SFG3881

CHINA: HCFC Phase-out in HCFC Production Sector and PU Foam Sector

ENVIRONMENTAL MANAGEMENT FRAMEWORK

Foreign Economic Cooperation Office

The Ministry of Environmental Protection

December, 2017

CONTENTS

I. Introduction

1 At the 19th Meeting of the Parties to the Montreal Protocol on September 2007, the Parties agreed to accelerate HCFC phase-out. China, as Article 5 country, will freeze production and consumption of HCFC in 2013 and will reduce HCFC production and consumption by 10% in 2015, by 35% in 2020, by 67.5% in 2025 with a total phase-out in 2030, while allowing for servicing an annual average of 2.5 percent during the period 2030 to 2040.

2 In November 2014, the Executive Committee of the Multilateral Fund for the Implementation (ExCom) has approved the "Preparation Reserve Fund Project of the 2nd Phase HCFCs Phase-out Management Plan in China's PU Foam Sector" at the 73rd Meeting; in November 2015, has approved the "Preparation Reserve Fund Project of the 2nd Phase HCFCs Phase-out Management Plan in China's HCFCs Production Sector" and the World Bank was assigned as the international implementing agency to assists Project Management Organization (hereinafter referred to as PMO) in China at the 75th Meeting. In December 2016, the 2nd Phase HCFCs Phase-out Management Plan in China's PU Foam Sector has been approved by the Executive Committee of the Multilateral Fund at the 77th Meeting for the Implementation and the entire phase-out of the use of HCFCs as the foaming agent in such section will be achieved before the end of 2025. The 2nd Phase HCFCs Phase-out Management Plan of China's HCFCs Production Sector has also been prepared completely and submitted to Executive Committee of the Multilateral Fund for the Implementation for the approval in March 2017.

3 As the project has multiple subprojects, to determine their locations of subprojects at the time of the appraisal, PMO has upgraded the Environmental Management Framework (EMF) under assistance of its consultants while looking back the 1st phase of the HCFC phase-out project. The Environmental Management Framework (EMF) will be used to provide guidance to both beneficiary enterprises and the PMO under the Ministry of Environmental Protection for the environmental management process and ensure the environmental management is in compliance with both Chinese recent environmental assessment (EA) laws and regulations and in accordance with World Bank EA policies and procedures as specified in OP/ BP 4.01 (Environmental Assessment). The EMF defines the contents, procedures and institutional responsibilities for environmental management of the sub-projects.

4 As the guiding framework, the EMF of the 1st phase period has achieved the smooth development of the project in the first implementation period by restraining the subproject enterprise. The 1st phase of the project is implemented and managed in strict accordance with the requirements of the

EMP, and the establishment of the surrounding environment monitoring, public participation and grievance mechanism, dismantling the production line according to the regulation, remediation and treatment of contaminated sites. During the implementation of the first phase of the project, the company complied with the relevant laws and regulations of the country and complied with the World Bank's security policy, and successfully completed the 1st phase of the HCFC elimination plan. The implementation experience of the EMF of the 1st phase have provided sufficient basis for the upgrade and preparation of the EMF of the 2nd phase. To complete the upgrade of the EMF of the 2nd phase, the PMO engaged an investigation team to conduct site visits to 5 HCFC production enterprises and 5 PU foam enterprises among about 130 subproject enterprises in the first phase so as to review the environmental and social problems and influences related to the project in the 1st phase. The survey results show that our country has closed 5 HCFC production lines and transformed 54 PU enterprises so as to achieve the 10% phase-out goal in 2015. At present, these phase-out activities have been completed basically and no significant adverse environmental and social influences have been found during the project implementation.

5 Based on the implementation mode of the framework document design subproject in the first phase, in view of that only 10% of HCFC production enterprises will be eliminated in the 1st phase, the types of the production lines to be closed are not included in the project implementation mode. However, many HCFC production enterprises hope to eliminate thoroughly their production quota and close their production lines in the 1st phase. Via the negotiation and coordination with World Bank, World Bank has approved the newly-added production line closure projects. The environmental and social guarantee requirements of the project will be executed by referring to the provisions for the dismantlement of original production lines during the conversion at new location of the PU enterprises, in order to meet the appeal that enterprise close the production line in the second phase of the process completely. In addition, many laws and regulations related to the environmental and social guarantee in China and the security policies of World Bank have been revised in recent years. Thus, it is necessary to revise the framework document according to the latest environmental and social guarantee requirements and add the subproject form of closing production lines of HCFC production enterprises. In addition, according to the experience of the 1st stage, the 2nd phase of the project will also support technical assistance activities, including to encourage enterprises to use of alternative new technologies, improve project management institutions and the local environmental protection bureau of the management ability, the development of new HCFC elimination policy etc. The project will not support project feasibility study / technical design, land use planning / resource management planning. Taking into account the 1st phase of the

project did not provide clear screening requirements for technical assistance activities, the updated environmental management framework documents on the selection of new technical assistance, policy, management and other aspects of environmental and social requirements.

6 The goal of this work is to revise the environmental and social guarantee framework document of the 1st phase for HCFC phase-out, upgrade relevant rules, procedures and systems needed for the project and arrange to identify, supervise and slow down the adverse environmental and social influences which may be caused by the activity implementation of various parts of the project, thus guaranteeing the crowd influenced by the project can enjoy fairly the project benefits.

II. Project Description

7 The Multilateral Fund for the Implementation of the Montreal Protocol will provide financial and technical support to eligible enterprises in order to meet the objective of total phase-out of HCFC in production and consumption sectors and assist to find the alternatives to replace HCFC. In view of the newly-added closure types of production lines of production enterprises, the 2nd phase Project will consist of the following types of subprojects: (1) PU foam sector: ①Foam enterprises whose conversions to alternative technology (e.g hydrocarbon) take place at their present location (hereinafter referred to as conversion at present location); ②Foam enterprises whose conversions to alternative technology (e.g hydrocarbon) involve relocation of their facilities and no PU foam production is conducted in the present location(hereinafter referred to as conversion at new location); ③Existing polyol system houses providing technical support on low GWP alternatives that may be flammable and provide the pre-blended ploy0l with hydrocarbon to small and medium foam enterprises (hereinafter referred to as system house conversion); ④Foam enterprises engaging in identification and testing of potential substitutes; (2)HCFC production Sector: ⑤HCFC production reduction; ⑥ Closure of production lines. This EMF will cover the 2nd phase HCFC phase-out project (from 2017 to 2025).

III. Applicable Laws and Regulations

3.1 National Laws and Regulations

8 For the construction or other project in china, the national laws and regulations should be followed. The important national regulations include:

Table 3-1 National Laws and Regulations

National Laws and Regulations	Contents
Environmental Protection Law of the People's Republic of China (2014)	Article 40 The enterprises shall preferentially use the clean energy and adopt the processes, equipment, comprehensive waste utilization technologies and innocent pollutant treatment technologies with high resource utilization level and less pollutant emission to reduce the generation of the pollutants. Article 41 The enterprises & public institutions and other production operators discharging the pollutants shall adopt measures to prevent and control the pollution and harms caused to the environment, i.e. waste gas, waste water, waste residue, medical waste, dust, odor, radioactive substance as well as the noise, vibration, optical radiation, electromagnetic radiation, etc. generated in the course of production, construction or other activities. The enterprises and public institutions discharging the pollutants shall establish the environment protection responsibility system, defining the responsibilities of the unit head and relevant staff. The key pollutant discharging units shall install and use the monitoring equipment, guarantee the normal running of the monitoring equipment and save the original monitoring records according to relevant national regulations and monitoring codes. It is forbidden to discharge the pollutants illegally via the ways eluding the monitoring such as the concealed conduit, seepage well, seepage pit, pouring, or monitoring data tampering or forging, or pollution prevention & control measures for abnormal running, etc. Article 46 The country shall implement the elimination system for the processes, equipment and products polluting the environment seriously. No units and individuals shall produce, market, transfer or use the processes, equipment and products polluting the environment seriously. Article 56 For the construction project for which the written report on environmental impacts shall be prepared according to law, the construction unit shall describe the conditions to the public who may be influenced and seek for opinions fully during the preparation. The department responsible for examining and approving the document for evaluation of the environmental impacts of a construction project shall make the full text public upon receipt of the environmental impact assessment report on construction project, except for the part involving the state secrets and business secrets.; where such department finds that the construction unit does not seek for public opinions fully, it shall instruct the construction unit to seek for public opinions.
Law of the Peoples Republic of China on	Article 16

EIA (2016)	On the basis of the extent of the effects exerted on the environment by construction projects，the State exercises，in a classified manner，control over the evaluation of the effects of construction projects on the environment. A construction unit shall，in accordance with the following provisions，make arrangements for preparing a written report on the environmental impacts or a statement on such impacts or filling out a registration form of environmental effects (hereinafter referred to as the document for evaluation of environmental effects，in general) ： (1) where significant impact may be exerted on the environment, preparing a written report on environmental effects, in which a comprehensive evaluation of the effects on the environment shall be made； (2) where less significant impacts may be exerted on the environment，preparing a statement on the impacts，in which an analyses or special evaluation of the effects shall be made；or (3) where the impacts on the environment are very little and therefore it is not necessary to make an evaluation of them，filling out a registration form of environmental impacts. The *Catalogue for Classified Administration of Environmental Impact Assessment on Construction Projects* of construction project shall be prepared and published by department of environmental protection administration under the State Council Article 22 The written report and statement on the environmental impacts of a construction project shall, in accordance with the regulations of the State Council, be submitted by the construction unit for examination and approval to the competent administrative department for environment protection that has the power of examination and approval. Article 24 Where，after the document for evaluation of the environmental impacts of a construction project is approved，major changes are made in the nature，scale and location of the construction project，in the production techniques adopted， or in the measures taken for prevention and control of pollution and for prevention of damage of the ecology，the construction unit shall submit a new document for evaluation of the environmental impacts of the construction project for examination and approval. Article 25 Where the document for evaluation of the environmental impacts of a construction project is not reviewed by the examination & approval department pursuant to the laws or is not approved after being reviewed, the construction unit shall not commence the construction. Article 26 During the construction of the construction project, the construction unit shall implement simultaneously the environmental protection countermeasures proposed in the written report and statement on environmental impacts and examination & approval opinions of the department examining and approving the document for evaluation of the environmental impacts. Article 27 Where there is the condition not conforming to the document for evaluation of the environmental impacts examined and approved during the project construction and operation, the construction unit shall organize the post evaluation on the environmental impacts, adopt the improvement measures and report to the original examination & approval department for the

	document for evaluation of the environmental impacts and the construction project examination & approval department for the filing; the original examination & approval department for the document for evaluation of the environmental impacts can also instruct the construction unit to conduct the post evaluation and adopt the improvement measures.
Regulations of the People's Republic of China on the Administration of Construction Project Environmental Protection(1998)	Article 5 For the reconstruction project, expansion project and technological transformation project, the measures must be adopted and the original environmental pollution and ecological damages related to such projects must be controlled. Article 7 On the basis of the extent of the effects exerted on the environment by construction projects, the State exercises, in a classified manner, control over the environmental protection of the construction projects according to the following regulations: (1) where significant impact may be exerted on the environment, preparing a written report on environmental impacts, in which a comprehensive and detailed evaluation of the pollution and impacts on the environment of the construction project shall be made; (2) where less impacts may be exerted on the environment, preparing a statement on environmental impacts, in which an analysis or special evaluation on the pollution and impacts on the environment of the construction project shall be made; (3) where the impacts on the environment are very little and therefore it is not necessary to make an evaluation of them, filling out a registration form of environmental impacts. Article 16 Simultaneous design, simultaneous construction and simultaneous going into operation with the main body project must be realized for matching environmental protection facilities construction which is required for the construction project. Article 17 The initial design of the construction project shall prepare the environmental protection chapters according to the requirements of the environmental protection design codes and determine the measures used for preventing and controlling environmental pollutions and ecological damages as well as the investment budget for environmental protection facilities in the environmental protection chapters in line with the approved written report or statement on environmental impacts of construction project.
Relevant Questions Concerning the Environmental Impact Assessment of Montreal Protocol Projects (huanjian(1995) No.019)	1. Since alterative technology is introduced from abroad, Environmental Assessment (EA) contents should be simplified. There is no need to discuss with ozone impact. For most one production line renovation, EA table is needed. If there are inflammable materials involved, environmental risk assessment is necessary and emergency system and protection distance should be carried out during construction. 2. If there is the substance sensitive to environmental conditions, launch the relatively in-depth work for the individual environmental factor and propose the control measures. 3. If there are inflammable materials involved, environmental risk assessment is necessary and emergency system and protection distance should be carried out during construction.
Regulation for Public Participation in the Environmental Impact Assessment(2006)	Article 2 This regulation is applicable to the public participation of construction projects as below:

