中央大学経済研究所年報　第52号（2020）pp. 145-157

アジアの環境と政策研究会

The Tentative Definition of Environmental Service Trade: The Negative List Method Using Environmental Goods Trade

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International negotiations regarding environmental goods and services were initiated at the Doha Development Round of the 2001 World Trade Organization (WTO) negotiations. Since then, the WTO has been advancing negotiations on environmental goods (the Environmental Goods Agreement) with respect to environmental services. This study examines the international development of the "environmental service trade" from the perspective of environment service providers engaging in cross-border transactions. A unique overview of the ongoing discussions held among various international organizations is presented. These discussions focus on "core environmental services," such as wastewater treatment and waste management, proposed by the Organization for Economic Cooperation and Development. The study analyzes the categories of industries to which foreign-affiliated companies that provide waste treatment services in Asia-Pacific Economic Cooperation member states belong. The findings reveal that many of the companies expanded from a wide range of industries into waste treatment services. Therefore, the findings suggest that given the policy implications of reducing or eliminating non-tariff barriers to environmental services under the Doha Ministerial Declaration, formulating definitions of feasible environmental services would considerably limit the list of environmental services. Thus, this study proposes a unique negative list approach that is limited to service providers who directly contribute toward the solution of environmental issues. The list defines environmental services for industries focusing on the end users of environmental goods. An empirical analysis of waste treatment services and wind power generation services in Thailand verifies the list's applicability. This study has implications for global and domestic policy makers and global environmental service providers.

1. Introduction

When running an environmental business overseas as a totally managed business including operation and management, in addition to the sale and export of environment-related equipment, it is also inevitably necessary to expand operations in the export destination country and undertake maintenance of the equipment as well as recovery and collection of pollutants. This is, in essence, the international development of environmental services, and it is necessary to focus on the perspective of service trade

encompassed in the global environmental business (hereinafter, “environmental service trade”).

International negotiations regarding environmental goods and services started at the Doha Round of the 2001 World Trade Organization (WTO). The WTO has been advancing negotiations on environmental goods (the Environmental Goods Agreement) ahead of environmental services. However, while discussions have been progressing based on a list of designated items drawn up by major developed countries (the “environmental goods list”), as of January 2019, advanced nations and developing and emerging nations have yet to reach consensus.

Meanwhile, in 2012 the Asia-Pacific Economic Cooperation (APEC) drew up a list of 54 environmental goods, including renewable energy products, waste water treatment equipment and materials, and air pollution control equipment, and agreed to reduce the effective tariff rates on these to 5% or lower by the end of 2015. APEC also formulated the Environmental Services Action Plan in 2015, under which it plans to conduct a survey of regulatory and policy measures under the United Nations’ Central Product Classification, CPC 94, and a wider ranging environmental business study, before submitting a final review by 2020 (APEC Secretariat 2018).

Furthermore, New Zealand, who will host APEC in 2021, intends to continue the research on environmental services. In 2019, New Zealand and other WTO member states proposed to resume the discussion on the definition of environmental services (WTO 2019).

We first overview these discussions, which have been held in various international organizations. Next, focusing on the concept of “core environmental services”, such as wastewater treatment and waste management proposed by the Organization for Economic Cooperation and Development (OECD), we analyze the categories of industries to which the foreign-affiliated companies that provide waste treatment services in APEC members belong. Based on the results, we propose a “negative list approach, limited to service providers who directly contribute toward the solution of environmental issues, and intended to define environmental services involving various industries, focusing on the end users of environmental goods.” Furthermore, we examine its applicability through an empirical analysis of waste treatment services and wind power generation services in Thailand.

