthening of relations between Japan and ROK is important for Japan as it will enhance the stability of East Asia as well as from the aspect of strengthening partnerships with China and ASEAN countries.
Method of liberalization	➤ What are the domestic trade measures (tariffs, non-tariff barriers, trade-related subsidies) being considered as trade liberalization methods, and what are the types of agreements (preferential agreements, trade liberalization agreements) being considered?	● A bilateral trade liberalization agreement, which is a non-tariff trade measure, is being considered.
	➤ What are the specific measures to liberalize trade?	A comprehensive economic partnership agreement (EPA) is being considered.

	<ul style="list-style-type: none"> ➤ Will trade liberalization include regulations to reinforce/ eliminate subsidies? 	<ul style="list-style-type: none"> ● At this point in time, regulations to reinforce/ eliminate subsidies have not been discussed.
	<ul style="list-style-type: none"> ➤ Will trade liberalization reduce/ eliminate tariffs? 	<ul style="list-style-type: none"> ● Regulations to reduce/ eliminate trade may be included.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will the application of import regulations accompanying domestic product standards be included in the text of the agreement? 	<ul style="list-style-type: none"> ● If the application of import regulations accompanying domestic product standards is to be included in the text of the agreement, sufficient consideration is necessary to ensure that it does not go against WTO Agreements.
Target product/ sector	<ul style="list-style-type: none"> ➤ Which products and sectors does trade liberalization especially target? 	<ul style="list-style-type: none"> ● A more comprehensive EPA/FTA, as opposed to one that targets certain products or sectors, is envisioned.
Treatment of environment-related aspects	<ul style="list-style-type: none"> ➤ In trade liberalization, will goals such as sustainable development be included in the text of the agreement? 	<ul style="list-style-type: none"> ● There is a possibility that such goals will be stipulated.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will a consideration of environmental principles such as preventive approaches and the “polluter is responsible” principle be included in the text of the agreement? 	<ul style="list-style-type: none"> ● At this point in time, such considerations have not been explicitly discussed.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will special exceptions for environmental protection be included in the text of the agreement? If so, what are criteria for determining whether there will be exceptions? 	<ul style="list-style-type: none"> ● There is a possibility that special exceptions for environmental protection will be incorporated.
Environmental policy measures	<ul style="list-style-type: none"> ➤ In trade liberalization, will environmental regulations or regulations to enforce standards be included in the text of the agreement? 	<ul style="list-style-type: none"> ● At this point in time, such regulations have not been explicitly discussed. ● If environment-specific regulations are included in the text of the agreement or as supplementary agreements, it is possible that these agreements will stipulate that the countries concerned will have the right to decide their environmental policies.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations concerning the notification of environmental measures affecting trade be included in the text of the agreement? What is the scope and timing in requesting notification? 	<ul style="list-style-type: none"> ● At this point in time, such regulations have not been explicitly discussed. ● Regardless of whether they are environmental measures, at least in cases where measures affecting trade are implemented, it is possible that regulations requiring notification will be established.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations to harmonize environmental standards be included in the text of the agreement? 	<ul style="list-style-type: none"> ● Although there have not been explicit discussions at this point in time, it is unlikely that regulations on harmonizing environmental standards will be included.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations on subsidies from the government to the private sector to achieve the environmental goals be included in the text of the agreement? 	<ul style="list-style-type: none"> ● Although there have not been explicit discussions at this point in time, it is unlikely that regulations on the application of environmental subsidies will be included.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations on border tax adjustments such as environmental tax and surges be included in the text of the agreement? Will regulations on adjustments in the taxation of domestic products, manufacturing process, etc. be included in the text of the agreement? 	<ul style="list-style-type: none"> ● Although there have not been explicit discussions at this point in time, it is unlikely that such regulations will be included given the vast number of technical issues involved in border tax adjustments.

	<ul style="list-style-type: none"> ➤ In trade liberalization, will ways to treat voluntary efforts such as government-industry voluntary agreements and eco-labelling be included in the text of the agreement? 	<ul style="list-style-type: none"> ● It was confirmed that eco-labels are an effective method to boost the production and consumption of environment-friendly goods and that the mutual recognition of eco-labels would be promoted in both countries.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations on environmental cooperation be included in the text of the agreement? 	<ul style="list-style-type: none"> ● There is a consensus that both countries should search for ways to launch various activities to strengthen the environmental field.
How the above environmental policy measures are related to other policy measures	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations on intellectual property rights and trade-related aspects of intellectual property rights (TRIPs), which are related to environmental policy, be included in the text of the agreement? 	<ul style="list-style-type: none"> ● At this point in time, there have been no discussions on environmental policy-related measures, but it is possible that they will be incorporated in intellectual property rights.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations concerning environment-related trade in services (environmental services or trade in services impacting the environment) be included in the text of the agreement? 	<ul style="list-style-type: none"> ● At this point in time, there have been no discussions on whether regulations concerning environment-related trade in services will be incorporated.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations on dispute settlement be included in the text of the agreement? Will special regulations that take into account environment-related trade disputes be included in the text of the agreement? 	<ul style="list-style-type: none"> ● At this point in time, there have been no explicit discussions on such regulations. Presumably it is difficult to regulate special environment-specific dispute settlement procedures unless a separate supplementary agreement concerning the environment is concluded.
Treatment of other environmental agreements	<ul style="list-style-type: none"> ➤ In trade liberalization, will regulations concerning trade measures in other environmental agreements be included in the text of the agreement? How will “environmental agreements” be defined? 	<ul style="list-style-type: none"> ● At this point in time, there have been no explicit regulations, but it is possible that trade measures in a number of environmental agreements will be approved as exceptions.
	<ul style="list-style-type: none"> ➤ In trade liberalization, will the treatment of environmental laws and environmental ordinances of government-related agencies be included in the text of the agreement? 	<ul style="list-style-type: none"> ● There are cases in Japan where local governments have environmental laws/ordinances, but there have been no explicit discussions in particular at this point in time.