	(1) The unit of the construction project which may cause considerable impacts on the environment and for which a written report on environmental impacts is required to be prepared. (2) Where，after the document for evaluation of the environmental impacts of a construction project is approved， major changes are made in the nature，scale and location of the construction project，in the production techniques adopted，or in the measures taken for prevention and control of pollution and for prevention of damage of the ecology，the construction unit shall submit a new document for evaluation of the environmental impacts of the construction project for examination and approval. (3) Where decision is made for starting construction of a project more than five years following the date the document for evaluation of the environmental impacts is approved，the said document shall be submitted to the original examination and approval department for examination and verification anew and Public Participation is needed.
Regulation on the Administration of Ozone Depleting Substances (2010)	Article 5 The State shall phase down and eliminate eventually the ozone depleting substances serving as the refrigerant, foaming agent, fire extinguishing agent, solvent, cleaning agent, processing agent, insecticide, aerosol, expanding agent, etc. Article 6 The competent department for environmental protection of the State Council shall determine and publicize the categories of the ozone depleting substance construction projects of which the new construction, reconstruction and expanded production and use are restrained or forbidden and formulate or publicize the directory of the ozone depleting substances of which the production, use, import and export are publicized or forbidden jointly with relevant departments of the State Council according to the national program and ozone depleting substance elimination progress conditions. Article 8 The State shall encourage and support the scientific research, technological development and promotion & application of the substitutes and substitute technologies of the ozone depleting substances.
Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution (2005 Revision)	Article 7 The enterprises & public institutions and other production operators shall adopt effective measures to prevent and reduce the atmospheric pollutions and be responsible for the damages caused by them. Article 18 When constructing the projects with impacts on the atmospheric environment, the enterprises & public institutions and other production operators shall conduct the environmental impact assessment and make the environmental impact assessment document public pursuant to the laws; where the pollutants are emitted to the atmosphere, the atmospheric pollutant emission standards shall be met and the control requirements for the total emission of key atmosphere pollutants shall be followed. Article 30 Where the enterprises & public institutions and other production operators violate the laws & regulations and emit the atmospheric pollutants and the serious atmosphere pollution is or may be caused consequently or relevant evidences may be lost or hided, the competent department for environmental protection of the people's government above the county level and other departments responsible for the supervision and management on the atmospheric environment protection can adopt administrative coercive measures against relevant facilities, equipment and objects such as the sealing up, detention, etc. Article 85 The State shall encourage and support the production and use of the substitutes of the ozone depleting substances and

	phase down and stop eventually the production and use of the ozone depleting substances. The State shall conduct the total quantity control and quota management on the production, use and import & export of the ozone depleting substances. The specific measures shall be stipulated by the State Council.
Law of the People's Republic of China on the Prevention and Control of Environmental Pollution Caused by Solid Waste (2016 Revision)	Article 13 For the construction of projects generating the solid wastes and projects storing, utilizing and disposing the solid wastes, the environmental impact assessment must be conducted pursuant to the laws and the national provisions concerning the environmental protection management on the construction project must be observed. Article 30 The units generating the industrial solid wastes shall establish and perfect the environmental pollution prevention & control responsibility system and adopt the measures for preventing and controlling the environmental pollution caused by the industrial solid wastes. Article 31 The enterprises and public institutions shall reasonably select and utilize the raw materials, energy sources and other resources, adopt advanced production processes and equipment, reduce the generation of the industrial solid wastes and lower the harm of the industrial solid wastes. Articles 85 In case of the environmental pollution caused by solid wastes, it is necessary to eliminate the harm, compensate for the losses pursuant to the laws and adopt measures to restore the environment.
Law of the People's Republic of China on the Prevention and Control of Noise Pollution (1996)	Article 13 For the newly-constructed, reconstructed and expanded construction projects, the national provisions concerning the environmental protection management on the construction project must be observed. Where the construction project may generate the environmental noise pollution, the construction unit must propose the written report on environmental impacts, specify the prevention & control measures for the environmental noise pollution and report to the administrative competent department for environmental protection for the approval according to the procedures specified by the State. In the written report on environmental impacts, there shall be the opinions of the units and residents of the place where the construction project locates. Article 23 Where the industrial noise is emitted to the surrounding living environment within the urban scope, the environmental noise emission standards for the industrial enterprise factory boundary specified by the State shall be satisfied. Article 24 The industrial enterprise causing the environmental noise pollution due to its utilization of fixed equipment during the industrial production must declare the category and quantity of the equipment causing the environmental noise pollution owned by it as well as the value of the noise generated under normal operation conditions and the conditions of the facilities used for the noise prevention & control to the administrative competent department for environmental protection of the people's government above the county level of the place where it locates and provide the technical data concerning the noise pollution prevention and control according to the provisions of the administrative competent department for environmental protection of the State Council. Where the category and quantity of the equipment causing the environmental pollution as well as the noise value and prevention

	& control facilities have the significant changes, the relevant industrial enterprise must conduct the timely declaration and adopt necessary prevention & control measures. Article 25 The industrial enterprise generating the environmental noise pollution must adopt effective measures to reduce the impact of the noise on the surrounding living environment. Article 26 The relevant competent department of the State Council shall specify gradually the noise limits for the industrial equipment which may generate the environmental noise pollution in the national and industrial products standards formulated pursuant to the laws according to the environmental protection requirements and national economic and technical conditions.
Law of the People's Republic of China on Promoting Clean Production (2012 Revision)	Article 18 For the newly-constructed, reconstructed and expanded projects, it is necessary to assess the environmental impacts, conduct the analytic demonstration for the raw material use, resource consumption, comprehensive resource utilization, pollutant generation & disposal, etc. and adopt the clean production technologies, processes and equipment with high resource utilization ratio and less pollutant. Article 19 During the technical transformation, the enterprise shall adopt the following clean production measures: (1) Adopt the non-toxic, harmless or low-toxic, low-harmful raw materials to substitute the raw materials with high toxicity and serious harm; (2) Adopt the processes and equipment with high resource utilization ratio and less pollutant to substitute the processes and equipment with low resource utilization ratio and more pollutant; (3) Comprehensively utilize or recycle the waste, waste water, waste heat, etc. generated during the production process; (4) Adopt the pollution prevention & control technologies which can meet the pollutant emission standards and total quantity control indexes for pollution emission specified by the State or local.
Circular Economy Promotion Law of the People's Republic of China (2017 Revision)	Article 19 The design of the process, equipment, product and packing material shall adopt preferentially the non-toxic harmless or low-toxic low-harmful materials and design schemes which can be recycled, dismantled or degraded easily according to the requirement of reducing the resource consumption and waste generation and conform to the mandatory requirements of relevant national standards. Article 20 The industrial enterprise shall adopt advanced or applicable water saving technologies, processes and equipment, formulate and implement the water saving plans, enhance the water saving management and conduct the whole-process control on the production water. The industrial enterprise shall enhance the water measuring management, equip and use qualified water measuring instruments and establish the water consumption statistics & water condition analysis system. The newly-constructed, reconstructed and expanded construction projects shall be equipped with the water saving facilities. The water saving facilities shall be designed, constructed and put into operation simultaneously with the main part of the project.

Land Administration Law of the People's Republic of China (2004 Revision)	Article 26 The modification to the approved overall plan for land utilization must be approved by the original approval authority; without the approval, the land use determined by the overall plan for land utilization shall not be changed. Articles 53 Where the approved construction project needs to use the state-owned construction land, the construction unit shall hold relevant documents specified by the laws and administrative regulations, file the construction land application to the administrative department in charge of the land of the people's government above the county level with the approval power and report to the people's people's government at the same level for the approval after being reviewed by the administrative department in charge of the land.

Other Involved Environmental Protection Laws & Regulations and Policies

Measures for Public Participation in Environmental Protection (2015)	Article 3 The participation in environmental protection of the public shall follow the principles of legality, orderness, free will and convenience. Article 4 The competent department for environmental protection can seek for the opinions and suggestions on matters or activities related to the environmental protection from the citizens, legal persons and other organizations by the ways such as opinions seeking, questionnaire survey, forum organization & holding, expert demonstration meeting, hearing, etc. The citizens, legal persons and other organizations can propose the opinions and suggestions to the competent department for environmental protection by the ways such as the telephone, letter, fax, network, etc.
Technical Guidelines for Environmental Site Investigation (HJ 25.1-2014)	4.1 Basic Principles 4.1.1 Pertinence Principle According to the characteristics of the site and potential pollutants, conduct the investigation on the pollutant concentration and spatial distribution and provide the basis for the environment management of the site. 4.1.2 Standardization Principle Adopt the procedural and systematized ways to standardize the site environment investigation process and guarantee the scientificity and objectivity of the investigation process. 4.1.3 Operability Principle Comprehensively consider the factors such as the investigation way, time, expenditure and so on and combine the current science & technology and professional skill level to make the investigation process practical and feasible.

Technical Guidelines for Environmental Site Monitoring (HJ 25.2-2014)	4.1 Basic Principles 4.1.1 Pertinence Principle The environmental monitoring on the pollution site shall be carried out according to the environmental management objectives and requirements in various stages such as the environmental survey & risk assessment, control & restoration, engineering acceptance, retrospective assessment and so on, guarantee the representativeness, accuracy and timeliness of the monitoring results and provide the basis for the environmental management of the site. 4.1.2 Standardization Principle Adopt the procedural and systematized ways to standardize the basic principles, working procedures and methods which shall be observed for the environmental monitoring on the pollution site and guarantee the scientificity and objectivity of the environmental monitoring on the pollution site. 4.1.3 Feasibility Principle Under the condition that the monitoring requirements for various stages such as the pollution site survey & risk assessment, control & restoration, engineering acceptance, retrospective assessment and so on, comprehensively consider the factors such as the monitoring cost, technology application level and the like and guarantee the practical and feasible monitoring work as well as the smooth launching of the follow-up work.

Technical Guidelines for Risk Assessment of Contaminated Sites (HJ 25.3-2014)	4 Working Procedures and Contents The working contents of the pollution site risk assessment include the hazard identification, exposure assessment, toxicity assessment, risk characterization as well as the calculation of the risk control values of the soil and underground water. 4.1 Hazard Identification Collect relevant information and data obtained in the environmental survey stage of the site, master the concentration distribution of the concerned pollutants of the site soil and groundwater, plan definitely the land utilization way and analyze possible sensitive receivers such as the children, adult, underground water body, etc. 4.2 Exposure Assessment Based on the hazard identification, analyze the possibility of the transport of concerned pollutants and sensitive hazard receivers on the site, determine the main exposure ways of the site soil & groundwater pollutants and the exposure assessment model, define the parameter values of the assessment model and calculate the exposure quantity of the soil & groundwater pollutants for the sensitive group. 4.3 Toxicity Assessment Based on the hazard identification, analyze the hazard effects on the human health of the concerned pollutants, including the carcinogenic effect and non-carcinogenic effect, and determine the parameters related to the concerned pollutants, including the reference dose, reference concentration, carcinogenic slope factor and breathing inhalation unit carcinogen, etc. 4.4 Risk Characterization Based on the exposure assessment and toxicity assessment, adopt the risk assessment model to calculate the carcinogenic risks and hazard quotients via one single way of one single pollutant in the soil and groundwater, compute the total carcinogenic risk and hazard index of one single pollutant and conduct the uncertainty analysis. 4.5 Calculation of Risk Control Values of Soil and Groundwater Based on the risk characterization, judge whether the risk value obtained from the calculation goes beyond the acceptable level. If the pollution site risk assessment results does not go beyond the acceptable risk level, end the risk assessment; if the pollution site risk assessment results goes beyond the acceptable risk level, calculate the risk control values of concerned pollutants in the soil and groundwater; if the survey results show that the concerned pollutants in the soil can transport to the groundwater, calculate the soil risk control value for the groundwater protection; according to the calculation results, propose the soil & groundwater risk control values of the concerned pollutants.

Technical Guidelines for Soil Remediation of Contaminated Sites (HJ 25.4-2014)	4.1 Basic Principles 4.1.1 Scientificity Principle Adopt scientific ways and comprehensively consider the pollution site remediation objectives, treatment effects of soil remediation technologies, remediation time, remediation costs and environmental impact factors of remediation works to formulate the remediation scheme. 4.1.2 Feasibility Principle The pollution site soil remediation scheme formulated needs to be reasonable and feasible. It needs to base on the preliminary work, select reasonably the soil remediation technologies and formulate the remediation scheme by adapting to concrete circumstances according to the pollution nature, degree, scope and the harm to the human health or ecological environment of the pollution site so as to make the remediation objectives achievable and the remediation works practical and feasible. 4.1.3 Safety Principle For the formulation of the pollution site soil remediation scheme, it needs to guarantee the safe implementation of the pollution site remediation works and prevent the secondary harm to the health of construction staffs and surrounding group as well as the ecological environment.

