



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

23532



FINAL REPORT

**FOR ENVIRONMENTALLY SUSTAINABLE
MANAGEMENT OF MEDICAL WASTES IN CHINA**

Project No: GF/CPR/06/004

Contract No. 16001372

BEIJING, CHINA

November, 2007

INDEX

1	BACKGROUND.....	2
2	OBJECTIVE OF THE FULL SIZE PROJECT.....	2
3	PURPOSE OF THE SUBCONTRACT.....	3
3.1	<i>Analyzing the existing rules and procedures related to the medical waste disposal and management.....</i>	3
3.2	<i>Achieving a realistic picture of the situation of disposal and management of medical waste in the country in the light of the requirement of the Stockholm Convention.....</i>	4
3.3	<i>Identification and agreement of project priorities among stakeholders.....</i>	5
3.4	<i>Complete necessary work prior to the approval of the Project Document, including:.....</i>	5
3.5	<i>Establish an integrated system for managing the project, which will play an important role in harmonizing the interests and standpoints of different ministries, state administrations and commission.....</i>	5
4	PROGRESS MADE AND OUTPUTS ACHIEVED.....	5
4.1	<i>Report on the Inception Workshop and the progress made on national subcontractors during the first drafting period.....</i>	5
4.2	<i>Draft report about assessment of medical waste management practices and systems in hospitals and other health care facilities.....</i>	6
4.3	<i>Draft report about assessment of policies, laws, regulations and standards relevant to the medical waste management.....</i>	6
4.4	<i>Draft report about assessment of current medical waste treatment and disposal technologies in China.....</i>	7
4.5	<i>Draft report about situation analysis and techno-economical feasibility of manufacturing equipment required for medical waste management and disposal in China.....</i>	7
4.6	<i>Draft report about gap analysis and proposal for modification and establishment of regulations and release standards in China.....</i>	8
4.7	<i>Zero draft project brief on environmentally sustainable management of medical waste in China. 8</i>	8
4.8	<i>The meeting of reviewing zero draft of Project Brief.....</i>	8
4.9	<i>The workshop of mobilizing co-financing resources.....</i>	9
4.10	<i>Final Project Brief including amendments on the basis of all the draft reports as appendixes.....</i>	9
4.11	<i>Final Project Document and Conclusion workshop.....</i>	10

1 BACKGROUND

The Stockholm Convention entered into force on 11 November 2004 for China. Article 5 of the Convention requires the Parties to take measures to reduce or, where feasible, eliminate releases of PCDD/PCDF and other unintentionally produced POPs (UPOPs) in Part I from sources listed in Part II and III of Annex C. Waste incinerators, including co-incinerators of municipal, hazardous or medical waste or of sewage sludge are on the foremost top of the list. The parties to the Convention have to adopt best available techniques (BAT) and best environmental practices (BEP) to reduce PCDD/PCDF releases.

As the broke out of SARS (severe acute respiratory syndrome) epidemic in spring 2003 drew considerable attention of the Chinese Government to the issue of medical waste disposal, State Environmental Protection Administration (SEPA) and relevant organizations promptly formulated "The Hazardous Waste and Medical Waste Treatment Facility Construction Plan" (hereinafter referred to as Plan). The plan is to ensure environmentally sound management of hazardous and medical waste. Approved by State Council in 2003, the Plan proposed the construction of 332 centralized medical waste disposal facilities nationwide, of which 277 are medical waste disposal plants, while the other 55 are multi-purpose hazardous waste disposal plants. The issuance of the Plan marked a new step towards the introduction of the environmentally sound medical waste management in China.

However, the Plan was approved before Stockholm Convention entered into force in China; the dangers of PCDD/PCDF releases to human and environmental health were not sufficiently considered. At the beginning of the Plan implementation, medical waste incineration, which is now identified as key release source of PCDD/PCDF, was considered as the major technology for infectious control. Thus, in the National Implementation Plan (NIP) of China for the implementation of the Stockholm Convention on POPs, medical waste incineration is listed as a key PCDD/PCDF release source and, pursuant to the "Action Plan for Reduction and Elimination of PCDD/PCDF Releases", priority should be given to the application of BAT and BEP.

2 OBJECTIVE OF THE FULL SIZE PROJECT

The project to be developed under the PDF-B aimed at reducing the releases of UPOPs, predominantly PCDD/PCDF, which are formed by medical waste incineration. Moreover, the full size project will simultaneously explore ways to mitigate the releases of other POPs like HCB, PCB, mercury (Hg) and polycyclic aromatic hydrocarbons (PAH). The full size project will build capacity to move towards widespread adoption of BAT and BEP in China's medical waste disposal sector that will result in the reduction of releases of PCDD/PCDF and other pollutants, such as mercury. The full size project will improve the network of medical waste disposal systems at provincial and municipal levels and promote the creation of medical waste disposal networks at county and local levels, as well as strengthen managerial capability to manage and finally dispose medical waste.

The Full Size Project includes inter alia, the following main elements:

- ✓ Redesign waste management plan at the provincial level in order to guarantee the adoption of better solutions from economic, environment and management point of view;
- ✓ For existing facilities, promote the adoption of BAT disposal technologies not only with reference to the PCDD/PCDF emissions but also with other global environmental pollutants;
- ✓ Promote the use of non-combustion disposal technologies like autoclave and microwave sterilization, especially for those areas where small non-combustion plants are the best choice, thus allowing those plants to avoid the cost and risk of long-distance waste transport;
- ✓ Analyze the technical/economical feasibility of retrofitting existing disposal facilities to meet more stringent emission requirements for PCDD/PCDF and other global contaminants;
- ✓ Increase the awareness of environmental decision makers concerning the existence and usage of disposal technologies alternative or complementary to combustion and take the necessary action to legally establish community right to know principles and practices; and
- ✓ For new facilities, require adoption of BAT technologies and techniques in accordance with the Convention.

3 PURPOSE OF THE SUBCONTRACT

Foreign Economic Cooperation Office, SEPA (FECO/SEPA) delivered management, organization, recruitment and other services required to develop the full size project documents assisted by UNIDO:

In general terms, FECO/SEPA has delivered the following activities step by step:

3.1 Analyzing the existing rules and procedures related to the medical waste disposal and management.

- ✓ Gain a sound knowledge of base scenario on the existing rules and procedures related to the medical waste disposal and management;
- ✓ Review the current National Plan on Hazardous and Medical Waste, the related regulations and a number of technical rules, such as those, concerning the management of medical waste (2003); packaging and labeling of medical waste (2003); technical rules for the construction of medical waste incineration plants (1999, 2003, 2004); standards concerning storage (2001); landfill sites (2001); transportation of hazardous waste (2003); New technical and environmental standards for combustion and non-combustion medical waste disposal technologies (in preparation); etc.;
- ✓ Review the institutional structure in the medical disposal and management sector;
- ✓ Achieve a sound knowledge of existing regulations and of the possible trends for new technical standards and regulations, not limited to the problem of pollutant emission, but extended to the general framework of medical waste policy and management; and
- ✓ Define the knowledge of the regulation at the provincial and national level:

- ◇ The possible and immediately practicable actions and capacity building needs for a better implementation of the regulations itself; and
- ◇ The needs for improvement of existing regulation.

3.2 *Achieving a realistic picture of the situation of disposal and management of medical waste in the country in the light of the requirement of the Stockholm Convention*

- ✓ Identify the gaps to the obligations of Stockholm Convention;
- ✓ Identify the gaps to the requirements of BAT and BEP guidelines;
- ✓ Project the priority actions to be taken to address the gaps and improve the global environmental effect;
- ✓ Evaluate the emission of PCDD/PCDF and other pollutants from the medical waste sector for defining the baseline and the incremental cost of the adoption of BAT and BEP;
- ✓ Take into account the comprehensive situation on estimation of emission of PCDD/PCDF and other pollutants if BAT and BEP will not be not adopted;
- ✓ Gather information about the problem causing POPs emission in medical waste disposal and management sector, such as (i) waste minimization, (ii) waste segregation, (iii) disposal plant management, and (iv) adoption of proper disposal technologies;
- ✓ Investigate each critical step of the medical waste reduction plan at hospital level, the adoption of suitable BAT at incinerator level and the introduction of non-combustion disposal techniques for the potential reduction of PCDD/PCDF and other micropollutants;
- ✓ Analyze POP emissions from medical waste incinerators and carry out a preliminary evaluation of the different kinds of incinerators and assess a relationship among existing combustion/pyrolysis techniques, installed abatement devices and emissions characteristics
- ✓ In order to propose the reduction of possible contaminants (like mercury) and precursors (like plastics for PCDD/PCDF), proper actions such as the preferential purchasing of cleaner products, substitution with non-toxic products and non mercury devices, proper segregation and minimization, proper storage and handling, safe transportation and correct disposal measures at landfills and incinerators will be studied and proposed in accordance with international parameters and the Chinese situation;
- ✓ Carry out an overall assessment of the commonly used Chinese combustion/pyrolysis techniques and pollutant abatement devices;
- ✓ Evaluated and propose the introduction of suitable and feasible BAT and BEP from the technological and economic point of view based on the results of the Sino Italian UP-POP reduction Project; and
- ✓ Meetings with national and international experts, analysis of case studies concerning both disposal plants and the management of medical waste, translation and evaluation of technical documents from Chinese and site visits will be undertaken in order to reach the objective.

3.3 *Identification and agreement of project priorities among stakeholders*

- ✓ Target the root causes of environmental problems by consulting local stakeholders, collecting necessary data and information relevant to emission and environmental impact and identifying various technical, economic and social barriers to the implementation of BAT and BEP;
- ✓ Identify and analyze target stakeholders' capacity building needs to participate in development, promotion, and/or implementation of BAT and BEP for POPs generating medical waste related sources;
- ✓ Mobilize stakeholders through a series of workshops and informal communications so that final reports will fully reflect stakeholders' input to and concerns with the process; and
- ✓ Develop designed programs, approaches and strategies to carry out capacity building measures which will help shift the overall management and disposal of medical waste towards a market oriented practice while at the same time assisting China in fulfilling its obligations under the Stockholm Convention.

3.4 *Complete necessary work prior to the approval of the Project Document, including:*

- ✓ Calculate the incremental cost;
- ✓ Formulate the work plan;
- ✓ Draft the Project Brief and Project Document; and
- ✓ Obtain endorsement of all stakeholders; etc..

3.5 *Establish an integrated system for managing the project, which will play an important role in harmonizing the interests and standpoints of different ministries, state administrations and commission.*

- ✓ Establish project management office and project steering committee group; and
- ✓ Support parallel coordination with local governments, and stakeholders representing public, industry, academic and other groups.

4 PROGRESS MADE AND OUTPUTS ACHIEVED

4.1 *Report on the Inception Workshop and the progress made on national subcontractors during the first drafting period.*

The Inception Workshop with the participation of related ministries and other leading stakeholders including SEPA, UNIDO and other bilateral and multilateral agencies was held in Beijing at February 24, 2006. The detailed information was submitted in first progress report.

Subcontractors' teams submitted their first draft reports at January, 2007. Three subcontractors coordinating meetings have been held in Beijing for drafting reports. The meeting date is August 8th, 2006, November 24th, 2006, and December 30th, 2006.

The detailed information of each subcontract is illustrated in part 4.2 to 4.7.

4.2 Draft report about assessment of medical waste management practices and systems in hospitals and other health care facilities

This report was completed by the subcontract of the Investigation and Evaluation of Medical Waste Management in Medical Institutions. The public bidding process of this subcontract was taken place in June-July, 2006. National Institute of Hospital Administration of Ministry of Health is the national subcontractor undertakes this subcontract. The draft report was completed at May, 2007 (*Report on the Investigation and Evaluation on Medical Waste Management inner Medical Institutions*) and submitted in first progress report. The major issues in the report are the following:

- ✓ Preliminary medical waste inventory of China;
- ✓ Chinese medical wastes management practices and systems including classification, segregation, collection, package, temporary storage and the operational parameters of disposal equipment;
- ✓ Assessment on medical wastes management policy system about health care facilities;
- ✓ Assessment on BAT/BEP and international advanced technologies and experiences;
- ✓ Preliminary gap analysis between domestic practice and international advanced practice;
- ✓ Proposal on feasible/practicable measures and technologies for medical waste minimization, classification, segregation, collection, package and temporary storage at site and a work plan for adopting these measures and technologies;
- ✓ Medical wastes management BAT/BEP demonstration and dissemination plan.

4.3 Draft report about assessment of policies, laws, regulations and standards relevant to the medical waste management

This report was completed by the subcontract of the Medical Waste Policy, Regulations and Standard System Investigation and Evaluation. The public bidding process of this subcontract was taken place in June-July, 2006. Shenyang Environmental Science Academy is the national subcontractor undertakes this subcontract. The draft report was completed at May, 2007 (*Medical Waste Policy, Regulations and Standard System Investigation and Evaluation Subproject Report*) and submitted in first progress report. The major issues in the report are the following:

- ✓ Preliminary assessment on policies, laws, regulations and standards in medical wastes classification, segregation, collection, storage, transportation, treatment and disposal, and on the enforcement situation;
- ✓ Preliminary assessment on organizations and beneficiaries;
- ✓ Situation analysis of international experiences in medical wastes management;
- ✓ Considering the requirements for implementing the Convention and

promoting environmentally sound management of medical wastes a work plan on policies, laws, regulations and standards for medical wastes management, treatment and disposal

- ✓ Work Plan on capacity building for enforcing policies, laws, regulations and standards system, including training and awareness raising in medical waste management.

4.4 *Draft report about assessment of current medical waste treatment and disposal technologies in China.*

This report was completed by the subcontract of Investigation and Evaluation of Medical Waste Treatment and Disposal Technologies in China. The public bidding process of this subcontract was taken place in June-July, 2006. Chinese Academy for Environmental Planning is the national subcontractor undertakes this subcontract. The draft report was completed at May, 2007 (*Investigation and Evaluation of Medical Waste Disposal Techniques Report*) and submitted in first progress report. The major issues in the report are the following:

- ✓ Situation analysis of the current medical waste treatment and disposal technologies in China;
- ✓ Analysis and review of various types of incineration technologies and their alternatives, engineering aspects, equipment such as rotary kiln and incineration, non-incineration technologies, in terms of technological characterization, capacity, investment requirements, treatment cost, types of wastes that can be treated, etc;
- ✓ Assessment and analysis of environmentally sound medical wastes disposal plan, and its implementation.
- ✓ Analysis on medical wastes disposal as far as the quantities of dioxins reduction is concerned, and analysis on investment, cost and benefits;
- ✓ Preliminary review of BAT/BEP and international experience
- ✓ Overall recommendation on medical waste management, treatment and disposal, BAT/BEP demonstration and awareness raising.

4.5 *Draft report about situation analysis and techno-economical feasibility of manufacturing equipment required for medical waste management and disposal in China.*

This report was completed by the subcontract of Investigation and Assessment of Medical Waste Management and Disposal Industrialization in China. The public bidding process of this subcontract was taken place in June-July, 2006. China Environmental Protection Industry Association is the national subcontractor undertakes this subcontract. The draft report was completed at May, 2007 (*Research Report on Sub Project of Investigation and Assessment of Medical Waste Management and Disposal Industrialization in China*) and submitted in first progress report. The major issues in the report are the following:

- ✓ Evaluation on medical wastes treatment technology equipment considering the gaps between China and those foreign countries that have already applied new innovative technologies;

- ✓ Market survey and evaluation of products and equipment for medical wastes collection, storage, transportation and disposal, including the market of medical wastes collection equipment, etc;
- ✓ Market analysis of factors influencing of supply and demand including worker's protection, pressure of environmental protection, impact of policies and regulations, requirement of laws and responsibilities, impact of service market, waste minimization and recycling, cost reduction etc;
- ✓ Research and developing plan for establishing and introducing new technologies and equipment for incentives including awareness raising;
- ✓ Development strategy for new innovative technologies;
- ✓ Work plan of BAT/BEP demonstration and diffusion, environmental awareness raising campaigns, fund raising mechanism and related measures.

4.6 *Draft report about gap analysis and proposal for modification and establishment of regulations and release standards in China.*

This report was completed by the subcontract of gap analysis and proposal for modification and establishment of regulations and release standards in China. The public bidding process of this subcontract was taken place in June-July, 2006. Shenyang Environmental Science Academy is the national subcontractor undertakes this subcontract. The draft report was completed at May, 2007 and submitted in first progress report. The major outputs from the subcontract are the following:

- ✓ "Standards of hazardous wastes incineration pollution control" (draft) and "Explanation for modifying standards on hazardous wastes incineration disposal pollution control" (draft)
- ✓ "Standards of medical wastes non-combustion disposal pollution control" (draft) and "Explanation for modifying standards on medical wastes non-combustion disposal pollution control" (draft)

4.7 *Zero draft project brief on environmentally sustainable management of medical waste in China*

The public bidding process of the formation and drafting project brief subcontract was taken place in June-July, 2006. EnviSolve Consulting Co., Ltd. is the subcontractor undertakes this subcontract. The zero draft project brief on environmentally sustainable management of medical waste in China was formulated based on the report completed in activities 4.1 to 4.6 and submitted in first progress report. To formulated the zero draft, the coordinating meetings participated by all the subcontractors was held in Beijing for two times. The zero draft project brief has been completed at May, 2007.

4.8 *The meeting of reviewing zero draft of Project Brief*

The meeting for reviewing zero draft of project brief was held in Beijing from January 4th to 10th, 2007. The international experts from UNIDO, Italy, and Ireland worked with domestic experts to review the zero draft Project Brief. During one week

discussion, the experts have given lots of constructive suggestions to Project Brief. The meeting report is submitted in second progress report.

4.9 *The workshop of mobilizing co-financing resources.*

The workshop of mobilizing co-financing resources was held in Beijing from January 15th to 16th 2007. The representatives were from various co-financing resources, including SEPA, the owners of medical waste treatment and disposal centers, the medical waste treatment and disposal enterprises, and etc.. FECO/SEPA gave an introduction of the project. The officials from SEPA gave presentations on medical waste management in China. The representative of medical waste disposal enterprises gave presentations to introduce their techniques. The medical waste expert also gave their comments to the medical waste management in China and the project design. The representatives have showed their interest of co-financing to the project. FECO/SEPA had further discussion with them about co-financing to the project. The workshop report is submitted in second progress report.

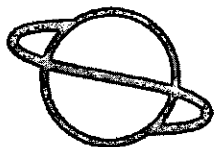
4.10 *Final Project Brief including amendments on the basis of all the draft reports as appendixes.*

The Final Project Brief was finalized at end of March, 2007. One UNIDO mission was held from March 4th to 10th in Beijing. The experts were from UNIDO, USA, Ireland, Italy and China worked closely to finalize the Project Brief. The final Project brief was submitted in second progress report. The list of amended reports on the basis of all the draft reports is below:

- ✓ Report about assessment of medical waste management practices and systems in hospitals and other health care facilities. (*Report on the investigation and evaluation of medical waste management in medical institutions sub-project*);
- ✓ Report about assessment of policies, laws, regulations and standards relevant to the medical waste management. (*Medical waste policy, regulation and standard system investigation and evaluation subproject report*);
- ✓ Report about assessment of current medical waste treatment and disposal technologies in China. (*Investigation and evaluation of medical waste disposal technique report*);
- ✓ Report about situation analysis and techno-economical feasibility of manufacturing equipment required for medical waste management and disposal in China. (*Research report on sub-project of investigation and assessment of medical waste management and disposal industrialization in China*);
- ✓ Report about gap analysis and proposal for modification and establishment of regulations and release standards in China. (*1. Pollution control standard for hazardous waste (including medical waste) incineration; 2. Standard and inspection methods using non-incineration technologies to treat medical waste*).

4.11 Final Project Document and Conclusion workshop.

Final Project Document was submitted to GEF Council at May, 2007. The project was approved by GEF Council meeting at June 12th – 15th 2007. The final project document was attached as Annex A. The Conclusion Workshop to bring the PPG project phase to a close was held in Beijing, China on September 20th -21st 2007. The representatives were from environmental protection authorities, health administration authorities, universities, research institutions, and etc.. FECO/SEPA gave an introduction of the overall project execution at PPG phase. The representatives of national sub-contractors reported their work at the workshop. The representatives also gave their valuable suggestions and comments to future full-size project implementation. Their suggestions and comments will be fully considered by FECO/SEPA. The workshop report is attached as Annex B.



GEF

PROJECT EXECUTIVE SUMMARY
REQUEST FOR Council Work Program Inclusion
UNDER THE GEF Trust Fund

GEFSEC PROJECT ID: 2927
IA/ExA PROJECT ID: GF/CPR/07/XXX
COUNTRY: China (People's Republic of)
PROJECT TITLE: Environmentally Sustainable Management of Medical Wastes in China
GEF IA/ExA: United Nations Industrial Development Organization (UNIDO)
OTHER PROJECT EXECUTING AGENCY(IES):
 State Environmental Protection Administration (SEPA) in cooperation with the Ministry of Health (MOH)
DURATION: 5 years
GEF FOCAL AREA: Persistent Organic Pollutants (POPs)
GEF STRATEGIC OBJECTIVES: POP- 3 and POP-4
GEF OPERATIONAL PROGRAM: OP14
PIPELINE ENTRY DATE: 5 December 2005
EXPECTED STARTING DATE: October 2007
EXPECTED CEO ENDORSEMENT: August 2007
IA/ExA FEE: US\$ 1,200,000

FINANCING PLAN (\$)		
	PPG	Project
GEF Total	350,000	11,650,000
Co-financing	<i>(provide details in Section b: Co-financing)</i>	
GEF IA/ExA	20,000	100,000
UNIDO (in-kind)		
Government of:		
China (SEPA) in kind	180,000	15,000,000
China (MOF) in cash		3,800,000
China (MOH)		4,500,000
Others	113,400	
USA (in cash/in kind)		120,000
Private enterprises (in kind)		9,557,140
Co-financing Total	313,400	33,077,140
Total	663,400	44,727,140
Financing for Associated Activities If Any:		

CONTRIBUTION TO KEY INDICATORS IDENTIFIED IN THE FOCAL AREA STRATEGIES:

In China, medical waste disposal accounts for more than 11.5% of total PCDD/PCDF releases. Therefore, this project would significantly contribute to the focal area strategies through the following indicators:

III.4: Reduction in releases of by-products by means of BAT/BEP demonstration and adoption in incineration facilities within the project areas and time frame: 1.94 g toxic equivalents (TEQs) per year and GEF cost of \$150,000 per g TEQs.

III.5: Avoided releases of by-products by means of BAT/BEP demonstration and adoption through alternative treatment processes within the project areas and time frame: 2.59 g toxic equivalents per year and cost \$66,274 per g TEQs.

IV.1: Number of sets of practices or technologies demonstrated, including:

- Demonstration site level:
 - BEP of medical waste management in 20 medical institutions in 6 municipalities;
 - Introduction of BAT in 1 rotary kiln facility, 2 pyrolysis facilities, 1 autoclave facility, 1 microwave facility, 1 chemical disinfection facility in 6 municipalities;
 - Adoption of appropriate technology for waste treatment in a remote rural context.
- Municipal level:

Based on the previous BAT/BEP demonstrations, adopt integrated lifecycle management of medical waste in targeted municipalities via a precautionary and preventative approach to domestic goods, services and technologies, and

- Provincial level

Based on the municipal demonstrations, adopt coordinated medical waste systems management in a manner that addresses economic and financial sustainability in 3 target provinces.

Approved on behalf of the *United Nations Industrial Development Organization (UNIDO)*. This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the GEF Project Review Criteria for work program inclusion.



Name & Signature
Mr. D. Piskounov, Managing Director
Programme Development and Technical
Cooperation Division
E-mail: D.Piskounov@unido.org

Mr. S.M. Si Ahmed, Director
Multilateral Environmental Agreements Branch
Programme Development and Technical
Cooperation Division
Phone: +43 1 26026 3782
E-mail: S.Si-Ahmed@unido.org

Date: 21 March 2007

1. PROJECT SUMMARY

a) PROJECT RATIONALE, OBJECTIVES, OUTCOMES/OUTPUTS, AND ACTIVITIES

The Stockholm Convention entered into force on 11 November 2004 for China. Article 5 of the Convention requires the Parties to take measures to reduce or, where feasible, eliminate releases of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) and other unintentionally produced Persistent Organic Pollutants (POPs) in Part I from sources listed in Part II and III of Annex C. Waste incinerators, including co-incinerators of municipal, hazardous or medical waste or of sewage sludge are on the foremost top of the list in Part II of Annex C.

In the National Implementation Plan (NIP) of China for the implementation of the Stockholm Convention on POPs, medical waste incineration is listed as a key PCDD/PCDF release source, to which priority should be given to the application of best available techniques and best environmental practices (BAT/BEP) pursuant to the "Action Plan for Reduction and Elimination of PCDD/PCDF Releases".

The project comes at a time when China is making a significant infrastructural investment in a nationwide program, which proposed that China would construct 332 dedicated medical waste disposal facilities in cities at municipal level and above across the country to ensure the safe disposal of medical waste.

The overall objective of the project is to continuously minimize and, where feasible, ultimately eliminate the releases of unintentionally produced POPs (UPOPs) and other globally harmful pollutants into the environment, and assist China in implementing its relevant obligations under the Stockholm Convention. The project is to interact with the Nationwide Investment Plan and promote the widespread adoption of BAT/BEP in the evolving medical waste management infrastructure and industry in a manner that sustainably reduces adverse environmental impacts and protects the human health. The project approach seeks to alter the current investment pattern that is overwhelmingly predominated by incineration technologies towards non-incineration alternatives and where incineration technologies are adopted that optimal operating standards are achieved. By promoting BAT/BEP across the medical waste sector, the project seeks to decrease waste generation and alter the characterisation of medical waste by reducing the presence of materials that can potentially generate PCDD/PCDF emissions.

Conceptually, the overall objective will be achieved through the combined strategies to reduce and modify the materials to be disposed of; the optimization of incineration technologies; the introduction of non-combustion technologies; the raising of awareness and the dissemination of know-how; the incorporation of management systems; the innovation and adaptation of appropriate technologies and techniques; the integration of economic and financial systems; and the enhancement of relevant laws and regulations.

Specifically, the following objectives will be sought by this project:

- Review, revision, and recommendation of appropriate changes of the regulatory and policy enabling environment.
- Institutional strengthening through the use of a targeted technical transfer activities to apply and disseminate BEP in the lifecycle management of medical waste.
- Application of BAT in 6 targeted municipalities within the project implementation period.
- Design and implementation of economic and financial systems that can support the medical waste management sector towards continuous reduction and where appropriate ultimate elimination of the release of PCDD/F.
- Support for development of an industrial base favorable to BAT and BEP that promotes a precautionary and preventive approach to domestic goods, services and the appropriate adaptation of technologies.

- Identification, demonstration and promotion of appropriate medical waste management systems and technologies in conformity with BAT guidance and BEP guidelines applicable to remote rural areas.
- Coordination of medical waste management with an effective transfer system in 3 targeted provinces to geographically optimise the application of BAT and BEP.
- Formulation of a nationwide replication program to disseminate BAT/BEP as part of a national strategy and action plan.

