



# Project Information Document/ Integrated Safeguards Data Sheet (PID/ISDS)

Concept Stage | Date Prepared/Updated: 13-Feb-2018 | Report No: PIDISDSC23493



**BASIC INFORMATION**

**A. Basic Project Data**

Country Thailand	Project ID P165235	Parent Project ID (if any)	Project Name Thailand HCFC Stage II (P165235)
Region EAST ASIA AND PACIFIC	Estimated Appraisal Date Oct 30, 2018	Estimated Board Date Jan 30, 2019	Practice Area (Lead) Environment & Natural Resources
Financing Instrument Investment Project Financing	Borrower(s) Public Debt Management Office	Implementing Agency Department of Industrial Works	

**Proposed Development Objective(s)**

The project development objective is to contribute to Thailand’s efforts to meet the 2020 HCFC consumption phase-out obligations of the Montreal Protocol and the initial requirements of the Kigali Amendment.

**Financing (in USD Million)**

**SUMMARY**

<b>Total Project Cost</b>	12.60
<b>Total Financing</b>	12.60
<b>Financing Gap</b>	0.00

**DETAILS**

<b>Total Government Contribution</b>	5.00
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Environmental Assessment Category

B-Partial Assessment

Concept Review Decision

Track I-The review did authorize the preparation to continue

Other Decision (as needed)



## B. Introduction and Context

### Country Context

1. Hydrochlorofluorocarbons (HCFCs) are ozone-depleting substances (ODS) subject to consumption and production control measures of the Montreal Protocol (MP) on substances that deplete the ozone layer. They are mainly used as refrigerants in refrigeration and air-conditioning equipment and as blowing agents for insulation foam. HCFCs are also very potent greenhouse gases (GHG), and consequently have an impact on both ozone depletion and climate change. The phase-out of HCFCs usually presents an opportunity to reduce direct and indirect GHG emissions through using low Global Warming Potential (GWP) alternatives and improvement of product design to enhance energy efficiency of the projects, thereby leading to multiple benefits to the global environment.
2. Thailand ratified both the Vienna Convention on protection of the ozone layer and the MP on substances that deplete the ozone layer on July 7, 1989. As an Article 5 signatory of the MP, Thailand has fulfilled its obligations to phase out consumption of all controlled substances except for HCFCs. It has committed to freeze consumption of HCFCs in 2013 and to reduce HCFC consumption by 10% in 2015, by 35% in 2020, by 67.5% in 2025, 100% by 2030 while allowing for servicing an annual average of 2.5% during the period 2030 to 2040. The baseline HCFC consumption of Thailand which is the 2013 freeze consumption level is 927.6 ODP tons.
3. To meet the first two obligations of the MP in 2013 and 2015, the Executive Committee (ExCom) of the Multilateral Fund (MLF) for Implementation of the MP approved in 2012 a total grant fund of US \$23 million to support implementation of Stage I HCFC Phase-out Project. Through this support, Thailand extended its commitment to reduce its HCFC consumption to 15% of the baseline level by 2018. The Stage I HCFC Phase-out Project entails HCFC phase-out in the foam sector, except spray foam due to lack of alternatives at that time, and in the residential air-conditioning (A/C) sector.
4. The implementation of the Stage I HCFC Phase-out Project will complete in December 2018. Thus far, Thailand has complied with the 2013 and 2015 consumption reduction targets. The latest independent verification of HCFC consumption confirmed that HCFC consumption in 2016 reduced to 588 ODP tons (equivalent to 9,436 MT). In addition, two ministerial notifications banning the use of HCFC-22 for manufacturing residential A/C for the domestic market and the use of HCFC-141b for manufacturing all polyurethane foam, except spray foam, have become effective since 1 July 2017.
5. With the reduced level of consumption achieved in 2016 and enforcement of the bans in the two sectors, Thailand will be able to achieve and sustain future consumption at the level below the 2018 target as stipulated in the agreement between the ExCom and Thailand. To ensure full compliance with the next target of 35% reduction by 2020, the ExCom and Thailand agree that there is a need for Thailand to implement additional activities to meet the new obligations (Decision 80/72).