Technical Guideline for Environmental Impact Assessment of Construction Project - General Programme (2017 Revision)	6.11 The time, content and method for the environmental impact prediction and assessment shall be determined according to the engineering features & environmental characteristics, assessment grade and local environmental protection requirements. 9.1 Propose specific environmental management requirements for different stages of the construction project such as the construction stage, production running, the period after the expiration of the service period (can be selected according to project conditions) and so on according to different working conditions and diverse environmental impacts & risk characteristics. 9.4 The environmental monitoring plan shall include the pollution source monitoring plan and environmental quality monitoring plan with the contents including the monitoring factor, monitoring network laying, monitoring frequency, monitoring data acquisition & processing, sampling & analysis methods and the like and define the contents of the self-monitoring plan. 10 Generalize and summarize the contents such as the construction overview of the construction project, present environment quantity condition, pollutant emission condition, main environmental impact, public opinion adoption condition, environmental protection measure, economic profit & loss analysis on environmental impact, environmental management & monitoring plan and so on, combine the environmental quality objectives & requirements and give definitely the environmental impact feasibility conclusions for the construction project. For the construction project that has the significant environmental constraints, or has unacceptable environmental impacts or uncontrollable environmental risks, or has the environmental protection measures and economic technologies which are not meeting steadily the long-term standard & ecological protection requirements or has serious regional environmental problems and does not implement the remediation plan or cannot satisfy the environmental quality improvement objectives, it is necessary to propose the conclusion that such construction project is not feasible because of the environmental impacts.

Administrative Measures for Environmental Impact Post-assessment on Construction Project (2016)	Article 6 The construction unit or production & operation unit shall be responsible for organizing and launching the environmental impact post-assessment, prepare the environmental impact post-assessment document and be responsible for the environmental impact post-assessment conclusion. The construction unit or production & operation unit can entrust the environmental impact assessment organization, engineering design unit, college & university, relevant assessment organization and the like to prepare the environmental impact post-assessment document. The environmental impact assessment organization preparing the written report on environmental impacts of the construction project shall not undertake the preparation of the environmental impact post-assessment document of the construction project in principle. The construction unit or production & operation unit shall submit the environmental impact post-assessment document to the original competent department for environmental protection that has examined and approved the written report on environmental impacts and accept the supervision and examination by the competent department for environmental protection. Article 12 The competent department for environmental protection can propose the improvement requirements for the environmental protection of the construction project according to the environmental impact post-assessment document and regard such document as the basis for the follow-up environmental impact assessment management on the construction project.
Notice on Guaranteeing the Environmental Safety for Redevelopment & Reutilization of Industrial Enterprise Sites Huan Fa [2012] No. 140	2. Plan reasonably the land use of the polluted site. When preparing the overall plan for land utilization, urban & rural plan and relevant plans, the local departments at different levels such as the land resource department, construction department, urban & rural plan department, etc. shall fully consider the environmental risks of the polluted site, plan the land use reasonably and execute the strict examination and approval for the land use. The polluted site which is judged as having serious impacts on the human health via the risk assessment shall not be developed for the projects such as the residential building, school, kindergarten, hospital, nursing site and the like if its not treated and restored or its treatment and restoration do not meet relevant standards. 4. Launch the treatment and restoration for the polluted site. Local competent departments for environmental protection at different levels shall treat and restore the polluted site according to local conditions jointly with relevant departments under the leadership of the local government and arrange preferentially to treat the polluted site with serious hidden pollution dangers such as the impacts on the resident environment safety, drinking water safety and so on; supervise and urge the responsible person to adopt the measures such as isolation, etc. so as to prevent the pollution dispersion of the polluted site. The polluted site can be put into use only after its treatment and restoration has been completed and it has satisfied the environmental protection requirements during the monitoring. For the polluted site which is not treated and restored, the redevelopment and reutilization shall be

	forbidden and the construction of any project irrelevant to the treatment and restoration shall be forbidden. 6. Prevent practically the site pollution. For the newly-constructed (reconstructed or expanded) construction project approved since the issuance of this notice, it is necessary to conduct the environmental survey and risk assessment on the soil & groundwater pollution conditions of the construction land and propose the site pollution prevention & control measures such as the anti-seepage measure, monitoring and so on in the environmental impact assessment stage; during the environmental protection completion acceptance on the construction project, it is necessary to conduct the acceptance on the site pollution prevention & control measures, etc. When the land use right enjoyed by the enterprise has the change, such enterprise needs to monitor the soil & groundwater conditions and conduct the treatment and restoration in case of any pollution. 8. Intensify the safeguard work. Enhance the publicity and education, lead the guide to know the environmental risks of the polluted site and their prevention & control measures, execute the information disclosure positively and reliably, and support and encourage the public participation.
Notice on Strengthening the Pollution Prevention & Control during Closure, Relocation and Original Site Redevelopment & Reutilization of Industrial Enterprises Huan Fa [2014] No. 66	3. Organize to conduct the environmental survey on the sites of the closed and relocated industrial enterprises. The local environmental protection departments at different levels need to positively organize, supervise and urge relevant responsible persons like the holder of the site use right to entrust the professional institution to conduct the environmental survey and risk assessment on the original sites of the closed and relocated industrial enterprises according to the requirements of relevant regulations and policies. For the site which is affirmed as the polluted site via the environmental survey and risk assessment, it is necessary to supervise and urge relevant responsible persons like the holder of the site use right to perform the treatment & restoration responsibilities of the closed and relocated industrial enterprises, prepare the treatment & restoration scheme and include the expenses needed for the site survey, risk assessment, treatment & restoration, etc. in the relocation costs. 4. Strictly control the transfer and development & construction approval of the polluted site. The local environmental protection departments at different levels need to positively cooperate with the land department and construction department and forbid the land transfer of the sites of the closed and relocated enterprises which are planned to be developed and utilized with the environmental survey and risk assessment not conducted according to relevant provisions and the subject responsible for the treatment and restoration not defined; forbid the construction of any project irrelevant to the treatment and restoration if the polluted site is not treated and restored. Supervise and urge the responsible person to adopt measures like isolation to prevent the pollution dispersion for the sites of the

	closed and relocated enterprises which will not be developed and utilized temporarily. 5. Strengthen the survey, assessment and the treatment & restoration supervision on the site. Relevant responsible persons like the holder of the site use right shall submit timely relevant data of various links such as the environmental survey, risk assessment, treatment & restoration and so on of the site to the environmental protection department above the city level of the place where the site locates with the district set up. 6. Intensify the information disclosure. The relocated and closed enterprises shall publish timely the environmental quality conditions of the site soil and groundwater. Relevant responsible persons like the holder of the site use right shall make the information such as the site pollution survey & assessment conditions and corresponding treatment & restoration progress and so on known to the public via its web portal or the relevant media or print the special data for the public inspection. The local environmental protection departments at different levels shall make the pollution prevention & control monitoring information with regard to the closure, relocation and original site redevelopment of the industrial enterprise known to the public.
Guidelines for Environmental Survey, Assessment and Restoration of Industrial Enterprise Sites (Trial) Environmental Protection Department 2014	Guiding ideology: With the protection of human health & ecological environment as the starting point, the establishment and perfection of working methods for site management and improvement of environmental management capacity as the objective and the existing study & practice experiences as the support, propose the technically feasible, convenient, practical, complete and comprehensive work guidelines, prevent the environmental risks of the site and guarantee the environmental safety by referring to foreign experiences and based on actual Chinese conditions. 4.3 Restoration of Polluted Site Where the site is confirmed as being polluted via the environment survey and assessment, the responsible subject of the site shall organize to restore the site. 4.3.3 Restoration Acceptance and Later-period Management After the completion of the polluted site restoration works, the responsible subject shall conduct the acceptance on the site restoration and shall also execute the later-period management on the site when necessary. The responsible subject shall entrust the professional institution to conduct the site restoration acceptance and later-period management assessment, submit relevant data and results to the local environmental protection department above the city level of the place where the site locates with the district set up for the filing and accept the supervision

	and inspection by the local environmental protection department during the implementation. When necessary, the local environmental protection department above the city level of the place where the site locates with the district set up shall organize the experts to conduct the demonstration review on the scientificity and reasonableness of the restoration acceptance report and later-period management assessment report of the industrial enterprise site.
Interim Measures for Soil Environment Management in Polluted Sites (Exposure Draft) Huan Ban Han [2009] No. 1321	Article 8 (Obligation of Polluted Site Responsible Person) The polluted site responsible person shall undertake the obligation of the survey, assessment and treatment & restoration of the polluted site and bear relevant expenses. Where there is the change due to the restructuring, combination or separation, the survey, assessment and treatment & restoration responsibilities undertaken by the polluted site responsible person shall be undertaken by the unit that inherits its obligatory right and debt after the change pursuant to the laws. Where the parties concerned otherwise agreed before the change, follow such agreement; however, the survey, assessment and treatment & restoration responsibilities of the party shall not be exempted. Where the land use right is transferred pursuant to the laws, the transferee o the land use right shall be responsible for the survey, assessment and treatment & restoration and bear relevant expenses. Where the parties concerned otherwise agreed, follow such agreement; however, the survey, assessment and treatment & restoration responsibilities of the party shall not be exempted. Where the polluted site responsible person can not be determined due to historical reasons, the relevant local people's government shall be responsible for the survey, assessment and treatment & restoration of the polluted site pursuant to the laws and bear relevant expenses. Article 11 (Start of Survey and Assessment) The polluted site responsible person shall entrust the institution with corresponding qualifications to survey and assess the polluted site soil environment according to relevant provisions of this Measures before submitting the application materials for the land utilization mode change to the relevant department. Article 20 (Contents of Site Soil Environment Survey) The soil environment survey in the polluted site shall include the following contents: (1) Basic conditions of the site; (2) Change conditions of the land utilization mode and use right holder of the site; (3) Main production activities and pollution source conditions within the site; (4) Conditions of the buildings and equipment & facilities within the site; (5) Environmental conditions and sensitive targets of the groundwater, etc. within and surrounding the site; (6) Pollution level and scope of the soil within and surrounding the site.

	Article 17 (Requirements for Treatment & Restoration Scheme) The soil treatment & restoration scheme for the polluted site shall include the following contents: (1) Scope and expected goal of the treatment & restoration works; (2) Technical roadmap and process flow of the treatment & restoration works; (3) Environmental protection measures adopted during the implementation of the treatment & restoration works; (4) Implementation schedule of the treatment & restoration works; (5) Supervision plan for the treatment & restoration works; Article 22 (Acceptance on Treatment & Restoration Works) After the completion of the soil treatment & restoration works of the polluted site, the holder of the land use right of the polluted site shall entrust the third-party institution with corresponding qualifications to conduct the acceptance on the treatment & restoration works, submit the acceptance report signed by the experts to the administrative competent department for environmental protection of the provincial level for the filing and send a copy to the administrative competent department for environmental protection of the county level of the place where the site locates. Article 25 (Safety Protection of Polluted Site) Where the site is confirmed as the polluted site via the survey and assessment, its holder of land use right shall set up obvious signs on the boundary of the pollution site, indicating the pollutant types, existing risks and safety precautions.
Opinions on Strengthening the Soil Pollution Prevention & Control Huan Fa [2008] No. 48	(8) Supervision and management on the soil environment protection of the polluted site. By combining the survey on the soil pollution conditions in key regions, conduct the system survey on the soil of the polluted sites, especially the remained or abandoned urban industry site, master the pollutant types, pollution scope and level of the soil and groundwater within and surrounding the original factory site and establish the polluted site soil file and information management system. Establish the polluted soil risk assessment & restoration system. Where the factory site left after the relocation of the polluting enterprise and other land which may be polluted are developed and utilized, the environmental protection department shall supervise and urge relevant responsible units or individuals to assess the polluted soil risks, define the responsible subject and technical requirements for the remediation and treatment, supervise the soil remediation and treatment of the polluted site and reduce the risks of the land reutilization, especially the impacts on the human health generated by changing the land as the residential land. For the environmental problems caused by the remained pollutants such as the soil & groundwater pollutions and so on, the original production & operation unit shall be responsible for the soil treatment and function remediation. Intensify the supervision and inspection on

