

Country Name	Project for the Development of Basic Schemes for PRTR System¹
Kingdom of Thailand	

I. Project Outline

Background	<p>In Thailand, there was a concern about serious air pollution arisen from progressive industrialization and urbanization. To respond to this, the Pollution Control Department (PCD) under the Ministry of Natural Resources and Environment (MONRE) set a series of environmental standards for air pollutants such as sulfur oxide and suspended particulate matter. With the standards, it became capable of controlling volatile organic compounds (VOCs), the causative substances of photochemical oxidants to a certain level through systematic, nationwide monitoring mainly in the Bangkok metropolitan area. Based on the interventions, PCD was to move on to the next stage of engaging in comprehensive risk management of chemical substances, environmental information services, and dissemination. On the other hand, in the area around the Map Ta Phut Industrial Complex, dozens of pupils and teachers at a local elementary school came to urgent medical attention due to air pollution of undetermined origin. Also, residents in the neighboring community frequently petitioned that they were suffering from offensive odors. It was under stronger social pressure to tighten environmental control, which was manifested in an increasing number of lawsuits by local residents against the government and businesses in industrial parks. However, as there was a bottleneck to assess the amount of chemical release and transfer accurately in PCD, it was difficult to take effective measures against chemical substances.</p>				
Objectives of the Project	<p>Through the development of the basic design of the PRTR system, emission reporting scheme together with the strengthening of the capacity of aggregate calculation and estimation of pollutant emission, and the establishment of a system for risk communication with local communities, the project aimed at strengthening the capacity of staff of PCD, the Department of Industrial Works (DIW), and the Industrial Estate Authority of Thailand (IEAT) for implementation of the PRTR pilot project, thereby contributing to the establishment of a Thai model of the PRTR system.</p> <ol style="list-style-type: none"> Overall Goal: Model of the PRTR System for Thailand is established. Project Purpose: Capacity of PCD, DIW, and IEAT's staff for implementation of the PRTR pilot project is strengthened. 				
Activities of the Project	<ol style="list-style-type: none"> Project Site: Rayong Province (target area) Main Activities: 1) establishment of the basic design of the PRTR system, 2) development of emission reporting scheme for industry, 3) strengthening of the capacity of estimation of emission and transfer for point source, 4) strengthening of the capacity of emission estimation for non-point source, 5) awareness building on the importance of the use of PRTR data including the initial assessment, 6) development of a risk communication implementation structure in the pilot area. Inputs (to carry out the above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> Japanese Side 1) Experts: 6 persons 2) Trainees Received in Japan: 49 persons 3) Outsourcing expenses (local surveys, database construction, support services for PRTR system promotion secretariat) </td> <td style="width: 50%; vertical-align: top;"> Thai Side 1) Staff Allocated: 43 persons 2) Land and facilities: office including a meeting room 3) Local cost: local consultant commission fee for operation, various surveys, manual preparation, factory notification database construction, etc. </td> </tr> </table> 			Japanese Side 1) Experts: 6 persons 2) Trainees Received in Japan: 49 persons 3) Outsourcing expenses (local surveys, database construction, support services for PRTR system promotion secretariat)	Thai Side 1) Staff Allocated: 43 persons 2) Land and facilities: office including a meeting room 3) Local cost: local consultant commission fee for operation, various surveys, manual preparation, factory notification database construction, etc.
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Project Period	March 2011 – March 2016 (Extension period: February 2015 – March 2016)	Project Cost	(ex-ante) 316 million yen, (actual) 316 million yen		
Implementing Agency	Pollution Control Department (PCD) under the Ministry of Natural Resources and Environment (MONRE), Department of Industrial Works (DIW), and Industrial Estate Authority of Thailand (IEAT) under the Ministry of Industry (MOI)				
Cooperation Agency in Japan	Sowa Consultants Inc. / EX Research Institute Ltd.				

II. Result of the Evaluation

<Constraints on Evaluation>

- Due to the COVID-19 pandemic, the government-imposed restrictions on inter-city travel made the planned interview survey with local residents impossible.

< Special Perspectives Considered in the Ex-Post Evaluation >

Overall goal:

- The overall goal was differently documented in the Japanese and the English version. In this ex-post evaluation, the evaluation judgment was made based on the overall goal and its indicator in the English version as being agreed by both parties of Thailand and Japan.