There are 8 Outcomes designed to achieve the above objectives. The Outcomes/Outputs and the corresponding main activities are as follows:

Outcome 1 will strengthen the national, provincial and local regulatory framework for medical waste management. Activities to be undertaken include the adaptation and application of laws and regulations relating to medical waste management and upgrading and establishing performance levels associated with *BAT for medical waste disposal*.

Outcome 2 will strengthen nationwide institutional capacity for integrated medical waste management at national and local levels in support of the Nationwide Investment Plan. It will establish a National Steering Group addressing all relevant institutions and stakeholders and through this coordination mechanism, the capacity for monitoring, supervision and evaluation of medical institutions and dedicated medical waste treatment and disposal facilities of relevant authorities will be strengthened.

Outcome 3 will demonstrate systems management and application of BEP in 20 medical institutions covering such aspects as good procurement practices, waste segregation at source, waste reduction/minimization, reuse and recycling, intermediate storage, transportation, traceability and staff training.

Outcome 4 will demonstrate BAT for medical waste disposal using thermal combustion, including air pollution monitoring. One existing rotary kiln facility and two pyrolysis incinerators will be selected to test and verify BAT application and demonstrate reduction of PCDD/PCDF emissions to between 0.1-0.5 ng TEQ/Nm³ within demonstrable management systems structures that are designed to achieve continuous improvement over time. Outcome 4 will be achieved by process improvement and process optimization as well as by introduction of monitoring (sampling and analysis), in other words no capital investment will be required from the GEF grant part of the project budget. Experience will be derived and summarized for wider dissemination of BAT in Outcome 7. These demonstration activities will also support the development of specifications for the engineering design and construction of such facilities by adopting BAT as well as operational safety.

Outcome 5 will demonstrate BAT/BEP for medical waste thermal non-combustion, chemical treatment or other appropriate non-combustion treatments that may also be suitable for remote rural areas. In order to demonstrate the replacement of incineration disposal methods, one autoclave facility, one microwave facility and one chemical disinfection facility will be procured and installed. The project will also promote the adoption of similar but smaller scale facilities appropriate for remote rural areas. Experience will be derived and summarized for wider dissemination of BAT/BEP in Outcome 7. In addition, these demonstrations will also support the development of specifications for the engineering design and construction of such facilities by adopting BAT as well as operational safety.

Outcome 6 will demonstrate spatially integrated and coordinated medical waste management and disposal systems in geographically defined clusters that include medical institutions and dedicated treatment and disposal facilities. Integrated or life-cycle medical waste management among various institutions within a municipality of each of the three demonstration provinces will be demonstrated. Three provinces will be selected for the demonstration of spatially coordinated medical waste treatment and disposal systems incorporating a number of dedicated facilities within a defined area in a manner that is economically effective and efficient.

Outcome 7 will develop and formulate a national strategy and action plan of BAT/BEP for medical waste management and disposal based on the experience gained through the demonstration activities of the project. This project will also contribute to the national strategy and its implementation specifically through the following outputs:

- Formulation of techno-economic policies that promote the adoption of BAT/BEP.
- Demonstration and promotion of different commercial models (e.g. BOT, BOO, TOT¹, etc.) for the construction and operation of medical waste treatment and disposal facilities.
- Strengthening of national capacity to develop new medical waste treatment technologies appropriate to China's socio-economic context.
- Development and implementation of a medical waste treatment equipment certification and labeling program.
- Establishment of training and accreditation systems for lifecycle management of medical waste that support BAT/BEP.
- Extensive raising of stakeholder awareness, including a series of national and international workshops.

Outcome 8 will establish and utilize the necessary tools to facilitate effective monitoring and evaluation on progress of project implementation and achievement of results. A series of training programs will be conducted to improve the managerial and technical capabilities for effective project implementation and management.

b) KEY INDICATORS, ASSUMPTIONS, AND RISKS (FROM LOGFRAME)

Key indicators include the following:

- Number of medical institutions adopting BEP.
- Number of dedicated medical waste disposal facilities adopting BAT.
- Number of dedicated medical waste treatment facilities adopting BAT/BEP.
- Quantitative and qualitative change in medical waste disposed of.
- Reduction of manufacturing and use of medical care products containing hazardous substances such as mercury (Hg) and polyvinyl chloride (PVC).
- Reduction of PCDD/PCDF emissions from medical waste incineration disposal.
- Avoid releases of PCDD/PCDF emissions from medical waste treatment.
- Level of stakeholder awareness and participation in environmentally sound medical waste management.
- Levels of PCDD/PCDF in biological organisms in the vicinity of dedicated medical waste treatment and disposal facilities.
- Social and economic benefits from adoption of BAT/BEP.

The Project Logical Framework elaborates the indicators, assumptions and risks for each activity.

Project design is based on the following key assumptions:

- The NIP is endorsed by the Chinese Government.
- BAT/BEP guidelines and guidance is endorsed by COP-3.
- Local governments and facility owners support and participate in project activities.
- National and local governments provide necessary co-funding and post-project support.

¹ BOT (Build-Operate-Transfer) is a form of project financing, wherein a private entity receives a franchise from the public sector to finance, design, construct, and operate a facility for a specified period, after which ownership is transferred back to the public sector. BOO (Build-Operate - Own) is a project financing model similar to BOT except that private ownership remains subject to contracted payments to the public sector. TOT (Transfer-Operate-Transfer) is a new form of financing that is being increasingly adopted. A TOT investor will pay the local authority for the right to operate a facility for a specified period, which is usually not more than 30 years.

- Strengthened national regulatory and policy framework supported by the project continues to work effectively after completion of the project.

The following risks have been identified during the project design:

- Lack of adequate inter-sectoral coordination and cooperation.
- Lack of technical competencies and economic resources for local government and facility owners to adequately support and participate in project activities.
- Conflicting stakeholder interests will inhibit realization of project goals.
- Failure to adequately implement the existing fee-based financing mechanism to cover medical waste disposal costs.

Project design has addressed the above risks as follows:

- Establishment of inter-sectoral coordination bodies.
- Strong capacity building activities and provision of financial support to project participants and stakeholders.
- Identification of potentially conflicting stakeholder interests through involvement of stakeholders in the project design process.
- Project activities will improve implementation of the fee-based system, and stakeholder awareness building will increase its acceptance.

2. COUNTRY OWNERSHIP

a) COUNTRY ELIGIBILITY

China signed the Stockholm Convention on POPs in May 2001, and ratified it in June 2004. The Convention entered into force on 11 November 2004. Article 13.2 of the Convention provides that developing country Parties and Parties with economies in transition will have access to new and additional financial resources to enable them to meet the agreed full incremental costs of implementing measures that fulfill their Convention obligations.

China is eligible for GEF funding under para 9 of the GEF Instrument.

b) COUNTRY DRIVENNESS

Incineration of medical wastes was listed in the Action Plan to Reduce and Eliminate Releases of Unintentionally Produced POPs in the NIP as a priority source category. According to the Action Plan, China is to apply BAT and promote BEP in new sources in priority source categories by 2008, and complete PCDD/PCDF release reduction demonstrations in selected existing sources in the priority sectors by 2010.

Following the outbreak of Severe Acute Respiratory Syndrome (SARS) in June 2003, the Chinese Government moved quickly to draft and approve the National Program for the Construction of Facilities for Disposal of Hazardous Waste and Medical Waste, which proposed that China would construct 332 dedicated medical waste disposal facilities in cities of municipal level across the country to ensure the safe disposal of medical waste. The present project will enable enhanced consideration of global environmental issues during the implementation of the Nationwide Investment Plan, with particular reference to continuous reduction of PCDD/PCDF releases.

3. PROGRAM AND POLICY CONFORMITY

a) FIT TO GEF FOCAL AREA STRATEGIC OBJECTIVES AND OPERATIONAL PROGRAM

The project is consistent with Operational Program 14 (OP 14). Project activities include: building medical waste management capabilities; strengthening policy and regulatory frameworks; strengthening monitoring capacity; developing capacity to assess technologies and management practices; developing and implementing public awareness, information and environmental education programs; facilitating dissemination of experiences and lessons learned and promoting information exchange; promoting access to, and the transfer of clean and environmentally sound alternative technologies; and demonstrating viable and cost-effective alternatives to the processes and practices that lead to the release of POPs.

Project activities regarding formulation of techno-economic policies and promotion of different commercial models for construction and operation of medical waste disposal facilities under Outcome 7 are to encourage partnering in investments for PCDD/PCDF reduction, which are consistent with Strategic Objective POP-3 of the GEF4 Strategy.

Project activities regarding the cluster of demonstration of advanced incineration technologies, non-incineration technologies, and integrated and coordinated medical waste management, treatment and disposal are to promote partnering in the demonstration of innovative technologies and practices for POPs reduction, which are consistent with Strategic Objective POP-4 of the GEF4 Strategy.

The GEF4 Strategy in POPs focal area also states that coordination and synergies with countries' responses to related multilateral environmental agreements addressing chemicals issues will be encouraged. The design of activities regarding BAT/BEP demonstration and replication has taken account of Technical Guidelines on the Environmentally Sound Management of Biomedical and Healthcare Wastes issued by the Secretariat of Basel Convention and other related guidelines issued by the World Health Organization (WHO).

b) SUSTAINABILITY (INCLUDING FINANCIAL SUSTAINABILITY)

The sustainability of the project will be ensured by:

- Strengthening and adaptation of laws, regulations, and policies relating to medical waste management.
- Compliance with ongoing monitoring and reporting requirements under the Stockholm Convention.
- Institutional capacity building at the national and local levels.
- Mobilization of stakeholders at central and local levels.
- Strong national commitment to significant investment in public health, as evidence by the substantial investment represent by the nationwide investment program.
- Strong national and international focus on global public health issues resulting from the SARS, HIV-AIDS, avian flu and other high-risk global infectious diseases.

The financial sustainability of the project will be ensured by:

- Enhanced implementation of a fee-based medical waste management system.
- Cost saving from the effectiveness of BEP and the optimization of BAT process parameters coupled with effective management.

- Emergence of industrial and service sector dedicated to the technical and technological support of BAT/BEP in medical waste management.
- Development of different commercial models (e.g. BOT, BOO, TOT, etc.) for construction and operation of medical waste treatment and disposal facilities.

c) REPLICABILITY

The project consists of two types of activities contributing to the replication of project results throughout China's medical waste management sector: nationwide capacity building and regulatory activities under Outcomes 1 and 2, coupled with targeted demonstration activities under Outcomes 3-6. Under Outcome 7, the targeted demonstration activities will be replicated nationally through an action plan that is a combination of techno-economic policies, replicable commercial models for medical waste facilities, strengthened national capacity to develop new medical waste technologies, medical waste treatment equipment certification and labeling, training and accreditation systems, and extensive raising of stakeholder awareness. Replication of these results will in turn be directly supported by the nationwide capacity building and regulatory activities that have taken place under Outcomes 1-2.

This is the first project in China to explore and apply BAT/BEP to the continuous reduction and where feasible elimination of releases of unintentionally produced POPs in a selected source category. According to the National Action Plan for Unintentionally Produced POPs and applying the methodology and lessons learned through the project, China will also cooperate with other Implementing Agencies such as the World Bank and UNDP to develop and implement a number of release reduction programs for other key industries. GEF and other UN agencies will be invited and consulted during the project implementation.

Finally, the project will support regional and global dissemination of project results through sponsorship of a series of workshops and seminars including representatives of the medical waste sectors from other countries in the region, and through presentation of project results by project staff at other medical waste and POPs related workshops and international fora. The project will also interact and coordinate with the regional Basel Convention Center based in Beijing, China in order to further promote replicability and dissemination of project results.

d) STAKEHOLDER INVOLVEMENT

The Convention Implementation Office (CIO) organized the kick-off meeting for the preparatory phase of the Project, which was attended by the Ministry of Health (MOH), State Environmental Protection Administration (SEPA), and all other health-related ministries and commissions. At the kick-off meeting, a cross-department steering committee was established and guidance was provided for the preparation of the project. The CIO subsequently commissioned a multidisciplinary Expert Group composed of international and domestic hospital waste management experts, medical waste treatment and disposal experts, regulatory and policy experts, and environmental economist. The Expert Group was tasked with the preparation of the project brief and supporting documentation. The steering committee provided substantive valuable guidance to the Expert Group in the whole project preparation process. The development of the project proposal also benefited significantly from the active participation of professional staff responsible for the development and implementation of the Nationwide Investment Plan.

During the preparation of the project proposal, the Expert Group carried out extensive field surveys and consultations in a representative sample of medical institutions and medical waste disposal units in Eastern, Central and Western China. The Expert Group also completed questionnaires and a census survey, which provided as the basis for identifying and analyzing barriers to successful project implementation and designing project activities.

SEPA and UNIDO also organized and sponsored a study tour to visit hospitals and medical waste management facilities in India, Ireland and Italy. UNIDO, the U.S. Environmental Protection Agency (USEPA), and the Italian Ministry of Environment and Territory also commissioned a review of international best practices in medical waste management and their applicability to China. Each of these activities provided a valuable contribution to the project design.

For the implementation of the proposed project, the Project Team will continue to actively mobilize, coordinate and liaise with all relevant stakeholders.

e) MONITORING AND EVALUATION

Project monitoring and evaluation will be conducted in accordance with established UNIDO and GEF procedures and will be provided by the project management group and the UNIDO focal point to this project. The Logical Framework Matrix (Annex B) provides performance and impact indicators for project implementation along with their corresponding means of verification. These will form the basis on which the project's Monitoring and Evaluation system will be built.

SEPA, as the national implementing agency, will be responsible for the preparation of progress reports as stipulated in the implementation agreement between UNIDO and SEPA, for Project Implementation Reviews (PIRs), for the Annual Project Review (APR) meeting, and for mid-term and terminal evaluations.

UNIDO will also make arrangements for an independent international terminal evaluation of the project according to GEF monitoring and evaluation procedures. The Project Management Office (PMO) and its partners will use the results of these reviews to inform project implementation planning in subsequent periods.

4. FINANCING

a) PROJECT COSTS

Project Components/Outcomes	GEF (\$)	Co-financing (\$)	Total (\$)
Outcome 1. Strengthen the regulatory framework for medical waste management and upgrade or establish performance levels for dedicated medical waste disposal facilities	373,785	514,295	888,080
Outcome 2. Strengthen the institutional capacity for integrated medical waste management at national and local levels in support of the Nationwide Investment Plan	1,409,485	3,490,185	4,899,670
Outcome 3. Demonstrate systems management and the application of BEP	628,125	1,696,375	2,324,500
Outcome 4. Demonstrate BAT for medical waste disposal using thermal combustion including air pollution monitoring	2,432,600	10,799,600	13,232,200
Outcome 5. Demonstrate BAT/BEP for medical waste thermal non-combustion, chemical treatment or other appropriate non-combustion treatments	1,984,450	7,600,450	9,584,900
Outcome 6. Demonstrate spatially integrated and coordinated medical waste management and disposal systems in geographically defined clusters that include medical institutions and dedicated treatment and disposal facilities	1,137,200	1,287,200	2,424,400

Project Components/Outcomes	GEF (\$)	Co-financing (\$)	Total (\$)
Outcome 7. Develop and implement a strategy for the adoption of BAT/BEP for medical waste management and disposal	2,565,085	5,830,755	8,395,840
Outcome 8. Project management, monitoring and evaluation*	1,097,220	1,858,280	2,955,500
Total Project Costs	11,650,000	33,077,140	44,727,140

* This item is the aggregate cost of project management; breakdown of this aggregate amount is presented in table b) below.

b) PROJECT MANAGEMENT BUDGET/COST

Component	Estimated staff weeks	GEF (\$)	Other sources (\$)	Project total (\$)
Locally recruited personnel*	2,080	-	780,000	780,000
Locally recruited consultants*	600		405,530	405,530
Internationally recruited consultants*	100	290,000	-	290,000
Office facilities, equipment, vehicles and communications		217,500	452,500	670,000
Travel		205,250	205,250	410,500
Miscellaneous		15,000	15,000	30,000
Total	2,780	727,750	1,858,280	2,586,030

* Local and international consultants in this table are those who are hired for functions related to the management of project. Consultants hired to do a special task, are referred to as consultants providing technical assistance, and are detailed in c) below:

c) CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS

Component	Estimated staff weeks	GEF (\$)	Other sources (\$)	Project total (\$)
Personnel	21,140	-	7,926,800	7,926,800
Local consultants	5,400	3,048,220	3,722,530	6,770,750
International consultants	240	1,010,300	-	1,010,300
Total	26,450	4,058,520	11,649,330	15,707,850

LIST OF INTERNATIONAL CONSULTANTS AND STAFFWEEKS

Expert	Description	Workweeks
Int'l M&E expert	Monitoring and evaluation	16
Int'l incineration expert	Incineration technology	32
Int'l autoclave expert	Autoclave technology	32
Int'l microwave expert	Microwave decontamination technology	32
Int'l chemical disinfection /	Chemical disinfection and microbiology	12

Expert	Description	Workweeks
microbiology expert		
Int'l waste management expert	Waste management systems	32
Int'l hospital management expert	Hospital management systems	24

LIST OF NATIONAL CONSULTANTS AND STAFFWEEKS

Expert	Description	Workweeks
Nat'l M&E experts (2 experts)	Monitoring and evaluation	360
Nat'l AQ experts (3 experts)	Air quality technology and systems	480
Nat'l policy experts (6 experts)	Policy	480
Nat'l chemical experts (6 experts)	Chemical analysis and sampling	480
Nat'l incineration experts (3 experts)	Incineration technology	480
Nat'l autoclave experts (3 experts)	Autoclave technology	480
Nat'l microwave experts (3 experts)	Microwave decontamination technology	480
Nat'l chemical disinfection / microbiology experts (3 experts)	Chemical disinfection and microbiology	480
Nat'l legal experts (2 experts)	Legal and regulatory issues	280
Nat'l waste management experts (4 experts)	Waste management systems	480
Nat'l hospital management experts (3 experts)	Hospital management systems	320
Nat'l program development experts (6 experts)	Program development	600

d) CO-FINANCING SOURCES

Name of co-financier (source)	Classification	Type	Amount (\$)	Status*
UNIDO	Implementing Agency	In kind	100,000	Commitment letter obtained
US Government	Bilateral Agency	In cash/in kind	120,000	Commitment letter obtained
Ministry of Finance	National Government	In cash	3,800,000	Commitment letter obtained
Ministry of Health	National Government	In kind	4,500,000	Commitment letter obtained
SEPA/Nationwide Investment Plan	National Government	In kind	15,000,000	Commitment letter obtained
Enterprises	Private Sector	In kind	9,557,140	Commitments under discussion
Total			\$ 33,077,140	

5. INSTITUTIONAL COORDINATION AND SUPPORT

a) CORE COMMITMENTS AND LINKAGES

Commitment of China

China has given high priority to the implementation of the Stockholm Convention. China signed the Convention in May 2001 and completed the ratification process on 25 June 2004, and the Convention entered into force in the country on 11 November 2004. China has devoted substantial resources and solicited significant international support for the development of its NIP. China is committed to implement the Stockholm Convention and has initiated the development and implementation of several priority demonstration projects with the financial support from the GEF and bilateral donors such as Canada, Germany, Italy, Japan, Norway, Switzerland and the USA.

In order to effectively coordinate and guide the Convention implementation, a high-level National Coordination Group (NCG) has been established, consisting of 11 POPs-related ministries and agencies. A Convention Implementation Office (CIO) with specific responsibility for the day-to-day management of the Convention implementation has been established at SEPA. A broad partnership for POPs management and control has been established and has provided strong support during the NIP development.

Commitment of UNIDO

UNIDO is committed in assisting its developing country Member States with the fulfillment of their obligations under the Stockholm Convention. The GEF has approved Enabling Activity proposals submitted by UNIDO for more than 40 countries, including China and India, which have opted to undertake the NIP development through the GEF full project cycle. In addition, UNIDO is executing and/or developing a range of demonstration and capacity building projects to support the Convention implementation, including several BAT/BEP-related projects. UNIDO has committed considerable effort to build this assistance program, both in support of the Convention implementation and in furtherance of UNIDO's mandate and corporate strategy in support of the Millennium Development Goals.

China is UNIDO's largest recipient of technical cooperation assistance. Activities undertaken in China by UNIDO include a range of measures related to investment, industrial efficiency and waste management. The experience gained in these projects will be directly relevant to Sustainable Environmental Management of Medical Waste in China. UNIDO's in-kind contribution to the project will include establishment of a project focal point, provision of the part-time assistance of senior staff within UNIDO's Multilateral Environmental Agreements Branch to support and ensure effective project implementation, and assignment of a dedicated staff person to provide project support in UNIDO Office in Beijing. In addition, UNIDO will continue to seek co-financing or associated financing for activities that further the objectives of the project and of implementation of the Stockholm Convention in China.

b) CONSULTATION, COORDINATION AND COLLABORATION BETWEEN IAS, AND IAS AND ExAs

In order to guide the NIP development, China has established a coordinating group led by SEPA and consisting of the National Development and Reform Commission (NDRC), Ministry of Foreign Affairs (MOFA), Ministry of Finance (MOF), Ministry of Commerce (MOFCOM), Ministry of Science and Technology (MOST), Ministry of Agriculture (MOA), Ministry of Public Health (MPH), Ministry of Construction (MOC), General Administration of Customs (GAC) and State Electricity Regulatory Commission (SERC). Development of the NIP has benefited greatly from the valuable

support and active participation of these agencies, a wide variety of other international and domestic organizations, and from extensive consultations with international and domestic stakeholders.

UNIDO, as the GEF Executing Agency with Expanded Opportunities for the NIP development project in China, has developed close cooperation and linkages with SEPA and the Stockholm Convention Implementation Office (CIO). Throughout the implementation of the NIP development project, UNIDO has participated actively in all working levels with the NIP Development Leading Group, coordinated closely with all relevant government departments and stakeholders, and interacted with other Implementing and Executing Agencies in the development of China's NIP. During the preparation of this project, UNIDO also worked closely with UNDP to organize the study tour to visit hospitals and medical waste management facilities in India, leading to positive exchanges between the governments of India and China. Project development also benefited significantly from the detailed substantive comments provided by the World Bank, GEF Secretariat, and USEPA during the project design process. Review and responses to these comments by project proponents allowed the meaningful improvements in the project design.

UNIDO looks forward to continuing this close working relationship with the IAs, EAs, and the GEF Secretariat throughout the development and implementation of this project as part of the post-NIP program for Stockholm Convention implementation in China.

C) PROJECT IMPLEMENTATION ARRANGEMENTS

Convention Implementation Coordinating Group (CICG). The SEPA-led Coordinating Group will provide (i) review of significant policies related to POPs management and control, (ii) guidance and coordination for national POPs management activities and Convention implementation.

National and Local Steering Groups. The project will establish a national steering group by drawing upon resources from related ministries or commissions in charge of development and reform, environment, health, construction, and pricing to provide the project team with political guidance and inter-ministerial coordination support. To facilitate the extensive demonstration and replication activities at provincial and municipal levels, the National Steering Group will encourage and assist local governments in the establishment and operation of their own corresponding steering groups.

Convention Implementation Office (CIO). The CIO is part of SEPA and is responsible for the coordination of the day-to-day management of the Stockholm Convention implementation in China. The CIO's responsibilities include: (i) provision of technical support for international negotiations and policy studies on the Stockholm Convention, (ii) provision of support for development and implementation of POPs-related policy and regulations, as well as coordination of key governmental stakeholders, (iii) mobilization of co-financing from bilateral, international and national sources, (iv) collecting data and information, compiling reports, organizing training activities and publishing information. The CIO will provide guidance to ensure the project's successful implementation, including regular monitoring and enforcement inspections. As the CIO is not an independent legal entity, Foreign Economic Cooperation Office (FECO) will represent SEPA and the CIO in the management and completion of contracts for project implementation.

National Project Management Team for Environmentally Sustainable Management of Medical Waste in China. The Project Team will be composed of staff from SEPA, MOH, NDRC, MOC, and other relevant agencies. SEPA will designate a coordinator/team leader. The Project Team will be responsible for the day-to-day management and execution of the project, and will oversee local project management offices. The Project Team's responsibilities will include (i) assignment and supervision of project activities; (ii) recruitment of international and national consultants; (iii) providing guidance to local project management offices (PMOs); (iv) coordination with stakeholders, donors, the IA, relevant national agencies and the private sector; (v) preparation of terms of reference (TORs) for project activities, (vi) review of project progress reports submitted by the local PMOs, (vii) supervising project procurement and financial resources in accordance with UNIDO procedures, (viii)

organizing and convening project coordination stakeholder meetings, and (ix) review of project outputs. The project expert team will provide technical support to the project team.

Project Expert Team. The project will recruit an international Chief Technical Advisor (CTA), a National Technical Advisor (NTA), policy experts, waste management industry experts, health sector experts, chemists, monitoring & evaluation experts, and other technical experts. These experts will form a Project Expert Team to assist the CIO and Project Team through the following activities:

- i) Introduction of successful experiences gained from foreign countries;
- ii) Management and coordination of all project activities;
- iii) Provision of technical support for policy framework, institutional strengthening, demonstration activities, technology selection, market promotion, awareness raising and education, results and experience dissemination, project monitoring and evaluation, replication program development, and project management;
- iv) Periodic project implementation progress appraisal;
- v) Support for development of training materials; and
- vi) Liaison for international study tours.

Local Project Management Offices. The project will involve a large number of medical institutions (MIs) and dedicated medical waste (MW) treatment facilities nationwide at national, provincial, municipal, county and sub-county levels. Extensive awareness promotion and training activities will be conducted at community and local governmental levels. Oversight for the implementation of relevant regulations will rely on local administrative agencies. The breadth of these activities poses a significant management and coordination challenge to the national Project Team. In order to effectively implement the project and fully involve local stakeholders, three local PMOs will be established in the three provinces where intensive demonstration activities and will be conducted. Local PMOs will be composed of staff from relevant provincial governmental agencies and local experts. Their responsibilities will include (i) coordination/organization of local training programs and seminars; (ii) overseeing facility construction and operation; (iii) oversight of regulatory implementation; (iv) policy consultation and coordination; and (v) collecting information and preparing progress reports.

UNIDO Focal Point. A project focal point will be established within UNIDO to assist with project execution. This focal point will consist of dedicated core staff, supplemented by support from professional and support staff colleagues on a part-time as needed basis, including in particular senior staff engaged in the management and coordination of UNIDO's POPs program. UNIDO will make these services available as part of its in-kind contribution to the project.

ANNEX A: INCREMENTAL COST ANALYSIS

A. PROJECT BACKGROUND

Historically, the Chinese healthcare system generated significantly less volumes of medical waste than today, as the system greatly relied on reprocessing and reuse of materials. However, crowded hospital wards and the absence of effective infection control measures created an environment where the risk of cross infections became prevalent, and some were even fatal. To overcome this problem and reduce nosocomial infections of patients in medical institutions, China started in 1987 adapting successful international experience in the use of disposable medical items. In the past two decades, the quantity of disposable medical devices used in Chinese medical institutions has increased rapidly. However, although the profile of Chinese medical waste is rapidly converging towards the western profile, the required medical waste management and disposal systems have not yet been developed.