Table 3.2 Screening Sheet: Relationship Between Trade Liberalization and Environmental Impacts

Aspect to check point	Item to checkpoint	Result
Will the discretion of each member country concerning environmental policy be approved?	<ul style="list-style-type: none"> ➤ Has it been confirmed that each member country has adopted the necessary measures for environmental protection at their own discretion (or there are prospects for such confirmation)? 	<ul style="list-style-type: none"> ● At this point in time, there have been no explicit discussions on such confirmation, but it is possible that the agreement will stipulate that each country has the right to enforce environmental standards or regulations within own country.
Are there any differences in the international obligations on environmental protection?	<ul style="list-style-type: none"> ➤ Are there any differences in the status of accession to Multilateral Environmental Agreements (MEAs)? ➤ Are there any differences in the degree of obligation in countries that have acceded to these MEAs? 	<ul style="list-style-type: none"> ● In the case of Japan and ROK, the status of adoption to major MEAs (Montreal Protocol, Basel Convention, United Nations Framework Convention on Climate Change, Convention on Biological Diversity, Convention on International Trade in Endangered Species of Wild Fauna and Flora) is the same. ● In some cases there are differences in the degree of obligation stipulated by the convention, for example, the United Nations Framework Convention on Climate Change, Convention on Biological Diversity and the Montreal Protocol.
Environmental impacts resulting from trade liberalization		
Environmental pressure resulting from the extraction of natural resources, manufacturing of products, etc.	<ul style="list-style-type: none"> ➤ Is there a significant pressure on the environment in the production process of agricultural, fishery and forest products in each member country (e.g. impact on mangroves caused by shrimp cultivation, bycatch fishing, manufacturing forestry products from forests without sustainable management)? ➤ Is there a significant pressure on the environment due to the production processes in the manufacturing industry in each member country (e.g. wastewater standards are strikingly lax)? 	<ul style="list-style-type: none"> ● It is necessary to confirm the significant environmental pressure in the production process of agricultural, forestry and fishery products in both Japan and ROK. ● It is presumed that because there are no significant differences in environmental standards, the production processes in the manufacturing industry will not place a particularly striking pressure on the environment. As for the extent of the environmental pressure, it is necessary to consider differences in technologies to deal with the environment in addition to environmental standards.
Environmental pressure resulting from the use of products	<ul style="list-style-type: none"> ➤ Is there a possibility that flora and fauna whose habitats are different will be exported and imported as pets or for other uses? ➤ Is there a possibility that introduced species will enter different habitats as a result of the increased traffic of products and tourists? 	<ul style="list-style-type: none"> ● The possibility that introduced species will enter different habitats cannot be denied. However, it is predicted that this will not have that significant an impact.
	<ul style="list-style-type: none"> ➤ Are there any major differences in the standards on pesticide use? 	<ul style="list-style-type: none"> ● It appears that there are different standards on pesticide use, but the details need to be confirmed.

	<ul style="list-style-type: none"> ➤ Are there any major differences in standards on the use of toxic substances? 	<ul style="list-style-type: none"> ● It appears that there are different standards on the use of toxic substances in that Japan has more stringent standards. However, the details need to be confirmed.
	<ul style="list-style-type: none"> ➤ Are there any major differences in product-related standards such as energy efficiency and emission standards? 	<ul style="list-style-type: none"> ● In particular, there are differences between Japan and ROK in automobile emission standards in that Japan has more stringent standards.
Environmental pressure resulting from disposal of products	(Wastewater) <ul style="list-style-type: none"> ➤ Are there major differences in wastewater treatment standards and technology? 	<ul style="list-style-type: none"> ● It appears that Japan is more advanced in both standards and technology.
	(Solid waste, etc.) <ul style="list-style-type: none"> ➤ Are there any major differences in the treatment systems for toxic substances, etc.? ➤ Are there any major differences in the chlorofluorocarbon (CFC) treatment systems? 	<ul style="list-style-type: none"> ● As for toxic substances in particular, both Japan and ROK are signatory countries to the Basel Convention. ROK is one of the countries to which Japan may export toxic substances under the Basel Convention. ● As for CFCs, it appears that Japan's treatment system is superior to that of ROK due to the difference in the status of signing the Montreal Protocol.
	(Recycling) <ul style="list-style-type: none"> ➤ Are there any major differences in the recycling systems? 	<ul style="list-style-type: none"> ● Japan has in place many laws concerning measures to respond to waste and recycling, such as the Basic Law for Establishing a Recycling-based Society (Basic Law for Recycling). Japan is also considering a framework to recycle end-of-life vehicles. ● With the introduction of a deposit-refund system, ROK has a payback system wherein it collects disposal fees in advance from manufacturers, processors, importers, distributors, etc. and reimburses vendors that have fulfilled their responsibilities.
Environmental impacts resulting from investment liberalization	<ul style="list-style-type: none"> ➤ Are there any major differences in environmental regulations on the operation of factories, etc.? ➤ Are there any major differences in the environmental impact assessment systems? ➤ Are there any concerns regarding investor protection regulations and environmental policies? 	<ul style="list-style-type: none"> ● Both Japan and ROK have environmental regulations on air, water quality and waste, but it appears that overall, Japan is more stringent. ● Both Japan and ROK are conducting environmental impact assessments in accordance with laws. ● At this point in time, it is difficult to predict whether there will be investor protection regulations and regulations concerning the drafting of environmental policies.

