

**PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE**

Report No.:56146

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|--|---|
| Project Name | <i>China HCFC Phase-out Project (Stage I)</i> |
| Region | <i>East Asia and Pacific</i> |
| Country | <i>China</i> |
| Sector | <i>Other Industry and Central Government Administration</i> |
| Lending Instrument | <i>Specific Investment Loan</i> |
| Project ID | <i>P115561</i> |
| <i>{If Add. Fin.}</i> Parent Project ID | |
| Borrower(s) | <i>People's Republic of China</i> |
| Implementing Agency | <i>Ministry of Environment Protection</i> |
| Environmental Screening Category | []A [X]B []C []FI []TBD (to be determined) |
| Date PID Prepared | <i>29 July 2010</i> |
| Estimated Date of Appraisal Completion | <i>28 November 2011</i> |
| Estimated Date of Board Approval | <i>30 December 2011</i> |
| Concept Review Decision | Following the review of the concept, the decision was taken to proceed with the preparation of the operation. |

I. Introduction and Context

1. Hydrochlorofluorocarbons (HCFCs) are ozone-depleting substances (ODS) subject to consumption and production control measures of the Montreal Protocol on Substances that Deplete the Ozone Layer. The Montreal Protocol requires complete phase-out of HCFC consumption and production by 2030 for developing countries known as “Article 5” countries. This project will support China’s efforts to phase out both (a) its production of HCFCs, and (b) the consumption of HCFCs in the foam sector.

2. HCFCs are substances mainly used as refrigerant in refrigeration and air-conditioning equipment and as blowing agents for insulation foam. HCFCs are also used as solvent cleaning agents, propellants in aerosol products, and as fire extinguishing agents. One major type of HCFC (HCFC-22) is also used as a feedstock for producing teflon. HCFCs were introduced as transitional substances to chlorofluorocarbons (CFCs) which are more potent ozone depleting substances.

3. HCFC phase-out acceleration applies to developed and developing countries, with the latter being subject to a freeze on HCFC consumption and production as early as 2013. This presents a number of challenges for effective HCFC phase-out, including resistance from enterprises that only recently converted from CFC to HCFCs, an extremely high growth rate in HCFC-using sectors (more than 10% annually in China alone), and constraints in alternative technologies for some manufacturing sectors.

4. HCFCs are not only ozone depleting substances, but they also are high global warming gases whose global warming potential (GWP) ranges from several hundred to several thousand times that of carbon dioxide. Moreover, the conversion of various HCFC-based manufacturers to alternative, advanced technologies usually leads to improved energy efficiency, particularly in the refrigeration and air-conditioning sectors. Thus, phasing out HCFCs provides two types of potential benefit to the climate. Synergies with the climate agenda were duly recognized by the Parties to the Montreal Protocol when they decided to accelerate HCFC phase-out in 2007.

Country Context

5. In 2008, China produced more than 90% of the global HCFC supply and was responsible for more than 60% of the global HCFC consumed. HCFCs produced in China include HCFC-22, HCFC-141b, HCFC-142b, HCFC-123, HCFC-124, and HCFC-133, with the first three accounting for 99% of production and uses. Statistical data on 2008 HCFC production and consumption in China for these three key HCFCs are shown below.

Table 1: 2008 Production, Consumption and Exports of Major HCFCs in China

| | | 2008 |
|------------------|-------------|---------|
| HCFC-22 | Production | 275,962 |
| | Net export | 97,721 |
| | Consumption | 178,241 |
| HCFC-141b | Production | 85,228 |
| | Net export | 35,999 |
| | Consumption | 48,603 |
| HCFC-142b | Production | 35,479 |
| | Net export | 5,424 |
| | Consumption | 30,055 |

6. The large difference between production and consumption figures for HCFC-22 is attributed to its use as not only a refrigerant but as feedstock (defined as the use of the HCFC product as an input to a subsequent chemical process that removes its ODS impact). Under the Montreal Protocol, use of ODS as a feedstock is not considered consumption. Nonetheless, HCFC-22 use in China for feedstock is significant (40% of HCFC-22 produced) and must be part of the equation when formulating production sector interventions for Montreal Protocol compliance.

