

Global Project on Demonstrating and Promoting Best Techniques and Practices for Reducing Health-Care Waste to Avoid Environmental Releases of Dioxins and Mercury

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Terminal evaluation report – FINAL REVISION

GEF Project ID: 1802

UNDP Project ID: 2596 – Atlas project ID 00058547

Country: Global (Argentina, India, Latvia, Lebanon, Philippines, Senegal, Tanzania, Vietnam)

Region: Global

GEF Focal Areas: POPs

GEF Focal Area objectives: 14, 10

Executing Agency: UNOPS

Implementing Agency: UNDP

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1. FOREWORDS

The terminal evaluation of the project “Promoting best techniques and practices for reducing health-care waste to avoid environmental releases of dioxins and mercury” started officially with the recruitment of the Terminal Evaluation Team in the second half of September 2012. The closure of the project activities was expected by September 2012, with project completion set at December 2012.

However, since the very beginning of the evaluation exercise it was clear that some activities were still pending in most of the project countries. In few cases the completion of these activities will allow for significant project achievements, which otherwise will be lost. In other cases the remaining activities are only minor tasks. The evaluators therefore informed the Global Project Team, UNDP and UNOPS about this issue.

In the course of the final evaluation exercise, a proposal was then made and adopted at the Project Global Steering Committee to allow for another year of implementation to enable some countries to finish the work, at no additional expenses for GEF. The present evaluation report, which therefore cannot be considered “final” covers activities carried out until December 2012.

Due the situation, it may be anticipated that an update of this report to take these last activities into account will be carried out by the end of 2013.

Another aspect which should be emphasized, is the great effort paid by the UNDP MPU, and the Global Project Team to keep the project on track and to solve the innumerable issues deriving from the implementation of such sensitive and complex tasks – at the forefront of infection control in hospitals from one side and hazardous waste management on the other side - in eight very diverse countries.

The fact that the project was conducted in all the countries with no deviation from its original design, and that it achieved most of its results should not be taken for granted. This is in large part the result of the careful management ensured by UNDP MPU, who devote time and efforts to attend the weekly teleconference calls with the Global Team and follow up on very many implementation issues with the country offices, and were present at the steering committee meetings and the Global Team Meetings and contributed to them. The CTA was perceived by all the project stakeholders as a real problem solver and an outstanding scientist; the whole GPT worked however as a well integrated team, and maintained the full control of the project for four long years by means of weekly meetings, and several missions conducted in the eight countries.

Finally, one of the peculiarities of this project is the unique involvement of NGOs – particularly, Health Care Without Harm, Toxic Links, Salud sin Daño – in the design and implementation of the project. HCWH is part of the global Project Steering Committee and of some of the National Steering Committees; therefore it worked side by side with governmental institutions – sometime not without difficulties – and provided the project with technical resources, thrust and an unparalleled experience on the management of healthcare waste in the hospitals.

2. SEPTEMBER 2015 UPDATE

The current report has been updated with latest information received from the project countries until August 2015. Latvia and Lebanon provided complete final reports. Argentina, India, and Vietnam submitted detailed final reports but with some missing pieces. Senegal did not submit a complete report but the CTA was able to obtain additional information. Philippines did not submit a final report.

3. EXECUTIVE SUMMARY

3.1. PROJECT SUMMARY TABLE

Table 1: Project Summary Table

Project Title	Promoting best techniques and practices for reducing health-care waste to avoid environmental releases of dioxins and mercury			
GEF Project ID	1802		At endorsement	At completion (November 2012)
UNDP Project ID	2596	GEF Financing	USD 10,326,455	
Country	Global (Argentina, Latvia, Lebanon, India, The Philippines, Senegal, Tanzania, Vietnam)	Total Co-financing	USD 12,970,494	
Region	Global	Total Project Cost	USD 24,021,897	
Focal Area	POPs	Signature of Project Document		June 2008
		Operational Closing Date	Proposed: October 2011	Actual: December 2012

3.2. PROJECT DESCRIPTION

The project “Demonstrating and Promoting Best Techniques and Practices for Reducing Health-Care Waste to Avoid Environmental Releases of Dioxins and Mercury” has the overall objective to “*demonstrate and promote best practices and techniques for health-care waste management in order to minimize or eliminate releases of persistent organic pollutants and mercury to the environment*”. Eight project components are envisaged by the project: 1) Establish model facilities and programs to exemplify best practices in health-care waste management; 2) Deploy and evaluate commercially-available, non-incineration health-care waste treatment technologies; 3) Develop, test, manufacture and deploy affordable, small-scale non-incineration technologies for appropriate use in small- and medium-size facilities in sub-Saharan Africa; 4) Introduce and demonstrate best practices for management of mercury waste; 5) Establish or enhance training programs to build capacity for implementation of best practices and appropriate technologies beyond the model facilities and programs; 6) Review relevant policies, and if appropriate, assist in holding a policy review conference for these purposes; 7) Distribute Project results on best techniques and practices to relevant stakeholders; 8) Make Project results on demonstrated best techniques and practices available for dissemination and scaling-up regionally and globally. In Tanzania only a specific component (component 3) is implemented, whilst all the other components are being implemented in each of the other 7 participating countries, (Argentina, India, Latvia, Lebanon, the Philippines, Senegal and Vietnam).

3.3. KEY PROJECT ACHIEVEMENTS RELEVANT TO UNDP CUMULATIVE POPS RESULTS

Number of national POPs regulative instruments adopted:

Thanks to the project, in 2 countries (Latvia and Vietnam) new regulations on Health Care Waste Management which will have a positive impact in term of U-POPs reduction were drafted, approved by the Parliament, and entered into force. In these countries the new regulations will ensure the implementation of environmentally safe waste management at hospital facilities and the disposal by means of BAT/BEP compliant technologies. In the Philippines, the 3rd edition of the Health Care Waste Manual, approved by DOH, and containing the methodology that the hospitals have to adopt by law for the drafting and implementation of Health Care Management Plans, has been distributed to HCWM operators. In India, the guideline to reduce environment pollution through mercury use was finalized by the government on 8th March, 2010, and a draft biomedical waste management rules was prepared which entered into force on August 2015. The level of effectiveness on these regulatory instruments in preventing UP-POP emission is diverse, and indeed exchanges underwent between GPT and the governmental partners of India and the Philippines on possible improvements.

Number of people trained in POPs management /alternative: Training and capacity building was one of the major efforts of the project. In addition to people who were trained within the project timeframe, it is important to remember that under the project, curricula in the field of HCWM have been established in several universities. Therefore, the training is expected to continue in the future after the project ends.

Within project timeframe, the following amount of people has been trained:

Country	Training at hospital facilities	Curricular training carried out by universities
Argentina	Operators in 2 hospital were trained (6 workshops and 180 people trained in General Roca and 6 workshops and trained 170 people in Reconquista)	During in the second half of 2011 and the first quarter of 2012 UTN, with the technical support of the PWT, implemented the 45 hours training-of-trainers (TOT) program, accounting for a total of 17 teachers and 32 participants coming from 9 provinces and an evaluation through the presentation of elaboration of healthcare waste projects in 6 different hospitals
India	66 people trained at KGMU, 68 people trained in Chennai.	A total of 66 candidates are enrolled for the 6 months Certificate Course on HCMWM at the Study Centre established under the project. Another 29 candidates from 14 partner hospitals in Tamil Nadu were trained through the Certificate Course under the project. The 29 trainers became part of the regular in-house training programme for the 14 project hospitals.
Latvia	900 (HCWM + non-mercury devices, not including dissemination activities)	The Training material developed by the global team was adapted to local needs, translated in Latvian, and spread for more than 75 partners. 60 people trained in short programs
Lebanon	Training of Trainers at 2 hospital facilities completed and assessed.	A training video that can be used by any hospital has been completed. An interactive game was also developed. A training manual on health care waste management was developed. A curriculum was prepared.
The Philippines	Training of the whole staff of 2 hospitals completed	2 training sessions, using the DOH HCWM manual, completed.
Senegal	An overall number of 680 people (the whole staff of 2 hospitals) trained	
Vietnam	251 people trained.	90 trainers trained in a TOT scheme

POPs disposed. The project does not deal directly with the disposal of POPs, however its results, where sustainable, will ensure the reduction of the release of U-POPs (particularly PCDD/F) in the environment. This will occur by means of 2 different mechanisms:

- 1) better waste management at hospital level, resulting in waste minimisation and segregation, which will result in less plastic being incinerated; this activity will be disseminated and replicated, therefore its effects will continue after project end.
- 2) the shift from incineration to autoclaving followed by waste recycling and landfilling

The detailed calculation of the U-POPs release reduction has been carried out directly by the CTA, as most of the countries did not complete this part of their report. The calculation details of the PCDD/F release avoided are reported in Annex 1

	UPOPs reduced by the project (g TEQ/year)	UPOPs reduced if project is replicated (g TEQ/yr)	Notes on replication scenario used in calculation of column C
Argentina	4.8 ⁽¹⁾	30.92	If all rural hospitals and central treatment facilities in Argentina follow the model
India	14.6	183.5	If all central treatment facilities and hospitals sending waste to the central treatment facilities in India follow the model
Latvia	0.011	0.016	If the few remaining incinerators in Latvia are replaced by non-incineration
Lebanon	0.24	0.23	If the remaining incinerators in Lebanon are replaced by non-incineration
Philippines	0 ⁽²⁾		
Senegal	0.60	8.12	If all district hospitals, health centers, and health posts in Senegal follow the model
Vietnam	2.65	24.9	If all central, provincial and district hospitals in Vietnam follow the model
Africa technology	18.5	173.7	If the technology is disseminated in Africa at the current annual manufacturing capacity of the South African manufacturer; the manufacturer can double their current manufacturing capacity which would double the UPOPs reduction per year.

- 1) Indeed Argentina did not inform the evaluator whether the autoclave in Reconquista was finally installed. In case the autoclave was not installed, the PCDD/F release avoided would not exceed 0.1gTEQ/yr
- 2) The Philippine did not provide information concerning the installation and operation of the autoclave. Based on the outcome of visit to the facilities carried out by HCWH, the project activities in the model facilities was not sustained.

3.4. EVALUATION RATING TABLE

In Table 2, the rating of each evaluation component by country and project component are summarized. The detailed rating worksheets are reported in Annex 2.

Table 2 Rating of evaluation components

	Global (incl. Tanzania)	Argentina	India	Latvia	Lebanon	Senegal	The Philippines	Vietnam	Total rating
Monitoring and evaluation	S(*)	MS	S	S	S	MS	MS	S	S

UNDP and implementing partners implementation and execution	HS	MU	S	HS	S	S	MU	S	S
Relevance	S	S	S	S	S	MS	MS	MS	S
Effectiveness and efficiency	S	MS	S	HS	S	MS	MS	S	S
Overall results / Attainment of outcomes	S	MS	S	HS	S	S	MS	S	S
Sustainability	ML	ML	ML	L	L	ML	MU	ML	ML

(*): HS= Highly Satisfactory; S= Satisfactory; MS= Moderately Satisfactory; MU = Moderately unsatisfactory; U=Unsatisfactory; HU= Highly Unsatisfactory

3.5. SUMMARY OF CONCLUSIONS, RECOMMENDATIONS AND LESSONS

Monitoring / Evaluation. Although on the average the monitoring and evaluation was satisfactory, the evaluators found some areas / countries of possible improvement of project monitoring. In Argentina, the project was not monitored on the basis of the standard monitoring forms (AWP, QPR) or at least the evaluators were not provided with those documents. In Vietnam, evaluators were provided with APRs, QPRs, AWP and PIRs, which were however found not very informative; in Senegal, these documents were not available for the last year of implementation (2012). Both Lebanon and Latvia provided limited information on component 2 (Technology) which for these countries represents a significant amount of counterpart funds (2.5 MUS\$ for Latvia and 0.25 MUS\$ for Lebanon). Some differences in the arrangement of project activities and of component numbering among countries were reflected in the structure of the Atlas budget database sheets making difficult the evaluation of financial aspects. The complexity of the project (six to seven components with several activities for each country) created additional difficulties in the proper monitoring at national level. Accounting of counterpart funds (co-financing) was in general very limited, except for Tanzania, India, Vietnam. Although the GPT “Guidance on measurement and documentation” was delivered in the last quarter of 2012, at the time of this update of the terminal evaluation (September 2015) most of the countries did not deliver the required terminal report based on the Guidance, so the CTA had to calculate the amount of PCDD/F avoided for each country.

Project conceptualization / Design. The evaluators consider that the project conceptualization and design are satisfactory. The main objective of the project is to demonstrate best practices and non-burn technologies for the management and disposal of medical waste. The procedures sought by the project for a substantial reduction of POPs release (minimisation, segregation, waste disinfection) are the very same procedures that will prevent the spreading of waste borne disease in the hospitals. Therefore, in addition to its global environmental objectives, the project produces a direct benefit on the health of patients and hospitals personnel, by improving the hygienic conditions of the facilities where it is implemented.

The evaluators consider that the holistic approach sought by the project, aimed at establishing an entire chain of healthcare waste management (from production to disposal) and at the same time supporting non-combustion technologies, is the correct approach for minimising the release of U-POP from the sector.

Most of the project components and Objectively Verifiable Indicators are Specific, Achievable, Relevant and Time Bound. Project component 3 (development and testing of a small scale innovative autoclave for the African market) may be considered as a research and development activity in a highly promising sector: The high technological risk related to Outcome 3 is compensated by the great benefit it may generate if the proposed technology is successfully produced and marketed.

The project activities and components are structured in such a way that risks are minimized, as the failure of one project activity or a component in a country would not affect the completion of the activities in the other countries; a certain level of independence of project activities also exists among components being executed within the project countries.

There are however some shortcomings that should be taken in due consideration in future in designing similar projects:

1. The project does not establish a quantitative target for the reduction of PCDD/F and mercury releases. The project document only states that *“If replicated nationally and sustained, best practices and techniques initiated during the Project’s implementation are expected to reduce the release of an estimated 187 g TEQ of dioxins and 2,910 kg of mercury to the environment each year from participating countries’ health-care sectors”* ;
2. The resource allocated for the technology components are probably too low (24% of the budget including Tanzania); this aspect represented a difficulty for several countries, which, because also of the depreciation occurred in the course of project implementation, had to reduce the number or size of equipment to be procured;
3. Finally, considering the limited budget available at country level, the project structure is probably too complex: 6 to 7 project components per country, with activities to be carried out in 3-4 hospital and 1-2 treatment facilities, represented indeed a significant administrative burden for project management and monitoring, with the result that in some cases the project monitoring at country level was low.

Country Ownership and Drivenness. The level of ownership was significant in almost all the countries. In all the countries except Senegal activities related to the improvement / amendment of legislation and guidance documents on healthcare waste management was carried out; in two cases (Latvia and Vietnam) new legislation was enforced thanks to the project and within project timeframe; in the Philippines, with the support of the project, the country drafted the 3rd edition of the Health Care Waste Management Manual, which is a guidance document all the hospitals are required to comply with by law. In all the other cases, an analysis of legislation was carried out and discussed among relevant stakeholders. In most countries an effective coordination of the project, by means of the National Project Steering Committees and the NWGs has been established; the commitment from the governmental stakeholders (Ministries and Departments of Health, Environment, and in some case Agriculture) is high. In Senegal the general regulation on waste management is currently under revision, but, although the Ministry of Environment committed to hold a conference on waste legislation by the end of 2011 / early 2012 that conference did not take place.

Stakeholder involvement. The important role of HCWH has to be recognized. HCWH contributed significantly to the project design and implementation, and indeed this is the only GEF project on POPs where a NGO is sitting in the Project Steering Committee. In addition, several consultants at both global and national level are or have been members or collaborators of this NGO. Important contribution also came from the national NGOs, like HCWH Philippine, Toxic Links (India), Salud sin Daño (Argentina), Agenda (Tanzania), and the several NGOs operating in Latvia. HCWH and the local NGOs, with their competence, enthusiasm and networking capabilities, ensured trust to the project. In some cases, however, HCWH was not effective in addressing a certain level of conflict with the governments. Difficulties among DOH and HCWH in the Philippines and MOEF and Toxic Links in India were observed, mainly due to the different views on HCWM policies. In the Philippines the project is perceived as too much oriented by HCWH, therefore these difficulties translated in implementation and coordination issues. On the other side, the very good relationship between the government and Salud sin Daño in Argentina was not effective enough to timely understand and address the implementation problems in that country. As the project deals with healthcare waste, the beneficiaries are in most cases hospital facilities, which are under the responsibility of the ministries of health. At the same time, the management of waste is usually under the responsibility of the ministries of environment. For this reasons, these are the two key stakeholders whose participation was sought since the design stage. In all the project countries, the Ministries (or Departments) of Health and the Ministries (or Departments) of Environment are member of the NPSCs, thus ensuring a good coordination among these 2 key stakeholders.

Implementation approach. As already discussed in the MTE, the shift from MEX to NEX created delays and misunderstandings in the course of project implementation. That concerned mainly the initial stage of the project in the majority of the countries. At the same time it is also a fact that the NEX modality has the clear advantage over Agency Execution to enhance project ownership, the project being actually executed locally with only technical supervision from the international experts recruited by the IA.

Concerning other implementation aspects:

1. Operational relationships among project stakeholders: There are 3 main institutions at the national level, whose operational relationship represented a key factor in the project success: Ministries of Health, Ministries of Environment, UNDP COs. In general, the relationships among MOHs and MOEs were good and effective in all the project countries, but there is still a need to improve coordination in the regulatory aspects that may hinder project sustainability. Coordination among UNDP CO and governmental stakeholders was also effective, although due to the limited project size at country level, UNDP CO sometime assigned a low priority to this project.
2. A key for the project success is the availability of trained technical consultants implementing the project activities at the model facilities. In all the countries where skilled technical consultants were operating at the model facilities the improvement in HCW management at the hospital level was evident. In some countries (i.e. Senegal) the recommendation to facilitate the contribution of technical consultant was accepted and taken seriously, and the results was the rescuing of the project with achievement of good results, which otherwise would have failed.
3. All the countries experienced significant difficulties with the procurement of equipment required under component 2 of the project, namely, in drafting of technical specification, bidding, purchasing and installing of these equipment. India solved procurement issues only in the second half of 2012; Argentina has completed the bidding, and procurement, however as of August 2015 the equipment resulted still unused; the Philippines solved only recently the issue of procurement and currently the equipment is still unused. In Vietnam the 5 ton/day autoclave was delivered to the site and unpacked only in November 2012, and was tested and started its operation by the end of 2014. Senegal was successful in the bidding and purchasing of autoclaves for the three model facilities, however the installation and testing of this equipment was completed only in the second half of the year 2012. It is evident that, in future projects, this kind of activities need to be carefully planned starting from project design and early stage of implementation.

Financial planning. Based on UNDP/Atlas data (September 2015) the amount of GEF grant not disbursed yet is relatively low and amounts to USD 456,932 corresponding to 4.1% of the overall GEF grant budget.

Sustainability . As most the benefit of the project in term of reduction of POPs and mercury release in the environment depends on the continuation and replication of the activities and of the good practices established at the model facilities, sustainability is one of the main criteria for evaluating the project success. Sustainability has been evaluated taking into account socio-

economical, institutional /governmental and financial risk; whilst environmental risk has not been considered as all the project activities are all highly sustainable and are not significantly endangered by environmental parameters. Socio-political risk has been evaluated based on the World Bank classification (WB, 2011). Financial and institutional risks have been evaluated on the basis of data gathered at component and country level in the course of the evaluation. As the rule for assessing project sustainability in a country is to assign the minimum sustainability value among the three sustainability components considered, countries with high socio-political risk would be penalized and may score low (high risk) even when the risk for financial and institutional sustainability is low. This situation concerns India, Lebanon, the Philippines, Vietnam. Therefore, although reported in the table, the socio-political risk has not been used for calculating the sustainability risk. The overall risk for project sustainability scores Moderately Low.

Attainment of objectives (effectiveness, efficiency, impact) by country.

Tanzania (project component 3): Component 3 of the Project (Tanzania) has been executed directly by UNOPS with the objective to develop, test and disseminate affordable non-burn health-care waste treatment technologies that can be built and serviced in sub-Saharan African countries using locally available supplies and skills. After completion of pilot activities and testing of the prototype in Tanzania, due to difficulties in the local commercial production of the equipment, the project, following the indication of the CTA, decided to launch a bid among African countries for the commercial production of the new autoclave system. The new system has been placed on the market by a South Africa manufacturer who exceeded all the tests and certifications, and then distributed in African countries under the UNDP Ebola response project where it proved extremely successful (see: <https://noharm-global.org/articles/blog/global/west-africa-autoclaves-deployed-help-anti-ebola-campaign>). **(Score: HS)**

Argentina: In Argentina the best results were achieved in the field of training, and in the experimentation of Fenton technologies for the disposal of cytotoxic waste. The project in Argentina however faced several difficulties, including changes in administrative arrangements, complexities in international procurement, delay in reaching an agreement with the provincial government on the management modality for the autoclave which has been procured. The autoclave and boiler have been finally procured, but information on whether the equipment was finally put into operation were never provided. The project achieved only limited results on the legislative components **(Score: MS)**

India . Although – due to financial management issues – disbursement were blocked for one whole year, in India in the last year of implementation significant achievements occurred in almost all the components. The improvement in waste management obtained at the King George Medical Hospital in Uttar Pradesh compared to the baseline were outstanding; the project contributed to the improvement of one incineration facility, and in Tamil Nadu a centralized equipment consisting of an autoclave and a shredder has been procured and tested. Some activities (training, procurement of mercury devices) faced delays due to retirement of key staff, however eventually these were completed.. The difficulties related to the financial mechanism established in the country affected disbursement of funds until project conclusion. In India, a limited extension of project deadline allowed for the successful completion of project activities **(Score: S)**

Latvia. All the activities were successfully completed in Latvia within the first months of the year 2012. The assistance provided by the project experts to the model facilities was continuous and very effective. Thanks to the very good cooperation among all the project stakeholders, one of the outstanding results achieved in Latvia was the development and approval by the Parliament of a new regulation on medical waste. The project achieved positive results also in the other components, including an effective cooperation with a private medical waste disposal operator, which contributed to the co-financing budget, and which effectively adopted Environmentally Sound standards for HCWM. **(Score: HS)**

Lebanon. All the project activities were successfully completed in Lebanon. In Lebanon, the project established original modalities for training and dissemination: a training video that can be used by any hospital has been completed. An interactive game for training on healthcare waste segregation was also developed. Similarly to Latvia, an operator (Arc en Ciel) of healthcare waste disposal facilities contributed to the project activities. **(Score: S)**

Philippines: In the Philippines the project faced two main issues: the repeated failure of the procurement of the autoclaves for the two model facilities and the disagreement between the National Project Team and the Global Project Team on technical issues, including reference to incineration technologies in the Healthcare Waste Manual, technical specifications on non-combustion technologies to be procured, use of training materials. A significant part of the budget was shifted from the model facility component to the technology component. Although during the extension period the project was able to complete the procurement of equipment, no information was given on the operational status of the equipment. Information provided by the CTA indicated that the segregation capability in the model facilities was still very poor. The Philippine was the only project country which did not provide a final project report **(Score: MS)**

Senegal. The project solved most of the issues emerged at Mid Term, by ensuring proper installation and connection of the equipment already procured in the model facilities (Hopital General Du Grand Yoff, Sangalcam hospital, and Youssou Mbargane Diop Hospital), deployment of the mercury equipment, and completion of training activities. A “ribbon cutting” event was organized in September 11, 2012, which actually boosted HCWM awareness and facilitated the project completion. No significant results were achieved on the side of updating the HCWM legislation. Due to the poor financial management of the project, in its last year of implementation the project was not properly monitored. **(Score: S)**

Vietnam. The project since the end of 2011 benefited of a substantial acceleration and achieved most of its objectives; however, it is evident that due to the late start, the time for carrying out practical activities was too short, and the outcomes are not very well consolidated yet. The waste management procedures at model facilities improved significantly even in comparison with the findings reported by the international consultants after their last visit (April 2012). Almost 100% of the facilities' staff was trained. Management of sharp waste is in place, although GPT raised concerns about its effectiveness. Hospitals confirmed that they would be able to update annually the waste management plans and implement these plans on their own budget. Delay on the side of instalment and testing of the centralized autoclave and of building of the related infrastructures was only solved by the end of the year 2014 thanks to the direct intervention of the CTA. **(Score: S)**

4. ACRONYMS AND ABBREVIATIONS

AA	Administrative assistant
CTA	Chief Technical Advisor
DOH	Department of Health
ESM	Environmentally Safe Management
GEF	Global Environmental Facility
GPSC	Global Project Steering Committee
GPT	Global Project Team
HCW	Health Care Waste
HCWH	Health Care Without Harm
HCWM	Health Care Waste Management
LTEC	Lead Terminal Evaluation Consultant
MEX	Mixed Execution Modality
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOEF	Ministry of Environment and Forests
MOH	Ministry of Health
NEX	National Execution modality
NTEC	National Terminal Evaluation Consultant
NPC	National Project Coordinator
NPD	National Project Director
NPSC	National Project Steering Committee
NTC	National Technical Consultant
NWG	National Working Group
OVI	Objectively verifiable indicators
PCDD/F	Polychlorodibenziodioxins/Polychlorodibenzofurans
POPs	Persistent Organic Pollutants
UIC	University of Illinois School of Public Health Great Lakes Center
UNDP	United Nations Development Program
UNDP CO	UNDP Country Office
UNDP HQ	UNDP Headquarter
UNOPS	United Nations Office for Project Services
USD	United States Dollar
WHO	World Health Organization

5. INTRODUCTION

5.1. PURPOSE OF THE EVALUATION

The terminal evaluation has been conducted in compliance with the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects. The main stakeholders in the evaluation process are UNOPS, UNDP Country offices in the respective participant countries, World Health Organization office in Geneva and the respective countries, Health Care Without Harm, relevant ministries involved in the project (Ministries or Departments of Health and Environment) and the project implementing institutions, as well as the project steering group members established in each country (which include ministry representatives, NGOs and academia). The project is implemented through the involvement of health institutions, which develop and showcase best practices. Thus, key project partners, which have been at the focal point of the evaluation, included the specific health care establishments engaged in the project in each country

As per TOR, the principal objectives of the evaluation have been to **assess the achievement** of project results, and to **draw lessons that can both improve the sustainability** of benefits from this project, and **aid in the overall enhancement of UNDP programming**. The evaluation relied on the outcome of the mid-term evaluation of the project that was conducted in June-August 2011, by the same team of evaluators. As the mid-term evaluation report included lessons learned and recommendations for the completion of the project, one of the aims of the terminal evaluation is to review the project's progress from mid- to final term, and conclude whether the project as a whole, and/or the national components have addressed and duly responded to the concerns of the mid-term evaluation accepted by the management team(s).

The second main focus, as a final evaluation is to take a final, expert, independent look at the project and its results, provide ratings in accordance with the GEF and UNDP guidelines, and provide recommendations for the final phase of the project on ensuring sustainability and on the replication approach of the project.

As per the TOR, the Lead Terminal Evaluator Consultant (LTEC) visited 3 countries: Vietnam, India and Argentina. These missions added up to the other 3 countries visited in the course of the midterm evaluation, which were Latvia, The Philippines and Senegal, covering therefore 6 of the 8 project countries.

Due to the complexity of the project, and the relevant number of project stakeholders, a significant effort was devoted to the consultation process. During the first stage of the evaluation, the LTEC focused his efforts in the preparation of questionnaires templates, definition of consultation criteria, and team building – by means of briefing, conferencing and when possible meetings -with the eight National Terminal Evaluator Consultants (NTECs). The evaluation team interviewed (mostly by face to face meetings) 86 persons, of which about 55 in the course of the missions performed by the LTEC and the NTEC in Vietnam, India and the Argentina.

5.2. SCOPE & METHODOLOGY

The following were the fundamental evaluation steps carried out:

Preparation of templates for questionnaires and surveys. These templates were mainly based on the key evaluation questions deriving from the project logical framework and the GEF methodology terminal evaluation. These forms with few modifications were almost the same of the forms used at Mid Term evaluation; therefore, at Terminal Evaluation the function of questionnaire form was mainly limited to a “memo” for conducting interviews and understanding progresses in comparison with Mid Term Evaluation.

Briefing with national evaluators. 8 national terminal evaluation consultants (NTECs) were in charge of conducting the evaluation in the 8 participating countries and of assisting the Lead TEC in establishing mission agenda, collecting and translating relevant project documents, and drafting relevant part of the TE report. Before the briefing, which was conducted by telephone or Skype conferences, all the NTECs were provided with the following documents:

- Basic methodological information for the terminal evaluation;
- Questionnaire / interview template for project managers;
- Questionnaire / interview template for managers or staff of model facilities;
- Template for reporting co-financing budget and project progresses;
- List of project stakeholders to be interviewed / contacted;
- Logical Framework template to be used for listing interviews performed, documents gathered, and for rating indicator values on the basis of interviews outcome and document examination;

Subsequently, the NTECs were provided with the relevant extracts from GPTs meeting notes

Interviews / questionnaires at the national level. In general, the NTECs interviewed at least one person for each of the following entities:

- UNDP Country Office representatives in charge of project activities;

- Members of the National Project Steering Committee;
- Members of the National Working Group;
- Representatives of NGOs or stakeholder associations involved in the project activities;
- Operators of the model facilities involved in the project activities.
- The list of the persons interviewed by country is provided in Annex 4

Interviews of key persons of the Global Project Team.

The following members of the Global Project Team have been interviewed by the LTEC:

- Jorge Emmanuel, Project CTA
- Ashley Iwanaga, Global Project Coordinator

Missions. As per TORs, the LTEC performed three missions in the following countries participating in the project:

- Vietnam (from November 4th to November 12th)
- India (from November 18th to November 24th)
- Argentina (from December 2nd to December 11th)

The general objective of the missions was to visit the model facilities where the project activities are being conducted, and holding meeting with the key project stakeholders, namely:

- Members of the NPSCs
- Officers of UNDP Country Offices and UNDP country representatives
- Members of the NWGs and technical consultants;
- Personnel and Managers of the model facilities and of Centralized Treatment Facilities
- Relevant Stakeholders at the governmental and industry level;
- Representatives of NGOs

Mission agendas are attached as Annex 8

5.2.1. SCORING.

A scoring, expressed as High Satisfactory, Satisfactory, Marginally Satisfactory or Unsatisfactory was specifically required in the TOR for the following evaluation aspects:

- Monitoring and evaluation
- UNDP and implementing partners implementation and execution
- Relevance
- Effectiveness and efficiency
- Overall results / Attainment of outcomes
- Sustainability

In this chapter, the criteria and methodologies adopted for this scoring are discussed.

Evaluation rating and criteria. An assessment of the project has been carried out, based against expectations set out in the Project Logical Framework/Results Framework which provided performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation covered the criteria of: relevance, effectiveness, efficiency, sustainability and impact as following:

Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution	Sustainability ratings	Relevance ratings
6: Highly Satisfactory (HS): no shortcomings 5: Satisfactory (S): minor shortcomings 4: Moderately Satisfactory (MS): recoverable shortcomings. 3. Moderately Unsatisfactory (MU): significant shortcomings 2. Unsatisfactory (U): major problems 1. Highly Unsatisfactory (HU): severe Problems	4, Likely (L): negligible risks to sustainability 3. Moderately Likely (ML): moderate risks 2. Moderately Unlikely (MU): significant risks 1. Unlikely (U): severe risks	2. Relevant (R) 1.. Not relevant (NR)
Additional ratings where relevant:		

Not Applicable (N/A)
Unable to Assess (U/A)

In compliance with the TOR, ratings have been provided on the following performance criteria.

Evaluation rating by criteria			
1. Monitoring and Evaluation	Rating)	2- IA and EA implementation	Rating
M&E Design at entry	(HU to HS, 6 levels)	Quality if UNDP implementation	(HU to HS, 6 levels)
M&E Plan Implementation		Quality of execution – Executing Agency	
3. Assessment of Outcomes		4. Sustainability	Rating
Relevance	(R or NR)	Financial resources:	(U to L, 4 levels)
Effectiveness	(HU to HS, 6 levels)	Socio-political:	
Efficiency		Institutional framework and governance:	
Overall project outcome ratings		Environmental :	
		Overall likelihood of sustainability	

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Impact. An impact scoring has been added to the evaluation of outcome. Each project component has been assigned with a different weight in term of its direct, indirect or secondary impact on the main project objective (U-POP) reduction, as from the following table. The impact weight has been used to weight scores concerning effectiveness and efficiency of the activities carried out at country level. A sensitivity analysis of this parameter revealed however that this weighting would not affect significantly the ranking of project countries.