1 Relevance

<Consistency with the Development Policy of Thailand at the Time of Ex-Ante Evaluation >

¹ An abbreviation of "Pollutant Release and Transfer Register." The PRTR system is a system that requires businesses handling chemical substances potentially hazardous to the ecosystem and/or human health to estimate the amounts of chemical substances released and transferred in waste or to the outside (air, water, soil) of the facilities, and to report the data to the government, and that the government then compiles data submitted and makes the results public.

Source: https://www.meti.go.jp/policy/chemical_management/law/prtr/index.html (accessed October 2020)

The project was consistent with the development policies of Thailand. At the time of the ex-ante evaluation, the strategy for the development of biodiversity and conservation of the environment and natural resources was listed as one of the five pillars in the “10th National Economic and Social Development Plan” (2007-2011). Furthermore, the “20-year Policy and Perspective Plan for Enhancement and Conservation of National Environmental Quality” (1997-2016) provided a framework for encompassing control measures against water and air pollution, noise, vibration, waste treatment, etc. including hazardous air pollutants.

<Consistency with the Development Needs of Thailand at the Time of Ex-Ante Evaluation >

The project was consistent with the development needs of Thailand. Due to serious air pollution arisen from progressive industrialization, there were widespread health hazards as well as offensive odors appealed from neighboring communities of industrial parks. Also, stronger social pressure to tighten environmental control was discernable through increasing lawsuits by local residents against the government and businesses in industrial parks. Nonetheless, there was a limited system for the government to access the amount of emission and transfer of chemical substances in private business activities. It was not possible to implement effective measures against chemical substances. Therefore, it was needed to establish a system to control environmentally hazardous substances.

<Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation>

The project was consistent with Japan’s ODA policy at the time of the ex-ante evaluation; “Country Assistance Program to Thailand” (May 2006) based on policy discussion with the Thai government as assistance for the environmental management system was included as a priority area. As it was agreed that more proactive environmental management was needed to move to an upper-middle-income country, it was intended to provide cooperation for the improvement of the urban environment and environmental disaster prevention.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

The Project Purpose was achieved by the project completion. The basic design of the PRTR system applied in the pilot project area was drafted and the model was approved by the PRTR sub-committee in 2013. Subsequently, the contents incorporated with the outline and results of the pilot project were reported to the PRTR sub-committee and acknowledged (Indicator 1). According to the Terminal Evaluation Report, the estimation manuals for point sources and non-point sources were approved by the respective taskforces in 2013. Furthermore, the manuals were revised and duly approved by the taskforces during the extended period of the project. For non-point sources, all non-point source emissions were estimated in 2014 (Indicator 2)

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The project effects have been continued since project completion. Regarding the basic design of the PRTR system to be ensured for de facto enforcement, the implementing agencies have been implementing various measures to encourage target industries to report PRTR data on a voluntary basis. PRTR pilot implementation has been extended to Samutprakarn (since 2016) and Chonburi (since 2017). Also, dialogues with several local governments, businesses, civil society have been held continuously with the aim of disseminating the PRTR system per se. The estimation manual for PRTR non-point source release estimation has been used for ongoing pilot projects in Rayong, Samut Prakan, and Chonburi provinces. Furthermore, the manuals for emission estimation have been used by business establishments located in the three pilot provinces. Furthermore, there have been continued efforts to improve the PRTR system including revisions of target substances and target industry groups to report PRTR data. In addition, supported by the JICA project (phase 2), the implementing agencies have been implementing various measures to enhance the utilization of PRTR data such as public audit activities.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal had been achieved at the time of ex-post evaluation. Regarding legal documents on the PRTR system in Thailand, the Ministerial Regulation issued by the MOI under the “Factory Act” in 2020 stipulates the reporting obligation for the PRTR system (Indicator 1). The number of PRTR data reports from the target industries has been increasing gradually from the expanded areas of pilot projects and the implementing agencies’ efforts to request the private sector to report PRTR data. Also, the operation record was confirmed that data/information on the domestic emission status of chemical substances has been open to the public through the official website.