The net amount of medical waste (excluding domestic waste) produced in medical institutions nationwide was approximately 670,000 tons in 2006, with a daily average output of 1,780 tons. The increasing level of economic development and health awareness drives pressure for the development of health services, a shift to the management of chronic non-communicable diseases, increased life expectancy, and increased demand for eldercare, which resulted in an ever-increasing production of medical wastes.

Prior to the SARS outbreak in 2003, medical waste management and disposal of China focused on decentralized hospital-based disposal systems. Medical waste was simply burned in incinerators without necessary air pollution control devices. This approach led to serious secondary pollution, including dioxins emission. Medical waste was also often mixed with municipal waste and landfilled, or illegally reused and recycled, both of which constitute significant threats to the worker safety and public health.

The risks inherent with these approaches became apparent during the outbreak of SARS, as a result of which significant national resources were mobilized in response to the epidemic. In the same year following the SARS outbreak, the Chinese Government moved quickly to draft and approve the National Program for Construction of Facilities for Disposal of Hazardous Waste and Medical Waste, which proposed that China would construct 332 dedicated medical waste disposal facilities in cities of municipal level and above across the country to ensure the safe disposal of medical waste.

The Program envisaged adopting incineration technology in most of these new facilities, since incineration has traditionally been viewed as the safest and most dependable way to destroy infectious waste. In the urgent context of SARS, quick construction of these facilities became one of the government's highest priorities and such issues as dioxin releases associated with the incineration of medical waste and the impact of the Stockholm Convention (which China had not yet signed) were not specifically considered.

In China, there are 149 dedicated medical waste disposal facilities with a total disposal capacity of 1,327 tons per day. Of these facilities, only one facility is using autoclaving technique, another facility use microwaving technique, and the rest applies incineration or pyrolysis. About half (70) medical waste incinerators have not installed even the basic air pollution control system (APCS) and the majority of the incinerators have only limited devices to control the PCDD/PCDF emissions.

Though most facilities do not measure their PCDD/PCDF emissions, the estimation of annual air emissions from medical waste incinerators is believed to be very high. In the development of the NIP, PCDD/PCDF releases from the incineration of medical waste in China were estimated based on the Standardized Toolkit for Identification and Quantification of PCDD/PCDF Releases. Based on that estimation, PCDD/PCDF releases from medical waste incinerators in China reached 427.4g TEQ in 2004, accounting for 8.47% of all nationwide air releases and 11.5% of total releases of all sources listed in the Toolkit.

B. INCREMENTAL COST ASSESSMENT

Baseline

Disposal of medical waste in dedicated facilities started as an emergency measure after the SARS outbreak in 2003 and prior to China's accession to the Stockholm Convention. The Nationwide Investment Plan was designed on the basis of environmental and health standards existing at that time in China where incineration technology was designated as the primary disposal technology. The Program focused on the elimination of public health threats posed by medical waste and gave less consideration to the application of BAT/BEP in implementing the integrated management systems for medical waste or for controlling PCDD/PCDF and other pollutants releases.

In the absence of this project, the medical waste disposal sector in China is characterized as follows:

- A regulatory framework focused on infection control;
- Under-developed institutional capacities, in terms of both hardware (infrastructure) and software (skills and expertise) for supervision and inspection of medical institutions and medical waste disposal facilities in terms of pollution control and monitoring, environmental impact assessment, and operation risk evaluation;
- Incinerators continue to play the predominant role in disposal of medical waste and generate unintentional POPs releases that significantly exceed BAT performance levels;
- Non-combustion alternatives, which can avoid formation of PCDD/F have not been adopted;
- Integration and coordination of medical waste management, treatment and disposal systems have not been explored to achieve optimal social, economic and environmental benefits;
- National debts and local government investments remain the principal financial source for construction of dedicated medical waste disposal facilities, but are unsustainable;
- Stakeholder awareness regarding secondary pollution from medical waste disposal is insufficient; and
- The fee-based system supporting medical waste management, treatment and disposal systems has not been operated adequately and effectively.

Global Environmental Objective

Like other POPs, PCDD/PCDF is a group of toxic chemicals that resist degradation, bio-accumulate and has the potential for long-range transport. Exposure to these chemicals can harm human health and ecosystems at locations both near the site from which they are released into the environment, and at very far distances from that site, with severe adverse impact on wildlife, aquatic and marine life, domestic animals and humans. Due to their unique properties, POPs do not respect national boundaries, and therefore pose a special of challenge that makes it impossible for any one-nation acting alone to address the POPs problem.

Many well-established studies have confirmed that PCDD/PCDF pose a serious human cancer risk. In addition to cancer, exposure to PCDD/PCDF can also cause severe reproductive and developmental disorders. As endocrine disruptors, these pollutants are well known for their ability to damage the immune system and interfere with hormonal systems. PCDD/F exposure have been linked to birth defects, inability to maintain pregnancy, decreased fertility, reduced sperm counts, endometriosis, diabetes, learning disabilities, immune system suppression, lung problems, skin disorders, lowered testosterone levels and much more.

The overall objective of the project is to reduce and ultimately eliminate the releases of PCDD/PCDF and other global pollutants (such as mercury) from medical waste incinerators to the environment, and to assist China in implementing its obligations under the Stockholm Convention.

Alternative

Through this project, medical institutions will adopt BEP for medical waste management. Waste reduction at source will help achieve resource conservation; reduce collection, transportation, treatment, and disposal costs; and decrease pollution control liability and cost. Waste segregation will reduce the waste stream's volume and toxicity. Proper procurement practices, such as switching to products and materials that do not contain PCDD/PCDF precursors, will substantially reduce PCDD/PCDF emissions. Increased hospital staff awareness of hazardous and infectious materials management will also reduce accidental injuries and cross-infection cases.

This project will achieve great reduction of air pollutant emission from medical waste incinerators through the application of BAT in the combustion process and through the improvement and optimization of necessary air pollution control devices (APCD), such as activated carbon tower, bag filters, dry or wet scrubbers, lime and activated carbon injection. No purchase of incineration equipment is foreseen in the project.

BAT will also be applied to replace outdated incinerators with alternative non-combustion medical waste technologies, such as autoclaving and microwaving, which can avoid unintentional PCDD/PCDF formation. In applying these alternatives, emphasis will be placed on sterilization efficacy and VOCs emission control to ensure safe disposal of medical wastes.

The project will significantly contribute to the POPs focal area as follows:

- Reduction in releases of by-products by means of BAT/BEP demonstration and adoption in incineration facilities within the project areas and time frame: 1.94 g TEQ per year amounting to US\$ 150,000 per g TEQs. National replication will result in a reduction of 47.88 g TEQ/year with a corresponding incremental cost of US\$ 7,182,000/year. These estimates are extrapolated from the earlier Sino-Italian UP-POP project to illustrate the cost implication of national replication.
- Avoided releases of by-products by means of BAT/BEP demonstration and adoption of alternative treatment processes: 2.59 g TEQ per year amounting to US\$ 66,274 per g TEQs.

Due to the very high price tag of monitoring PDCC/PDCF, the incremental costs of incinerators will be higher than those of non-combustion technology equipment in which the possibility of unintentional POPs production and the monitoring expenses are significantly less. It is true in spite of the fact that the project has targeted incineration facilities with good APCS, so that only process optimization and improvement (including environmental monitoring) need to be carried out by the project without significant capital equipment budget requirements and for non-combustion technologies supported by the project, the budget for the procurement of equipment is necessary, given that no pre-existing facility is involved.

The Project Summary and the Logical Framework (Annex II) give more detailed description of project activities designed to reach the alternative scenario.

Summary Incremental Cost Matrix in USD

Project Components/Outcomes	Baseline	Increment	Alternative
<i>Outcome 1.</i> Strengthen the regulatory framework for medical waste management and upgrade or establish performance levels for dedicated medical waste disposal facilities	514,295	373,785	888,080
<i>Outcome 2.</i> Strengthen the institutional capacity for integrated medical waste management at national and local levels in support of the Nationwide Investment Plan	3,460,185	1,439,485	4,899,670
<i>Outcome 3.</i> Demonstrate systems management and the application of BEP	1,646,375	678,125	2,324,500
<i>Outcome 4.</i> Demonstrate BAT for medical waste disposal using thermal combustion including air pollution monitoring	10,759,600	2,472,600	13,232,200
<i>Outcome 5.</i> Demonstrate BAT/BEP for medical waste thermal non-combustion, chemical treatment or other appropriate non-combustion treatments	7,600,450	1,984,450	9,584,900
<i>Outcome 6.</i> Demonstrate spatially integrated and coordinated medical waste management and disposal systems in geographically defined clusters that include medical institutions and dedicated treatment and disposal facilities	1,287,200	1,137,200	2,424,400
<i>Outcome 7.</i> Develop and implement a strategy for the adoption of BAT/BEP for medical waste management and disposal	5,830,755	2,565,085	8,395,840
<i>Outcome 8.</i> Project management, monitoring and evaluation	1,758,280	1,197,220	2,955,500
TOTAL PROJECT COST	32,857,140	11,870,000	44,727,140

ANNEX B: LOGICAL FRAMEWORK

Project Strategy	Objectively verifiable indicators		
Goal	Continuously minimize and, where feasible, ultimately eliminate the releases of unintentionally produced POPs and other globally harmful pollutants into the environment, and assist China implementing the relevant obligations under the Stockholm Convention to protect the global environment and human health.		
Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Objectives The project is to interact with the Nationwide Investment Plan and promote the widespread adoption of BAT/BEP in the evolving medical waste management infrastructure and industry in a manner that sustainably reduces adverse environmental impacts and protects human health.</p>	<ul style="list-style-type: none"> ➤ Number of medical institutions adopting BEP ➤ Number of dedicated medical waste disposal facilities adopting BAT ➤ Number of dedicated medical waste treatment facilities adopting BAT/BEP ➤ Quantitative and qualitative change in medical waste disposed of ➤ Reduction in the manufacture and use of medical care products containing hazardous substances such as Hg and PVC containing phthalates ➤ Reduction of PCDD/PCDF releases from medical waste incineration disposal ➤ Avoid releases of PCDD/PCDF releases from medical waste treatment ➤ Level of the stakeholder awareness of and participation in environmentally sound medical waste management ➤ Levels of PCDD/PCDF in biological organisms in the vicinity of dedicated medical waste treatment and disposal facilities ➤ Social and economic benefits from the adoption of BAT/BEP 	<ul style="list-style-type: none"> ➤ Texts of revised or established regulations, standards, and policies and their specifications ➤ Bidding documents calling for proposals for the purchase of technical services and equipment ➤ TORs of consulting services ➤ Service contracts ➤ Work plans ➤ Thematic study reports ➤ M & E reports 	<ul style="list-style-type: none"> ➤ The country, society and sector support actions to reduce PCDD/PCDF releases ➤ Various barriers can be successfully removed with effective interventions from this project ➤ MW treatment will be an economically viable option ➤ The regulatory and policy framework established by this project can continue to work effectively after the completion of the project

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Outcome 1: Strengthen the regulatory framework for medical waste management and upgrade or establish performance levels for dedicated medical waste disposal facilities			
<p><i>Output 1.1 Strengthen the regulatory framework for MW management</i></p> <p>Activity 1.1.1 Investigate, analyze and evaluate the laws and regulations on MW s and their implementation</p> <p>Activity 1.1.2 Adapt the related regulations to the BAT/BEP requirements</p> <p>Activity 1.1.3 Hold workshop to discuss the revised drafts</p> <p>Activity 1.1.4 Circulate the drafts among governmental agencies, enterprises, academia, international community, and the public for comments</p> <p>Activity 1.1.5 Promulgate the adapted regulations, and introduce and implement enforcement mechanisms</p>	<ul style="list-style-type: none"> ➤ Adapted Detailed Rules to Implement Measures on MW Operating License Management ➤ Adapted Measures on MW (as Hazardous Waste) Consignment Management ➤ Adapted Classification System of Medical wastes 	<ul style="list-style-type: none"> ➤ Explanations of Detailed Rules to Implement Measures on M W Operating License Management ➤ Explanations of Adapted Measures on Hazardous Waste Consignment Management ➤ Explanations of Adapted Classification System of MWs ➤ Meeting minutes ➤ Collection of suggestions 	<ul style="list-style-type: none"> ➤ Government will endorse and adopt the adapted regulations and measures ➤ The adapted regulations meet the international requirements and respect the actual situation of China ➤ The adapted regulations are practicable for implementation ➤ The adapted regulations are not enforced
<p><i>Output 1.2 Upgrade or establish performance levels for dedicated MW disposal facilities</i></p> <p>Activity 1.2.1 Investigate and analyze feasibility to upgrade or establish new pollution performance levels</p> <p>Activity 1.2.2 Draft the upgraded pollution control levels for the incineration of MW to the BAT achievable performance level</p> <p>Activity 1.2.3 Draft the pollution performance levels for non-incineration treatment of medical waste</p> <p>Activity 1.2.4 Hold a workshop with representatives from international organizations, governments, academia, enterprises, and the public to review the proposed performance levels</p>	<ul style="list-style-type: none"> ➤ Technical standards upgraded or established regarding: <ul style="list-style-type: none"> - Pollution control for incineration of MW - Pollution control for non-incineration treatment of MW ➤ PCDD/PCDF release in pilot provinces meeting upgraded performance levels ➤ Other pollutants release in pilot provinces meeting established performance levels 	<ul style="list-style-type: none"> ➤ Explanations on standards upgraded or established regarding: <ul style="list-style-type: none"> - Pollution control for incineration processes - Pollution control for non-incineration treatment of MW ➤ Investigation and feasibility study reports ➤ Meeting minutes ➤ Collection of suggestions 	<ul style="list-style-type: none"> ➤ The upgraded performance levels can meet the requirements of BAT/BEP and also respect the actual technical and economic situation ➤ Various stakeholders can be effectively involved throughout the whole process ➤ Selected pilot provinces are willing to implement the upgraded performance levels first ➤ The government will accept and promulgate the established or revised performance levels nationwide

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 1.2.5 Select 3 provinces for first pilot implementation of the upgraded performance levels</p> <p>Activity 1.2.6 Revise the performance levels by incorporating the experience from the pilot implementation</p> <p>Activity 1.2.7 Circulate the revised performance levels for comments and forward to SEPA for review</p> <p>Activity 1.2.8 Promulgate nationwide the revised performance levels as technical standard</p>			
<p>Outcome 2: Strengthen the institutional capacity for integrated medical waste management at national and local levels in support of the Nationwide Investment Plan</p>			
<p>Output 2.1 Establish a long-term national coordination mechanism for integrated MWs management</p> <p>Activity 2.1.1 Establish a national medical waste management steering group led by SEPA and MOH and composed of other relevant ministries for coordination of integrated MW management</p> <p>Activity 2.1.2 Regularly hold coordination meetings to provide guidance and coordination on issuance of laws, regulations, standards and policies and other important issues</p> <p>Activity 2.1.3 Provide guidance to the establishment and operation of local steering groups on MW management</p>	<ul style="list-style-type: none"> ➤ A national inter-ministerial coordination mechanism for integrated MW management ➤ Local inter-departmental coordination mechanism for integrated MW management ➤ Improved coordination of MWs management at national and local levels 	<ul style="list-style-type: none"> ➤ Working rules of the national steering group and the local steering groups ➤ Work plans and annual reports of the national and local steering groups ➤ Minutes of review, coordination and guidance meetings ➤ Resolutions agreed by the steering groups 	<ul style="list-style-type: none"> ➤ Relevant ministries agree on and support the concept of integrated MW management ➤ Coordination and cooperation can be achieved among various ministries
<p>Output 2.2 Strengthen supervision and inspection on medical institutions in MW management</p> <p>Activity 2.2.1 Based on Output 3.1, develop specifications for Health Agencies to supervise Medical Institutions in the adoption of BEP on MW Management</p>	<ul style="list-style-type: none"> ➤ Specifications for Health Departments to supervise Medical Institutions in adoption of BEP on MW Management 	<ul style="list-style-type: none"> ➤ Explanations on specifications for Health Departments to supervise Medical Institutions in adoption of BEP on MW Management 	<ul style="list-style-type: none"> ➤ Health agencies attach sufficient importance to MW management supervision

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 2.2.2 Organize health departments to have trainings on the specifications based on the staff training system established by Output 7.4</p> <p>Activity 2.2.3 Establish and implement a MW data reporting system between medical institutions and authorities</p> <p>Activity 2.2.4 Establish a mechanism for the local environment and health departments to regularly inspect the implementation of the BEP for MW management</p>	<ul style="list-style-type: none"> ➤ Number of trainees ➤ Capacity for supervision and inspection improved ➤ MW amount reporting system ➤ MW traceability system ➤ A dedicated management system for integrated MW management 	<ul style="list-style-type: none"> ➤ Training materials ➤ Inventory of medical wastes ➤ Monitoring report ➤ Consignments saved and archived for tracing ➤ Intensive inspection reports ➤ Management system records 	<ul style="list-style-type: none"> ➤ Personnel training system established by Output 7.4 is effective in practice
<p><i>Output 2.3 Strengthen the monitoring and supervision capacity on MW treatment and disposal</i></p> <p>Activity 2.3.1 Develop monitoring and supervision standard norms</p> <p>Activity 2.3.2 Train the municipal monitoring and supervision staff on the application of the methods</p> <p>Activity 2.3.3 Develop and implement monitoring data publishing and reporting system</p> <p>Activity 2.3.4 Undertake formal quarterly inspections in pilot MW disposal facilities during the project implementation period</p>	<ul style="list-style-type: none"> ➤ Methods on monitoring and supervision of pollutants release from MW facilities ➤ Municipal monitoring and inspection capacity improved ➤ On-line monitoring network connected with the environmental authorities established ➤ Monitoring data publishing and reporting systems established 	<ul style="list-style-type: none"> ➤ Explanations on methods on monitoring and supervision of pollutants release from MW ➤ Monitoring data ➤ Training materials ➤ Regularly published monitoring and statistical data ➤ Regularly reported monitoring and statistical data 	<ul style="list-style-type: none"> ➤ The dedicated treatment facilities install on-line monitoring system in compliance with related regulations and standards ➤ The local EPBs have the access to the on-line monitoring data of the dedicated treatment facilities
<p><i>Output 2.4 Strengthen the environmental impact assessment on disposal facilities</i></p> <p>Activity 2.4.1 Develop Guideline for Environmental Impact Assessment on MW Disposal Facilities to include related existing or new engineering design standards and other related standards</p>	<ul style="list-style-type: none"> ➤ Guideline for Environmental Impact Assessment on MW Disposal Facilities ➤ 	<ul style="list-style-type: none"> ➤ Explanations on Guideline for Environmental Impact Assessment on MW Disposal Facilities 	<ul style="list-style-type: none"> ➤ The EIA reports prepared in accordance with the Guideline will be used by the environmental authorities in approving or not approving the proposals for the construction of dedicated MW disposal facilities

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 2.4.2 Hold a training workshop on the implementation of the guideline to a qualified number of certified environmental impact assessors</p> <p>Activity 2.4.3 Issue and implement the guideline nationwide on disposal facilities</p>	<ul style="list-style-type: none"> ➤ Number of environmental impact assessors having received the training ➤ Number of disposal facilities assessed with the guideline, including number of accepted or rejected proposals 	<ul style="list-style-type: none"> ➤ Training materials and list of trainees ➤ EIA reports 	
<p>Output 2.5 Strengthen the capacity to audit the operation of disposal facilities</p> <p>Activity 2.5.1 Design and disseminate a methodology to audit disposal facilities</p> <p>Activity 2.5.2 Develop accreditation and management measures for the establishment of national audit services</p> <p>Activity 2.5.3 Support and encourage the existing institutions for the audit of the operation of disposal facilities</p>	<ul style="list-style-type: none"> ➤ methodology to audit disposal facilities ➤ Measures on Accreditation and Management of Auditing Institutions for MW Facilities ➤ New facilities checked and accepted ➤ Existing facilities operation risk evaluated 	<ul style="list-style-type: none"> ➤ Explanations on methodology to audit disposal facilities ➤ Explanations on Accreditation and Measures on Management of Auditing Institutions for MW Facilities ➤ Evaluation reports ➤ Correction reports 	<ul style="list-style-type: none"> ➤ Evaluation and correction reports can be used as a strong reference by the environmental authorities in approving or suspending MW management license
Outcome 3: Demonstrate BEP based management of medical waste including measurement and monitoring			
<p>Output 3.1 Demonstrate BEP in medical institutions for the management of medical waste</p> <p>Activity 3.1.1 Develop Specifications on MW Management in Medical Institutions</p> <p>Activity 3.1.2 Develop booklet for BEP Application in Medical Institutions for pilot application based on the previously achieved experience</p> <p>Activity 3.1.3 Select 20 representative medical institutions for the demonstration program</p>	<ul style="list-style-type: none"> ➤ Booklet of BEP Application in Medical Institutions ➤ Reduced MW amount ➤ Reduced use of disposable medical products ➤ Reduced use of Hg contained products ➤ Reduced use of PVC products 	<ul style="list-style-type: none"> ➤ Tender document calling for technical services needed in demonstration of BEP in Medical Institutions ➤ MOUs signed with the selected medical institutions for demonstration ➤ Monthly progress reports ➤ Inventory of MWs 	<ul style="list-style-type: none"> ➤ The selected demonstration institutions are active and cooperative ➤ The demonstration plan is feasible ➤ The trainers can help the trainees understand the BEP

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 3.1.4 Develop the demonstration program, covering purchasing practices, reduction, reuse, waste segregation, intermediate storage, transportation and traceability</p> <p>Activity 3.1.5 Establish waste management systems and carry out staff trainings on BEP application at the demonstration institutions</p> <p>Activity 3.1.6 Monitor, record and evaluate the implementation process and results</p> <p>Validate the draft booklet by incorporating lessons and experience from the evaluations, issue and disseminate the validated booklet</p>	<ul style="list-style-type: none"> ➤ Reduced injuries to MW working staff ➤ Improved personnel capacity for MW management and improved awareness ➤ Established MW management system ➤ Specifications on MW Management in Medical Institutions 	<ul style="list-style-type: none"> ➤ Evaluation reports ➤ Technical training materials Recorded texts, photos and videos 	
Outcome 4: Demonstrate BAT for medical waste disposal using thermal combustion including air pollution monitoring			
<p><i>Output 4.1 Demonstrate the application of BAT for incineration process of MW</i></p> <p>Activity 4.1.1 Develop a draft Booklet of BAT Application for Incineration Process of MW</p> <p>Activity 4.1.2 Develop a draft Specification for Construction and Operation of MW Disposal Facility Using Incineration Process</p> <p>Activity 4.1.3 Select one representative existing facility for demonstration</p> <p>Activity 4.1.4 Carry out the feasibility study and EIA of the demonstrative facility and develop the demonstration implementation plan</p> <p>Activity 4.1.5 Retrofit and optimize the operation of the modified facility, including on-line PCDD/PCDF sampling system, and train the relevant managerial and operation staff</p> <p>Activity 4.1.6 Validate the modified facility, monitor, record and evaluate the implementation process and results</p>	<ul style="list-style-type: none"> ➤ Booklet of BAT Application for Incineration Process of MW ➤ Specification for Construction and Operation of MW Disposal Facility Using Incineration Process ➤ Demonstration implementation plan ➤ Skills of operators improved ➤ Overall management level improved ➤ PCDD/PCDF releases consistent with performance level associated with BAT ➤ Releases of other pollutants meeting the limits ➤ Solid residues to landfill meeting the limits for safe disposal 	<ul style="list-style-type: none"> ➤ Tender document calling for technical services needed in demonstration of BAT in selected incineration facilities ➤ MOUs signed with selected facilities ➤ Monthly progress reports ➤ Evaluation reports ➤ Report of engineering validation ➤ Technical training materials ➤ Recorded texts, photos and videos 	<ul style="list-style-type: none"> ➤ The selected demonstration facilities are willing to cooperate ➤ The demonstration implementation is feasible ➤ The purchased equipment is reliable ➤ Modified facilities can meet the release standards ➤ The trainers can help the trainees master the operating skills

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 4.1.7 Validate the Booklet and the Specification by incorporating lessons and experience from the evaluation, issue and disseminate the validated Booklet and Specification</p>			
<p>Output 4.2 Demonstrate the application of BAT in pyrolysis process of MWs</p> <p>Activity 4.2.1 Develop a Booklet of BAT Application in Pyrolysis Process of MW</p> <p>Activity 4.2.2 Develop a draft Specification for Construction and Operation of MW Disposal Facility Using Pyrolysis Process</p> <p>Activity 4.2.3 Select 2 representative existing facilities for demonstration</p> <p>Activity 4.2.4 Carry out the feasibility study and EIA of the demonstrative facility and develop the demonstration implementation plan</p> <p>Activity 4.2.5 Retrofit and optimize the operation of the modified facility, including on-line PCDD/PCDF sampling system, and train the relevant managerial and operation staff</p> <p>Activity 4.2.6 Validate the modified facility, and monitor, record and evaluate the implementation process and results</p> <p>Activity 4.2.7 Validate the Booklet and the Specification by incorporating lessons and experience from the evaluation, issue and disseminate the validated Booklet and Specification</p>	<ul style="list-style-type: none"> ➤ Booklet of BAT Application in Pyrolysis Process for MWs Disposal ➤ Specification for Construction and Operation of MW Disposal Facility Using Pyrolysis Process ➤ Demonstration implementation plan ➤ Skills of operators improved ➤ Overall management level improved ➤ PCDD/PCDF releases consistent with performance level associated with BAT ➤ Release of other pollutants within permitted limits ➤ Solid residues to landfill meeting the standards of safe disposal 	<ul style="list-style-type: none"> ➤ Tender document calling for technical services needed in demonstration of BAT in selected pyrolysis incinerator facilities ➤ MOUs signed with selected facilities ➤ Monthly progress reports ➤ Evaluation reports ➤ Report of engineering validation ➤ Technical training materials ➤ Recorded texts, photos and videos 	<ul style="list-style-type: none"> ➤ The selected demonstration facilities are active and cooperative ➤ The demonstration implementation is feasible ➤ The purchased equipment is reliable ➤ Modified facilities can meet the performance levels ➤ The trainers can help the trainees master the operating skills
<p>Outcome 5: Demonstrate BAT/BEP for medical waste thermal non-combustion, chemical treatment or other appropriate non-combustion treatment</p>			
<p>Output 5.1 Demonstrate the application of BAT in autoclaving process of MW</p> <p>Activity 5.1.1 Develop Booklet of BAT Application in Autoclaving Process of MW</p>	<ul style="list-style-type: none"> ➤ Booklet of BAT Application in Autoclaving Process for MW Treatment 	<ul style="list-style-type: none"> ➤ Tender document calling for technical services needed in demonstration of BAT in selected autoclave facilities 	<ul style="list-style-type: none"> ➤ The selected demonstration facilities are active and cooperative