Component	Description	Direct impact (1) Indirect Impact (0.5) Secondary impact (0.25)
1.	Model facilities.	1
2.	Waste treatment technologies.	1
3.	Non-incineration technologies in sub-Saharan Africa	1
4.	Non mercury equipment	1
5.	Establish or enhance national training programs.	0.5
6.	National policies.	0.25
7.	National dissemination .	0.25
8.	Regional and global dissemination and scaling up.	0.25

Concerning the attainment of outcomes, as a rating has to be provided for the results achieved by the 7 participating countries plus the component 3 carried out in Tanzania, this was mostly based on the number of objectively verifiable indicators fulfilled, confirmed by interviews and check of documentary evidence. A specific semi-quantitative approach was developed for this purpose. As far as the assessment of outcomes is considered, a specific formula has been adopted for relating project activities to the amount of avoided emission of U-POPs, to bring immediate evidence of the impact the project could have toward the achievement of SC objectives. The evaluation therefore included a country by country qualitative assessment – built into the formula used for the ranking - of the amounts of dioxins and mercury that could be reduce.

5.2.2.SCORING SYSTEM FOR MONITORING AND EVALUATION

The following approach was adopted in evaluating Monitoring and Evaluation:

- Consistency of the methods adopted by the different project management structures for evaluation and monitoring;
- Use of the logical framework in project monitoring;
- Effectiveness of reporting and communication among project structures;
- Effectiveness of financial monitoring – adoption of realistic and reliable budget workplan;
- Effectiveness of technical monitoring – adoption of measurable indicators and of realistic timelines;

Also in this case, the score was subjectively assigned by the LTEC both on the basis of the analysis of the project documentation and by means of interviews and questionnaires with the main project stakeholders.

5.2.3.SCORING SYSTEM FOR UNDP AND IMPLEMENTING PARTNERS IMPLEMENTATION AND EXECUTION

Scoring system for this evaluation items has been assigned subjectively by the evaluators on the basis of the following considerations:

- Effectiveness of implementing partners in implementing and executing project activities, based also on the availability of management documents
- Coordination among implementing partners, evaluated on the basis of consistence on their perception of project status, problem to be solved, frequency of their interactions;
- Capacity of solving conflicts among implementing partners.

5.2.4. SCORING SYSTEM FOR EFFECTIVENESS, EFFICIENCY AND IMPACT

The scoring system for the attainment of outcomes and achievement of objectives has been developed with the purpose to assess the country level performance in a consistent manner. The main parameters used for this evaluation were the effectiveness, efficiency and impact of the activities.

The basis for the scoring was mainly the measurement of the Objectively Verifiable Indicators (OVIs). OVI were measured cross checking, where possible, the information provided on relevant reports (like APR, QPR, etc.), with all available documents, including administrative documents, interviews, site visits.

For each activity and each country, the scoring for attainment of outcomes was therefore structured as following:

$$S = \frac{\sum_1^c \left[\left(\frac{\sum_1^a e}{a} + \frac{\sum_1^a ef}{a} \right) \times I_c \right]}{\sum_1^c I_c}$$

Where S = score, c = number of project components, a = number of activities for each project component, e = effectiveness value (from 0 to 6), ef = efficiency value (from 0 to 6), I = Impact for component.

Scores are assigned as following: = 0 = HU; from 0.5 to 1 = U; from 1 to 2 = MU; from 2 to 3 = MS; from 3 to 4 = S; over 4 = HS

5.2.5. SCORING SYSTEM FOR RELEVANCE

Relevance: all the project activities performed are considered relevant to the project objectives and the GEF 4 and 5 POPs focal area strategies and objectives. Scoring for relevance was therefore not included in the evaluation at the country level.

5.2.6. SCORING SYSTEM FOR SUSTAINABILITY

Sustainability The sustainability value within each component has been scored by assigning to the component the minimum value among the sustainability score for the 2 sustainability components (Institutional framework and governance, Financial). Financial, socio-political and Institutional sustainability have been assessed on the basis of a four level scale (Likely sustainable = 3, Moderately Likely sustainable = 2, Moderately Unlikely sustainable = 1, Unlikely sustainable = 0). Environmental sustainability has not been included in the evaluation as all the activities performed are considered highly sustainable from the environmental point of view. The socio-political sustainability has been evaluated on the basis of the World Bank Governance Index for socio-political risk, however it has not been used for the overall sustainability evaluation scoring.

6. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

6.1. PROJECT START AND DURATION

In the request for CEO endorsement the project starting date was set as October 2007; the expected starting date for the mid term evaluation was October 2009, and the expected completion date was October 2011. Due to the delayed starting, the project closure was recently postponed to December 2012 by decision of the Global Project Steering Committee (Plenary Meeting, June 8-10 2011, Riga). At the Dec 4, 2012 GPSC meeting in Dar es Salaam, the GPSC agreed to continue work plan activities into 2013 for countries who need more time to complete project objectives. No exact date was set. In some countries, project activities continued until the end of the year 2014. Philippine never delivered a final report, therefore it is assumed that only the activities which were completed at TE have been completed.

6.2. PROBLEMS THAT THE PROJECT SOUGHT TO ADDRESS

Incineration and open burning of health-care waste are the one of the main sources of dioxins released in the environment, and are major modes of transport for mercury. Mercury spills and the breakage or inappropriate disposal of mercury-containing devices, such as thermometers and sphygmomanometers, are the principal ways by which mercury from health facilities enters

the environment. Little data are available quantifying releases of dioxins and mercury to the environment from health-care facilities in developing countries.

By improving segregation of healthcare waste and demonstrating non-combustion pre-treatment technologies, the project intends to promote technologies and procedures that will greatly reduce the emission of U-POPs.

The contaminants to be addressed by the project are the unintentionally produced POPs listed in Annex C of the Stockholm Convention (polychlorinated dibenzo-p-dioxins, dibenzofurans, PCBs and HCB) and mercury.

This Project falls primarily under the GEF's POPs Focal Area (OP 14). However, the project's mercury component falls under GEF OP 10, the Contaminants-Based Operational Program of the International Waters Portfolio.

6.3. IMMEDIATE AND DEVELOPMENT OBJECTIVES OF THE PROJECT

The Project objective is to demonstrate and promote best practices and techniques for health-care waste management which at the same time can reduce the emission of U-POPs and mercury, and reduce waste borne diseases in the hospitals.

The Project goal is to demonstrate this approach in seven countries at different stages of development, in different regions and working in different UN languages. Additionally, the Project will demonstrate effective minimization of mercury releases to the environment resulting from health-care practice. This Project component is a barrier-reduction effort aimed at protecting International Waters from contamination by persistent toxic substances, as described in the GEF OP 10.

To fully achieve cooperation and buy-in, the Project's global environmental objectives have been linked to the dominant concerns of health providers, namely, improvement of the quality and effectiveness of the delivery of health services more broadly. The project rationale is that best practices for health-care waste management also improve infection control and occupational safety and reduce nosocomial infections, and that the experience in many health-care facilities has shown that proper health-care waste management and minimization can reduce the overall cost of health-care delivery.

6.4. BASELINE INDICATORS ESTABLISHED

Concerning emission of dioxins and mercury, a baseline yearly release value of around 187 g TEQ of dioxins and 2,910 kg of mercury to the environment each year from participating countries' health-care sectors is estimated. The project objective is to reduce the emission of these pollutants, though a quantification of the achievable reduction is not reported in the project.

Based on the project document, *"investments in adoption of Best Available Techniques and Best Environmental Practices with respect to medical health-care waste management will, to varying degrees amongst the participating countries, be limited due to a lack of incentives, a lack of awareness and capacity amongst stakeholders."* The baseline analysis by country reported in project documents basically concerns the presence of alternatives to incineration. Other aspects which may be relevant to the reduction of U-POPs (adoption of BAT in incineration, considering that the phase-out of this technology are not always practicable; country capabilities in the field of sampling and analysis of dioxins) are not mentioned in the baseline analysis.

6.5. MAIN STAKEHOLDERS

Main stakeholders of the project, identified at the project stage, are:

- UNOPS (United Nation Office for Project Services), in charge of executing the global project component and the Tanzania component
- UNDP, in charge of execution of the project in the 7 project countries by means of it UNDP COs
- WHO (World Health Organization)
- HCWH (Health Care Without Harm)
- Ministries of Health
- Ministries of Environment
- Model facilities.
- Manufacturer of non combustion disposal technologies
- Private owner of disposal facilities.

6.6. EXPECTED RESULTS

From Project Document: *"If replicated nationally and sustained, best practices and techniques initiated during the Project's implementation are expected to reduce the release of an estimated 187 g TEQ of dioxins and 2,910 kg of mercury to the environment each year from participating countries' health-care sectors. The Project will also lay the groundwork for sustainability, replicability and the scaling-up of best techniques and practices beyond the model facilities and the Project countries by establishing or enhancing national training programs, pursuing policy reform, developing replication toolkits and*

awareness-raising materials, and disseminating these materials nationally and globally. An additional component aimed at developing locally-produced, affordable, non-burn health-care waste treatment technologies will be executed in Tanzania.

7. FINDINGS

7.1. PROJECT DESIGN / FORMULATION

7.1.1. ANALYSIS OF LFA/RESULTS FRAMEWORK (PROJECT LOGIC /STRATEGY; INDICATORS)

The technical objective of reducing the release of PCDD/F and mercury is pursued by means of a demonstration / replication approach structured in 8 project outcomes:

- 1) *the establishment of model facilities and programs to exemplify best practices in health-care waste management, and the development of materials to facilitate replication;*
- 2) *the deployment and evaluation of commercially-available, non-incineration health-care waste treatment technologies appropriate to the needs of each facility or cluster;*
- 3) *the development, testing, manufacture and deployment of affordable, small-scale non-incineration technologies for appropriate use in small and medium-size facilities in sub-Saharan Africa, and preparation and dissemination of manuals for their manufacture, installation, operation, maintenance and repair;*
- 4) *the introduction of mercury-free devices in model facilities, evaluation of their acceptability and efficacy, and development and dissemination of awareness-raising and educational materials related to mercury;*
- 5) *the establishment or enhancement of training programs to build capacity for implementation of best practices and appropriate technologies beyond the model facilities and programs;*
- 6) *the review of relevant policies, seeking of agreement by relevant authorities on recommended updates or reformulations if needed, seeking of agreement on an implementation plan, and if appropriate, assistance in holding a policy review conference for these purposes;*
- 7) *the distribution of Project results on best techniques and practices to relevant stakeholders, dissemination of materials, and holding of conferences or workshops to encourage replication; and*
- 8) *the making available of Project results on demonstrated best techniques and practices for dissemination and scaling-up regionally and globally.*

A “SMART” (Specificity, Measurability, Relevance, Time Bound) analysis of project outcome and of objectively verifiable indicators has been carried out during the project Mid Term Evaluation.

The results of that analysis are summarized below:

Specificity: Project outcomes have a different degree of specificity. Outcomes 1 to 5 may be considered highly specific, and indeed they were carried out in all the countries following very similar approach and methodologies. Outcomes 6 to 8 are less specific, and indeed they were carried out in the countries adopting different approaches, with different results and degree of success.

Measurability. The project does not establish a quantitative objective for the reduction of PCDD/F releases. The project document only states that “*If replicated nationally and sustained, best practices and techniques initiated during the Project’s implementation are expected to reduce the release of an estimated 187 g TEQ of dioxins and 2,910 kg of mercury to the environment each year from participating countries’ health-care sectors*”

In term of avoided release of POPs and mercury, only outcome 1, 2, 3 and 4 are measurable; all the other outcomes are not directly measurable and even their measurability by means of proxies is uncertain. The measurability of the above outcomes is also affected by the uncertainty in the baseline measurement; in Annex 3 of project document baseline estimates for 5 of the 7 project countries concerning release of mercury and dioxin is provided. To overcome measurability issue and to ensure consistence, the GPT distributed in September 2012 to the project countries a guidance document named “Guidance On Measurements And Documentation” which sets methodologies and forms for measuring project achievement. The deadline set for submission of final measurement was set by the GPT as October 17, 2012. Argentina submitted their information in a 700 page report, which was firstly sent to the evaluators in December 2012 fragmented in several parts, and finally provided by the CTA on January 26, 2013. Lebanon submitted its report during the GPSC meeting on December 4, 2012. India, Philippines, Senegal and Vietnam submitted incomplete reports.

Achievability (A of SMART). Although very ambitious, all the project objectives are practically achievable. The availability of a team of high level international experts (the GPT) led by the CTA was set since project design as one fundamental resource to solve any technical issue that would have emerged in the course of implementation. Only component 3 (the development and testing of a small scale innovative autoclave for the African market) poses a certain degree of technological risk, associated to the development of new technologies; component 6 (policy) is also associated with significant risk due to the fact that the

issuing of new legislation involves political decisions by the country governmental bodies. In general, the achievability of outcomes appears high

Relevance (R of SMART) All the project components can be considered relevant as far as the main objective to reduce POPs and mercury emission is concerned. Some of the outcomes may be considered as having a direct impact on the release of POPs or mercury: activity 1 (establishment of proper HCW practices at model facilities, including waste minimisation and waste segregation); activity 2 (deployment of non combustion technologies for the disposal of HCW); activity 4 (adoption of non mercury devices) may be considered as such. Other project components will have an indirect impact on the emission of POPs and mercury, like training, dissemination, revision / issuing of HCW policies. Activity 3 is highly relevant, but its success depends both on the successful demonstration of the technology and on its subsequent commercial success, which is however beyond the scope of the project. In general, all the project components and outcomes are highly relevant and the correct completion of all of them is key for the achievement of the project objectives.

Time Bound (T of SMART) A clear time schedule is established in the project document. The outcomes however are quite independent of each other, which ensures a good flexibility in the project implementation.

SMART analysis of project indicators

Objectively Verifiable Indicators have been used for the assessment of the project progress in the 7 participating countries. The outcome of the SMART analysis of OVIs, carried out at Mid Term Evaluation, at least partially based on the practical experience gained in the course of the evaluation, is confirmed at Terminal Evaluation. The large majority of the indicators are Achievable and Relevant, and are or may be bound to a specific project timeline (hence being Time bound). The indicators pertaining to outcomes characterized by a low level of specificity (outcomes 6, 7 and 8) are in general characterised by a low measurability.

7.1.2. ASSUMPTIONS AND RISKS

Achievement of the goals and outcomes of all elements of the Project is based on the following assumptions and risks:

- Participating countries will maintain political and social stability over the course of the Project period;
- There will be good level of cooperation from the health care sector;
- Commercially-available alternative health-care waste treatment technologies that are appropriate to the needs of each model facility or cluster could be purchased, deployed and evaluated within the budget parameters ;
- Affordable mercury-free devices for use in model facilities must remain within budget, since cost will be a large part of determining device acceptability;
- Demonstration results in the Project countries will provide a framework that will help inform interventions that may be instituted in other countries;
- Training institutions must be capable of targeting the most appropriate personnel in non-combustion Project facilities in order to implement systems of the kind demonstrated by the Project and effectively utilize the skills the training program is designed to impart;
- Participating countries must be willing to undertake a policy review aimed at possible reformulations and/or updates to their policy instruments.

Most of the assumptions listed above proved to be correct. Due to the substantial delay in starting the activities, the project however faced difficulties related to the increase of equipment costs, resulting in downsizing of the purchased technology to stay within budget limit. Moreover, although policy review was carried out in most project countries, only in two countries (Latvia, Vietnam) it resulted in the formal approval and promulgation of new healthcare waste legislation; in Senegal, no substantial effort on policy review was made, whilst in Argentina the detailed review of national and provincial regulations remained at the stage of internal project report.

7.1.3. LESSONS FROM OTHER RELEVANT PROJECTS (E.G., SAME FOCAL AREA) INCORPORATED INTO PROJECT DESIGN

The project document does not mention lessons from any other project in the area of U-POP reduction or POPs management. Partially this is because there were no similar projects ongoing or completed when the project was proposed. However, lessons from other existing U-POPs reductions projects in other sectors, proposed and initiated by other UN agencies, could have been useful examples to be considered in project design. On the side of reduction of U-POP release, the project document is mainly focused on the promotion of non-burning technologies and on the adoption BEP at the level of waste management in the hospital waste. The option to reduce U-POP dioxin by upgrading existing incinerators (BAT), adoption of best practices for incineration management (BEP) or building capacity in the field of U-POP monitoring was not explicitly considered in the project document. The evaluators consider relevant the following comments provided at PDF-B stage by WB (Annex 7a of the project document, Comment 5):

“Finally, the proposal presents a general objective of eliminating practices of incineration from future HCW management projects of all implementing agencies (page 14). This is not a pertinent objective, nor is it recommendable. While the use of batch HCW

incinerators with no emissions control should be controlled and ultimately stopped, recommending an end to HCW incineration, with no analysis of the context, the technologies, or the alternatives, is misleading.”

Indeed the problem of incineration in many developing countries is that the existing incinerators are very often only small, rudimentary equipment operating discontinuously and lacking even the most elementary form of air pollution control systems, which cannot clearly be upgraded in any way. Due to the lacking monitoring capacity, these equipment often receive a “formal” permit to operate without any substantial control from the authority. There is therefore an urgent need to increase the awareness of local and central authorities on the harm for the environment and health brought by these substandard equipment.

It must be acknowledged however that in one case (India) the project tried to improve the incineration of health care waste by establishing the on-line monitoring of combustion parameters (O₂, CO₂, CO) for one new, small-scale batch incinerator in the Central Treatment Facility in Tamil Nadu. Although the upgrading of the incinerator did not allow the fulfilment of the Indian emission limit for PCDD/F, nevertheless it caused a significant reduction of the Dioxin release.

7.1.4. PLANNED STAKEHOLDER PARTICIPATION

The Project is structured so as to allow stakeholder involvement at different levels.

Full Project implementation is carried out under the guidance of a Global Project Steering Committee (GPSC) whose members include one representative from each of the following: UNDP, UNOPS, a senior level official designated by each of the Project participating Governments, one representative each from the World Health Organization (WHO) and the international NGO Health Care Without Harm (HCWH), as well as other major donors and partners.

In each participating country, a National Project Steering Committee (NPSC) oversees the national Full Project activities. Typically, the NPSC include a designated senior representative from the Health and Environment Ministries and from the Ministry in which the GEF Operational Focal Point is located, a representative or a liaison from the authority responsible for Stockholm Convention NIP preparations and from the authority responsible for Basel Convention implementation.

The NPSC usually (but not always) also includes representation from the national health care sector, the country WHO and UNDP offices, as well as one or more appropriate representatives from national NGOs with demonstrated concern and activity in matters associated with health-care waste management. In addition to the NPSC, broad stakeholder participation will also take place through the National Working Group (NWG), composed of individuals from appropriate ministries, agencies and stakeholder groups who have practical involvement or interest in day-to-day Project activities. The NWG may include representatives from UNDP Country Offices, WHO Country Offices, health, environment and other appropriate ministries, NGOs, training institutions, health-care facilities, medical and municipal waste service providers, and health-care related associations. The NWG will advise the NPSC and will assist the National Consultants by providing expertise and advice on project-related policy, economic, scientific and technical issues and by assisting in networking.

As the project deals with healthcare waste, the direct beneficiaries are in most cases hospital facilities, which are under the responsibility of ministries of health. At the same time, the management of waste is usually under the responsibility of the ministries of environment. For this reasons, these are the two key stakeholders whose participation was sought since the design stage. In all the project countries, the Ministries (or Departments) of Health and the Ministries (or Departments) of Environment are members of the NPSCs, thus ensuring a good coordination among these 2 key stakeholders. The contribution of national or international NGOs like Health Care Without Harm, Agenda (for the Tanzania component), Toxic Links (in India) was massive and qualified since the project design stage. Unfortunately, after project inception, some national stakeholders (like Toxic Links in India, or some national NGOs in the Philippine) dropped out.

7.1.5. REPLICATION APPROACH

The replication approach envisaged by the project is based on demonstration of practices and technologies at local level in diverse circumstances, capacity building activities and legislation upgrade at national level. The World Health Organization (WHO) and Health Care Without Harm (HCWH) were supposed to support and facilitate global dissemination.

The replication approach is therefore based on the integration of the three project levels: local, national and global. It requires all project partners to be aware of the replication mechanism, and to carry out their tasks in a very coordinated and integrated fashion, which however in a few cases did not happen.

Replication is based on the basic project unit which is a “model facility” (a hospital or a cluster of hospitals). In the original project design, specific practices at the individual facility level will be identified, evaluated and incorporated into training curricula by national training and educational institutions for the reinforcement of lessons learned at the local and national levels. These facility-level experiences also serve to provide background on best practices and technologies for integration into any national legislation, regulation or policy.

This very good replication approach has been fully adopted in Latvia; integration among activities in model facilities, training and policy review was adopted with diverse effectiveness in all the other countries.

Senegal is another good example. The written medical waste management procedures developed for the model facilities are now being used by PRONALIN as a reference to be replicated by all Senegalese hospitals in the country.

The global dissemination of the project results was ensured in most cases by the GPT and more specifically by the CTA, who proactively facilitated the publication of project results in scientific papers or conferences; and partially also by HCWH and WHO.

7.1.6. UNDP COMPARATIVE ADVANTAGE

As from the GEF Council Document on “Comparative Advantages of the GEF Agencies, *“UNDP’s comparative advantage for the GEF lies in its global network of country offices, its experience in integrated policy development, human resources development, institutional strengthening, and non-governmental and community participation. UNDP assists countries in promoting, designing and implementing activities consistent with both the GEF mandate and national sustainable development plans. UNDP also has extensive inter-country programming experience.”*

On the basis of the above it can be affirmed that, beside the technical aspects of the project, the competitive advantages of UNDP perfectly fit the developmental and multi-country features of the project.

Although activities in the field of HCWM are not explicitly listed as UNDP comparative advantages by GEF, activities in the field of POPs are listed as one of UNDP comparative advantages (Comparative Advantages of the GEF agencies, GEF Council June 12-15 2007). Concerning POPs, GEF considers that *“In addition to UNDP’s core sound management of chemicals program, this priority area brings together the work of UNDP as an Implementing Agency supporting the compliance objectives of the Montreal Protocol on Substances that Deplete the Ozone Layer and the Stockholm Convention on Persistent Organic Pollutants. Priorities include:”*

(... omissis...)

(b) A portfolio totaling US \$57.3 million, active in 35 countries to support the reduction and elimination of releases of persistent organic pollutants (POPs) under the Stockholm Convention; and,

(c) Identification of opportunities for improvement of cross-sectoral governance for SMC through establishment of links with Millennium Development Goals (MDG)-based national development policies and plans in support of the Strategic Approach to International Chemicals Management (SAICM) where UNDP manages a growing portfolio, currently present in 5 countries.

7.1.7. LINKAGES BETWEEN PROJECT AND OTHER INTERVENTIONS WITHIN THE SECTOR

The project document, in its Annex 6, lists the activities and project carried out in the sector of healthcare waste by WHO and HCWH. Some of these activities have a direct linkage with the project, and are considered as co-financing to the project. Other activities are listed as “activities on project related issues not specifically in collaboration with the project”.

Activities with major linkages include: (1) major revision of the WHO main reference guideline on medical waste (“Safe management of wastes from health-care activities” to be released 2013) which incorporated lessons from the project and is the reference for countries around the world; (2) WHO guidelines on replacement of mercury thermometers and sphygmomanometers (2012) which directly adopted the UNDP/GEF project’s guidance document; (3) the various Inter-governmental negotiating committee meetings for the mercury treaty which benefitted from mercury-related data from the project; and (4) a WHO-Ghana Health Service sharps waste recycling project in Ghana which uses lessons from the project to deal with immunization waste.

It is worthwhile noticing that HCWH funded all the project preparation activities (PDF-A and PDF-B stage), and supported several activities related to dissemination, participation in project meetings, dissemination and networking, etc.

At national level, in at least 4 cases the project established linkages with other existing interventions in the sector.

- In Latvia, the project established cooperation with two private health-care waste companies that have chosen the rotating autoclave as the preferred technology for Latvia’s needs and size. One company purchased the autoclave in 2006 for operation at the hazardous waste site in Olaine (20 km from the capital city Riga) and the other had EU LIFE financing to install an autoclave within the Riga region. Thus the UNDP/GEF Project complemented this private initiative through a public-private partnership to improve health-care waste treatment in the country.
- In Lebanon, the project established cooperation with Arc en Ciel (AEC) and Env-Sys. AEC at project starting was treating HCW from 10 hospitals in two facilities (urban and rural), at the rate of about 1.2 tonnes per day, which is equivalent to 15 percent of the national waste stream. The EU awarded AEC a three-year project (2006-8) worth €450,000 to expand their work in HCWM.
- In Senegal, the Project collaborated with and built on the PRONALIN training program on infection control, HCWM and epidemiology funded by the Scandinavian Development Fund and overseen by the Department of Preventative

Medicine of the Ministry of Health in Senegal. All the three model facilities have been trained through the PRONALIN program.

- In Vietnam, the Project collaborated with the Vietnam Administration of Preventive Medicine (VAPM) of the Ministry of Health on the national training program. At the project start, VAPM had already an extensive national training program on HCWM and occupational health and safety. In addition, the project collaborated with URENCO (Hanoi Urban Environment Company), which at the time of project implementation already had a plan for replacing its incinerator with non-combustion technologies for the treatment of healthcare waste, and therefore contributed with substantial co-financing to the project.

7.1.8. MANAGEMENT ARRANGEMENTS

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The following UN agencies are involved in project execution, management and implementation:

1. UNOPS (United Nation Office for Project Services) is the Executing Agency for the global component of the project (including the Technology component implemented in Tanzania)
2. UNDP is the project Implementing Agency. The UNDP Country Offices of Argentina, India, Latvia, Lebanon, The Philippines, Senegal and Vietnam execute national activities through the national execution modality (NEX).
3. The WHO manage an eighth sub-project and provide financial oversight management services for the funds associated with the project activities to be carried out by the organization.
4. Each of the seven NEX sub-projects and the WHO sub-project are linked financially to the global main project in order to facilitate financial reporting and accountability. UNDP CO assist countries in drafting technical specifications,

At the global level, the following structures were in charge of project management:

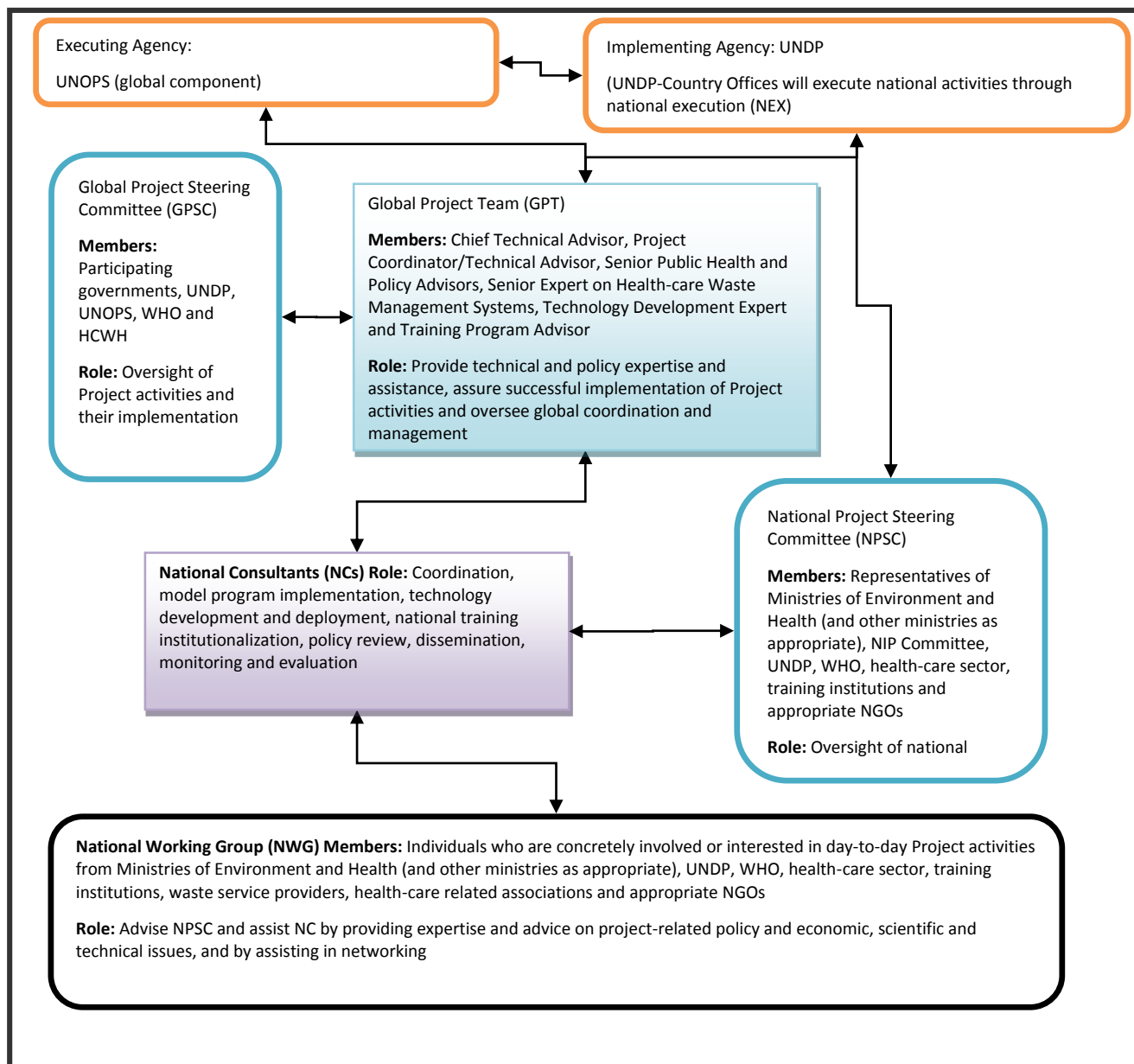
- A Global Project Team, led by a Chief Technical Advisor and by a Global Project Coordinator. The GPT is in charge of drafting guidance for the activities to be conducted at the national level, preparing training material to be distributed and subsequently translated into the respective local language by the national countries, and of performing periodic missions to the participating countries; the Tanzania project component is under the direct supervision of the Global Project Team.
- A Global Project Steering Committee, which is in charge of overseeing project activities and their implementation. The GPSC is participated by all the main national and global project stakeholders, namely: UNDP; UNOPS; HCWH; WHO; National experts; Representatives from UNDP country offices; other GEF/IA/EAs; SC and BC secretariat representatives; representative of Donors, and partner.

At the country level, the project is implemented by UNDP following the NEX (National Execution) modality. In each country two main structures are in charge of project activities:

- The National Project Steering Committee, led by a National Project Director. The NPSC is participated by representatives of governmental institutions, representative of the UNDP CO, representatives of Non Governmental Organization, managers of model facilities.
- The National Working Group (WG) participated by all the experts and institutions that perform specific technical activities, including the experts which are in charge of conducting activities like assisting model facilities in the conduction of baseline assessment, drafting, implementing and monitoring HWC management plans, designing and carrying out training, and other technical activities.

The UNDP Country Offices are in charge of assisting the project stakeholders in procurement issues, supervising periodical monitoring and planning, and performing disbursement.

The relationships among global and local structures summarised in the diagram below.



7.2. PROJECT IMPLEMENTATION

7.2.1. ADAPTIVE MANAGEMENT (CHANGES TO THE PROJECT DESIGN AND PROJECT OUTPUTS DURING IMPLEMENTATION)

There were no significant changes in project design or project outputs during implementation. Limited changes occurred in the sizing of technologies to be procured, or in the replacing of model facilities with other model

A significant and positive change, compared to project design, was however the use of the autoclave technology developed in Africa for the disposal of Health Care Waste in countries affected by the Ebola emergency.

Since the microbiological tests indicated that the Ebola virus would be effectively destroyed by the waste treatment autoclave system developed under the project, a project was immediately launched by UNDP to provide the autoclave system to the three Ebola-affected countries of Liberia, Sierra Leone, and Guinea as part of UNDP's Ebola Response Project. The GEFSEC approved the use of remaining unused funds from the UNDP GEF project and additional funds were raised internally by UNDP NY and from the Government of Korea. The CTA and Dr. Babacar Ndoeye headed the team to install the new autoclaves and provide training in infection control and HCWM in Liberia, Sierra Leone, and Guinea.

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7.2.2. PARTNERSHIP ARRANGEMENTS (WITH RELEVANT STAKEHOLDERS INVOLVED IN THE COUNTRY/REGION)

In each participating country, a National Project Steering Committee (NPSC) oversaw for national Full Project activities. Typically, the NPSC included a designated senior representative from the Health and Environment Ministries and from the Ministry in which the GEF Operational Focal Point is located, a representative or a liaison from the authority responsible for Stockholm Convention NIP preparations and from the authority responsible for Basel Convention implementation.