(2) Necessity of environmental impact assessments in EPAs/FTAs

35. Screening sheet reveals that it is necessary to consider not only economic impacts (impacts of trade liberalization) of concluding an EPA/FTA but also a variety of environmental impacts and that there is room to have such considerations. Moreover, if trade is liberalized through conclusion of a bilateral EPA/FTA between Japan and ROK, then it is presumed that increased economic activity will lead to environmental impacts. Thus it appears that it is necessary to conduct environmental impact assessments for a Japan-ROK EPA/FTA.

3.2.2 *Overview of trade and environment in Japan and ROK*

(1) Overview of trade between Japan and ROK

36. ROK was **Japan's third largest trading partner** following the US and China and the volume of trade was 4.4 trillion yen (in 2002). As for trade between Japan and ROK, **ROK has experienced a constant deficit**. In 1998, the deficit was US\$4.6 billion, which rose to US\$11.4 billion in 2000, and it has been increasing every year. One of the major reasons that has been cited for this deficit is that although ROK is internationally competitive in assembly industries within manufacturing such as automobiles, household appliances and shipbuilding, it remains **dependent on imports from Japan for the procurement of parts and raw materials**, and the products are exported to many more markets other than Japan. Another reason is that there are many cases where **ROK imports large machinery and equipment such as steelmaking plants and semiconductor manufacturing equipment from Japan**.

37. The total volume of Japan's exports to ROK was US\$28.54691 billion (in 2002), which was a growth of 12.4% from the previous year. **Electronics** account for the largest share of these exports, or just under 30% (29.4%) of the total volume. The next largest share was held by **general machinery** (17.6%), then **chemical products** (15.1%). Other exports included **metal and metal products** (13.8%) and **precision equipment** (5.7%). Electronic parts such as integrated circuits (IC) made up nearly half of electronics, which holds the largest share of exports. Furthermore, there were also notable volumes of exports of electrical measuring equipment and video equipment such as TVs and videos.

38. For Japan, ROK was the third largest importer after the US and China. The **total volume of imports from the ROK** was US\$15.4502 billion (in 2002), a 10.7% fell from the previous year. The largest share of these imports, or 45.6%, was held by **machinery and equipment**. The next largest share was held by **mineral fuel** (13.9%). Other imports included **food** (8.7%) and **chemical products** (7.5%). Since a larger share of imports is now held by products such as electric and electronic equipment, machinery and equipment and chemical products, there is greater competition between Japanese and ROK goods and intra-industry specialization (international specialization in production) is advancing in some industries.

(2) Comparing the status of the environment in Japan and ROK

39. In Japan, the Ministry of the Environment was established in 2001 to replace the existing Environment Agency, thereby enhancing and strengthening role of environmental policy such as waste disposal and international environmental cooperation. Furthermore, the Basic Environment Law was enacted in 1993 and the Basic Law for Establishing a Recycling-based Society was enacted in 2000. Japan deems it crucial to combat global warming and air pollution in cities caused by NO_x, suspended particulate matter (SPM), etc., maintain the water environment, conserve nature and manage chemical substances.

40. In ROK, after the Basic Environmental Policy Act was enacted in 1990, a legal framework for environmental policy was completed with the development of environment-related laws. Although there are some similarities between Japan and ROK in the way environmental issues arose and how they were dealt with, the serious issue that ROK faces is how to respond to industrial pollution such as air pollution and water pollution caused by its dependency on the heavy and chemical industry, which is an energy-intensive industry. Serious issues include not only industrial pollution in industrial cities but also urban and lifestyle-related pollution such as traffic congestion and waste disposal.

1) Air pollution

41. As for global warming issue, Japan's total greenhouse gas emissions amounted to 1.332 billion tons/year (converted to carbon dioxide), which was 8.0% higher compared to 1990. Looking at CO₂ emissions in FY2000 by sector, industry accounts for approximately 40% of the total, transport accounts for approximately 21%, and the civil sector accounts for approximately 13%. However, compared to CO₂ emissions in FY1990, the share of industry rose by 0.9%, of transport by 20.6%, and of the civil sector by 20.4%, which shows that there have been substantial increases in the transport and civil sectors. Meanwhile, ROK's greenhouse gas emissions (in 1998) amounted to 404 million tons/year. Given that CO₂ emissions in ROK have been growing rapidly in recent years and it is likely that in the future international goals will be established to reduce greenhouse gas emissions, it is expected that concrete measures will be promoted with the government and industrial circles playing a leading role. Although CO₂ emissions per person (1998) was 8.9 tons/person for Japan and 8.0 tons/person for ROK, the growth rate since 1980 was 14% for Japan and 144% for ROK.