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 5.1.2 Develop a draft Specification for Construction and Operation of MW Disposal Facility Using Autoclaving Process</p> <p>Activity 5.1.3 Select one representative existing facility for demonstration</p> <p>Activity 5.1.4 Carry out the feasibility study and EIA of the demonstrative facility and develop the demonstration implementation plan</p> <p>Activity 5.1.5 Procure, retrofit, and operate the modified facility and train the relevant managerial and operation staff</p> <p>Activity 5.1.6 Validate the modified facility, and monitor, record and evaluate the implementation process and results</p> <p>Activity 5.1.7 Validate the Booklet and the Specification by incorporating lessons and experience from the evaluation, issue and disseminate the validated Booklet and Specification</p>	<ul style="list-style-type: none"> ➤ Specification for Construction and Operation of Medical waste Disposal Facility Using Autoclaving Process ➤ Testing methods for emissions and discharges ➤ Demonstration implementation plan ➤ Skills of operators improved ➤ Overall management level improved ➤ Emission of VOCs and other pollutants meeting the performance levels ➤ Validation of sterilization process ➤ Treated waste meeting standards for safe disposal to landfill 	<ul style="list-style-type: none"> ➤ MOUs signed with selected facilities ➤ Monthly progress reports ➤ Evaluation reports ➤ Report of engineering validation ➤ Technical training materials ➤ Recorded texts, photos and videos ➤ 	<ul style="list-style-type: none"> ➤ The demonstration implementation is feasible ➤ The purchased equipment is reliable ➤ Modified facilities can meet the performance levels ➤ The trainers can help the trainees master the operating skills
<p><i>Output 5.2 Demonstrate the application of BAT in other non-incineration processes of medical waste</i></p> <p>Activity 5.2.1 Develop Booklet of BAT Application in Other Non-incineration Processes of MWs</p> <p>Activity 5.2.2 Develop a draft Specification for Operation of MW Disposal Facility Using Other Non-incineration Process</p> <p>Activity 5.2.3 Select 2 representative existing facilities for demonstration of microwave irradiation, chemical disinfection, or combination</p>	<ul style="list-style-type: none"> ➤ Booklet of BAT Application in Non-incineration Processes for MW Treatment ➤ Specification for Construction and Operation of MW Disposal Facility Using Other Non-incineration Process ➤ Demonstration implementation plan ➤ Skills of operators improved ➤ Overall management level improved 	<ul style="list-style-type: none"> ➤ Tender document calling for technical services needed in demonstration of BAT in selected facilities ➤ MOUs signed with selected facilities ➤ Monthly progress reports ➤ Evaluation reports 	<ul style="list-style-type: none"> ➤ The selected demonstration facilities are active and cooperative ➤ The demonstration implementation is feasible ➤ The purchased equipment is reliable

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 5.2.4 Carry out the feasibility study and EIA of the demonstrative facilities and develop the demonstration implementation plan</p> <p>Activity 5.2.5 Procure, retrofit, and operate the modified facility and train the relevant managerial and operation staff</p> <p>Activity 5.2.6 Validate the modified facility, and monitor, record and evaluate the implementation process and results</p> <p>Activity 5.2.7 Validate the Booklet and the Specification by incorporating lessons and experience from the evaluation, issue and disseminate the validated Booklet and Specification</p>	<ul style="list-style-type: none"> ➤ Emission of VOCs and other pollutants meeting the limits ➤ Validation of sterilization process ➤ Treated waste meeting standards for safe disposal to landfill 	<ul style="list-style-type: none"> ➤ Report of engineering validation ➤ Technical training materials ➤ Recorded texts, photos and videos 	<ul style="list-style-type: none"> ➤ Modified facilities can meet the standards ➤ The trainers can help the trainees master the operating skills
<p><i>Output 5.3 Demonstrate the application of BAT/BEP for treatment and disposal of MWs in remote rural areas</i></p> <p>Activity 5.3.1 Develop Booklet of BAT/BEP Application for Treatment and Disposal of MW in remote rural areas</p> <p>Activity 5.3.2 Select representative remote rural areas for demonstration of the recommended BAT/BEP of the Booklet</p> <p>Activity 5.3.3 Develop the demonstration implementation plan</p> <p>Activity 5.3.4 Procure, install and operate the facilities and train the relevant managerial and operation staff</p> <p>Activity 5.3.5 Monitor, record and evaluate the implementation process and results</p> <p>Activity 5.3.6 Validate the Booklet by incorporating lessons and experience from the evaluation, issue and disseminate the validated Booklet</p>	<ul style="list-style-type: none"> ➤ Booklet of BAT/BEP Application for Treatment and Disposal of MW in remote rural areas ➤ Operation and pollutant release indicators of the demonstrated facilities meeting BAT achievable limits ➤ Skills of the facility operators improved ➤ Overall medical waste management capacity improved ➤ Established policies and management systems ➤ Treated waste meeting standards for safe disposal to landfill 	<ul style="list-style-type: none"> ➤ Investigation reports on medical waste management status in proposed demonstration areas ➤ Demonstration implementation plan ➤ Report on the economic, technical, policy and management studies of the demonstration projects ➤ Training materials ➤ Evaluation reports 	<ul style="list-style-type: none"> ➤ The municipal authorities are stably staffed ➤ The managerial and operating staff in demonstration areas can properly treat medical waste through training ➤ Reliable and affordable equipment can be locally provided or introduced from abroad ➤ Proper fee-based system can be implemented

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Outcome 6: Demonstrate spatially integrated and coordinated medical waste management and disposal systems in geographically defined clusters that include medical institutions and dedicated treatment and disposal facilities			
<p>Output 6.1 Demonstrate the application of integrated MW management among institutions at the municipal level</p> <p>Activity 6.1.1 Select 3 demonstration municipalities</p> <p>Activity 6.1.2 Participation of project stakeholders to international symposia and undertake field visits to learn international experience in integrated medical waste management among institutions</p> <p>Activity 6.1.3 Establish inter-departmental mechanisms for policy consultation and coordination for integrated medical waste management among institutions at municipal level</p> <p>Activity 6.1.4 Develop municipal-level integrated medical waste management information system</p> <p>Activity 6.1.5 Monitor, record and evaluate the implementation process and results</p>	<ul style="list-style-type: none"> ➤ Municipal-level Integrated MW Management Plan ➤ Municipal Integrated MW Management Coordination Mechanism ➤ Municipal integrated MW management information system ➤ Established municipal policies regarding medical waste treatment charge, taxation, financial support, market orientation, and other incentives 	<ul style="list-style-type: none"> ➤ Workshop notes and proceedings ➤ Overseas study tour report ➤ Report on the development of Municipal Integrated MW Management Plan ➤ Report on municipal MW treatment policies ➤ Report on the development of municipal integrated MW management information system ➤ Training materials ➤ Evaluation reports 	<ul style="list-style-type: none"> ➤ The municipal authorities are stably staffed ➤ Good cooperation among the municipal authorities, medical institutions, and dedicated treatment and disposal facilities can be achieved ➤ MW fee-based system can be implemented
<p>Output 6.2 Demonstrate coordinated medical waste treatment among the dedicated medical waste facilities at the provincial level</p> <p>Activity 6.2.1 Select 3 demonstration provinces for coordinated medical waste management and treatment</p> <p>Activity 6.2.2 Assist the selected provinces establish provincial MW management steering groups</p>	<ul style="list-style-type: none"> ➤ Better social, economic and environmental benefits achieved by disposal technologies: <ul style="list-style-type: none"> - Different MW streams treated by different way - Effective response to emergencies - Co-building between neighboring municipalities - Co-building medical waste treatment facility with hazardous waste treatment facility 	<ul style="list-style-type: none"> ➤ Explanations on Specifications of BAT/BEP Application in Coordinated MW Treatment Planning and Implementation ➤ Bidding document calling for technical services for coordinated MW treatment planning and implementation ➤ 	<ul style="list-style-type: none"> ➤ The provincial authorities are stably staffed ➤ Good coordination and cooperation can be achieved by the following actions: <ul style="list-style-type: none"> - Strengthen supervision and inspection to ensure safe treatment of all types of medical waste

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 6.2.3 Hold a coordinating workshop among the provincial and municipal departments and the dedicated MW treatment facilities</p> <p>Activity 6.2.4 Develop and carry out a logistics plan for the coordinated activities</p> <p>Activity 6.2.5 Promulgate and implement supporting policies by the local government</p> <p>Activity 6.2.6 Monitor, record and evaluate the implementation process and results</p>		<ul style="list-style-type: none"> ➤ Investigation and feasibility study reports ➤ Implementation plan ➤ Meeting minutes ➤ Texts of promulgated policies ➤ Evaluation reports 	<ul style="list-style-type: none"> - Raise the awareness of the local governments about the importance of safe medical waste treatment - Develop reasonable benefit sharing mechanism among dedicated facilities ➤ Accidental risks from transportation can be managed ➤ Consignment system is effectively implemented
<p>Outcome 7. Develop and formulate a national strategy and action plan of BAT/BEP for medical waste management and disposal based on the experience gained through the demonstration activities of the project</p>			
<p><i>Output 7.1 Formulate techno-economic policies that promote the adoption of BAT/BEP</i></p> <p>Activity 7.1.1 Investigate and analyze the needs of techno-economic policies according to the requirements of BAT/BEP and the Convention</p> <p>Activity 7.1.2 Draft the needed techno-economic policies</p> <p>Activity 7.1.3 Hold a policy dialogue workshop attended by representatives from governments, international and domestic experts, enterprises, and the public</p> <p>Activity 7.1.4 Circulate the policy texts for comments</p> <p>Activity 7.1.5 Incorporate the comments into the final policy texts</p> <p>Activity 7.1.6 Submit the policies to SEPA and other related ministries for promulgation</p>	<ul style="list-style-type: none"> ➤ Techno-economic policies promoting adoption of BAT/BEP in MW management ➤ MW treatment fee-based system ➤ Policies encouraging investment in MW treatment from the private sector ➤ Policies encouraging commercialization of MW treatment ➤ Measures of Franchised Operation of MW Treatment 	<ul style="list-style-type: none"> ➤ Explanations on techno-economic policies promoting adoption of BAT/BEP in MW management ➤ Explanations on MW treatment fee-based system ➤ Explanations on policies encouraging investment in MW treatment from the private sector ➤ Explanations on policies encouraging commercialization of MW treatment ➤ Explanations on Measures of Franchised Operation of MW Treatment ➤ Meeting minutes 	<ul style="list-style-type: none"> ➤ The existing legal framework provides clear status to commercialization in waste management sector ➤ The established techno-economic policies can meet the BAT/BEP requirements and also respect the actual situation of China ➤ Policies implementation is pushed by proper incentives

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p><i>Output 7.2 Demonstrate and promote different commercial models for the construction and operation of MW treatment and disposal facilities</i></p> <p>Activity 7.2.1 Develop investment models to facilitate MW treatment and disposal</p> <p>Activity 7.2.2 Conduct trainings for government officials and enterprises managers from at least 60 municipalities in the realization and management of MW management projects</p> <p>Activity 7.2.3 Assist at least 20 municipalities in establishing MW management steering groups</p> <p>Activity 7.2.4 Provide technical assistance to the municipalities with MW management steering group in adopting BOT, BOO, TOT models, etc.</p> <p>Activity 7.2.5 Provide incentives to facility owners to purchase certified equipment</p> <p>Activity 7.2.6 Establish technical consulting institutions to provide technical services in options for private investment</p>	<ul style="list-style-type: none"> ➤ Specifications on investment models to facilitate MW treatment and disposal ➤ List of trained municipal staff ➤ Investment amount from non-governmental sources ➤ More than 20 municipal MW management steering groups established ➤ Dedicated MW treatment facilities operation meeting pollutant release levels ➤ Dedicated MW treatment facilities operating on a financially sustainable basis ➤ Established technical consulting institutions providing technical services in options for private investment 	<ul style="list-style-type: none"> ➤ Training materials ➤ Contracts signed between the municipal environmental authority and the dedicated MW treatment facilities ➤ Working rules of the municipal MW management steering groups ➤ Monitoring data and reports ➤ Financial statement of the facility owners ➤ Consulting contracts and reports 	<ul style="list-style-type: none"> ➤ The municipal governments take in great consideration the safe MW treatment ➤ The municipal governments alone can not afford the financial and human resources needed to realize safe MW treatment ➤ The municipal government can promote favorable conditions to attract external investment
<p><i>Output 7.3 Strengthen national capacity to develop new MWs treatment technologies appropriate to China's socio-economic context</i></p> <p>Activity 7.3.1 Identify, evaluate and establish the catalogue of processes, techniques and equipment in great demand while not yet made locally available and affordable in China</p>	<ul style="list-style-type: none"> ➤ Program of research, development and application of key technical processes, techniques, and equipment ➤ National investment on R&D of the needed technical processes, techniques and equipment 	<ul style="list-style-type: none"> ➤ Report on program of research, development and application of key technical processes, techniques and equipment 	<ul style="list-style-type: none"> ➤ The national government continues to push the implementation of Construction Plan of Dedicated Hazardous and Medical waste Treatment Facilities

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 7.3.2 Hold 3 workshops attended by representatives from national and local governments, international technology vendors, domestic research institutes, equipment manufacturers, and medical waste treatment operators to discuss technology supplies and demands for incineration, autoclave and other non-incineration technologies</p> <p>Activity 7.3.3 Establish incentives to encourage joint development of market needed technologies and equipment by international vendors and domestic research entities</p> <p>Activity 7.3.4 Establish incentives for successful application of advanced feasible technologies and equipment</p>	<ul style="list-style-type: none"> ➤ Key equipment locally available and affordable ➤ Joint ventures established and operated profitable 	<ul style="list-style-type: none"> ➤ Meeting minutes ➤ Funding program developed and implemented by national R&D funding authorities ➤ R&D result appraisal report ➤ Statutes of joint ventures ➤ Financial statement of manufacturing enterprises 	<ul style="list-style-type: none"> ➤ The national R&D funding program can be adjusted to emerging needs ➤ The domestic R&D community has a basis for further R&D ➤ There are effective regulations protecting intellectual property rights and patents
<p>Output 7.4 Develop and implement a medical waste treatment equipment certification and labeling program</p> <p>Activity 7.4.1 Develop technical requirements for Certification and Labeling of MW Treatment Equipment</p> <p>Activity 7.4.2 Develop procedures on Certification and Labeling of MW Treatment Equipment</p> <p>Activity 7.4.3 Strengthen the capacity of certification institutions</p> <p>Activity 7.4.4 Strengthen the capacity of the testing institutions and laboratories</p> <p>Activity 7.4.5 Hold series of workshop targeting separate technologies, implementation of the certification and labeling program and participation of equipment producers and investors in the program</p>	<ul style="list-style-type: none"> ➤ Technical requirements for Certification and Labeling of MW Treatment and Disposal Equipment for processes of: <ul style="list-style-type: none"> - Incineration - Pyrolysis - Autoclaving - Microwaving - Chemical disinfection ➤ Procedures on Certification and Labeling of MW Treatment Equipment ➤ Number of accredited labs and testing institutions ➤ Number of accredited equipment certification institutions ➤ Number of enterprises and products successfully certified and in certification pipeline 	<ul style="list-style-type: none"> ➤ Explanations on technical requirements for Certification and Labeling of MW Treatment Equipment ➤ Explanations on Detailed Measures on Certification and Labeling of MW Treatment Equipment ➤ Bidding document recruiting technical services in developing and implementing the certification and labeling program ➤ Capacity requirements on certification and testing institutions ➤ Designs of labels 	<ul style="list-style-type: none"> ➤ There are existing laboratories capable of PCDD/PCDF analysis ➤ Equipment produced by top manufacturing enterprises can meet the certification requirements ➤ The authorities can strictly enforce the related technical requirements and standards with necessary trainings delivered and awareness raised

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 7.4.6 Carry out pilot certification and labeling on qualified products produced by those manufacturing enterprises of better-off conditions Launch extensive publicity in the MW treatment sector</p>			
<p>Output 7.5 Establish training and accreditation systems for lifecycle management of MW that support BAT/BEP</p> <p>Activity 7.5.1 Integrate all the experience and results from demonstrations and other external successful experience to compile textbooks for managerial and technical trainings</p> <p>Activity 7.5.2 Develop various curricula to meet different training needs such as entry training, on-the-job training, refresh training, etc.</p> <p>Activity 7.5.3 Train the trainers in environmental and health sectors</p> <p>Activity 7.5.4 Formulate Regulations and Resources Requirements for MW Management Training Institutions</p> <p>Activity 7.5.5 Based on the existing administrative structure and training system of the health administration, establish a 4-tier personnel training system covering national, provincial, municipal, and county medical institutions, including establishment of 7 training bases for training of high-level managerial and technical staff in health agencies and medical institutions</p> <p>Activity 7.5.6 Based on the existing environmental technical training and research system, establish 3 training bases for training of dedicated MW treatment staff</p>	<ul style="list-style-type: none"> ➤ Number of trainers receiving training ➤ Regulations and Resources Requirements for MW Management Training Institutions ➤ Personnel training systems for lifecycle management of MW ➤ 7 training bases established for training of high-level managerial and technical staff in health agencies and medical institutions ➤ 3 training bases established for training of central MW treatment staff ➤ Number of medical institution staff receiving BEP trainings ➤ Number of dedicated MW treatment staff receiving BAT/BEP trainings ➤ Number of management systems certified 	<ul style="list-style-type: none"> ➤ Tender document recruiting technical services in training the trainers ➤ Training materials, textbooks, and other courseware ➤ Text of Regulations and Resources Requirements for MW Management Training Institutions ➤ Licenses issued by the authorities to the established training bases ➤ Certificates granted to the trainees ➤ Reports on establishment of personnel training systems for lifecycle management of MW ➤ Evaluation reports 	<ul style="list-style-type: none"> ➤ Medical institutions and dedicated MW treatment facilities take in great consideration the personnel training ➤ Compulsory training and authorized certificates are required on some key working posts by law ➤ Training is subject to governance of health and safety ➤ Existing administrative management and training system of the health sector is appropriate for MW management training ➤ Existing environmental technical training and research system is appropriate for MW disposal training

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Output 7.6 Extensive stakeholder awareness raising, including a series of national and international workshops</p> <p>Activity 7.6.1 Prepare technical materials for targeted stakeholder awareness for administrators, managers and other influential players in national investment programs where the outputs of the project can potentially be replicated.</p> <p>Activity 7.6.2 Launch awareness raising and education campaign to the identified stakeholders using direct communication including publications and lectures</p> <ul style="list-style-type: none"> - Mobilize industrial associations to introduce BAT/BEP among medical product manufacturing enterprises - Mobilize NGOs to introduce knowledge about medical waste treatment in hospitals, communities, and schools <p>Activity 7.6.3 Promote academic and professional articles for environmentally sustainable medical waste management</p> <p>Activity 7.6.4 Organize a workshop by the end of this project bringing together all stakeholders and consultants/companies involved in this project to evaluate the outcomes of the project</p> <p>Activity 7.6.5 Hold a national workshop with participation from all provinces and stakeholders</p> <p>Activity 7.6.6 Hold an international workshop to share the national experience with representatives from other countries and also learn from their experiences</p>	<ul style="list-style-type: none"> ➤ Plan for stakeholder awareness and education on MW management ➤ Number or percentage of the stakeholders receiving information ➤ Improved stakeholder awareness levels ➤ BAT/BEP extended to medical product manufacturing enterprises ➤ Reduced use of hazardous and toxic substances in manufacturing medical products ➤ Improved medical product design considering easier recycle and reuse ➤ Experience, lessons, results and impacts summarized ➤ National experience presented, and international experience learned 	<ul style="list-style-type: none"> ➤ Stakeholder awareness investigation questionnaires ➤ Materials for stakeholder awareness raising and education ➤ Reports by industrial associations ➤ Academic articles ➤ Evaluation reports ➤ Meeting notices and list of participants ➤ Meeting minutes ➤ Workshop/seminar proceedings 	<ul style="list-style-type: none"> ➤ Materials are made easy to understand, impressive, and acceptable to the stakeholders ➤ Industrial associations have strong influences on enterprises in improving awareness and changing behaviors ➤ Project results including raw data can be disseminated effectively to the scientific research community ➤ National and international stakeholders can be widely mobilized ➤ Provinces will have the willingness to implement BAT/BEP in the sector of MW management

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Outcome 8 Project management, monitoring and evaluation			
<p>Output 8.1 Establish the project management structure</p> <p>Activity 8.1.1 Establish the Steering group by relying on resources from related ministries or commissions at the national level and from local governmental agencies</p> <p>Activity 8.1.2 Establish the National Project Management Team under CIO</p> <p>Activity 8.1.3 Recruit a CTA, a NTA, policy experts, technical experts in medical waste management, and evaluation and programming experts to form a project expert team</p> <p>Activity 8.1.4 Establish 3 local PMOs in selected provinces for intensive demonstrations</p> <p>Activity 8.1.5 Carry out a series of management training classes to the national and local project management staff</p>	<ul style="list-style-type: none"> ➤ Steering group established ➤ National Project Management Team established with necessary office equipment procured ➤ National project expert team established ➤ 3 local PMOs established ➤ Project management capabilities improved at national and local levels 	<ul style="list-style-type: none"> ➤ Working rules of the Steering group ➤ TORs of the project management staff, including the project managers, coordinator, and technical support staff ➤ Expert recruitment notices and TORs for the CTA, NTA, policy experts, technical experts in medical waste management, and evaluation and programming experts ➤ TORs of the local PMOs ➤ Training materials on contractual management, project management tools, and basics of medical waste management and disposal 	<ul style="list-style-type: none"> ➤ Various ministries agree on and support the project ➤ Coordination and cooperation can be achieved among various ministries ➤ Qualified project management staff can be recruited ➤ Qualified experts can be recruited ➤ The selected demonstration provinces have strong willingness for participation and cooperation
<p>Output 8.2 Design and implement an M&E mechanism according to GEF M&E procedures</p> <p>Activity 8.2.1 Hold the Inception Workshop</p> <p>Activity 8.2.2 Prepare the Inception Report</p> <p>Activity 8.2.3 Measure impact indicators on an annual basis</p> <p>Activity 8.2.4 Prepare Annual Project Reports and Project Implementation Reviews</p>	<ul style="list-style-type: none"> ➤ Inception Workshop held ➤ Detailed work plans prepared ➤ Data and information against indicators input into the MIS ➤ Non-compliances identified and corrected 	<ul style="list-style-type: none"> ➤ Inception workshop meeting minutes ➤ Inception Report ➤ Annual Project Reports and Project Implementation Reviews ➤ Biannual Steering group meeting minutes 	<ul style="list-style-type: none"> ➤ The trained project management staff can well perform their jobs required in TORs ➤ Qualified external evaluation experts can be recruited

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Activity 8.2.5 Hold annual tripartite review meetings</p> <p>Activity 8.2.6 Hold biannual Steering group meetings</p> <p>Activity 8.2.7 Carry out mid-term external evaluation</p> <p>Activity 8.2.8 Carry out final external evaluation</p> <p>Activity 8.2.9 Complete the Terminal Report</p> <p>Activity 8.2.10 Carry out annual project financial audits</p> <p>Activity 8.2.11 Carry out biannual visits to selected field sites</p> <p>Activity 8.2.12 Establish a project management information system (MIS); including a project website to disseminate information to various stakeholders</p>	<ul style="list-style-type: none"> ➤ Technical and political guidance from the Steering group ➤ Experience summarized and recommendations raised ➤ Problems identified and recommendations provided by field visits ➤ MIS established and made functional ➤ Project information, experience and lessons disseminated through website 	<ul style="list-style-type: none"> ➤ Mid-term and terminal external evaluation reports ➤ Terminal Report ➤ Annual project financial audit reports ➤ Field inspection reports ➤ MIS development documentations and reports generated by properly retrieving data and information from the MIS ➤ Project website development and maintenance documentations 	<ul style="list-style-type: none"> ➤ No extreme weather conditions or other extreme events upon field visits ➤ Qualified IT service providers can be recruited to develop the MIS, including the project website ➤ A data and information collection mechanism among various stakeholders at different levels can be established to activate the MIS

ANNEX C: RESPONSE TO PROJECT REVIEWS

- a) Convention Secretariat comments and IA/ExA response

- b) STAP expert review and IA/ExA response

STAP TECHNICAL REVIEW OF GEF PROJECT PROPOSALS

Subject of the Review:

Project name: Environmentally Sustainable Management of Medical Wastes in China

Requesting countries: The People's Republic of China

Background and justification:

China signed the Stockholm Convention on Persistent Organic Pollutants in May 2001, and the National People's Congress ratified the Convention in June 2004. To guide the development of the NIP, China has established a coordinating group consisting of 11 POPs-related ministries. The development of the National Implementation Plan (NIP) in China has benefited from the valuable support and active participation of a variety of international and domestic institutions and organizations, and from extensive consultations with international and domestic stakeholders and will be finished soon.

The Stockholm Convention entered into effect on 11 November 2004 for China. Article 5 of the Convention requires the Parties to take measures to reduce or, where feasible, eliminate releases of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) and other unintentionally produced POPs in Part I from sources listed in Part II and III of Annex C. Waste incinerators, including co-incinerators of municipal, hazardous or medical waste or of sewage sludge are on the foremost top of the list in Part II of Annex C.

In the National Implementation Plan (NIP) of China for the Implementation of the Stockholm Convention on Persistent Organic Pollutants, medical waste incineration is listed as a key PCDD/PCDF release source, to which priority should be given to the application of best available techniques and best environmental practices (BAT/BEP) pursuant to the "Action Plan for Reduction and Elimination of PCDD/PCDF Releases".

The project comes at a time when China is making a significant infrastructural investment in a nationwide program which proposed that China would construct 332 dedicated medical waste disposal facilities in cities of municipal level and above across the country to ensure the safe disposal of medical waste.

Project has the following objectives:

- Review, revision, and recommendation of appropriate changes of the regulatory and policy enabling environment;
- Institutional strengthening through the use of a targeted technical transfer activities to apply and disseminate BEP in the lifecycle management of medical waste;
- Application of BAT in 6 targeted municipalities within the project implementation period;
- Design and implementation of economic and financial systems that can sustainably support the medical waste management sector;
- Support for development of an industrial base that promotes a precautionary and preventative approach to domestic goods, services and the appropriate adaptation of technologies;
- Identification, demonstration, and promotion of appropriate medical waste management systems and

- technologies applicable to remote rural areas;
- Coordination of medical waste management with an effective transfer system in 3 targeted province;
- Formulation of a nationwide replication program to disseminate BAT/BEP as part of a national strategy and action plan.

Scientific and technical soundness of the project:

There are 8 outcomes designed to achieve the above objectives. The outcomes/outputs and the corresponding main activities are as follows:

Outcome 1 will strengthen the national, provincial, and local regulatory framework for medical waste management.

Outcome 2 will strengthen nationwide institutional capacity for integrated medical waste management at national and local levels in support of the Nationwide Investment Plan.

Outcome 3 will demonstrate systems management and the application of BEP in 20 medical institutions covering such aspects as good procurement practices, waste segregation at source, waste reduction/minimization, reuse and recycling, intermediate storage, transportation, traceability, and staff training.