The NPSC usually (but not always) also included representation from the national health care sector, the country WHO and UNDP offices, as well as one or more appropriate representative from national NGOs with demonstrated concern and activity in matters associated with health-care waste management. In addition to the NPSC, broad stakeholder participation will also take place through the National Working Group (NWG), composed of individuals from appropriate ministries, agencies and stakeholder groups who have practical involvement or interest in day-to-day Project activities. The NWG may include representatives from UNDP Country Offices, WHO Country Offices, health, environment and other appropriate ministries, NGOs, training institutions, health-care facilities, medical and municipal waste service providers, and health-care related associations. The NWG will advise the NPSC and will assist the National Consultants by providing expertise and advice on project-related policy, economic, scientific and technical issues and by assisting in networking.

As the project deals with healthcare waste, the beneficiaries have been in most cases hospital facilities, which are under the responsibility of ministries of health. At the same time, the management of waste is usually under the responsibility of the ministries of environment. For this reason, these have been the two key stakeholders whose participation was sought since the design stage. In all the project countries, the Ministries (or Departments) of Health and the Ministries (or Departments) of Environment are members of the NPSCs, thus ensuring a good coordination among these 2 key stakeholders. The contribution of national or international NGOs like Health Care Without Harm, Agenda (for the Tanzania component), Toxic Links (in India) was massive and qualified in the project design stage. Unfortunately, after project design, some national stakeholders (like Toxic Links in India, or some national NGOs in the Philippine) were not properly involved in project implementation.

It is important to underline the role of waste management companies in supporting the project activities, like URENCO in Vietnam, Lautus in Latvia, AEC in Lebanon.

7.2.3. FEEDBACK FROM M&E ACTIVITIES USED FOR ADAPTIVE MANAGEMENT

The main mechanism of adaptive management was based on the interactions among the GPT and their technical consultants with the National Project Teams and National Project Coordinators. In general there is good communication between GPT and the project countries. The high number of activities and countries involved resulted however in the overload of CTA and GPT. Among others, the GPT provided suggestions for a number of corrective measures for the implementation of the project in the Philippines (suggesting initially to replace the procurement of the centralized autoclave with other activities, and then providing indications on the TOR for the autoclave); in Senegal, by providing indication on the proper use of GEF grants and technical specifications; in Vietnam, proposing corrective activities and procedures for the instalment and testing of the large size autoclave procured; in India, by trying to solve problems related to disbursement and procurement procedures, etcetera. In addition to that, GPT provided continuous supervision and feedback to technical activities and management issues.

The project implementation did not deviate significantly from its original design; therefore, most of the adaptations were on the side of timeframe extension, minor reallocation of budgets, change of technical specification and size of the equipment due to the increase of price occurred from project approval to the time of bidding.

Most of the recommendation provided in the MTE report were considered seriously by the project countries, significant examples being Senegal (where the suggestion to facilitate the task of technical consultants in model facilities was accepted and a technical consultant recruited), in Vietnam (which substantially rescued the project after the very low rating provided at MTE); with few exceptions, recommendations provided by MTE were not implemented in the Philippines or in Argentina.

After project approval, the GPSC met for the first time in June 2011, in Riga and for the second time in Dar es Salaam on December 2012; whilst Countries NPSCs met at least annually to review project progress.

The level of supervision by the Government Focal Point and UNDP CO is diverse. In all the countries, the UNDP COs are effective in project administration, however in a few countries, the UNDP CO did not have a complete grasp of the activities being performed in the field; in few cases it has been observed that the report drafted by the NPSCs does not properly reflect the actual situation of the project. Work plan and progress reports are in some cases perceived as a purely administrative duty to be performed ex-post rather than effective management tools.

7.2.4. PROJECT FINANCE

Table 3 shows the distribution of the budget by country and project component. Most of the figures provided in the table derived from the AWP provided by the UNDP COs, whilst others (Lebanon) are from initial budget reported in the Inception report. In some countries the budget for the National Management is redistributed under other components; in other cases the budget related to individual cost items (like for instance personnel) has been disbursed under a specific component. In Latvia, components 1 and 2 have been merged. For this reason the table below must be considered as an estimate and is reported only for illustrative purposes.

Table 4 shows the overall budget for the project. As the country budget items “*National missions: costs related to all missions to countries (not including consultant salaries/fees)*” and “*International support: costs associated with support received from WHO, HCWH and UIC*” (see countries budget breakdowns under Table 14 in the Project Document) are administered by UNOPS, the second column of the table shows the actual national budget under execution of UNDP COs, (after verification with the UNDP COs of all the countries). On this basis, the budget administered by UNOPS (including the Tanzania component) amounts to around 4.47 MUSD, whilst the budget administered by UNDP COs amounts to the remaining 5.85 MUSD.

Table 5 shows the status of GEF grant disbursement, based on ATLAS data (November 2012) integrated with information on the committed budget provided – when available - by the project countries.

Table 7 shows the status of the committed (as from project document or co-financing commitment letters) versus reported co-financing, as of November 2012.

Table 3 Distribution of the budget (USD) by country and project component (estimated by the evaluation team on the basis of different sources)

	Argentina	India	Latvia	Lebanon	Philippines	Senegal	Vietnam	Total
National management: national meetings, national coordination, consulting and translations		38,250		242,900		141,192	109,655	531,997
Model facilities (component 1):	253,440	287,552	353,585	165,200	205,902	87,755	564,113	1,917,547
Demonstration technology linked to model facilities (component 2)	244,710	283,000	0		362,000	424,800	118,979	1,433,489
Non-mercury equipment and policy (component 4)	47,500	48,004	50,910	69,800	65,589	26,249	79,656	387,708
National training program (component 5)	170,550	96,962	63,239	69,600	106,260	46,387	29,225	582,223
National policy review (component 6)	15,000	19,335	40,171	6,000	20,000	29,599	37,140	167,245
National dissemination activities (component 7)	68,500	47,000	92,871	46,500	68,500	60,300	46,947	430,618
Total	799,700	820,103	600,777	600,000	828,251	816,282	985,715	5,450,828

Table 4 Overall project budget (USD)

Description	Original budget from the PD	Recalculated on the basis of country budgets
International personnel (UNOPS)		
Global coordination, Global Expert Team and international technical consultants (UNOPS)	1,346,210	1,346,210
International support to the project countries including missions and international experts (UNOPS)		1,337,312
Global and regional dissemination		
Project website; participation at global and regional conferences; validation of emerging health-care waste management technologies and mercury-free technologies; Project-related publications and validation testing; and collaboration and information-exchange with related GEF Projects (UNOPS)	375,000	375,000
Global meetings		
Global Project Steering Committee Meetings and National Consultant trainings (UNOPS)	300,000	300,000
Country budgets	Including international support executed by UNOPS	Not including international support executed by UNOPS
Argentina	1,014,000	799,700
India	1,014,300	820,103
Latvia	814,300	600,777
Lebanon	814,300	600,000
Philippines	1,044,435	828,251
Senegal	1,012,870	816,282
Tanzania (Component 3 - UNOPS)	775,000	775,000
Vietnam	1073935	985,715
Line total	7,563,140	6,225,828
Miscellaneous		
Technology contingency	300,000	300,000
Miscellaneous, reporting, evaluation	100,000	100,000
UNOPS (8% of global & Tanzania components)	342105	342105
Line total	742,105	742,105
Total Project budget excluding PDF A and PDF B	10326455	10326455
Project co-financing and in-kind contributions	12,970,494	12,970,494
Sub-total	23,296,949	23,296,949
PDF A	25,000	25,000
PDF B	699,948	699,948
Total Project budget including PDF A and PDF B	24,021,897	24,021,897

Table 5 Status of GEF Grant Disbursement as of November 2012

Country	Project budget (as from MTE report)	Commitments (USD)	Balance as of nov. 2012 (USD)	Balance including commitments
Argentina	799,700	179,406	432,187	252,781
India	820,103		339,657	339,657
Latvia	600,777		0	0
Lebanon	600,000		55,937	55937
Philippines	828,251		584,265	584,265
Senegal	816,282		1779	1779
Tanzania	775,000		25,744	25,744
Vietnam	985,715	213,478	214,721	1243
Total	6,225,828	392,884	1,652,510	1,259,626

Table 6. Status of GEF grant disbursement as of 14 September 2015 (source UNDP)

Country	Total project budget approved at the Prodoc	Total expenditures	Cumulative project balance as of Sept 2015
Argentina	799,700	707,656	92,044
India	800,000	689,000	111,000
Lebanon	600,000	590,011	9,989
Latvia	600,000	600,000	0
Philippines	830,135	759,064	71,071
Senegal	798,570	796,661	1,909
Vietnam	859,635	859,116	519
UNDP	4,468,415	4,300,075	168,340
WHO	570,000	568,998	1,002
Total	11,186,090	10,792,698	456,932

Table 7 Status of committed vs. reported co-financing*

	Planned co-financing	Committed co-financing as from commitment letters	Reported co-financing
Argentina	2,186,166.00	2,186,166.00	269,737.00
India	480,555.00	480,555.00	171,400
Latvia	2,847,211.00	2,847,211.00	N/A
Lebanon	1,578,632.00	1,388,632.00	434,150
Philippines	1,425,774.00	1,425,774.00	N/A
Senegal	810,000.00	N/A	N/A
Tanzania	181,156.00	N/A	113,500.00
Vietnam	1,040,000.00	2,035,000.00	2,108,780.00
HCWH	1,315,000.00	1,315,000.00	N/A
WHO	536,000.00	536,000.00	N/A
UIC	465,000.00	465,000.00	N/A

At design stage, the project envisaged the following monitoring activities, to be carried out by different project partners:

- The Annual Project Workplan (to be revised by the National Project Manager)
- The Annual Project Report, to be prepared each year by each National Project Manager and the local UNDP-CO with assistance of key stakeholders and the global project management team. The APR shall be submitted to the UNDP Resident Representative
- APR will be held in conjunction with the annual *Project Implementation Review* (PIR), the annual monitoring process mandated by the GEF
- The TPR considers the progress of the project, based on the APR. TPR meetings will be held once a year (the first within 12 months of the start of the project) under the leadership of the UNDP-CO.
- The *Terminal Report* is the overall assessment of the project by its stakeholders and additionally aims to serve as a source of lessons learned and recommendations for follow-up activities
- Mid-term and final evaluations are independent evaluations organized mid-way through the Project (focusing on project effectiveness, efficiency and timeliness of implementation; and highlighting issues requiring decisions and actions) and at the end of the project (as above, plus identifying impact and sustainability of results)

Moreover, the “Guidance Document on Roles, Responsibilities and Decision-Making Structure” established clear rules on project monitoring and governance.

The general design for monitoring the project has to be considered satisfactory and in line with other similar projects.

At implementation, the Global Team ensured a number of activities aimed at periodically monitoring project outcome, by means of continuous contact (by telephone and email) with National Project Teams, and by means of weekly telephone meetings among members of the Global Team. The minutes of the weekly GPT meetings constituted a very useful documentation even for the evaluation team, which therefore relied on the information provided by these minutes cross checked with direct interviews, meetings and visits to project sites.

At national level, the evaluation of Monitoring and Evaluation activities has been carried out by scoring separately the following monitoring activities: Financial monitoring and accounting (GEF grant and Co-financing); Co-financing in line with committed co-financing; Project planning; Project reporting; National meetings; Model facility waste management monitoring; Relationship between UNDP CO and NPT.

The outcome of the M&E evaluation is reported in the table below. Although the overall score for M&E was S (Satisfactory), nevertheless the evaluation team found some areas where monitoring was not effective (like the monitoring and accounting of co-finance grants); in few cases, a not effective relationship between the National Project Team and UNDP CO was associated with low reporting capability (for instance, that was the case of Argentina, initial stage of Senegal implementation, and the Philippines). The evaluators consider that M&E is an area where significant improvements can be achieved by establishing a more effective coordination between project teams and UNDP COs, and by establishing more formalized and standardized procedures in the field of monitoring and accounting of co-financed resources.

Instead, the monitoring of project accomplishment carried out by the GPT should be considered as a success story of the project, and an example to be followed in other global projects characterised by similar level of complexity.

Monitoring activity during project implementation	Global (UNDP HQ, UNOPS, GPT)	Argentina	India	Latvia	Lebanon	Philippines	Senegal	Vietnam
Financial monitoring and accounting (GEF grant)	S	S	S	S	S	S	S	S
Financial monitoring and accounting (co-financing)	N/A	MS	MS	MU	MU	MU	MU	S
Co-financing in line with committed co-financing	U/A	MU	MS	MU	MU	MU	MU	HS
Project planning	HS	MU	S	S	S	MS	MS	MS
Project reporting	HS	MU	S	S	MS	S	MS	S
National meetings	HS	MS	S	HS	S	MS	MS	S
Model facility waste management monitoring	N/A	MS	S	S	S	S	MU	S

Relationship between UNDP CO and NPT	N/A	U	S	HS	S	U	MU	S
Average score	S	MS	S	S	S	MS	MS	S
Total score for Monitoring and Evaluation	S							

7.2.6. UNDP AND IMPLEMENTING PARTNER IMPLEMENTATION / EXECUTION (*) COORDINATION, AND OPERATIONAL ISSUES

Global. UNDP HQ and UNOPs, by means of the Global Project Team, ensured an outstanding level of coordination and technical assistance to the project countries. The GPT held weekly conference call to update on project achievements at country and global level, to timely identify corrective action, to plan mission to the project countries. The GPT carried out a significant number of missions in all project countries. Rating: HS.

Argentina. Coordination issues among UNDP CO and the governmental project stakeholders were evident. Separate meetings held by the evaluators with both UNDP CO, MOH, HCWH and manager of model facilities showed that there were significant differences in understanding the real project status, and difficulties in addressing issues which were hindering the project achievements. Rating: MU

India. A high level of commitment from all the parties (UNDP CO, governmental stakeholders, IGNOU training center, model facilities, Toxic Links) has been observed in all meetings held in the course of the evaluation. However, this commitment was in some case not enough to solve coordination on financial issues, which eventually resulted in the complete stop of the project for at least one year. The feeling was the one of committed people fighting against a sometime illogic bureaucracy, and indeed some financial procedures remained unresolved almost until project end. Luckily, commitment of project partners prevailed over bureaucracy obstacles. Rating: S

Latvia. All the project partners (UNDP CO, governmental stakeholders, private companies, NGOs, model facilities) in Latvia worked like a single, well coordinated and motivated team. Conflicts were successfully resolved by talking and improving communication. The results were outstanding, as the project was very effective not only on the technical side, but also on the sustainability side by achieving the approval of regulatory instrument by the Parliament within project deadline. Rating: HS

Lebanon. A good level of coordination and agreement among UNDP CO and governmental institutions was observed in Lebanon. Strong commitment was observed both on the UNDP CO side and on the governmental side. Rating: S

Philippines. Although all project partners were very committed to the project, different views on project strategies resulted in coordination difficulties. There were conflicts on several issues (organisation of meetings and conferences, views on incineration technologies) among HCWH and DOH. In some cases, UNDP CO seemed not completely aware of project status, or not willing to be involved in problem solving. The difficult relationship between HCWH and DOH eventually resulted in lack of mutual trust between GPT and Philippines NPT. In the Philippines, although obviously all the parties acted for preserving the environment, protecting human health and carrying out their respective organizations' mandates, it seems that these were unable to find satisfactory solution to solve implementation issues. **Rating: MS.**

Senegal: Although the project completed early the procurement of equipment and carried out a significant effort on training, UNDP CO and governmental stakeholders were until MTE ineffective in solving the key project issues, namely the need for an effective and sustainable improvement of sound HCWM practices in the model facilities, and the connection, building of infrastructures and placing into use of procured equipment. After MTE the situation however changed and the partners, with the technical support and advices from the GPT, found the resources and motivation to solve most of the problems which differently may have led the project to failure. **Rating: S.**

Vietnam. Difficulties in adopting new rules on procurement, and changes occurred in the organization of governmental stakeholders (MOH and MOEF), significantly slowed down the project which at MTE was still far from achieving significant achievements. The situation had the effect to reduce motivation and trust, and indeed at one point the UNDP CO was considering the project as "unsuccessful". The project was however rescued in the last year of implementation thanks to the self-motivation of the National Project Team, which addressed problems identified by the international consultants (GPT). Therefore, once procedural issues were solved, the National project team was effective in achieving several project objectives although, due to the late start, procedures at model facilities consolidated only at the project end. It is important to recognize that the project also was effective in promoting the adoption and promulgation of new legislation in the field of Healthcare Waste, and in the coordination with other UN initiatives in the field. **Rating: S.**

	Global (UNDP HQ, UNOPS, GPT)	Argentina	India	Latvia	Lebanon	Philippines	Senegal	Vietnam
UNDP and Implementing partner Implementation / execution (*) coordination, and operational issues	HS	MU	S	HS	S	MU	S	S

8. PROJECT RESULTS

8.1. ATTAINMENT OF OBJECTIVES BY PROJECT COUNTRY (*)

In this chapter, separate sheets concerning the detailed update of the attainment of objectives by project country are provided. The scoring concerning attainment of objectives is reported in the summary table below. The detailed evaluation sheet for attainment of objectives by country and project activity is reported in Annex 2

	Global (Tanzania)	Argentina	India	Latvia	Lebanon	Philippines	Senegal	Vietnam
Attainment of objectives by project country (Effectiveness and Efficiency normalized by Impact)	HS	MU	HS	HS	S	MU	S	S

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8.1.1. PROJECT COMPONENT 3. DESIGN OF NON-INCINERATION TECHNOLOGY FOR THE AFRICAN NEEDS (TANZANIA)

Component implementation. Component 3 of the Project (Affordable, non-incineration, health-care waste treatment technologies successfully designed to meet African needs and manufactured, and their replication plans in place) is being executed directly by UNOPS in Tanzania with the objective to develop, test and disseminate affordable non-burn health-care waste treatment technologies that can be built and serviced in sub-Saharan African countries using locally available supplies and skills. This component is composed by seven activities: 1) Identification of concepts for development; 2) Prototype development; 3) Testing, modifications and draft manuals; 4) Field testing and documentation; 5) Fabrication demonstration; 6) Finalization of documentation and replication assistance; 7) Global and regional dissemination of component results. The main approach used in this component was to “Design the whole system around an autoclave instead of modifying existing systems originally designed for incinerators”. Other key aspects are that the steam generator is separate from the autoclave, so that electricity, gas or other energy sources are all allowed for generating steam; and that there is no need for a vacuum pump or a steam ejector because of special container design. The containers are designed for being directly introduced into the autoclave, and are provided with a special system that allows the rapid flow of the steam. This approach allows for the elimination of plastic bags as the containers themselves are disinfected together with the waste contained in them.

Project Achievements. The “Needs Assessment” study was completed by Agenda in May 2009. The main outcomes of the study were that Africa has over 67740 healthcare facilities with different level of HCW management capacity; in some countries the waste generation data shows a very low segregation of waste; over 1000 incinerators exists, most of them have been reported inoperative or operating below standards. In the hospital in Bagamoyo, after baseline assessment of the HCW management, training of the personnel, and procurement of the correct equipment for waste management (colour coded bins and bags, sharps containers, etc.) an autoclave and a sharps shredder were procured and operated for around 2 years, demonstrating the capability of the local staff in operating non combustion technology.

Autoclave: Three prototypes were designed and built. The third prototype included the following improvements compared to the previous: point of entry of wastes made low enough for easy access (more ergonomic), the gas assembly for gas a source of energy has been considered though not installed yet. Leakage –which affected previous prototypes - has been controlled by silicon gaskets and the door has been made lighter by reducing its thickness to 8-12 mm and bearings put for easy opening and closing. Also stainless steel autoclave containers have been developed that minimize the exposure of handlers to infection. In total one autoclave has been made and two more are in their final stages.

Sharp cutter: The first prototype of needle/sharp cutter was automatic and was not handy enough to be used during the ward rounds. It was considered noisy and dependent on electricity for its operations. The design team has made a manual portable needle destroyer that would fit onto a ward-round trolley. So far one of the designs has been made and two are underway.

Compactor: The first prototype of a compactor was a manually operated one that had a number of shortfalls including the fact that it was not very effective in compacting wastes due to volume rebound and a staff had to perform the work manually. Therefore, a hydraulic run compactor has been made (instead of being run manually) which means there is no need of a staff to be there all the time to operate it. One hydraulic fitted compactor has been made so far and two are underway. Additional design improvements were made on the waste containers.

Autoclavable containers. The latest version of the aluminium containers, demonstrated at the Technology Launching at CCBRT Hospital on December 5, 2012, attended by government and international representatives, uses special plugs that allow steam to enter and sterilize the waste. Elimination of plastic bags is a big advantage for poor countries and further reduces waste. The



second prototype of the autoclavable sharps container (for facilities that do not want to use a sharps cutter) was completed also on December 5 and the sharps container design is now being transferred to Vietnam.

Technology testing: After the Bagamoyo hospital denied its support, it was proposed to move the technology to CCBRT hospital, a private donor-funded facility in Kinondoni Municipality in Dar es Salaam region. The equipment was demonstrated to the management and staff from 27th to 28th June 2012.

Construction of a shade, installation of power, water supply and drainage systems

and later extended testing of the equipment were completed in time for the formal launching on December 5, 2012 which was also the start of the extended field testing for six months or more at CCBRT Hospital, where the cost-effectiveness, practical issues such as weight of waste per day produced, durability of parts, safety and efficiency of the technologies will be put on the line.

Dissemination of the technology developed and advocacy. During the renowned international trade fair exhibition in Dar es Salaam in July 2012, the team put on display the technology developed to a wider community. The president of the United Republic of Tanzania also had a chance to visit the UDSM pavilion and was shown the equipment and was informed of the need to take the work into the next level. He was impressed with the work and promised support

On November 26th, 2012 the work has been presented in the Infection Control African Network. The technologies were presented by Dr. Emrod Elisante of UDSM and by the CTA at the Infection Control Africa Network in Cape Town, South Africa. Dr. Babacar Ndoeye also presented on the outcomes of the GEF project in Senegal at the same conference.

The work has been presented in the first international Conference of Ministers of Health in Francophone for the Prevention and Control of Infection in Africa in Dec 10-14, 2012 in Cotonou, Benin. Presentation was made by both Dr. Tito Mwinuka of UDSM and Abdoulaye Faye, Senegal consultant. The UNDP GEF project also had a booth on the new technologies in Benin. The booth was visited personally by the Ministers of Health of Benin, Niger, Gabon, and Comoros, as well as the Director of Healthcare Institutions of Togo.

The replication of the manufacturing of the UDSM designs by three competitively selected Tanzania manufacturers proceeded and was completed on February 2014. Unfortunately, it was evident that the Tanzanian manufacturers lacked the capacity to start the commercial production of the autoclave, therefore another industrial partner (Medi-Clave Pty Ltd of South Africa) was identified through official bidding procedures.

Design modifications were made in a collaborative effort between the Medi-Clave engineers and CTA, and the design was approved in July and manufacturing began in August 2014. The final tests showed that the new waste treatment autoclave manufactured by Medi-Clave was of very high quality compared to autoclaves in industrialized countries and exceeded the STAATT standard by a factor of 10. Furthermore, Medi-Clave had already by then received certification from a government-approved Third Party that the new waste treatment autoclave met ASME and SA safety standards. The company also fabricated autoclavable sharps containers of very high quality as designed by the CTA and a special waste collection trolley. Since the microbiological tests indicated that the Ebola virus would be destroyed in seconds by the Medi-Clave waste treatment autoclave system, a project was immediately launched by UNDP to provide the autoclave system to the three Ebola-affected countries of Liberia, Sierra Leone, and Guinea as part of UNDP's Ebola Response Project. The GEFSEC approved the use of remaining unused funds from the UNDP GEF project and additional funds were raised internally by UNDP NY and from the Government of Korea. The CTA and Dr. Babacar Ndoeye headed the team to install the new autoclaves and provide training in infection control and HCWM in Liberia, Sierra Leone, and Guinea.

Between late November 2014 and April 2015, 10 of the new medical waste treatment autoclave systems were installed in hospitals and Ebola Treatment Centers in West Africa. Another 10 Medi-Clave units are due to arrive in West Africa in July 2015.

A national consultant for each country, as well as the medical and nursing staff, hospital cleaners, and waste workers in all the hospitals and Ebola Treatment Centers were provided training on the use of new equipment and in healthcare waste management and infection control. The national consultants are tasked with monitoring autoclave use in each hospital and ensuring the sustainability of healthcare waste management practices.

Special in-depth training and training resources (dealing with WHO guidelines, HCWM recommended practices, the new non-incineration technologies, and on assessment and monitoring provided to the Ministries of Health and Environmental Protection Administration officials responsible for HCWM in the three countries, as well as officials of the Ebola Command Centers of the three countries. In addition to the national consultants, the World Health Organization's WASH (water,

sanitation and health) regional coordinator is monitoring the new technologies and has been impressed with the results thus far. Officials of the three West African countries, Government of Korea representatives, UN officials, and some international NGOs have seen the technologies in action and were pleased. Messages of appreciation have been received by various users recently.

<i>Lesson learned</i>	<p>As any technology development, the transition from the design stage to the commercial stage proved to be uncertain and risky; the GPT – and more specifically the CTA –adopted the correct countermeasures at any stage by planning the steps for patenting the technology and at the same time creating expectations by presenting the technology in the IPCAN. Since 2012 the GPT organized several consultations and meetings in 2012 of different stakeholders and interested parties, including FHI360 which operates in 60 countries including Tanzania, HCWH with members in 50 countries, and UDSM, which have all signified their interest in funding or co-financing the rollout of the new technologies in Africa and Asia beginning in 2013.</p> <p>Unfortunately, after several attempts, it was evident that the Tanzanian manufacturers lacked user-driven product design capability including detail design, field testing, and refinement especially for pressure vessels and equipment used in health care. There is also a lack of maturity in the manufacturing base for equipment requiring geometric tolerancing and quality control. Based on NASA’s methodology, the CTA estimated Tanzania’s TRL (technology readiness level) at 7 in a scale from 1 to 9, and Tanzania’s MRL (manufacturing readiness level) at 7 in a scale from 1 to 10. This meant that Tanzania was not yet ready to manufacture high quality equipment with precise fabrication techniques for hospitals.</p> <p>Therefore, following the suggestion of the CTA, a new approach was adopted, based on the search of a reliable African company to manufacture the autoclave, and the issuing of a request for Expression of Interest. After careful inspection and evaluation, the South African company “Medi Clave” was selected. The company had already by then received certification from a government-approved Third Party that the new waste treatment autoclave met ASME and SA safety standards. The company also fabricated autoclavable sharps containers designed by the CTA and a special waste collection trolley.</p>
<i>Success stories</i>	<p>The microbiological tests carried out on the equipment by Medi Clave indicated that the Ebola virus would be destroyed in seconds by the Medi-Clave waste treatment autoclave and that the unique waste collection trolley barrel would protect waste workers from exposure to the Ebola virus.</p> <p>A project was therefore immediately launched by UNDP to provide the autoclave system (waste treatment autoclave, internal boiler, water treatment system, waste collection trolley, and autoclavable sharps containers) to the three Ebola-affected countries of Liberia, Sierra Leone, and Guinea as part of UNDP’s Ebola Response Project.</p> <p>Between late November 2014 and April 2015, 10 of the new medical waste treatment autoclave systems were installed in hospitals and Ebola Treatment Centers in West Africa. Another 10 Medi-Clave units are due to arrive in West Africa in July 2015.</p> <p>The medical and nursing staff, hospital cleaners, waste workers and maintenance operator in all the hospitals and Ebola Treatment Centers were provided with training in healthcare waste management and infection control and specific use of the new equipment. A national consultant in each country was given in-depth training in healthcare waste management and in the use of the new equipment. The assessment and monitoring tools developed by the UNDP GEF project for Senegal were modified to fit the conditions in West Africa and are being used to monitor HCWM practices and use of the waste treatment autoclave systems.</p> <p>In addition to the national consultants, the World Health Organization’s WASH (water, sanitation and health) regional coordinator is monitoring the new technologies and has been impressed with the results thus far. Officials of the three West African countries, Government of Korea representatives, UN officials, and some international NGOs have seen the technologies in action and were pleased. Messages of appreciation have been received by various users recently.</p>

	As a result of their experience with the new technologies, many government officials have indicated strong interest in replacing their substandard incinerators with the cheaper autoclave technology nationwide and various project proposals have been developed to expand autoclave use. The project received national media coverage in the three countries and was the focus of several video documentaries by UN Communications. The project was presented at the “From science to action” Science Fair of the Basel, Rotterdam and Stockholm COP conference in Geneva on May 2015. Due to international interest, the project was also presented upon invitation to an International Medical Waste Conference in Adana, Turkey; to the Philippine College of Physicians and Davao Medical Society in the Philippines; to the Inter-American Congress of Solid Wastes conference (AIDIS/DIRSA) in El Salvador; and in two international webinars by Global Green & Health Hospitals and HCWH. The new technologies were mentioned in UNDP’s Chemicals and Waste Management for Sustainable Development publication. This was one of the major successful achievements of the UNDP GEF Project.
<i>Recommendations</i>	UNDP should ensure that the new autoclave equipment will be recommended as a standard in all the HCWM project implemented by UNDP to replace small size batch incinerators.

Gef Budget. As of November 7th 2012, US\$ 189,660.00 had already been issued and used for the project out of US\$ 215, 404 that was budgeted. US\$ 25,744.00 is yet to be released.

Co-financing budget. The committed co-financing budget amounted to 181,156 USD as from the following commitment letters:

Letter of co-financing	Partner	Co-financing purpose	Co-financing amount (USD)
Tan1cofi.tif	University of Dar es Salaam	Technology development and implementation activities	114,946
Tan2cofi.tif	AGENDA	Technology development coordination activities	27,780
Tan3cofi.doc	Technology Development and Transfer Centre	Technology fabrication and transfer activities	38,430

The reported co-financing has been estimated on the basis of the following assumptions:

- Project assistant / accountants paid by other projects though he performs project’s activities
- Meetings attended by some members that were supported from other sources
- Time staff spent on project activities, around 20%.
- Equipment testing at the Bagamoyo hospital

Based on the information provided by the project team, the co-financing budget disbursed amount to 113,500 USD.

Baseline. In Argentina, the national legislation on hazardous waste consists of the National Law on Hazardous Waste (Public Law #24.051) and its Regulatory Order (#831/93), establishing that the enforcement authority (currently, the Environment and Sustainable Development Secretariat) will consider the provisions by the National Ministry of Health and Social Action (currently, the Ministry of Health) in the regulations in force. The Ministry of Health, being responsible for drafting the regulation on pathogenic waste, issued the Resolution #349/94 “National Technical Regulations on Bio-pathogenic Waste Management from Health Care Facilities,” supplemented at a later stage by Resolution #355/99, which requires an update in view of the progress made, the knowledge gained and the current waste management needs. Local regulations referring to pathogenic and healthcare waste (HCW) however differ in each part of the country. HCW classifications and definitions are an issue, as well as the lack of sanitary landfills. Transport of waste is complicated by jurisdictional issues between national and provincial routes. Concerning mercury, it is important to notice that the MOH has a five-step process for phasing out mercury devices which started in 2008. (1. National assessment; 2. Resolutions prohibiting use and imports; 3. Dentistry; 4. Sources outside the health field, and 5. Risk awareness)

Implementation. The project implementation in Argentina followed the general logical framework established in the Project Document, with some modifications. There were originally four model facilities participating in the project: the Juan P. Garrahan Public Paediatric Hospital (Hospital Público de Pediatría) in the City of Buenos Aires; the Francisco Lima hospital in General Roca City, Province of Rio Negro; the Reconquista Central Hospital (Hospital Central Reconquista) in Reconquista City, Province of Santa Fe; the President Juan Domingo Perón Hospital in the City of Tartagal, in Salta Province. However, the latter establishment was heavily damaged in early 2009 due to heavy rains and then pulled out from the project.

The centralized treatment autoclave is part of a larger project in the Santa Fe province. The UNDP GEF project developed the model and plans for collection, transport and treatment of medical waste for the region. It will serve as a model for regions of the country that do not have centralized facilities and have to transport their waste long distances to the nearest urban treatment centers. As of November 2013, the siting and layout plans for solid waste management at the landfill in Reconquista were completed. The plans included waste sorting, recycling and treatment, with detailed designs of: the building for waste classification, materials recovery and encapsulation; burial sites for encapsulated waste; composting facilities; ecopark; facilities for wood processing; recovery of plastics, paper, and other materials; and wastewater treatment were completed. Specifically, the project developed the design of the healthcare waste treatment plant as an integral part of the solid waste management and landfill system. An agreement provides the autoclave equipment to the municipality which will assume responsibility and covers capacity building and human resources. Equipment had been procured and was stored awaiting installation as of November 2013.

As of November 2013, the laboratory work was completed demonstrating the destruction of selected chemotherapy agents using the Fenton reaction. At the suggestion of the CTA, an ultrasonic probe was added to ensure penetration of the Fenton reagent into lumened materials such as syringe needles. Tests with the ultrasonic probe were successful. Design and manufacture of the reactor were completed. Tests of the shredder were ongoing in 2013.