Sectoral and Institutional Context

7. More than 66% of the total HCFC consumption in China is for manufacturing and servicing refrigeration and air-conditioning equipment. China currently commands more than 70% of the global market of refrigeration and air-conditioning products. Another 30% of the total HCFC consumption is in the production of insulation foam for buildings and cold storage.

8. Phasing out of HCFCs presents opportunities for China not only in the redesign of its products to ozone-friendly technologies but also from the benefit of new available technology that is more energy efficient. Refrigeration and air-conditioning equipment represents on average more than 40% of electricity demand in developing countries, including China.

Adoption of 20-30% more energy efficient refrigeration and air-conditioning technologies would enable developing countries to lower electricity demand by at least 10%.

9. Improving thermal insulation, increasing energy efficiency of refrigeration and air-conditioning products, and replacing the production of HCFCs with environmentally friendlier chemicals through the modernization of existing manufacturers; and, alongside an enabling policy and regulatory framework, will allow China to improve its efficient use of energy and its limited resources. This can be achieved while China maintains or even enhances its share of products in the global market.

Relationship to the CAS

10. The proposed project directly supports Pillar 3 of the Bank's Country Partnership Strategy (CPS) for China (2006–2010): Managing Resources Scarcity and Environmental Challenges. In the context of this strategy, the Bank is supporting China to respect commitments to international environmental conventions on climate change and ozone depleting substances.

11. The project is also consistent with the Bank's 2001 Environment Strategy. The Bank's Environment Strategy is a framework for focusing Bank interventions in three main areas of action: integrating environmental considerations into strategies and actions for poverty reduction; establishing public policies that enable sustainable economic growth led by the private sector; and addressing regional and global environmental challenges.

12. The Bank has played a major role in assisting developing countries develop and implement policies, and investment and technical assistance activities to meet their obligations under various international conventions. The World Bank is one of the implementing agencies for the Multilateral Fund for Implementation of the Montreal Protocol (MLF) and Global Environment Facility (GEF). For the MLF, the Bank has assisted its client countries to phase out over 282,000 metric tons (MT) of ozone depleting potential (ODP). This represents nearly 70% of the total ODP phased out under the MLF.

13. The Bank has been engaged in ODS phase-out activities in China since the early 1990s, and was an important partner in assisting it to phase out CFC production and consumption by 2009. As CFCs are very high GWP gases, eliminating their production and consumption has resulted in significant climate benefits. The climate benefits achieved for example by the ongoing ODS IV Project that covers seven production and consumption sector plans are equivalent to emission reductions of 329 million tons of CO₂.

II. Proposed Development Objective(s)

14. The project development objective is to assist China to meet its HCFC consumption and production phase-out obligations: (i) freeze of the production, and freeze of the consumption of HCFCs in the PU Foam Sector at the baseline level by 2013; and (ii) 10% reduction from the baseline level by 2015; as per the Montreal Protocol, and by adopting low-carbon alternative technologies, where possible, as replacement of HCFCs.

III. Preliminary Description

15. The proposed project can be considered as a continuation of the ODS IV Project as it will employ the infrastructure and capacity established under ODS IV to deliver the required assistance to beneficiaries and stakeholders. In addition, the Bank's expertise in designing a well-coordinated programmatic approach, based on a combination of investment, technical assistance, policy and regulatory-support interventions at the sector level – a proven formula under the ODS IV Project – will be extended to this proposed Project.

16. The approach taken in ODS IV, and which was first conceived in the mid-1990s, employs a financing delivery mechanism that is performance-based, meaning that funding is released against a few, macro-level performance targets, such as compliance with annual consumption and production targets as agreed with the Executive Committee of the MLF. The programmatic, sector plan approach with performance-based funding was quickly adopted by the MLF and now is the principle approach for delivering MLF assistance to Article 5 countries. The advantages of this approach as seen in China are: the flexibility given to the country to utilize the funding in the most effective manner and to reprogram funding as needs evolve; the inclusion of a regulatory and policy framework and technical assistance activities to create an enabling environment; the guarantee of committed funding under a long period of time that allows governments to obtain buy-in for phase-out from an otherwise reluctant private sector; and, the guarantee provided to the MLF through independent verification audits that it is getting results for its funding.