Outcome 4 will demonstrate BAT for medical waste disposal using thermal combustion, including air pollution monitoring.

Outcome 5 will demonstrate BAT/BEP for medical waste thermal non-combustion, chemical treatment or other appropriate non-combustion treatments that may also be suitable for remote rural areas.

Outcome 6 will demonstrate spatially integrated and coordinated medical waste management and disposal systems in geographically defined clusters that include medical institutions and dedicated treatment and disposal facilities. Integrated or life-cycle medical waste management among various institutions within a municipality of each of the three demonstration provinces will be demonstrated. Three provinces will be selected for the demonstration of spatially coordinated medical waste treatment and disposal systems incorporating a number of dedicated facilities within a defined area in a manner that is economically effective and efficient.

Outcome 7 will develop and formulate a national strategy and action plan of BAT/BEP for medical waste management and disposal based on the experience gained through the demonstration activities of the project.

Outcome 8 will establish and utilize the necessary tools to facilitate effective monitoring and evaluation on progress of project implementation and achievement of results.

Project description, background information and the description of project context are described sufficiently and consist a suitable base for the decision concerning to final support. The main problems and risks are effectively mentioned.

Outcomes are well defined and quite well prepared.

Key indicators include the following:

- Number of medical institutions adopting BEP
- Number of dedicated medical waste disposal facilities adopting BAT
- Number of dedicated medical waste treatment facilities adopting BAT/BEP
- Quantitative and qualitative change in medical waste disposed of
- Reduction of manufacturing and use of medical care products containing hazardous substances such as Hg and PVC

- Reduction of PCDD/PCDF emissions from medical waste incineration disposal
- Avoid releases of PCDD/PCDF emissions from medical waste treatment
- Level of the stakeholder awareness of and participation in environmentally sound medical waste management
- Levels of PCDD/PCDF in biological organisms in the vicinity of dedicated medical waste treatment and disposal facilities
- Social and economic benefits from adoption of BAT/BEP

Fitting of project within the context of the goals of GEF:

Rationale for the GEF intervention is described in the context of the SC articles and the COPs and GEF conclusions and recommendations.

Regional and/or global context:

Similar as in the case of previous Chinese projects, this one is example of potential joint and useful collaboration between international bodies such as GEF and national authorities (local Government) and local private sector for future efforts which will be undertaken pursuant to the Stockholm Convention.

Important aspect is that this type of project can be very useful for other GEF Projects in this part of Asia or in other part of Globe.

Project Design:

Project and Project Summary including the budget and its structure are well prepared, clearly defined and described whole range of the problems, they were prepared based on the deep knowledge of the problems with the respect of the country specificity, political and economical situation.

Project design and its structure is very logic and detailed, all problems and clearly defined and well described.

Project summary is very comprehensive and illustrative as far as a description of all relevant problems, project goals, outcomes, risks.

Evidence for government commitment and sustainability:

The sustainability is described. The Governments of the country will support part of this project.

Project barriers, risks, sustainability and commitment:

Project very detailed describes potential barriers and risks of project realization. The description of project risks, sustainability and commitment consists from the comprehensive and sufficient description of the possible risks and sufficient overview of the all aspects of project sustainability, replicability and commitment.

The Project Logical Framework elaborates the risks for each activity.

Project design has addressed the above risks as follows:

- Establishment of inter-sectoral coordination bodies
- Strong capacity building activities and provision of financial support to project participants and stakeholders
- Identification of potentially conflicting stakeholder interests through involvement of stakeholders in the project design process

- Project activities will improve implementation of the fee-based system, and stakeholder awareness building will increase its acceptance

The Project is faced with a variety of barriers that will need to be addressed to ensure its successful implementation and the achievement of project objectives. These include:

- Tradition in hospitals of direct disposal of medical waste without treatment or with poorly designed treatment processes.
- Development of China's Nationwide Investment Plan for new medical waste treatment facilities without regard to BAT/BEP, minimized PCDD/PCDF emission or consideration of non-combustion technologies
- Inadequate regulatory framework and standards
- Lack of coordination mechanism
- Stakeholder conflict of interests
- Lack of institutional supervisory capacity
- Lack of familiarity with BAT/BEP technologies and techniques
- Lack of appropriate techno-economic policies
- Lack of R&D capability to develop and adapt disposal technologies
- Lack of certification and labeling programs for waste treatment equipment
- Lack of diverse commercial available options for construction and professional operation of medical waste treatment and disposal facilities
- Lack of institutional capacity to develop and implement lifecycle waste management systems
- Poor stakeholder awareness

Replicability of the project:

Experiences gained during the project realization in so big and highly populated country such as the People's Republic of China will be very helpful for many other countries especially as far as the better understanding of potential barriers during project implementation. This project can lead to optimum procedure with using of the experiences and results from the many developed countries and the results of this Chinese project, which is focused on the country where the own development is very rapid, but still has a lot of problems, which can be relevant and important for the implementation in many other developing countries.

Project funding:

The proposed project will be funded by GEF as the financial mechanism for the Stockholm Convention on POPs, which will provide a proposed \$12 million incremental cost funding for the project. Bilateral agencies committed to providing co-financing include the Government of the United States and the Government of Ireland. UNIDO has committed to contribute \$100,000. The Government of the US is committed to providing \$50,000 as co-financing to demonstrate reduction and substitution of the use of medical products containing mercury. The Government of China has already committed to provide the necessary co-financing under this project. The central government has committed to provide 30 million RMB, or equivalent of 3.8 million USD as cash co-financing to be used mainly for legal and institutional strengthening and capacity building. In addition, the Government will provide \$10 million in-kind funding.

Linkages to other programs and action plans at regional or sub-regional levels:

Direct linkage with the development of National Implementation Plans in the China through GEF funded Enabling Activities exists and can be very useful as a potential example of the application or potential future way of realization in other countries. The experiences and information from this project realization should be a valuable resource for many others.

Degree of involvement of stakeholders in the project:

The role of stakeholders in the phase of Project preparation is described and can be very useful for project realisation.

The management of the project including involvement of stakeholders has few important and quite well defined and described levels:

- Convention Implementation Coordinating Group (CICG)
- National and Local Steering Groups
- Convention Implementation Office (CIO)
- National Project Management Team for Environmentally Sustainable Management of Medical Waste in China
- Project Expert Team
- Local Project Management Offices
- UNIDO Focal Point

Summary:

The Project “Environmentally Sustainable Management of Medical Wastes in China” is one from the best which I have evaluated until now. Project is very well prepared and defined. Project has a great chance to be a successful and contribute to the solution of the POPs problems in the PR China.

Project defines the main goals and outcomes based on the conclusions and recommendations of the Chinese National implementation Plan and all expected risks and barriers which can be limited steps for application in the developing countries and in the countries with economy in transition.

I confirm that this project is very well prepared and will contribute to the Implementation of the Stockholm Convention in the People’s Republic of China and solution of POPs problems there.

I recommend this project to accept.

Brno, 19/03/2007

Prof. Dr. Ivan Holoubek

Prof. Dr. Ivan Holoubek
RECETOX – TOCOEN & Associates
Kamenice 126/3, 625 00 Brno, Czech Republic
Tel.: +420 549 491 475, Mobile: +420 602 753 138
Fax: +420 549 492 840
E-mail: holoubek@recetox.muni.cz
<http://recetox.muni.cz/>

UNIDO response to the STAP Review

The STAP review indicated that:

“Project and Project Summary including the budget and its structure are well prepared, clearly defined and described whole range of the problems, they were prepared based on the deep knowledge of the problems with the respect of the country specificity, political and economical situation.”

“Project design and its structure is very logic and detailed, all problems and clearly defined and well described.”

“Project summary is very comprehensive and illustrative as far as a description of all relevant problems, project goals, outcomes, risks.”

The STAP review further recommended that the project should be accepted for funding by the GEF.

UNIDO agrees on the STAP comments that the budget of the project is well prepared and defined.

The government of China has expressed its strong support to the project as evidenced by high amount of government co-financing. The actual national co-financing for the project might be beyond the current level and its credibility is high due to the fact that the amount of co-financing is derived from the amount indicated in the Nationwide Investment Plan for the relevant demonstration provinces in the project and it is supported with a high percentage of investment from the central government (35% to 75%). It is likely that the co-financing from national government has been underestimated because it is counted based on current available disbursement figures from the investment plan of central government for the demonstration provinces. However, if the co-financing figure is counted through the approved quota of central government investment, the national co-financing figure will be higher since disbursement from central government after the quota approval will be a continuous process. With the implementation of the project and the continuous disbursement from the approved amount in the Nationwide Investment Plan, there is reason to believe that the current national co-financing figure is a conservative figure.

Local investors, public or private, have been also active in co-financing. They have been actually cooperating with the current ongoing Nationwide Investment Plan and have expressed strong willingness to cooperate with the GEF project.

c) GEF SECRETARIAT PROJECT REVIEW AND IA RESPONSE

1. COUNTRY OWNERSHIP			
<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
<p>Country Eligibility:</p> <p>China is a party to SC.</p>			
<p>Country Drivenness:</p> <p>The project is set in the framework of China's Hazardous Waste and Medical Waste Treatment Facility Construction Plan developed in response to the SARS.</p>	<p>Support in cash and kind from MoF, MoH and SEPA are testament that the project is priority.</p>		
<p>Endorsement:</p> <p>The proposal is endorsed.</p>	<p>Endorsement of Sep 2005 is still valid.</p>		
2. PROGRAM AND POLICY CONFORMITY			
Program Designation and Conformity			
<p>The proposal conforms to OP 14 and POPs SP2 'NIP Implementation'. (Under GEF-4 when this proposal will be submitted for WP inclusion: Strategic Objective SO3 'Investments for POPs reduction', with relevance to SO2 'Capacity building for NIP implementation'.)</p>	<p>Apr 2007 – Conforms to POPs SP2 and SP3.</p>		
Project Design			
<p>One table of particular importance that is missing is one that would give an overview of estimated releases of unintentionally –produced POPs in China. Even if it is very very crude, this would give an idea of the significance of the proposed project in terms of dioxin emissions abatement.</p>	<p>The revised concept shows that a significant amount of U-POPs is generated from hospital wastes. It will be important also to show how this compares to the overall dioxin budget in China.</p>		

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
<p>The GEF support will be used towards promoting practices that minimize the production of unintentionally-produced POPs such as:</p> <ul style="list-style-type: none"> - promoting alternatives to small inefficient incinerators; - improving the operations of existing larger ones (avoiding stop and start operations for example); - minimizing medical waste production. <p>The proposal also describes the development of an 'incentive program', which would merit further discussion between UNIDO and GEFSEC.</p> <p>Finally, the WB in its comments notes, perhaps rightly, that the concept might be overambitious in scope.</p>	<p>Apr 2007</p> <p>It is still unclear how the project is articulated with the nationwide plan to build 332 medical waste facilities. In summary, the project proposes to demonstrate BEP in 20 facilities, BAT for 6 disposal techniques, and integrated management in 3 provinces. Are these 6 disposal facilities a subset of the 332? What happens to the other 316 (An incidental query: are the 20 facilities and 6 disposal demonstrations to be located in these provinces?)</p>		<p>After the SARS outbreak, the National Development and Reform Commission (NDRC) initiated and led a National Plan for Construction of Facilities for Disposal of Hazardous Waste and Medical Waste (NPHMW), a nationwide investment program to build 332 hazardous and medical waste disposal facilities in response to the public call for infection control created by SARS. The Convention Implementation Office (CIO) has organized professional research institutes to carry out an overall technical assessment of the nationwide investment program's progress, and explore opportunities to influence it in order to allow China to proceed along a lower PCDD/PCDF emitting pathway. The approach that has been developed and is embodied in this proposed project is to (1) alter the existing investment pattern that is currently overwhelmingly predominated by incineration technologies, (2) where incineration technologies are adopted, provide technical and financial support for implementation of BAT/BEP such that PCDD/PCDF emissions are reduced, and (3) promote BAT/BEP throughout the medical waste sector to decrease waste generation, reduce PCDD/PCDF precursors in medical materials, and minimize the potential for PCDD/PCDF formation and release.</p> <p>To achieve the former goal, the project has targeted adoption of non-combustion technology by at least 120 disposal facilities by the completion of the project. To accomplish the latter goals, the project will undertake a variety of activities to promote BAT/BEP throughout the medical waste sector (please see the project logical framework for activities and indicators).</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<p>According to the assessment report, China has installed and operated 149 dedicated medical waste disposal facilities as of December 2006. Of these, 77 medical waste incinerators have only limited and out of date air pollution control systems (APCS), and very few, if any, can meet the current national release limit of 0.5 ng TEQ/Nm³. There is therefore a need to adopt BAT/BEP technologies and techniques at these plants.</p> <p>The other 70 plants will need to be demolished and replaced by licensed technologies that meet new environmental requirements, including the requirements of the Stockholm Convention. More detailed information can also be found in paras 37-42 of the Project Brief.</p> <p>The assessment report also shows that altogether 95 facilities have been approved under the program as of December 2006. The majority of these approved projects are now under construction, but none of them has been finished yet. GEF project support will therefore allow for non-combustion technology to be adopted in the remaining unapproved projects (conservatively estimated at approximately 160 projects; additional projects may also be able to be converted to non-combustion technologies). The implementation of the nationwide investment program has purposely been delayed, hence offering an opportunity for the project to intervene. The timely approval of this project by the forthcoming Council Meeting is therefore crucial to enable the project to achieve greater impact on the national investment program.</p> <p>According to the project strategy, the 20 medical institutions and 6 disposal facilities at which BAT/BEP will be demonstrated, will be located in 3 pilot provinces.</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<p>These facilities will be managed through a comprehensive integrated systems-based approach that will result in a more cost effective and efficient PCDD/PCDF emissions reductions.</p> <p>For incinerators already built or now under-construction, the project intends to promote BAT/BEP by demonstrating BAT for each of three main kinds of incinerators (one rotary kiln and two kinds of pyrolysis incinerator) and establish a supportive institutional, legal, policy, and management framework.</p> <p>The management structure designed by the project will also assure coordination of the project with the nationwide investment program. Crucially, the Project Steering Committee and the Project Management Office will consist of members from the relevant ministries and departments within SEPA who are responsible for the development and implementation of the nationwide investment program. Furthermore, the technical support institutes that have played important roles in development and initial implementation of the national program have actively participated in the design of the project, as shown by their reports attached as appendices. These institutions include the Chinese Academy for Environmental Planning (responsible for technical review of projects in the nationwide investment program), the Shenyang Environmental Science Academy (which has undertaken intensive study of managerial policies and standards), and the Hospital Management Research Institute of Ministry of Health (which has rich experience in the area of hospital administration). These institutions will continue to play an important role during implementation of the project.</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<p>The success and sustainability of the project and its impact on the nationwide investment program will be assured by the fact that no funds for investment can be released without the review and endorsement of SEPA. Therefore for maximizing the project impact, its timely implementation has of crucial importance. The outputs and results of the project will be incorporated without delay into SEPA's review and decision process for approving new investment projects in the nationwide investment program, and thus SEPA will assure the sustainability and nationwide replication of the project.</p>
	<p>Outcome 4 proposes to demonstrate BAT in one rotary kiln and two pyrolysis facilities. BAT for incinerators is well established. With limited resources, there is no demonstration value in the GEF investing in air pollution control and other devices for incinerators. Moreover, it is unclear what would be accomplished for \$2.4m here.</p>		<p>Few incinerators in China currently use APCS and BAT to reduce emissions. The Sino-Italian Unintentional POPs production project has verified that in some facilities that claim to meet national emissions standards (0.5 ng TEQ/Nm³), the actual releases still far exceed the standards. Currently, the internationally recommended PCDD/PCDF release limit is 0.1 ng TEQ/Nm³ but, no incinerator in China can meet this standard.</p> <p>Several points merit special attention:</p> <ul style="list-style-type: none"> • For the demonstration facilities, it is crucial that the internationally recommended release limit of 0.1 ng TEQ/Nm³ be applied rather than the current national release limit of 0.5 ng TEQ/Nm³. While project owners are committed to this goal, it will result in an increase of incremental costs. These incremental costs are however consistent with GEF and Stockholm Convention principles and requirements. • Air pollution control systems used in existing incinerators are out of date and need to be retrofitted. For example, not a single incinerator in China has installed Selective Catalytic Reduction (SCR) technology, whereas in developed countries, it is commonly applied.

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<ul style="list-style-type: none"> • However, it should be noted that no major capital investment in incineration will be made from project budgetary allocations of the GEF grant. • Demonstration activities are also promoting establishment of a supportive policy and management framework, including technical guidelines, construction and operation codes, and other supportive measures, making them broader than is traditionally the case with such activities. <p>Demonstration activities will also be required to apply Continuous Emission Monitoring (CEM) systems. These systems will allow for emission monitoring at facilities and the implementation of a monitoring network and is expected to have a deep impact on the correct application of BAT by facility managers. Furthermore, the implementation of new methods for the continuous sampling of PCDD/PCDF can better link the emissions of these pollutants with operating conditions at the demonstration plants. The lack of capacity for monitoring of general pollutants such as particulates in flue gases deprive decision makers and management of an important surrogate marker for monitoring PCDD/PCDF emissions as well (being the fly ash one of the main carriers of absorbed PCDD/PCDF).</p> <p>Finally, incineration is still overwhelmingly applied in China and is unlikely to be completely phased out in the foreseeable future. It is therefore crucial to address BAT/BEP in incineration-based facilities in order to allow China to adhere to Convention requirements.</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
	P41 of the brief gives a number of reasons as to why the GEF intervention is justified. Most of these reasons are purely health related, and/or baseline April 13, 2007. - Please improve that section.		In response to GEFSEC's comments, the text in question has therefore been revised in order to better clarify this relationship.
	The proposed management arrangements lack clarity, with unclear responsibilities and reporting lines. The organigram provided P62 is little help.		In response to GEFSEC's comments, the text in question and the organogram have been revised in order to better delineate proposed management arrangements.
	Output 5.3: "BAT/BEP in rural areas": what is envisaged?		Open burning of waste, including burning of landfill sites, is included in Part III Annex C as a source from which unintentional POPs may be formed and released. In China's rural and remote rural areas, open burning of medical waste is a common practice. Project authorities believe this practice must be banned, but such a ban can only be effective based on demonstration of non-combustion technologies. In many rural areas in China, low population density, large distances, and the dispersed production of medical waste make the construction of large facilities and transport of waste to this facility would not be technically and financially feasible. In such cases, autoclave and/or microwave systems will be applied to sanitize waste without requiring incineration. In response to GEFSEC comments, we have also increase the elaboration in the relevant barrier analysis of PB.
	Activity 7.1.1: what is meant by "techno-economic policies"?		Techno-economic policies are an combined expression for technical policies and economic policies: <ul style="list-style-type: none"> • Technical policies for environmental protection are technical guidelines, methods and standards formulated and issued by the government to encourage industries to take self-regulatory actions in choosing and upgrading their technologies to meet the requirements of the Stockholm Convention.

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<ul style="list-style-type: none"> Economic policies for environmental protection are economic instruments including but not limited to pricing, taxation, credit, and insurance designed to regulate or influence the behavior of market players. The United Nation's Rio Declaration on Environment and Development clearly states that countries should adopt economic policies to internalize environmental costs into the production and consumption processes. <p>For more details regarding the techno-economic policies to be developed and launched under the project, please see the discussion of techno-economic policies under section 1.2, Analysis of Barriers to Project Implementation (page 27 of the revised Project Brief).</p>
	7.3.2 Suggestion to hold 3 workshops to "discuss technology suppliers" seems rather unfocused.		As shown in Figure 1 (Project Conceptual Framework), one of the project's key objectives is to promote BAT/BEP technologies and techniques and establish an enabling infrastructure for different forms of foreign and domestic investments to locally manufacture the much required equipment in compliance of BAT/BEP. Given the diversity of technical requirements existing in China, a basket of technology options will be introduced through a series of 3 workshops, focusing respectively on incineration technologies, autoclave technology, and other non-incineration technologies. Pursuant to GEF Secretariat comment, the text in question under activity 7.3.2 has been revised to clarify this.
	Other points: Please define acronyms used in the Executive Summary such as BOT/BOO/TOT.		Based on GEFSEC comments, acronyms including BOT, quasi-BOT and TOT are defined in the revised PES (viz. footnote).
	It would be useful to have a summary of PDFB outputs (in addition to the formal PDFB report expected at CEO endorsement), including weblinks to		During the PDF-B phase, Hospital Management Research Institute of Ministry of Health, Shenyang Environmental Science Academy, Chinese Academy for Environmental Planning and China Environmental Protection Industry

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
	reports that might have been produced during project preparation, for example the review of international best practices.		<p>Association were subcontracted to undertake technical surveys and evaluations based on their comparative advantages. All the subcontractors have been able to deliver informative reports and other outputs, which have laid a solid foundation to draft the Project Brief and the PES. As per GEFSEC comment, the reports are uploaded to the website (http://www.chinapops.org/):</p> <ul style="list-style-type: none"> • Report on medical waste management within medical institutions in China by Hospital Management Research Institute of Ministry of Health; • Report on the legislations and institutions for medical waste management in China by Shenyang Environmental Science Academy; • Report medical waste treatment and disposal in China by Chinese Academy for Environmental Planning; and • Report the market and industrialization of medical waste treatment and disposal in China by China Environmental Protection Industry Association. <p>For a review of international best practices completed during project preparation, please see Annex 1 of the Project Brief. Please also see Annex 2 to this document for a summary of the PDF-B outputs.</p>
	Reduction of Hg is mentioned in a number of places. Does the project envisage specific activities to support that?		<p>The project lists reduction of manufacturing and use of medical care products containing hazardous substances such as Hg and PVC both as a goal and as an impact indicator to be measured, given that this important global environmental goal can be accomplished simultaneously (and generally at little or no additional implementation cost) with PCDD/PCDF precursor reduction. In order to accomplish this target, the project will demonstrate systems management and application of BEP including such aspects as good procurement practices, waste</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<p>segregation at source, waste reduction/minimization, reuse and recycling, intermediate storage, transportation, traceability and staff training. Specific activities for reducing Hg will be incorporated in these BEP activities during the project implementation. However, it should be noted that any additional costs that may occur in reducing Hg will be funded from co-financing and not from the GEF grant.</p> <p>In addition to concurrent Hg and PCDD/PCDF reductions through hospital-based BEP approaches, Hg and PCDD/PCDF can also often be jointly reduced by adopted BAT/BEP in incinerator plants. Similarly, both Hg and PCDD/PCDF emissions are eliminated by selection of non-combustion technologies. The project will adopt both of these approaches.</p>
Sustainability (including financial sustainability):			
<p>The main element in support of sustainability of the approach is the importance that China attaches to the subject, in light notably of the SARS.</p>	<p>Analysis of conditions required to ensure sustainability, and specific project interventions to promote sustainability.</p> <p>Apr 2007</p> <p>Predicated in particular on:</p> <ul style="list-style-type: none"> - the adoption of relevant laws and regulations and their enforcement; - the implementation of an effective fee-based system for hospital waste management. <p>What is lacking is an explanation as to why the fee system has failed so far and how the project intervention will be addressing that.</p>		<p>According to national regulations on medical waste management, medical waste treatment facilities are permitted to charge hospitals for treatment of medical waste, and hospitals are permitted to pass on those costs to patients. However, these requirements are in the form of guidance documents, and are not mandatory. This lack of mandatory enforcement and the regulations' vagueness regarding approaches has inhibited development of consistent and optimal systems. In case the fee based system could be fully implemented in China, the sustainability of medical waste disposal would be assured. Therefore one of the important outputs (Output 7.1) and the respective project activities will enhance the implementation of the fee-based medical waste management system.</p> <p>For detailed discussion of the fee-based system, please see Project Brief Annex 2, which has been revised and expanded pursuant to the GEFSEC comment.</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
Replicability:			
The proposal notes that, in principle, the experience of China is relevant to other developing nations, particularly to the other industrialized nations of South and Southeast Asia.	<p>Specific project interventions to facilitate dissemination of lessons learned and transfer of experience with related activities.</p> <p>Apr 2007</p> <p>The project will demonstrate integrated hospital waste management in 3 provinces and makes provisions to promote replication through the development of a national strategy.</p>		Noted
Stakeholder involvement:			
The proposal describes the involvement of 'international stakeholders'. What about the local, provincial, or national agencies with responsibility for Health Care Waste Management (see WB comments).	<p>Stakeholder involvement plan, in particular involvement of other national agencies with responsibility for Hospital Waste Management.</p> <p>Apr 2007</p> <p>Annex 3 describes the mandates of the relevant stakeholders in general terms, but not their specific responsibilities in implementing this project. In particular one would like to see how MoH, the local health bureaus, the research institute of hospital management etc are capacitated to take ownership of the project alongside SEPA.</p>		<p>Lifecycle management of medical waste involves a wide spectrum of stakeholders in the general administrative framework of China. Annex 3 of Project Brief describes the mandates of these stakeholders within the system and relative to the project. (See also the responses to question 4 above for further discussion of this issue.)</p> <p>Project authorities understand and fully agree that the administrative stakeholders of the health sector, including MOH and the local health bureaus supported by the research institute of hospital management, should have a central role in project management, oversight, and ownership. Project authorities have taken the following steps to ensure that this takes place:</p> <ul style="list-style-type: none"> The Chinese Government has approved and established the Convention Implementation Coordination Group (CICG), comprised of 11 ministries including MOH. All Convention implementation plans and projects will be monitored and coordinated by this Group.

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<ul style="list-style-type: none"> • During the PDF-B phase, MOH joined the CIO and SEPA in conducting a number of on-site studies of the internal management of medical waste in hospitals. The Hospital Management Research Institute was designated and guided by MOH and CIO to prepare a report that addresses hospital management, in particular the issues of reduction and segregation of medical waste. This report, along with the report discussed in response to Question 9 above, constituted an important resource in development of the Project Brief. • MOH and the Hospital Management Research Institute will join in the coordination mechanisms (such as steering group and M&E) to be established during project implementation. • During the project implementation phase, staff will be seconded from MOH to join the CIO and National Project Management Team to ensure their ownership of the project and allow their full involvement in working level management. <p>From a budgetary point of view, the project design has apportioned US \$1.6 million in GEF funds to directly support MOH, local health bureaus and medical institutions.</p>
	It would be useful to have the list of the 'international and domestic hospital waste management experts' consulted.		A list of international and domestic hospital waste management experts consulted for the preparation of the Project Brief is provided in Appendix I.
Monitoring and Evaluation			
Outlined	M&E plan with quantitative indicators, baseline and targets.		