Component	Success / Opportunities	Threats / Weakness
Component 1. Model Facilities and programs	MOU were signed with the following hospitals: “Prof. Dr. Juan P. Garrahan” of the Autonomous City of Buenos Aires, “Francisco López Lima” of General Roca (Province of Río Negro), and “Olga Stuky de Rizzi” Reconquista Central Hospital (Province of Santa Fe). An Internal Waste Management Committee was established in all the hospitals. The project delivered to the hospitals equipment for the management of waste (bins, carts, signs), and, limited to the Reconquista hospital (as the other two facilities were already mercury free at project starting) mercury free thermometers. Garrahan hospital was provided with special plastic containers for its special waste transport system, signs for the HCWM, stainless steel container for the transport of chemical waste. In General Roca (Río Negro) and in the Hospital Central Reconquista, capacity building activities on healthcare waste management involving doctors, nurses, and technicians were performed in several occasions during the visits of the project technical group. In Reconquista, the revision of the classification of some waste and the improvement in their segregation and transport were completed.	All the activities related to this component were completed
Component 2. Development of technologies	<p>Technical specification and scope of the autoclave were based on a generation and logistic study of healthcare waste in the province. The centralized treatment autoclave is part of a larger project with Santa Fe province. The UNDP GEF project developed the model and plans for collection, transport and treatment of medical waste for the region. As of November 2013, the siting and layout plans for solid waste management at the landfill in Reconquista were completed. Specifically, the project developed the design of the healthcare waste treatment plant as an integral part of the solid waste management and landfill system. An agreement provides the autoclave equipment to the municipality which will assume responsibility and covers capacity building and human resources. Equipment had been procured and was stored awaiting installation as of November 2013.</p> <p>A very promising research on the use of Fenton technology was completed at laboratory scale and is currently in the stage of development of a prototype. An ultrasonic probe was added to ensure penetration of the Fenton reagent into lumened materials such as syringe needles. Tests with the ultrasonic probe were successful. Design and manufacture of the reactor was completed. Tests of the shredder were ongoing in 2013.</p>	<p>Although explicitly requested, no information was provided by the Argentinian counterparts (MOH) on the status of completion of the Reconquista Regional Treatment Plant. Therefore it is assumed that, although procured, the facility is not yet operational..</p> <p>Latest update of the Chemo-Fenton technology dated November 2013.</p>
Component 4 Procurement of mercury-free devices and best practices in mercury management	<p>The MOH was already undertaking a five-step process for phasing out mercury devices which started in 2008. A mercury inventory, using a specific tool was taken in each institution as part of the project activities held in regional hospitals. The meeting “Mercury in the Argentine Dental sector” was held as a one-day session on October 21st 2010 in the city of Buenos Aires”.</p> <p>General Roca and Garrahan Hospitals finished its mercury phase out, the latter before the start of the project</p> <p>Reconquista installed mercury-free devices, including the replacement of several old incubator mercury thermometers (funded by MOH) and has already conducted awareness raising. Reconquista has procured mercury-free devices (funded by MOH) and has already conducted awareness raising. The CTA developed a Guidance on Maintaining and Calibrating Non-Mercury Thermometers and Sphygmomanometers, which was translated into Spanish and disseminated to relevant stakeholders.</p>	All the activities under this component were completed
Component 5: National training	<p>By June 2011 UTB completed the survey for training needs in the regions, defined the training objectives including target audience, developed a profile and created a roster of master trainers, as well as completed the development of training materials and methods.</p> <p>During in the second half of 2011 and the first quarter of 2012 UTN, with the technical support of the PWT, implemented the 45 hours training-of-trainers (TOT) program, accounting for a total of 17 teachers and 32 participants coming from 9 provinces who received certificates from both the Ministry of Health and National Technical University</p> <p>The group projects developed as part of the national training program resulted in the following: plans for improvement of and training on HCWM at a public hospital in Rosario including development of three training modules and a training program for the University Hospital of the National University of Cuyo in Mendoza; assessment and proposal for HCWM at Maria Auxiliadora Hospital in Tucuman; assessment and proposal on HCWM for Vicente Lopez y Planes Hospital in Buenos Aires province; and a work plan to improve HCWM at Dr Enrique Vera Barros Hospital in La Rioja...</p>	Most of the activities successfully completed, unclear whether the second training, planned for late 2013, was actually undertaken..
Component 6: National review of HCWM policy	The document on HCWM was discussed with representatives of the 24 provinces of the country during a workshop on December 13-14, 2012 in Buenos Aires. The document was subsequently published.	All the activities under this component were completed.
Component 7: National dissemination activities	<p>On November 7-8, 2013, a national workshop was held in Buenos Aires to disseminate the results of the project. It was attended by health representatives around the country.</p> <p>As of November 2013, four publications were completed: (1) recommendations regarding management of mercury amalgams and mercury replacement; (2) the national review of HCWM policies; (3) a publication on organization and assessment regarding HCWM (contents: assessment tools, formation of HCWM committees, signage, indicators, and accident investigations); and (4) project results (contents: reports of the model hospitals, national training and project reports by trainees, and updates on the technologies). UNDP and GEF logos were used.</p> <p>The results of the project were also presented at Reunión Ordinaria de Comisión Internacional de Salud Ambiental y Trabajo (CISAT-MERCOSUR), to the mission of the Ministry of Health of Venezuela, at a videoconference of CISAT de MERCOSUR, and at the website of OMS-OPS (PAHO).</p>	All the activities under this component were completed.

<i>Success stories</i>	A success story of the project in Argentina is the national training. During the second half of 2011 and the first quarter of 2012 UTN, with the technical support of the PWT, carried out a 45 hours training-of-trainers (TOT) program, accounting for a total of 17 teachers and 32 participants coming from 9 provinces and an evaluation through the elaboration of a diagnosis in 6 different hospitals. The training was not limited to technical aspect, but included also lessons on motivational and management psychology, and made wide use of videoconferences. The experts formed are now prepared to train HCWM coordinators and workers involved in HCWM. The MOH sees these experts as major resources and plans to support the network of experts that have been trained.
<i>Recommendations</i>	As of November 2013, the centralized autoclave and boiler resulting are still awaiting installation. Although officially requested, no update on the status of this project activity was delivered to the evaluators. It is recommended therefore that in future project in the country, activity progress is carefully monitored by a tighter supervision, to ensure accomplishment of project tasks.
<i>Lesson learned</i>	<p>Based on the document received, it seems that the project did not make use of standard UNDP management tools and procedures (except PIRs), which created gaps in communication and difficulties for project managers to understand the real situation of the project in the field. A person dedicated to project administration would have mitigated the delay in disbursement due to the complex procedure established at UFI. In addition to procurement, other difficulties (like the missed agreement on PPP for the management of technology in Reconquista, the missed circulation of guidance document and policy review among key stakeholders) hindered project results.</p> <p>The evaluators observed significant differences in the perception on project status by different stakeholders. For instance, the Garrahan Hospital has been considered by a recent visit (June 2012) of the Global Team as one of the best model hospital of the global project. Indeed, the hospital had already in place, before project starting, a rather unique system for the collection and transportation of waste, based on intermediated collection areas, and on the use of an automated rail transport for the final transportation of bins to the final storage and delivery area, as well as the implementation of sound waste separation and management protocols.</p> <p>That conflicted with the outcome of the evaluator's visit to the hospital, as well as with the outcomes of the meetings with UTN and UFI, and the examination of procurement documents. Hospital HCWM managers reported that onsite training and technical assistance were not delivered by the project, the automatic doors for the storage of waste (initially intended to be provided by the project) were eventually procured directly by the hospital due to project delays.</p>

GEF Grant Budget as of November 2012

Activity	Budget 2011 (USD)	Budget 2012 (USD)	Balance at nov. 2012 (USD)	Balance including commitment
Model facilities (component 1):	113,442.24	92,415.63	113,716.65	
Demonstration technology (component 2)	27,388.01	14,391.00	168,509.00	
Non-mercury equipment and policy (component 4)	0	0.00	8,116.00	
National training program (component 5)	18,733.60	29,676.16	43,050.84	
National policy review (component 6)	0.00	0.00	11,570.00	
National dissemination activities (component 7)	0.00	2,469.87	97,224.13	
Total	159,563.85	138,952.72	432,186.62	252,781

Committed Co-financing by component.

Component	Co-financing amount
Model facilities (component 1):	846,398
Demonstration technology (component 2)	270,000
Non-mercury equipment and policy (component 4)	65,000
National training program (component 5)	464,884
National policy review (component 6)	105,000

Committed co-financing by project partners

Letter of co-financing	Partner	Co-financing purpose	Co-financing amount (USD)
Arg1.1cofi.jpg Arg1.2cofi.jpg	Ministry of Health and Environment	On behalf of national partners including ministries, central facility, model facilities, training program and NGOs	880,000

Arg2cofi.pdf	AAMMA	Related HCWM activities	50,000
Arg3cofi.pdf	Wr2	25% discount on purchase of Alkaline Hydrolysis Technology	Not indicated
Arg4cofi.jpg	Ministry of Health and Environment	Written manuals and training on chemicals management	266,000
Arg5cofi.jpg	Ministry of Health and Environment	Community Doctors Program curricular module	990,166

MOH provided a detailed budget summary concerning in-kind co-financing amount disbursed in the period 2009-2012, for an overall amount of 269,737 USD

Baseline. In India, the Bio-Medical Waste (Management and Handling) Rules, 1998, The Municipal Solid Wastes (Management and Handling) Rules, 2000, and the India's Hazardous Waste (management, Handling and Trans-boundary Movement) Rules, 2008 are the regulations containing provision on HCWM. The rules on biomedical waste require that *“every producer of bio-medical waste needs to install an appropriate facility in the premises or set up a common facility to ensure requisite treatment of waste. The bio medical waste needs to be segregated into container/bags at the point of generation, prior to its storage, transportation, treatment and disposal. The container shall be labelled”* However, despite the existence of these regulatory instruments, in several areas of the country the management of medical waste is still very poor.

Implementation

One of the bigger challenges the project faced was difficulties in disbursements which substantially endangered the continuation of project activities. Slow disbursements continued in TN in 2012 due to the funding mechanism which requires that an allotment can only be disbursed when the previous allotment is completely spent.

Project implementation in India then focused on a three-part strategy.

1. Developing a model state where work will improve the current system within one Central Treatment Facility and the area it services. The state of Tamil Nadu has been chosen for this project component; the CTFs of GJ Multiclave (India) Pvt. is equipped with an autoclave, a shredder an incinerator for anatomical waste. 15 hospitals have also been identified for developing as model Health Care Facilities (HCFs).
2. Identify a model hospital in a poorer state with an underdeveloped waste management system for development into a model facility whose performance may be replicated in other states and regions. The State of Uttar Pradesh has been selected for this component; the Chhatrapati Shahuji Maharaj Medical University, now King George Medical University (KGMU) in Lucknow has been selected as model facility in this state.
3. The Indira Gandhi National Open University (IGNOU) was selected as the principal training partner. IGNOU's program is recognized by the World Health Organization and others as among the best training programs in healthcare waste management that address conditions in developing countries. IGNOU conducts six months training program in healthcare waste management as well as organize short term training program and workshops.

The Tamil Nadu component of the India project was completed in October 31, 2013. The final report was submitted in November 3, 2013.

With the help of the Indian Medical Association and Tamil Nadu's Department of Health and Family Welfare, 14 hospitals and health centers participated in the project as model hospitals—the largest number of model hospitals in a country under the UNDP GEF project. All the health institutions were provided with technical expertise, supply of equipment, training and capacity building to improve their HCWM practices. The equipment given to the hospitals included needle hub cutters and consumable items such as containers. After the previous national consultant (Dr. Megha Rathi left for Geneva, Switzerland), she was replaced by another competent national consultant (Rajesh Rangarajan) to work with and monitor the 14 Tamil Nadu model hospitals and the central treatment facility in Chennai.

The UNDP GEF project funded some technical improvements of the existing incinerator, the testing of dioxins/furans after the improvements, and the installation and validation testing of non-incineration technologies (one autoclave commissioned at the end of 2012 and a shredder) at the GJ Multiclave central treatment facility (CTF) in Chennai. The UNDP GEF project also provided technical support for the procurement of real-time monitoring of carbon monoxide, carbon dioxide, and oxygen from the incinerator stack. The real-time monitoring was integrated into the TNPCB's Care Air programme which monitors real-time emissions of many industrial sources in the region. The UNDP GEF project also provided funding and technical support for the development of a GPS-based waste tracking software to track healthcare waste management in order to prevent pilferage and irregularities in the handling and transport of healthcare waste. In addition, IGNOU provided special training to the CTF staff.

Comparisons of the emission tests of 2010 and 2013 show significant reductions in dioxins/furans, particulate matter, carbon monoxide, and hydrogen chloride. The 2010 tests showed that the incinerator would have failed to meet particulate matter, hydrogen chloride and dioxin limits under the 2015 rules. With the improvements in the incinerator (addition of a scrubber), the incinerator easily meets particulate matter, nitrogen oxides, and hydrogen chloride limits and the combustion efficiency is further improved. However, the results indicate that despite the addition of the scrubber and a 98% decrease in dioxin emissions, the dioxin levels are still above the India emission limits. A higher efficiency scrubber and/or the addition of a baghouse filter are needed to bring dioxin levels even lower.

The UNDP GEF Project procured non-mercury IR thermometers and sphygmomanometers and provided them to the model hospitals in a 1:1 exchange program. All 14 model hospitals have almost zero usage of mercury devices. The mercury devices were removed from the hospitals, transported securely, and stored in a special room at the CTF. They will be kept at the CTF until further direction from TNPCB.

IGNOU provided training under a “training of trainers” (TOT) program and developed 29 master trainers nominated by each of the model facilities under IGNOU’s 6-month certification course. Repeated trainings were provided to the HCWM committees and staff of all of the 14 model hospitals in Tamil Nadu. Later, some of the in-house training was taken over by the graduates of the IGNOU certification program.

IGNOU developed a special training module and manual translated into Tamil for waste handlers and sanitary workers at hospitals. The module/manual was mostly pictorial with limited text (since waste handlers generally have lower literacy levels) and was also distributed to all model hospitals.

Comments of the GPT were provided to the Ministry of Environment, Forests and Climate Change. The Bio-Medical Waste (Management and Handling) Rules, 2015 includes changes in what is now Schedule I (categories and treatment options). While items contaminated with blood and body fluids like gloves, dressings, plaster casts, cotton swabs, and bags must still be incinerated, other items such as discarded linen and beddings with blood or body fluids can be disinfected by chemicals and then disposed in a secure landfill. The new rule requires recyclable contaminated waste to be treated by non-incineration methods prior to recycling.

The 2015 rules are still considered draft, with an extended comment period until August 30, 2015, in order to coordinate the revisions of the draft waste management rules for bio-medical waste, fly ash, e-waste, plastic waste, and solid waste together into the overall Waste Management Rules of 2015.

A draft of the Guidelines for Common Bio-medical Waste Treatment Facilities (CTFs) was revised on February 26, 2014. Siting, liability, and annual reporting requirements for the CTFs have been incorporated into the 2015 Rule.

National dissemination of the work at KGMU was presented at the KGMU Convention Center on March 5, 2013. It included the showing of a video documentary developed and funded by the UNDP GEF project, presentations and discussion on the major achievements of the project, capacity building, sustainability, waste tracking, mercury waste management, CTF operations, and the presentation of a special award by the UNDP GEF Project steering committee to KGMU. The event, which included international delegates from UNDP and WHO, received widespread media coverage and the video documentary was uploaded to the UNDP website. The video documentary (a 5-minute version and a 30-minute version) has since been shown at various international conferences and as part of training programs.

The results of the KGMU work were presented at the International Solid Waste Association World Congress on Waste Management by Dr. Kirti Srivastava of KGMU in Vienna on October 7-11, 2013. The overall results of the project and the IGNOU training were presented at the Conference of the Indian Society of Healthcare Waste Management held in KGMU, Lucknow, on December 7-8, 2013. The selection of KGMU as their conference venue by the Indian Society of Healthcare Waste Management was in part a recognition of the achievements of the UNDP GEF project in India.

A half-day National Dissemination workshop was organized by the Tamil Nadu Pollution Control Board on October 31, 2013 in Chennai to disseminate the results of the project. A total of 230 people attended from hospitals from other parts of the State, CTF operators, and district environmental engineers. It was also attended by the Minister of Environment, Chief Secretary to Government, Environment and Forests, Director of the Tamil Nadu Health Systems Project, and UNDP CO. The national workshop received extensive coverage in local media and in the most popular English newspaper, The Hindu.

The work at KGMU was published by Drs. A. Singh, K. Srivastava and other colleagues at KGMU in the *Annals of Environmental Science*, Vol. 7, 93-100 (2013). The work in Tamil Nadu was presented as a conference poster by project consultant Rajesh Rangarajan at the International Solid Waste Association (ISWA) World Congress in Sao Paulo, Brazil in September 8-11, 2014.

Component	Achieved results	Comments
Component 1: Model Facilities and programs	<p>Uttar Pradesh - KGMU Lucknow. All activities successfully performed. A complete and consolidated system for HCWM management in place. KGMU is even receiving revenues for recycling sterilized/shredded materials. GPT suggested that KGMU should be written up as one of the case studies of the UNDP GEF Project</p> <p>No. of Training: No. of trainees for 6 months course in KJMU 22, 13, 16 & 15 for 1st, 2nd, 3rd and 4th batch.</p> <p>Tamil Nadu Baseline assessment completed and action plan derived from the observations of the assessment study. Trainees in 6 months course at Chennai (Jan, 2011: 41, June, 2011: 27) . For facility wide training, the TNPCB hired a consultant who has developed a plan of action for facility wide training of the participating hospitals.</p> <p>With the help of the Indian Medical Association and Tamil Nadu's Department of Health and Family Welfare, 14 hospitals and health centers participated in the project as model hospitals—the largest number of model hospitals in a country under the UNDP GEF project..</p>	The Tamil Nadu component of the India project was completed in October 31, 2013. The final report was submitted in November 3, 2013..
Component 2: Development of technologies	<p>The equipment (autoclave, shredder, gas analyzer) for the CTF have been procured by GJ Multiclave The installation was completed and initial reports indicate that the measured parameters are all within acceptable. It remains to be seen how much reduction in dioxins/furans was achieved</p> <p>GJ Multiclave has also spent 1.6 million rupees to purchase an Alfatherm incinerator as required by the TNPCB. GJ. Multiclave supported the project investment on technologies with 3.4 million INR (around 61,700 USD). The waste tracking system, based on bar-code labelling of waste and GPS tracking of vehicles, has been established in UP, and is currently being transferred to TN.</p>	<p>The task is reported to be completed by first week of Nov 2012.</p> <p>Comparisons of the emission tests of 2010 and 2013 show significant reductions in dioxins/furans, particulate matter, carbon monoxide, and hydrogen chloride.</p> <p>With the improvements in the incinerator a 98% decrease in dioxin emissions was obtained, although not enough to comply with the national emission limit for dioxin</p>
Component 4: Procurement of mercury-free devices and best practices in mercury management	<p>Workshops on Mercury Phase Out held in CCSMU and Chennai. (46, 47)</p> <p>Dissemination materials on Mercury Workshop (reports, flyer, CD, Posters) developed.</p> <p>Analysis of mercury uses performed at KJMU, Lucknow.</p> <p>The UNDP GEF Project procured non-mercury IR thermometers and sphygmomanometers and provided them to the model hospitals in a 1:1 exchange program. All 14 model hospitals have almost zero usage of mercury devices. The mercury devices were removed from the hospitals, transported securely, and stored in a special room at the CTF. They will be kept at the CTF until further direction from TNPCB.</p>	Activities under this component completed
Component 5: National training on health-care waste management	<p>A Study Centre for the IGNOU's 6 months Certificate course on Health Care Waste Management (CHCWM) is established at KGMU. A total of 25 candidates are enrolled for the CHCWM training programme from KGMU under the project. A Study Centre for the IGNOU's 6 months Certificate course on Health Care Waste Management (CHCWM) is established at Sri Ramchandra Medical University. A total of 41 candidates are enrolled for the CHCWM training programme under the project</p> <p>IGNOU continued with the training work after the retirement of person in charge. . IGNOU provided training under a "training of trainers" (TOT) program and developed 29 master trainers nominated by each of the model facilities under IGNOU's 6-month certification course. The project consultant provided repeated trainings to the HCWM committees and staff of all of the 14 model hospitals in Tamil Nadu. Later, some of the in-house training was taken over by the graduates of the IGNOU certification program.</p>	Activities under this component completed.
Component 6: National review of health-care waste management policy	<p>The Bio-Medical Waste (Management and Handling) Rules, 2015 includes changes in what is now Schedule I (categories and treatment options). While items contaminated with blood and body fluids like gloves, dressings, plaster casts, cotton swabs, and bags must still be incinerated, other items such as discarded linen and beddings with blood or body fluids can be disinfected by chemicals and then disposed in a secure landfill. The new rule requires recyclable contaminated waste to be treated by non-incineration methods prior to recycling. The 2015 rules are still considered draft, with an extended comment period until August 30, 2015, in order to coordinate the revisions of the draft waste management rules for bio-medical waste, fly ash, e-waste, plastic waste, and solid waste together into the overall Waste Management Rules of 2015.</p> <p>A draft of the Guidelines for Common Bio-medical Waste Treatment Facilities (CTFs) was revised on February 26, 2014. Siting, liability, and annual reporting requirements for the CTFs have been incorporated into the 2015 Rule.</p>	All activities under this component are completed.
Component 7: National dissemination activities	<p>CDs and posters on the risk of using mercury medical devices have been distributed in different hospitals. Some of them before the starting of the project.</p> <p>Some of the training material has been translated in local language by IGNOU and distributed. A video document is being developed to disseminate project results on best techniques and practices on healthcare waste management to relevant stakeholders to encourage its replication in various other healthcare facilities of the country. The video documentary has been completed. The national dissemination workshop is tentatively scheduled for early March 2013.</p>	<p>Hold national conferences and/or workshops held</p> <p>Distribute toolkits; Conduct public awareness campaign to provide information to the general public, patients and families. Hold Interviews/dialogues with relevant authorities for further agreement or commitment on implementation plan for replication of best practices</p>

<i>Lesson learned</i>	<p>The issue of disbursement seriously endangered the project result, as funds were blocked for more than one year, causing the delay of several project activities. Financial issues delayed project activities even in its final stage of completion, the release of around 127.000 USD was suspended until TN PCB returned documentation on the usage of the other 9 disbursements received earlier which however were not related to the project. It is evident that alternative and less complex financial modalities have to be found in future activities.</p> <p>Difficulties also derived from the replacement / retirement of key staff during project implementation. As a general suggestion, for key project activities there should be the need to timely identify alternate experts to be ready for taking over.</p>
<i>Success stories</i>	<p>GPT suggested that KGMU should be written up as one of the successful case studies of the GEF Global HCWM Project. Before project implementation, the waste management in the KGMU hospital was very primitive. At project closure, a well organized system for the management of medical waste was in place and consolidated. A waste tracking tool software has been established at UP, and is being replicated at TN. The facility is generating Rs.150,000 per month by segregating and selling its recyclable waste. It has also created a dedicated fund for waste management.</p>
<i>Recommendations</i>	<p>Due to the delay of fund disbursement throughout the period February 2011- March 2012, the project needed to undertake the activities beyond Sept 2012 and complete the project implementation by Jan-Feb 2012. The project has enough funds remaining for sustaining the work of the hired staff during the extension period.</p> <p>Reopen the discussion of Category 6 waste at the light of the very poor environmental performance of small HCW incinerators, encouraging the disposal of this category of waste with alternative technologies compliant with SC BAT/BET standards.</p> <p>Ensure the replication of the waste tracking system, as this is crucial in enforcing a sound HCWM.</p> <p>Follow up on the disposal of mercury devices, as it was observed that mercury awareness is still low in some hospitals and there are no regulations concerning the disposal of mercury.</p> <p>Ensure and monitor, in future projects, the continuity of project teams who are in charge of sensitive or technically complex activities, to avoid that replacement of key persons endanger project success.</p> <p>Prepare a guidance document on the disbursement procedures in India under the CAAA/DEA, so that future projects can avoid the difficulties faced by this project in disbursement.</p>

GEF Budget in USD (source: UNDP NY)

Activity #		2009	2010	2011	2012	Balance (11/2012)
1	Identification of sites	2,750.00	14,461.10	8,032.46	87,838.39	102,692.11
2	Deployment of Technology	0	0	0	95,011.99	149,044.47
3	Non-incineration technology		119,687.40	-70,542.33		
4	Non-mercury devices		34,785.00		26,963.87	1,591.55
5	Capacity Building Prog	472.09	44,668.10	37,521.79	32,533.97	-2,684.36
6	Policy Review			30.09	125.61	19,859.39
7	Dissemination		1,845.90		4,500.00	58,154.00
8	Project Assurance					11,000.00
	Total	3,222.09	215,447.50	-24,957.99	246,973.83	339,657.16

Co-financing Budget.

At project preparation, In India, co-financing was supposed to be mainly through the activities of Toxic Link and IGNOU. At project implementation also GJ Multiclave provided a significant amount of counterpart funds.

Planned Co-financing by component.

Component	Co-financing amount (USD)
Component 1 – Model Facilities	127,500
Component 2 – Technologies	42,500
Component 4 – Procurement of Mercury Free Devices	127,500
Component 5 – National Training Program	140,555
Component 7 National dissemination	42,500

Planned Co-financing by project partners

Letter of co-financing	Partner	Co-financing purpose	Co-financing amount (USD)
Ind1cofi.doc	Toxics Link	Toxics Link and Shristi HCWM-related activities	425,000
Ind2cofi.jpg	IGNOU	IGNOU HCWM training program	55,555

Reported co-financing:

Co-financed item	Amount (USD)
GJ Multiclave co-financing for building and installation of autoclave and disposal technologies:	96.000
University Personnel (high level experts):	60.900
University employee (office clerk, computer operators, etc.): around	10.100
Computer – communications	4.400
Total	171.400

Baseline. After joining the EU, Latvia started the implementation of the environmental EU legislation on waste. In 2008, a new directive on waste was issued by the EU (Directive EU 2008/98 on waste), and at that time Latvia was in the process of implementing and raising awareness on the enforcement and application of this directive. Thus the baseline in the country is quite advanced in terms of waste management, although some gaps still exist in the field of waste disposal technologies. The replacement of mercury biomedical devices started before project implementation, and waste segregation was already in place - at least partially - in the hospital. An incinerator for disposal of anatomical waste was used till recently in the Rezekne hospital, and will be dismantled before the establishment of the tissue digester.

Implementation. The Latvian Project team established three working groups to effectively deal with the following Project subcomponents: a) training; b) technology and waste system-related issues; and c) legislation.

The Municipal Hospital of Ventspils was selected for inclusion in the Project, as it could act as a representative model facility in the western region of Latvia. Ventspils has established practices in waste treatment both on-site and in cooperation with the private waste management company SIA "Lautus"; and surrounding medical institutions have submitted requests to transport their medical waste for treatment to Ventspils.

The Municipal Hospital of Rēzekne was selected to be a model facility in the eastern region of Latvia, partly due to its geographic location. The Rēzekne Hospital has established practices for collection and treatment of waste from other surrounding hospitals.

In Latvia, the model facility component (component 1) of the project also includes the establishment of waste treatment technologies at the hospital level. In both the Rezekne and Ventspils hospitals digestors for biological waste were planned to be installed by the end of 2011.

Two private health-care waste companies are active in Latvia. The non combustion waste disposal equipment (rotating steam autoclave) have been selected and purchased by these companies independently of one another with funds external to the project. One company purchased the autoclave in 2006 for operation at the hazardous waste site in Olaine (20 km from the capital city Riga) and the other (Lautus) received EU LIFE financing to install an autoclave within the Riga region. The UNDP/GEF Project is complementing these private and public initiatives through a public-private partnership to improve health-care waste treatment in Latvia.

The project was formally finished on Dec 31, 2011. The tissue digesters were however installed in the beginning of March 2012. The tender procedure was organised through UNDP Bratislava region. The contract was signed between the UNDP and the PRI. The payment was organised (in 3 parts) - advanced, upon delivery and upon installation and the completion of training.

The project team effectively addressed the few recommendations provided at MTE and the project activities in Latvia can be considered successfully completed. The positive aspects already evident at project MTE are confirmed at project closure.

Component	Achieved results	Comments
Component 1+2. Model Facilities and programs; Technologies	<p>In the 2 hospitals, MOUs have been ratified. The baseline assessment, based on the methodology provided by the Global Project Team, has been completed. The results of the baseline assessment were officially presented to the manager of the facilities.</p> <p>In the Rezekne Hospital the main priority for the new Waste Management plan were: closure of the old incineration facility; increase of segregation; disposal of infectious waste with a non combustion technology, use of PPE.</p> <p>In Ventspils, recommendations were provided on better segregation and management of recyclable materials as paper, glass, plastic was a hot topic for Ventspils, and storage and transportation of pathological waste. Technical specification for the alkaline tissue digester were prepared with the help of the WG after technical economical comparison of different technologies (capacity 13-14 kg/cycle). Implementation of HCWM was completed, replication material distributed, monitoring procedures established, procurement, testing and training on the use of tissue digesters carried out. Monitoring procedures established for the hospitals and the disposal facilities. The old incinerator in Rezekne was phased out and dismantled.</p> <p>BAO and Lautus were provided with equipment (Screw conveyer, scales, label printers, microbiological testing kits). In Jelgava veterinary clinic (University of Agriculture, Faculty of Veterinary Medicine) the main priority was to improve the overall waste management- packaging, storage, labeling. The clinic was equipped with new bins, bags, labels. The development of waste tracking system for the Centralised HCW model facility (Lautus) was completed and the waste compacting system (in BAO) improved.</p> <p>The project provided an estimate of the U-POP reduction obtained with the non-combustion technologies. The draft guidelines on dioxin emissions were sent to UNDP and GPT.</p>	<p>No significant weakness / risk for the implementation of this project component. Concerning the centralized HCW disposal, an estimate on the amount of their contribution to the project from the project facilities, or even amount of waste treated within the project is missing.</p>
Component 4 Procurement of mercury-free devices and best practices in mercury management	<p>Guidelines on safe handling and disposal of phased-out mercury devices developed by the Project Global team.</p> <p>In Rezekne, around 210 thermometers were replaced by non mercury electronic devices. In Ventspils around 140 thermometers were replaced (of which only 14 were mercury thermometers).</p> <p>Old mercury devices were collected for disposal old, crushed thermometers were stored in the bottles.</p> <p>During the replacement organized by the project-all the thermometers were collected directly by the waste management company. More than 550 kg of mercury containing waste and 760 kg of chemical waste were collected by the hazardous waste management company and stored for short time in the hazardous waste storage site.</p> <p>The personnel at the hospital (doctors and nurses) have been trained on the use of non mercury devices and now the acceptance of these devices is high (Start of training in Rezekne hospital May 5, 2011; Ventspils hospital: May 6, 2011; posters for the instructions of the use and interpretation of devices at model facilities; surveys of personnel on the acceptance proceeded) additional training in September 2011, for one department.</p> <p>Dissemination on the use of non mercury started (conferences hold at the Associations of Nurses). Four regional seminars on safe handling, short term and long term storage, treatment of mercury containing equipment/waste; alternatives to mercury containing equipment in HC sector held in September 2010 in Valmiera (September 7, 2010), Riga (September 7, 2010), Rezekne (September 8, 2010) and Ventspils (September 9, 2010). Total amount of participants – 160, including the personnel from model facilities. Seminar program developed by international expert.</p>	<p>Risk: Based on the internal evaluation carried out by the project it seems that there may be still difficulties / resistances in using non-mercury thermometers.</p>
Component 5: National training on health-care waste management	<p>Baseline assessment of university and practical training programmes developed and discussed with the Partners.</p> <p>Methodology for training programs developed by the Global Team, commented and discussed with the National partners. The global team developed the training material and transmitted that material to the project team in Latvia. In the WG the global programme was adapted to local needs, and then translated in Latvian, CDs made and spread for more than 76 partners.</p>	
Component 6: National review of health-care waste management policy	<p>A draft regulation has been developed and officially submitted to the Ministry of Environment. Such regulation was approved in May 2012, given to the acceptance to the Parliament in December 20, 2011, and entered in force in May 22, 2012. Three Ministries (Health, Environmental protection and Agriculture) participated in the process. The development of Guidelines (soft law) on medical waste management and veterinary waste management is in process.</p>	<p>No weakness on this point, which is indeed one of the success story of the project.</p>
Component 7: National dissemination activities	<p>Project results were disseminated at international level through missions to Kazakhstan, Kirgizstan, Estonia, Ukraine and Georgia, sent to Lithuania, Armenia and also project replication materials was translated into English, Latvian and Russian, published on the web page of the implementing Agency.</p>	<p>No weakness / risk on this point. A short report in English on the outcome of these missions should be made available and published on the global website.</p>

<i>Success stories</i>	<p>The project in Latvia is confirmed as the most successful among all the participating countries, due to several reasons:</p> <ol style="list-style-type: none"> 1. The very good relationship established among the Working Group team and the personnel of the hospitals, with special reference to the continuous effort paid by the project experts in completing and communicating all the relevant project steps in the facilities (baseline, training, monitoring, technical specification of the non combustion equipment, results evaluation); 2. The timely conclusion of project activities, with good sustainability perspectives; 3. The open and intense collaboration among Governmental Institutions, UNDP CO, and NGOs; 4. The commitment of the private waste facilities in adhering to Environmentally Sound standards for HCW, by implementing proper monitoring procedures 5. The selection of the veterinary sector, as a further sector to be considered within project activities <p>The project represented an important platform for drafting the legislation and guidelines on medical waste and veterinary waste, which was approved and entered into force in May 2012.</p>
<i>Recommendations</i>	<p>Follow up concerning the post monitoring of project activities, particularly with regard of cost effectiveness would be beneficial to project sustainability.</p> <p>Based on the internal evaluation report, it seems that some issues on the use of mercury thermometers still remain. If possible, follow up should be provided on this matter.</p> <p>There is no clear monitoring / estimate of the co-financing amount, although the committed co-financing at project starting was very high.</p>
<i>Lesson learned</i>	<p>Role of technical expert. One full time technical expert was in charge of the HWCM at the pilot hospitals. As proven in other project countries, the continuous availability of a technical expert in the model facilities, by providing immediate training on HWCM, ensured the attainment of project objectives in the facilities.</p> <p>Dissemination. One of the dissemination activities carried out by the project involved the cooperation between one of the HWCM company and the lecturers and masters students of the Institute of Energy system and the Environment of the Riga Technical University, who helped to establish procedures and to develop a handbook for the environmental management system of the company. The system was developed by the students, and certified with minor modification by external auditors in August 2010. This constituted a best practice in term of communication, education and public-private sectors.</p> <p>Cooperation model between the national NGOs, treatment companies, ministry and the project team (incl. international project team), ministries (MoH, MoEnviro, MoAgriculture) focused on one specific topic showed a lot of advantages and this cooperation platform is still efficiently working in Latvia.</p>

GEF Budget in USD (source: UNDP CO)

Output	Existing Budget-2011	Expenditures Jan.- Oct.2011	Workplan Q4 2011	NEW Budget-2011	Balance
Output 1 (Model facilities)	300103	97183	217574	314757	14653
Output 2 (Non-Mercury Equipment &Policy)	24660	22729	0	22729	-1932
Output 3 (National Training Program)	45237	16413	18450	34863	-10374
Output 4 (National Policy Review)	3000	1713	0	1713	-1287
Output 5 (National Dissemination Activity)	52486	11586	39839	51425	-1060
Total for Project	425488	149624	275863	425488	0

Co-financing.