	key industries and enterprises such as the chemical, electroplate, oil storage and so on and handle the soil pollution problems found without delay. Where it plans to change the use of the regional or centralized industrial land, the environmental protection department of the place where such land locates needs to supervise and urge the relevant unit to assess the risks of the polluted site and regard the risk assessment result as the important basis for the planning environmental impact assessment. In the meantime, promote positively the relevant department to launch the planning environmental impact assessment pursuant to the laws and organize the review on the planning environmental impact assessment document according to the established procedure; for the region for which the planning environmental impact assessment is not launched pursuant to the laws, the environmental protection department shall not approve the environmental impact assessment document of the newly-constructed projects within such region pursuant to the laws. In accordance with the principle of "whoever causes the pollution shall be responsible for the treatment", the remediation and treatment of the polluted soil or groundwater shall be undertaken by the unit and individual causing such pollution. Where there is the change of the unit causing the pollution due to the reconstruction, combination or separation, the remediation and treatment responsibilities undertaken by such unit shall be undertaken by the unit which inherits its obligatory right and debt pursuant to the laws after the change. Where the parties concerned otherwise agreed before the change, follow such agreement; however, the pollution prevention & control responsibilities of the party shall not be exempted. Where the unit causing the pollution has been terminated or the unit or it is unable to confirm the individual that causes the pollution due to historical reasons or other reasons, the relevant people's government shall be responsible for the remediation and treatment of the polluted soil or groundwater pursuant to the laws; where the land use right enjoyed by such unit is transferred pursuant to the laws, the transferee of the land use right shall be responsible for the remediation and treatment. Where the parties concerned otherwise agreed before the change, follow such agreement; however, the pollution prevention & control responsibilities of the party shall not be exempted.
Notice on Practical Completion of Environmental Pollution Prevention & Control during Enterprise Relocation Huan Ban [2004] No. 47	1. When finishing the original production & operation activities and changing the original land use nature, all the industrial enterprises and laboratories generating dangerous wastes and the units producing and operating dangerous wastes must entrust the environmental monitoring department with the quality certification qualifications above the provincial level to conduct the monitoring and analysis on the land of the original site, submit to the environmental protection department above the provincial level for the review and determine the soil function remediation implementation scheme according to the monitoring assessment report. The local governmental environmental protection department shall be responsible for the supervision and management on the soil function remediation. The monitoring assessment report needs to conduct the environmental impact analysis on the soil of the original site with the contents

	including: The types and scope of the pollutants left on the original site and underground as well as the soil pollution level; the burial conditions of underground pipelines and storage tanks and the evaluation conditions of the soil & ground water pollution status. 2. For the externally-relocated industrial regions which have been developed or are under development, it needs to formulate the soil environment status survey, exploration & monitoring scheme as soon as possible, survey the pollution source within the construction scope and determine the cleaning work plan and soil function remediation implementation sachem so as to eliminate the soil environment pollution with the least delay possible. 3. For the environmental problems caused by the remained pollutants, the original production & operation unit shall be responsible for the soil treatment and function remediation.
Notice of General Office of the State Council on Issuing the Administrative Measures for Contingency Plans of Emergencies Guo Ban Fa [2013] No. 101	Article 9 The contingency plans of the unit and grassroots organization shall be formulated by the legal persons and grassroots organizations such as the organ, enterprise, public institution, social organization, neighborhood committee, village committee and so on, focusing on defining the contingency response responsible person, risk & hidden danger monitoring, information report, early warning response, contingency disposal, personnel evacuation organization & path, conditions of contingency resources which can be transferred or used for assistance, implementation way and the like and embodying the characteristics of self & mutual aid, information report and early disposal. The large-scale enterprise group can establish its own contingency plan system according to relevant standards & codes and actual work needs by referring to international practices. Article 15 The preparation of the contingency plan shall be conducted based on the execution of risk assessment and contingency resource survey. (1) Risk assessment. According to the emergency characteristics, identify the hazard factors, analyze possible immediate, secondary and derivative consequences, evaluate the hazard level of various consequences and propose the measures for risk control and hidden danger handling.
National Hazardous Waste Inventory Bu Ling No. 39	Article 2 The solid wastes (including the liquid wastes) with one of the following conditions shall be included in this Inventory. (1) The waste has the one or several hazardous characteristics such as the corrosivity, toxicity, inflammability, reactivity or infectivity and the like; (2) The waste may have harmful impact on the environment or human health and needs to be managed as the hazardous waste; in addition, its hazardous characteristics can not be eliminated.

	Article 4 After the abandoning, the chemical substances included in *Hazardous Chemical Substance Inventory* belong to the hazardous waste. Article 6 Judge the attribute of the mixture of the hazardous wastes and other solid wastes as well as the waste obtained from the hazardous waste after the treatment according to the identification standards for hazardous wastes specified by the State. Article 8 Identify the solid waste with the hazardous characteristic undefined according to the identification standards and methods for hazardous wastes specified by the State. Where the solid waste is identified as having the hazardous characteristic and belonging to the hazardous waste, it is necessary to determine its waste type according to its toxic ingredient and hazardous characteristic and conduct the classified management by the code "900-000-××" (×× is the code of the hazardous waste type).
Catalogue for Classified Administration of Environmental Impact Assessment on Construction Projects (2015 Revision)	Article 2 On the basis of the extent of the effects exerted on the environment by construction projects，the State exercises，in a classified manner，control over the environmental protection of the construction projects. A construction unit shall，in accordance with the provisions of this Catalogue, make arrangements for preparing a written report on the environmental impacts or a statement on such impacts or filling out a registration form of environmental impacts. Article 3 The environmental sensitive area referred in this Catalogue refers to various natural and cultural protected areas set up pursuant to the laws as well as the areas particularly sensitive to a certain type of pollution factor or ecological impact factor of the construction project, mainly including: (1) Natural reserve, tourist attraction, world cultural and natural heritage site, drinking water source preservation area; (2) Prime cropland preservation area, prime grassland, forest park, geopark, important wetland, natural forest, natural concentrated distributed area of rare and endangered species, natural spawning site of important aquatic organism, feeding ground, wintering ground, migration pathway, natural fishing ground, resource water-deficient area, key prevention & control area of water and soil loss, forbidden desertified land preservation area, sealed and semi-sealed seas, eutrophic waters; (3) Areas with the main functions as he residence, medical treatment & public health, cultural education, scientific research, administrative office and the like, culture relic protection sites, protected areas with special history, culture, science and national significance. Article 4 The sensitive nature and level of the environment where the construction project locates are the important bases for determining the type of the environmental impact assessment on the construction project. For the construction project involving the environmental sensitive area, it is necessary to determine its environmental impact assessment type

	in strict accordance with this Inventory and it is forbidden to raise or lower the environmental impact assessment type arbitrarily. The environmental impact assessment document shall focus on analyzing the impacts on the environmental sensitive area of such project. Article 5 Determine the environmental impact assessment type according to the item with the highest level for the multi-industry and compound construction projects.
Guideline for Environmental Impact Assessment on Hazardous Waste of Construction Project (Exposure Draft) Huan Ban Tu Rang Han [2016] No. 2279	2. Basic Principles (1) Execute the key assessment and scientific estimation. For all the construction projects generating hazardous wastes, the environmental impact assessment institution must make the hazardous waste as the key point for the environmental impact assessment in relevant chapters of the written report (statement) on environmental impact assessment. It is necessary to estimate scientifically the types and quantity of hazardous wastes generated by the construction project and relevant information. (2) Execute the scientific assessment and reduce the risk. Execute the scientific assessment on the types, quantity, handling & disposal ways, environmental impacts, environmental risks and the like of hazardous wastes generated by the construction project and propose the feasible pollution prevention & control countermeasures. Insist on the principles of reduction, recycling and harmlessness, properly handle and dispose the hazardous generated and guarantee the environmental safety. (3) Execute the whole-process assessment and standardized management. Execute the analysis and assessment on the whole process including the generation, collection, storage, transfer, utilization and disposal of hazardous wastes generated by the construction project, implement strictly various legal systems for hazardous wastes and improve the level of the standardized management on hazardous wastes generated by the construction project by standardizing the written report (statement) on environmental impact assessment. 3. Technical Requirements for Environmental Impact Assessment on Hazardous Waste (2) Environmental impact analysis. 1. Basic requirements: Based on the engineering analysis, the environmental impact assessment document shall consider the whole process including the generation, collection, storage, transfer, utilization, disposal, etc. of hazardous wastes and the whole time including the construction period, operation period and the period after the expiration of the service period, analyze the environmental impacts on the environmental factors such as the ambient air, surface water, groundwater, soil and so on as well as the environmentally sensitive protection targets which may be caused by hazardous wastes generated by the construction project and then guide the supplement and perfection of the pollution prevention & control measures for hazardous wastes. In the meantime, it is necessary to pay special attention to the project-related characteristic pollution factors, launch necessary environmental background monitoring on the soil, groundwater and the like and analyze the change conditions of environmental background.

	(3) Techno-economic demonstration on pollution prevention & control measures. 1. Basic requirements: The environmental impact assessment document shall assess the technical advancement, economic feasibility and operational reliability of the pollution prevention & control measures in the technical documents of the construction project like the feasibility study report, design document and supplement and perfect the pollution prevention & control measures for hazardous wastes.
Guideline for Management Plan Formulation of Unit Generating Hazardous Wastes Announcement 2016 No. 7	2. Basic Principles (1) Execute the formulation legally and the implementation strictly. The unit generating the wastes shall formulate the management plan according to relevant requirements of relevant national laws & regulations and standards & codes and enhance the environmental management on the whole life cycle of the hazardous wastes in strict accordance with the management plan. (2) Execute the source reduction and process control. The management plan shall focus on reducing the generation and harmfulness of hazardous wastes and adopt preventive measures to avoid the environmental risks generated during the storage, utilization, disposal, etc. of hazardous wastes. (3) Act by adapting to local conditions and gear to circumstances. Based on this Guideline and under the precondition of guaranteeing the true and operable management plan, the enterprise can combine actual conditions and request the competent department for environmental protection of the people's government above the county level of the place where it locates to adjust relevant contents. 4. Main Contents (3) Environmental monitoring. The unit generating the wastes shall monitor the hazardous wastes by utilizing by itself relevant operation parameters, environment quality, pollutant emission, etc. of the disposal facilities. Where the enterprise launches the environmental monitoring by itself, such enterprise shall have corresponding monitoring instruments and equipment and formulate the maintenance and calibration schemes for monitoring instruments. The monitoring personnel shall have relevant qualifications; where the enterprise does not have the self-monitoring capacity, then such enterprise shall sign the monitoring entrustment contract with the unit with monitoring qualifications (passing the measuring certification). (4) Retrospection of plan implementation conditions of the previous year. The unit generating the wastes shall summarize the management plan implementation conditions of the previous year with the contents mainly including: Conditions of inspection and environmental monitoring on the enterprise by the environmental protection department in the

	previous year; social disclosure conditions of relevant information of hazardous wastes; actual output, types, storage, utilization, disposal, etc. of hazardous wastes in the previous year; comparative analysis with expected results in the management plan; execution conditions of management systems related to hazardous wastes in the previous year.
Standard for National Demonstration Eco-industrial Parks (2016)	5.2.18 Completion Conditions of Total Emission Control Indexes for National Key Pollutants and Local Characteristic Pollutants in Eco-industrial Parks It refers to that the total emission of national key pollutants and local characteristic pollutants in parks shall not go beyond the total national or local emission control index. Of which, the key pollutants refers to the pollutant types for which the State has the total emission control requirement starting from the construction planning base year to the acceptance year. 5.2.22 Concentrated Disposal Facility for Waste Water It refers to that all the waste water of industrial enterprises in the park are pre-disposed, meet the requirement for concentrated disposal and enter the concentrated disposal facility for waste water equipped with the automatic online-monitoring device (inside or outside the park).
Ambient Air Quality Standard 2012	7.3 According to the provisions of *Law of the People's Republic of China on the Prevention & Control of Atmospheric Air*, the key city for prevention & control of atmospheric air not meeting this Standard shall meet this Standard according to the deadline specified by the State Council or the administrative competent department for environmental protection of the State Council. The people' government of such city shall formulate the deadline compliance plan and adopt more strict measures according to the authorization or provision of the State Council so as to realize the compliance plan on schedule. Each people's government of provincial level can formulate and implement the local ambient air quality standards for the pollutant items unspecified in this Standard according to local environmental protection needs and environmental pollution characteristics.
Guiding opinions of the general office of the State Council on promoting the relocation and reconstruction of hazardous chemicals production enterprises in	7. strengthening the safety and environmental protection management of relocation and reconstruction To urge enterprises to carry out safety assessment and environmental impact of relocation project in accordance with the law, strictly implement the construction project safety facilities and pollution control facilities, the "three simultaneous" (also designed, constructed and put into production and use) system, timely organize the project completion and acceptance, to ensure that after the completion of the project to meet the safety and environmental requirements. According to the law in a timely manner to the local transformation and off-site relocation after enterprises issued safety production license and permit. Supervision and inspection of enterprises are being carried out to ensure the