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
	<p>Apr 2007</p> <p>The M&E plan should be much more synthetic with clear indication of who is responsible for what. This would also help address some aspects of managerial arrangements, which are unclear (Who is in charge, the CTA, NTA, Project manager?)</p>		<p>In response to GEFSEC comments, project authorities have reviewed and revised the GEF Monitoring and Evaluation Policy. An indicative monitoring and evaluation work plan and corresponding budget has been prepared and added to the M&E part of the Project Brief and PES. The work plan defines M&E activities, responsibilities, costs and time frame.</p>
	<p>The objectively verifiable indicators (are those the "impact indicators" referred to P34 under activity 8.2.3?) on the first page of the logframe appear for the most part difficult to measure, and there are no targets. How will project success be judged?</p>		<p>The "impact indicators" referred to in page 34 of the PES under activity 8.2.3 are the objectively verifiable indicators for monitoring and measurement which will be used to determine the success of the project. Most of these indicators are designed according to the SMART principles defined by the GEF Monitoring and Evaluation Policy, while some indicators are more comprehensive in order to combine the results of the SMART indicators, and this is why they appear difficult to measure. Different methods including periodic sampling, laboratory analysis, on-site investigation, questionnaire survey, and other such methods will be adopted to obtain data to allow tracking of these indicators during project implementation. In response to the GEF Secretariat comment and in order to clarify the proposed approach, a table of impact measurement template (Table 5 in page 71) has been added to the M&E section in the Project Brief to indicate the baseline, target, means of verification, sampling frequency, and location of selected indicators for measurement of the success of the project. Additionally, the 3 provincial and 6 municipal project management offices will play an important role in collecting or assisting to collect data to track indicators. All these impact measurement activities are also consistent with the budget of activity 8.2.3.</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
	Moreover, I see indication that the M&E plan has been pulled in part from some other project which is a source of concern when considering how important the M&E plan is: this refers to "tripartite review" and "UNDP-GEF extended team".		The M&E part is basically adapted from UNIDO's policies and regulations for project monitoring and evaluation. However, there is a general convergence toward internationally recognized principles, norms and standards for project monitoring and evaluation. In order to better design the M&E mechanism for this project, we reviewed and included M&E related text from several recently approved projects, including a UNDP project, which resulted in the clerical error referred to in the Secretariat comments. Corrections are made in the revised Project Brief.
	Finally para 252, the TORs for final independent evaluation have to be based on the generic TORs developed by GEF EO.		The generic TORs developed by the GEF Evaluation Office will be followed during project implementation for the independent mid-term and terminal evaluations. The relevant sections of the Project Brief have been revised to specify and confirm this.
3. FINANCING			
Financing plan Grant financing / 50% co-financing from GoC and others. In view of the (mostly) domestic benefits that accrue from investments in healthcare waste management, it is not clear why the increment is so high.	Thorough discussion of baseline and alternative / domestic and global benefits		
	Apr 2007 The baseline is not always very clear. In particular for outcomes 4 and 5 where we have the greatest highest baseline of \$11m and \$8m – what exactly does it consist of? Moreover, as discussed elsewhere, it is unclear how the project will influence the medical waste nationwide investment program - if at all.		Outcomes 4 and 5 are designed to demonstrate BAT/BEP applications in incineration and non-incineration facilities. The demonstrations will be critical to verify and adapt (if necessary) the BAT/BEP that should suit the needs of medical waste disposal and treatment in China. The experience and results gained through the demonstrations will be incorporated into pertinent project activities to strengthen the legal framework and issue

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<p>technical guidance and guidelines that will regulate the operation of medical waste treatment and disposal facilities. The extensiveness of these activities is therefore reflected in their high baseline cost levels. Specifically, the baseline for Outcome 4 is the baseline cost to operate and maintain incinerators meeting the current PCDD/PCDF release limit (0.5 ng/Nm³), and the incremental cost represents the process improvement and process optimization needed to enable the incinerators to meet the internationally recommended limit of 0.1 ng/Nm³. However, for non-combustion technologies supported by the project, funding for equipment procurement is necessary, given that no pre-existing facility is involved.</p> <p>The project design took a bottom-up budgeting approach that divided the budget for each activity into components for international consultants, national consultants, personnel, equipment, meetings, travel, and other miscellaneous costs (e.g., sundries and publications), and subsequently allocated these among project financial sources including GEF, the Chinese Government, bilateral sources, and the private sector, using the GEF's incremental costs policy (GEF/C.7/Inf.5) as guidance. The complete bottom-up budget table can be provided upon request.</p>
	<p>The text of the penultimate para P17 under the description of the alternative, about the relative cost of incineration and non-combustion technologies, does not seem to square with the incremental cost table.</p>		<p>In the penultimate paragraph of page 17 of the PES, the cost per gram of reduced PCDD/F was based on the findings of the Sino-Italian UP-POP project and the two demonstration facilities under study in that project, as explained in Annex 5 of the Project Brief. Since those demonstration plants yielded varying results, a linear extrapolation has been used to expand their results to a large number of incinerators.</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<p>As discussed previously, out of the 147 existing dedicated incinerators, about 77 have low level APCS. It has been assumed that the measures to be applied to introduce BAT/BEP in these incinerators with APCS targeted to reach the current limit of 0.5 ngTEQ/Nm³ would be similar to those of the Italian funded project. The figures expressed in page 17 therefore seek only to provide a general idea of the costs for a national replication.</p> <p>The incremental cost for incinerators (2 pyrolysis incinerators and 1 rotary kiln) indicated in the incremental cost table represents the investment needed to enable the existing incinerators foreseen for this project to meet the internationally recommended limit of 0.1 ng/nm³ by referring to international experience and based on the actual situation of the demonstration facilities. Costs include process improvement and process optimization of incineration operating parameters and APCS configuration and operating parameters, and also the implementation of CEMs and PCDD/PCDF monitoring.</p> <p>For non-combustion technologies supported by the project, incremental costs were evaluated based on the known capital, operating and maintenance costs of 4 pieces of equipment. The budget for the procurement of equipment is necessary, given that no pre-existing facility is involved.</p> <p>Due to the very high price tag of monitoring PDCC/PDCF, the incremental costs of incinerators will be higher than those of non-combustion technology equipment in which the possibility of unintentional POPs production and the monitoring expenses are significantly less.</p>
	<p>Specific budget related comments follow: Project management budget table:</p>		

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
	Why is the GEF asked to pay for office facility, etc.		The budget for office facility has been taken out.
	"Miscellaneous" is not a description of expenses.		"Miscellaneous" costs refer to costs not included in the principal project budget categories (viz. discussion under question 18 above) such as translation, publications, and other miscellaneous expenses. Given that the budget was created on a bottom up basis by developing expense costs by seven categories for almost 200 Outcomes, Outputs, and Activities yielding a budget matrix of well over 1300 cells, the project's organizers and developers chose to combine these relatively small miscellaneous items into a single category for ease of budget development and presentation.
	Why is the GEF requested to fund \$202K of travel: for whom, to go where		As explained in the above responses, the project budget breaks out all travel-related projected expenditures, including travel by international consultants to and within China, by national experts within China, trainees to training sites, and other such travel. Given the project's scope and complexity, intensive travel is necessary to achieve project goals. While \$202K is not an insignificant amount, it represents less than 2% of the total GEF project budget, which the project organizers did not believe to be excessive. Furthermore, a significant amount of co-finance has been leveraged to support travel costs, significantly reducing the GEF travel cost.
	Almost \$5m of GEF allocation, or 42%, is for personnel costs – this appears excessive.		Personnel costs were calculated by aggregating all projected costs for international consultants, national consultants, and administrative personnel requested from the GEF are equal to US\$4.5 million, slightly different than the US \$5 million referred to in the comment. This level of funding is attributable to the high degree of technical assistance and training to be provided by the project by national and international consultants. This is an incremental project cost which project organizers believe to be necessary for the project's success and for China's successful adherence to the Stockholm

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			Convention in the medical waste sector. Furthermore, given the high degree of co-finance which the project includes, this level of funding is perhaps better understood as a share of the total approximately \$45 million project budget (10%) rather than exclusively of the GEF project budget.
	Why is the GEF expected to pay \$42K to hold a "workshop to discussed revised drafts" (Activity 1.1.3)?		As discussed in the Logical Framework, activities under Output 1.1 will deal with the investigation, drafting, discussion, circulation for comments, revision, and promulgation of a series of regulations, namely (i) Detailed Rules to Implement Measures on Medical Waste Operating License Management, (ii) Measures on Medical Waste (as Hazardous Waste) Consignment Management, and (iii) Classification System of Medical wastes. To avoid unnecessary repetition, Activities 1.1.1 to 1.1.5 are designed to cover all the 3 regulations. In practice, each of these activities will be performed for each of the regulations separately, yielding a budget of \$14K per regulation. Therefore, in total, 3 workshops will be held, the text in PB has been changed accordingly.
	Similarly for 1.2.4 (\$24K for something that it would seem could be largely co-financed).		In response to GEFSEC comment, the budget has been reduced and funds allocated to support activity 1.2.6 "Revise the performance levels by incorporating the experience from the pilot implementation".
	And for 2.1.1 (establish a medical waste management steering group).		The Steering Group is for strengthening the co-inspections to be jointly organized and conducted by SEPA and MOH (principally), with participation by representatives of other ministries as applicable. The team may also include members of the National People's Congress, the Chinese People's Political Consultative Conference, and Ministry of Supervision. The inspection team will work with local authorities in the field to promote application of BAT and BEP and address cases in which regulations and policies have been violated. The cost referred to is the cost relevant travel and meetings.

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			Corresponding activities will take place at the local level, the cost of which is included in the revised budget for activity 7.6.2.
	Why is the GEF expected to pay \$47K to "circulate the drafts amongst [...] (1.1.4)		The cost involves the recruitment of national and international experts to further develop (improve and formulate) draft text based on stakeholder recommendations received. In response to GEFSEC comment, the budget has been reduced and transferred to activity 1.1.5 "Promulgate the adapted regulations, and introduce and implement enforcement mechanisms", so that fee based medical waste disposal system can be better targeted.
	Activity 1.2.2 is stated as "propose to [...]". Please rephrase. Propose per se cannot cost \$35K to the GEF.		Activity 1.2.2 is to draft the upgraded pollution control standards for incineration of medical waste to the BAT performance level. The activity involves intensive expertise and resource input. The wording in the text has been revised to clarify this.
	"Establish and implement a medical waste data reporting system" sounds like mostly baseline (2.2.3)		The medical waste data reporting system will enable the health and environmental bureaus to effectively supervise the BEP applications in medical institutions. It also provides a data basis for operating the medical waste transfer system between medical institutions and dedicated medical waste treatment and disposal facilities that facilitates BAT applications. It was found during the PDF-B phase that the existing unsystematic, inconsistent, multifarious, paper-based, manual medical waste data recording forms being used by medical institutions can not meet the requirements of BAT and BEP. Therefore, such a data reporting system is of incremental cost nature due to the introduction of BAT and BEP. It should be also noted that a significant amount of fund is co-financed for this activity in recognition of its baseline nature.

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
	Activity 2.3.1 (\$333K) "develop monitoring and supervision methods". Meaning?		Activity 2.3.1 is to develop technical standards and norms for the local environmental bureaus to carry out monitoring and supervision over the operation of dedicated medical waste treatment and disposal facilities. These standards and norms will incorporate the requirements of BAT/BEP, working as an important legal and regulatory instrument to have the facilities meet acceptable pollution control level. The text of this activity has been rephrased accordingly.
	As discussed elsewhere in this review, activities under outcome 4 do not appear to have much demonstration benefits.		This issue is addressed in the response to Question 2 above.
	6.1.2 "Study tour" is not considered something that the GEF should be financing.		The budgetary allocation referred to is for the project staff to attend important international symposiums or conferences relevant to BAT and BEP. Pursuant to the GEFSEC comment, the budget of the activity has been reduced and transferred to activity 6.1.3 to strengthen inter-department coordination so that problems in fee based medical system can be better addressed.
	7.4.5: this workshop carries an overtly high price tag for the GEF.		This item is more appropriately characterized as a series of workshops, each targeting separate technologies, implementation of the certification and labeling program, and participation of equipment producers and investors in the program. The Project Brief text has been revised accordingly.
	7.6.1 and 7.6.2 pertaining to stakeholder awareness seems unfocused and expensive.		The activity 7.6.1 is designed to inform and educate a wider circle of stakeholders who will directly influence the replicability of the project outputs at national level.

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
			<p>This wider circle of stakeholders is not directly involved in the project but is critical and influential players in national investment programs and need to be made aware that there are new effective and efficient technologies to be considered for medical waste management.</p> <p>The target stakeholders include:</p> <p>Managers, politicians, and technical support representatives outside of demonstration provinces and municipalities, who will be involved in funding, procuring and being responsible for operation of installations for medical waste management;</p> <p>Managers, politicians, and technical support representatives outside of demonstration provinces and municipalities, who will be involved in funding, procuring and being responsible for operation of medical institutions;</p> <p>Communication to this group will be targeted and focused taking into account the professional standing and experience of the group; and</p> <p>Communication material for this group will be highly technical and generated within awareness campaign office that would open communication channels through general or academic publications and targeted lecture programs.</p> <p>With the relevant GEF comments taken into account, the budget of activity 7.6.1 from GEF's contribution has been reduced to \$82,550 and budget of activity of 7.6.2 from GEF's contribution has been increased to \$222,300 to increase the target outreach.</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
	7.6.3 Why is it so expensive to publish results in academic journals"?		<p>Politicians and managers often listen to academicians. Therefore, scientific publishing is valuable. The activity is designed to promote academic articles targeting at key politician and managers by providing support to academic members to conduct in depth case studies and wider economic, technological, environmental and social surveys. The results will be shown in academic or professional journals that are accessible to key politicians, managers, health care professionals and medical waste management practitioners. To avoid misunderstanding, we have taken into account GEF's comment and made the relative changes in the text of PB.</p>
	8.1.1 Why is the GEF expected to support the "establishment of the steering committee"?		<p>The Steering Group is the highest-level coordination body in the project management mechanism. Without this project, the project management mechanism would not be necessary. While support for the Steering Group therefore represents an incremental cost, it should also be noted that the project has leveraged a significant amount of co-financing from the Chinese Government for Steering Group maintenance and other project oversight costs so as to ensure the ownership and country-drivenness of this project.</p>
	And why \$10K to "establish the project team"?		<p>The project team is the nucleus in the project management mechanism to ensure that the project will be implemented in an accountable and transparent way. To ensure the ownership and country-drivenness of this project, most of the cost for the project management team is co-financed by the Chinese Government. The amount referred to in the GEFSEC comment is to support publications, translation, and other miscellaneous project team costs.</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
4. INSTITUTIONAL COORDINATION AND SUPPORT			
Core Commitments and Linkages			
China is UNIDO's largest recipient of TA. UNIDO is the lead Agency assisting China in the development of its NIP	UNIDO is co-financing the project to the tune of \$100K. Since UNIDO will be receiving 1.2m to implement the project please clarify credibly that these 100K are above and over the agency fee. P12 for example refers to UNIDO establishing a project focal point. Is that from the fee or additional to the basic GEF agency services?		The \$100K is calculated based on the working hours that the dedicated core staff, senior supportive staff and relevant staff will contribute to the project. The salaries of these staffs will be covered through the in-kind contribution of UNIDO.
Consultation, Coordination, Collaboration between IAs, and IAs and EAs, if appropriate			
The proposal notes the desirability to incorporating lessons learned from the UNDP/WHO/HCWH multi-country hospital waste management demonstration project.	<p>Collaboration and strong linkages with the UNDP/WHO/HCWH project. The project would also benefit from the WB's experience in India under safeguarding.</p> <p>Apr 2007 International good practices have been considered in the development of this project. Linkages with UNDP project referred to the above need to be established.</p>		During the PDF-B phase, a delegation composed of officials from SEPA and MOH visited the UNDP project site in India for the referenced project. The concept of the lifecycle management of medical waste was reaffirmed during this visit, and has been stressed in the proposed project by referring to the experience achieved by the UNDP project. During the project implementation, UNDP project staff will be invited to meetings of the projects to further exchange information and share experience.
5. RESPONSE TO REVIEWS			
Council			
NA	NA		
Convention Secretariat			
None received	None received		

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
<p>GEF Secretariat</p> <p>The concept has been previously discussed in general terms between UNIDO and GEFSEC, and benefits from these discussions.</p>			
<p>Other IAs and RDBS</p> <p>The Bank has provided relevant comments that need responding to.</p> <p>1 Dec 2005. Done</p>	None received		
<p>STAP</p> <p>None received</p>	None received		
<p>Review by expert from STAP Roster</p> <p>NA</p>	The review is overall supportive.		
GENERAL COMMENTS			
<i>(for records purpose only, not pre-condition)</i>			
<p>The content is in principle eligible under the POPs focal area if the case can be made that it addresses a not insignificant source of unintentionally produced POPs.</p> <p>Particularly attractive is the opportunity offered by the commitment of China to implement its Hospital Waste Strategy. It should be noted, however, that the total \$ figure nominally requested from the GEF with the three concepts submitted for this pipeline entry exercise amounts to \$45m. , following the SARs epidemic.</p>	<p>The project is in line with the GEF-4 priorities for POPs, and is a timely priority for China in the context of the implementation of China's nationwide investment plan for medical waste. The project also does a good job of evaluating the baseline in terms of dioxins emissions, and what can be expected in terms of direct (project intervention) and indirect (replication) reduction.</p>		Done

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
<p>This, under any of the replenishment scenarios under consideration, inevitably represents most if not all GEF resources that can be realistically allocated to China under GEF-4.</p> <p>Nov 2006 repipeline exercise The project aims to take advantage of planned investments in China in the framework of the recently approved 'Hazardous Waste and Medical Waste Treatment Facility Construction Plan'</p> <p>The project focuses on medical waste and would promote the use of best available techniques/best environmental practices and ensure that these investments are in line with Stockholm Convention obligations, thereby reducing releases of dioxins in the environment.</p>	<p>A number of points are raised in the review that should be addressed to strengthen the document. The principle issues are repeated here:</p> <p>1) It is still unclear how the project is articulated with the nationwide plan to build 332 medical waste facilities. In summary, the project proposes to demonstrate BEP in 20 facilities, BAT fro 6 disposal techniques, and integrated management in 3 provinces. Are these 6 disposal facilities a subset of the 332? What happens to the other 316? Or put another way, what is the commitment from the recipient country if the GEF finances this project?</p> <p>2) BAT for incinerators is well established. With limited resources, there is no demonstration value in the GEF investing in air pollution control and other devices for incinerators.</p> <p>3) The management arrangements for this project lack clarity, with unclear responsibilities and reporting lines.</p> <p>4) Not enough seems to have been done to build ownership for this process in the health sector – if the health sector is not directly in the driving seat of the project side by side with SEPA, there will be no ownership.</p>		<p>Done</p> <p>Done</p> <p>Done</p> <p>Done</p>
SUMMARY RECOMMENDATIONS BY PROGRAM MANAGER			
<p>Submission of a revised concept responding to the points raised in this review, in particular clarifying:</p>			

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
<ul style="list-style-type: none"> - significance of projected avoided releases of U-POPs; - instrumentality; and - complexity of project design. <p>1 Dec 2005 The points raised in this review were discussed and largely clarified during a concept review meeting between GEFSEC and UNIDO, and are addressed in the revised concept.</p>			
FURTHER PROCESSING			
<p>Concept review meeting.</p> <p>1 Dec 2005 Pipeline entry and CEO approval of the PDF-B.</p> <p>Nov 2006 repipeline exercise: The project aims to take advantage of planned investments in China in the framework of the recently approved 'Hazardous Waste and Medical Waste Treatment Facility Construction Plan' following the SARS epidemic. The project focuses on medical waste and would promote the use of best available techniques/best environmental practices and ensure that these investments are in line with Stockholm Convention obligations, thereby reducing releases of dioxins in the environment.</p>	<p>Nov 2006</p> <p>Further project development to take into account the comments raised in this review sheet, including those made during the Nov 2006 repipeline exercise.</p>		<p>Done</p>

<i>At PPG, if any</i>	<i>Expected at Work Program inclusion</i>	<i>Expected at CEO endorsement</i>	<i>IA response</i>
<p>Comments:</p> <p>The size of the GEF grant is too high, and the amount of co-financing proposed too low (53% of project total) with regards the size of the overall envelop available for POPs under GEF-4. In particular, GEF grant should be lower and co-financing higher for components 4, 5 and 6: treatment and disposal BAT/BEP demo; waste management BEP; and BAT/BEP replication plan: The GEF grant should therefore not exceed US\$12m, and the financing gap should be covered by co-financing. (For components 4, 5 and 6, I would suggest that GEF allocations should be around US\$3.5m; \$0.8m; and \$2.4m, respectively.)</p> <p>The overall envelop for project management appears appropriate (slightly above 5% GEF total). The proposed budget for international consultants appears very high in absolute terms (\$1.55m – at least 100 man-mo.)</p> <p>Recommendation: repipeline</p>			

Appendix 1: International and National Hospital Waste Management Experts Consulted by CIO During Project Brief Development

Name	Position and Specialty
International Experts	
Dr. Csizer, Zoltan	UNIDO Consultant for Environmental projects and programs developing, environmental management and policy
Dr. Dhua, S.P.	Regional Coordinator, Regional Network on Pesticides for Asia & the Pacific (RENPAAP) and POPs for Asia
Mr. O'Laoire, Donal	UNIDO Consultant, environmental policy and management
Dr. Phillips, Ray	Environmental projects and program development expert, International Program Director, RP Consulting, Inc.
Dr. Sbrilli, Andrea	UNIDO consultant, Environmental Monitoring and Technology
Dr. Lupi, Carlo	Chief Technical Advisor, Sino-Italian Cooperation Program for Environmental Protection
Dr. Russell, Ronald J	Senior Lecturer, University of Dublin, Department of Microbiology, Moyne Institute for Preventive Medicine, Trinity College
Mr. Sengupta, A.K.	Coordinator, Health Action in Crisis, WHO India
Mr. Arora, S. Kumar	Program officer, Environment & GEF section, UNDP, India
Ms. Tavorath, Ruma	Environmental Specialist, South Asia Region, The World Bank, India
Dr. Baghotia, K. S.	State Leprosy Officer (Delhi), Directorate of Health Services, GNCT of Delhi,
Mr. Scholtes, Philippe-Roger	UNIDO Representative and Head, Regional Office, India
Mr. Agarwal, Ravi	Director, Toxics Link, India
Mr. Sinha, Satish	Chief Coordinator, Toxics Link, India
Dr. Suzanne Giannini-Spohn	Program Manager for Industrial Eco-Efficiency, OIA, USEPA
Mr. Takata, Keith A.	Director, Superfund Division, Region 9, USEPA
Ms. Lida Tan	China Coordinator, Region 9, USEPA
Dr. Lee, Chun- Wai	Senior Scientist, ORD-RTP, USEPA
Mr. Jeffrey Ryan	Professor, ORD-RTP, USEPA, USA
National Experts	
Dr. Yu Gang	Professor, Director of Department of Environmental Science & Engineering, Tsinghua University, co-Chair of BAT/BEP Expert Group under POPs Convention
Dr. Zheng Minghui	Research Center for Eco-environment Sciences, Chinese Academy of Science, member of TWG for POPs monitoring and Toolkit Expert Group under POPs Convention
Dr. Hu Jianxin	Professor, College of Environmental Sciences, Peking University, member of POPs Review Committee under POPs Convention
Dr. Tian Honghai	Professor, National Research Center for Environmental Analysis & Measurement, POPs monitoring
Mr. Wang Qi	Professor, Chinese Research Academy of Environmental Science, Solid Waste Management
Ms. Shen Yingwa	Deputy Director, Chemical Products Registration Center, mercury management
Dr. Li Xiaodong	Professor, Institute of Thermal Power Engineering, Zhejiang University, Dioxin Monitoring and Reduction
Mr. Liang, Minghui	Director General, Research Institute of Hospital Management, Ministry of Health, hospital reformation policies and fee policies;
Ms. Gong, Yuxiu	Chief of Nursing Center, Research Institute of Hospital

Name	Position and Specialty
	Management, Ministry of Health; Former director of Department of Medical Policies, Ministry of Health; Organize and participate in the development of <i>Regulations on Management of Medical Waste</i> ; Hospital waste management
Ms. Yao, Li	Deputy Chief of Nursing Center, Research Institute of Hospital Management, Ministry of Health; Member of edition committee, <i>Chinese Nursing Administration</i> ; Hospital waste management
Ms. Li, Liuyi	Professor Nosocomial Infection Control expert; Director of Dept. of Nosocomial Infection Control, Peking University First Hospital; Writer of the national policies, rules and guidelines for MOH, such as <i>Regulations on Management of Medical Waste</i> , etc.
Ms. Wu, Yinghong	Professor, Division Chief of Infection Control, Beijing University People's Hospital, Medical waste management
Mr. Wang Yanrang	Professor, Tianjin CDC, Hospital waste management
Dr. Wu, Shunze	Chief Technical Adviser of the national investment plan; Director of Environmental Project Consulting Department, Chinese Academy for Environmental Planning
Ms. Sun, Ning	Senior Engineer, Chinese Academy for Environmental Planning, Major editors of the national investment plan
Mr. Hou, Guiguang	Engineer, Chinese Academy for Environmental Planning, Major editors of the national investment plan;
Mr. Shao, Chunyan	Vice dean of Shenyang Environmental Sciences Institute, Senior Engineer on Medical Wastes
Mr. Chen, Yang	Medical waste management policies, treatment and disposal expert; Environmental policies on Medical waste treatment
Mr. Jiang Feng	Deputy General Manager, Envisolve Consulting Company, Environmental Management
Ms. Teng Jing	Vice Secretary-General, China Association of Environmental Protection Industry, Certification for Environmental Protection Equipment
Mr. Yi, Bin	Director of Technical Department, China Association of Environmental Protection Industry, policies and market of environmental protection industry, standard on environmental friendly products and etc.
Mr. Liao Shilong	Director, Chongqing Solid Waste Management Center, Solid waste management
Mr. Huang Guoquan	Director, Shanxi Solid Waste Management Center, Solid waste management
Mr. Feng, Zhongfu	Lawyer, Environmental and economic law
Ms. Wang Xiaoyan	General Manager, Jinan Hanyang Solid waste Treatment Co., LTD, Solid waste management
Mr. Jiang Longsheng	Director, Treatment Center of Industrial Solid Waste of Xiamen, Solid waste management
Mr. Tang Chunpeng	Professor, Tianjin Hejia-onyx Environmental Protection Co., Ltd, Medical waste management
Mr. Chen Guihao	General Manager, Zhangjiagang Huarui Hazardous Waste Treatment Center, Hazardous waste management
Dr. Shen Xiaojiang	Deputy General Manager, Houzhou Industrial & Medical Waste Treatment Center, Industrial and medical waste disposal and management
Mr. Zhu Jianhua	General Manager Assistant, Changshu Heavy Machine Manufacture Co., Ltd., Equipment manufacturer for Medical waste disposal

Appendix 2: Summary of PDF-B outputs

1. Report on international experience in medical waste management and disposal and the applicability to China

- Report on review international experience achieved by related international organizations and other countries in medical waste management and disposal, including:
 - Status and trend of legislations, policies, standards and guidelines;
 - Adoption of best available technologies and best environment practices (BAT/BEP) regarding the generation, separation, collection, storage, transportation, disposal and treatment, particularly from a point of view of PCDD/PCDF emission reduction and other pollution control such as Hg.
- Gaps of China in medical waste disposal and management in meeting Stockholm Convention's requirements in regard to PCDD/PCDF emission reduction and other pollution control such as Hg;
- Analysis on applicability of international experience to the actual situation of China and give recommendations to close up the gaps from the following aspects:
 - Revision of establishment of legislations, policies, standards and guidelines;
 - Technology transfer and BATs/BEPs in regard to the generation, separation, collection, storage, transportation, disposal and treatment;
 - Staff training and capacity building.
- Economic technical analysis report on international medical waste treatment facilities.
- Report on the implementation status, issues and solutions for current policy, technical norms.
- Successful case studies report for construction of facilities to dispose and treat the medical waste.