The LAUTUS company, by establishing its non-combustion technology, ensures the operation of health care waste treatment system and provides the input for the UNDP/GEF Project. Besides, LAUTUS and BAO management took part in Project work groups, provided commentaries and input for the legislation and the development of other document, organized training, took part in development of Environmental Management Programme for them together with University.

Similar situation was with BAO who during the application development of the Project were planning changes in their company by installing technology that would improve health-care waste treatment in Latvia. That was completed and – similar to LAUTUS, this technology from the perspective of Project provides input to the whole system improvement in Latvia.

Environmental Protection Fund provided the funding by supporting collection of Mercury (Liepaja City Demercurisation Center) and by supporting hospitals for procurement of health-care waste treatment equipment.

In addition, Ministry of Health, Ministry of Agriculture and Ministry of Environment provided in-kind co-financing by ensuring participation of experts in Work groups, use of facilities for the Project meetings etc,

Planned Co-financing by component.

Component	Co-financing amount (USD)
Component 1 – Model Facilities	170,211
Component 2 – Technologies	2,521,000
Component 4 – Procurement of Mercury Free Devices	136,000
Component 6 National review of HCWM policy	20,000

Co-financing by project partners

Letter of co-financing	Partner	Co-financing purpose	Co-financing amount (USD)
Lat1cofi.pdf	Environmental Protection Fund	Technology and mercury-replacement investment	335,911
Lat2cofi.pdf	BAO	Purchase and maintenance of appropriate technology	300,000
Lat3cofi.pdf	Medical Waste Solutions Limited	Technology investment through LIFE program	2,000,000
Lat4cofi.pdf	Ministry of Health	On behalf of model facilities and the ministry	211,300

Baseline. In Lebanon, the Decree 8006 establishes the rules for classification, segregation, sterilization and storage of health-care waste (HCW). It requires health-care institutions wishing to install a treatment plant to be licensed from the Ministry of Environment after performing an Environmental Impact Assessment, and that treated HCW be dumped in “special” dumping areas separate from the area used for municipal waste. Subsequently, the Decree 13389 made two main changes to Decree 8006, namely that HCW can be discarded in landfill areas used for municipal waste and that shredding of waste is not obligatory (It was obligatory in Decree 8006).

There are two companies that treat health-care waste in Lebanon by autoclaving and are licensed from the Ministry of Environment. One is an NGO (Arc En Ciel) currently managing five treatment plants, covering all the country. One plant is available in the Bekaa area, covers seven hospitals and can treat 1000 kg per day; one in the North, in Zgharta with a capacity of more than 1000 kg per day; one in the South, in Saida, with a capacity of more than 3000 kg per day; two in Beirut, one of them in the Hotel Dieu de France Hospital in Beirut that covers three hospitals and can handle 1000 kg per day and the other one in Jisr el Wati with a capacity of more than 3000 kg per day. However, some of the treatment plants are now quite old and need to be replaced for a better efficiency. The other company (EnvSys) is private and has one truck that sterilizes waste on site and can process 1000 kg per day. This company currently has a contract with five hospitals and committed to start operating another truck with a larger capacity. Three hospitals are licensed by the Ministry of Environment to treat health-care waste. Two use autoclaving, and the third – a public hospital – uses incineration. A May 2005 study showed that 17 private hospitals and 2 public hospitals use incineration as a waste disposal method.

Implementation. In February 2006, the NPSC selected three facilities to be involved in the project: Hotel Dieu (Beirut); Rayak Hospital (Bekaa) and Haykal Hospital (North). In 2009, a rapid assessment of the performance of these hospitals was conducted using the I-RAT tool. Due to the good waste management in place in 2 of the 3 facilities (Hotel Dieu and Haykal hospital), these hospitals were withdrawn from the pilot project, and a new call for applications was launched bringing on board 2 other facilities (Hammoud – Saida hospital and Nabatyeh hospital. The Nabatiyeh public hospital is the only public/government hospital that has passed the MoPH accreditation cycle in 2005 and uses incineration for disposing HCW (reportedly since the start of the project this incinerator has not been functional). As international funding from other sources (EC Life, EU/OMSAR, etc.) is already secured for non-burn waste treatment technologies, activities related to Component 2 (demonstration technology) focus exclusively on conducting a comparative analysis of existing technologies.

Component	Achieved results	Comments
Component 1. Model Facilities ad programs	MOU signed with 2 model facilities Baseline assessment performed in the 2 model facilities Waste management plan in the 2 model facilities drafted Health care waste management plans implemented. Key performance indicators established Training needs assessment (TNA) performed. Training of trainers at the model facilities completed and assessed. The report was submitted on December 4, 2012. We will send a copy.	Replication materials on best practices and techniques to be distributed and evaluated.
Component 2. Development of technologies	Activity on this component is fully co-financed	The Project developed a quarterly reporting system to support the operations of the treatment technologies at the CTFs. A sample is included in the Lebanon report. As this activity represent the bulk of co financing, understanding its integration with the project is essential .
Component 4 Procurement of mercury-free devices and best practices in mercury management	The study design for the comparative analysis for mercury free equipment was sent to the concerned parties in Hammoud hospital (ref). Hammoud hospital's administration is planning to phase out mercury thermometers and started using a sample in 2 departments. 50 thermometers with accessories delivered to the Nabatieh Governmental hospital. The implementation of the comparative study for mercury free equipment and staff preferences at Nabatieh Governmental hospital completed. National report under development. Guidance on selection of mercury devices drafted. A scientific publication drafted and published.	A conference on mercury will be held on December 5.
Component 5: National training on health-care waste management	A training video that can be used by any hospital has been completed. An interactive game was also developed. A letter to MOE and Ministry of Education was written on the need to establish training curriculum on the management of healthcare waste. A training manual on health care waste management was developed. Student certification will not be established, but coordination with the Ministry of Education is taking place to include a course on HCWM in the curricula of healthcare professionals. A curriculum was prepared. The training evaluation has been also completed	At least two training sessions conducted
Component 6: National review of health-care waste management policy	An official letter (Letter no. 4209/B dated 25/8/2010) was drafted and sent from the Minister of Environment to the Minister of Public Health to explore the opportunity of coordination and involving the Ministry of Environment in the licensing and Accreditation of hospitals and medical labs; working on phasing out mercury from healthcare facilities; improve compliance with decision 13389/2004; including healthcare waste management in the curriculum of health professionals; etc... and the Ministry of Public Health appointed 2 people for coordination with the project team on these matters.. Law suits were filed against around 80 hospitals not complying with decree 13389/2004. Based on the review of the legal framework, the project team worked on developing legal texts concerning HCW treatment centers, hazardous waste management, environmental guidelines for the establishment and operation of infectious HCW treatment centers and for the transportation of healthcare waste, mercury management in healthcare facilities. These drafts were circulated to concerned parties for review and feedback. Summaries of feedback and comments including responses of the project team were prepared before the finalization of the legal text.	Hold national policy review conference, if appropriate
Component 7: National dissemination activities	A project newsletter has been developed by the project team. All the material has been presented in the "Eco-Orient conference" - television coverage obtained. In Lebanon a competition among hospitals on who will implement the best healthcare waste management practice has been launched.	Interviews/dialogues with relevant authorities held for further agreement or commitment on implementation plan for replication of best practices Local language materials distributed

<i>Success stories</i>	The project developed original tools for HCWM training: a training video was developed showing the different steps for healthcare waste management in a hospital setting from waste minimization to waste treatment. An interactive game on healthcare waste segregation was also developed to assist healthcare staff in improving their segregation skills.
<i>Recommendations</i>	Follow up on the cooperation among waste management facilities (Arc en Ciel and Env Sys) and the project should be ensured, to allow for cost/benefit estimates, co-financing estimation and replication.
<i>Lesson learned</i>	The limited information received on component 2 (entirely co-financed) proved the need of a better integration in the projects and of a more frequent and extensive exchange of information on co-financed activities.

GEF Grant Budget (USD) as of November 2012

Activity	Budget 2011 (USD)	Budget 2012 (USD)	Balance at nov. 2012 (USD)
Model facilities (component 1):	84181	236090	38932
Demonstration technology (component 2)			
Non-mercury equipment and policy (component 4)	20233	19075	5966
National training program (component 5)	25487	24220	6513
National policy review (component 6)			5000
National dissemination activities (component 7)	2475	4800	-475
Total	132377	284186	55937

Planned Co-financing by component.

Component	Co-financing amount (USD)
Component 1 – Model Facilities	729,632
Component 2 – Technologies	249,000
Component 4 – Procurement of Mercury Free Devices	
Component 5 – National Training Program	600,000
Component 6 National review of HCWM policy	20,000

Co-financing by project partners

Letter of co-financing	Partner	Co-financing purpose	Co-financing amount (USD)
Leb1cofi.pdf	Arc en Ciel (AEC)	Waste handling, transportation and treatment	1,260,132
Leb2cofi.pdf	Ministry of Environment	Project-related MOE activities	128,500

Reported Co-financing

The following figures, for an overall co-financing amount of 434,150 USD have been reported as accounted co-financing from Lebanon:

1) in kind co-financing from MOE

Co-financing item	total per year (USD)
Personnel Cost (PC)	53,239.
Consumables Cost/Stationary Expenditures (CC)	10,720
Rent cost (RC)	31,487
Communication & Mailing Services (CMS)	23,292
In Cash contribution (ICC)	0
MOE contribution	11,8739
	0
MOE contribution	237,477

2) In Kind co-financing by NGH

Co-financing item	total per year (USD)
Employees fees	7,920
Thermometre maintenance + probes	4,021
Prepare the area for waste management rooms	4,000
External healthcare waste storage	300
Total	16,242

3) In Kind co-financing by Hammoud Hospital

Co-financing item	total per year (USD)
Renovation of utility rooms	3335
Training costs	890
Supplies	176206
Total	180431

Baseline. At the project starting, some hospitals have adopted health-care waste management practices and a good immunization model is in place under the management of the Department of Health. DOH conducts some training but it is not strategically organized to address HCWM practices in a holistic manner. The country has put in place a ban on incineration, with some ambiguities on the definition of “non-burning” technologies.

Implementation. In the Philippines, most of the government hospitals are devolved to the Local Government Units. For this reason, LGU hospitals were initially selected as model facilities for the project. Ospital ng Maynila Medical Center (OMMC) was initially identified as the urban model hospital because it is a good representative of the Local Government Unit (LGU)-operated hospitals in the National Capital Region and the country as a whole. Pangasinan Provincial Hospital (PPH) was identified as the rural model hospital because it is a good representative of the Local Government Unit (LGU)-operated hospitals in the country.

In August 2010 PPH pulled out from the project. The Ospital ng Maynila remained as the urban model facility but in early 2011 it pulled out from the project too. Two new model facilities were then selected: the Sta. Ana Hospital in Manila, and the Diosdado P. Macapagal Memorial Hospital in Guagua, Pampanga. A National Training Program on Health Care Waste Management was developed and completed by the University of the Philippines. This was intended to be used by the DOH for training nationwide. While the initial trainings were performed on the basis of the material developed by the University of Philippines, the DOH opted to modify the training modules for the succeeding trainings to suit the specific training needs at different levels of organizations. There is a tight interconnection between the project components concerning training and policy. The policy component is vested on the DOH Health Care Waste Management Manual which is now being reproduced and distributed. This manual has to be adopted by law through a DOH Department Administrative Order for all the generators of HCW in the Philippines. In the implementation stage, there could be differences in the content of the training modules and the Manual that have to be reconciled.

The GPT reported to the evaluators its grave concerns regarding HCWM Manual listing pyrolysis as the first choice for waste treatment technologies without any qualifications, caveats or additional guidance. Indeed, having the UNDP and GEF logos in the cover of the manual may be interpreted as endorsement of uncontrolled pyrolysis technologies.

In general, it seems that, for some reasons, the project team in the Philippines was not open either to the suggestions provided by the GPT (which already during its mission in August 2010, proposed to withdraw the procurement of autoclaves due to time constraints and other reasons) or even to the recommendation forwarded at MTE.

Indeed, except for the business plans of the 2 hospitals which were drafted in February 2012, none of the recommendations proposed at MTE were addressed. It is evident that at least for component 2, the project will not reach its objective; and that sustainability issue may affect component 1 of the project.

Component	Achieved results	Comments
Component 1. Model Facilities and programs	<p>MOA for Diosdado P. Macapagal Memorial Hospital signed.</p> <p>MOA for the Sta. Ana Hospital signed.</p> <p>Baseline assessments have been performed and Healthcare Waste Management Plans drafted for both the Diosdado P. Macapagal Memorial Hospital and for the Sta. Ana Hospital) The two baseline assessments have been revised by the GPT.</p> <p>Training at both the above hospitals is completed.</p> <p>The HCWM plans, including the monitoring of waste segregation are being implemented in the 2 hospitals. The two plans and their implementation have been revised and improved by the GPT</p> <p>The installation of the waste treatment facility at Diosdado Macapagal Memorial Hospital (DMMH), the model hospital in Guagua, Pampanga was completed on March 3, 2014.</p>	<p>After MTE, the project team was partially replaced and the contracts of the consultants working at the hospitals were terminated.</p> <p>Based on a report from HCWH (September 2014), there was no segregation, and mixed waste was stored to nearly overflowing in a storage room (see Photos 1 and 2 below). Based on that report, the hospital was even practicing open burning of regular waste which is against national regulations.</p> <p>As of July 31, 2015, no final report has been received by the MOH. It is the only country that has not submitted a final report.</p>
Component 2. Development of technologies	<p>A first bidding for the procurement of 2 autoclaves and a vehicle for the transportation of medical waste failed.</p> <p>New technical specifications were drafted and revised by the GPT Technical Advisor.</p> <p>After failure of the first bidding for the 2 autoclaves, the UNDP Procurement Unit requested revised financial proposals from the three technically-compliant bidders using scaled-down specifications. The scaled-down specifications were prepared by DOH together with the GPT. Before its release for a 3rd bidding, the UNDP CO sent the tender documents in early October 2012 to an independent evaluator called PAPP for review and comments.</p> <p>Business plan for HCWM at the 2 model facilities carried out. The studies showed that autoclaves installed at the hospitals can sustainably only if their capacity is fully exploited.</p>	<p>Although the equipment was finally procured and installed, based on CTA report in September 2014 it was not yet operational, reportedly because the Environmental Compliance Certificate and the Permit to Operate were not released by DOH.</p> <p>UNDP-Philippines reported that the autoclave-shredder equipment for Santa Ana Hospital in Metro Manila, the second model hospital, had not yet been installed pending a signed MOA with the city government which has been very delayed.</p>
Component 4 Procurement of mercury-free devices and best practices in mercury management	<p>The two hospitals were already mercury free. Guidelines on safe handling and in-facility storage of phased-out mercury devices developed.</p> <p>Two conferences on Mercury were organized, one National Mercury Conference in November 2010 organized by DOH and one second Regional Conference on Mercury-Free Health Care organized by HCWH together with WHO and UNDP in March 2011. Procurement of spill kits for SAH completed; procurement of non-mercurial devices is on-going. Delivery of Spill kits and non-mercurial devices to DPMMH completed and use of the same is ongoing.</p>	<p>Some activities related to the procurement of mercury free devices were still ongoing by the end of Sept. 2012. There is doubt on the usefulness of Spill Kits at DPMMH which reportedly is a mercury free hospital.</p> <p>As of Sept 2015, the project is still awaiting fund utilization reports from CHD-Central Luzon and CHD-MM</p>
Component 5: National training on health-care waste management	<p>A MOA with the institution in charge of the training, UP CPH, has been executed</p> <p>Material for the pilot training on HCWM has been developed by the UP CPH and by DOH. At least two training sessions conducted.</p> <p>HCWM Trainors' manual, participants' handbook and training strategy were completed by UP-CPH and submitted to DOH</p> <p>Workshop on preparation of corresponding training modules was conducted on June 05-08, 2012 in Tagaytay City. Expenses were shouldered by DOH.</p> <p>Participants were the Sanitary Engineers from DOH regional offices who are in charge of training on HCWM</p> <p>Training and training evaluation as per contract of the UP CPH has been completed. DOH and WHO plan to conduct one batch of training by December 2012</p>	<p>Based on the interviews, there are inconsistencies or conflicts between the UP CPH training modules and the DOH HCWM Manual developed by the NPSC. HCWH and GPT also have disagreements with the HCWM Manual contents. There are no update on this aspect.</p>
Component 6: National review of health-care waste management policy	<p>The main activity under this component is the drafting of the 3rd Edition of the Health Care Waste Management Manual).</p> <p>During negotiations with UNDP-NY in 1st Quarter 2013, the DOH agreed to amend Table 6.1 (page 76) of the new Health Care Waste Manual stating: "The UNDP-GEF Project does not endorse pyrolysis as a first choice of healthcare waste disposal technologies, noting the high auxiliary equipment and management requirements pyrolysis technologies require for meeting the Stockholm Convention BAT guidelines on dioxin and furan emissions." DOH also agreed to send out a notice to people who had already received the printed manual to notify them of this change.</p> <p>A National Roadmap on Health Care Waste Management is being formulated under the leadership of the DOH to serve as a policy for long term sustainability; Meetings with DOH, UNDP and DOH UNDP Coordination Office on July 20 and August 8, 2011). A TWG has been formed by the DOH and has met once.</p> <p>Monthly meetings are planned</p> <p>WHO has already selected Consultant for the formulation of Roadmap. Contract approval is in process.</p>	<p>The inclusion of pyrolysis as one of the recommended options for treatment of HCWM appears not fully supported by scientific evidence and considerations on the specific situation in the Philippines.</p> <p>Formulation of roadmap still to be started in Sept. 2012.</p> <p>Since there is no final report, the GPT has no information on the status of the HCWM Manual nor on the plans to develop a national roadmap.</p>
Component 7: National dissemination activities	<p>The 3rd edition of HCWM Manual has already been printed and are currently being distributed to all government hospitals with financial assistance from WHO. WHO (2,000 copies). DOH has a plan to reproduce additional copies. The National Center for Health Promotion (NCHDP) of the DOH was requested to resume work on the development of IEC materials</p>	<p>Limited dissemination performed until now. No evidence were provided on national dissemination activities.</p>

<p><i>Recommendations</i></p>	<p>The project in the Philippines faced a number of difficulties which in the end resulted in a unsuccessful outcome.</p> <p>The implementation entity did not submit the final report, therefore most of the information on project achievements comes from the CTA reports or from the reports provided by HCWH.</p> <p>It was evident since the year 2013 that the component 2 of the project cannot be completed within the project deadline, and that given the uncertainty affecting the procurement, an extension would probably not have solved the issue. There were very different views among project partners – the GPT, DOH, and even the management of the project facilities (DMMH and Santa Ana hospital).</p> <p>As of September 2014, the equipment delivered to DMMH was not yet operational, as DOH did not released yet the necessary permits to operate whilst as of July 2015 the equipment delivered to S. Ana Hospital had not yet been installed pending a signed MOA with the city government which has been very delayed.</p> <p>Difficult issues also derived from the debate concerning disposal technology. In the view of the evaluator, the dispute concerning combustion vs. non-combustion (see the HCWH position paper and the reply from DOH) was conducted too much ideologically, which did not help. On one side, it has to be considered that, based on the guidelines of the SC BAT/BEP, incineration technologies are indeed listed among BAT as long as technical features and fulfilment of environmental standards are ensured; on the other side, any technology should be considered in the context of the local capacity to monitor and enforce environmental standards, and considering its sustainability given the market of the disposal of specific waste streams. The evaluators also consider that small incineration plants should be discouraged for the following reasons: the technical impossibility to achieve satisfactory environmental standards (first of all the dioxin emissions $<0.1\text{ngTE/Nm}^3$) at sustainable costs; the significant burden they would pose to the environmental authorities in charge of monitoring and enforcing environmental regulations (dioxin testing capacity is still limited in the Philippines); the negative feedback they exert on HCWM, as incineration of waste actually represents a disincentive to waste segregation in the hospitals, with negative consequences on human health. It is also to be considered that the SC BAT/BEP guidelines provide several warnings against pyrolysis: “... <i>application of these systems is low and operational difficulties are reported at some installations</i>”. and “...<i>many of these developments have met technical and economic problems when scaled up to commercial, industrial sizes, and are therefore pursued no longer</i>”.</p> <p>During negotiations with UNDP-NY in 1st Quarter 2013, the DOH agreed to modify Table 6.1 (page 76) of the new Health Care Waste Manual stating: “<i>The UNDP-GEF Project does not endorse pyrolysis as a first choice of healthcare waste disposal technologies, noting the high auxiliary equipment and management requirements pyrolysis technologies require for meeting the Stockholm Convention BAT guidelines on dioxin and furan emissions.</i>” DOH also agreed to send out a notice to people who had already received the printed manual to notify them of this change. However there were no follow-up on the fulfilment of this agreement.</p> <p>Final request of information from the international evaluator to clarify the status of the above issues were not answered. The obvious recommendation is therefore to monitor step by step the implementation of further project to be carried out in the country to ensure the fulfilment of project objectives.</p>
<p><i>Lesson learned</i></p>	<p>A full and detailed exchange on technical and policy views, as well as on rights and obligation of each project implementation party since project design stage would have possibly avoided some of the difficulties that the project faced in the Philippine. The country government is evidently rethinking its strategy on waste management, trying to re-introduce incineration currently forbidden by the existing regulation which established a sort of “incineration ban”. The debate generated by this changing of policy was not only technical and seriously affected project implementation due to disagreement between the government, the model facilities management, NGO, UNDP-CO and the international GPT. The lesson for future projects is to carefully monitor that all project partners share the commitment toward implementation of the SC convention objectives since early stage of project preparation.</p>

GEF Grant Budget (USD) as of November 2012

Activity	Budget 2011 (USD)	Budget 2012 (USD)	Balance at nov. 2012 (USD)
Model facilities (component 1):	36544.53	35,226.13	37355.30
Demonstration technology (component 2)	0.00		512644.70
Non-mercury equipment and policy (component 4)	14,510.86	-21.55	21.55
National training program (component 5)	44,466.84	18,091.54	-401.54
National policy review (component 6)	1,377.94	-189.51	189.51
National dissemination activities (component 7)	78,342.28	6189.15	34455.13
Total	175,242.45	59295.76	584264.65

Committed Co-financing by component.

Component	Co-financing amount
Component 1 – Model Facilities	363,509
Component 2 – Technologies	528,302
Component 4 – Procurement of Mercury Free Devices	
Component 5 – National Training Program	458,491
Component 6 National review of HCWM policy	20,000
Component 7 – Global / Regional dissemination	75,472

Committed Co-financing by project partners

Co-financing letter	Partner	Co-financing purpose	Co-financing amount (USD)
Phi1cofi.pdf	Department of Health	On behalf of national partners.	1,425,774

Baseline. In Senegal, a sound waste management system is not completely in place. An integrated legislation on waste is still missing, although a decree on the management of medical waste (Decree 2008-1007 de la Ministere de la Sante et de la Prevention) has been issued before project start. In fact, Senegal had various legislation disseminated in various ministries and offices. The project has started a process of having a uniform platform to be compiled as a law. The government has already adopted a “Code de L’Environnement” which address some major issues. The project’s compilation of existing regulation will complete the process once it is enacted as a law. Such law has not yet reached the new assembly which is very recent.

Environmentally sound health-care waste treatment technologies are currently quite limited. In many cases, health care waste is not treated at all and is disposed with municipal waste. However, the Dakar region has a sanitary municipal landfill where hospital waste is disposed of. In some Health Medical region facilities such waste landfills do exist. However Senegal has still a long way to go to have modern dumps that can properly receive the different category of healthcare waste. In the rest of the country, all waste is disposed in a non-sanitary and non-secure fashion. Most treated health-care waste is either buried, open-burned or burned in small-scale incinerators with no air pollution control measures. Due to low or no awareness of proper health-care waste management systems and lack of knowledge about economically viable non-polluting treatment technologies, the current trend in Senegal is still the promotion of burning.

Implementation. Three hospitals have been selected as model facilities for the project in Senegal:

- The Grand Yoff General Hospital (Hopital General Du Grand Yoff, HOGGY). It is a medium-sized hospital located in the Dakar area, large enough to be an appropriate urban model while small enough that Project results could be easily replicated by health-care facilities throughout the country. This is a private hospital under the jurisdiction of the Ministry of Health
- Youssou Mbargane (YM) Diop Hospital is a rural model facility located in the Rufisque region. Of the two rural facilities, YM Diop Hospital is farther away from Dakar and located in a more remote rural area.
- The Sangalkam Hospital, located approximately 30 kilometers outside of Dakar in the Rufisque region, is under the jurisdiction of the YM Diop Hospital. It is anticipated that the waste generated by the Sangalkam hospital will be treated with the facilities established in YM.

The project is now under the full control of the Ministry of Health (MOH). PRONALIN, the main MOH training unit, performed the training design and implementation. PRONALIN is a training program on infection control, HWCM and epidemiology funded by the Scandinavian Development Fund and overseen by the Department of Preventative Medicine of the Ministry of Health in Senegal. In addition to PRONALIN the Hospital nosocomial units called CLIN also played a key role in the implementing locally the training and other project objectives at the hospitals and health center units. Some issues still need to be addressed: accidents (for instance injuries from used needles) need to be registered; hospital management including Administrators and Professors in charge of medical units need to own the process and play key roles in supporting internally waste policy; the project should also identify disposal methods for liquid waste and organic waste, which presently are not covered. After the project end, the continuity of supplies can be problematic. The MOH has clearly indicated that hospitals should build the funds in their budget and yet low hospital budgets are subject to constant arbitrage as to what purchases are priority or not. This arbitrage does not favour waste management related expenses since every medical act seems addressed to urgency. Recycling of recyclable materials is very low.

Component	Achieved results	Comments
Component 1. Model Facilities and programs	<p>In the 3 hospitals, the needs assessment, based on a tailored guidance methodology provided by the Global Project Team, has been completed in April 2011, as the first draft submitted was not considered satisfactory..</p> <p>Training of managers and Trainer of Trainers were performed in all the hospital. Replication of training for medical and paramedical personnel was also performed.</p> <p>At the YM hospital, only sharp are collected in specific containers (despite the procedure was not satisfactory).</p> <p>Equipment for HCW pre-treatment (autoclave, shredders) procured, installed, connected and tested (microbiological testing carried out at HOGGY). A system for measurement and documentation established. Written procedures have also been completed for HOGGY and Youssou Mbargane. This may be the most significant outcome in terms of impact since the written procedures will now be used by all Senegal hospitals as a reference document to help them develop their own procedures.</p> <p>The GPT hired biomedical engineer Abdoulaye Faye of Senegal under the global component budget to follow up on the three model hospitals from 2013 to August 2014. Engr. Faye worked with HOGGY and Youssou Mbargane model hospitals to monitor and maintain the waste management systems.</p> <p>(PRONALIN) of MOH, developed a monitoring tool to assess segregation and compliance with required HCWM practices. PRONALIN also developed a roadmap matrix tool for hospitals to help them plan improvements in HCWM. The tools were tested in the model hospitals and later used around the country.</p>	All the project activities completed.
Component 2. Development of technologies	<p>Procurement of equipment (2 horizontal autoclave; 2 vertical autoclaves; 2 shredders) have been completed, based on technical specification verified by the GPT.</p> <p>An additional autoclave has been procured for the Sangalcam Hospital. At the Hoggy hospital, a building dedicated to storage and pre-treatment of HCW has been built. In this building the 2 steam horizontal autoclaves (200L), and one shredder have been installed.</p> <p>The same has been done at the YM where 2 vertical steam autoclaves (80L), and one shredder have been installed.</p> <p>The autoclave at Hoggy was tested with the assistance of GPT.</p> <p>The project worked with Sangalcam model health to conduct further training and improve on the installation of the autoclave, conduct tests, and promote the use of the waste treatment autoclave.</p>	All the activities under this component have been completed. Cost effectiveness of the pre-treatment need to be measured; if a recycling strategy is not put in place, there is the risk that the waste pre-treatment is not sustainable.
Component 4 Procurement of mercury-free devices and best practices in mercury management	<p>Mercury free devices have been procured. Reportedly, 600 Orion thermometers were delivered at Hoggy and 250 at YM; 20 Sphigmomanometers delivered at Hoggy and 14 at YM.</p> <p>Totally, around 1000 mercury free thermometers and 300 sphygmomanometers have been procured</p> <p>Personnel have been trained in the use of mercury free devices. Two awareness raising event, covering the personnel of the three model facilities, have been held. Non mercury equipment distributed for use. As of August 2014, the sequestered mercury devices remained stored in the special storage area at HOGGY. The survey questionnaires, filled by hospital hygiene focal points, indicated satisfaction by the staff with the non-mercury devices.</p>	All the activities under this component were completed.
Component 5: National training on health-care waste management	<p>Training at the model facilities has been completed. 3 trainings session were conducted, of which one for the managers of the three hospitals, conducted at the Hoggy premises, and 2 training of trainers, conducted respectively at Hoggy (for the Hoggy personnel) and at Youssou Mbargane (for YM and Sangalcam staff). The trainees have further replicated the training at the internal hospital level; around 400 people were trained at Hoggy, and around 280 people were trained at YM and Sangalcam..</p> <p>The training has also covered all issues related to MERCURY and Dioxin. The UNDP GEF Project and partner PRONALIN, with the support of the CTA developed a national training program, which was integrated into PRONALIN's national training program on infection control. PRONALIN toured the country and provided training to major hospitals and health centers in each region of the country on both infection control and HCWM.</p>	
Component 6: National review of health-care waste management policy	<p>The UNDP GEF project in collaboration with the MOH's PRONALIN developed a Manual of Procedures for the Management of Wastes from Healthcare Activities. The manual was based on experiences at two of the model hospitals, HOGGY Hospital and Youssou Mbargane Diop Hospital. According to PRONALIN, the manual was disseminated widely and has now become the standard procedure for all hospitals in the country. This is a major contribution of the UNDP GEF project to Senegal.</p>	All the activities under this project component were completed.
Component 7: National dissemination activities	<p>A website has been developed. A big event was organized in September 11, 2012, which actually boosted HCWM awareness and facilitated the project.</p> <p>In the course of the event, authorities were interviewed and dialog on project needs at the highest level started. The big event received an intense TV and newspaper coverage.</p> <p>A national dissemination conference was held on July 27, 2012 and received media coverage in various local, national and regional newspapers.</p> <p>The results of the project was presented at various international and regional conferences including the 1st Conference Internationale des Ministres de la Sante sur la Gestion des Risques et la Security des Systemes de Sante en Afrique (CIMSEF Conference), Cotonou, Benin, December 10-14, 2012; and the 5th ICAN/ICAZ Conference, Harare, Zimbabwe, 3-7 November, 2014.</p> <p>The project's MOH focal point and former director of PRONALIN, Dr. Babacar Ndoeye, has become a recognized HCWM expert in the country and in the Africa region. He joined the CTA in the UNDP team that provided autoclaves and HCWM trainings to Ebola-affected countries in West Africa.</p>	All the activities under this component were completed

<i>Success stories</i>	<p>At Mid Term Evaluation, the project in Senegal seemed close to failure. Although procurement of equipment and training were almost completed, the Health Care Waste Management at the hospital was extremely poor, and the equipment was lying unused in the warehouses. However the project was very active in addressing the recommendation proposed at MTE; an expert was hired to take care of the HCWM in the three facilities, which was greatly improved; the NPCD actively sought additional funds for solving financial issues, which were provided by WHO; the equipment was connected and placed into use; training on HCW was repeated in all the facilities; the process of replacing mercury equipment with non mercury equipment finally started, and presently the project seems to have reached almost all of its goals. Toward the end of the project, a “ribbon cutting” event, hosted at HOGGY, was held. This event was very successful and raised the attention of the governmental stakeholders on the promotion of HCWM activities carried out by the project; and – even more important – boosted the commitment and enthusiasm of people working in the hospital toward a better implementation of an environmentally sound HCWM. News magazines and TV have relayed strongly the event and the need to develop waste management throughout in country</p>
<i>Recommendations</i>	<p>It is necessary to carefully follow project activities to ensure that waste are properly segregated, that only trained employees are implicated in waste management; that PPE is always used in presence of hazards; that sound HCWM methods are disseminated; and that continuity of needed consumables (bags, bin, batteries) is ensured. Environmentally sound HCWM cannot be developed in the hospitals as a separate process; a recycling strategy should be established to ensure that pre-treatment by non combustion technologies is economically sustainable. If HCW are just placed in landfills, there is no cost advantage in the adoption of sound HCWM at the hospital. If safe landfills, benefits for recycling, and specific rules are established, then sound HCWM may result not only in health and environmental benefits, but also monetary saving and possibly revenues. However it seems that the effort on the implementation of a better legislation on waste is still very limited in Senegal.</p>
<i>Lesson learned</i>	<p>Role of technical expert. The MTE raised a clear warning concerning the need to have a technical expert who take cares at the situation of model facilities. That warning has been seriously considered by the project management in Senegal. One full time technical expert was in charge of the HWCW at the three pilot hospitals. The role of the technical expert after MTE, together with the assistance provided by international consultant, was one of the keys in rescuing the Senegal project. Other keys were the additional financial support provided by WHO and by the global budget. Dissemination. The success story of the “ribbon cutting” event at HOGGY proved that dissemination may be an important driving force for the project not only after it has been carried out, but also during its preparation. The pressure and expectations generated for the preparation of the event at HOGGY, together with the success of the event, seemed to have secured abundant fuel for concluding successfully the project in one facility that, by several stakeholders, was perceived as “problematic”.</p>

GEF Grant Budget as of November 2012. For Senegal, the remaining budget as of December 2011 was 28,443.06 USD, whilst the remaining budget as of 16 November 2012 was 1778,83 USD. The small amount of funds remaining after December 2011 was mainly spent for project management.

