PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE

Report No.: PIDC558

Project Name	CH GEF Municipal Solid Waste Management Project (P126832)
Region	EAST ASIA AND PACIFIC
Country	China
Sector(s)	Solid waste management (100%)
Lending Instrument	Specific Investment Loan
Project ID	P126832
Focal Area	Persistent Organic Pollutants
Parent Project ID	P123323
Borrower(s)	International Department, Ministry of Finance
Implementing Agency	Foreign Economic Cooperation Office of Ministry of Environmental Protection
Environmental Category	A-Full Assessment
Date PID Prepared	27-Aug-2012
Estimated Date of Appraisal Completion	26-Jun-2013
Estimated Date of Board Approval	15-Jan-2014
Concept Review Decision	Track II - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

The rapid increase in production and consumption of China since 1978 has brought significant environmental pollution and ecological degradation. The Chinese Government is committed to reversing this downward environmental trend and has made environmental protection a national policy. As part of China's commitment, China has ratified numerous conventions including the Stockholm Convention on Persistent Organic Pollutants (POPs) in 2004 for which a National Implementation Program (NIP) was prepared in 2007. POPs are a group of chemical substances that persist in the environment, can be transported far from their sources and bio-accumulated through the food web, and can "lead to serious health effects including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease and even diminished intelligence." Under the Stockholm Convention, a total of 21 chemical substances are listed as POPs, including pesticides (such as DDT), industrial chemicals (such as polychlorinated biphenyls, PCBs) and unintentional by-products of industrial processes, such as dioxins and furans . According to the NIP, municipal solid waste (MSW) incineration is one of the key sources of dioxin and furan release in China.

Sectoral and Institutional Context

MSW management is a growing concern for China's cities. With China's rapid economic development, urbanization, and rising standards of living, the quantity of municipal solid wastes collected and transported has increased more than five-fold nationwide from about 85 thousand tons per day in 1980 to about 430 thousand tons per day in 2009 and is projected to reach 1.6 million tons per day in 2030. No country has ever experienced as large and rapid an increase in waste generation.

In China, waste management involves formal as well as informal arrangements. In 2009, the formal infrastructure consisted of 366 sanitary landfills, 17 composting facilities, and 93 incinerators. About 62% of the MSW generated in urban areas was processed through this formal infrastructure. The informal arrangements for MSW management include basic types of landfills / dumpsites and few controlled landfills, which account for the balance of 38% of the urban MSW.

Modern MSW management approaches most favor prevention, followed by -- in order of preference -- minimization (reduction), reuse, recycling, recover (digestion and composting). Investment in disposal, including through incineration, is the last resort. In China, present MSW management generally focuses narrowly on collection and disposal. Household waste is not separated at the source. The for-profit informal private sector focuses on extracting paper products, metals, plastics, and glass. However, residential waste collected and transported by municipal sanitation units for disposal at incineration or landfills still contains a considerable proportion of plastic bags, packaging materials, and kitchen waste. The high moisture content of the waste delivered to incinerators inhibits the combustion process, while plastics lead to dioxins precursors, both causing generation and release of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzo furans (PCDFs).

Incineration is gaining prominence in China. The importance of incineration in MSW management in China has been growing and will continue to grow due to a shortage of available land for landfills and the incinerators' potential ability to generate heat or electricity ("waste-to-energy"). A series of incentive policies are in place to encourage investment in MSW incinerators, including value added tax refunding, prioritized commercial bank loans, state subsidy (2%) for loan interest, and favorable feed-in prices for the electricity sale into the grid. Consequently, the number of MSW incinerators is expected to rise from 93 in 2009 to 200 in 2015, increasing the incineration capacity from 55.4 thousand tons per day to 140 thousand tons per day over the same time period.

Financial concerns. Incinerators are often built and operated by private companies under a concessional agreement with municipal sanitation units in China. Candidate operators bid down the tipping fee with the result that the fee included in the concession agreement with the city or district municipality is a fraction of fees in western countries. Payment arrears and unilateral reductions of the tipping fee by municipal governments are also not uncommon. Under these conditions, investing in and sustainably implementing environmental emission control, especially if emission limits were to increase in line with international standards, is a challenge.