2. The progress of discussions on the definition of environmental services in international organizations

Sasaki (2014) summarized the discussions on environmental services held in

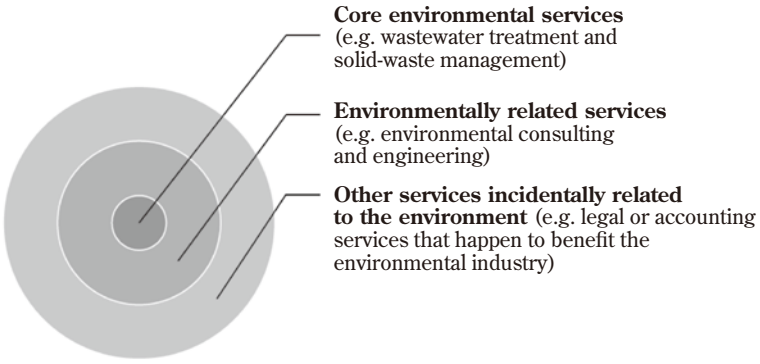
international organizations. In the WTO, even the discussions on normally traded environmental goods have not made much progress, and no significant progress has been made in the discussions on environmental services. The International Monetary Fund (IMF) revised the compilation methods of the "Balance of Payments Statistics" in the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6), but there was no indication that the trade volume of environmental services would be captured. On the other hand, the OECD and Eurostat proposed to disaggregate the IMF's BPM5 and capture environmental services (OECD and Eurostat 1999). The OECD independently publishes information on the trade in services pertaining to waste treatment and depollution. However, the trade volumes of 13 of the 30 OECD member states were not captured (OECD 2011). In a hearing with the OECD Statistics Bureau, only the definition of waste treatment and depollution was determined, but those of other environmental services have not been decided. Furthermore, the majority of the trade volumes were classified only as "cross-border transactions (Mode 1)," such as consulting services via the Internet. Capturing "the supply of services through commercial presence (Mode 3)" has proven to be difficult.

Thus, despite the lack of progress in the discussions, APEC and the OECD have led the research in this field more than other international organizations. The main points at issue in the definition of environmental services by APEC and the OECD are as follows.

In 2012, APEC leaders endorsed the APEC List of Environmental Goods that directly and positively contribute to APEC's green growth and sustainable development objectives by committing to reduce applied tariff rates to five percent or less on environmental goods in the list by the end of 2015, taking into account economies' economic circumstances without prejudice to their positions in the WTO. In line with the significant achievements in the area of environmental goods, in 2015, APEC Ministers welcomed the endorsement of the Environmental Services Action Plan (ESAP) to promote liberalization, facilitation, and cooperation in environmental services, aiming for an interim progress review by 2018 and a final review in 2020 (APEC Secretariat 2018). And APEC Surveys points out ambiguity and abstractness of definition and a range of current environmental services. The study examined environmental services covered by Central Product Classification (CPC) 94 and concluded that the current coverage of CPC94 could be expanded to include a wider range of environmental services or complementary services which impact businesses delivering environmental services in foreign markets in order to understand a more complete picture of the regulatory measures in place (APEC Policy Support Unit 2016).

OECD pitched the necessity of more clarity of environmental services in order to make trade in environmental goods and services more prosperous and introduced potential

Figure 1 Three categories of environmental services



(Source) Sauvage and Timiliotis (2017)

approach to categorize relevant services based on market operation and relativity (OECD 2017). Sauvage and Timiliotis (2017) suggests that the restrictions that countries impose on services trade may have a detrimental effect on the provision of environmental activities through the establishment by specialized firms of a commercial presence abroad, i.e. through mode 3 trade in services. They also suggest that there are three categories, core environmental services, environmental related services and other services incidentally related to the environment (Figure 1).

Both APEC and the OECD are considering a broader definition of environmental services, encompassing other relevant services. The WTO Secretariat includes business services (CPC 85, CPC 86), construction services (CPC 51), distribution services (CPC 62), and other services in environmental services. Therefore, the discussions held by APEC and the OECD are in line with the orientation of the WTO Secretariat.

3. The validity of the "core environmental services" proposed by the OECD and hypothesis formulation

To assess the necessity of determining the definition of environmental services, the discussions held at the WTO on environment and trade should be reviewed. At the Fourth Ministerial Conference of the WTO in Doha in November 2001, the Committee on Trade and Environment Special Session (CTESS) was established. With regard to environmental services, according to paragraph 31 (iii) of the Doha Ministerial Declaration, it was agreed that "negotiations on the reduction or elimination of tariff and non-tariff barriers to environmental goods and services" will be held. Environmental service providers also offer other services, so it is not too difficult to reach a consensus on a broader definition.

However, given the policy implications of reducing or eliminating non-tariff barriers to environmental services under the Doha Ministerial Declaration, it may not be feasible to obtain the consent of WTO member states regarding environmental services, including a wide range of other service industries.