Co-Financing. Co-financing was secured through the contribution of PRONALIN. Training program on HCWN performed under the PRONALIN umbrella represents the Senegal co-financing contribution to the project, and is coordinated with the training objectives and criteria set under the project. The training budget represents part of the Senegal co-financing contribution to the project. The other part is a National voted budget allocation provided to the Ministry Of Environment for the project use. Monitoring of the total funding for co financing was not evident to allow a complete accountability. However, Senegal has made serious effort to support the project in proving funding, facilities and training. As in other countries, no monitoring or accounting of co-financing has been established. Although project document envisaged an overall amount of 810.000 USD as in kind co-financing provided by the Government of Senegal, the commitment letter signed by the Ministry of Health did not contain any quantitative reference.

Planned Co-financing by component.

Component	Co-financing amount
Component 1 – Model Facilities	90,000
Component 5 –National Training Program	750,000

Co-financing by project partners

Letter of co-financing	Partner	Co-financing purpose	Co-financing amount (USD)
Sen1cofi.pdf	Department of Health	On behalf of national partners including model facilities and Nordic Fund training program.	Not indicated

Baseline At the time of project design, environmentally safe health-care waste management practices were not the standard operating procedure in hospitals. Burning was considered the best option for disposing HCW. However, most incinerators in the country are not equipped with any air pollution control system. Subsequently, and partially also thanks to the raised awareness achieved already in the stage of project preparation, several regulations on health waste management were promulgated which provided a better legal framework for the implementation of the project¹.

Besides, the establishment of a Department on Health Environment under the Ministry of Health provided a better institutional support for the project implementation.

Implementation. The project, which until the MTE, for several reasons – including the need to comply with the Harmonized Programme & Project Management Guidelines (HPPMG) - was almost dormant, since end of 2011 benefited of a substantial acceleration and achieved most of its objectives. However, it is evident that due to the late start, the time for carrying out practical activities was too short, and the outcomes are not very well consolidated yet.

Repeated changes of the UNDP and Government project managers also somehow affected the management of the project. On the side of Vietnamese partners, institutional changes in both the Ministry of Health (with the establishment of the new Health Environment Management Agency) and the Ministry of Natural Resources and Environment (the Department of Waste Management and Environmental Improvement was established in late 2009) affected the start up of the project.

Three main project implementation areas were defined at project design:

Urban Model Hospital: Viet Duc was chosen as the model urban hospital for the project for its outstanding reputation, for the amount of support and investment amounts from the Government of Vietnam, and for its commitment to the project goals. Viet Duc it is a training/university hospital thus ensuring replication of the management practices.

“Cluster” of hospitals. In Vietnam, provincial hospitals, district hospitals and health centers work closely in providing health-care services. For this reason, NPSC and NWG agreed on the need to examine the system holistically in order to make any substantial and long-lasting change. Additionally, the NPSC and NWG set proximity to Hanoi as a criterion for the rural cluster. After careful assessment, the cluster in Ninh Binh province, with the Provincial General Hospital as its core, was selected.

Central facility. URENCO is a waste management company providing waste disposal service of all the hospitals and the majority of health centres in Hanoi. To minimize environmental impacts, URENCO proposed to replace its existing incinerator with a non-burn technology. The Project has chosen to work with URENCO to purchase two autoclaves and a shredder.

Concerning the training component, the Project established collaboration with the Vietnam Administration of Preventive Medicine (VAPM) of the Ministry of Health on the national training program. In April 2010, VAPM was transformed into two different agencies. One of these two new structures, the Health Environment Management Agency followed up with the project implementation. The Agency currently has an extensive national training program on occupational health and safety, and mandated with capacity building, monitoring and policy development for health environment. Through the Project, the aforementioned training program could be further evaluated, supported and enhanced.

¹ Among these, is worth recalling the Decision No 2149/QĐ-TTg dated 17/12/2009 by the Prime Minister on a National Strategy for solid waste management; Circular No 18/2009/TT-BYT dated 14/10/2009 by Ministry of Health on Guidance for infection control in health facilities; the Decision No 1873/QĐ-BYT dated 28/5/2009 by Ministry of Health on Health Environment Protection Plan for 2009 - 2015; Circular No 12/2011/TT-BTNMT dated 14/4/2011 by Ministry of Natural Resources and Environment on Hazardous Waste Management; Decision No. 170/QĐ-TTg dated 08 Feb 2012 by the Prime Minister on Approved master plan for hazardous healthcare solid waste treatment systems to 2025; Decision No. 2038/QĐ-TTg dated 08 Feb 2012 by the Prime Minister on Approved master plan for healthcare waste treatment for 2011-2015 and orientation to the 2020 ; Circular No 1/2012/TT-BTNMT dated 16/3/2012 by Ministry of Natural Resources and Environment on Provisions on establishment, appraisal, approval and Inspection, certification of the implementation detailed environmental protection proposal; establishment and Registration simple environmental protection proposal

Attainment of project objectives - Vietnam

Component	Achieved results	Comments
Component 1. Model Facilities ad programs	<p>Waste segregation is performed correctly (only one case of incorrect segregation found during the visit of the evaluators) Improvement is evident in comparison with the report produced by the international consultants after the last visit (April 2012). Almost 100% of the facilities' staff trained</p> <p>At Viet Duc hospital, the administration passed a Decision document on HCWM procedures. At Ninh Binh hospital, the hospital administration officially approved a Plan, Decision, and Instructions on segregation for the model hospital. The final report states that the hospital plans and procedures are reviewed and updated annually..</p> <p>In August 2014, a medical waste shredder was provided to Ninh Binh Hospital to reduce the volume of treated waste. In September 2014, the CTA installed the shredder at Ninh Binh Hospital, conducted tests of the shredder and autoclave system, and made engineering improvements in the autoclave. The CTA also made quick assessments and recommendations to further improve HCWM practices at Ninh Binh Hospital and introduced a new autoclavable sharps waste container to the hospital .</p>	Some issues on transportation of wastes from the departments to the temporary storage still persist. In one of the 2 facilities, infectious bins are accessible to the public.
Component 2. Development of technologies	<p>Autoclave at Ninh Binh working and avoiding the incineration of 1400 kg/month of HCW to minimize environmental impacts and high economic efficiency . Autoclave delivered at URENCO site (testified by visit of the evaluators) with the potential of avoiding incineration of 5000 kg/day of HCW. The "city wide sharp component" scaled up to the use and recycle of sharp waste containers in other Hospitals in Hanoi through URENCO</p> <p>After URENCO completed further site preparations and procured a generator to ensure sufficient power, the GPT sent autoclave engineering specialists in May 2013 to assist URENCO in completing the installation of the large autoclave and to conduct microbiological tests. The CTA went to Vietnam on July 31 to work with URENCO engineers and fixed outstanding problems on August 4, 2013. Tests were completed and the results were all successful. Training was provided to the URENCO staff and supervisor. The CTA presented a set of recommendations to URENCO to ensure sustainability. NARIME (National Research Institute of Mechanical Engineering) in Hanoi was contracted to develop an autoclavable sharp container. The containers were manufactured under the supervision of NARIME. In September 2014, the CTA inspected the products and recommended minor improvements. The sharps containers were successfully presented and tested at Ninh Binh General Hospital. Samples of the autoclavable sharps containers were given to URENCO, VEA (MONRE), Ministry of Health, and World Bank HWMSP project (see component 7 below) for consideration as a safer and more environmentally sound system for sharps waste management for Vietnam</p>	This component of the project ended on September 4, 2013 with the submission of the final report and recommendations to sustain the URENCO autoclave.
Component 4 Procurement of mercury-free devices and best practices in mercury management	<p>Two sets of trainings on mercury were conducted at Viet Duc Hospital for managers, doctors, and nurses. Hospital staff expressed preference for non-mercury devices. Nevertheless, mercury sphygmomanometers were still used in the surgical/operating department of the hospital.</p> <p>In June 2013, the CTA issued a Guidance on Maintaining and Calibrating Non-Mercury Thermometers and Sphygmomanometers, which was sent to Vietnam and all project countries, as well as to WHO, HCWH, and other project partners. The Guidance was disseminated in Vietnam on July 2013. The CTA provided samples of mercury calibration equipment to Ninh Binh Hospital during his visit in September 2014</p>	All the activities under this component completed.
Component 5: National training on health-care waste management	<p>All the activities concerning national training performed. Six training course on healthcare waste management were organized for 251 participants Two courses of Training of Trainers (ToT) on Health Care Waste Management were organised for 90 trainers from different Provincial Department of Health, Hospitals and Provincial Department of Natural Resources and Environmental, Universities These trainers would be able to carry out training for their provincial hospital and health care facilities using reference materials produced by the ToT.</p>	No significant weakness / threat on this component.
Component 6: National review of health-care waste management policy	<p>The analysis of policy and legislation benefitted of the coordination with another GEF project in the field of medical waste, and generated a comprehensive report which was discussed by the relevant governmental stakeholders in workshops and meetings.</p> <p>The GPT reviewed examples of international regulations on medical waste treatment provided by the CTA; reviewed national technical regulations; consulted with stakeholders including URENCO, selected hospitals, Ministry of Health, and VEA/MONRE; developed a draft national regulations; present the draft at consultation workshops and technical meetings which included hospital representatives and relevant experts; review technical notes prepared by the CTA; and finalize a draft national technical regulation to present to VEA/MONRE.. The English version of the draft regulation was completed on February 27, 2014 and reviewed by the CTA. The final draft regulations were submitted to VEA/MONRE and the work for this component was completed on March 4, 2014.</p>	All the activities under this component completed
Component 7: National dissemination activities	<p>Dissemination started mostly thanks to the facilities who communicated the results and methodologies to other hospitals in their network.</p> <p>A short broadcast on the national TV News and Hanoi Radio Television was made on the launching of the project in 2010 Four articles were produced at the Ministry of Natural Resources and Environment's Volume on Environmental Management ; Vietnam News and Vietnam Investment Reviews. National workshop on mercury minimization has been reported on online newspapers: Ministry of Natural Resources and Environment; Vietnam Environment Administration; POP website ; safety information website; Provincial Department of Natural Resources and Environment.</p> <p>The outcomes of the UNDP GEF project and a number of key UNDP GEF Vietnam consultants were used by an ongoing large World Bank project on HCWM, which started when the UNDP GEF project was in its final stage</p>	All the activities under this component were completed.

<i>Lesson learned</i>	<p>To avoid future disputes with the suppliers, it is important to ensure that, in addition to complete technical requirements, bidding documents for large equipment always clearly regulate the following: delivery of equipment documentation (handbooks, detailed tech. specs, connections, electric layout, SOP, etc.); delivery of spare parts during the warranty period; installation obligations, testing modalities and responsibilities, warranty, schedule and condition of payments with final payment only after successful testing of the equipment.</p> <p>For activities requiring behavioural changes (as in the case of waste segregation) time is needed for consolidating awareness and results.</p>
<i>Success stories</i>	<p>The analysis of policy and legislation benefitted from the coordination with another GEF project in the field of medical waste, and generated a comprehensive report which was discussed by the relevant governmental stakeholders in workshops and meetings. Such discussions were well received by policy makers as stated in the minutes of the workshop [Ref#6.30] and apparently contributed positively to the development of new legislation on Waste Management in general and in particular Health Environmental Management, with the introduction of the Master National Plan for Hazardous Health Care Waste Management by 2025 (Decision 170/QĐ-TTg on 08/02/2012 and Decision 2038/QĐ-TTg on 15/11/2011). Circular No. 01/2012 of Ministry of Natural Resources and Environment on Planning Detail/Simple Environmental Protection</p> <p>The autoclave at Ninh Binh is currently replacing around 1.3 t/month of incineration of medical waste; the autoclave provided by the project to URENCO has the potentiality to process 5t/day of HCW, which therefore will be not incinerated.</p>
<i>Recommendations</i>	<p>Dissemination. Ensure dissemination at least by publishing and distributing to other facilities a simple booklet containing project results, environmental, social and economical benefits of an environmentally sound HCWM, contact information of focal points, as well as project guidelines on health care waste management planning, and training materials</p>

GeF Budget. The Situation of the GEF budget in Vietnam is reported in the table below. Hard commitment includes allocation of budget under both already signed and not yet signed contracts.

Outcome	Budget	Total expenditure	Hard commitment	Actual balance	Balance After commitment
Outcome 1: Model facilities at Vietduc Hospital and Ninh Binh Healthcare Centers Cluster and Autoclave at Ninh Binh	\$184,542.10	\$152,781.02	\$31,551.42	\$31,761.08	\$209.66
Outcome 2 Appropriate non-incineration healthcare waste treatment technology successfully deployed and demonstrated	\$306,982.50	\$229,873.73	\$81,549.41	\$77,108.77	-\$4,440.64
Outcome 3: City Wide Sharp Waste Management	\$39,132.82	\$39,035.86	\$0.00	\$96.96	\$96.96
Outcome 4: Mercury	\$49,238.43	\$49,240.90	\$0.00	-\$2.47	-\$2.47
Outcome 5: National Training	\$86,866.01	\$57,156.41	\$26,106.46	\$29,709.60	\$3,603.14
Outcome 6: Policy review	\$18,968.10	\$14,475.06	\$4,461.87	\$4,493.04	\$31.17
Outcome 7: Dissemination	\$66,825.76	\$14,318.86	\$54,026.85	\$52,506.90	-\$1,519.95
Project Management	\$107,079.63	\$88,032.55	\$15,782.34	\$19,047.08	\$3,264.74
Total	\$859,635.35	\$644,914.39	\$213,478.35	\$214,720.96	\$1,242.61

Planned Co-financing by component.

At starting, the project expected co-financing amounted to around 1,040,000 USD as reported below. The co-financing committed with co-financing letters signed by the Ministries, the central disposal facility, and the model facilities amounted to 2035000 USD. At TE, the evaluators were provided with a reassessment of the co-financing status amounting to 2108780 USD.

Component	Co-financing amount (USD)
Component 1 – Model Facilities	45,000
Component 2 – Technologies	710,000
Component 4 – Procurement of Mercury Free Devices	20,000
Component 5 – National Training Program	220,000
Component 6 National review of HCWM policy	15,000
Component 7 – National Dissemination	30,000

Co-financing by project partners

Letter of co-financing	Partner	Co-financing purpose	Co-financing amount (USD)
Vie1cofi.jpg	Vietnamese Environmental Protection Agency (VEPA)	On behalf of all national sources including those enumerated below.	1,040,000
Vie2cofi.jpg	Ministry of Health	MOH HCWM-related activities	240,000
Vie3cofi.jpg	URENCO	For sharp and health-care waste treatment partnership activities	705,000
Vie4cofi.jpg	Viet Duc Hospital	Model facility Project-related activities	30,000
Vie5cofi.jpg	Ninh Binh Cluster	Model facility Project-related activities	20,000

Co-financing budget reassessed at terminal evaluation (source: PMU, MONRE, MOH)

Partner	Budget
Ministry of Health	\$461,905
Ministry of Natural Resources and Environment/Vietnam Environment Administration	\$36,589
Viet Duc Hospital	\$161,905
Ninh Binh General Hospital	\$200,000
URENCO	\$1,248,381
Total	\$2,108,780

8.2. RELEVANCE(*)

Rating for relevance: S

All the project activities are relevant to the immediate and development project objectives, and to the GEF focal area objectives. More specifically, the GEF 4 Persistent Organic Pollutants focal area strategy and strategic programming envisages that

“Projects addressing unintentionally produced POPs are expected to be mostly of a planning and strategy development nature under GEF-4, thereby preparing the groundwork for more systematic efforts that will be required in future phases of the GEF.”

The GEF 4 strategic programming 1 “Strengthening Capacities for NIP Implementation” set the following outcomes and indicators:

*“Outcome: GEF eligible countries have the capacity to implement the measures required to meet their obligations¹⁰ under the Convention, including POPs reduction measures. As such measures will address the full range of chemicals (e.g., pesticides, industrial chemicals, and **unintentionally produced by-products**). Countries will also be implementing measures that will improve their general capacity to achieve the sound management of chemicals.”*

“Indicators: The following outcome indicators are proposed as measures of capacity development for NIP implementation:

- *legislative and regulatory framework in place in supported countries for the management of POPs and the sound management of chemicals in general*
- *Strengthened and sustainable administrative capacity, including chemicals management administration within the central government in supported countries*
- *Strengthened and sustainable capacity for enforcement in supported countries*

The technology component of the project seems more relevant to the GEF 5 objectives and priorities, considering that “POPs releases to the environment reduced;” is one of the five outcomes of the Chemical Strategy Objective 1 of the GEF 5.

“Following NIP priorities, investments supported by the GEF will address implementation of best available techniques and best environmental practices (BAT/BEP) for release reduction of unintentionally produced POPs, including from industrial sources and open-burning.”

Therefore it may be affirmed that all the project activities aimed at enhancing capacities in the project countries and at supporting and strengthening the legislative and regulatory framework and the administrative capacity are fully relevant to the GEF 4 POP focal area strategies, whilst the technological components of the project (component 2 and component 3) are fully relevant with the GEF 5 POP focal area objectives and priorities.

As some activities may have an indirect rather than a direct impact on GEF outcomes, the relevance rating is set to satisfactory.

8.3. EFFECTIVENESS & EFFICIENCY (*)

Ratings for effectiveness and efficiency has been carried out using the methodology described in Chapter 5.2.4 on the basis of the detailed analysis of the outcome achieved at country level (chapters 8.1.2 to 0), plus the analysis of the outcome of the Global component and the Global team (scored separately).

The detailed results for effectiveness and efficiency are reported in Annex 2

8.4. COUNTRY OWNERSHIP

Country ownership is strictly related to sustainability, and therefore in the evaluation of sustainability the assessment of institutional and governmental risks played an important role. Country ownership has been evaluated on the basis of the following facts:

- **Consistency of the project objectives with the country objectives in the field of healthcare waste management and U-POPs reduction;** all the project countries ratified the Stockholm convention, and the reduction of U-POPs from waste incineration is among the highest priorities in all the countries.
- **Existence of plans or activities for improving legislation and regulation of healthcare waste or their enforcement , in line with the methodologies and criteria envisaged by the project and the Stockholm Convention;** or project mainstreaming into governmental initiatives aimed at the management of healthcare waste. With some differences, such activities were initiated in all project countries. In Latvia, the adoption of the EU directive 2008/98 on waste was one of the main driving force in establishing sound regulation on healthcare waste; in Vietnam, several regulations on health waste management, including these promoting non-combustion technologies, were under preparation at the time of project implementation, and subsequently were promulgated and enforced also thanks to the experience gathered in the course of project preparation and implementation; in India, the Bio-Medical Waste (Management and

Handling) Rules,1998, The Municipal Solid Wastes (Management and Handling) Rules,2000, and the India's Hazardous Waste (management, Handling and Trans-boundary Movement of hazardous waste) are the regulatory instrument which enforcement need to be strengthened; in the Philippine, the 3rd version of the Healthcare Waste Management manual is intended as one of the main official guidance tool for the sector; in Lebanon, both actions aimed at improving the regulatory framework and EU initiatives on healthcare waste management were integrated into project activities. Similar initiatives were ongoing in Argentina, which has to face the standardisation of hazardous waste regulation among jurisdictions, and Senegal where the drafting of new regulation on waste management is undergoing.

- **Active participation of governmental stakeholder in project management and activities.** Governmental institutions were in general active in the project management and coordination, although the level of participation was diverse. Details concerning country ownership and governmental initiative are provided in chapters 8.1.1 to 0

8.5. SUSTAINABILITY (*)

The socio-political sustainability has been evaluated on the basis of the risk value provided by the World Bank² for political stability / absence of violence. It has to be recalled that for each project component and each country, the lowest value among the 3 sustainability component has been assigned, in compliance with the TOR. By adopting this criterion, countries (like Lebanon, and the Philippines) characterized by a high socio-political risk are penalized in term of sustainability score.

In Table 1, rating for socio-political risk following the World Bank governance index is reported:

Table 8. World Bank Governance Index – Socio-political and stability index.

Country	Year	WB Governance Score	Rating (*)
		(-2.5 to +2.5)	
ARGENTINA	2011	0.2	ML
INDIA	2011	-1.2	MU
LATVIA	2011	0.29	ML
LEBANON	2011	-1.55	U
PHILIPPINES	2011	-1.39	U
SENEGAL	2011	-0.31	MU
TANZANIA	2011	-0.01	MU
VIETNAM	2011	0.17	ML

This score has been applied to all the project components of each country.

Concerning the other parameters affecting project sustainability (institutional and financial), these were subjectively assessed based on of the detailed analysis of the project implementation at country level (chapters 8.1.2 to 0), plus the analysis of the outcome of the Global component and the Global team (scored separately).

The detailed sustainability analysis is reported in Annex 3.

² World Bank Governance Index, <http://info.worldbank.org/governance/wgi/index.asp>, accessed 30 December 2012

9. CONCLUSIONS, RECOMMENDATIONS & LESSONS

9.1. CORRECTIVE ACTIONS FOR THE DESIGN, IMPLEMENTATION, MONITORING AND EVALUATION OF THE PROJECT

9.1.1. CORRECTIVE ACTION FOR PROJECT IMPLEMENTATION

65

The project closure date was established as December 2012. From the monitoring activities carried out since the end of September 2012 it was evident that in some countries, project activities would not be completed within project deadline. That was the case of:

- Vietnam (extension granted for completing the installation and testing of the autoclave, already delivered to the project site);
- Argentina (extension granted for completing the building, delivery, installation and testing of an autoclave and a boiler, already procured, and other activities related to the publication of manuals on Health Care Waste Management, and to the development of a technology for the non combustion disposal of waste by means of a Fenton reactor);
- The Philippines (extension granted for completing the procurement, building, delivery, installation and testing of two autoclaves)
- India (extension granted for completing the procurement of some non-mercury equipment and for completing training);
- Tanzania (extension granted for demonstrating that the technologies could be manufactured locally, with the purpose to establishing commercial scale production of the experimental autoclave)
- Lebanon (limited extension granted for completing project documentation)

Although it is not expected that a second extension would have automatically translated in the successful completion of project activities, nevertheless in some countries a limited additional extension of the project deadline helped in securing significant project results in term of avoidance of U-POP release which otherwise will be missed. This is the case for instance of Vietnam, where the big autoclave facility (5t/day) was already delivered to the site, with only installation and testing work remaining, allowing the phasing out of the obsolete incinerator presently working at the same site.

As of 2015, the completion of all the activities in Argentina appeared more problematic, as the building of the equipment, expected to be completed on January/February 2012, was not completed and an agreement on the site where the equipment has to be installed and operated was still missing.

Similarly, outstanding issues remain unresolved in the Philippines, where the procurement of the equipment has completely stopped since around September 2012, pending resolution, and additional issues derived from the discontinuation of the expert contracts providing assistance to model facilities.

9.1.2. IMPROVEMENT OF PROJECT DESIGN

Considering that the project document was drafted in 2007, the project design should be considered outstanding and very innovative, especially on the side of replication approach and in the correct identification of risks. The project document addressed most of the comments and suggestion put forward by project reviewers.

There are however some improvements that could still be considered for future projects.

The implementation of a project in 7 +1 countries, while from one side constituted an excellent modality for testing BAT and BEP in a wide range of situations, from the other side represented a very challenging task from the administrative, management and monitoring standpoint. Some of the management issues faced at project implementation, including the difficulties from national project managers to fully understand the replication approach, could have been partially solved by simplifying the project structure. At the country level indeed the project has a limited budget which is further fractioned in 7 components; in each country activities were carried out in a minimum of 3 model facilities, in addition to centralized facilities for waste treatment, and institutions where training and legislation had to be carried out. The result is that project monitoring at national level was in some cases limited; that shortcoming was only partially addressed by the very careful and continuous monitoring and technical supervision carried out by GPT with outstanding effort from the CTA. Probably reducing the number of project components and avoiding overlapping among components (there were for instance training activities to be carried out in three separate project component: national training, model facilities and non-mercury equipment) could have reduced some of the difficulties experienced by some project countries in management and monitoring. Indeed, UNDP is currently programming increasingly single country projects to avoid these difficulties.

Another approach for future projects, as suggested by the CTA, could be to have, at the project start, all national and local technical consultants and coordinators brought together, trained at the same time on technical issues and project implementation, and discussed work plans together. The countries would benefit from interacting among each other and a more uniform approach and understanding of what need to be done would be achieved.

On the side of project management and monitoring, corrective actions should be mainly dedicated at building common procedures and reinforcing coordination in the early stage of project implementation. In some cases, it was observed that the level of coordination among UNDP COs and the National Project Teams was low. Eventually, the redundant project management effectively solved some management issues occurred at national level, with the GPT backing up in situation where the local management presented some issues.

As the poor performance in the Philippines demonstrated, the lesson for future projects is to carefully monitor that all project partners share the commitment toward implementation of the SC convention objectives at early stage of project preparation.

Finally, for the implementation of other multi-country (global or regional) projects, it would be envisaged to have a better designed GPT composed by a global CTA coordinating a group of CTAs, each one assigned to a specific country, to avoiding overloading of the international experts.

9.1.3. MONITORING AND FINANCIAL ISSUES

On the financial side, the biggest issue was the lacking of proper accounting of co-financing resources. The evaluator appreciated the substantial contribution provided by the countries in term of cash or in-kind co-financing; however, the lack of a proper accounting of these resources prevented from their proper documentation in the terminal evaluation report. It is clear that the lacking of co-financing reporting does not mean that co-financing was not provided. However to demonstrate this effort to the GEF, which is disbursing grant against co-financing commitment, it is recommended to establish, since project implementation and possibly even at the time of drafting of commitment letters, proper procedure and guidance for the accounting and documentation of co-financing. In case of a further delay of project deadline, co-financing partners should therefore put any effort in the estimation and accounting of the resource provided by them. It is suggested that UNDP Country Offices are involved in this task.

9.1.4. PROCUREMENT.

Most of the delays (Argentina, India, Philippines, Senegal, Vietnam) had to do with problems in procurement, with each country having its own procurement policies and procedures. It is not clear however whether a centralized procurement would have solved all the delays and difficulties in procurement, as eventually the beneficiaries have to agree on the equipment they have to be provided with. However it is clear that since the project start, definitions of standard procedures and criteria, including procedure for clearing technical specification before issuing the bid, could have solved at least part of the issues.

9.2. ACTIONS TO FOLLOW UP OR REINFORCE INITIAL BENEFITS FROM THE PROJECT

In some countries, most of the project activities started very late, and project results are therefore not consolidated. Consolidation of best HWCM practices in model facilities, by means of repeated measurement of waste management indicators, is recommended in Senegal, Philippines, Vietnam, Argentina (limited to Reconquista model facility). Follow up and measurement of the effectiveness of autoclave is recommended in all the countries where new autoclaves were established. Consolidating capacity building and training is recommended for the correct utilization of the online monitoring system established at GJ Multiclave, in Tamil Nadu.

9.3. PROPOSALS FOR FUTURE DIRECTIONS UNDERLINING MAIN OBJECTIVES

A possible area of improvement, to be considered in the design of future projects, concerns the approach adopted for reducing U-POP emissions. It is evident that the project intentionally adopted the approach to work mainly on the side of hospital facilities. The project deliberately did not include in its design any activity addressed at capacity building in the field of dioxin monitoring, or adoption of BAT / BEP in industrial incinerator, as, with the only exception of India, its approach was mainly dedicated to the procurement and testing of non-combustion technologies and to the phase out of incineration whenever possible. However, it is evident that, as correctly pointed out by the WB comment, *“While the use of batch HCW incinerators with no emissions control should be controlled and ultimately stopped, recommending an end to HCW incineration, with no analysis of the context, the technologies, or the alternatives, is misleading”*. In future projects related to the reduction of emission from the healthcare waste management should properly include components for the adoption of BAT and BEP for large incinerators and for the capacity building in the field of dioxin monitoring.

On the management side, establishing the fulfilment of standard project monitoring procedures, including the use of APR, PIR, QWP and QPR templates, would be very beneficial for ensuring project success. Monitoring procedures should include proper accounting of co-financing resources, in compliance with GEF requirements.

9.4. BEST AND WORST PRACTICES IN ADDRESSING ISSUES RELATING TO RELEVANCE, PERFORMANCE AND SUCCESS

In two countries, timely countermeasures aimed at solving issues which were hindering project success were adopted. In Senegal, following the recommendation of the GPT, a full time technical expert was recruited to provide technical assistance for the management of healthcare waste in the three model facilities. The autoclaves were finally connected to the utilities and tested. The GPT moreover promoted the idea of holding a “ribbon cutting” event at the HOGGY hospital to celebrate the successful building and testing of the autoclaves. The event was attended by the ministers of the government and by UNDP HQ representatives, and was extremely effective – during its preparation and after it was successfully held - in motivating the personnel of the facilities in adopting sound HCWM.