Dioxins releases from MSW incinerators. China's NIP dioxin release inventory identified waste incineration as the third largest among nine dioxin release sources in China, following ferrous and non-ferrous metal production, and heat and power generation. Few of China's MSW incinerators apply in their operations the Best Available Techniques (BAT) or Best Environmental Practices (BEP) defined in the Stockholm Convention (SC) on POPs. This is particularly true for older incinerators. Inadequate waste input control, operations management, and monitoring and control systems prevent optimal combustion, leading to dioxin formation in post-combustion zones. MSW incinerators are generally equipped only with simple unsophisticated air pollution control devices, such as semi-dry scrubbers and fabric filters for dust and acid gas abatement. As a result, dioxins

absorbed in small particulates remain in the flue gas and are emitted to the atmosphere. More sophisticated incinerators reduce the formation of dioxins, but still have to address the problem of dioxins captured in the residues of pollution control devices.

Newly enacted higher feed-in tariffs for renewable energy power generators, including MSW incinerators that minimize coal consumption will likely lead to lower incineration temperatures and/or reduce incentives to segregate out plastics from the waste, both leading to higher dioxins emissions if there is no other means to increase the heat values of the waste or the combustion performance.

Regulatory framework. The current standards for MSW incineration pollution control do not require BAT/BEP technologies. They have simple and limited requirements for incineration temperature, residence time, and stack height. Chinese regulations stipulate that fly ash, which contains dioxins, heavy metals and other toxic pollutants, and therefore is toxic, be disposed of in hazardous waste landfills. However, this requirement is often not fulfilled due to high cost, unavailability of hazardous waste landfills, or poor enforcement. As a result, BAT/BEP for waste input control, high efficiency combustion, and cost effective air pollution control systems are not being commercially developed or applied. However, the Ministry of Environmental Protection (MEP) has drafted an amendment to the current standard for incinerators with treatment capacity of greater than 150 metric tons/day that would reduce the dioxin limit value to one tenth of current allowable levels, namely from 1.0 ng I-TEQ /Nm3to 0.1 ng I-TEQ/Nm3 (“0.1 ng” henceforth for brevity) . If the proposed amendment comes into force by September 2012, as planned, existing and newly built incinerators must comply with the new limit value by July 1, 2013. On the other hand, Beijing has already adopted the 0.1ng level.

Monitoring and enforcement. While central authorities are committed to stricter emission standards, enforcement of dioxin emission standards at the local level is weak due to the inadequate capacity of local environmental authorities and municipal sanitation units; weaknesses in the EIA system in this sector (lack of expertise, experience, and reliable and adequate monitoring data for modeling and prediction, and inadequate public consultation and community engagement) ; an inadequate environmental permit system, which does not specify operational standards and monitoring and reporting requirements; and weak monitoring. The weaknesses in monitoring and permitting are particularly problematic, since without adequate monitoring, even a new and certified technology can quickly deteriorate in performance Public Engagement. In China, disclosure of dioxins emissions from incinerators is not compulsory. The lack of reliable information on emissions from incinerators has led to public aversion to any incineration facilities even those that apply BAT/BEP. This threatens the use of incineration in cases where it has a legitimate place in an integrated MSW management system after maximizing other preferred waste management measures.

Government policy and plans for improved MSW management. To reduce waste and increase recycling, the Chinese government has formulated a number of important laws and development plans linked to municipal solid waste, with sections in the Five Year Plans, the ‘Solid Waste Pollution Prevention and Control Law’ (2005), and the ‘Circular Economy Promotion Law’ (2009). Minimization and recycling measures have been recognized as a cost-effective approach in MSW management in China. The 12th Five Year Plan (FYP) envisages that by 2015 all counties will be able to adequately manage solid wastes. The 12th FYP emphasizes recycling and aims to demonstrate in 80 cities proper waste and used products recycling, including rational network layout, up-to-standard management, diversified recycling modes and high recovery rates of key product types. In terms of policy instruments, the 12th FYP envisages increasing both the waste treatment levy and the level of fiscal subsidies. In April 2011, the State Council formally endorsed the ‘Suggestions for Further Strengthening MSW Management’, which was jointly prepared by 16 central ministries. This document is consistent with the 12th FYP and provides implementation

requirements for MSW management; in particular, 1) incineration shall be given priority in populated cities that lack land; 2) MSW facility operational performance shall be improved. For incinerators, emission compliance shall be ensured. Day-to-day monitoring shall be established and monitoring results shall be reported to local municipal sanitation units and environmental authorities on a monthly basis; 3) strengthening supervision capacity of local municipal sanitation units and environmental authorities. Exploring the introduction of third-party professional institutions which will implement supervision; 4) providing incentives to the public for promoting 3Rs; pushing forward tipping fee collection based on the "polluters pay" principle; and 5) on technical side, clean combustion, dioxins control and safe fly ash disposal are listed as key areas for technical innovation. Recently, the State Council published a "public announcement on kitchen waste management", which focuses on separate collection and treatment of restaurant waste and requires that 33 cities implement plans to this end.