2. Report on assessment of medical wastes management practices and systems in hospitals and other health care facilities:

- Chinese medical wastes management practices and systems including classification, segregation, collection, package, temporary storage and the operational parameters of disposal equipment;
- Preliminary medical waste inventory of China, with focus on chlorinated plastics and mercury wastes;
- Assessment report on medical wastes management situation and policy system;
- Assessment report on BAT/BEP and international advanced technologies and experiences, with focus on the experiences in disposal of chlorinated plastics and mercury wastes;
- Gap analysis (assessing the gaps between China and above selected foreign countries in medical waste management, in medical wastes disposal and analyzing the reasons of these gaps from technological, economic, managerial and public awareness aspects);
- Proposal on feasible/practicable measures and technologies for medical waste minimization, classification, segregation, collection, package and temporary storage at site and a work plan for adopting these measures and technologies;
- Medical wastes management BAT/BEP demonstration and popularizing plan.

3. Report on assessment of policies, laws and regulations and standards in medical wastes management in hospitals and other health care facilities:

- Assessment report on policies, laws, regulations and standards in medical wastes classification, segregation, collection, storage, transportation, treatment and disposal

and on the enforcement situation;

- Assessment report on organizations and beneficiaries (relevant government line ministries and organizations and their responsibility, including but not limited to NDRC, SEPA, Ministry of Health, Ministry of Health, technical development organizations, monitoring and technical support organizations, professional associations, NGOs, and target groups and the population at large);
- Situation analysis of international experiences in medical wastes management;
- Considering the requirements for implementing the Convention and promoting environmentally sound management of medical wastes a work plan on policies, laws, regulations and standards for medical wastes management, treatment and disposal
- Work Plan on capacity building for enforcing policies, laws, regulations and standards system, including training and awareness rising in medical waste management.

4. Report on assessment of current medical wastes management practices in hospitals and other health care facilities:

- Situation analysis of the current medical waste management and treatment and disposal practices;
- Analysis and review of various types of incineration technologies and their alternatives, engineering aspects, equipment such as rotary kiln and incineration, non-incineration technologies, in accordance with the requirements of BAT/BEP, in terms of technological characterization, capacity, investment requirements, treatment cost, types of wastes that can be treated, etc;
- Assessment and analysis of environmentally sound medical wastes disposal plan, and its implementation.
- Analysis on medical wastes disposal as far as the quantities of PCDD/PCDF reduction is concerned, and analysis on investment, cost and benefits;
- Review of BAT/BEP and international experience;
- Recommendation on medical waste management, treatment and disposal, BAT/BEP demonstration and awareness rising.

5. Report on assessment of current situation analysis and techno-economical feasibility of manufacturing equipment required for medical waste management and disposal in China;

- Evaluation on medical wastes treatment technology equipment considering the gaps between China and those foreign countries that have already applied new innovative technologies;
- Market survey and evaluation of products and equipment for medical wastes collection, storage, transportation and disposal, including the market of medical wastes collection equipment, market of medical wastes management , disposal service covering products and equipment producers, etc;
- Market analysis of factors influencing of supply and demand including worker's protection, health care, hobby of the users, pressure of environmental protection, pressure of environmental protection organizations, impact of policies and regulations, requirement of laws and responsibilities, impact of service market, waste minimization and recycling, and cost reduction;
- Research and developing plan for establishing and introducing new technologies and equipment for incentives including awareness raising;
- Development strategy for new innovative technologies;
- Work plan of BAT/BEP demonstration and diffusion;
- Work plan environmental awareness raising campaigns;
- Work plan for fund raising mechanism and related measures

6. Study report on the medical waste management and disposal in India and Ireland

A delegation headed by Mr. Zhao Yingming, Director General of the Department of Science & Technology of SEPA, including 9 administrative and technical personnel from relevant department of SEPA and managements and research institutions in the medical waste field completed a 10-day study tour abroad to learn the medical waste management and disposal situation in Ireland and India from October 9 to 19, 2006. The study tour took place on the background of the POPs Convention and the efforts of China to boost the progress of the PDF-B stage of GEF-China Sustainable Environmental Management of Medical Wastes Project, and it is a major component of the Project. The purpose of the study tour was to review medical waste management technologies, policies, regulations and standards in Ireland and India. The main components of the report are:

- Main activities of study tour, including visits to medical waste disposal companies and hospitals and meetings with UNIDO, EB, UNDP, WHO and the Governments of Ireland and India;
- Elaboration of the achievements in the study tour;
- Comparative analysis of the problems with medical waste management and disposal in China.

Minutes of Meeting

Subject: Conclusion Workshop on Environmentally Sustainable Management of Medical Waste in China Project (PPG)

Venue: Beijing, China

Date: 20-21 September 2007

1. The Conclusion Workshop on “Environmentally Sustainable management of Medical Waste in China” Project (PPG) was held in Beijing, China on September 20-21 2007. Forty three representatives from environmental protection authorities, health administration authorities, universities, and research institutions attended the workshop.
2. The representative from Convention Implementation Office gives a brief introduction of the overall project execution at PPG phase.
3. The representatives of sub-contactors reported their work at the workshop. The survey activities of PPG phase have been carried out by several subcontracts:
 - a) The part related to medical waste management in medical institutions was elaborated in the subcontract undertaken by National Institute of Hospital Administration of Ministry of Health (NIHAMOH).
 - b) The part related to overall regulatory framework was elaborated in the subcontract undertaken by Shenyang Environmental Science Academy (SESA).
 - c) The part related to technical and environmental assessment was elaborated in the subcontract undertaken by Chinese Academy for Environmental Planning (CAEP).

d) The part of industrialization overview of medical waste management in China was elaborated in the subcontract undertaken by China Environmental Protection Industry Association (CEPIA).

4. Officers from State Environmental Protection Administration and Ministry of Health also give the valuable suggestions to the project execution according to their day-to-day work.

5. The representatives have acknowledged the overall project implementation. They understood that the project was designed from the angle of life-cycle management, considered deeply about medical waste management system accomplishing, institutional capacity building, and engineering demonstration and replication. Through a serious action of promoting best available technique and best environmental practice, the project could fulfill the requirements of Stockholm Convention and also incorporate with the medical waste management and disposal situation of China. The implementation of this project is very important for promoting the Convention implementation and capacity building on management in the medical waste field.

6. Regarding to the further project execution, the following recommendations were raised from the workshop:

a) In the view of progress of project execution, the project should be at the similar pace as the execution of “Plan for Construction of National Hazardous Waste and Medical Waste Disposal Facilities”. This arrangement could better promote the project implementation and lead medical waste management and disposal in China to the international standard.

b) In the view of the activities of the project, it should consolidate with the existing regular work of SEPA and MOH, for instance, related regulation and

standard edition, the supervision, enforcement, management and technical training in medical waste field. The harmonies between the work of related operation departments of Chinese government and the project activities would promote the project execution and realize the factual requirement in China.

- c) In the view of project implementation results, it is emphasized that the results should put into effect on the coordination system between sanitation and environmental protection organizations. Standing on the root of medical waste life-cycle management, including segregation, collection, transportation and other elements related to medical waste treatment and disposal, the project should solve the key issues in current medical waste management field.

7. The Conclusion workshop brought the PPG phase project to a close. The representatives gave their important suggestions and comments to further full-size project implementation. These suggestions and comments could be applied in the near future.

LIST OF PARTICIPANTS, SEP 20-21, 2007, BEIJING, CHINA

No.	Name	Organization
1.	Luo Gaolai	FECO, SEPA
2.	Yang Xiaoling	FECO, SEPA
3.	Fang Zhi	SEPA
4.	Wang Kaiyu	SEPA
5.	Zhong Bin	SEPA
6.	Guo Yanhong	MOH
7.	Yang Xia	MOH
8.	Gong Yuxiu	NIHAMOH
9.	Yao Li	NIHAMOH
10.	Jin JianMin	NIHAMOH
11.	Li Liuyi	Beijing University Hospital
12.	Chen Yang	SAES
13.	Chen Gang	SAES
14.	Sun Jun	SAES
15.	Chen Xi	SAES
16.	Wu ShunZe	CAEP
17.	Hou Guiguang	CAEP
18.	Zuo Lesheng	CAEP
19.	Yi Bing	CEPI
20.	Li Ming	CEPI
21.	Feng Zhongfu	CEPI
22.	Yang Hangsheng	Zhejiang University
23.	Jiang Feng	Envisolve
24.	Chen Peng	Envisolve
25.	Sheng Deling	AMMS
26.	Li Xinwu	China CDC
27.	Tang Chunpeng	Tianjin Jianghuan Environmental Protection Technology Co.Ltd
28.	Jia Qing	SENTECH Co.Ltd
29.	Zhang Ming	China National Environmental Protection Corp.
30.	Xu Bo	CQSWMC
31.	Huang Guoquan	SXSWMC
32.	Tang Wangqi	SXSWMC
33.	Liu Fuqiang	Tsinghua University
34.	Zheng Minghui	RCEES
35.	Sheng Hongzhi	IMCAS
36.	Xu Diandou	IHCPCAS

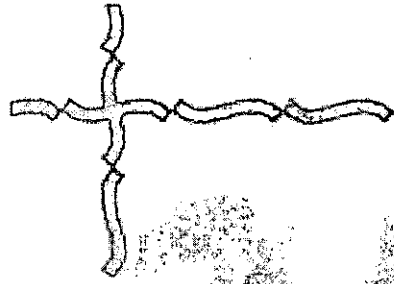
37.	Yuan Qinliang	IHCPCAS
38.	Zhuang Guotai	FECO, SEPA
39.	Sun Yangzhao	FECO, SEPA
40.	Jiang Chen	FECO, SEPA
41.	Zhou Yunrui	FECO, SEPA
42.	Wang Zhifang	FECO, SEPA
43.	Hu Jian	FECO, SEPA

Environmentally
Sustainable
Management of
Medical Waste in
China



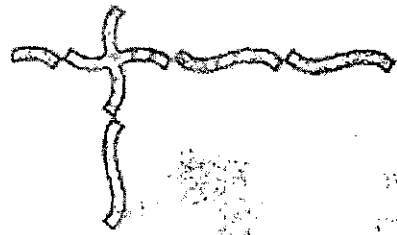
CIO/SEPA

September, 2007



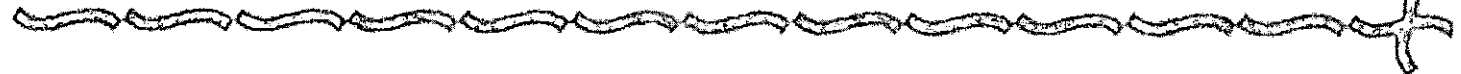
Background

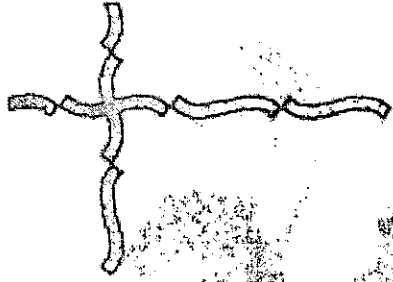
- ❖ The SARS epidemic which broke in Spring of 2003 drew Chinese Government considerably attention to the term of medical wastes disposal. The State Environmental Protection Administration (SEPA) and relevant organizations promptly formulate “The Hazardous Waste and Medical Waste Treatment Facility Construction Plan ” (hereinafter refereed as (“Plan”)), to ensure environmentally safe management of hazardous wastes and medical wastes.
- ❖ Approved by State Council in 2003, the “Plan” proposed to construct 332 centralized medical wastes disposal facilities national wide, of which 277 are medical wastes disposal plants, while other 55 are multi-purposed hazardous wastes disposal plants. The issuing of the “Plan” marks a new step towards the medical wastes management in China.



Background

- ❖ Whereas, the “Plan” was approved after the break of SARS and before China’s accession to the Stockholm Convention, the requirement for ensuring long-term people’s health and environmental protection is not sufficiently considered.
- ❖ Because of containing higher intensity of chlorinated plastics, infectious and toxic material than normal wastes, medical wastes are more likely to form PCDD/PCDF, HCB, PCB and other slight pollutants when they are disposed by method of incineration.
- ❖ PCDD/PCDF, HCD and PCB are listed as unintentionally produced POPs in Convention of Annex C and the signatories of Convention are requested to adopt (BAT/BAP) to reduce the emission of these pollutants as possible.





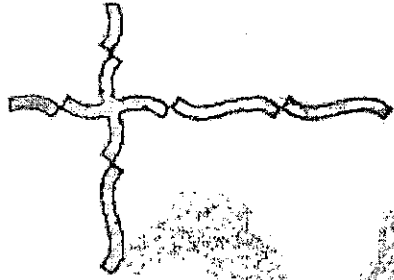
Overall Objective

- ❖ The overall objective of the project is to reduce and ultimately eliminate the releases of unintentionally produced POPs and other globally harmful pollutants into the environment, and assist China in implementing its relevant obligations under the Stockholm Convention.
- ❖ The project is to interact with the Nationwide Investment Plan and promote the widespread adoption of BAT/BEP in the evolving medical waste management infrastructure and industry in a manner that reduces adverse environmental impacts and protects human health.



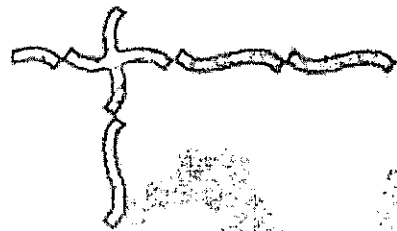
Overview

- ❖ The implementing duration of full size project is 5-year.
- ❖ The full size project is applied GEF donation 11.65 million dollars.
- ❖ The total budget of the project is about 45 million dollars.



Progress

- ❖ The PPG phase project was approved by GEF at the end of 2005.
- ❖ The inception workshop was held on 24 February, 2006.
- ❖ SEPA and UNIDO intensively prepared and developed the project brief for the full size project.

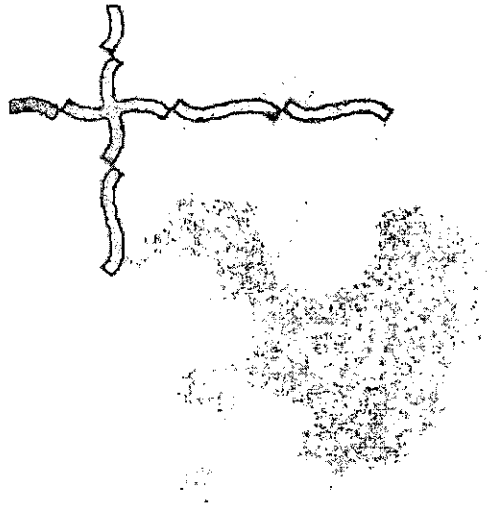


Progress

To prepare the project brief, the PPG phase surveys are:

- ❖ Investigation and evaluation of the medical waste management in medical institutions;
- ❖ Investigation and evaluation of the policies, regulations and standards in medical waste management;
- ❖ Investigation and evaluation of the technologies for medical waste disposal and treatment;
- ❖ Investigation and evaluation on medical wastes management and disposal industrialization; and
- ❖ Revise and establish technical standards of pollutant emission from medical waste incineration and non-incineration treatment.





Outcomes

- ❖ The project was approved by GEF council during the meeting at June 12-15, 2007.
- ❖ The project will be endorsed by GEF CEO momentarily.

Thank You Very Much!



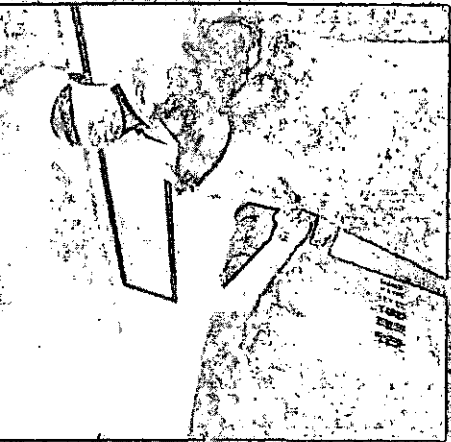
Wish a great success!

UNIDO/GEF/China Project
Environmentally Sustainable Management of
Medical Wastes in China

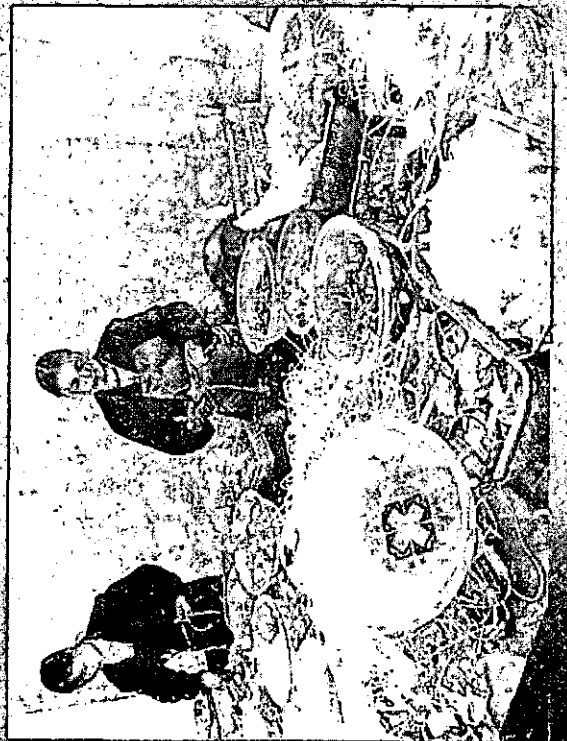
Project Design

CIO/China



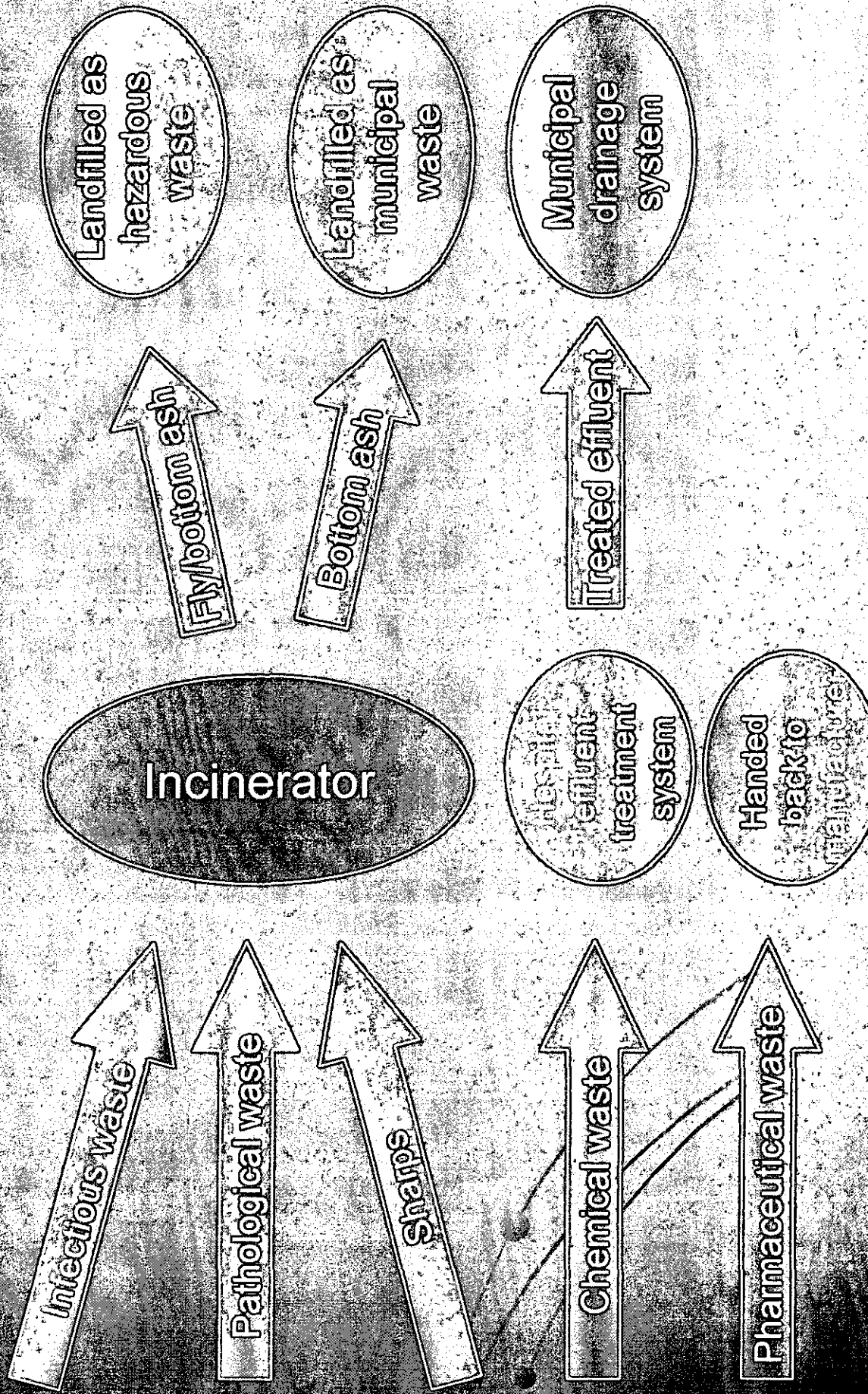


medical waste

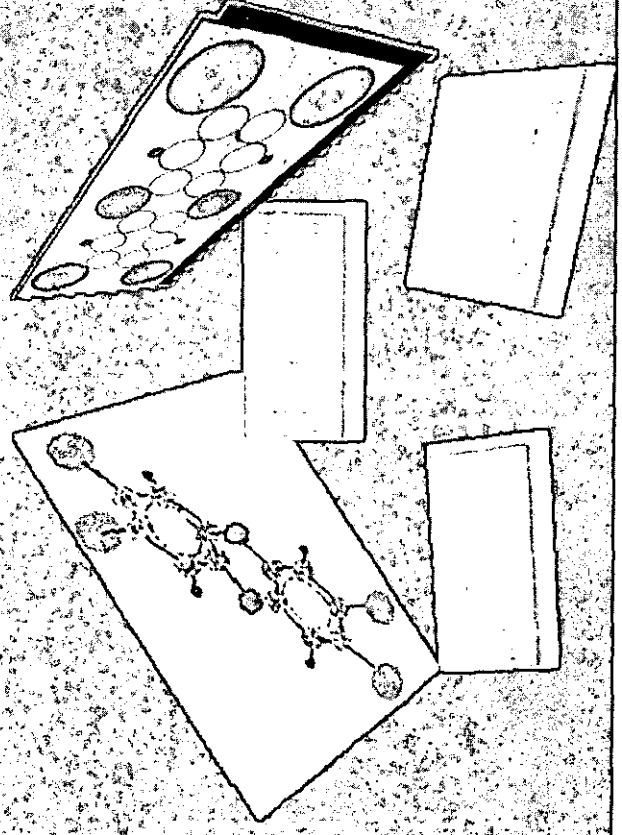


- China produces approximately 670,000 tons medical waste per annum or 1,780 tons pre day

Visualization of medical waste stream in China



The estimation result shows that the total amount of PCDD/PCDF releases into air from medical waste incinerators in China in 2004 reached 427.4g TEQ, accounting for 8.47% of the total releases to air from all sources.