<Other Impacts at the time of Ex-post Evaluation>

No other negative or positive impact was confirmed at the time of ex-post evaluation.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results
(Project Purpose) Capacity of PCD, DIW, and IEAT’s staff for the implementation of the PRTR pilot project is strengthened.	(Indicator 1) The draft PRTR system in Thailand is approved by the PRTR sub-committee by the end of the project.	Status of the Achievement: achieved (continued) (Project Completion) The basic design of the PRTR system in the pilot project area (drafted on paper) was approved by the PRTR subcommittee in 2013. Subsequently, given the indicator to capture the capacity building more comprehensively, the contents incorporated with the outline and results of the pilot project were reported to the PRTR sub-committee and acknowledged. (Ex-post Evaluation) The model of the PRTR system was approved by the PRTR sub-committee, and the implementing agencies made efforts for the implementation of the pilot PRTR system as follows: - PRTR pilot implementation has been extended to Samutprakarn (since 2016) and Chonburi (since 2017). - Eco-industrial town development: Participation in the PRTR system is stipulated as one of the chemical substance management indicators to be used to assess the level to be eligible to be an eco-industrial town

		<p>where companies are planned to move in are encouraged to report PRTR-related data.</p> <ul style="list-style-type: none"> - Private Company: In the Map Ta Phut Industrial Complex and other pilot project sites, dialogue opportunities were provided through holding workshops on emission estimation and reporting, such as discussions with private companies to promote the PRTR system. - Local government: Meetings related to the PRTR system were held, with the target local governments in attendance. - Civil Society: Planning and implementing risk communication seminars/meetings for citizens regarding how to utilize public information on chemical substance data. In addition, in the Map Ta Phut Industrial Complex in Rayong province, a community monitoring system was designed by the local citizens themselves based on environmental data analysis, and the pilot run was implemented effectively in 2020. 																																																																																																				
<p>(Overall Goal) Model of the PRTR system in Thailand is established.</p>	<p>(Indicator 1) The PRTR system is described in the legal documents of the Thai government.</p>	<p>Status of the Achievement: achieved (continued) (Project Completion)</p> <ul style="list-style-type: none"> - In 2013, the emission estimation manuals for point sources were prepared for the major sources of emissions: petroleum refineries, chemical/ petrochemical industries, automobiles, and related industries, and approved by the respective task force. - In 2013, regarding non-point sources, estimation methodologies were prepared, by clarifying coverage and estimation approaches for various non-point sources. - In 2014, emissions of all the known non- sources were estimated. <p>(Ex-post Evaluation)</p> <ul style="list-style-type: none"> - The methodologies for release estimations from non-point sources including households, agriculture, construction (painting), gas station, and vehicle have been improved and used in the ongoing pilot areas in Rayong, Samut Prakan, and Chonburi provinces. - In the above-mentioned three pilot provinces, the estimation manuals for point sources have been used by target industries designated by DIW, and the data reporting results were confirmed (see the table below). <p>(Ex-post Evaluation) Achieved</p> <p>Regarding the Thai legal document on the PRTR system, by the amended “Factory Act” in 2020, Article 8(7) stipulates the reporting obligation for the PRTR system. Although the PRTR system was included in the proposed revision of the “Enhancement and Conservation of the National Environmental Quality Act”, it is under review by the Office of Council of State and not yet enacted in the Thai Parliament at the time of the ex-post evaluation.</p> <p>It is noted, however, that regarding the status of chemical substance emissions, it was confirmed that the PRTR system was in operation as data related to chemical substance emissions has been available in a searchable format on the PCD website shown below. (http://prtr.pcd.go.th/)</p> <p>Table 1: The Actual Number of PRTR Report submitted by Factories and the Total Number of Factories covered by PRTR System in Thailand</p> <table border="1" data-bbox="774 1630 1528 2161"> <thead> <tr> <th colspan="2">Industry</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Chemical/ Petrochemicals</td> <td>Actual</td> <td>69</td> <td>N.A.</td> <td>96</td> <td>115</td> </tr> <tr> <td>Total</td> <td>225</td> <td>687</td> <td>733</td> <td>751</td> </tr> <tr> <td rowspan="2">Automobile/ Auto parts</td> <td>Actual</td> <td>43</td> <td>N.A.</td> <td>87</td> <td>124</td> </tr> <tr> <td>Total</td> <td>290</td> <td>805</td> <td>1,173</td> <td>1,205</td> </tr> <tr> <td rowspan="2">Natural gas separation/ Petro product</td> <td>Actual</td> <td>6</td> <td>N.A.</td> <td>10</td> <td>13</td> </tr> <tr> <td>Total</td> <td>23</td> <td>57</td> <td>75</td> <td>111</td> </tr> <tr> <td rowspan="2">Primary metal industry/ Metal products</td> <td>Actual</td> <td>43</td> <td>N.A.</td> <td>131</td> <td>206</td> </tr> <tr> <td>Total</td> <td>382</td> <td>1,958</td> <td>2,633</td> <td>2,700</td> </tr> <tr> <td rowspan="2">Electrical appliances manufacturing</td> <td>Actual</td> <td>16</td> <td>N.A.</td> <td>37</td> <td>67</td> </tr> <tr> <td>Total</td> <td>86</td> <td>434</td> <td>663</td> <td>692</td> </tr> <tr> <td rowspan="2">Plastic product manufacturing</td> <td>Actual</td> <td>25</td> <td>N.A.</td> <td>60</td> <td>103</td> </tr> <tr> <td>Total</td> <td>223</td> <td>952</td> <td>1,283</td> <td>1,373</td> </tr> <tr> <td rowspan="2">Rubber / Rubber product manufacturing</td> <td>Actual</td> <td>13</td> <td>N.A.</td> <td>17</td> <td>24</td> </tr> <tr> <td>Total</td> <td>109</td> <td>241</td> <td>275</td> <td>284</td> </tr> <tr> <td rowspan="2">Power plant</td> <td>Actual</td> <td>2</td> <td>N.A.</td> <td>11</td> <td>10</td> </tr> <tr> <td>Total</td> <td>35</td> <td>62</td> <td>79</td> <td>81</td> </tr> <tr> <td>Waste management</td> <td>Actual</td> <td>8</td> <td>N.A.</td> <td>48</td> <td>71</td> </tr> </tbody> </table>	Industry		2015	2016	2017	2018	Chemical/ Petrochemicals	Actual	69	N.A.	96	115	Total	225	687	733	751	Automobile/ Auto parts	Actual	43	N.A.	87	124	Total	290	805	1,173	1,205	Natural gas separation/ Petro product	Actual	6	N.A.	10	13	Total	23	57	75	111	Primary metal industry/ Metal products	Actual	43	N.A.	131	206	Total	382	1,958	2,633	2,700	Electrical appliances manufacturing	Actual	16	N.A.	37	67	Total	86	434	663	692	Plastic product manufacturing	Actual	25	N.A.	60	103	Total	223	952	1,283	1,373	Rubber / Rubber product manufacturing	Actual	13	N.A.	17	24	Total	109	241	275	284	Power plant	Actual	2	N.A.	11	10	Total	35	62	79	81	Waste management	Actual	8	N.A.	48	71
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		Total	149	330	614	646
		Actual*1	225	403*2	497	733
		Total	1,522	5,526	7,528	7,843