densely populated areas of cities and towns（2017）	safety and environmental protection during the relocation of enterprises. The relocation of enterprises demolition of dangerous chemicals production equipment, structures and pollution prevention facilities, to advance the development of abandoned hazardous chemicals, contaminants cleanup and disposal, take effective measures to prevent the demolition caused casualties and environmental pollution; to add strong toxic chemicals, explosive chemical safety management, to prevent the loss of theft. To strengthen risk control and vacate land pollution remediation, to vacate the land planning land with soil environmental quality standard.
Guiding Opinions of General Office of the People's Government of Zhejiang Province on All-around Implementation of "Regional Environmental Impact Assessment + Environmental Standard" Reform Zhe Zheng Ban Fa (2017) No. 57	2. Reform Content. Draw up the planning environmental impact assessment on the reform region with high quality, formulate uniform environmental standards for project admittance of the reform region, work out the negative list of environmental impact assessment examination & approval of the reform region and implement the following reform measures according to the environmental impact level of the project construction. (1) Free from the environmental impact assessment procedure. For the construction project beyond the classified management directory of environmental impact assessment on national construction project, there is not need to transact the environmental impact assessment procedure, except for the emerging industry with relatively large environmental impacts or risks. (2) On-line filing. For the project for which the registration form of environmental impacts is required to be completed according to the requirements of the *Catalogue for Classified Administration of Environmental Impact Assessment on Construction Projects*, the construction unit shall complete online by itself the registration form of environmental impacts and transact the filing procedure before the project is completed and put into operation. For the project which is required to be kept in confidentiality by the State, still adopt the paper filling mode. (3) Degradation of environmental impact assessment. Complete with high quality the regional planning environmental impact assessment, various management lists and clear feasible reform regions. For the project which is beyond the negative list of environmental impact assessment examination & approval and meets the admittance environment standards, where the written report on environmental impacts is required to be prepared originally, prepare the statement on environmental impacts; where the statement on environmental impacts is required to be completed originally, compete the registration form of environmental impacts. The public participation link in the environmental impact assessment preparation stage shall be executed according to the original provisions. (4) Simplification of environmental impact assessment contents. Simplify the assessment contents. According to the requirements of review opinions and conclusion lists of the regional planning environmental impact assessment, the project environmental impact assessment can share the data such as the environmental status, pollution source survey and so on with planning environmental impact assessment and simply corresponding assessment contents. Simplify the public participation form. For the public participation link in the environmental impact

	assessment preparation stage o the project, the two times of content publicizing required originally can be merged into one time and the public survey can no longer be launched. (5) Commitment filing management. For the "zero land" technical improvement project of the industrial enterprise which does not increase the key pollutant emission and the project which is beyond the negative list of environmental impact assessment examination & approval and meets the admittance environment standards (except for the project of which the environmental impact assessment is degraded as the statement on environmental impacts), implement the commitment filing management: After making the written commitment, the construction unit shall make the commitment letter, environmental assessment document and relevant information known to the public by itself and register with the environmental protection department before the commencement of the project and the environmental protection department shall make relevant information known to the public pursuant to the laws. (6) Innovative environmental protection "three simultaneities" management. Establish the management mechanism of connecting the environmental impact assessment, environmental protection "three simultaneities" and the pollution emission license and cancel the administrative license for environmental protection completion acceptance. Before the construction project is put into operation or used, the construction unit shall entrust the third-party institution to prepare the environmental protection completion acceptance report according to the requirements of the environmental impact assessment and approval document or commitment filing, make the report known to the public and bring into the pollution emission license management.

Other Involved Local Environmental Protection Laws & Regulations and Policies

Environmental Protection Regulation of Shandong Province (2001 Revision);

Regulation for Atmospheric Pollution Prevention & Control of Shandong Province (2016);

Clean Production Promotion Regulation of Shandong Province (2010);

Regulation for Water Pollution Prevention & Control of Shandong Province (2000);

Regulation for Ambient Noise Pollution Prevention & Control of Shandong Province (2003);

Work Scheme for Soil Pollution Prevention & Control of Shandong Province (2016);

Administrative Measures for Environmental Protection of Construction Project of Shandong Province (1987);

Examination & Approval Principle for Environmental Impact Assessment on Construction Project of Shandong Province (Trial) (2012);

Environmental Protection Regulation of Jiangsu Province (1997 Revision);

Regulation for Atmospheric Pollution Prevention & Control of Jiangsu Province (2015);

Regulation for Ambient Noise Pollution Prevention & Control of Jiangsu Province (2005);

Work Scheme for Soil Pollution Prevention & Control of Jiangsu Province (2016)

Opinions of Environmental Protection System of Jiangsu Province on the Further Completion of Economic Development Serving (2008);

Regulation for Atmospheric Pollution Prevention & Control of Zhejiang Province (2016);

Interim Measures for Clean Production Examination & Approval of Zhejiang

Notice on the Issuance of 2015 Annual Implementation Plan of Implementation Rules for Atmospheric Pollution Prevention & Control Action Plan of Sichuan Province (Chuan Ban Han [2015] No. 59);

Notice of Sichuan Province on the Issuance of Sichuan Province Work Scheme of Water Pollution Prevention & Control Action Plan (2015);

Administrative Regulation for Drinking Water Source Protection of Sichuan Province (Revised in 2011);

Interim Measures for Urban Environmental Noise Management of Sichuan Province (1986);

Sichuan Province Work Scheme of Soil Pollution Prevention & Control Action Plan (2016);

Interim Measures for Environmental Protection Management on Basic Construction of Sichuan Province (1981);

Measures for Classification and Examination & Approval of Environmental Impact Assessment Documents of Construction Project of Sichuan Province (2007);

Environmental Protection Regulation of Guangdong Province (2015);

Action Plan for Atmospheric Pollution Prevention & Control of Guangdong Province (2013);

Notice of Guangdong Province on Work Opinions of All-around Promotion of Clean Production (2016);

Implementation Scheme for Water Pollution Prevention & Control Action Plan of Guangdong Province Yue Fu 92015] No. 131;

Measures for Implementation of 'Law of the People's Republic of China on Ambient Noise Pollution Prevention & Control' of Guangdong Province (2010 Revision);

Province (2003); *Regulation for Water Pollution Prevention & Control of Zhejiang Province* (2013); *Administrative Measures for Environmental Protection of Construction Project of Zhejiang Province* (2014); *Measures for Responsibility Investigation of Environmental Illegal Act of Zhejiang Province* (2014); *Work Scheme for Soil Pollution Prevention & Control of Zhejiang Province* (2016); Environmental Protection Regulation of Sichuan Province (2017 Revised Draft); *Implementation Measures for Clean Production Examination & Approval of Sichuan Province (Interim)* (2005);	*Regulation for Soil Pollution Prevention & Control of Guangdong Province (draft)* (2017)*;* *Measures for Classification and Examination & Approval of Environmental Impact Assessment Documents of Construction Project of Guangdong Province* (2012)*;* *Notice of the office of Guangzhou Environmental Protection Bureau on printing and distributing the technical points of environmental investigation, repair and effect evaluation documents of industrial enterprises in Guangzhou*（2017）.

3.2 Word Bank Safeguard

9 OP 4.01 provides essential guidance on objectives and principles to applicable projects.

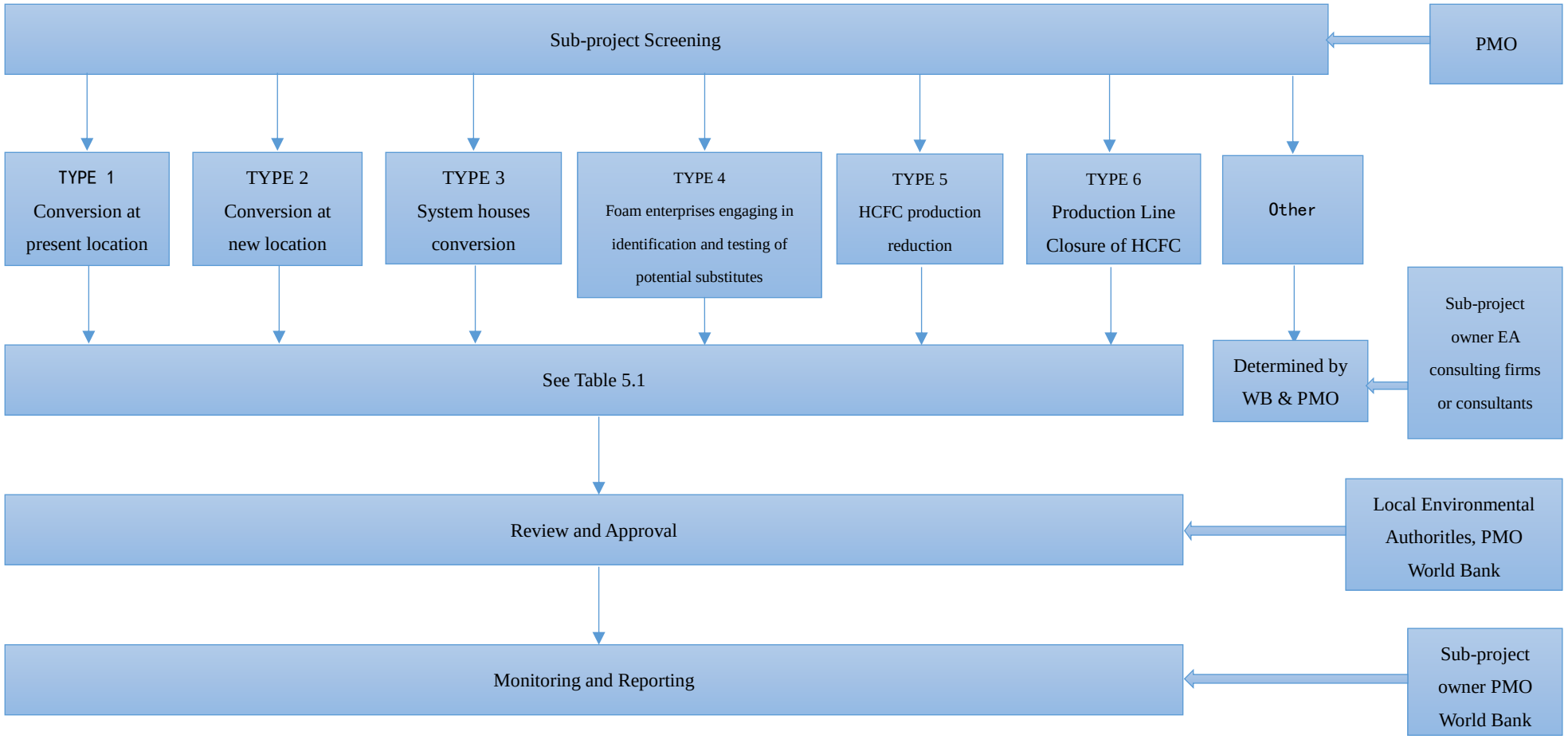
Table 3-2 World Bank Safeguard Policy

Word Bank Safeguard	Abstract
Environmental Assessment (OP 4.01)	2. EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The Bank favors preventive measures over mitigatory or compensatory measures, whenever feasible. 3. The environmental assessment also needs to consider simultaneously different conditions of the project and specific conditions of the state where the project locates, environmental study achievement of the state where the project locates, national environmental action plan, national overall policy framework, capability of the legislation institution related to the environment and society as well as the state responsibilities applying to various project activities under relevant international environmental treaties and agreements. If it is confirmed that partial project contents collide with such state responsibilities via the environmental assessment, World Bank will not provide the fund for such project. The environmental assessment shall be started as soon as possible during the whole project period and combined closely with the analysis on the economy, finance, institution, society and technology of the proposed project. 6. In view of the legislation and local conditions of the borrowing state, the environmental assessment can recommend the replaceable emission level as well as the methods for pollution prevention and reduction for the project. The environmental assessment report must provide sufficient detailed reasons to explain the emission standards and measures selected for a certain specific project or site. 7. All the conclusions and suggestions of the environmental assessment, measures in the legal agreements, environmental management plans as well as relevant provisions of other project documents are the bases for the environmental inspection on the project by World Bank.
Environmental, Health& Safety(EHS) General	The Environmental, Health, and Safety (EHS) Guidelines are technical reference. When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. If the rules of the host country

Guidelines	are different from the indexes and measures specified in *EHS Guideline*, we require that the project needs to adopt the indexes and measures with higher requirements. If adopting the indexes and measures with lower requirements is deemed as proper according to specific project conditions, it needs to make detailed demonstration on the proposed alternative scheme in the environmental assessment on such site. Such demonstration shall indicate that the modified indexes can protect the human health and environment.
World Bank Policy on Disclosure of Information (202)	Guarantee that the personnel and groups influenced by the project funded by World Bank know about the project objectives and influences; establish and maintain the public dialogue and promote the contact with stakeholders. 31. As the separate backup file, the environmental assessment (EA for short) report shall be prepared by the borrower upon the request of World Bank. Such report shall be made known to the public under two circumstances.(a) The borrower draws up the EA report draft. According to relevant provisions of the World Bank policies and business procedure 4.01 "Environmental Assessment", such draft shall be placed in public occasions for the consultation by the groups influenced by the project and local governmental organizations. (b) After World Bank receives officially such EA report but before the project assessment.
Pollution Prevention & Reduction Manual (1998)	These guidelines apply to the projects which are funded by all the bank groups and approved in principle on or after July 1, 1998, unless the project investor can prove that the main investment of the project execute the 1998 Guideline (or an agreement with legal effects). This Manual aims at obtaining the environmental and economic interests by launching the pollution prevention, including the clean production and good management technology, and then promoting the sustainable development.