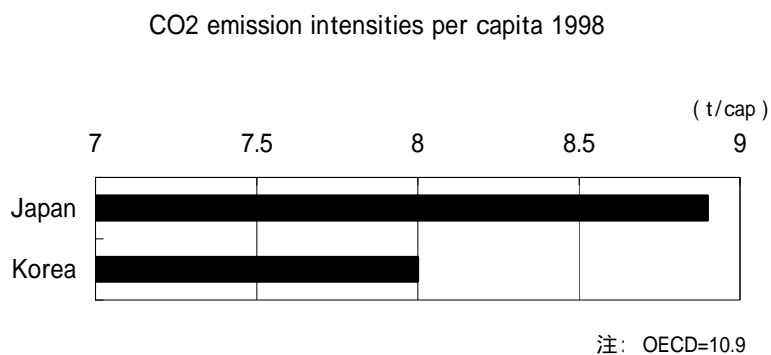


Figure 3-1 CO2 emissions of Japan and ROK

Source: OECD(2001) "OECD Environmental Indicators TOWARDS SUSTAINABLE DEVELOPMENT"

42. As an Annex I Party of the Kyoto Protocol to the UN Framework Convention on Climate Change, Japan has been implementing various measures aimed at reaching the reduction targets stipulated in the Kyoto Protocol. In contrast, since ROK is not an Annex I Party, at

this point in time it does not have greenhouse gas emissions reduction targets, which are international commitments.

43. As for ozone layer protection issue, Japan has enacted the Law Concerning the Protection of the Ozone Layer Through the Control of Specified Substances and Other Measures. Japan has also been gradually reducing production levels and consumption levels according to the regulation schedule for developed countries in the Montreal Protocol. On the other hand, ROK is not treated as a developed country under this Protocol and thus such reductions do not apply. ROK has a higher CFC consumption level compared to Japan.

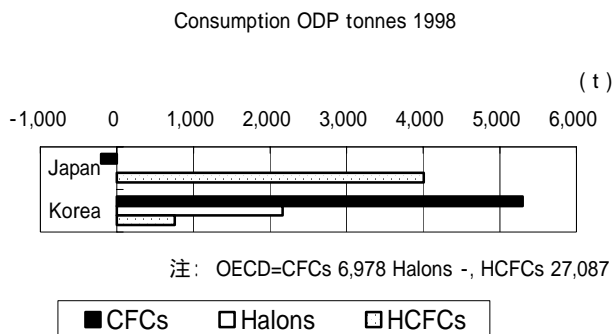


Figure 3-2 CFC consumption of Japan and ROK

Source : OECD(2001) “ OECD Environmental Indicators TOWARD SUSTAINABLE DEVELOPMENT ”

44. As for air pollution issue, if the air pollution concentration of fixed sources for Japan and ROK is compared, it is generally the same for NO_x, but the concentrations of SO_x and particulate matter are clearly lower in Japan than in ROK. This is because Japan is extremely advanced in its measures to combat air pollution of fixed sources, for instance, SO_x.

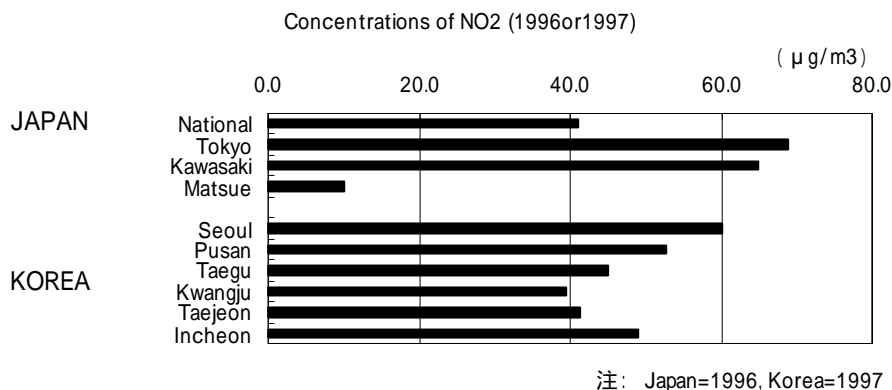


Figure 3-3 Air pollution of major cities in Japan and ROK

Source : OECD(2002) “ OECD Environmental Performance Reviews: JAPAN ”

45. As for combating automobile emissions, both countries are urged to take measures in large urban areas where air pollution conditions remain severe. In addition to measures for automobiles units, fuel measures, emission controls and controls on vehicle types are being implemented by vendors.