### Sectoral and Institutional Context

6. Thailand does not produce any HCFCs, its demand for HCFCs is met through imports. Based on the definition of the MP, the total amount imported within the calendar year is considered as consumption. HCFC consumption in Thailand is primarily attributed to HCFC-22, HCFC-141b, HCFC-123, HCF-124, and blends of HCFC-225ca and HCFC-225cb. According to the independent verification of HCFC consumption in 2016, there were four HCFCs imported during that year and the total quantity was 588 ODP tons or 9,436 MT with HCFC-22 represented 84% of the total imports in MT. Statistical HCFC consumption data for the period 2011 – 2016 is shown below.



Table 1: Statistical HCFC Consumption Data in MT

HCFC (MT)	Average*	2011	2012	2013	2014	2015	2016
HCFC-22	13,029	11,446	16,821	12,318	11,984	10,365	7,921
HCFC-141b	1,866	1,620	2,029	2,028	1,830	1,818	1,353
HCFC-142b	2	-	-	-	-	-	-
HCFC-123	160	135	199	116	136	143	135
HCFC-124	-	3	3	4	4	-	-
HCFC-225ca/cb	55	29	24	38	39	9	28
Total	15,111	13,232	19,076	14,504	13,995	12,335	9,436

\*Average is the average consumption between 2009 and 2010.

Table 2: Statistical HCFC Consumption Data in ODP tons

HCFC (ODP t)	Average*	2011	2012	2013	2014	2015	2016
HCFC-22	716.568	629.517	925.165	677.505	659.139	570.092	435.641
HCFC-141b	206.100	178.200	223.188	223.061	201.351	199.945	148.821
HCFC-142b	0.130	-	-	-	-	-	-
HCFC-123	3.190	2.691	3.978	2.316	2.721	2.858	2.693
HCFC-124	-	0.066	0.066	0.097	0.097	0.003	-
HCFC-225ca/cb	1.595	0.830	0.697	1.104	1.141	0.251	0.804
Total	927.583	811.303	1,153.093	904.084	864.449	773.149	587.959

\*Average is the average consumption between 2009 and 2010.

7. Imported HCFCs were used typically for manufacturing new products as well as for servicing existing products that have already been placed in the market. The manufacturing sector using HCFCs include refrigeration and air-conditioning industry, fire protection industry, and solvent cleaning industry. For servicing, HCFC-22, HCFC-123 and HCFC-141b are used for maintaining A/C and refrigeration systems. Since July 2017, HCFC consumption in the manufacturing of residential A/Cs with cooling capacity less than 50,000 BTU/hr and polyurethane foam products (except spray foam) have already been banned. Currently, manufacturing of the following products still use HCFCs: light commercial and industrial A/C and commercial and industrial refrigeration (HCFC-22); spray foam (HCFC-141b); fire protection equipment (HCFC-123); and solvent cleaning industry (HCFC-141b and HCFC-225ca/cb).

8. Due to the current requirements of international standards pertaining to safety use of mildly and highly flammable refrigerants in large A/C equipment, no low/lower-GWP alternative technologies are technically feasible. Efforts to accommodate these alternatives are underway. The revised standards to allow the use of a larger charge of lower-GWP alternative refrigerants in larger A/C systems are expected to be approved in the next few years.

9. While there is still HCFC-22 used in manufacturing commercial refrigeration equipment, the quantity and its growth are expected to be limited. Most commercial and industrial refrigeration manufacturers in Thailand have shifted to high GWP HFCs for applications where the use of natural refrigerants is not feasible due to safety concerns, and some to natural refrigerants, where feasible. Conversion from HCFC-22 to high GWP HFC technology in this application has



become the norm of the industry. This could pose challenging problems for Thailand when the obligations of the Kigali Amendment controlling HFC consumption and production enter into force in 2024.