In Vietnam the project was almost dormant until Mid Term. However the National Project Team implemented all the recommendations put forward in the MTE and by the GPT international experts. Since the end of 2011 the project benefited of a substantial acceleration and achieved most of its objectives.

Unfortunately, the situation was different in two other countries, Argentina and the Philippines. In Argentina, all the project activities were very late at MTE. The recommendation was to agree among project partners, monitor and enforce, a detailed workplan for securing the completion of all the project activities. One year later, progress was noted only on the national training and on testing of the Fenton technology, whilst the issues blocking the installation of non combustion equipment and other activities remained unresolved (among them the lack of publication of training/dissemination materials). The situation slightly improved until 2015 with the completion of the procurement and assembling of the centralized autoclave facility; however no information was provided to the evaluator on whether the facility was eventually operational.

In the Philippines, the different strategic views of GPT and NPD on some important issues, like centralized vs. non-centralized technologies, or incineration vs. non incineration, generated since the very beginning some misunderstandings which did not facilitate the project implementation. Therefore, also the recommendations put forward at MTE were mostly disregarded. It has however to be recognized that the GPT, in multiple occasions, tried to address the main project issues proposing solutions that, if accepted, could have solved almost all the difficulties that the project faced. Although based on evaluation rules, the scoring of the Philippine project rated MS, the perception is that it almost failed as no information was provided on the status of the autoclave procured, and the latest information received from one of the project partner (HCWH) seem to indicate that the ESM of healthcare waste in the model facilities was eventually discontinued. An open and frank discussion with the government and local project partners, including UNDP CO should be pursued to understand what were the causes of the failure and how these can be avoided in future activities.

ANNEXES

1. AVOIDED PCDD/F RELEASES BY COUNTRY ELABORATED BY THE PROJECT CTA

1.1. ARGENTINA

A. Hospital Francisco Lopez Lima, General Roca, Rio Negro

148 beds

Data from 2010:

Total waste generated	5505 kg/month	66.06 tonnes/yr
Infectious waste generated	2238 kg/month	26.856 tonnes/yr

Before the project:

Infectious waste sent to an external incinerator

Using UNDP GEF guidance, emission factor	1400 ug TEQ/tonne in air
	20 ug TEQ/tonne in residue
Dioxins/furans in air	0.037598 g TEQ/yr in air
Dioxins/furans in residue	0.000537 g TEQ/yr in residue
Total dioxins/furans	0.038136 g TEQ/yr

After the project:

Infectious waste treated by autoclaving

UPOPs reduced = 0.04 g TEQ/yr

B. Prof Dr Juan P Garrahan Hospital de Pediatria, Buenos Aires

Waste treated in an external autoclave before and after the project

Therefore, no UPOPs reduced.

C. Hospital Central de Reconquista, Santa Fe

Data from 2010:

Total waste generated	6118 kg/month	73.416 tonnes/yr
Infectious waste generated	2216 kg/month	26.592 tonnes/yr

Before the project:

Waste is dumped and open burned

From UNDP GEF guidance for open burning:	6600 ug TEQ/tonne in air
	600 ug TEQ/tonne in residue
Dioxins/furans in air	0.484546 g TEQ/yr in air
Dioxins/furans in residue	0.04405 g TEQ/yr in residue
Total dioxins/furans	0.528595 g TEQ/yr

After the project:

If the autoclave has been installed and is used in the regional treatment center planned for Reconquista, the UPOPs reduction should be based on the all the waste that is now autoclaved and previously dumped and open burned.

Basis: Assume the autoclave is now functioning:

Autoclave capacity: based on 150 kg/hr	1800 kg/day
operating for 12 hours as planned	657 tonnes/year
From UNDP GEF guidance for open burning:	6600 ug TEQ/tonne in air
	ug TEQ/tonne in
	600 residue
Dioxins/furans in air	4.3362 g TEQ/yr in air
Dioxins/furans in residue	0.3942 g TEQ/yr in residue
Total dioxins/furans	4.7304 g TEQ/yr

Total UPOPs reduced in Reconquista = 4.7 g TEQ/yr

D. SCENARIO if lessons of the project are replicated nationwide

Based on 2007 NIP report for Argentina

If all rural hospitals follow the General Roca hospital model and all regional central treatment plants follow the Reconquista model, the total

UPOPs that would be reduced would be 23.53 g TEQ/yr in air
7.39 g TEQ/yr in residue/bottom ash
or 30.92 g TEQ/yr total

1.2. INDIA

INDIA

A. King George's Medical University (KGMU), Lucknow:

Data from January - June 2012

Non-infectious waste	62315.26 kg/mo		
Infectious waste (yellow bag)	3240.21 kg/mo	or	22.1 % of infectious waste
Infections waste (non-yellow)	11433.36 kg/mo		
Total infectious	14673.57 kg/mo		

70

Before the project:

(a) Incineration of all infectious waste in single-chamber brick incinerator

From UNDP GEF guidance for box-type incinerators:	40000 ug TEQ/tonne in air
	200 ug TEQ/tonne in residue
Waste burned in single-chamber incinerator per year:	176.08284 tonnes/yr
Dioxins/furans in air:	7.0433136 g TEQ/yr in air
Dioxins/furans in residue:	0.03521657 g TEQ/yr in residue
Total D/F from incineration:	7.1 g TEQ/yr

(b) Dumping and open-burning of all non-infectious waste

From UNDP GEF guidance for open burning:	6600 ug TEQ/tonne in air
	600 ug TEQ/tonne in residue
Waste dumped and open-burned per year:	747.78312 tonnes/yr
Dioxins/furans in air:	4.93536859 g TEQ/yr in air
Dioxins/furans in residue:	0.44866987 g TEQ/yr in residue
Total dioxins/furans from open burning:	5.4 g TEQ/yr
Total dioxins/furans from incineration & open burning:	12.5 g TEQ/yr

After the project:

Only yellow bag waste is incinerated using a central incinerator

Other infectious waste is autoclaved and recycled

Non-infectious waste is recycled or disposed of in landfill

(a) Incineration of yellow bag waste only

Using emission data from GJ Multiclave	2.6327 ng TEQ/Nm3 in air
	1.0208 ng TEQ/Nm3 in air
Average:	1.82675 ng TEQ/Nm3 in air
From UNDP GEF guidance - dual-chamber incinerator:	64 ug TEQ/tonne in residue
Using UNDP GEF guidance: Volume/mass ratio =	15 m3/kg
Yellow bag waste burned per year:	38882.52 kg/year
Air volume per year:	583237.8 m3/yr
Dioxins/furans in air:	1535490.16 ng TEQ/yr in air
or	0.00153549 g TEQ/yr in air
Dioxins/furans in residue:	0.00248848 g TEQ/yr in residue
Total dioxins/furans from incineration:	0.00402397 g TEQ/yr

(b) No dioxins from autoclaving and recycling

UPOPs reduction = 12.5 minus 0.004024 = 12.5 g TEQ/yr

B. GJ Multiclave, Tamil Nadu:

Basis of calculation is 4 tonnes/day (reported in Mission Report, July 2010)

Before project:

All waste is incinerated

Emission data for GJ Multiclave (from CPCB test, March 28, 2010)

15.67 ng TEQ/m³ in air

174.898 ng TEQ/m³ in air

Average: 95.284 ng TEQ/m³ in air

From UNDP GEF guidance - dual-chamber incinerator with good T control:

20 ug TEQ/tonne in residue

Waste incinerated per year: 1460000 kg/yr

Using UNDP GEF guidance: Volume/mass ratio = 15 m³/kg

Air volume per year: 21900000 m³/yr

Dioxins/furans in air: 2086719600 ng TEQ/yr in air

or 2.0867196 g TEQ/yr in air

Dioxins/furans in residue: 0.0292 g TEQ/yr in residue

Total dioxins/furans from incineration: 2.1 g TEQ/yr

After the project:

Using the same basis of 4 tonnes per day

Only yellow bag waste is incinerated, the rest is treated by autoclaving

Assume percentage of yellow bags is 22.1 % of all infectious waste (based on KGMU data)

Emission data for GJ Multiclave after improvement of the system (from CVR Lab test, October 1, 2013):

2.6327 ng TEQ/Nm³ in air

1.0208 ng TEQ/Nm³ in air

Average: 1.82675 ng TEQ/Nm³ in air

From UNDP GEF guidance - dual-chamber incinerator with good T control:

20 ug TEQ/tonne in residue

Waste incinerated per year (yellow bags only): 322396.431 kg/yr

or 322.396431 tonnes/yr

Using UNDP GEF guidance: Volume/mass ratio = 15 m³/kg

Air volume per year: 4835946.47 m³/yr

Dioxins/furans in air: 0.00883407 g TEQ/yr in air

Dioxins/furans in residue: 0.00644793 g TEQ/yr in residue

Total dioxins/furans from incineration: 0.01528199 g TEQ/yr

UPOPs reduction = 2.1 minus 0.015282 = 2.1 g TEQ/yr

C. SCENARIO if lessons of project are replicated nationwide:

Assume that all central treatment facilities (CTFs) upgrade their incinerators to the same level or better as GJ Multiclave

Assume that all hospitals sending their waste to CTFs improve their segregation to the same level as KGMU

Decrease in dioxins/furans by GJ Multiclave: 0.00722239

Below is a list of all the CTFs in India. Based on data from GJ Multiclave, one estimates

that the CTFs accounted for 184.8634 g TEQ/yr

... resulting UPOPs reduction
would be:

If	25 % of CTFs follow GJ Multiclave model, then ...	45.88206 g TEQ/yr
	50 % of CTFs follow GJ Multiclave model, then ...	92.43169 g TEQ/yr
	75 % of CTFs follow GJ Multiclave model, then ...	138.6475 g TEQ/yr
	100 % of CTFs follow GJ Multiclave model, then ...	183.5282 g TEQ/yr

A. Rezekne**Hospital**Before the project:

Pathological waste incinerated	1.4 tonnes/yr
Other infectious waste incinerated	1.69 tonnes/yr
Total infectious waste incinerated	3.09 tonnes/yr
From UNDP GEF guidance for open burning:	3500 ug TEQ/tonne in air
	64 ug TEQ/tonne in residue
Dioxins/furans in air	0.010815 g TEQ/yr in air
Dioxins/furans in residue	0.000198 g TEQ/yr in residue
Total dioxins/furans	0.011013 g TEQ/yr

After the project:

Pathological waste treated by alkaline hydrolysis.

Other infectious waste sent to central treatment facilities using non-incineration treatment.

UPOPs reduced = 0.011 g TEQ/yr

B. Ventspils Hospital

Hospital used non-incineration technologies before and after the project.

C. SCENARIO if lessons from the project were applied nationwide

Estimate of waste from hospitals incinerating in 2012 (end of project):

Bed size	Waste generated	Waste incinerated
49	0.1085 kg/bed-day	1.940523 tonnes/yr
74.5	0.0895 kg/bed-day	2.433729 tonnes/yr
	Total	4.374251 tonnes/yr
From UNDP GEF guidance for open burning:		3500 ug TEQ/tonne in air
		64 ug TEQ/tonne in residue
Dioxins/furans in air		0.01531 g TEQ/yr in air
Dioxins/furans in residue		0.00028 g TEQ/yr in residue
Total dioxins/furans		0.016 g TEQ/yr

1.4. LEBANON

A. Hammoud University Hospital, 350 beds

Before the project:

Waste generated:	1006.5 kg/day
	367.3725 tonnes/yr
Percentage of waste estimated burned:	7 %
Waste resulting in dioxin/furan emissions:	26 tonnes/yr
Emission factors	6600 ug TEQ/tonne in air
	600 ug TEQ/tonne in residue
Dioxins/furans in air:	171600 ug TEQ/yr in air
Dioxins/furans in residue:	15600 ug TEQ/yr in residue
Total dioxins/furans:	187200 ug TEQ/yr

After the project:

All infectious waste is autoclaved

UPOPs reduction = 187200 ug TEQ/yr or **0.1872** g TEQ/yr

B. Nabatieh Government Hospital, 112 beds

Waste generated:	306 kg/day
	111.69 tonnes/yr
Percentage of waste estimated burned:	7 %
Waste resulting in dioxin/furan emissions:	8 tonnes/yr
Emission factors	6600 ug TEQ/tonne in air
	600 ug TEQ/tonne in residue
Dioxins/furans in air:	52800 ug TEQ/yr in air
Dioxins/furans in residue:	4800 ug TEQ/yr in residue
Total dioxins/furans:	57600 ug TEQ/yr

Lebanon report estimates no reduction of dioxins/furans due to increase in quantity of waste generated and increase number of beds.

However, at the end of the project, the hospital subcontracted with a local contractor to treat the waste by autoclaving. Thus **0.0576** g TEQ/yr

C. SCENARIOS if lessons of the project are replicated nationwide

Number of hospitals in Lebanon	168
Number of hospital beds in Lebanon	13790
Number of hospitals using incinerators	15.12 (based on statistics)
Number of hospital beds using incinerators	1241.1
Tons of waste treated by incineration	453

Amount of waste incinerated per year

that would generate dioxins/furans	32 tonnes/yr
Emission factors	6600 ug TEQ/tonne in air
	600 ug TEQ/tonne in residue
Dioxins/furans in air:	211200 ug TEQ/yr in air
Dioxins/furans in residue:	19200 ug TEQ/yr in residue
Total dioxins/furans:	230400 ug TEQ/yr

... resulting UPOPs reduction would be:

If ...	50 % of incinerators are replaced ...	0.1152	g TEQ/yr
	100 % of incinerators are replaced ...	0.2304	g TEQ/yr

1.5. PHILIPPINES

The model facilities did not use incineration before or after the project.

Some hospitals reportedly dump or illegally burn medical waste but no data is available.

The non-incineration technologies have not yet been installed or are not operational in the model facilities.

UPOPs reduction

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0

1.6. SENEGAL

A. Hôpital Général De Grand Yoff (HOGGY), Dakar

287 beds

Waste generated November 2010 Mission Report)

350 kg/day

Before the

project:

Wastes are mostly incinerated at the Le Dantec Hospital incinerator

Total waste per year

127.75 tons per year

From UNDP GEF guidance, emission factors

3500 ug TEQ/tonne in air

ug TEQ/tonne in

64 residue

Dioxins/furans in air:

0.447 g TEQ/yr in air

Dioxins/furans in

residue:

0.0082 g TEQ/yr in residue

Total dioxins/furans:

0.5 g TEQ/yr

After the project:

Waste is now treated on-site in an autoclaves/shredder

UPOPs reduced = 0.5 g TEQ/yr

B. Yousou Mbargane Diop Health Center, Rufisque

50 beds

Before the

project:

Waste is mostly dumped and burned openly

Estimated waste

18.25 tonnes/yr

From UNDP GEF guidance, emission factors

6600 ug TEQ/tonne in air

ug TEQ/tonne in

600 residue

Dioxins/furans in air:

0.120 g TEQ/yr in air

Dioxins/furans in

residue:

0.0110 g TEQ/yr in residue

Total dioxins/furans:

0.1 g TEQ/yr

After the project:

Waste is now treated on-site in autoclaves/shredder

UPOPs reduced = 0.1 g TEQ/yr

C. Sangalcam Health Post

4 beds

Before the

project:

Waste is mostly dumped and burned openly

Estimated waste

1.46 tonnes/yr

From UNDP GEF guidance, emission factors

6600 ug TEQ/tonne in air

	ug TEQ/tonne in 600 residue
Dioxins/furans in air:	0.010 g TEQ/yr in air
Dioxins/furans in residue:	0.0009 g TEQ/yr in residue
Total dioxins/furans:	0.01 g TEQ/yr

After the project:

Waste is now treated on-site in autoclaves/shredder

UPOPs reduced = 0.01 g TEQ/yr

D. SCENARIO if lessons from the project are replicated nationwide

I. PARTIAL SCENARIO: if the three major hospital incinerators are replaced by non-incineration following

the model facilities:

Hôpital LE			
DANTEC	40 kg/hr	or	87.6 tonnes/yr
Hôpital			
PRINCIPAL	5000 kg/wk	or	260 tonnes/yr
Hôpital Régional El Hadji Ibrahima Niasse de Kaolack			87.6 tonnes/yr
	Total		435.2 tonnes/yr
From UNDP GEF guidance, emission factors			3500 ug TEQ/tonne in air 64 ug TEQ/tonne in residue
Dioxins/furans in air:			1.523 g TEQ/yr in air
Dioxins/furans in residue:			0.0279 g TEQ/yr in residue
Total dioxins/furans:			1.6 g TEQ/yr

II. SCENARIO if lessons are replicated nationwide

WHO and World Bank data:

Population (2013)	14133000 population
Hospital beds in Senegal (World Bank data, 2008)	0.34 beds per 1K population
(http://www.tradingeconomics.com/senegal/hospital-beds-per-1-000-people-wb-data.html, rounded to 0.3 in http://www.indexmundi.com/senegal/hospital_bed_density.html)	

Estimate of waste generated based on	4805.2 hospital beds
Waste generation rate (using an average of HOGGY data and typical African rate of 0.5 kg/bed-day)	0.86 kg/bed-day
Annual waste generated	1507.9 tonnes/yr

Assume that 3/4ths of waste is open burned and 1/4th is burned
by incineration using dual chamber with low temperature and residence time:

Assume waste that is incinerated	753.9653881
From UNDP GEF guidance, emission factors	3500 ug TEQ/tonne in air 64 ug TEQ/tonne in residue
Dioxins/furans in air:	2.639 g TEQ/yr in air

Dioxins/furans in residue:	0.0483 g TEQ/yr in residue
Total dioxins/furans:	2.7 g TEQ/yr

Assume waste that is open burned	753.9653881
From UNDP GEF guidance, emission factors	6600 ug TEQ/tonne in air
	ug TEQ/tonne in residue
	600 residue

Dioxins/furans in air:	4.976 g TEQ/yr in air
Dioxins/furans in residue:	0.4524 g TEQ/yr in residue
Total dioxins/furans:	5.43 g TEQ/yr

UPOPs reduced if lessons are replicated nationwide =	8.1 g TEQ/yr
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1.7. VIETNAM

Viet Duc Hospital: UPOPs reduction included in URENCO
since Viet Duc hospital waste is now sent to URENCO

A. Ninh Binh Provincial Hospital

Before the project:

Number of beds	550
Total waste	746.5 kg/day
Infectious waste	85 kg/day
Chemical waste	1.5 kg/day
Regular waste	600 kg/day
Recycled waste	60 kg/day

Waste incinerated: 1400 kg/month
16.8 tons/yr

Using UNDP GEF guidance, emission factors are

3500 ug TEQ/tonne in air
ug TEQ/tonne in
64 residue

Dioxins/furans in air:

0.0588 g TEQ/yr in air

Dioxins/furans in residue:

0.0010752 g TEQ/yr in residue

Total dioxins/furans:

0.060 g TEQ/yr

After the project:

All the waste is treated in the autoclave-compactor

UPOPs reduced = 0.060 g TEQ/yr

B. URENCO central treatment plant

Basis of

calculation: 5 tonnes per day
or 1825 tonnes per year

Before the project:

From UNDP GEF guidance, emission factors

1400 ug TEQ/tonne in air
ug TEQ/tonne in
20 residue

(assume dual chamber with high temperature)

Dioxins/furans in air:

2.555 g TEQ/yr in air

Dioxins/furans in residue:

0.0365 g TEQ/yr in residue

Total dioxins/furans:

2.6 g TEQ/yr

After the project:

All the waste is treated in the 5 ton/day autoclave

UPOPs reduced = 2.6 g TEQ/yr

C. SCENARIOS if the lessons from the project are replicated

Using data from World Bank Project Document, 2011

Total hospital beds in the country

187843 beds

Total infectious hazardous waste in the country

40 tonnes/day

Average waste generation rate of infectious waste	or	40000 kg/day
		0.21294 kg/bed-day
Number of central hospitals		39 hospitals
Total beds of central hospitals		21160 beds
Number of central hospitals using incineration		34 hospitals
Estimated beds corresponding to incinerated waste		18447.2 beds
Estimated waste incinerated by central hospitals		3928.21 kg/day
	or	3.9282 tonnes/day
	or	1433.80 tonnes/year
From UNDP GEF guidance, emission factors		1400 ug TEQ/tonne in air
		ug TEQ/tonne in
(assume dual chamber with high temperature)		20 residue
Dioxins/furans in air:		2.007 g TEQ/yr in air
Dioxins/furans in residue:		0.0287 g TEQ/yr in residue
Total dioxins/furans:		2.0 g TEQ/yr
Number of provincial hospitals		441 provincial hospitals
Total beds of provincial hospitals		98349 provincial beds
Number of district hospitals		628 district hospitals
Total beds of district hospitals		61112 district beds
No. of incinerators in provincial & district hospitals		485 incinerators
Fraction of provincial to provincial+district hospitals		0.41254
Estimated no. of provincial hospitals with incinerators		182 provincial hospitals
Estimated no. of district hospitals with incinerators		369 district hospitals
Fraction of incinerators not in operation		0.19
Est. no. of provincial hospitals with operating incinerators		147 provincial hospitals
Est. no. of district hospitals with operating incinerators		299 district hospitals
Estimated beds corresponding to incinerated waste from provincial hospitals:		
		32863.65 beds
Estimated waste incinerated by provincial hospitals		6998.11 kg/day
	or	6.9981 tonnes/day
	or	2554.31 tonnes/year
From UNDP GEF guidance, emission factors		3500 ug TEQ/tonne in air
		ug TEQ/tonne in
(assume dual chamber with low temperature)		64 residue
Dioxins/furans in air:		8.940 g TEQ/yr in air
Dioxins/furans in residue:		0.1635 g TEQ/yr in residue
Total dioxins/furans:		9.1 g TEQ/yr
Estimated beds corresponding to incinerated waste from district hospitals:		
		29079.93654 beds
Estimated waste incinerated by district hospitals		6192.39 kg/day
	or	6.1924 tonnes/day
	or	2260.22 tonnes/year
From UNDP GEF guidance, emission factors		5900 ug TEQ/tonne in air
		ug TEQ/tonne in
(assume single chamber with no afterburner)		200 residue
Dioxins/furans in air:		13.335 g TEQ/yr in air

Dioxins/furans in residue:

0.4520 g TEQ/yr in residue

Total dioxins/furans:

13.8 g TEQ/yr

UPOPs reductions

if all central hospitals follow URENCO/Viet Duc model

2.0 g TEQ/yr

If all provincial hospitals follow Ninh Binh model

9.1 g TEQ/yr

If all district hospitals follow Ninh Binh model

13.8 g TEQ/yr

A. Bagamoyo District Hospital, Tanzania

There was significant reduction at first but since the autoclave was not maintained properly, it is no longer used and the hospital has been incinerating again.

B. West Africa Application of the Medi-Clave Technology developed in South Africa

As part of the UNDP project, 20 autoclaves have been provided to Guinea, Liberia and Sierra Leone.

These autoclaves replaced incinerators or open burning for treating Ebola-contaminated waste but they are now used for treating hospital waste in the post-Ebola recovery period.

Basis of the calculation is the treatment capacity of the autoclaves operated for 8 hours/day.

Capacity	175	liters/cycle	1.25	hrs/cycle	0.15	kg/liter	8	hrs/day
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Waste treated per day per autoclave:	168	kg/day
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Annual amount of waste treated per autoclave:	61.32	tons per year
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Basis of calculation:

Guinea:	Replaced one large single chamber incinerator, one open burning
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Sierra Leone:	Replaced two large single chamber, one large double chamber, three small incinerators, four open burning
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Liberia:	Replaced three double-chamber, two small scale, three open burning
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Number of large single chamber	3
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Waste treated per year	183.96	tonnes/yr
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From UNDP GEF guidance, emission factors	5900	ug TEQ/tonne in air
	200	ug TEQ/tonne in residue

Dioxins/furans in air:	1.085	g TEQ/yr in air
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Dioxins/furans in residue:	0.0368	g TEQ/yr in residue
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Total dioxins/furans:	1.1	g TEQ/yr
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Number of large double chamber	4
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Waste treated per year	245.28	tonnes/yr
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From UNDP GEF guidance, emission factors	5900	ug TEQ/tonne in air
	200	ug TEQ/tonne in residue

Dioxins/furans in air:	1.447	g TEQ/yr in air
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Dioxins/furans in residue:	0.0491	g TEQ/yr in residue
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Total dioxins/furans:	1.5	g TEQ/yr
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Number of small scale type	5
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Waste treated per year	306.6	tonnes/yr
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From UNDP GEF guidance, emission factors	40000	ug TEQ/tonne in air
	200	ug TEQ/tonne in residue

Dioxins/furans in air:	12.264	g TEQ/yr in air
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Dioxins/furans in residue:	0.0613	g TEQ/yr in residue
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Total dioxins/furans:	12.3	g TEQ/yr
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Number of open burning	8
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Waste treated per year	490.56	tonnes/yr
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From UNDP GEF guidance, emission factors	6600 ug TEQ/tonne in air
	600 ug TEQ/tonne in residue
Dioxins/furans in air:	3.238 g TEQ/yr in air
Dioxins/furans in residue:	0.2943 g TEQ/yr in residue
Total dioxins/furans:	3.5 g TEQ/yr

Total UPOPs reduced = 18.5 g TEQ/yr

C. SCENARIO if Medi-Clave technology is expanded throughout Africa

Basis of calculation:

Waste treated per autoclave: 61.32 tonnes per year

The number of hospitals that need waste treatment autoclaves is very large.

Current manufacturing capacity of Medi-Clave
12 autoclave/month
144 autoclaves

Waste treated per year by the autoclaves 8830.08 tonnes per year

Assumption:

Fraction of incinerators that are box single chamber 0.4

Fraction of incinerators that are dual chamber low T 0.2

Fraction that are open burning 0.4

Waste previously burned in box single chamber	3532.032 tonnes/yr
From UNDP GEF guidance, emission factors	40000 ug TEQ/tonne in air
	200 ug TEQ/tonne in residue
Dioxins/furans in air:	141.281 g TEQ/yr in air
Dioxins/furans in residue:	0.7064 g TEQ/yr in residue
Total dioxins/furans:	142.0 g TEQ/yr

Waste previously burned in dual chamber low temp	1766.016
From UNDP GEF guidance, emission factors	3500 ug TEQ/tonne in air
	64 ug TEQ/tonne in residue
Dioxins/furans in air:	6.181 g TEQ/yr in air
Dioxins/furans in residue:	0.1130 g TEQ/yr in residue
Total dioxins/furans:	6.3 g TEQ/yr

Waste previously open burned	3532.032
From UNDP GEF guidance, emission factors	6600 ug TEQ/tonne in air
	600 ug TEQ/tonne in residue
Dioxins/furans in air:	23.311 g TEQ/yr in air
Dioxins/furans in residue:	2.1192 g TEQ/yr in residue
Total dioxins/furans:	25.4 g TEQ/yr

Total UPOPs reduced = 173.7 g TEQ/yr

2. DETAILED EVALUATION WORKSHEET FOR EFFICIENCY, EFFECTIVENESS AND IMPACT

Component	Objectively verifiable indicator	Argentina			Rating	India			Rating	Latvia			Rating	Lebanon			Rating	Philippines			Rating	Senegal			Rating	Vietnam			Rating
		Effect.	Effic.	Sum		Effect.	Effic.	Sum		Effect.	Effic.	Sum		Effect.	Effic.	Sum		Effect.	Effic.	Sum		Effect.	Effic.	Sum		Effect.	Effic.	Sum	
1	Tools for baseline assessment developed/adapted and facility Baseline assessment completed	4	4			4	4			5	5			4	4			3	3			3	3			4	4		
	System for measurement and documentation established	4	3			4	4			5	5			4	3			3	3			3	3			4	4		
	Health-care waste management plan completed and implemented	4	3			5	4			5	4			4	4			3	3			4	4			4	3		
	Facility-wide training instituted	4	3			5	4			4	5			5	4			3	3			4	4			4	4		
	Practices at facility measured, evaluated and documented	3	3			5	3			4	5			4	4			3	2			4	4			4	4		
	Replication materials on best practices and techniques created and distributed	4	2			5	3			4	5			4	4			3	2			3	3			4	4		
	Replication materials evaluated	3	2			5	2			4	5			4	3			3	3			3	3			4	4		
2	Commercially-available non-incineration technologies successfully purchased and deployed	2	1			4	3			4	4			4	4			2	1			4	3			4	2		
	Institutional needs satisfied	1	1			5	3			4	4			4	4			1	1			4	3			5	2		
	Environmental and performance standards satisfied	1	1			4	3			4	4			4	4			1	1			4	3			5	2		
	Use/efficiency and cost implications reported	1	1			4	3			4	3			4	4			1	1			4	3			4	2		
4	Guidelines on safe handling and disposal of phased-out mercury devices developed	4	3			4	3			5	4			4	4			4	4			3	3			4	4		
	Training on mercury practices organized	4	4			4	3			5	4			4	4			4	4			4	3			3	4		
	Comparisons of the efficacy, acceptability, full costs, device lifespan and other relevant characteristics of mercury-free versus mercury-containing devices carried out	4	4			4	3			4	4			4	4			4	4			2	3			3	2		
	Awareness-raising and educational materials on mercury developed	4	3			5	3			4	4			4	4			4	4			2	3			3	4		
	Mercury conferences held, where applicable	3	3			4	3			4	4			3	3			4	2			4	3			4	3		
	Devices received and used by the facilities	4	4			4	2			4	4			4	4			4	4			4	2			3	3		
	80% of mercury devices in facilities replaced with mercury-free alternatives	4	4			4	3			4	4			4	4			4	4			4	2			5	3		
5	Core curriculum developed	5	4			5	4			4	4			3	3			3	3			4	4			4	3		
	Partnership with host institutions formalized	5	4			5	4			4	4			4	3			4	3			4	4			4	4		
	Training TORs/plan developed	5	4			5	4			4	4			4	3			4	4			4	4			4	3		
	At least two training sessions conducted	3	3			3	3			4	4			3	3			4	3			4	4			5	5		
	Student certification program established, if applicable	5	4			5	4			4	4			2	2			2	2			4	4			4	3		
	Training evaluation completed	3	3			4	4			4	4			4	3			4	4			4	4			4	3		
6	Relevant national policies listed and analyzed in light of Project experiences	4	2			5	4			5	5			4	4			3	2			2	2			4	4		
	Consideration of updates or revisions to relevant guidelines or other national policy instruments recommended	2	2			4	4			5	5			4	4			2	1			2	2			5	5		
	Dialogue/interview with relevant authorities (MOE, MOH, others) on possible updates or reformulations of policies or guidelines aimed at replicating and sustaining the demonstrated best practices	2	2			4	4			5	5			4	4			2	2			2	2			5	5		
	National policy review conference held, if appropriate	2	2			4	4			5	5			4	4			3	2			2	2			4	4		
7	Awareness-raising and educational materials developed and localized	4	2			5	4			4	4			5	4			3	3			3	3			3	3		
	National conferences and/or workshops held	4	3			5	4			4	4			4	4			2	3			4	4			4	3		
	Toolkits distributed and utilized	3	2			5	4			4	4			4	4			4	3			2	2			3	3		
	Public awareness campaign conducted to provide information to the general public, patients and families	4	3			5	4			4	4			4	4			2	2			2	2			3	3		
	Interviews/dialogues with relevant authorities held for further agreement or commitment on implementation plan for replication of best practices	3	3			5	4			4	4			3	3			3	3			2	2			4	3		
	Local language materials distributed	4	2			4	4			4	4			3	3			2	2			2	2			3	3		
Overall rating				2.5	MS			3.9	S			4.2	HS			3.9	S			2.4	MS			3.2	S			3.6	S

3. EVALUATION WORKSHEET FOR SUSTAINABILITY

Component	Component name	Argentina				
		Socio Pol.	Institut.	Financial	Min	Rating
1	Model facilities.	2	2	2	2.0	ML
2	Waste treatment technologies.		1	1	1.0	MU
4	Non mercury equipment		2	2	2.0	ML
5	Establish or enhance national training programs.		3	2	2.0	ML
6	National policies.		1	1	1.0	MU
7	National dissemination .		0	1	0.0	U
	Total				1.4	ML
Component	Component name	India				
		Socio Pol.	Institut.	Financial	Min	Rating
1	Model facilities.	1	2	3	2.0	ML
2	Waste treatment technologies.		2	2	2.0	ML
4	Non mercury equipment		2	2	2.0	ML
5	Establish or enhance national training programs.		1	1	1.0	MU
6	National policies.		1	2	1.0	MU
7	National dissemination .		2	2	2.0	ML
					1.8	ML
Component	Component name	Latvia				
		Socio Pol.	Institut.	Financial	Min	Rating
1	Model facilities.	2	3	3	3.0	L
2	Waste treatment technologies.		3	3	3.0	L
4	Non mercury equipment		3	3	3.0	L
5	Establish or enhance national training programs.		3	3	3.0	L
6	National policies.		3	3	3.0	L
7	National dissemination .		3	3	3.0	L
					3.0	L
Component	Component name	Lebanon				
		Socio Pol.	Institut.	Financial	Min	Rating
1	Model facilities.	0	3	3	3.0	L
2	Waste treatment technologies.		3	3	3.0	L
4	Non mercury equipment		3	3	3.0	L
5	Establish or enhance national training programs.		3	3	3.0	L
6	National policies.		3	3	3.0	L
7	National dissemination .		3	3	3.0	L
					3.0	L
Component	Component name	Philippines				
		Socio Pol.	Institut.	Financial	Min	Rating
1	Model facilities.	0	1	1	1.0	MU