17. Due to the similar nature of the proposed activities and those under the ongoing ODS IV project, it is proposed that the project arrangements in ODS IV be replicated. The proposed project will therefore include a combination of investment, technical assistance, and policy and regulatory interventions which will be carried out in tandem in order to ensure timely achievement of project objectives. Financing of this project will be obtained from the Multilateral Fund and allow China to meet the first two HCFC production and consumption reduction targets in 2013 and 2015 as required by the Montreal Protocol. The project consists of the following five components:

Component 1: Investment in HCFC consumption reductions (US\$111 million)

18. The project will focus initially on reduction of HCFC-141b used as a blowing agent for manufacturing polyurethane foam (PU Foam) as HCFC-141b has the highest ozone depleting potential among all HCFCs. PU foam is used mainly as an insulation material in refrigeration equipment, buildings and automobiles. Addressing this substance first is consistent with the decision of the Executive Committee of the Multilateral Fund to give funding priority to HCFC-141b phase-out.

19. The PU foam sector in China consists of over 3,500 small, medium and larger foaming companies with a combined foam production of more than 750,000 MT per year. This sector employs about 60,000 workers. The project aims at introducing low carbon alternative technologies, primarily hydrocarbon as a blowing agent, instead of HCFC-141b to support larger foam companies in specific sub-sectors where hydrocarbon technology is well proven (e.g. refrigeration equipment manufacturers, reefers, household appliances, and etc.). As hydrocarbon is a flammable gas, this technology may not be appropriate for certain PU foam manufacturers

and applications at this point in time given higher conversion costs, safety constraints, and lack of technical capacity. The following aspects regarding HCFC phase-out by foam companies are foreseen in the design of the project:

- Large and medium size foam companies will, with financial support from the project, convert to low-carbon alternatives, most likely hydrocarbon;
- In the few cases where companies might not be permitted to use hydrocarbon at present locations, the project will provide financial support only after the companies have relocated to new locations where domestic safety regulations can be met and hydrocarbon technology can be used safely; and
- For the companies facing certain constraints in adopting full hydrocarbon technology as mentioned above, they will be assisted through local technical support centers and through the use of polyol pre-blended with hydrocarbon from polyol system houses. The project will finance the technology transfer to those supporting facilities.

20. Applications and circumstances where low carbon technologies are not presently available or utilizable will be addressed in the next phase of the HCFC phase-out program, i.e. after 2015. In order to ensure that technologies for the next phase are available, the current proposed project will support activities related to identification and testing of potential substitutes in Chinese foam enterprises (in Component 4). This will include consideration of needs of small, low-capacity foam blowing enterprises which would be targeted in a future project or project phase after 2015.

Component 2: Reducing HCFC supply (US\$244 million)

21. An overall reduction of HCFC consumption in a verifiable and sustainable manner can only be achieved through simultaneous control and reduction of the supply of HCFCs. Hence, the project will include an HCFC production reduction component where all 37 HCFC producers presently operating in China will be addressed in some manner. This will lay the foundation for eventual production closure of the three major HCFCs produced in China beyond 2015.

22. Because of the complicated national and global supply and demand dynamics surrounding HCFCs, including feedstock uses, interventions for reducing production of the three most important HCFCs (HCFC-22, HCFC-141b and HCFC-142b), consisting primarily of compensation for profits foregone due to downscaling production, will commence in 2013 when financing from the MLF is expected to be available. HCFC-141b production in particular will be made a priority for phased reduction of supply to complement efforts made in Component 1 on the demand side. In fact, depending on evolving MLF policies on eligible incremental costs of HCFC phase-out, some funding might be used to support the establishment of production capacity for new low-carbon blowing agents for the foam sector. Currently, costs of establishing production capacity of alternatives are considered on a case-by-case basis by the MLF Executive Committee. In case project funding is used to support establishment of substitute production capacity, the Bank environmental safeguard policies will be applied.

23. While HCFC production reductions under the first phase – amounting to 10% of China's 2009-2010 baseline are not expected to result in closure of HCFC production facilities, some

companies, might decide to close and dismantle their facilities depending on prognostics of the market and policy incentives provided by the Government. Relevant environmental safeguard measures would be applied to those facilities. It is roughly estimated that these 37 HCFC producers employ 2,000 to 3,000 workers. Any job losses resulting from closure of production facilities will be properly addressed, in accordance with the Bank's guidance on severance payments, to avoid any adverse impact on workers.