While MSW management is a dynamic and challenging sector in China, the proposed Project would address only one important aspect: the need to properly monitor and reduce projected release of dioxins coming from waste incineration. There are two main ways to reduce dioxin releases – either reduce the amount of waste being incinerated, or reduce dioxin releases per ton of waste incinerated. The proposed Project will focus more on the latter approach (technological improvements), while also supporting institutional capacities to put in place a reliable, globally accepted, and cost-effective monitoring system. The Project will also support waste separation that favors reduced dioxin emissions.

The proposed Project is consistent with Strategic Theme One: Supporting Greener Growth of the China – of the draft World Bank Country Partnership Strategy (CPS) for FY2013-FY2016. Under this theme, the Project would support Outcome 1.2: Enhancing Urban Environmental Services by "improving sanitation, solid waste and other basic urban services in selected second-tier cities, while reducing pollution" and Outcome 1.6: Demonstrating Pollution Management Measures, which would be achieved among others by "supporting efforts to reduce hazardous waste, by continuing to support the reduction of persistent organic pollutants (POPs)—the byproducts of industrial production and the world's most toxic chemicals—from the regulatory level to emissions control and urban site cleanup."

The Bank has strong comparative advantage in assisting China in dealing with the dioxin emissions from MSW incineration. The Bank has been involved in MSW management in several Chinese cities, including in Ningbo where the MSW Minimization and Recycling Project would demonstrate modern upstream MSW management practices that support BAT/BEP for dioxin emission reduction. The Bank's advice on MSW management, including notably "Waste Management in China: Issues and Recommendations" (2005) is widely recognized in China as a seminal publication. The Bank is also assisting China in preparing or implementing three other POPs projects, of which FECO is also the executing agency.

Relationship to CAS

The proposed Project is consistent with Strategic Theme One: Supporting Greener Growth of the China – World Bank Country Partnership Strategy (CPS) for FY2013-FY2016. Under this theme, the Project would support Outcome 1.2: Enhancing Urban Environmental Services by "improving sanitation, solid waste and other basic urban services in selected second-tier cities, while reducing pollution" and Outcome 1.6: Demonstrating Pollution Management Measures, which would be achieved among others by "[s]upporting efforts to reduce hazardous waste, by continuing to support the reduction of persistent organic pollutants (POPs)—the byproducts of industrial production and the world's most toxic chemicals—from the regulatory level to emissions control and urban site cleanup."

The Bank has strong comparative advantage in assisting China in dealing with the dioxin emissions from MSW incineration. The Bank has been involved in MSW management in several Chinese cities, including in Ningbo where the MSW Minimization and Recycling Project would demonstrate modern upstream MSW management practices that support BAT/BEP for dioxin emission reduction. The Bank's advice on MSW management, including notably "Waste Management in China: Issues and Recommendations" (2005) is widely recognized in China as a seminal publication. The Bank is also assisting China in preparing or implementing three other POPs projects, of which FECO is also the executing agency.

II. Proposed Global Environmental Objective(s)

Proposed Global Environmental Objective(s) (From PCN)

The Project would aim to enhance the regulatory framework for compliance with new dioxin emissions standards for incineration facilities, demonstrate best available techniques (BAT) and best environmental practices (BEP) in MSW management to lower dioxins and furans emissions from such facilities, and establish favorable conditions for replicating project results more widely across China. As such, the Project would support China in meeting its obligations under the Stockholm Convention.

Key Results (From PCN)

1. Pilot dioxins emission reduction enforcement mechanisms are in place;
2. Dioxin monitoring combining stack emissions testing and monitoring of incinerator operational parameters piloted in project areas; and
3. Data on dioxin emissions from incinerators in project areas disclosed to the public in an easily accessible manner.