2) Waste and recycling

46. In recent years, the amount of domestic waste that is generated in Japan has stayed flat and the total amount was 51.45 million tons (FY1999), or 1,114 kg per person. The amount of industrial waste that is generated has also stayed flat, but was approximately 400 million tons in FY1999, or slightly lower than the previous year. The national average of the number of years remaining for landfills was 12.3 years for domestic waste and 3.7 for industrial waste, and metropolitan areas in particular face a critical situation. Although the waste recycling rate was 13.1% in FY1999 and is rising every year, the level remains low. In 2000, Japan established the Basic Law for Establishing a Recycling-based Society and related individual laws, such as the Containers and Packaging Recycling Law, Home Appliance Recycling Law, Food Recycling Law, Construction Material Recycling Act and the Automobile Recycling Law.

47. Meanwhile, the amount of domestic waste that is generated in ROK has been on a downward trend beginning in the 1990s, but the amount of industrial waste that is generated has been rising by over 10% every year. The total amount of waste generated in FY1995 was 1.479 billion tons. The breakdown is as follows: domestic waste – 47.8 million tons (1,060 kg per person) and industrial waste – 98.8 million tons/day. The waste recycling rate in FY1995 was 65.4% and has been growing year by year.

3) Energy use

48. The proportion of energy supply in 1998 was generally similar for Japan and ROK. Both countries were dependent on oil for over 50% of their energy. While Japan is shifting to other sources of energy such as natural gas and atomic energy, ROK remains dependent on coal for 20% of its energy.

49. The amount of energy consumed (in 1997) by Japan and ROK is 2.7 person for Japan and 2.8 toe/person for ROK. Japan had consumed more energy in 1990 (2.4 toe/person) than ROK (1.6 toe/person) but the situation has now reversed and energy consumption in ROK is growing rapidly. However, the total energy consumption is higher for Japan since its population is approximately 2.7 times larger than that of ROK.

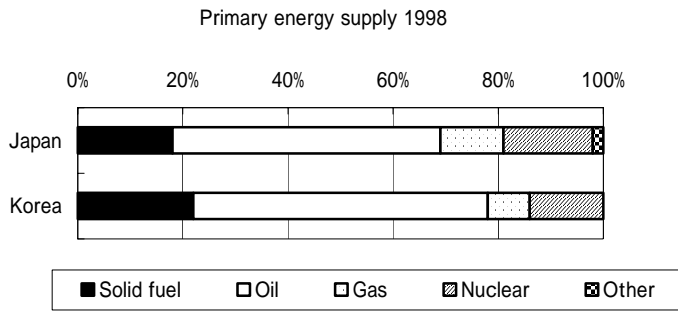


Figure 3-4 Primary energy supply of Japan and ROK

Source : OECD(2001) “ OECD Environmental Indicators TOWARD SUSTAINABLE DEVELOPMENT ”

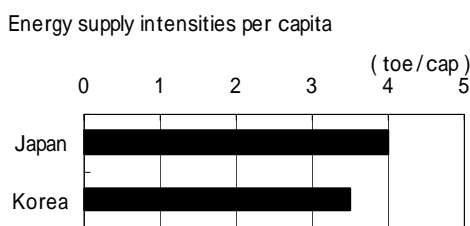


Figure 3-5 Energy supply intensities per capita of Japan and ROK

Source : OECD(2001) “ OECD Environmental Indicators TOWARD SUSTAINABLE DEVELOPMENT ”

3.3 Scoping

3.3.1 Understanding the basic economic, environmental and social situation

50. Understanding the basic situation is a process of qualitatively organizing environmental impacts that a bilateral EPA/FTA may cause, based on the basic information on the economy and environment of Japan and ROK, which will contribute to the selection of content for which there should be prioritized considerations in environmental impact assessments. **Sheets on the economic, environmental and social situation contributing to impact assessments were prepared**, and the items contributing to the establishment of impact assessment methods, items and scope of consideration and narrowing down the issues were extracted.

51. First, the scoping sheet on the economic impacts of the conclusion of a Japan-ROK EPA/FTA was prepared. Next, scoping sheets on environmental and social impacts resulting from economic impacts was prepared.

Table 3.3 Scoping sheet on the economic impacts on conclusion of a Japan-ROK EPA/FTA