Component 3: Supporting policies and regulations (US\$1 million)

24. Both the phase-out of HCFC production and HCFC-141b consumption will be supported by policies and regulations at the national, provincial and sector levels. Based on experiences from previous ODS activities, sustainable HCFC phase-out in each sub-sector, would best be achieved through a complete ban on the use of HCFC in that particular sub-sector. Firstly, policies preventing establishment of new foam manufacturing facilities using HCFC-141b and expansion of existing HCFC-based production facilities will be developed and implemented under the project. Secondly, a complete ban of HCFC-141b usage in 3 out of 9 existing applications, or subsectors, will be part of this component. Specific applications that will be subject to a complete ban will be determined through the project. Thirdly, a tradable HCFC production quota system will be introduced in 2013 to ensure that reduction targets will be achieved and that both production and consumption levels stay below the agreed limits.

Component 4: Technical assistance activities (US\$ 5 million)

25. The project will finance technical assistance (TA) activities supporting HCFC phase-out. The activities will include, among others, training activities, identification and testing of low carbon blowing agents, development of guidelines for use of hydrocarbons in the different foam applications, revision of existing foam standards to remove any barriers for HCFC-141b phase-out, and introduction of new low-carbon blowing agents. A list of TA activities with objectives, scope of work, and costs for the first two years of the project (2011 – 2012) will be identified at the appraisal stage. Additional TA activities beyond 2012 will be identified during project implementation. This flexibility will allow the project to adapt to evolving technological needs and circumstances and take advantage of the experience gained from the early phase of project implementation.

Component 5: Capacity building and project management (US\$ 5 million)

26. The Foreign Economic Cooperation Office (FECO) has built a strong implementation team with significant operational experience from the previous ODS IV Project. It is expected that the FECO project management team will be maintained and be in charge of implementing the new HCFC phase-out program. The project management team will be financed by the MLF.

IV. Safeguard Policies that might apply

| Safeguard Policies Triggered | Yes | No | TBD |
|---|----------|----|-----|
| Environmental Assessment (OP/BP 4.01) | X | | |
| <p>The project itself is an environment project to reduce HCFC emissions that damage the ozone layer and contribute to the globe climate change. The proposed Project will include a combination of investment, technical assistance, and policy and regulatory interventions, but the specific activities could only be determined during project implementation. An environmental framework is proposed to be used. The framework will provide guidance to both sub-project sponsors and FECO/MEP for the environmental assessment process to be followed in evaluating individual sub-projects to be considered for financial support under the Project. This Framework will define the contents, procedures and institutional responsibilities for environmental assessment of the sub-projects whose purpose is to ensure the environmental assessment is in compliance with both Chinese environmental assessment (EA) laws and regulations and in accordance with World Bank policies and procedures as specified in OP/ BP 4.01.</p> <p>The Client will prepare the following Environmental Safeguards Instruments for Bank review and will disclose them before commencing appraisal or during project implementation:</p> <p>a. Documents preparation to be ready before appraisal: An Environmental Management Framework (EMF) - This framework is required as industrial units in the Bank financed project can only be identified during implementation.</p> <p>b. Documents to be prepared during implementation:</p> <ul style="list-style-type: none"> • TYPE 1- <i>Foam enterprises whose conversions to hydrocarbon technology take place at their present location</i> Environmental, occupational health, safety and fire protection certificates/approvals from local authorities at sub-project completion; • TYPE 2- <i>Foam enterprises whose conversion to hydrocarbon technology involve relocation of their facilities</i> EA/EMP for the operations of the new industrial unit. Environment audits are required for identifying environmental liabilities for the existing premise, and prepare, if necessary, a mitigation and site remediation plan. • TYPE 3- <i>Existing polyol system houses providing technical support on low GWP alternatives, that may be flammable and provide the polyol pre-blended with hydrocarbon(an alternative), to smaller foam enterprises</i> Certificates/approvals(Environmental, occupational health, safety and fire protection) from local authorities to allow the existing system houses for such service. Confirmation that technical support centers, polyol system houses and small foam enterprises are in compliance with application national laws and regulations should also be provided by the Client; • TYPE 4- <i>Foam enterprises that will close down their operations</i>: Environmental Audits and Environmental Management Plans. Environment audits are required for identifying environmental liabilities, if any, and prepare, if necessary, a mitigation and remediation plan for the existing premise taking into account the future land-use plans. Environmental Management Plans should address the dismantling and destruction of foam production equipment; • TYPE 5- <i>Foam enterprises engaging in identification and testing of potential substitutes</i>: Standard Environmental Management Plans. Standard EMPs should cover hazardous waste management and disposal, and occupational health and safety measures; • TYPE 6- <i>Establishment of new facilities to produce alternative chemicals to HCFCs</i>: Environmental Assessment and Environmental Management Plans. A negative list may be considered for avoiding siting at environmentally sensitive locations; • TYPE 7- <i>HCFC production facilities that will be closed down, if any</i>: Environment audits are required for | | | |