IV. Flowchart and Institutional Responsibilities

4.1 Flowchart of Environment Management



4.2 Institutional Responsibilities

Table 4-2 Institutional Responsibilities

Institution	Responsibilities
PMO (FECO)	➢ Sub-project Preparation Phase: 1) to retrospect the projects eliminated in 1st Phase and select the subproject owners of Phase II with assistance from professional experts and industrial associations and identify the type of subproject and the requirements for environmental documents (including the technical assistance subprojects) ; 2) to review environmental documents submitted by sub-project owner; 3) to review the organizational capacity of the enterprises to effectively implement their Environmental Management Plan (EMP); 4) to ensure that appropriate clauses are included in enterprises contract obligating the enterprises to effectively implement the EMP and 5) to request subproject owner to entrust the experienced expert/unit to prepare and submit environmental Due Diligence Report. ➢ Sub-project Implementation Phase: 1) to lead the supervision of the compliance of beneficiary enterprises in EMPs implementation, under assistance of local EPBs and/or consultants; 2) Report the implementation of EMP to World Bank regularly.
Sub-project owner	➢ Sub-Project Preparation Phase: Carry out the HCFC phase-out project planning, design and implementation and if necessary, prepare environmental documents (e.g. EA/EMP, due diligence report), public consultation and information disclosure. ➢ Sub-project Implementation Phase: 1) Conduct the activities in accordance with approval environmental documents, and cooperate with project verification and monitoring; 2) ensure that relevant tender documents and contracts include requirements put forward in the EMP; 3) document monitoring results in accordance with the Monitoring Plan included in the EMP and identify any necessary corrective or preventive actions taken during the monitoring period, as well as the results/outcome of similar action that may have been taken in previous reporting period ; 4) submit the progress report including implementation status of EMP to PMO and the local environmental protection department; 5) obtain the approval of Local Fire-fighting Protection Bureau if substitute is flammable, and obtain the approval of relevant governmental agencies/institutions on workers' occupation health, if requested by national regulations.
EA consulting firms or consultants	➢ With the entrustment by the subproject owner, prepare the environmental impact assessment documents (hereinafter referred to as "EIA Documents"): The EIA documents may include the environmental impact assessment report, environmental management plan, environmental

	impact assessment, environmental due diligence report, environmental risk assessment report on polluted site, polluted site cleaning plan and the like; ➢ Assist the enterprise to consult the people and units influenced by the project as well as the local environmental protection department about the EIA documents; ➢ Assist the subproject owners to implement the environment management plan and propose the corrective measures and suggestions for important environmental issues detected. ➢ With the entrustment by the project management organization, analyze the environmental and social influences which may be generated by the technical assistance activities of the project and propose corresponding countermeasures for the project management organization.
Local Environmental Authorities	➢ Sub-Project Preparation Phase: Environmental Impact Assessment (EIA) documents review and approval. ➢ Sub-project Implementation Phase: 1) to supervise the compliance of beneficiary enterprises in EMPs implementation; 2) to confirm whether the subproject owners meet the emission requirements of the environment impact assessment approval; to supervise timely the subproject owners to solve the remained environmental problems (such as the excessive emission, complaint proposed by surrounding residents, etc.); 3) to confirm whether the projects followed the "3 simultaneous" regulation and environmental policies while sub-project owners install new facilities; 4)) to work on other daily duties, such as work on prevention of the environmental pollution accidents and dissensions etc;
Word Bank	➢ Post Review environmental documents submitted by sub-project owner, and supervise the implementation of EMP.

V. Environmental Management Procedures

10 The environmental management procedure covers the following five aspects of preparation/construction phase and two aspects of implementation phase. Each of the aspects is described as below along with the requirements and responsibilities for stakeholders.

A. Sub-Project Preparation and Construction Phase

1. Sub-project Screening and Categorization
2. Preparation of Environment Documentation
3. Public Consultation and Disclosure(if applicable)
4. Grievance Mechanism (if applicable)
5. Review and Approval

B. Implementation Phase

6. Monitoring
7. Reporting

5.1 Sub-project Screening and Categorization

11 PMO is responsible for the subproject screening. The eligible enterprises will be selected based on approved HCFC Phase-out Management Plan, and their application materials sent to the PMO. PMO will exclude from financing any proposed sub-project included in the Exclusion List presented in Annex 1. Sub-projects include six types and PMO will define the types for different HCFC phase-out subprojects:

- PU foam enterprises

① Conversion at present location

② Conversion at new location

③System house conversion

④Foam enterprises engaging in identification and testing of potential substitutes

- HCFC Production sector

⑤HCFC production reduction

⑥ Closure of production lines

5.2 Preparation and Requirements of Environmental Documents

12 The sub-project owner will provide the environmental documents and governmental approval. The EA documentation requirements for different types of sub-projects are outlined in the table below:

Table 5.1 Environmental Documentation

Types of Sub-projects	Required Documents*
① Conversion at present location	✓ Approval or filing from Local Environmental Protection Bureau. ✓ Approval of Fire-fighting Bureau if flammable alternatives such as Hydro-Carbon(HC) are used
② Conversion at new location	For the operations at the new location (any newly-constructed subproject needs the environmental and social screening - refer to the annex "Screening Table of Environmental and Social Problem of Newly-constructed Subprojects") ✓ EIA report and environmental management plan (refer to Annex 3); ✓ EIA report and environmental management plan shall obtain the approval of the local environmental protection department; ✓ Approval from Fire-fighting Bureau if flammable alternatives such as Hydro-Carbon (HC) are used For the existing premise. ✓ Environmental Due Diligence investigations are required for identifying environmental liabilities[1] for the existing premise, and ✓ Environmental risk assessment on the polluted site; ✓ If necessary, prepare the polluted site restoration plan.

[1] Site investigation and assessment scope need to cover and close all relevant areas of the production line.

	Submit the above documents to the local environmental protection department for the filing/approval.
③ System house conversion	✓ Approval from Local Environmental Protection Bureau; ✓ Approval from Fire-fighting Bureau if flammable alternatives such as Hydro-Carbon (HC) are used. ✓ Confirmation that polyol system houses and associated small/median foam enterprises participated in the phase-out project are in compliance with application national laws and regulations. (Environmental Due Diligence)
④ Foam enterprises engaging in identification and testing of potential substitutes	✓ EMP (refer to Annex 4) ✓ Approval from Fire-fighting Bureau if flammable alternatives such as Hydro-Carbon (HC) are used.
⑤ HCFC production reduction	✓ None
⑥ Production line closure of HCFC production enterprise	✓ Prepare the environmental management plan for the dismantlement of the production lines; ✓ The environmental due diligence report needs to define the environmental obligations of the original site; ✓ Environmental risk assessment on the polluted site; ✓ If necessary, prepare the polluted site restoration plan. Submit the above documents to the local environmental protection department for the filing/approval.

*Note: Occupational health will be addressed in the EA/EMP. If a clearance or approval from relevant government agencies or institutions is required by National regulations, the enterprise is requested to provide the PMO with such an approval or certificate(s).

13 If any sub-project is excluded in the categories indicated above, the required environmental documents will be clarified after the discussion between the World Bank and PMO, when necessary, it may need to conduct the site survey or additional review.

14 In case of foam facilities dismantling or facilities dismantling of enterprise

closing the lines, to ensure that production site meet the local land use planning and environmental protection requirements, if site clean-up is warranted by due diligence report or site risk assessment report or required by Local Environmental Protection Bureau, the subproject owner should prepare a site remediation plan and its implementation follow the approved site remediation plan in accordance with applicable laws, regulations and policies.

Environment Impact Assessment (EIA)

15 The enterprise is responsible for EIA Documentation preparation. The environmental assessment of the sub-project will be carried out by the qualified and experienced institutions, which entrusted by the sub-project owner and have the consulting certificates from the departments of Environmental Protection. The environmental assessment of the sub-project will be carried out by the qualified and experienced institutions, which entrusted by the sub-project owner and have the consulting certificates from the departments of Environmental Protection, according to Chinese environmental policies and World Bank security policies.

EIA Report and Environmental Management Plan (EMP)

16 Sub-project owner is responsible for the preparation of EIA or EMP. The specific requirements of the EIA report include the world bank's OP4.01 policy and the relevant environmental impact assessment policies in China. An EMP consists of a series of environmental protection measures during project design, construction and implementation. Those measures eliminate or compensate the negative environmental and social impacts, or at least help to control the impacts at the acceptable levels. For conversion to alternatives (e.g. hydrocarbon) at new location and production line closure projects of production enterprises, EMP template is listed in Annex 3. For identification and testing of potential substitutes in Chinese foam enterprises, the EMP may refer to Annex 4

Environmental Due Diligence Report

17 Subproject owner is responsible for preparation of the Environmental Due Diligence Report with assistance from professional experts and institutions. The due diligence investigation will be carried out by independent and experienced institutions/consultants, which are entrusted by the sub-project owner. The enterprises shall submit the qualification of the institutions or consultants and the due diligence report to PMO for review.

18 Environment Due Diligence Report is required for identifying environmental liabilities, if any, and prepares, if necessary, a mitigation and remediation plan for the existing premise taking into account the future land-use plans. Environmental Due Diligence Report including but not limited to 1) the compliance with the laws and regulations of environmental protection,

including whether received environmental administrative penalty or an environmental disputes, or whether environmental appeal petition or petitions happened; 2) the implementation status of environmental protection measures prescribed in environmental approval documents; 3) the operation of environmental protection measures; 4) the emissions of the pollutants, and leakage/spill of hazardous chemicals on the site which may lead to contamination; 5) the disposal of industrial solid waste and hazardous waste; and 6) whether use the banned substances and complying with industrial policy, etc.

19 Environmental risk assessment on the polluted site: The assessment shall be launched according to the environmental protection standards and codes such as *Technical Guidelines for Environmental Site Investigation, Technical Guidelines for Environmental Site Monitoring, Technical Guidelines for Risk Assessment of Contaminated Sites, Technical Guidelines for Soil Remediation of Contaminated Sites, etc.* Based on the environmental survey on the site, analyze the main exposure ways of the pollutants in the soil and groundwater of the polluted site for the people, assess the risks and hazards of the pollutants to the human health and provide sufficient mitigation measures.

5.3 Public Consultation and Disclosure

20 The sub-project owner is responsible for conducting public consultation. These responsibilities include: (a) public notification; (b) conducting the consultation and (c) recording the significant findings, conclusions and suggestions. Sub-project owners or the entrusted consultation agencies shall put the information available in the public and collect the opinions from surrounding residents. The methods for public consultation include questionnaire, workshop, and meeting, etc. The template and requirements are listed in Annex 5. The purpose of public consultation is to collect the information of environmental impacts caused by subprojects in surrounding residents and identify the important environmental issues they believe to be significant. Any significant issues, established during the public consultation, should be incorporated into EIA documents.

21 PMO or its consultants should review minutes of the public consultation conducted during the preparation of the EIA to determine if it was adequate. If the public consultation for the EIA was *not* adequate, the PMO requires the sub-projects owner to perform another public consultation.

22 Requirements for public consultation are as follows：

Table 5.2 Requirements for public consultation

Sub-project type	Requirements
TYPE 1 Conversion at present location	Public Participation

TYPE 2 Conversion at new location	Public Consultation
TYPE 3 System houses conversion	N/A
TYPE 4 Foam enterprises engaging in identification and testing of potential substitutes	N/A
TYPE 5 HCFC production reduction	N/A
Type 6 Production line closure of HCFC production enterprise	Public Consultation

23 For the sub-project that public consultation is required, in order to make the consultation more effective among different stakeholders, sub-project owner should provide the public with draft EIA documents before consultation. All final EIA documents should be locally disclosed at a public location where is accessible for the affected persons and other stakeholders. The public notification can be carried out through posters, newspaper and internet. It is recommended that enterprises or PMO place subproject EIA and EMPs on their websites.

5.4 Grievance Mechanism

24 In order to ensure that consultation, disclosure, and community engagement continues throughout the project implementation, the enterprises will establish a grievance mechanism.

25 Grievance Mechanism will be established in EIA documents to make sure that all complaints of affected persons will be responded in time. Sub-project owner should announce the appealing ways to the affected groups or individuals during the public consultation. The grievance mechanism shall consist of (1) recording and reporting system, including written and oral appealing; (2) persons in charge of appealing; (3) Time required to appeals respond. The procedure is as follows, any people affected by adverse environmental impacts from the sub-project may write or talk to the sub-project owner directly and the sub-project owner should solve the issues with limited time. If affected people are not satisfied with the result, they may forward their appeal to local environmental protection authorities. If the decision of local environmental protection authorities is not acceptable to the affected people, they may forward their appeal to a court.

5.5 Review and Approval

26 **Domestic Review and Approval**：PMO will review the document package submitted by enterprise. For sub-project that EIA document is needed, PMO or its consultants will check for consistency between EIA and EMP prior to local EPB’s approval. If the environmental documents do not meet all the

requirements, sub-project owners will be asked to provide additional information. After approved, EIA documents should be submitted to PMO together with EMP.

27 **Related Conditions and Responsibilities.** PMO will ensure that an appropriate clause is included in enterprises contract obligating the sub-project owner to implement the mitigation, monitoring, and reporting measures specified in the EMP and strictly follow the procedures according to related Chinese laws and regulations .