10. Use of HCFC-141b and HCFC-225ca/cb for cleaning processes in the manufacturing sector is reported to be stable for the past six years. Similarly, the demand of HCFC-123 for fire protection equipment remains stable during the same period.

11. The demand of HCFCs for servicing purposes is growing. As HCFC-22 A/Cs and refrigeration systems that have already been out in the market are getting older, these systems tend to leak and break down more frequently.

12. Taking into account the consumption reduction achieved from the Stage I HCFC Phase-out project and Decision 80/72, the Stage II HCFC Phase-out Project will address the phase-out of HCFC-141b in the spray foam application, limited intervention in the commercial refrigeration sector to demonstrate the use of low GWP alternatives for this sector, and HCFC-22 and HCFC-141b phase-out in the servicing sector.

#### Relationship to CPF

13. The draft Country Partnership Framework for the Kingdom of Thailand dated November 20, 2017, lays out the World Bank Group's plan of assistance for Thailand for supporting Thailand's national development priorities to revive high growth while strengthening inclusion and sustainability in fiscal years 2018 to 2022. The development objective of the Stage II HCFC phase-out project is specifically linked to Objective 4 pertaining to further strengthen the sustainability of growth. The second prong of the strategy targets improvement of Thailand's competitiveness under Objective 1 and contributes to the quality of the vocational education under Objective 6.

14. The project will provide technical and financial support to Thai industry for transforming their manufacturing processes to climate friendly technologies which have become standard requirements of most trading partners in developed and developing countries. The project will also support improvement of the curriculum of A/C and refrigeration service technicians by providing technical assistance to develop good servicing practices and provide training equipment to technical institutes.

#### **C. Proposed Development Objective(s)**

15. The project development objective is to contribute to Thailand's efforts to meet the 2020 HCFC consumption phase-out obligations and requirements of the Kigali Amendment of the Montreal Protocol and the agreement between Thailand and the Executive Committee of the Multilateral Fund.

#### Key Results (From PCN)

16. The objective will be achieved by reducing HCFC consumption in the spray foam application and A/C and refrigeration servicing sectors, demonstration of alternative technologies in the commercial refrigeration, and introducing the use of low GWP alternatives.

17. The HCFC consumption will be limited to the level not exceeding 788 ODP tons in 2019 and 602.94 ODP tons by 2020. This represents a HCFC consumption reduction of 185 ODP tons from the 2018 maximum allowable consumption level as stipulated by the agreement of the Stage I HCFC phase-out project between Thailand and the ExCom. Carbon



dioxide (CO<sub>2</sub>) emission reduction from the use of lower GWP alternatives and improved energy efficiency will be captured through result indicators.

#### D. Concept Description

18. The proposed project is a continuation of Thailand HCFC Phase-out Project (P115761) Stage I. It will build on the infrastructure and capacity established under the Stage I project to deliver the required assistance to beneficiaries and stakeholders. While the 2016 HCFC consumption has already reduced to 589.09 ODP tons, the consumption is expected to grow due to the increasing use of HCFC-141b in the spray foam application and the growing demand of HCFC-22 for servicing applications due to the aging of existing A/C and refrigeration systems that have already been installed in the market.

19. The overarching strategy of the Stage II HCFC Phase-out Project is to leverage industry cooperation to extend the effect of the Stage I HCFC Phase-out Project in the polyurethane foam industry to eliminate the remaining use of HCFC-141b in the spray foam application. The proposed project will continue to nurture the relationship between the A/C manufacturing industry and the network of training schools/centers, which was built under the Stage I project, with an aim to reduce HCFC leakage during operations and during services.