Therefore, as it is unlikely that brown issues such as wastewater and waste treatment will be excluded from the definition of environmental services, this study focuses on the core environmental services proposed by the OECD (Figure 1).

According to SASAKI(2019), when the degree of liberalization and market trends were analyzed for the environmental services trade in APEC, the result showed that the tendency for the disparity in Average of Operating revenue and Average of Total assets between domestic and overseas companies to decrease as the degree of liberalization increases is stronger in the waste treatment services trade than the sewerage treatment services trade.

In this study, to identify the subject environmental business companies for the analysis, we used the ORBIS company and financial database (provided by Bureau van Dijk), which is one of the largest in the world (approximately 110 million companies). We made use of the United States' Standard Industrial Classification (SIC) code to identify companies that have registered waste treatment services (SIC code 4953) as their main or side business in 21 APEC member countries and regions. The database included 75,827 waste treatment service companies were selected as subject companies for analysis as the necessary financial data (net sales, total assets, and investment ratios) were available for them. Furthermore, in this study, domestic and overseas companies were classified by whether or not their investment capital was 100% domestic in origin.

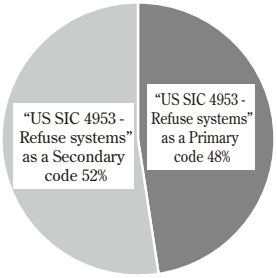
We focus on the SIC codes of foreign-affiliated companies that expanded to APEC member economies. These companies were identified by the method described above. Companies that provide waste treatment services among core environmental services have the SIC code 4953. First, we broadly classify the companies based on whether the SIC code 4953 is their primary or secondary SIC code, which indicates whether it is their primary business (Figure 2).

As shown in Figure 2, for the majority of the aforementioned companies, the provision of waste treatment services represents their secondary rather than primary business.

Table 1 lists the primary business activities of foreign-affiliated companies that provide waste treatment services as their secondary business.

As shown in Table 1, 2,767 foreign-affiliated companies expanded to APEC member economies and provide waste treatment services as a secondary business, and their primary businesses belong to 354 various categories of industries. In terms of trends, many of the companies expanded from wholesale trade, with the SIC codes ranging from

Figure 2 Provision of waste treatment services as the primary or secondary business for foreign-affiliated companies



(Source) Based on ORBIS database

Table 1 Categories of industries from which the foreign-affiliated companies expanded into waste treatment services

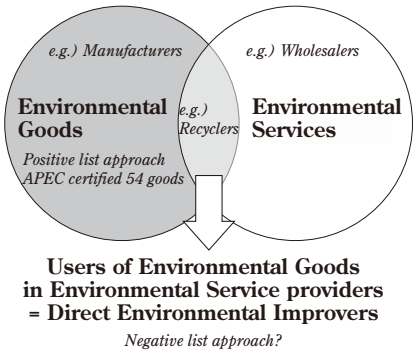
Top 10	US SIC Primary code(s)	Primary US SIC, text description	Number	Rate
1	8999	Services not elsewhere classified	204	7%
2	5085	Industrial supplies [wholesale dealing in]	201	7%
3	5162	Plastics materials and basic from and shapes [wholesale dealing in]	184	7%
4	5051	Metals service centers and offices [wholesale dealing in]	139	5%
5	5199	Nondurable goods, not elsewhere classified	112	4%
6	4212	Local trucking without storage	68	2%
7	5052	Coal and other minerals and ores [wholesale dealing in]	64	2%
8	5093	Scrap and waste materials [wholesale dealing in]	59	2%
9	5032	Brick, stone, and related construction materials [wholesale dealing in]	54	2%
10	6531	Real estale agents and managers	52	2%
Other 344 business sectors			1,630	59%

(Source) Based on ORBIS database

5000 to 5199.

Thus, it can be said that many companies providing waste treatment services, which make up a part of the core environmental services proposed by the OECD, have expanded from a wide range of industries to this sphere of business. Therefore, it is necessary to consider a definition of environmental services that further limits the core environmental

Figure 3 Image of Negative list approach for identifying Direct Environmental Improvers



services. Fundamentally, the ultimate goal is to revitalize the environmental business and improve the environment through "reducing or eliminating tariff and non-tariff barriers on environmental goods and services. That is, it is necessary to identify the users, who are actually using environmental goods from a wide range of environmental service providers, as 'direct environmental improvers.'"