28 **Review and Approval from Word Bank**：The environmental documents will be post- reviewed by Word Bank. The review may include prior review during the early stage of project implementation, and post review after the enterprises and PMO are familiar with the EMF.

29 **Implementation Phase:** The enterprise is responsible for ensuring that all the requirements of the EMP are properly implemented. It is the responsibility of the enterprises to ensure that relevant tender documents and contracts include requirements put forward in the EMP. During sub-project implementation, PMO has the right to check the documents and contracts to verify this condition has been satisfied.

5.6 Monitoring

30 During the project implementation, PMO will work with local environmental authorities and its consultants to monitor the implementation of HCFC phase-out subprojects and to ensure that all the specified EMPs, and the site remediation plans (if any) are implemented properly.

5.7 Reporting

31 During the project implementation, PMO will request the enterprises to report implementation of its EMP. The enterprises should carefully document monitoring results in accordance with the Monitoring Plan included in the EMP and identify any necessary corrective or preventive actions taken during the monitoring period. The progress report submitted by the sub-project owner should include the implementation of their EMPs (e.g. mitigation, monitoring) and whether if there are any significant environmental issues occurred, and how the issues were resolved or are being resolved. The PMO can request more frequent reporting if the EMP were not being implemented adequately.

32 The PMO will submit the progress report to World Bank regularly. The report should include: (a) implementation status of EMP (b) any issues that were occurred, and (c) how the issues were resolved or are being resolved.

VI. Capacity Building/Training

33 The Project will be administered by the PMO, which will designate staff to manage environmental risk and assure that procedures specified in the EMF are properly followed during implementation. In addition, ralated experienced environmental consultants will be contracted to support the PMO to perform the tasks required under this Framework in the identification and management of environmental risk in project evaluation and implementation.

34 The contracted experts and qualified consultants will provide environmental safeguard training to sub-project owners or other stakeholders. The EMP will be prepared and implemented by sub-project owner with assistance from qualified consultants. The training shall include (1) relevant requirements of environmental laws and regulations; (2) environmental assessment procedures; (3) Environmental issues may be caused by sub-project preparation and implementation.

VII. Public Consultation and Information Disclosure

35 To avoid or reduce the adverse environmental and social impacts caused due to the launching of project activities to the greatest extent and guarantee that the personnel and groups influenced by the projects funded by World Bank can know about the project objectives and influences, this Framework includes the public consultation and information disclosure during its formulation according to the requirements of World Bank and the environmental protection department.

7.1.Public Consultation

36 According to the provisions of safety guarantee policies of World Bank, this framework report includes the public participation & consultation. The public consultation has the following types:

- Questionnaire survey. According to the implementation conditions in 1st Phase of HCFCs phase-out projects, draw up the questionnaire, consult 10 enterprises within the influence scope of the environmental management framework in Phase I with the contents including the main possible activities of the project, possible environmental impacts, mitigation measures adopted and the like, ask the groups and individuals related to the project for the opinions and summarize the opinions on all aspects.
- Visiting consultation. Visit the site of the place where the project locates and ask the groups (enterprises) and individuals influenced by the project execution for the opinions.
- Expert consultation. Listen to the opinions of the environmental protection

experts from World Bank and the environmental protection department, conduct the technical consultation and discussion about the environmental problems caused by the project, know about the possible influences of the project, the problems to be noted during the project execution and the mitigation measures which shall be adopted.

- Symposium. FECO is in the responsible for the organization of second stage of environmental and social security framework of public consultation in the environment of international convention building, held in October 11, 2017. Meeting content is on the draft environmental and social security framework for public opinion consultation, listening to the opinions and suggestions of the above documents for local environmental protection departments and enterprises. Details of the meeting are shown in Annex seven.

7.2 Information Disclosure

37 This Framework will publish the information on the official website of FECO since November 2, 2017 according to the requirements of the safety guarantee policies of World Bank and Ministry of environmental protection. Publicity website：

http://www.mepfeco.org.cn/dtxx/tzgg/201711/t20171102_94944.html.

This framework document will also be published on relevant domestic websites and the website of World Bank.

7.3 Information Feedback

38 This Framework fully considers the pubic opinions: For the reasonable opinions, the project management organization and World Bank will incorporate them in this Framework after the negotiations; for the unreasonable opinions, the project management organization will explain to the public.

Annex 1 Exclusion List

1) Production or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements, or subject to international bans.

2) Backward process, production or technology deemed not in accord with national industrial policy, environmental policy and technical policy.

3) Projects involving Environmental Sensitive Area.

4) Subprojects being classified as Category A.

Annex 2 Screening Form for Environmental and Social Problems of Newly-constructed Subprojects

Draw up the draft screening form for the potential environmental protection and social safeguards issues and determine the applicability of relevant Chinese laws and World Bank policies.

The project management organization (FECO) must perform environmental and social screening to determine (i) the eligibility of the subproject and guarantee that it is not in the prohibited list; (ii) the environmental and social risks/issues; (iii) subproject category; (iv) relevant safeguard measures to be prepared for each eligible subproject.

The screening form below will be used:

Screening Checklist of World Bank Environmental Protection and Social Safeguards

Questions	Answer		If Yes, WB Policy triggered	Document Requirements
	Yes	No		
Is the proposed subproject likely to have adverse environmental impacts?			OP 4.01 Category C	No action needed beyond screening
Are the subproject likely to have adverse environmental impacts that are sensitive, diverse or unprecedented?			OP 4.01 Category A	Not eligible
Do the impacts affect an area broader than the sites where the subproject locates and are the significant adverse environmental impacts irreversible?			OP 4.01 Category A	Not eligible
Is the subproject neither a Category A nor Category C as defined above?			OP 4.01 Category B	Environmental Impact Assessment or Environmental Management Plan
Will the subproject be supporting reconstruction or preservation of physical cultural resources? Will the subproject adversely impact physical cultural resources?			OP 4.11	Not eligible
Does the subproject construct a new dam or rely on the performance of an existing dam or a dam under construction?			OP 4.37	Not eligible
Will the subproject involve the significant conversion or degeneration of critical or non-critical natural habitats?			OP 4.04	Not eligible

Does the subproject involve involuntary land acquisition or prior acquisition of land or demolition of existing structures?			OP 4.12	Abbreviated Resettlement Action Plan (ARAP)/Resettlement Action Plan (RAP)
Are there any ethnic minority communities present in the project area and are likely to be affected by the proposed sub-project?			OP 4.10	Ethnic Minority Development Plan/Indigenous Peoples Plan

Annex 3 Environmental Management Plan (For conversion to alternatives, e.g.hydrocarbon at new location and closure of the production line)

An EMP consists of a series of mitigation, monitoring, and institutional measures to be taken during construction and operation phase in order to eliminate negative environmental and social impacts, or at least controlled at acceptable levels. The plan shall include the following:

A. Sub-Project Description

It will present a brief description of the Sub-project and include the actual investment, the location, and the characteristics of the new location or present location, for example, whether it is near to a protected area, cultural or historical heritage and so on. Additionally, it is needed to briefly describe in which purpose the land has been used, such as farming land or industry zone and the nearest population centers to the project location.

B. Mitigation Plan

This part is to identify and summarize all important possible environmental impacts and risks and describe every mitigation measures in detail. If necessary, the information about technical design, facility description and operation procedure should be included.

Phase	Issues	Mitigation Measures	Cost of mitigation	Responsibility*	Start-Completion Date
Construction					
Operation					

* Items indicated to be the responsibility of the contractor shall be specified in the bid documents

C. **Monitoring Plan**

Describe the measures taken during monitoring, including monitoring standards and locations, and selected methods and frequencies, etc.

Phase	Monitoring Standards	Monitoring Location	Monitoring Method	Monitoring time/ frequency/ duration	Budget (Yuan)	Responsibility	Starting Date	completion Date

Construction								
Operation								

D. **Institutional Arrangements**

This part includes the illustration of organization arrangement and responsible persons for taking the mitigation measures and monitoring, for instance, who collects the data, who analyzes it, who prepares reports, whom the reports are sent to and how often.

Measures	**Institutional Arrangements**
Measures	**Institutional Arrangements**
Data Collection Construction Operation	 Construction Operation
Data Analysis Construction Operation	 Construction Operation
Report Reception / frequency (who/how often) Construction Operation	

Annex 4 EMP (For foam enterprises engaging in identification and testing of potential substitutes)

Standard EMP is used for category of foam enterprises engaging in identification and testing of potential substitutes.

A The Environmental Management Unit

The aim of the Environmental Management Unit is to ensure the environmental protection laws be followed, handle the testing in an environmental manner, monitor and record the effects of pollution treatment facilities, and guarantee the environment and employees' health and safety has been considered.

The Environmental Management Unit will be responsible for:

- Carrying out mitigation measures and monitoring；
- Recording information (e.g. leak or accidents)；
- Preparing and implementing Environmental Emergency Plan；
- Preparing and conducting environmental protection training.

The waste management is indicated in below in order to give an example of what kind of mitigation measures and monitoring procedures should be carried out during the project implementation for identification and testing of potential substitutes.

B Waste Management

Concerns/issues	Management/mitigation measure	monitoring		
		Monitoring item	Time/frequency/continuous time	Responsible institution
Wastewater	➢ Identify opportunities to prevent or reduce wastewater pollution through such measures as recycle/reuse within their facility; ➢ Wastewater will be treated in the wastewater treatment unit in enterprises to comply with the applicable standard before discharged into the drainage trench.	COD, pH	1 time/year	Local Environmental Monitoring Center
Air Emission	➢ Provide buffer zone around the operating zone; ➢ Provide adequate ventilation for fugitive emission. ➢ Collection of Volatile Organic Compounds (VOCs) through air extractors and remove VOCs with control devices such as condensers or activated carbon absorption.	TSP, SO_2	1 time/year	Local Environmental Monitoring Center
Noise	➢ Selecting equipment with lower sound power level; ➢ Installing silencers for fans; ➢ Installing acoustic enclosures for equipment casing radiating noise; ➢ Improving the acoustic performance of constructed building, apply sound insulation; ➢ Installing vibration isolation for mechanical equipment.	Leq (A)	1 time/year	Local Environmental Monitoring Center
Non-hazardous waste	➢ Evaluate of waste production process and identification of potentially recyclable material, then recycle and reuse it; ➢ Non-hazardous waste will be stored in separate watertight storage area and then treated by the sanitation department.	Visual inspection. Ensure all wastes are stored and disposed appropriately.	Regularly	Local Environmental Monitoring Center

Hazardous waste	➢ Hazardous waste will be stored segregated from non-hazardous waste ➢ Store in closed containers away from direct sunlight, wind and rain; ➢ Provide adequate ventilation ➢ Conducting periodic inspections of storage areas and documenting the findings; ➢ Preparing and implementing spill response and emergency plans to address their accidental release; ➢ Provide secondary containment for all on-site hazardous waste and waste storage facilities; ➢ Equipped with adequate firefighting equipment	Visual inspection. Ensure hazardous waste is stored appropriately.	Regularly	
Occupational health and Safety	➢ Under operating conditions, workers should wear personal protective equipment, e.g. gas mask, PE gloves and other personal protection equipment. Appropriate measures such as ventilation, fire prevention and cooling should be planned and installed to accommodate the use of different chemicals. ➢ The workers should receive proper safety training and proved to be qualified through tests before assuming the position;When the use of hazadous chemicals is involved, a safety facilitator with adequate knowledge of safety operation of hazadous chemicals should be recruited. ➢ No Smoking, No Food and No Fire in project site; ➢ Mark the caution signs both in Chinese and in English; ➢ Safety use of electrical appliance.	/	/	Local Health authorities
Environmental Risks	➢ Install alarm and adsorption facility; ➢ Provide emergence response plan.	/	/	Local Environmental Monitoring Center

Annex 5 Public Consultation

- The followed documents should be provided:
- **Manner in which notification of the consultation was announced**: media(s) used, date(s), description or copy of the announcement
- **Forms of public consultation (**if there are two or more than two rounds of public consultation, sub-project owner can use questionnaire survey for the first round of consultation, while a meeting with project affected people as the second round of public consultation. In case of only one round of public consultation, the enterprise should organize a consultation meeting with the project affected people on the draft EIA documents.**) :**

A) Questionnaire Survey

- Questions, Respondents (Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)), Investigation Scope, findings and Results

B) Meetings , Discussions or Hearings

- Date(s) when consultation(s) was (were) held
- Location(s) where consultation(s) was (were) held
- Who was invited

——Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)

- Who attended

——Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)

- Meeting Program/Schedule

——What is to be presented and by whom

- Summary Meeting Minutes (Comments, Questions and Response by Presenters)
- List of decisions reached, and any actions agreed upon with schedules and deadlines and responsibilities.