20. The project will provide technical and financial assistance to eligible manufacturers, primarily in the spray foam sector, to reformulate new foam systems (polyol and blowing agent) and retooling manufacturers with new equipment compatible with new foam systems. The proposed project will support adoption of low-GWP blowing agents consistent with the Kigali Amendment of the MP. In addition, the project will support a limited number of eligible commercial refrigeration manufacturers to demonstrate low-GWP alternative technologies for commercial refrigeration equipment.

#### Component 1: Investment in HCFC Consumption Reductions (US \$5 million)

21. The project will finance conversion in the foam and commercial refrigeration sectors respectively, the conversion from: (i) HCFC-141b used as a blowing agent for manufacturing polyurethane spray foam at about 40 enterprises and system houses; and (ii) HCFC-22 and/or high GWP chemicals used as refrigerants for manufacturing commercial refrigeration equipment in 1 – 2 enterprises.

22. For the spray foam manufacturers, the project will finance the following costs of conversion to low-GWP alternatives (HFOs and CO<sub>2</sub>): (i) purchasing and retrofitting of foam equipment; (ii) storage room for HFOs and new foam systems; (iii) trial production and training; (iv) incremental operating cost of the alternative technologies for a transitional period; and (v) other eligible costs to be determined during project preparation. For system houses, the project will finance: (i) development and testing of new foam formulation based on HFOs and CO<sub>2</sub><sup>1</sup>; (ii) cold room for storage of HFOs; and (iii) premixing unit for HFOs and polyols.

23. For the commercial refrigeration sector, the project will finance the following costs: (i) new manufacturing equipment compatible with HFC-32 or HFC/HFO blends; (ii) development and testing of new products; (iii) safety equipment; (iv) technology transfer; (v) training; (vi) equipment for installation and servicing of new products; and (vii) other incremental operating costs such as production of new brochures, catalogues, etc.

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<sup>1</sup> CO<sub>2</sub> technology does not require dedicated storage facilities nor premixing units.



24. Eligible beneficiaries will enter into sub-grant agreements with Government Savings Bank (GSB) serving as a financial agent of this project. This arrangement is similar to the Stage I project.

Component 2: Technical Assistance (US \$1.6 million)

25. Technical assistance component is designed to strengthen capacities of relevant government agencies, technical institutes and private entities that engage in HCFC import/export, handling, use, and end-of-use. Training on proper installation and maintenance of HFC-32 residential air-conditioners to enhance market penetration of this technology which was adopted by the Stage I project and training to minimize leakage of HCFC-22 from existing HCFC-22 based residential A/C and commercial refrigeration equipment will be financed by this component. Other eligible activities include policy and standard development to facilitate market transformation in the spray foam and commercial refrigeration sectors, public awareness to eliminate the use of HCFC-22 and avoid the use of high GWP HFCs, and technical review and dissemination of the findings on alternative cleaning agents to the industry that are still using HCFC-141b for manufacturing and servicing.

26. This project component would also include activities/tasks to strengthen authorities' understanding of the MP requirements and their enforcement capacity to ensure that there is no diversion of HCFCs to applications where such uses have already been prohibited.

27. Expenditures to be incurred by this component include goods, consultant service, and incremental operating costs (such as workshops, training, travel, communications, and others). Activities under this component would be implemented by both DIW and GSB. Specific roles and responsibilities of DIW and GSB will be delineated during project preparation.

Component 3: Project Management (US \$0.4 million)

28. The project management units (PMUs) of DIW and GSB established by the Stage I project will continue to provide project management support on a day-to-day basis. DIW-PMU will be responsible for management and coordination of the overall implementation of this project. Its main function will be to assist DIW to implement its HCFC import licensing and quota systems and existing sector-specific regulations put in place under the Stage I project as well as introduce new sector-specific regulations to support elimination of HCFC-141b in the manufacturing of spray foam and promoting the use of low-GWP alternatives in the commercial refrigeration sector.