For example, among waste treatment services, recycling companies and landfill services fit the description of direct environmental improvers. These companies buy crushers and wastewater treatment facilities from manufacturers and purchase waste and recycling materials from wholesalers. On the other hand, the maintenance and repair of environmental goods sold by manufacturers and the transportation of waste and recycling materials purchased by wholesalers can be regarded as environmental services in a broader sense. However, the priority here is to define environmental services in a narrower sense that further limits the core environmental services. Therefore, we propose a "negative list approach, limited to service providers who directly contribute toward the solution of environmental issues, and intended to define environmental services involving various industries, focusing on the end users of environmental goods" (Figure 3).

4. The applicability of the negative list approach

Is the aforementioned "negative list method" applicable?

As it is a trade secret, in practice it must be difficult to identify the end users of environmental goods. If third parties can identify the end users, then government agencies that implement tariff reduction measures based on the Regional Trade Agreements (RTAs)/Free Trade Agreements (FTAs) pertaining to environmental goods, special taxation measures, and grant various subsidies can also do so. Limiting the

negative list approach to the end users of environmental goods is expected to increase the compatibility with and feasibility of the policy implications of reducing or eliminating non-tariff barriers for environmental services.

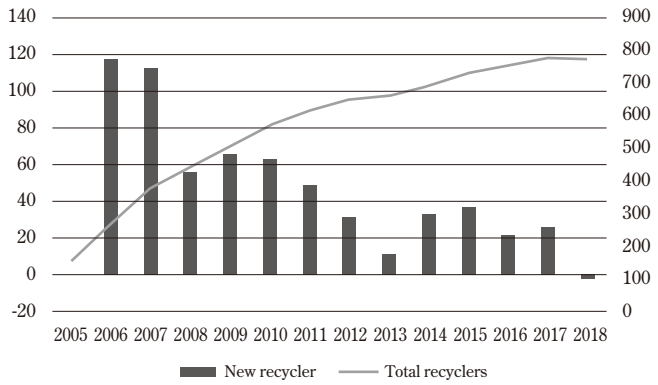
Since the aforementioned information cannot be obtained here, the applicability of the negative list approach is examined by focusing on the relationship between the number of direct environmental improvers and the volume of imported environmental goods based on cases in which improvements in tackling environmental issues have been observed. Considering that environmental indicators such as recycling rates and the installed capacity of wind power generation are improving in Thailand, we consider the cases of recycling companies and wind power companies in Thailand as direct environmental improvers. Furthermore, as there is no international definition of environmental goods other than the one provided by APEC, the analysis will target the 54 environmental goods included in the APEC list. It has been confirmed that the target environmental goods are imported into Thailand in excessive amounts.

First, the number of recycling companies in Thailand increased due to the relaxation of regulations in the industrial waste treatment market in 2005, and the total number of recycling companies reached 773 in 2018. As a result, the rate of recycling non-hazardous waste has improved (Figure 4) (Sasaki 2013).

Among the environmental goods imported during this period, the value of imported recycling-related equipment has gradually increased, with the running total reaching approximately $11,472 million in 2018 (Figure 5).

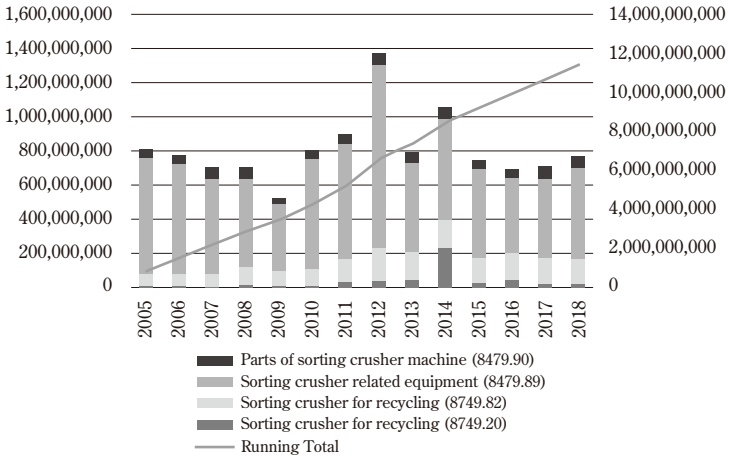
Based on the data, the coefficient of determination (R^2) indicates that there is a strong correlation between the total number of recycling companies and the total value of imported recycling-related equipment (R^2=0.88) (Figure 6).