| Safeguard Policies Triggered | Yes | No | TBD |
|---|------------|-----------|------------|
| identifying environmental liabilities, if any, and prepare, if necessary, a mitigation and remediation plan for the existing premise taking into account the future land-use plans. EMPs should include measures for safe dismantling, destruction disposal of old HCFC production facilities. | | | |
| c. To the extent relevant the applicable IFC Environmental Health and Safety Guidelines will be considered when preparing the instruments described above. | | | |
| Natural Habitats (OP/BP 4.04) | | X | |
| The project will not affect any protected areas, known natural habitats, or established or proposed critical natural habitats. | | | |
| Forests (OP/BP 4.36) | | X | |
| The project will not finance activities that would involve significant conversion or degradation of critical forest areas or related critical natural habitats as defined under the policy. | | | |
| Pest Management (OP 4.09) | | X | |
| The project will not finance procurement of pesticides or pesticide application equipment (either directly or indirectly). | | | |
| Physical Cultural Resources (OP/BP 4.11) | | X | |
| The project will not adversely affect sites with archeological, paleontological, historical, religious, or unique natural values. | | | |
| Indigenous Peoples (OP/BP 4.10) | | X | |
| The project will not affect Indigenous Peoples as defined in the policy, and project activities will not limit or prevent access to natural resources vital to the sustainability of their culture and livelihoods. | | | |
| Involuntary Resettlement (OP/BP 4.12) | X | | |
| Companies to be supported by the project have not been selected at this stage. It is foreseeable that there may be some companies supported by the project may need to relocate with possible land taking. To address the possible involuntary resettlement, a resettlement policy framework is prepared to provide guidance on land taking and involuntary resettlement. | | | |
| The Client will prepare the following Social Safeguards Instruments for Bank review and will disclose them before commencing appraisal or during project implementation: | | | |
| a. Documents preparation to be ready before appraisal: A Resettlement Policy Framework (RPF) - This framework is required as industrial units in the Bank financed project can only be identified during implementation. | | | |
| b. Documents to be prepared during implementation: Resettlement Action Plans (RAPs) - RAPs will be prepared according to the Bank safeguards policy if there is involuntary resettlement. | | | |
| Non-safeguard issue: the project may involve limited closure of foam production enterprises and closure of HCFC producers which may cause some job losses and require severance payments. The Bank policy on severance payments will be followed for such cases. | | | |
| Safety of Dams (OP/BP 4.37) | | X | |
| The project will not finance construction or rehabilitation of any large dams as defined under this policy. No action is required under this policy. | | | |
| Projects on International Waterways (OP/BP 7.50) | | X | |
| There are no known project components involving international waterways as defined under the policy. No action is required under this policy. | | | |
| Projects in Disputed Areas (OP/BP 7.60) | | X | |
| The project is not located in any known disputed areas as defined under the policy. No action is required under this policy. | | | |

V. Tentative financing

| | | |
|---|-------|--------|
| Source: | | (\$m.) |
| Borrower/Recipient | | 242 |
| IBRD | | |
| IDA | | |
| Others (specify): Montreal Protocol Investment Fund | | 365 |
| | Total | 607 |

VI. Contact point

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