29. GSB-PMU will be responsible for implementing Component 1 of the project. Its functions include: (i) provision of guidance to eligible enterprises to prepare sub-project proposals; (ii) appraising sub-project proposals; (iii) signing sub-grant agreements with eligible enterprises; (iv) monitoring sub-project implementation; (v) disbursement of funds to enterprises; and (vi) preparation of sub-project completion reports. DIW-PMU will assist GSB-PMU to: (i) confirm enterprises' eligibility; (ii) review and approve plans for disposing of baseline equipment replaced by the sub-project; (iii) confirm implementation completion including implementation of the disposal plans. Detailed roles and responsibilities of DIW-PMU and GSB-PMU will be delineated in the project implementation manual (PIM) to be prepared during project preparation.

Component 4: Strengthening of the National Ozone Unit (US\$ 0.6 million)

30. The National Ozone Unit (NOU) was established in 1992 within DIW. Its main functions are to monitor import and export of ODS and to report to the UNEP Ozone Secretariat in accordance with Article 7 of the MP. In this regard, the



NOU is responsible for establishing import/export quotas of ODS for all importers/exporters on an annual basis, and liaising with other government agencies including the Customs Department to ensure the effective control of the border to preempt any illegal shipments of ODS in and out of the country. In addition, the NOU is required by the ExCom to provide progress reports in the implementation of the country program, national ODS phase-out program, on an annual basis.

31. Under this proposed project, the NOU will have additional responsibility to support DIW and the Government of Thailand to proceed with the ratification of the Kigali Amendment, review existing Hazardous Substances Control Act and recommend any adjustment/amendment to ensure compliance with new obligations in relation to HFC control. The current licensing and quota systems will be reviewed and extended to cover HFCs.

32. The NOU is also tasked to carry out public awareness activities, information exchange with stakeholders in the country, including both public and private sectors, and stakeholders in other Article 5 countries within the region. It is required to participate in all international meetings related to the MP, including meetings of the Parties, UNEP networks of ozone officer meetings, and other meetings organized by all implementing agencies of the MLF (i.e., UNDP, UNEP, UNIDO and the World Bank).

## SAFEGUARDS

### A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

Conversion activities under the project will be undertaken at the existing manufacturing facilities which are located mostly in Bangkok and in industrial zones in the neighboring provinces (i.e., Samutprakarn and Nonthaburi). Conversion activities entail replacement or conversion of process which produce equipment containing non-ODS refrigerant and foam products with non-ODS blowing agent. Retooling process will happen within the premises of the individual companies. No land acquisition will be required under the project. The conversion process and technical support will be conducted within the premises/sites of the individual spray foam enterprises/system houses and demonstration commercial refrigeration enterprises.

It is likely that two HFOs (HCFO-1233zd and HFO-1336mzz-Z) will be selected as alternatives for the conversion of spray foam. Both HCFO-1233zd and HFO-1336mzz-Z are nonflammable substances. HCFO-1233zd is considered practically nontoxic by the inhalation route of the exposure. Workplace exposures with HFO-1336mzz-Z would likely occur via the inhalation route. The 4-hour LC50 in rats of >102,900 ppm (v/v) indicates that the substance has low acute inhalation toxicity. Due to physical characteristics of the HFOs, it is not anticipated adverse effect to human health. All participating foam enterprises must be in compliance with National, local laws and regulations related to environment/social/health and safety protection.

For one or two demonstration project under commercial refrigeration sector, the project will finance new manufacturing equipment compatible with HFC-32 or HFC/HFO blends. Since HFC-32 is mildly flammable substances, safety equipment will be provided and potential safety risks and fire hazards need to be properly addressed in the environmental management plan.

Another major activity of the project is to provide proper service tools for air-conditioning (A/C) and refrigeration service shops and training centers in order to minimize leakage during operations and services.