Note1: The data in 2015 is only from Rayong province, the sole pilot province at that time. In 2016, Samut Prakan joined the pilot program together with Rayong. And in 2017 and then after, the data was reflected by the addition of reporting records from Chonburi.

Note2: A total number only, and no breakdown data by industry available.

Source : Questionnaire responses from PCD, DIW, and IEAT.

3 Efficiency

Although the project cost was as planned (ratio against the plan: 100%), the project period exceeded the plan (ratio against the plan: 127%) in order to ensure the involvement of a wide range of stakeholders. The outputs were produced as planned. Therefore, the efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

The overall policy for environmental conservation has remained to enhance cooperation with local governments and communities including all the environmental data management, analysis, monitoring systems towards promoting the implementation of the PRTR system. In the context of industrial pollution prevention and reduction at source to control particulate matters as outlined in the Action Plan for Implementation of the National Agenda on “Solving Pollution from Particulate Matters” approved by the National Environmental Board Meeting No. 5/2562 dated 15 August 2019, the development of the PRTR system is incorporated among the short-term measures scheduled to be implemented from 2019 to 2021. Particularly, in the context of streamlining emission control, treatment and disposal methods at point sources in the agricultural and industrial sectors, the PRTR system is stated in: “Strategy on 20-Year Pollution Management and Pollution Management Plan” (2017-2021). Similarly, PCD’s “PRTR Development Plan” (2016-2021) specified legislation, public dissemination, data system management, risk communication through the PRTR data, training, estimation as well as the development and revision of the manuals, the implementation of the second phase of JICA’s PRTR project, and pilot project implementation in the three provinces, and so on.