Aspect to confirm	Item to confirm	Result
Impact on products	➤ Is there a possibility that conclusion of an EPA/FTA will directly impact export and import of specific products?	● It is possible that regulations to reduce/eliminate tariffs will be incorporated, and it is possible that imports and exports of products that had high tariffs to begin with will be affected.
	➤ Is there a possibility that conclusion of an EPA/FTA will increase/decrease production, consumption and investment into specific products and sectors?	● Regarding production, according to an existing example of analysis (IDE's "Toward Closer Japan-Korea Economic Relations in the 21 st Century"), the impact on the production level by the elimination of tariffs alone is expected to be a certain percentage, but it appears that some sectors will experience dynamic effects of an increase of over 30%. ● Regarding consumption, it appears that the EPA/FTA will have very few effects on final consumption in particular. ● Regarding investment, it appears that there will be changes in investment in sectors where intra-industry specialization between Japan and ROK is advanced.
Impact on production technology	➤ Is there a possibility that conclusion of an EPA/FTA will affect the production processes and production methods of specific products?	● It is expected that further specialization in trade between sectors with intra-industry specialization and technology exchange will be promoted, and production processes and production methods will be affected.
Impact on scale	➤ Is there a possibility that conclusion of an EPA/FTA will increase economic growth at the macro level? Will there be impacts on specific domestic local regions?	● Generally the effects of trade liberalization include changes in the trade balance (static effects) and changes in productivity resulting from market integration (dynamic effects). It is possible that economic growth will be increased at the macro level.
	➤ Which sectors will potentially experience contributions to the economic revitalization through conclusion of an EPA?	● In particular, there is a possibility that it will contribute to the economic revitalization of sectors with intra-industry specialization.
Impact on structure	➤ Is there a possibility that conclusion of an EPA/FTA will increase/reduce raw material costs, energy costs and capital costs of specific products or sectors?	● It is expected that further specialization will be promoted in trade between sectors with intra-industry specialization, and, as a result, it is possible that costs will be further reduced to improve productivity.
	➤ What kind of impact will conclusion of an EPA/FTA have on production, consumption and investment patterns of specific products and sectors?	● It is expected that further specialization will be promoted in trade between sectors with intra-industry specialization, and as a result, it is possible that production, consumption (of parts), investment patterns will be affected.
	➤ What kind of impact will conclusion of an EPA/FTA have on production, consumption and investment patterns in specific domestic local regions?	● It is possible that there will be an impact on regions whose core industries are in sectors that may experience changes such as downsizing resulting from factory shutdowns and technological innovation.
	➤ Will conclusion of an EPA/FTA increase/ease imbalances in trade patterns? Furthermore, what kind of impact will it have on the flow of trade?	● Since the general trend is to remove tariffs and non-tariff barriers, presumably imbalances in trade patterns will be eased.

Table 3.4 Scoping sheet on the environmental impacts resulting from economic impacts

Aspect to confirm	Item to confirm	Result
Impact on products	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA increase/ reduce exports of natural resources? 	<ul style="list-style-type: none"> ● Presumably, there will be an impact on fishery products, on which Japan has comparatively high tariffs. In particular, it is possible that catch from the ROK side (now large amount of fishery products exported from ROK to Japan) will increase. ● It is necessary to work to enhance cooperation in the joint management and use of marine resources before the FTA is concluded.
	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA impose a high risk on the environment, such as transfer of goods that are harmful to the environment? 	<ul style="list-style-type: none"> ● It is possible that there will be a transfer to the side with looser environmental standards of goods that are harmful to the environment in areas where environmental standards differ significantly between Japan and ROK.
	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA increase/reduce availability of environmental goods and services? 	<ul style="list-style-type: none"> ● It is possible that the boost in various exchanges between Japan and ROK will increase availability of environmental goods and services.
	<ul style="list-style-type: none"> ➤ What kinds of environmental impacts would arise if production, consumption and investment in specific products or sectors increases/decreases as a result of conclusion of an EPA/FTA? 	<ul style="list-style-type: none"> ● It is possible that energy consumption and pollutant emissions will rise in both countries due to increased production. ● It is possible that there will be problems such as the impact on the natural environment caused by capital investment (building or closing factories, etc.), air pollution, water pollution and waste generation.
Impact on environmental technology	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA promote environmental technology transfer? 	<ul style="list-style-type: none"> ● Environmental technology transfer may be promoted as a result of boost in various exchanges between Japan and ROK.
Impact on scale	<ul style="list-style-type: none"> ➤ What kinds of financial merits would there be in terms of environmental protection if macro-level economic growth is realized through conclusion of an EPA/FTA? 	<ul style="list-style-type: none"> ● Macro-level economic growth is anticipated through conclusion of an EPA/FTA. It is expected that this will lead to voluntary efforts by corporations to take environmental measures and progress in environmental measures due to increased government tax revenue.
	<ul style="list-style-type: none"> ➤ What is the relationship to the environment if there are sectors that experience economic revitalization through conclusion of an EPA/FTA? 	<ul style="list-style-type: none"> ● In particular, energy-intensive industries are expected to have an impact on the global warming issue.
	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA increase/reduce the overall pollution level? 	<ul style="list-style-type: none"> ● There is a concern that the environmental pressure (consumption of raw materials, energy consumption, pollution emission) will increase due to expanded production in the manufacturing industry. Meanwhile, it is possible that the environmental pressure will not increase as much as expansion in production if manufacturing processes using sophisticated technology become widespread. It is possible that the environmental pressure will not increase as much as expansion in production if there is further progress in environmental technology transfer in ROK.