Figure 4 Number of Licensed Recyclers in Thailand



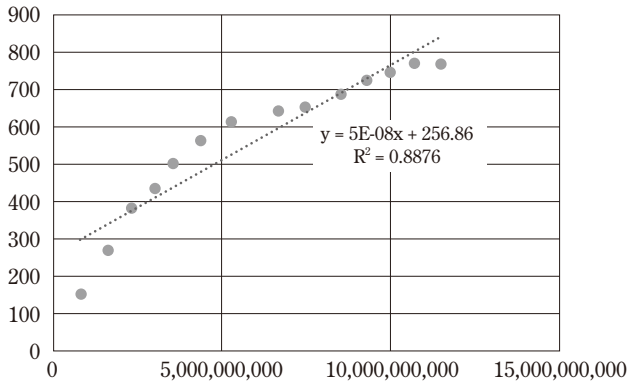
(Source) Department of Industrial Works, factory information search

Figure 5 Imported value of recycling-related equipment



(Source) UN Comtrade

Figure 6 Relationship between the total number of recycling companies and the total value of imported recycling-related equipment

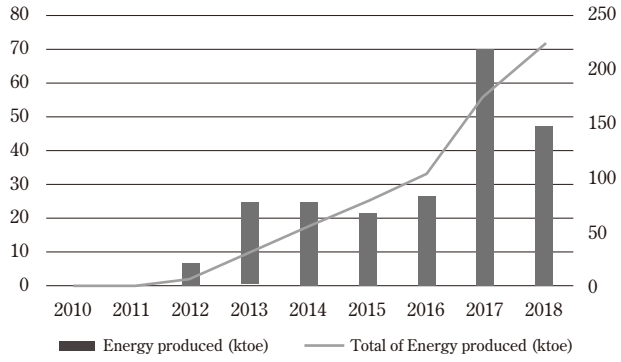


Next, we focus on the introduction of wind power generation in Thailand, which has been given preferential treatment by the feed-in tariff system since 2012. The installed capacity of wind power generation has also increased, with the total amount of wind power produced reaching 223 Ktoe (ton of oil equivalent) in 2018 (Figure 7).

Among the environmental goods imported during this period, the total value of imported equipment related to wind power generation has also gradually increased, with the running total reaching approximately $749 million in 2018 (Figure 8).

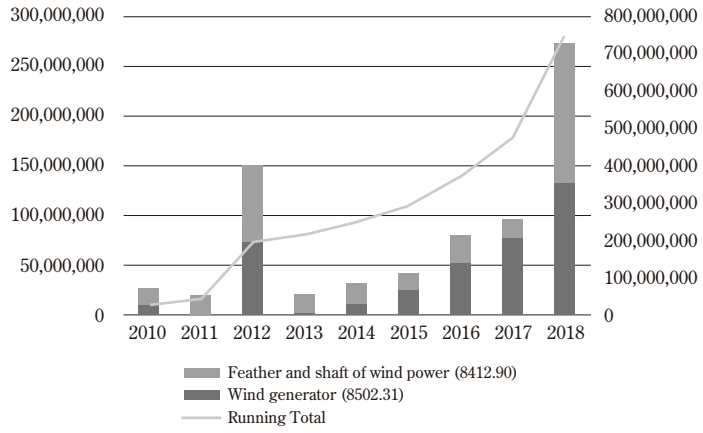
Based on the data, the coefficient of determination (R^2) indicates that there is a strong