III. Preliminary Description

Concept Description

The proposed Project would seek to demonstrate globally accepted monitoring and enforcement practices in order to support Chinese authorities in regulating the expected large wave of new incinerators. It would also seek to support successful application of BAT and BEP to reduce dioxin emissions. Lessons learned from the pilot investments would be disseminated in other parts of the country.

FECO has selected Kunming City, Ningbo City, and the Shunyi District of Beijing as candidate project areas. These three cities have met the eligibility criteria agreed by FECO and the Bank, and have submitted preliminary proposals. In Ningbo City, the Project would complement the World Bank loan-funded Ningbo MSW Minimization and Recycling Project ("Ningbo loan Project"), which is at an advanced stage of preparation and will aim to assist Ningbo Municipality in reducing the proportion of MSW disposed at landfills and incinerators through waste minimization, source separation, recycling, and institutional strengthening in selected districts.

The proposed project activities would be grouped in four components. The cost estimates provided are preliminary and will be refined during Project preparation.

Component 1. Piloting improved regulations, monitoring and compliance (5.58 million GEF, 10.48 million beneficiary municipalities, environmental protection bureaus and FECO).

- Improved monitoring. In all three project areas the project would support enhanced monitoring of incinerator performances in terms of dioxin emissions, through a combination of dioxin testing and inexpensive monitoring of incinerator operating parameters, such as temperature, which impacts dioxins emissions. Local environmental protection bureau and municipal sanitation

unit officials would be trained in interpreting such data to monitor the incinerators' operations continuously. The project would also fund the competitive selection and long-term contracting of a laboratory for dioxin emission tests. Ningbo proposes procurement of laboratory equipment for dioxin testing. Such equipment will be financed under the project (a) it is determined that the GEF will support it, (b) it is directly related to a strategy of reducing dioxin emissions from MSW incinerators, (c) the laboratory's cost effectiveness is demonstrated and a plan for ensuring its financial sustainability is place, and (d) strategies for ongoing quality assurance and quality control, and for ensuring international credibility are in place.

- Improved regulations, environmental permitting and enforcement. Kunming proposes to strengthen the regulatory framework for MSW source segregation, kitchen waste management, and tipping fee collection. The city also proposed support for a master plan for MSW management. The project may also pilot a system of permits that specify incinerator operating conditions, maintenance of the operating data which will be available for inspection. This would build on a bilateral project with the United Kingdom that aimed at strengthening institutional capacity for permitting and regulatory compliance, whereby MSW incineration was one of the focus sectors. Ningbo and Shunyi too have expressed strong interest in adopting improved enforcement tools, which will be elaborated during Project preparation.
- Public information dissemination. In all three project areas, data collected about dioxin monitoring and incinerator operations would be shared with the public in an accessible manner.
- Enhancing national level capacity for regulating MSW incineration and replication. At the national level, the Project would fund technical assistance to the drafting of technical guidelines or other materials that MEP identifies as high priority to support the implementation of BAT/BEP to encourage compliance with the Stockholm Convention. If MEP enacts the revised PCDD/F emission limit before Project appraisal, the Project would also fund priority technical assistance to support MEP in implementing the revised standard. The Project would also support dissemination of lessons learnt from BAT/BET applications under Components 1 and 2 through printed materials and national and international workshops in order to support replication in other cities of China.

Component 2. Demonstrating BAT/BEP in MSW incinerator operations (5.11million GEF, 32.28million beneficiary municipalities, incinerator(s) and the Ningbo loan project). This component would demonstrate of BAT and BEP for MSW incineration to reduce dioxin emissions and of good upstream MSW management practices if they can be shown to be directly linked to dioxin reduction.

- Demonstrating BAT and BEP for MSW incineration. In Shunyi, the Project would fund the installation of flue gas treatment facilities, including sophisticated acid removal, dust removal, nitrogen removal and activated carbon adoption systems in a planned new 700tpd-capacity, two-unit incinerator. The Project would also finance training of incinerator operators for the implementation of BEPs such as feed control, combustion temperature control, activated carbon dosing control, SCR catalytic agent control, and preparation of specifications for the operation and maintenance of the MSW incinerator and flue gas facility in the two units of the new incinerator. The proposed investments would allow the incinerator to consistently maintain dioxins emissions below the 0.1ng limit. While neither Ningbo nor Kunming have proposed BAT/BEP investments at any of their incinerators at this stage, technical assessments of the incinerators and feasibility studies during project preparation may lead to concrete investment activities.
- Demonstrating good upstream MSW management practices in Kunming, Ningbo, and Shunyi. The project may support a limited number of such practices provided that a direct link with MSW dioxin emissions can be demonstrated and the activities are not complex and can be completed within the project's time frame.