### B. Borrower’s Institutional Capacity for Safeguard Policies

The Department of Industrial Works (DIW) is mandated to enforce the law controlling the use and disposal of chemical substances in the country which includes the regulation of HCFCs. Hazardous Substances Division of DIW of the Ministry of Industry is in charge of regulation HCFCs in the country. DIW which is the responsible agency for the implementation of the Montreal Protocol, its amendment and Kigali amendment, has experience in Bank safeguards through the previous ODS projects funded by the World Bank. Therefore, DIW has the capacity to oversee, supervise and monitor the overall implementation of the spray foam conversion, demonstration of commercial refrigeration conversion and A/C and refrigeration servicing shops. For more than two decades, DIW-PMU responsible for providing technical input for the scope and deliverables for all technical assistance activities for ODS Phaseout project and ensure its compliance with the Bank safeguard policies. During the conversion of A/C to R-32 (mildly flammable substance) technology and foam enterprises (except spray foam) to CO2 technology and cyclopentane, DIW and PMU staff play an important role to review due diligence report, safety audit report, conduct site visits to ensure safety conversion to R-32 and Cyclo-pentane technology in line with Environmental management plan and National law and regulations.

DIW will work closely with its alliance the Department of Alternative Energy development and Efficiency, the Department of Skill development, the Office of Vocational Education Commission and several industry and professional associations. This will ensure the energy efficiency will be taken into the consideration of the HCFC phase-out and technical support to service technician in handling low GWP refrigerant will be successfully achieved.

DIW will prepared ESMF for the spray foam conversion project. The Environmental management Plan (EMP) will be prepared for one or two demonstration commercial refrigeration projects. The ESMF and EMP will be publicly disclosed in country and at the Bank’s Infoshop and a stakeholder consultation workshop will be conducted prior to project appraisal. The Bank safeguard policies will be trained to relevant stakeholders as a refreshment training during project preparation and at the project launch workshop.

### C. Environmental and Social Safeguards Specialists on the Team

Pamornrat Tansanguanwong, Social Safeguards Specialist  
Waraporn Hirunwatsiri, Environmental Safeguards Specialist

### D. Policies that might apply

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The project will have a positive impact on the global environment as HCFCs are not only ozone depleting substances, but they also are high global warming gases whose global warming potential (GWP) ranges from several hundred to several thousand times that of carbon dioxide. Moreover, the conversion of various HCFC-based manufacturers to alternative, advanced technologies usually leads to improved energy efficiency, particularly in the refrigeration and



air-conditioning sectors. Thus, phasing out HCFCs provides two types of potential benefit to the climate.

The project will provide financial and technical support to local 40 spray foam manufacturers to convert from HCFC 141 b to low-GWP technology. Most of foam enterprises will adopt non-flammable hydrofluoroolefins (HFOs) which are non-ozone depleting substances and with global warming potential of less than 1. The HFOs and CO<sub>2</sub> alternatives technologies are not caused significant adverse environmental and human health impact but proper measures need to be in place. For commercial refrigeration conversion, non-ODS and low-GWP alternative refrigerants will be considered. One or two demonstration project/s to convert commercial refrigeration to R-32 technology or HFC/HFO blended technology of which are mildly flammable can be mitigated by installation of appropriate safety equipment. The technical support to service technician to adopt good practices for installation and maintenance of lower GWP residential A/C and improve service practices for service and maintenance of residual HCFC-22 based residential A/Cs will support the sustainable of the implementation of HCFC phaseout stage I. Therefore, the project triggers Environmental Assessment (OP/BP 4.01), as its interventions may impact on environmental safety and occupational health. In particular, handling of the low GWP substances is not done properly. However, the project activities will likely occur in existing facilities and these impacts will be site-specific, which can be mitigated by implementation of proper measures. Therefore, the project is assigned as Environmental Category B project.