	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA increase/reduce the overall level of resource use? 	<ul style="list-style-type: none"> ● There may be an increase in the level of use of marine resources in particular.
Impact on structure	<ul style="list-style-type: none"> ➤ What kinds of environmental impacts would there be if production, consumption and investment patterns of specific products or sectors change as a result of conclusion of an EPA/FTA? 	<ul style="list-style-type: none"> ● The environmental burden may increase due to expanded production, which is the result of greater intra-industry specialization caused by changes in production, consumption and investment patterns of specific products or sectors. ● It is possible that the increase in the environmental pressure will not be as large as expansion in production due to greater intra-industry specialization.
	<ul style="list-style-type: none"> ➤ What kinds of environmental impacts would there be if production, consumption and investment patterns of specific domestic local regions change as a result of conclusion of an EPA/FTA? 	<ul style="list-style-type: none"> ● The environmental pressure may increase due to the development of new production bases brought about by the changes in production, consumption and investment patterns in specific local regions.
Impact on regulations	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA result in any issues in consistency with the Basic Environmental Plan? 	<ul style="list-style-type: none"> ● It is possible to have considerations on consistency beforehand.
	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA have an impact on the number, location, type and characteristics of project assessments that should be conducted? 	<ul style="list-style-type: none"> ● Under current conditions, it is difficult to predict the impact on the implementation of project assessments.
	<ul style="list-style-type: none"> ➤ Is conclusion of an EPA/FTA consistent with Multilateral Environmental Agreements (MEAs) such as the Montreal Protocol, Convention on Biological Diversity and Kyoto Protocol? 	<ul style="list-style-type: none"> ● It is possible that there will be prior coordination to ensure that proper consideration should be given in the EPA/FTA, at least for the MEAs in which both Japan and ROK participate.
	<ul style="list-style-type: none"> ➤ Will conclusion of an EPA/FTA have an impact on achieving environment-related goals such as reduction of greenhouse gas emissions and protection of endangered species? 	<ul style="list-style-type: none"> ● It is possible that there will be an impact resulting from expanded production. ● Achieving environment-related goals is dependent on how they are related to EPA/FTA, in addition to the differences between Japan and ROK in terms of environmental goals (status of participation in MEAs).
	<ul style="list-style-type: none"> ➤ Is there a possibility that conclusion of an EPA/FTA influence national environmental regulations or laws? 	<ul style="list-style-type: none"> ● At this point in time, it is difficult to confirm the details of the text of the agreement. It is necessary to consider responses when the details become more finalized.
Degree of impact	<ul style="list-style-type: none"> ➤ Are there any irreversible environmental impacts expected to arise from conclusion of an EPA/FTA 	<ul style="list-style-type: none"> ● At this stage, it is difficult to predict irreversible environmental impacts.
	<ul style="list-style-type: none"> ➤ What is the frequency, duration and geographical scope of environmental impacts resulting from conclusion of an EPA/FTA 	<ul style="list-style-type: none"> ● At this stage, it is difficult to predict the frequency and duration of environmental impacts.
	<ul style="list-style-type: none"> ➤ Is it necessary to consider compound environmental impacts arising from conclusion of an EPA/FTA 	<ul style="list-style-type: none"> ● At this stage, it is difficult to consider compound environmental impacts arising from conclusion of an EPA.

Table 3.5 Scoping sheet on the social impacts resulting from economic impacts

Aspect to confirm	Item to confirm	Result
Impact on society resulting from economic impacts	➤ What kinds of impacts are expected on domestic and overseas employment and low-income groups through conclusion of an EPA/FTA?	● Impact on employment is expected in industrial sectors that are significantly affected by conclusion of an EPA/FTA.
	➤ What kinds of impacts will conclusion of an EPA/FTA have on domestic and overseas gender issues and equality?	● It is difficult to predict the explicit impacts that conclusion of an EPA/FTA will have on gender issues and equality.
	➤ Is there a possibility that conclusion of an EPA/FTA will affect administrative power domestically and abroad?	● Presumably it is unlikely that conclusion of an EPA/FTA will affect administrative enforcement capacity.
	➤ Is there a possibility that conclusion of an EPA/FTA will heavily affect labour environment?	● Presumably it is unlikely that conclusion of an EPA/FTA will affect labour environment.

3.3.2 Establishment of impact assessment items

(1) Economic impact assessment items

52. It is expected that conclusion of an EPA/FTA will have an impact on the entire economy in both Japan and ROK. It is assumed that the industrial sector (products), which currently has high tariffs, will be greatly affected by the EPA/FTA. Furthermore, there may be economic effects, such as the possibility that industrial sectors where intra-industry specialization¹ has advanced in Japan and ROK will experience even further specialization. In this context, it is deemed necessary to assess the following items, with a focus on industrial sectors where tariffs are comparatively high under current conditions and industrial sectors where intra-industry specialization is advanced in Japan and ROK.

- Impact on scale (domestic productivity, trade balance, etc.)
- Impact on each industrial sector (products and industry)
- Impact on industrial structure

(2) Environmental impact assessment items

53. It is expected that environmental impacts will arise as a consequence of the economic impacts on conclusion of an EPA/FTA. Moreover, it is necessary to individually analyze the impacts on the overall environment and impacts on specific industries triggered by the

¹ Intra-industry specialization refers to sectors with an intra-industry structure to mutually procure low-grade products and high-grade products, or parts and finished products.

economic impacts on conclusion of an EPA/FTA. With respect to these analyses, it is extremely likely that the environmental pressure will increase if economic impacts intensify, for instance, expanded production. Therefore, it is important to conduct analyses together with the economic impacts, rather than solely analyzing where environmental pressure has increased. It is thus necessary to assess mainly the following items.

- Impact on the overall environment (impact of the environmental pressure)
- Environmental impact on each industrial sector (products and industry)
- Impact on availability of natural resources and environmental goods and services
- Impact on regulations, policy, etc.