Figure 7 Wind power installation



(Source) Department of Alternative Energy. Development and Energy

Figure 8 Imported value of Wind power related equipment

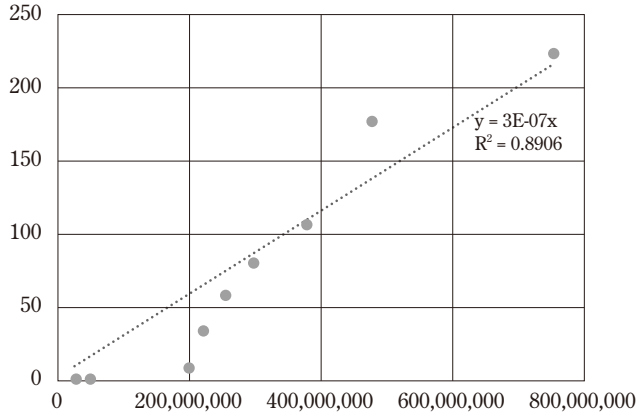


(Source) UN Comtrade

correlation between the total amount of wind power produced and the total value of imported equipment related to wind power generation (R^2=0.89) (Figure 9).

As previously mentioned, a strong correlation was established between the total number of recycling companies and the total value of imported recycling-related equipment. Similarly, a strong correlation was also established between the total amount of wind power produced and the total value of imported equipment related to wind power generation. Therefore, it can be argued that the effectiveness of the negative list approach, limited to service providers who are the end users of environmental goods and who directly contribute toward the solution of environmental issues, and intended to define

Figure 9 Relationship between the total amount of wind power produced and the total value of imported equipment related to wind power generation



environmental services involving various industries was partly verified.

However, we first analyzed cases in which improvements in tackling environmental issues have been observed. Nevertheless, these indicators cannot be said to have a direct causal relationship with environmental improvement indicators. For example, even if expensive recycling-related equipment is installed, it does not work in some cases due to local waste composition or sorting conditions. Furthermore, in the case of wind power generation, in some cases, wind power farms do not match local wind conditions and cannot reach the expected capacity. Moreover, as the verification method applied herein uses the value of imported goods as alternative data, it cannot be applied with regard to countries that export environmental goods. In the case of exporting countries, the verification of effectiveness needs to be based on the sales performance data of the manufacturers of environmental goods in the relevant countries.

5. Conclusion

Based on discussions on the definition of environmental services held in various international organizations, it was first confirmed that APEC and the OECD lead the research on the topic, and that they are considering a broader definition of environmental services encompassing other relevant services.

Focusing on the concept of “core environmental services,” such as wastewater treatment and waste management proposed by the OECD, we analyzed the categories of industries to which the foreign-affiliated companies that provide waste treatment services in APEC member states belonged. The results revealed that many of the companies

expanded from a wide range of industries into waste treatment services. Therefore, our findings suggest that given the policy implications of reducing or eliminating non-tariff barriers to environmental services under the Doha Ministerial Declaration, if we were to formulate a definition of feasible environmental services that the WTO member states can agree on, it would be necessary to consider a narrower definition of environmental services than that of the core environmental services.

Hence, we proposed a negative list approach, limited to service providers who directly contribute toward the solution of environmental issues, and intended to define environmental services involving various industries, focusing on the end users of environmental goods. Moreover, an empirical analysis of waste treatment services and wind power generation services in Thailand verified its applicability and strong correlations were established. As the verification method used the value of imported goods as alternative data, it cannot be applied with regard to countries that export environmental goods. In the case of exporting countries, the verification of the effectiveness needs to be based on the sales performance data of the manufacturers of environmental goods in the relevant countries, which is a task for future research.

Appendix

This paper is part of the result from grant-in-aid for scientific research (Kagaku Kenkyuuhi Wakate Kenkyuu) (A) 17H04722 “Kokusai Kankyou Bijinesu Sokusinsakku ni Shisuru Kankyou Sabisu Boeki Teiryou Hyouka Shuhou no Kaihatsu” (“Development of Quantitative Evaluation Methodology for Environmental Services Trade to Contribute to Promotion Strategies for Environmental Business”). The analysis of environmental business companies was performed with cooperation from Mr. Susumu Masuda of Bureau Van Dijk and Mr. Tana Sooksan of TK Wise Group Co., Ltd. Furthermore, the author would like to express his gratitude to officials from APEC, OECD, WTO, and relevant government agencies from each country who attended an invited report for the APEC Workshop on Environmental Services in February 2020. Their comments led to significant revisions.

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