< Institutional/Organizational Aspect>

The jurisdiction of each implementing agency concerning the PRTR system has remained unchanged. At the time of the ex-post evaluation, PCD under MONRE is an environmental policy formulating agency. DIW, under MOI, is a regulatory agency overseeing factories. IEAT, a state enterprise under MOI, is responsible for developing domestic industrial estates. PCD and DIW co-chair and share the secretariat role of the PRTR sub-committee which is in charge of designing the PRTR system. From the perspective of staffing in terms of the implementation for the development and dissemination of the PRTR system, PCD assigned five staff members, and they perceived sufficient to fulfill the duties. As for DIW, five full-time staff were assigned, and the other 20 staff members engaged indirectly in the related work. It was reported that there were no particular problems in terms of manpower. In IEAT, it was reported that five staff members were assigned, and it was sufficient to carry out the related tasks. In addition, the PRTR sub-committee under the Pollution Control Committee is still actively working.

<Technical Aspect>

According to the survey results, the number of counterparts still engaged in the promotion of the PRTR system was 3 in PCD, 1 in DIW, 5 in IEAT at the time of the ex-post evaluation. All counterparts in IEAT continue to work. As such, DIW conducted training for technology transfer to the successors. Both PCD and DIW responded that the needed skills of the staff in charge were maintained through the utilization of the manuals and training. As for IEAT, the staff in charge also utilize the manuals and training to maintain the necessary skills, although there is no chemical expert in the organization.

<Financial Aspect>

According to the survey results, the budget for the development and dissemination of the PRTR system has been annually allocated to PCD. DIW has operated on a budget of 2.8 million THB in 2017, the year after project completion, and most recently 0.8 million THB in 2019. In order to maintain and disseminate the PRTR system to additional areas in the future, it is important for each relevant agency to continuously and sufficiently adopt budgetary measures for the enforcement of the PRTR system.

<Evaluation Result>

In light of the above, slight uncertainties have been observed in terms of the technical and financial aspects. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The project has achieved the Project Purpose and the Overall Goal as the capacity of PCD, DIW, and IEAT to implement the PRTR system were notably strengthened and the Thai PRTR system model was established. Furthermore, it was confirmed a track record of PRTR data reports from private business establishments of target industries in the three pilot provinces. As for sustainability, whereas it was confirmed that it addressed the PRTR system in terms of policy and institutional/organizational aspects, there remain some challenges in terms of technical and financial aspects for the future extension of the PRTR system. As for efficiency, the project period exceeded the plan.

Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

In order to further enhance the sustainability of the project effect, it is indispensable to further strengthen the internal and external cooperation of implementing agencies of MONRE and MOI. For the future, to gain public understanding through holding workshops and to promote the maintenance and management of open data portals (information disclosure web system), it is recommended especially for DIW and IEAT, (1) to secure sufficient manpower to disseminate and develop the PRTR system, (2) to strengthen the knowledge and capacities to be systematically shared throughout each organization, e.g. institutionalized hand-over training in the event of personnel transfer, etc.

Lessons Learned for JICA:

Throughout the project, it was extremely important to hold dialogue with interested parties (information disclosure, etc.), collaboration, and trust-building of stakeholders (related government agencies private companies, NGOs). It was deemed to be indispensable to have a common understanding and trust among the three parties: government agencies (regulatory agencies), regulated organizations (private companies), and third parties (citizens, NGOs, etc.) that could be built through dialogue and information disclosure. Regarding the extent of efforts for the PRTR system, in particular, it was required to spend a year and a half to set the stage for trust and collaboration among major stakeholders at the very outset of the project. They were specifically, the MONRE, which is a policy-making agency, the MOI, which is responsible for industrial policy, and private companies (including IEAT), which are the sources of pollutant emissions. It should be noted that enhancing transparency while ensuring fairness, dialogue interactions with citizens and NGOs, and information disclosure by progress reports with data have contributed to building trust among stakeholders. Furthermore, in terms of the PRTR system that is fundamentally based on reports and notifications from the private business establishment as a source of emission, it would be ultimately appreciated as an effective environmental regulatory measure only if the registered and disclosed data are widely utilized by the government, businesses, and civil society. Therefore, it is imperative in promoting the development of the system (1) to set forth the collaborative relationships among stakeholders at the early stage, (2) to ensure transparency through fair and impartial information disclosure practice, and (3) to take due care of trust-building among all parties concerned. When it aims at the development and implementation of a regulatory system to be practical as well as effective, it is essential to adequately incorporate necessary activities into the project such as promoting a common understanding among stakeholders and building a collaborative framework to be engaged from the project formulation stage.



Participants from the PCD, the DIW, IEAT, and the private sector who co-announced the PRTR pilot project at the International Environmental Chemistry Society in 2014



Participants from PCD, DIW, and IEAT attended the PRTR Refresh Workshop in November 2020 in order to update the PRTR implementation in Thailand