(3) Social impact assessment items

54. It is expected that the economic impacts resulting from conclusion of an EPA/FTA will not only have environmental impacts but also social impacts. The main items for analysis of the social impact include issues such as employment and income disparity. This case study will assess the following item.

- What is the impact on employment in industrial sectors that are greatly affected by the conclusion of an EPA/FTA?

3.3.3 Establishment of impact assessment methods

(1) Classification of items for analysis

55. The items for analysis were classified into items for qualitative analysis and items for quantitative analysis. The impact assessment items and their classification are as follows (Table 3.6).

Table 3.6 Classification of analysis methods

	Qualitative analysis	Quantitative analysis	
		AIM/CGE	Input-output analysis
Economy	○	○	○
Environment	○	○ _{Note 1}	○ _{Note 2}
Society	○		

Note 1: Assessing impact mainly on the global scale

Note 2: Assessing impact focusing on Japan and ROK

56. A qualitative assessment was conducted taking into account the basic situation for each of the economic, environmental and social aspects, including review of existing literature, while referring to the scoping sheets.

57. A quantitative assessment using econometric models was conducted on some of the items established as items for qualitative analysis. In this case study, it was decided that the AIM/CGE model and international input-output analysis² would be used as models that could be applied for quantitative analysis. In order to estimate the economic impact on specific items of quantitative analysis, the AIM/CGE model was used to analyze macroeconomic effects (GDP level) on both Japan and ROK as well as on the entire world, and input-output analysis was used to examine changes in industrial and trade structures in both Japan and ROK. The analysis using the AIM/CGE model estimates both Japan and ROK's GDP growth rate and the rates of change in production by the industrial sector as of 1997 and as of 2010.³ These rates of change in production by industrial sector were used as input for the input-output analysis, which quantitatively estimated the changes in industrial structure resulting from conclusion of an EPA/FTA.

58. The limits of the data for each model were taken into account in the establishment of qualitative analysis items for environmental impacts. In the analysis of CO₂ emissions for both Japan and ROK using the AIM/CGE model, the rate of change of greenhouse gas emissions caused by changes in the amount of energy used was estimated in addition to the rate of change and emission intensity.⁴ The changes in CO₂ emissions on a global scale were estimated using the AIM/CGE model, and the input-output analysis was used to estimate the rate of change of emissions and the emission intensity for CO₂ and SO₂ by industrial sector.

(2) Assessment methods of quantitative analysis items

59. The assessment methods of qualitative analysis items were established in terms of geographical divisions and industrial categories, while prioritizing clarification of results as well as making the most of the features of each model and taking into account the time constraints needed for the analysis.

² AIM/CGE model takes a macro perspective (a closed model focusing on global equilibrium), while input-output analysis takes a micro perspective (an open model focusing on Japan and ROK).

³ The assessment for 2010 assumes that an EPA was concluded in 2005 (tariffs were eliminated beginning in 2005)

⁴ The emission intensity is the ratio of the rate of change of output to the rate of change of CO₂ (or SO₂) emissions.

$$\text{Emission intensity of CO}_2 = \text{Rate of change of CO}_2 \div \text{Rate of change of output} = \frac{\left[\frac{CO_{2\text{FTA}}}{CO_{2\text{BaU}}} \right]}{\left[\frac{X_{\text{FTA}}}{X_{\text{BaU}}} \right]}$$

60. Eleven geographical divisions are as follows: Japan, ROK, China, the rest of Asia (seven of the ASEAN countries), India, Australia (Australia and New Zealand), the United States, Canada, Western Europe, Russia and Eastern Europe, and other countries.

61. Twenty-six categories were identified as industrial categories after integrating the AIM/CGE model and input-output analysis. In particular, the industrial categories that have an impact on Japan-ROK trade were extracted and the industrial categories essential from both the economic and environmental aspects were also extracted in the process of integration. Considering the economic aspect, judging from the overall situation of Japan-ROK trade in particular, the **steel industry and petrochemistry**, in addition to **boilers and electronics**, comprise the trade items that would be handled most often in particular, and thus a separate category was established for these items. Meanwhile, regarding the environmental aspect, it was found that there was a strong relationship between the agricultural sector and transport services, and also taking into account the effects of nitrogen (N), a category for the **livestock industry** was established especially for the agricultural sector.

* Energy: 5 sectors	
GAS	Natural gas works
ELY	Electricity and heat
OIL	Refined oil products
COL	Coal transformation
CRU	Crude oil
* Energy Intensive Industry: 5 sectors	
I_S	Iron and steel industry
CRP	Chemical industry
NMM	Mineral products
PPP	Paper-pulp-print
OMN	Mining
* Agriculture: 5 sectors	
AGR	Agriculture
LVK	Livestock
FPR	Food products
FRS	Forestry
FSH	Fishing
* Other Industry: 7 sectors	
NFM	Non-ferrous metals
TRN	Transport equipment
ELE	Electronic equipment
OME	Other machinery
CNS	Construction
TWL	Textiles-wearing apparel-leather
OMF	Other manufacturing
* Service: 3 sectors	
T_T	Transport
SER	Commercial and public services
DWE	Dwellings
* Investment: 1 sector	
CGD	Investment composite