All three project areas have plans to introduce MSW segregation and have proposed pilot activities

to support these plans. In Ningbo, the Project would complement the Ningbo loan Project's component (a) "waste reduction through source separation" through public awareness campaigns aimed at promoting household waste segregation. To the extent such segregation reduces the organic content of the waste delivered to the city's incinerators, it would help improve combustion efficiency. The activities to be supported under this project that complement the Ningbo loan project will be defined during project preparation. Kunming City has proposed that project finance MSW segregation and transportation facilities in the Guandu district, collection and transportation for restaurant kitchen waste, and an MSW segregation pilot in urban areas of Kunming City. In Shunyi, the municipality plans to implement an MSW segregation, collection and transport pilot during 2012-2015 and has indicated that during project preparation it may identify specific areas for Project support. The proposed activities will be assessed during project preparation from the point of view of impact on dioxin emissions, complexity, and time required for completion.

Component 3. Project management, and monitoring and evaluation (US$ 1.31 million GEF and US$ 5.24 million FECO, beneficiary municipalities and environmental protection bureaus). The GEF TF will support day-to-day Project management activities and monitoring and evaluation (M&E) to ensure that Project output and outcome targets agreed at Project appraisal are achieved by the agreed Project closing date. M&E will include periodic monitoring of dioxin emissions from the pilot incinerators. The management of Project funds and procurement will be carried out in accordance with World Bank policies and guidelines. World Bank environmental and social safeguards will also be adhered to during Project implementation.

4. Safeguard policies that might apply

OP/BP 4.01 Environmental Assessment will apply to the project. The task team will conduct environmental screening in accordance with the policy at early stage of project preparation. During project preparation, the task team will support the client in preparing EIA/EMP in accordance with domestic EA regulations and Bank safeguard policies as well. The EIA/EMP will address thoroughly relevant environmental, health and safety issues, and provide sound management plans for future implementation and supervision.

On social safeguards, a social screening will be carried out in the pilot cities when the selection is complete to understand the social dimensions (benefits, impacts, opportunities, and risks) of the project to different social groups and to assess whether social aspects are critical for project success. In addition, information, education and communication strategy will be designed to promote behavior changes. Public consultation and community participation guideline will be developed to enhance community participation.

Efforts will be made to avoid or minimize land acquisition in any of project activities. If involuntary land acquisition cannot be avoidable, resettlement action plan will be prepared and implemented based on Bank policy on Involuntary Resettlement OP 4.12 and relevant policies of government of China.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	x		
Natural Habitats OP/BP 4.04			x
Forests OP/BP 4.36		x	
Pest Management OP 4.09		x	
Physical Cultural Resources OP/BP 4.11		x	
Indigenous Peoples OP/BP 4.10			x

Involuntary Resettlement OP/BP 4.12			×
Safety of Dams OP/BP 4.37		×	
Projects on International Waterways OP/BP 7.50		×	
Projects in Disputed Areas OP/BP 7.60		×	

V. Tentative financing

Financing Source	Amount
BORROWER/RECIPIENT	26.00
Global Environment Facility (GEF)	12.00
GLOBAL ENVIRONMENT - Associated IBRD	22.00
Financing Gap	0.00
Total	60.00

VI. Contact point

World Bank

Contact: Tijen Arin
Title: Senior Environmental Economist
Tel: 473-5535
Email: tarin@worldbank.org

Borrower/Client/Recipient

Name: International Department, Ministry of Finance
Contact: Mr. Yao Licheng
Title: Director
Tel: 861068551124
Email: yaolicheng@mof.gov.cn

Implementing Agencies

Name: Foreign Economic Cooperation Office of Ministry of Environmental Protection
Contact: Ms. Qiong Ding
Title: Deputy Division Chief
Tel: 86108226-8810
Email: ding.qiong@mepfeco.org.cn

VII. For more information contact:

The InfoShop
The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 458-4500

Fax: (202) 522-1500
Web: http://www.worldbank.org/infoshop

Public Disclosure Copy