Annex 6 Environmental Management Requirements for Technical Assistance Activities

All TA activities of the World Bank assisted projects, irrespective of their sources of financing and whether they are stand-alone or as part of an investment operation, should be reviewed for their potential environmental and social implications, risks and impacts. Therefore, it is necessary to observe the World Bank safeguard policies when applicable.

TA activities are grouped into the following four main types:

- Strengthening the capacity building of the institution receiving the assistance;
- Assisting in the formulation of the policies, programs, plans, strategies or legal frameworks, etc.;
- Land use planning or natural resources management;
- Preparing the feasibility studies, technical designs or other activities directly in support of the preparation of a future investment project (whether or not funded by the Bank).

The indicative safeguard approaches to the four types of TA activities are shown in the table below.

Indicative Safeguard Approaches to the Four Types of TA Activities[2]

Type of TA	Examples	Potential Environmental & Social Implications	EAt Category	Safeguard Policies that May be Triggered	Indicative Document List to be Prepared Prior to the Assessment or during Implementation (Applicable to Specific Projects)
Type 1: Strengthening the capacity building of the institution receiving the assistance	Capacity building activity; staff training & study tours; recruitment and payment of salaries; supply of office equipment, etc.	These activities usually do not have potential adverse environmental and social implications or risks. According to the regulation provisions of the institutional recipient of capacity building, there may be reputational risks if the Bank is perceived as assisting indirectly in the implementation of a national policy framework that is not attuned with Bank safeguard principles..	C	None	None
Type 2: Assisting in the formulation of the policies, programs,	Examples may included: • Water resources management/planning studies; •River basin management studies; •National or regional emission	These types of activities may have significant down-stream impacts. For example, the forestry regulations may affect access to forest resources. If the regulations lead to the future conservation areas, involuntary resettlement and seasonal access to forest resources may be involved. The ethnic	B or C	Any or all the policies below: OP 4.01	Analysis of potential environmental and social issues and how they will be addressed;

[2]The above, including the indicative EA category and indicative list of instruments to be prepared prior to appraisal or project implementation, are provided solely for the purpose of illustration.

The actual approach used in a given project will depend upon the specifics of project design and the outcome of discussions with regional safeguards advisors and expert teams, as appropriate.

plans, strategies or legal frameworks, etc.	studies; •Biodiversity conservation studies; • Defining emission or discharge standards etc.; • Developing the forestry regulations; •Supporting the drafting of land laws and land acquisition laws; • Drafting a strategy for private sector and finance transport infrastructure.	minority communities living close to the forest areas that are likely to be affected by the new regulation and the land issues might be involved. Some forest areas can be important natural habitats, including the water resources or the home to endangered species, For instance, the new regulation may consider expanding buffer zones to rehabilitate the connectivity between natural habitats. Similar analysis could be applied to the other examples cited..		OP 4.04 OP 4.36 OP 4.11 OP 4.12 OP 4.10	Preparation of the environmental impact assessment outline and draft for the present planning and study; IPPF if policies plans will potentially have significant implications for indigenous peoples.
Type 3: Land use planning or natural resources management	Coastal Zone Management, Urban Planning, Zoning, Agricultural and Rural Development Planning etc. Please see the 2010 Interim Guidance Note on Land Use Planning for more details.	Coastal resources management plans may affect local and ethnic minority communities; access restriction to forest and marine resources; Plans may lead to future land acquisition and resettlement for strengthening or establishing new protected areas; Concerns on sensitive sites within or in the periphery of the urban area, e.g., historical sites, natural habitats. Future urban planning may cause induced impacts on use of resources in urban periphery. Relocation of people, including illegal dwellers on public lands, will have substantial social implications.	B or C	Any or all the policies below: OP 4.01 OP 4.04 OP 4.36 OP 4.11 OP 4.12 Migrant[3] OP 4.10	Any or all of the documents below: Environmental Impact Assessment Outline & Draft of Social & Economic Statistics Administration Authority; Environmental Management

3 For land use planning activities, see the "Interim Guidance on Land Use Planning" available on the Information Disclosure Safeguards Webpage.

				Ethnic Minority	Framework Draft; IPPF; Migrant Resettlement Framework; Process Framework.
Type 4: Preparing the feasibility studies or technical designs	Activities such as feasibility studies; technical, engineering design studies; preparation of bid documents etc. that would facilitate construction of physical infrastructure which may or may not be financed by the Bank.	Each proposed infrastructure investment must be screened (like in any Bank financed investment lending operations) for its potential social and environmental impacts to identify/define: (a) safeguards policies triggered; (b) EA category; (c) safeguards instruments to be prepared during preparation of engineering designs; and (d) consultation and disclosure requirements[4].	A or B	Any or all of the ten policies	Environmental Management Framework or Environmental Impact Assessment Work Outline of Guarantee Policies

[4] In the case of TA in support of feasibility studies, it may be premature to prepare a full suite of safeguard measures by appraisal or even during implementation of the TA project. On the contrary, properly guarantee that the study personnel can reach the agreement with the client so as to consider relevant environmental and social problems during the study, thus reflecting the principles of the World Bank safeguard measures.

Annex 7 Public consultation and information disclosure of framework documents

HCFC Phase-out in China HCFC production Sector and PU Foam Sector The records of the public consultation conference of environmental and social security framework of the second phase-out project

Date: October 11, 2017 15:00-17:00
Place: Environmental Convention Convention building
Host: Kaixiang Wang
Attendance: Foreign Economic Cooperation Office The Ministry of Environmental Protection、China Association of Fluorine and Silicone Industry、Environmental Protection Department of Jiangsu Province、Environmental Protection Department of Zhejiang Province、Environmental Protection Department of Shandong Province、Some related enterprises(HCFC production enterprises and PU foam enterprises).
Theme: the public consultation conference of environmental and social security framework of the second phase-out project

Content:
According to the *Montreal Protocol on Substances that Deplete the Ozone Layer*, hydrochlorofluorocarbons (HCFCs) production industry and polyurethane foam industry has entered the second stage elimination (2017-2025), the World Bank as the international executive agencies responsible for the execution of the project. According to the requirements of the World Bank project implementation, the environmental management and social safety assurance activities of the second phase-out project need to be based on the environmental and social security framework document of second phase. The conference is to make public comments on the draft environmental and social security framework, and listen to the opinions and suggestions of the local environmental protection departments and enterprises on the above documents.

Yunpeng Li, the Ministry of environmental protection center, reviewed the implementation of the first phase of HCFCs phase-out project, and introduced some environmental documents that enterprises may need to prepare, and some programs that may need to carry out during the second phase out project. Wei Li, the professor of Beijing Normal University, introduced the update and compilation of framework document of the second phase, including EMP、RPF and SRM. The project files update the needed rules, procedure and system, and add a type of enterprise to shut down production line.

Part of the provincial and municipal environmental protection department of contaminated sites and ozone depleting substances out of management and enterprises of HCFCs production and PU foam were listened to through the discussion of the meeting, and some of questions were replied as follows:

1. The compensation provisions stipulated in RPF, according to the actual situation of China, should be led by the local government, not the enterprises.

REPLY: According to state regulations, if the enterprise has used land within the industrial park for more than one year, the resettlement plan is not necessary; if not in the industrial park, the resettlement plan should be done in accordance with the requirements of the world bank.

2. Environmental problems of PU foam enterprise are relatively small and the environmental risk assessment costs too much. Can PU foam enterprise not do risk assessment?

   REPLY: If the enterprise's due diligence report considers that the enterprise itself is less polluted and it is not necessary to make environmental risk assessment report, the risk assessment report is not necessary.

3. Public participation of the production line closed type enterprise can specifically divided into two kinds: change the land use and public participation; do not change the land use and not public participation.

   REPLY: It is not to say that public participation is needed only when the industrial land change to commercial land or residential land. Such as the original production of chemical products used as warehouses, may also be a way to expose the harmful substances cause harm to the public. To determine the environmental risks according to site usage, or the need to repair according to the case analysis, is in complicated situation. EMF, as a safeguard framework, its basic principle is to prevent the occurrence of risk from the source. So the public participation is necessary.

4. If the EIA is reported to the local environmental protection department and the enterprise does not receive a reply, how to deal with it?

   REPLY: The enterprise to submit a report to the local environmental protection department, if the local environmental protection department did not reply within ten working days, the FECO considers that the enterprise is responsible for its job already and the local environmental protection department has no objection to the EIA report.

5. Whether the local environmental protection departments still carry out the examination and approval of the documents? The preparation and requirements of the local environmental documents in table 5.1, should the local administrative departments "approve" be changed to "filing"?

   REPLY: Local environmental protection departments carry out the examination and approval of the documents EIA, but may not environmental management plan, which can be used as an annex to EIA report. Taking into account the different implementation of each place, it is agreed to change " approval" to "approval/filing".

6. Whether FECO can set up an expert organization, which is more convenient for enterprises to submit documents for examination and approval.

   REPLY: It is difficult for FECO to establish an expert organization. Enterprises

can hire a qualified agency to do the environmental management plan or by themselves, FECO will hire experts to review the enterprise environmental management plan.

7. Is the second HCFC phase-out work carried out in a project way or a long-term management of the industry?

   REPLY: The second phase environmental and social security framework document is only effective for the implementation of the second phase PU foam enterprises and HCFCs production enterprise projects, which is a framework guidance document.

8. For PU foam enterprises, if large enterprises and small and medium enterprises are applicable to this framework file? For small and medium enterprises, the implementation of the framework has great economic difficulties.

   REPLY: All of the project enterprises should follow the second phase of the environmental and social security framework at present.

9. If the type of closure of the production line covers the framework document when signing the contract?

   REPLY: The contract for the phase-out project will cover the environmental and social security framework document and some related requirements.

10. If the new project is added to the original site after the production line is closed/ removed and repaired, does the EIA is needed to be re-evaluated?

    REPLY: The second stage of phase-out project only involves the cleaning and repairing of the site after the production line is closed. The content of the subsequent land reuse is not covered in the HCFC phase-out project.

11. The sub project responsibilities of enterprises refer to submit progress report to FECO, but do not make mention of the local environmental protection departments. The local environmental protection department is in the duty of supervision but not real-time understanding of the project progress, and recommendations are also submitting progress reports to the local environmental protection department.

    REPLY: Enterprises should submit the environmental documents or reports to the local environmental protection department approved by FECO, so that the local environmental protection departments can understand the site situation and facilitate supervision.

If there are any objections, enterprises or institutions of second stages of environmental and social security framework can feedback to FECO since October 11th in 10 days. For the reasonable opinions, FECO and World Bank will incorporate them in this Framework after the negotiations.

The contents of the meeting will be used as an annex to the framework and will be published on the official website of FECO also with EMF/RPF/SRM.

The public consultation meeting will serve as the framework for security and file attachments, box second stages of environmental and social security (environmental management framework, resettlement framework, social risk and mitigation measures), will be in the center of the official website of the Ministry of foreign cooperation in environmental protection publicity.

Annex I: Photos at the conference site

Annex II: Conference attendance table

Foreign Economic Cooperation Office

The Ministry of Environmental Protection

October 12, 2017

Annex I: Photos at the conference site

Annex II: Conference attendance table

HCFC淘汰二阶段环境和社会安全保障框架文件讨论会签到表

序号	单位名称	参会人员	联系电话	签字
1	环境保护部大气环境管理司	董文福		
2	中国氟硅有机材料工业协会	梅胜放		
3	中国塑料加工工业协会	孟庆君	13011115498	
4	江苏省环境保护厅	洪岚		
5	浙江省环境保护厅	胡瑞丰	13989466915	
6	山东省环境保护厅	邵常盈	13790337863	
7	山东省环境保护厅	刘鑫		
8	金华永和氟化工有限公司		13515706772	
9	金华永和氟化工有限公司		13957988293	
10	临海市利民化工有限公司		13806561961	
11	临海市利民化工有限公司			
12	山东东岳化工有限公司		13869364989	
13	山东东岳化工有限公司		18053316858	
14	浙江衢化氟化学有限公司		18057095001	
15	浙江衢化氟化学有限公司		13905705705	
16	浙江三环化工有限公司		13375885208	
17	浙江三环化工有限公司			
18	浙江蓝天环保高科技股份有限公司		13396516889	
19	浙江蓝天环保高科技股份有限公司			
20	淄博鲁轩工贸有限公司		15898757609	
21	淄博鲁轩工贸有限公司		13409006004	
22	北京中万盛聚氨酯有限公司	于永进	13501165730	
23	三利节能环保工程股份有限公司	沈相斌	13701248985	

			签字	
24	三利节能环保工程股份有限公司	高继东		
25	北京汇泽建材有限公司	弓永威		
26	环境保护对外合作中心	王开祥		
27	环境保护对外合作中心	尚舒文		
28	环境保护对外合作中心	李云鹏		
29	环境保护对外合作中心	李雄亚		
30	环境保护对外合作中心	姜百可		
31	环境保护对外合作中心	李思成		
32	环境保护对外合作中心	王一雯		
33	环境保护对外合作中心	孙博		
34	北京师范大学	李巍		
35	北京师范大学	李林		
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				