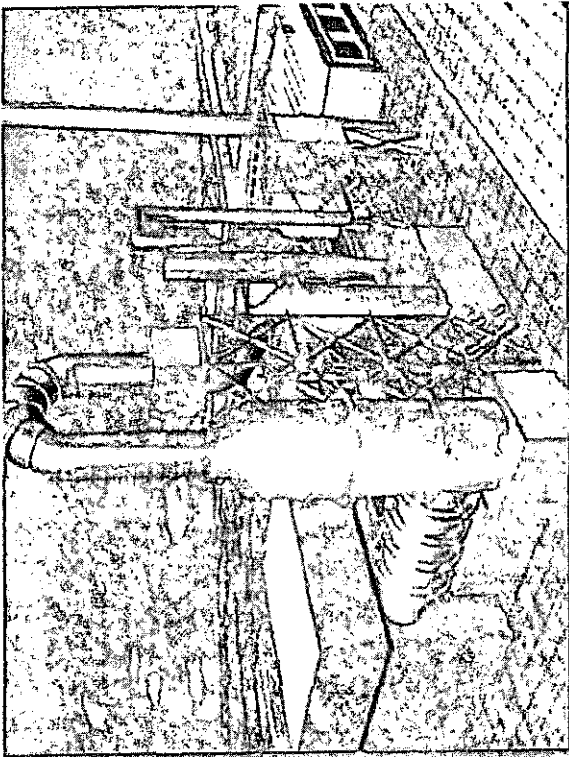
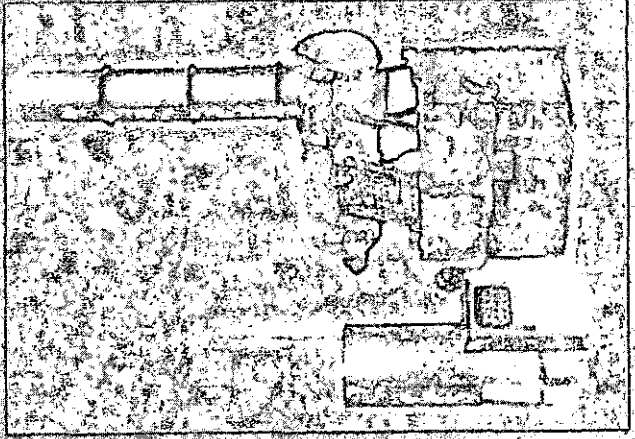
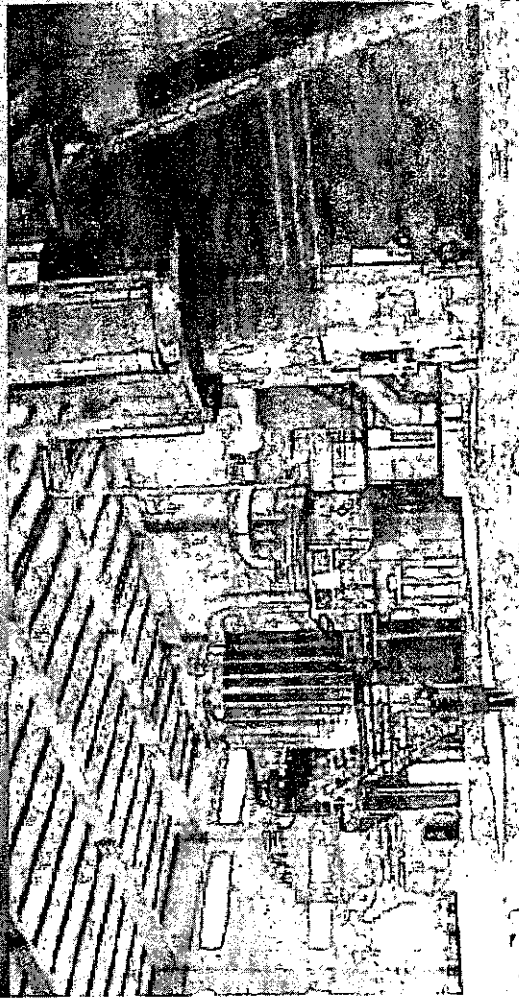


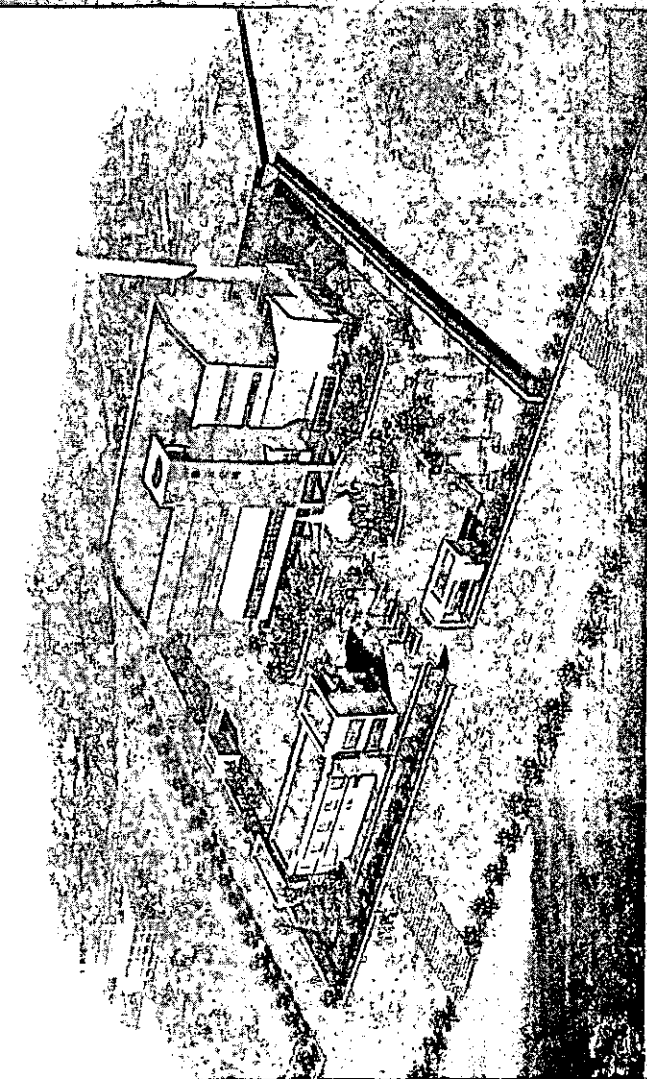
- In China, there are 149 dedicated medical waste disposal facilities

- ▣ 147 incinerators

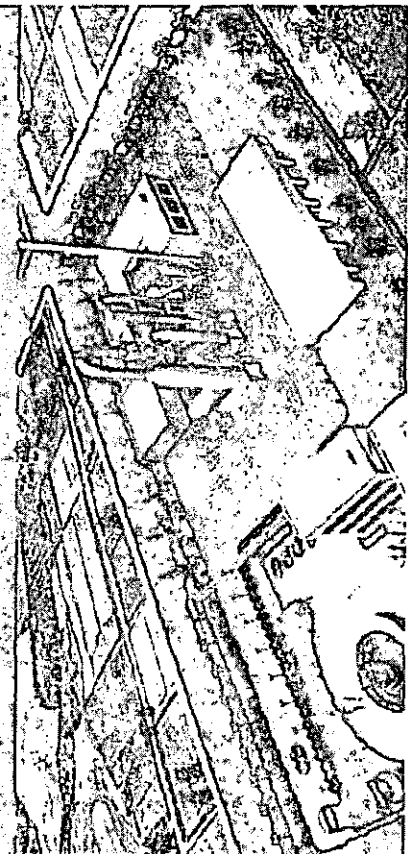
- ▣ 1 autoclave

- ▣ 1 microwave





o National Programme for Construction of Facilities for Disposal of Hazardous Waste and Medical Waste proposed to construct 332 dedicated medical waste disposal facilities

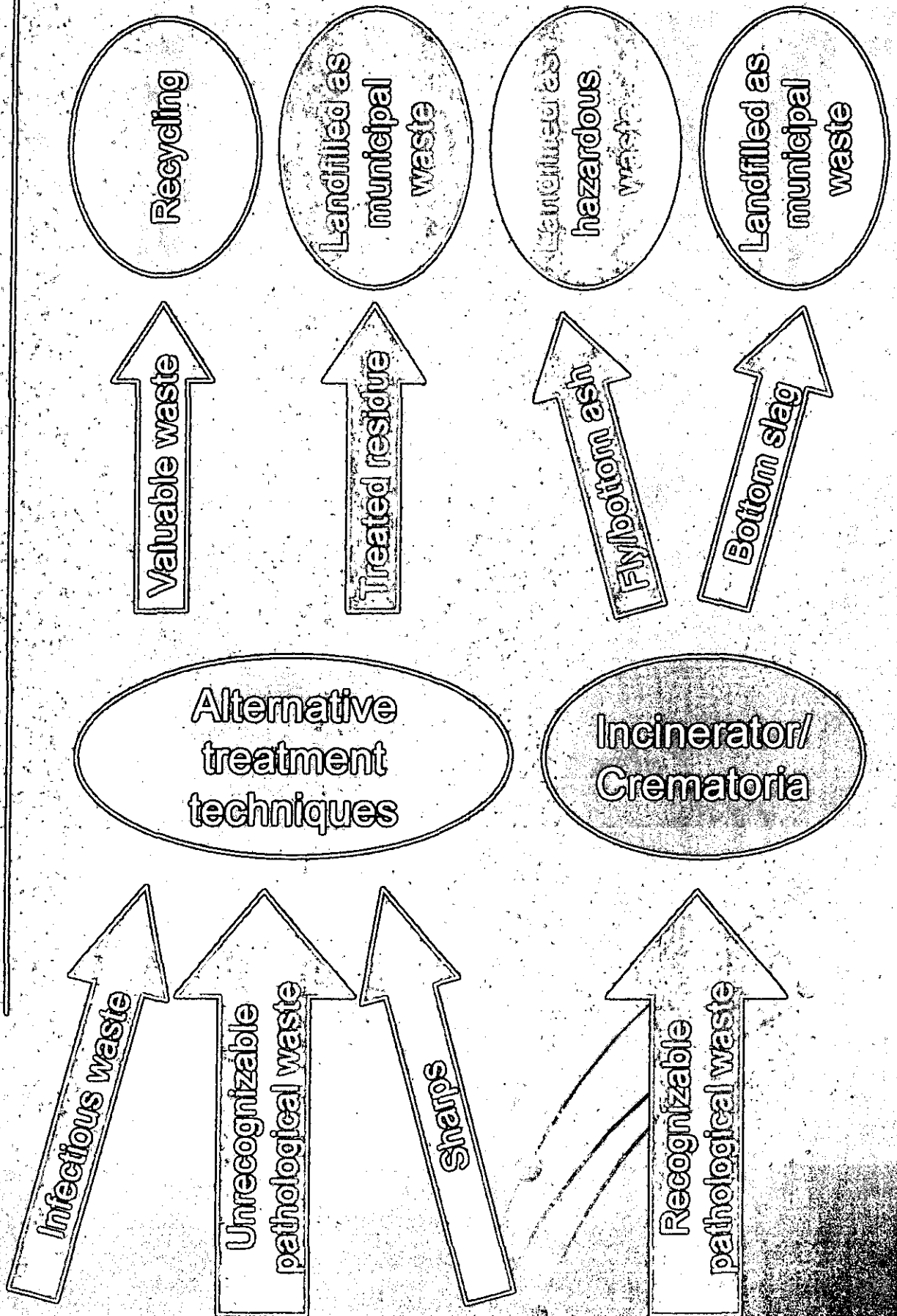


Project Objective

To reduce and ultimately eliminate the releases of unintentionally produced PCDD/PCDF and other pollutants of global harms from medical waste incineration into environment.

- Creation of a regulatory and policy enabling environment and strengthening of institutions, together with or based on a cluster of demonstrations to apply and verify the BAT/BEP in the lifecycle management of medical waste;
- Application of the successfully verified BAT/BEP in 3 selected demonstration provinces within the project implementation period;
- Formulate a replication program to disseminate the BAT/BEP to the whole nation by the end of the project implementation.

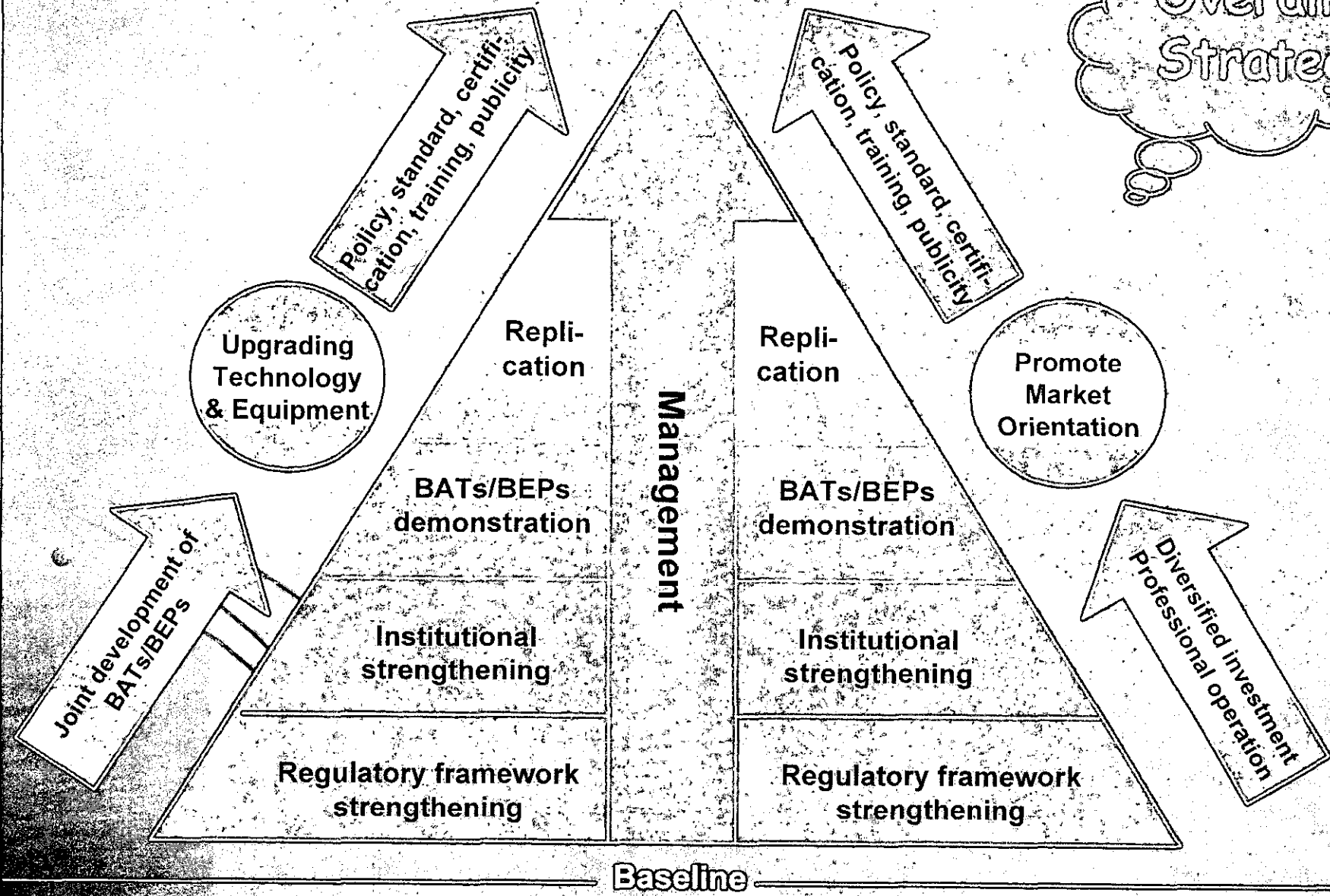
BAT/BEP introduced to MW disposal



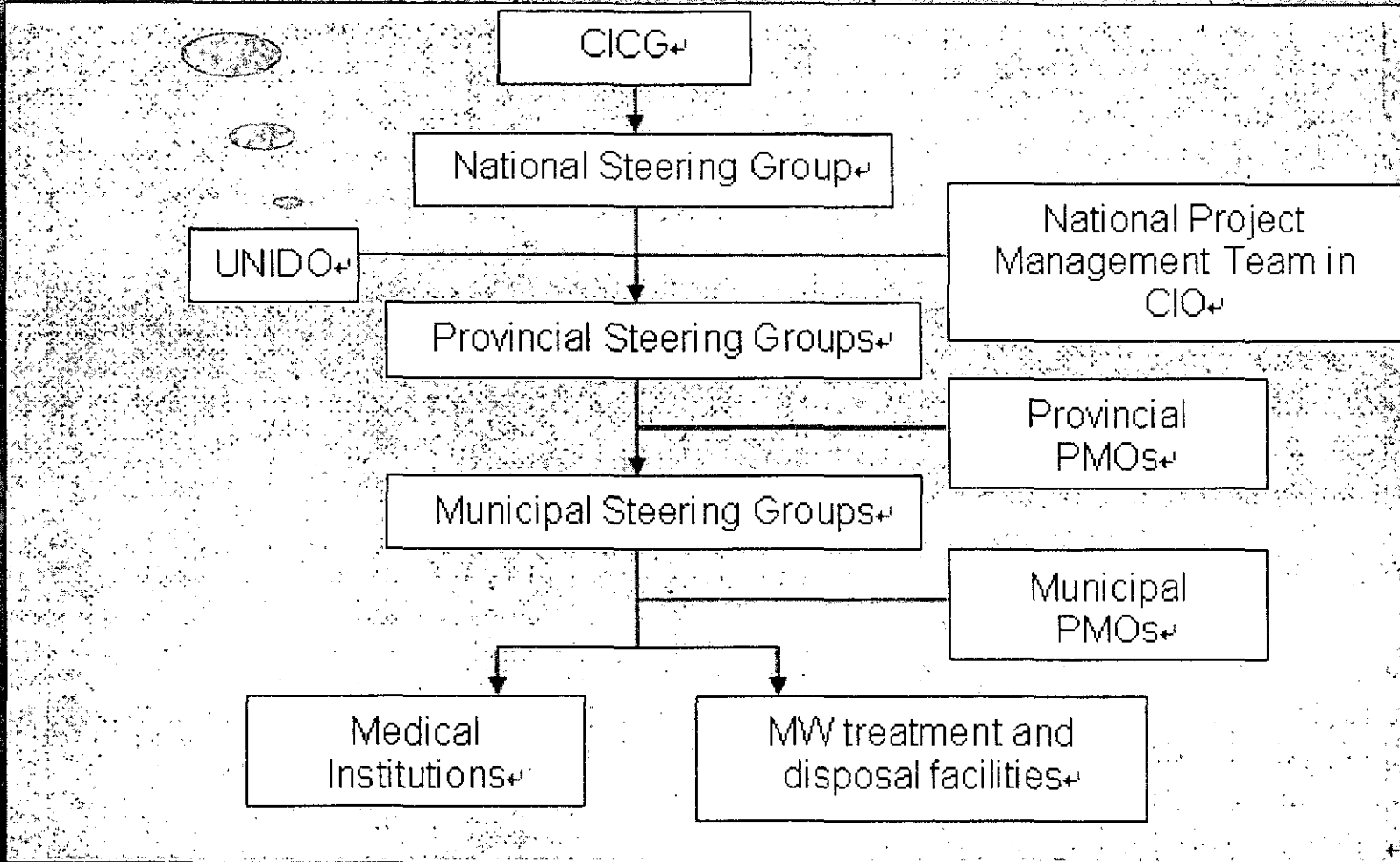
Methodological approaches

- Upgrade the incineration equipment to the BAT performance level
- Replace outdated or over-capacity incineration facilities with alternative non-incineration techniques that avoid the formation and emission of dioxins
- Promote BEP in medical institutions
- ~~Comprehensively apply regulatory, administrative, planning, technical, economic, market, information and training instruments to~~
 - ~~Promote the locally affordable or commercially available supply of technologies and equipment of needs, and~~
 - ~~Promote the commercialization of MW disposal~~

**Environmentally Sustainable
Management of Medical Waste**



Project Organogram



Project Approach

Approach

INDUSTRIAL SUPPORT

INCENTIVES

DEMAND FOR
• TECHNOLOGY
• EQUIPMENT
• CONSTRUCTION
BAT SPECIFICATIONS
DEFINED
NATIONAL STANDARDS
UPGRADED
TECHNOLOGY TRANSFER
FACILITATED
PREFERENTIAL POLICIES
SUPPORT FOR DESIGN AND
MANUFACTURING
PRIVATE OWNERSHIP OF FACILITY

DISINCENTIVES

ACCESS TO BAT STANDARD
TECHNOLOGIES AND
EQUIPMENT

COST

LONG TERM INVESMENT

MARKET

INCENTIVES

DEMAND CREATED
FEE SYSTEM
POLICY SUPPORT
LEGAL COMPULSION
INVESTMENT SUPPORT

DISINCENTIVES

FEE BASED SYSTEM
NOT MATURE

UNCERTAIN
COMMERCIAL
PARAMETERS

SERVICES SUPPORT

INCENTIVES

DEMAND FOR
• CONSULTING SERVICES
• MONITORING SERVICES
• LABORATORY SUPPORT
• TRAINING
• TRANSPORT AND LOGISTICS
• BEP SUPPORT
• AUDIT AND STANDARDS

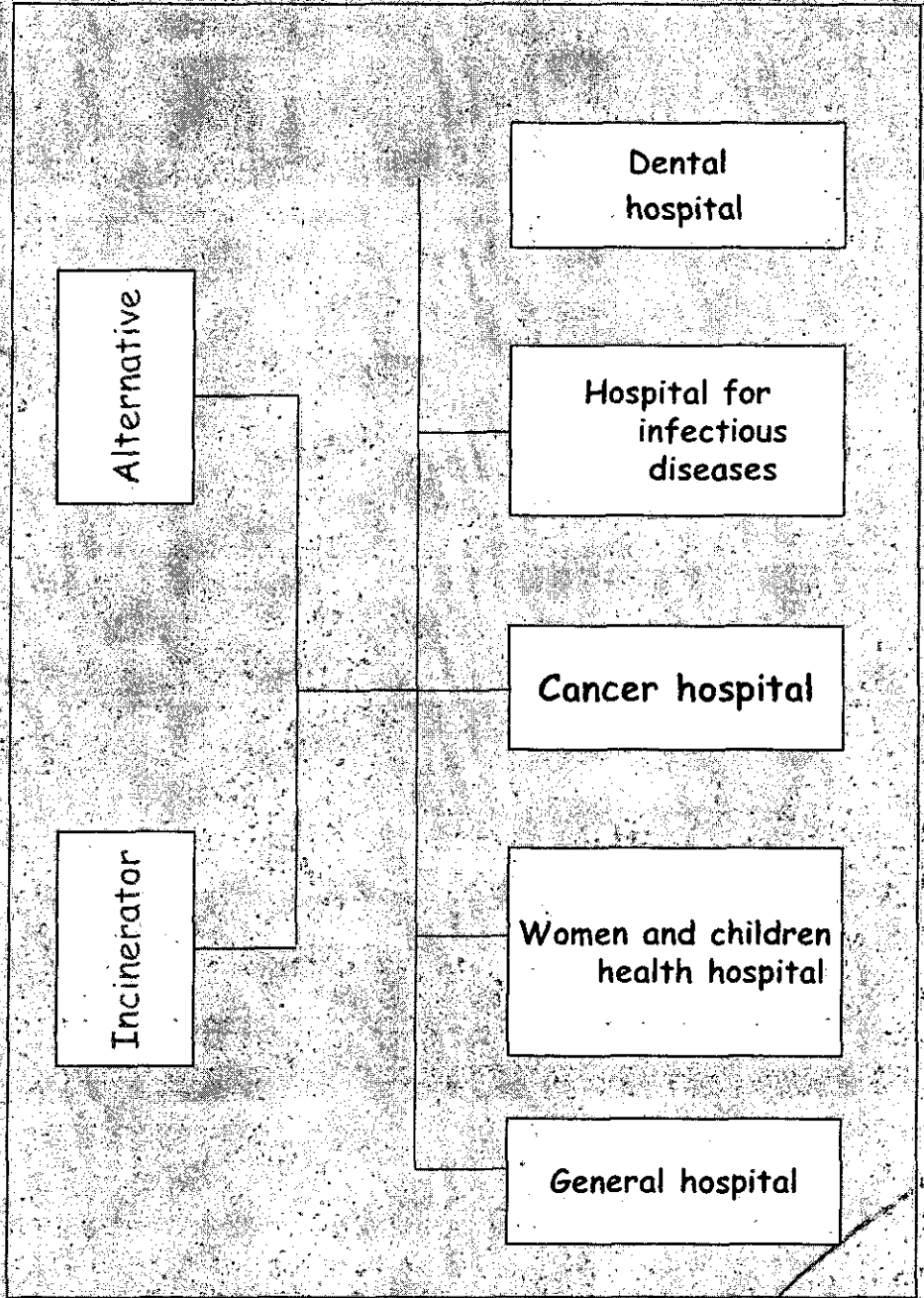
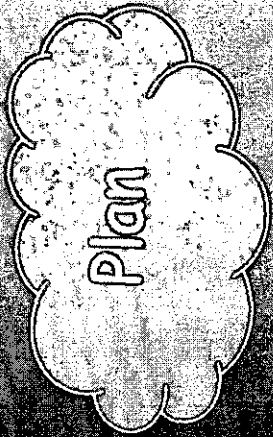
DISINCENTIVES

DEPENDENT ON
THE SUCCESS OF THE
FEE BASED SYSTEM

CAPACITY DEFICENCIES

Demonstration plan in a demonstration

○ province



Component 1. Strengthen the regulatory framework

- Strengthen the regulatory framework for medical waste management
- Detailed Rules to Implement Measures on MW Operating License Management
- Measures on MW (as Hazardous Waste) Consignment Management
- Classification System of Medical wastes
- Upgrade or establish emission limits from medical waste disposal
- Dioxin emission limit from incineration
- VOCs and other pollutants emission limits from non-incineration

Component 2. Strengthen the institutional capacity

- Establish a long-term national steering and coordination mechanism
- Strengthen supervision and inspection on medical care institutions
- Strengthen monitoring and supervision on medical waste treatment and disposal
- Strengthen environmental impact assessment on disposal facilities
- Strengthen performance audit of disposal facilities

Component 3. Demonstrate BEP based management of medical waste in MTIs

- Select 20 representative medical care institutions
- Establish waste management systems and carry out staff trainings on BEP application
- Implement best purchasing practices, reduction, reuse, waste segregation, reduction, intermediate storage, transportation and traceability
- Monitor, record and evaluate the implementation process and results
- Develop Specifications on Medical Waste Management in Medical Institutions
- Issue and disseminate the Specifications

Component 4. Demonstrate BAT/BEP for medical waste disposal using thermal combustion

- Select 1 facility using incineration process and 2 facilities using pyrolytic process
- Procure, retrofit, and operate the modified facility, including on-line PCDD/PCDF sampling system
- Train the relevant managerial and operation staff
- Monitor, record and evaluate the implementation process and results
- Develop Booklets of BAT/BEP Application for Thermal Combustion Processes of Medical Waste
- Develop Code for Consturction and Operation of Medical waste Disposal Facility Using Thermal Combustion Processes

Component 5.
Demonstrate BAT/BEP for medical waste
disposal using non-combustion

- Select 1 facility using steam treatment, 1 facility using microwaving treatment, and 1 facility using chemical treatment
- Procure, retrofit, and operate the modified facility
- Train the relevant managerial and operation staff
- Monitor, record and evaluate the implementation process and results
- Develop Booklets of BAT/BEP Application for Non-Combustion Treatment of Medical Waste
- Develop Code for Construction and Operation of Medical waste Disposal Facility Using Non-Combustion Processes

Component 6.
Demonstrate integrated and coordinated
medical waste management and disposal

- Demonstrate the application of integrated medical waste management among various institutions at municipal level
- Select 3 demonstration municipalities
- Demonstrate coordinated medical waste treatment among the dedicated medical waste facilities at provincial level
- Select 3 demonstration provinces

Component 7.
Develop and implement a strategy
for the adoption of BAT/BEP

- Formulate techno-economic policies promoting the adoption of BAT/BEP
- Demonstrate and promote different commercial models
- Strengthen national capacity to develop new medical waste treatment technologies
- Develop a medical waste treatment equipment certification and labeling program
- Establish training and accreditation systems
- Extensive stakeholder awareness raising

Component 8.

Project management, monitoring and evaluation

- Establish the project management structure
- Steering group, National Project Management Office, National Project Management Team, National Expert Team, 3 local project management offices
- Carry out a series of management training classes to the national and local project management staff
- Design and implement an M&E mechanism according to GEF M&E procedures

Financial framework (I)

Project Components/Outcomes	Co-financing (\$)	GEF (\$)	Total (\$)
-----------------------------	-------------------	----------	------------

Outcome 1. Strengthen the regulatory framework for medical waste management	514,295	373,785	888,080
---	---------	---------	---------

Outcome 2. Strengthen the institutional capacity	3,490,185	1,409,485	4,899,670
--	-----------	-----------	-----------

Outcome 3. Demonstrate BEP based management of medical waste including measurement and monitoring	1,696,375	628,125	2,324,500
---	-----------	---------	-----------

Financial framework (II)

Project Components/Outcomes	Co-financing (\$)	GEF (\$)	Total (\$)
-----------------------------	-------------------	----------	------------

Outcome 4. Demonstrate BAT/BEP for medical waste disposal using thermal combustion including air pollution monitoring	1,079,960	2,432,600	1,323,200
---	-----------	-----------	-----------

Outcome 5. Demonstrate BAT for medical waste thermal non-combustion, chemical treatment or other appropriate non-combustion treatment	7,600,450	1,984,450	9,584,900
---	-----------	-----------	-----------

Financial framework (III)

Project Components/Outcomes	Co-financing (\$)	GEF (\$)	Total (\$)
Outcome 6. Demonstrate the integrated medical waste management and disposal system in clusters of medical institutions and dedicated disposal facilities	1,287,200	1,137,200	2,424,400
Outcome 7. Develop and implement a strategy for the adoption of BAT/BEP for medical waste management and disposal	5,830,755	2,565,015	8,395,770
Outcome 8. Project management budget/cost	2,565,015	1,858,280	2,977,620
Total project costs	33,077,140	11,650,000	44,727,140

Thanks very much for
your attention!