For the foam sector, since the participation of the 40 potential foam enterprises and systems houses has not been confirmed by the project appraisal stage, an environmental and social management framework (ESMF) will be prepared for the implementation of the spray foam conversion sector to HFO or CO<sub>2</sub> technology prior to appraisal. The ESMF will be disclosed in country and at the Bank's InfoShop, and a stakeholder consultation will be conducted prior to project appraisal. For the two demonstration



commercial refrigeration projects, a due diligence review addressing occupational health and safety, fire and exposure risks, will be conducted during preparation. The Environmental Management Plan (EMP) with site-specific measures including appropriate emergency preparedness and response measures consisted with the World Bank Group's Environment, Health and Safety (EHS) Guidelines, will be prepared for each demonstration sub-project prior to appraisal. Staff involved in the production, installation and services will be trained as needed.

All the participating enterprises must be in compliance with National, and local law and regulations related to environment/ social/health and safety protection.

Similarly to the outcome of the project in Phase I, The outcome of the phaseout in this project is gender neutral. The project will provide equal opportunity for male and female workers to participate in training and other capacity building activities.

Natural Habitats OP/BP 4.04	No	The project will not affect any protected areas, known natural habitats, or established or proposed critical natural habitats since all the project activities will take place in existing industrial facilities. According to Thai law and regulation, the respective factories are not permitted to be located in any protected areas, known natural habitats, or established or proposed critical natural habitats.
Forests OP/BP 4.36	No	The project will not finance activities that would involve significant conversions or degradation of critical forest areas or related critical natural habitats as defined under the policy.
Pest Management OP 4.09	No	The project will not finance procurement of pesticides or pesticide application equipment (either directly or indirectly). In addition the project will not affect pest management in a way that harm could be done, nor lead to increased pesticide use and subsequent increase in health and environmental risk.
Physical Cultural Resources OP/BP 4.11	No	The project will not adversely affects sites with archeological, paleontological, historical, religious, or unique natural values as all project activities will be developed within the existing plants of the project beneficiary enterprises or in an industrial area.



Indigenous Peoples OP/BP 4.10	No	All project activities will be developed within the existing plants of project beneficiary enterprises or in industrial areas. The potential beneficiary enterprises are not located in an area with indigenous peoples. No indigenous peoples group will be affected.
Involuntary Resettlement OP/BP 4.12	No	All the project activities will be within the existing plants of project beneficiaries. There will be no land acquisition or involuntary resettlement related impact.
Safety of Dams OP/BP 4.37	No	The project will not involve any construction or rehabilitation of any dams.
Projects on International Waterways OP/BP 7.50	No	The project will not involve international waterways.
Projects in Disputed Areas OP/BP 7.60	No	The project is not located in any known disputed areas.

### E. Safeguard Preparation Plan

Tentative target date for preparing the Appraisal Stage PID/ISDS

Oct 15, 2018

Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the Appraisal Stage PID/ISDS

The safeguard instrument, Environmental and Social Management Framework (ESMF) for the implementation of the foam conversion sub-project, and site-specific Environmental Management Plans for enterprises in the commercial refrigeration sector will be prepared, disclosed and consulted prior to project appraisal. The ESMF and EMP will be disclosed locally (in local language-Thai) and in the Bank Infoshop prior to the appraisal mission.

### CONTACT POINT

#### World Bank

Viraj Vithoontien  
Lead Environment Specialist

#### Borrower/Client/Recipient

Public Debt Management Office  
Prapas Kong-led  
Director General  
prapas@pdmo.go.th



**Implementing Agencies**

Department of Industrial Works  
Mongkol Pruekwatana  
Director-General  
mongkol.diw@gmail.com

**FOR MORE INFORMATION CONTACT**

The World Bank  
1818 H Street, NW  
Washington, D.C. 20433  
Telephone: (202) 473-1000  
Web: <http://www.worldbank.org/projects>

**APPROVAL**

Task Team Leader(s):	Viraj Vithoontien
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**Approved By**

Practice Manager/Manager:	Christophe Crepin	22-Feb-2018
Country Director:	Ulrich Zachau	22-Feb-2018