2	Waste treatment technologies.		0	0	0.0	U
4	Non mercury equipment		2	2	2.0	ML
5	Establish or enhance national training programs.		2	2	2.0	ML
6	National policies.		2	2	2.0	ML
7	National dissemination .		1	1	1.0	MU
					1.0	MU
Component	Component name	Senegal				
		Socio Pol.	Institut.	Financial	Min	Rating
1	Model facilities.	1	1	1	1.0	MU
2	Waste treatment technologies.		1	1	1.0	MU
4	Non mercury equipment		2	2	2.0	ML
5	Establish or enhance national training programs.		2	2	2.0	ML
6	National policies.		0	0	0.0	U
7	National dissemination .		1	1	1.0	MU
					1.2	ML
Component	Component name	Vietnam				
		Socio Pol.	Institut.	Financial	Min	Rating
1	Model facilities.	2	2	3	2.0	ML
2	Waste treatment technologies.		2	2	2.0	ML
4	Non mercury equipment		2	2	2.0	ML
5	Establish or enhance national training programs.		2	3	2.0	ML
6	National policies.		2	3	2.0	ML
7	National dissemination .		2	2	2.0	ML
					2.0	ML

4. LIST OF PERSONS INTERVIEWED

Global (interviewed by Carlo Lupi)

1. Ashley Iwanaga (Global Project Coordinator)
2. Jorge Emmanuel (Project Chief Technical Advisor)

Argentina (interviewed by the Maria Onestini and. Carlo Lupi)

3. Daniel Alfano, Project Consultant.
4. Ricardo Benitez, Ministry of Health of Argentina
5. Luisa Brunstein, Ministry of Health of Argentina
6. Ester Chamorro, National Technological University
7. Alfredo Sequeira, National Technological University
8. Maria Della Rodolfa, Member of Project's Steering Committee, Health Care Without Harm
9. Maria Cristina Fernandez, Director of HCWM Committee at Garrahan Hospital, Pediatric Hospital Prof. Dr. Juan Pedro Garrahan
10. Monica Frances, National Technological University
11. Martin Hernandez, , Pediatric Hospital Prof. Dr. Juan Pedro Garrahan
12. Ruben Meriles, National Technological University
13. Maximiliano Morales, UFIS, Ministry of Health of Argentina
14. Matias Mottet, UNDP Project Officer and Member of the National Project Steering Committee
15. Sonia Alejandra Sagardoyburu, Ministry of Health of Argentina
16. Daniel Tomasini, UNDP CO

India (interviewed by Jitendra Sina and Carlo Lupi)

17. Sunil Aurora, UNDP India, New Delhi
18. S. Balaji, Member Secretary, Tamil Nadu Pollution Control Board, Chennai
19. Srinivasan Iyer, Assistant Country Director, UNDP India, New Delhi
20. Sanjay Kumar, Director, GJ Multiclave Pvt. Ltd, Chennai
21. Vinay Kumar, Deputy Director, Dept. of Health & Family Welfare
22. Dilip Mehta, Chairman, Dr. Mehta's Hospitals Pvt. Ltd.
23. Rajeh Rangarajan, Regional Technical Consultant, UNDP/GEF Global Health Care Waste Project
24. Subba Rao, Director, Ministry of Environment and Forest, New Delhi.
25. Megha Kela Rathi, National Technical Consultant, UNDP/GEF Global Health Care Waste Project.
26. Shubhangi Wankhede, UNDP India, New Delhi
27. Toxic Links

Latvia (interviewed by Maija Kurte)

1. Andris Egle, Ministry of Health, Senior Officer, Department of Addiction Prevention, Project Contact (Ministry of Health)
2. Sandra Eglīte, Director, NPSC member, LTD Lautus
3. Agris Markss, Technical Director, NPSC member, LTD Lautus
4. Māris Kalniņš, Member of Board, NPSC member, AS BAO.
5. Maris Klindzans, National technical advisor, UNDP/GEF Project's National technical advisor through "Latvian Environmental Investment Fund"
6. Julija Gusca, National Project Coordinator,
7. Ingrīda Savicka, NPSC member, LTD Rezekne Hospital Health Care Department Director
8. Diāna Gavare-Karpova, NPSC member, LTD Rezekne Hospital, Member of the Board
9. Elita Cīrule, LTD Rezekne Hospital, Hygiene Nurse
10. Mārtiņš Čapļa, LTD Rezekne Hospital, Doctor's Assistant – Caustic Digester operator
11. Raiza Vitkovska, LTD Rezekne Hospital, Head of Department
12. Tatjana Medinika, LTD Rezekne Hospital, Senior Laboratory assistant
13. Māra Bule, LTD "Rēzekne Hospital", Head of Department
14. Lilita Grīnpauka, NPSC member, LTD North Kurzeme Regional Hospital, Head Nurse
15. Maija Zaķe, LTD North Kurzeme Regional Hospital, Facility storage Nurse
16. Silīniece Egija, NPSC member, LTD North Kurzeme Regional Hospital, Head of the Board ,
17. Akeldama-Krūmiņa Inese, LTD North Kurzeme Regional Hospital, Economist

18. Ilze Donina, NPSC member, Ministry of Environmental Protection

Lebanon (interviewed by Fady Asmar)

28. Samar Khalil, Project Manager, UNDP CO

29. Abir Abou Salem, Operations Manager, Project Focal Point, Hammoud University Hospital

30. Mayssa Kallas, Infection Control Officer, Project Focal Point, Nabatieh Governmental Hospital

The Philippines (interviewed by Ricardo Miranda)

31. Imee Manal, UNDP CO

32. Michael Jaldon, UNDP CO

33. Jesus Capulong Jr., UNDP CO

34. Jennette Montebon, UNDP CO

35. Dr. Madeleine de Rosas-Valera, DOH Assistant Secretary of Health, Health Policy, Finance and Research Development Cluster

36. Rolando Benitez, DOH Bureau of International Health Cooperation

37. Engr. Zoraida Cuadra, DOH National Center for Health Facilities Development

38. Dr. Eddie Ponio, Hospital Director, DPMMH

39. Engr. Amelia Arce, Provincial Sanitary Engineer and Waste Management Officer, DPMMH

40. Marlene Carlos, Pollution Control Officer, DPMMH

41. Engr. Cesarea Valenzuela, Pollution Control Officer, DPMMH

42. Ms. Wilhelmina Bernardo, Chief Nurse, DPMMH

43. Dr. Mario Lato, Sta. Ana Hospital Director

44. Dr. Joyce Chow, Sta. Ana Hospital Assistant Director

45. Mary Margaret Cabral, Sta. Ana Hospital Waste Management Officer

46. Merci Ferrer, Health Care Without Harm South East Asia, Quezon City

47. Prof. Romeo Quizon, UP College of Public Health, Manila

48. Engr. Bonifacio Magtibay, Technical Project Officer, WHO, DOH Manila

49. Salvador Passe, Department of Environment and Natural Resources, Environmental Management Bureau

Senegal (interviewed by Iba Gueye)

50. Mr Gueye Ousmane Focal Point Hoggy

51. Mr Ndiaye Cheikh Pronalin Training Coordinator

52. Mr Faye Ousmane, Project Engineers

53. Mr Ousmane Sow, Project Coordinator

54. 2 workers at Project sites

55. 1 Student on Thesis on Hospital Hygiene

Vietnam (interviewed by Nghiem Kim Hoa and Carlo Lupi)

56. Bui Cach Tuyen, Ministry of Natural Resources and Environment (MONRE), Vice Minister, Director of PMU, High Level Government Representative in the GPSC

57. Mr. Nguyen Hoa Binh, Department of Waste Management, MONRE, Director of the Department, MONRE,

58. Deputy Director of the PMU

59. Nguyen Thanh Yen, Head of Hazardous Waste Management Division (VINAHAZ), VEA - MONRE, Head, Hazardous Waste Management Division (VINAHAZ)

60. Trinh Phuong Thao, Vietnam Environment Administration - (VEA-MONRE), Waste Management and Environment Promotion Agency, Project Officer

61. Dinh Viet Cuong, Vietnam Environment Administration - (VEA-MONRE), Waste Management and Environment Promotion Agency, Project Manager

62. Nguyen Thu Thuy, Vietnam Environment Administration - (VEA-MONRE), Waste Management and Environment Promotion Agency, Project Assistance and Accountant

63. Dao Xuan Lai, UNDP CO Project Contact, Head of Sustainable Development Cluster

64. Phan Minh Nguyet, UNDP CO Project Contact, Exec. Assistant

65. Nguyen Thanh Ha, Vietnam Health Environment Management Agency of the Ministry of Health, Focal point

66. Le Minh Sang, Local consultant (component 3 sharp waste and 6 Policy)

67. Le Van Chinh, Local consultant (component 5: National training)

68. Dang Thi Kim Chi,,Local consultant (component 4 - Mercury)
69. Nguyen Quang Dung,,Local consultant (Component 1 - HCWMP)
70. Nguyen Thu Ha,UNDP CO Vietnam,(Former) Programme Officer, oversaw the project
71. Pham Cao Phong,Ninh Binh General Hospital ,Vice - Director
72. Dang Hong Thanh ,Ninh Binh General Hospital, Department of Infection Control,Focal point
73. Vu Ngoc Doan,Ninh Binh General Hospital, Department of Equipments and Suplies,Chief of Department
74. Do Hong Thao,Ninh Binh General Hospital, Department of Infection Control,Autoclave operator
75. Nguyen Tu Trung Thanh,Ninh Binh General Hospital, Department of Infection Control,Autoclave operator
76. Dinh Manh Huy,Viet Duc Hospital,Vice director
77. Hoang Giang,Viet Duc Hospital, Department of Infection Control,Chief of the Department, Project Focal point
78. Ms. Loc,Viet Duc Hospital, Department of Infection Control,Chief Nurse
79. Nguyen The Hung,URENCO 10,Director
80. Dinh Minh Tri,URENCO 12,Vice director

5. LIST OF DOCUMENTS EXAMINED

5.1. ARGENTINA

Argentina - List of documents and reports gathered and consulted at TE

Project Output	logframe reference	#	Documents	Lang. (E/S)
0	Project Management	0.1	Argentina Mission Report of the Global Project Team Nov 2010	E
		0.2	Argentina and Brazil Mission Report June 2012	
1	Best practices for health-care waste management demonstrated, documented and made replicable	1.1	Proyecto PNUD arg 09/002 - Demostración y promoción de las mejores técnicas y prácticas para la reducción De desechos generados por la atención de la salud. Informe Final (cap. 01 – cap 05)	S
2	Commercially-available, non-incineration health-care waste treatment technologies that are appropriate to the needs of the facility or cluster, and that satisfy their needs, are purchased, deployed and evaluated.	2.1	Subcomponente b: Investigación y Demostración de Tecnologías Alternativas a la Incineración para el Tratamiento de Residuos Quimioterápicos en Argentina.	S
		2.2	Technical specifications for the procurement of an autoclave and of a boiler.	
4	Procurement of mercury-free devices	4.1	Resolución 139/2009 Ministerio de Salud, 19-feb-2009. Salud Publica. Plan de Minimizacion de Exposicion y Reemplazo del Mercurio.	S
		4.2	Ministerio de Salud Resolución 274/2010, Prohíbese la Producción, Importación, Comercialización de un Determinado Producto .bs. as., 9/2/2010	
		4.3	Anexo cap 3.3 El Mercurio En La Odontología-Resumenes Y Conclusiones De La Jornada En Buenos Aires	
		4.4	Anexo Cap 3.4 Recomendaciones Para El Manejo De Residuos De Amalgamas Dentales	
		4.5	Anexo Cap 3.5 Recomendaciones Para El Reemplazo De Instrumental Con Mercurio	

5	National Training	5.1	Anexo 4.1.a Carta Acuerdo con UTN	S
		5.2	Anexo 4.1.b1	
		5.3	Anexo 4.1.b2	
		5.4	ANEXO 4.10 Diseño pedagogico curso destinatarios finales	
		5.5	ANEXO 4.2 TDR UTN Modulo 1	
		5.6	Anexo 4.3.a	
		5.7	Anexo 4.3.b	
		5.8	Anexo 4.3.c	
		5.9	Anexo 4.3.d	
		5.10	Anexo 4.3.e	
		5.11	Formulario de inscripcion para el Curso ejemplo	
		5.12	ANEXO 4.5 Diseño del curso	
		5.13	ANEXO 4.6 Analisis variables pedagogicas y diseño pedagogico UTN	
		5.14	ANEXO 4.7 Guia para la evaluacion del curso	
		5.15	ANEXO 4.8 Informe final componente Capacitacion	
		5.16	Anexo 4.9.a Informe Final Equipo Neuquen	
		5.17	Anexo 4.9.b1 Equipo Tucuman	
		5.18	Anexo 4.9.b2 Equipo Tucuman	
		5.19	Anexo 4.9.c Equipo Rosario	
		5.20	Anexo 4.9.d1 Equipo Mendoza	
		5.21	Anexo 4.9.d2 Equipo Mendoza	
		5.22	Anexo 4.9.e Equipo Buenos Aires	
		5.23	Equipo La Rioja	
6	Policy review	6.1	Anexo 5.1 Analisis de las normativas de residuos biopatogénicos en la Republica Argentina	
		6.2	Anexo 5.2 Antecedentes de reuniones regionales para trabajar las problemáticas jurisdiccionales en la gestión de residuos	
		6.3	Anexo 5.3 Directrices para la gestión de residuos en establecimientos de atención de la salud.	
		6.4	Anexo 5.4 Señalización de Seguridad Proyecto de Resolución	

5.2. INDIA.

Project Output	logframe reference	#	Documents	Lang. (E/H)
	Project Management	0.1	Government Order on Constitution of Project Steering Committee	E
		0.2	Minutes from the Inception Workshop	E

		0.3	Annual Project Workplan 2010, 2011, 2012	E
		0.4	Annual Project Report 2010, 2011	E
		0.5	India Updated Work Plan - April 2012	E
		0.6	Quarterly project progress reports 2010	E
			Quarterly project progress reports 2011	E
			Quarterly project progress reports (Q1, Q2) 2012	E
		0.7	Minutes of the Third National Project Steering Committee Meeting held on 3rd May 2012	E
		0.8	Progress Implementation Report (PIR) – 2010	E
		0.9	Project Activity Chart	E
		0.11	Logical Framework-India project and overall	E
		0.12	Logframe	E
		0.13	Project Activity Chart	E
		0.14	PIR 2012 corrected	E
		0.15	PIR 2012 dsc corrected	E
		0.16	Project Timeline and Budget	E
		0.17	Combined Delivery Report Jan – Dec 2010	E
		0.18	Combined Delivery Report Jan – Dec 2011	E
		0.19	Combined Delivery Report Jan – Jun 2012	E
		0.20	Finalised Minutes (Minutes of Third NPSC Meeting	E
		0.21	India Mission Report	E
		0.22	Proposal for Extra budget	E
		0.23	Expenditure Statement 2010-11	E
		0.24	Newsletter	E
		0.25	India Mid term Evaluation report	E
Output 1	Best practices for health-care waste management demonstrated, documented and made replicable	1.1	UP MOU final	E
		1.2	TN MOU finalised	E
		1.3	Draft Report on Baseline Survey of Health Care Facilities and Centralized Bio-Medical Waste Treatment Plant Under the Tamil Nadu Component of the GEF/ UNDP- MoEF project on Health Care Waste Management.	E
		1.4	CSMMU (NOW KGMU) Lucknow Overview of Waste Management System	E
		1.5	Guidance on Measurement and Documentation	E
		1.6	Baseline Assessment Report-Uttar Pradesh	E
		1.7	Baseline Assessment Report-Tamil Nadu	E
		1.8	Baseline questionnaire Tamil Nadu	E
		1.9	Baseline report 15.9.	E
		1.10	Compilation of Observation Tamil Nadu Government Healthcare Institutions (HCIs)	E
		1.11	Compilation of Observation Tamil Nadu Private Healthcare Institutions (HCIs)	E

		1.12	Questionnaire on Infection control and Nosocomial Infection Surveillance	E
		1.13	Presentation on Safe healthcare waste management by NPD	E
		1.14	Waste collection and segregation practices (ppt)	E
		1.15	Agenda for Chennai Visit of CTA, 21 st -23 rd March, 2011	E
		1.16	CCSMU Posters (1-5)	E
		1.17	CCSMU Sheet for BP details	E
		1.18	CSMMU (NOW KGMU) Validation Report Version 4	E
		1.19	CSMMU (NOW KGMU) Waste System Overviews 14.6.12	E
		1.20	CSMMU (NOW KGMU) workplan 2011 4	E
		1.21	Fund requirement CSMMU (NOW KGMU) 2011	E
		1.22	Chatrapati Sahuji Maharaj Medical University (CCSMU) Department Code	E
Output 2	Commercially-available, non-incineration health-care waste treatment technologies that are appropriate to the needs of the facility or cluster, and that satisfy their needs, are purchased, deployed and evaluated.	2.1	Microbial Inactivation Efficacy Testing of the autoclaves at Chhatrapati Shahuji Maharaj Medical University Lucknow, India	E
		2.2	Guidance sheet on estimating baseline dioxin releases for the UNDP global healthcare waste project	E
Output 4	Procurement of mercury-free devices	4.1	Final Report on Workshop on Mercury Phase Out in Healthcare Sector, CCSMU 24 March, 2011	E
		4.2	Dissemination materials on Mercury Workshop (reports, flyer, CD, Posters)	E
		4.3	Mercury uses data at CSMMU (NOW KGMU), Lucknow	E
		4.4	Minutes of meeting dated 8 th March, 2010 to approve guidelines on mercury	E
		4.5	Guidance for GJ Multiclave on Mercury collection 2012	E
		4.6	Guidance for Hospitals on Mercury collection 2012	E
		4.7	Tender for non mercury devices (UP)	E
		4.8	Tender for non mercury devices 7th Sept 2012 (TN)	E
		4.9	5th Oct Mercury 1 (ppt)	E
		4.10	Guidance for GJ Multiclave on Mercury collection 2012	
Output 5	National training program	5.1	IGNOU MOU (pdf)	E
		5.2	Core curriculum documents	E
		5.3	MOU with host training institution	E
		5.4	Training reports with lists of attendees	E
		5.5	Test scores and copy of test if applicable	E
		5.6	Copies of student certificates,	E
		5.7	Training evaluation forms	E
		5.8	IGNOU component Action Plan Annex – 1	E
		5.9	IGNOU Final Workplan for 2011	E
		5.10	Final work plan IGNOU	E

		5.11	Quarterly Progress Report (IGNOU) Jul - Sept.	E
		5.12	Quarterly Progress Report (IGNOU) Oct - Dec 10	E
		5.13	Quarterly Progress Report (IGNOU) Jan – Mar 11	E
		5.14	Quarterly Progress Report (IGNOU) Apr - Jun 11	E
		5.15	Final Report Aug 2012 IGNO	E
		5.16	Expenditure Statement by IGNOU on 27 Aug 2012	E
		5.17	Mail of Mr AK Agrawal to Ms Shubhangi on QPR on (05 Oct 11 and 28 Jun 12)	E
		5.18	Training Module: Health and Environmental Impacts of Healthcare Waste	E
		5.19	Training Module: Activity and homework list	E
		5.20	Training Module: Activity List 3a Classification and Segregation of healthcare waste	E
		5.21	Training Module: Activity List 3a Healthcare Waste Management	E
		5.22	Training Module: Activity List 3c On Site Management	E
		5.23	Training Module: Activity List 3b Ideal Floor Plan	E
		5.24	Agenda for TOT Programme Chennai, 2-4 December, 2010	E
		5.25	Agenda for TOT Programme CCSMU, Lucknow, 11-12 Nov, 2010	E
		5.26	Agenda for TOR Programme Chennai, 25-27 April, 2011	E
		5.27	Agenda for TOT CSMMU (NOW KGMU) 23 Aug 2012	E
		5.28	Attendance Sheet of Participants at CCSMU 1 st TOT, 5-7 October, 2010	E
		5.29	Attendance sheet for Jr Residents Annex – 5 (2 copies)	E
		5.30	List of Participants for 2 nd TOT at CCSMU, Nov., 2010	E
		5.31	Attendance Sheet: Meeting of Health Care Waste Management, 7 th Feb, 2011	E
		5.32	Enrolment in IGNOU 6 months training program	E
		5.33	List of trained participants through TOT	E
		5.34	Training Report of 1 st TOT CCSMU Lucknow, 5-7 October, 2010	E
		5.35	Pre and post Test (22-23rd Aug 2012) - Evaluation sheet of training	E
		5.36	Evaluation format for TOT course	E
		5.37	TOR: Pre and Post Trainee Evaluation	E
		5.38	Programme Planning and Implementation: TOT Exercise	E
Output 6	National policies	6.1	Review and recommendation reports	E
		6.2	Government working papers and documents (circular 12 on Hazardous waste management)	E
		6.3	Conference minutes with participants list	E
		6.4	Hazardous Wastes (Management and Handling) Rules, 1989, Ministry of Environment of Forests, Government of India	E
		6.5	Bio Medical Waste(Management & Handling) Rules, 1998, Ministry of Environment of Forests, Government of India	E
		6.6	The Municipal Solid Wastes (Management and Handling) Rules, 2000	E

		6.7	India's Hazardous Waste (management, Handling and Trans-boundary Movement) Rules, 2008, Ministry of Environment of Forests, Government of India	E
Output 7	Dissemination	7	Newsletter	E

5.3. LATVIA

Project Output	Logframe reference	#	Documents	English / Latv.
0	Project Management	0.1	Project Plan on Procurements	L
		0.2	Combined Delivery Report by Project Jan-Dec, 2011 (12.09.2011)	E
		0.3	Project Budget Balance (04.11.2011)	E
		0.4	Project Budget (Aug, 2011)	E
		0.5	PSC Minutes of Meeting/Registrations sheet of Attendees/ PPT (25.11.2011)	E
		0.6	Letters of International Expert Dr. Jorge Emmanuel (17.01.2011; 14.03.2011; 26.09.2011)	E
		0.7	Audit Reports 2011 (Dec 2011, Apr 2012)	E
		0.8	Report on the Evaluation (Dec, 2011)	E
		0.9	Project Implementation Report	L
		0.10	QPR 2011 (Q2, Q3, Q4)	E
		0.11	QWP 2011 (Q2, Jul-Sept 8, Sept 9-30, Q4, Nov 22-Dec 31)	E
1	Best practices for health-care waste management demonstrated, documented and made replicable	1.1	Caustic Digester Safety Guides	E
		1.2	Description of tissue digesters	E
		1.3	Economic Feasibility Study Summary for Pathological Waste Management	L
		1.4	Instructions for waste segregation and digital thermometer use	L
		1.5	Agreements with LTD Rēzeknes Slimnīca, LTD Ziemeļkurzemes Reģionālā slimnīca, University of Agriculture, Faculty of Veterinary Medicine on Project Procurement Specification	L
		1.6	Certificate of Acceptance between Institute of Energy Systems and Environment, Riga Technical University/NPC	E
		1.7	Certificates of Acceptance LTD Ziemeļkurzemes Reģionālā slimnīca, LTD Rēzeknes slimnīca, University of Agriculture Veterinary Medicine Faculty	L
		1.8	Certificate of Acceptance LTD LAUTUS	L
		1.9	Statements of Acceptance LTD Ziemeļkurzemes Reģionālā slimnīca, LTD Rēzeknes slimnīca, LTD LAUTUS, LTD BAO	L
		1.10	Memorandums of Understanding A/s BAO / LTD LAUTUS	E
		1.11	Memorandum of Understanding Faculty of Veterinary Medicine of The Latvia University of Agriculture	E
		1.12	Annex IV to Memorandum of Understanding Faculty of LTD Ziemeļkurzemes Reģionālā slimnīca / LTD Rēzeknes Slimnīca	E
		1.13	Transfer of Ownership of the goods and non-consumable equipment LTD Rēzeknes Slimnīca/ LTD Ziemeļkurzemes Reģionālā slimnīca	E
		1.14.	Seminar "Training on Health Care waste management" at LTD Ziemeļkurzemes Reģionālā slimnīca Attendees sheet	L
		1.15	Mission Report: Training of Modal Facility staff in Rēzekne; PPT; List of attendees	L

		1.16	Mission Reports – Modal Facilities	L
4	Procurement of mercury-free devices	4.1	Statement of Acceptance LTD Rezeknes Slimnīca / LTD Ziemeļkurzemes Reģionālā slimnīca	L
		4.2	Results Monitoring Period on transfer to the use of digital thermometers for LTD Rezeknes Slimnīca/ LTD Ziemeļkurzemes Reģionālā slimnīca	L
		4.3	Results of Repeated Monitoring Period on transfer to the use of digital thermometers for LTD Rezeknes Slimnīca/ LTD Ziemeļkurzemes Reģionālā slimnīca	
		4.4	Introduction and control plan for the use of digital thermometers in LTD Rezeknes Slimnīca/ LTD Ziemeļkurzemes Reģionālā slimnīca	L
		4.5	Mission Reports: regional seminars on non-Mercury devices	L
		4.6	LTD BAO Informative Statement	E
5	National training program	5.1	WG 3 Registration sheet	L
		5.2	Study Programme on Health Care Waste Management Aspects	L
6	National policies	6.1	Regulations of the Cabinet of Ministers No. 353 “On waste generated in health care institutions”	L
7	Dissemination	7.1	Dissemination plan summary	L
		7.2	Guidance on conducting a baseline assessment of the model healthcare facility/ Guidance on estimating baseline dioxin releases for the undp global healthcare waste project/ Guidance on the microbiological challenge testing of healthcare waste treatment autoclaves/Guidance on reducing mercury releases from dental facilities	E/L
		7.3	Good practice manual for dealing with waste generated by medical institutions/Good Practice Manual for Dealing with Waste Generated at the Workplace of Veterinary Medical Care Practices	E/L
		7.4	Seminar „Ensuring control of infections in health care institutions” agenda	L
		7.5	Mission Reports - Kazakhstan, Kyrgyzstan, Ukraine, Georgia, Estonia	L
		7.6	Clean Med Europe Conference 2012 in Malmo Programme: Presentation "Healthcare Waste Management in Latvian Hospitals. UN/GEF Project Results"	E
		7.7	International Conference: Environmental Education and Science in Latvia and Europe: poster presentation and abstract	E/L
		7.8	Health Inspectorate and Environmental Inspection Service Capacity Seminar Survey of Attendees/ Attendees Sheet/Seminar program	L

5.4. LEBANON

Project Output	Logframe reference	#	Documents	English / Arab
0	Project Management	0.1	Inception Report. April 2010	E
		0.2	Annual Work Plans 2012 -POPs MW	

		0.3	Annual Work Plans EE projects 2012 17 02 12	
		0.4	PIR Lebanon 2011 -27.07.11	
		0.5	PIR POPs MW Lebanon 2012 final 05.07	
		0.6	PoPs MW Project Plans for 2012	
		0.7	Annual Work Plans 2012 Q3 18 07 12	
		0.8	National Steering Committee Minutes of meeting 23Jun11	
1	Best practices for health-care waste management demonstrated, documented and made replicable	1.1	Baseline Assessment – Nabatiyeh Hospital. February 2010	E
		1.2	Baseline Assessment- Hammoud Hospital. December 2010	
		1.3	Healthcare Waste Management Planning in the two Model Facilities, Task 1, June 2011	
		1.4	Healthcare Waste Management Planning in the two Model Facilities, Task 2, Development of Healthcare Waste Management Plans, June 2011	
		1.5	Healthcare Waste Management Planning in the two Model Facilities, Task 3, Responsibilities for Healthcare Waste Management in the Model Facilities, June 2011	
		1.6	Healthcare Waste Management Planning in the two Model Facilities, Task 4, Key Performance Indicators, June 2011	
		1.7	Healthcare Waste Management Training Component - TNA REPORT April 2011	
		1.8	Lebanon- Model Facility HCWM Plan Final	
4	Procurement of mercury-free devices	4.1	Comparative Evaluation of Non-Mercury Thermometers in Nabatieh Governmental Hospital and Healthcare Staff Preferences. Ali Ismail Naffaa, June 2011.	E
5	National Training	5.1	Healthcare Waste Management Training Component. TNA Report. .Amal J. Chammas, April 2011	E
		5.2	Training on Healthcare Waste Management - Evaluation report - September 2012	
		5.3	Attendance sheet. (in Arabic)	A
		5.4	Leb- Training Workshop Evaluation report Jan 2012	
6	National Policies	6.1	Letter from the Minister of Environment addressed to the Minister of Public Health registered under no. 4209/B dated 25/8/2010 concerning coordination for the enforcement of environmental rules, regulations and principles in the healthcare sector	A
7	Dissemination	7.1	5th Arab Cleaner Production Workshop Mission Report of mr. Darine Mawla	E
		7.2	Project Newsletter- Issue 1	

6. PHILIPPINES

Project Output	Logframe reference	#	Documents	English / Filipino
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0	Management	0.1	Project Status Updates -Timelines by Component (1,2,4 & 5), July2011	
		0.2	Status Report – First Quarter of 2011 by Waste Management Officer Mary Margaret Cabral	
		0.3	Status Report – Second Quarter of 2011 by Waste Management Officer Mary Margaret Cabral	
		0.4	Minutes of Mtg March 21-23, 2011with photographs, agenda, attendance sheets, and materials used:	
		0.5	Republic of the Philippines, Department of Health. Office of the secretary, notice of meeting of April 28 2011	
		0.6	DPMMH Health Care Waste Management Committee List of Member	
		0.7	Monthly Activity Reports for DPMMH Project Staff: January, February, February, March, April, May, June 2011	
		0.8	Project Quarterly Report s(2010 – 2012)	
		0.9	Philippines mission report may 2011, Pawell Gluszynski	
		0.10	2010 Annual Work Plan IEC Healthcare Without Harm	
		0.11	Annual Work Plan for GEF-IEC revised April 23 2010	
		0.12	Annual Work Plan for GEF-IEC revised May 25 2010	
		0.13	Annual Work Plan	
		0.14	Philippine Mission Report April 2010, Jorge Emmanuel	
		0.15	Philippine Mission Report July August 2010, Jorge Emmanuel, Ashley Iwanaga	
		0.16	Highlights from the National Project Steering Committee (NPSC) Meeting, 1 June 2011, DOH, Manila	
		0.17	Highlights from the National Project Steering Committee (NPSC) Meeting, 27 October 2010, DOH, Manila	
		0.18	Highlights Of The Meeting Of The National Working Group, 30 July 2010, Manila	
		0.19	2012 APRPIR-HCWM Project	
		0.20	Annual Project Review / Project Implementation Report - HCWM Project 17July2012	
		0.21	Annual Work Plan 2012	
		0.22	Project Implementation Report 2011Global Medwaste Final	
		0.23	Minutes of Meeting of DPMMH Health Care Waste Management Committee, 7July2011	
		0.24	Minutes of Meeting of DPMMH Health Care Waste Management Committee, 14July2011	
1	Best practices for health-care waste management demonstrated, documented and made replicable	1.1	Initial Draft Health Care Waste Management Plan for Sta. Ana dated March 24, 2011 based on March 21-23, 2011 meeting with transmittal to Dir Penafiel	
		1.2	Santa Ana Hospital, Individualized Rapid Assessment Tool, January 12th, 2011	
		1.3	Memorandum Prohibiting/Banning the Use and Entry of Styrofoam and Other Non-reusable Plastic Packaging at the Sta. Ana Hospital	
		1.4	Sta Ana Hospital Administrative memo re Schedule of Trainings for Health Care Waste Management Plan dated June 29, 2011 by Chief Administrative Officer noted by OIC-Hospital Director	
		1..5	MOA between CHD-MM and City of Manila re UNDP-GEF Project dated June 10, 2011 with attachments:	
		1.6	DOH DAO 2010-0067-A dated Feb 17, 2011 re change of model facilities and transfer of funds to CHD MM	
		1.7	CHD-MM 2011 Project Procurement Management Plan Charged to CHD-MM Account for Health Care Waste Project in Sta. Ana Hospital (UNDP Project)	
		1.8	Guidance on Conducting Baseline Assessment of the Model Health Care Facility from the GPT	

		1.9	Baseline Assessment Report, Sta. Ana Hospital, March 2011
		1.10	Powerpoint presentation: Guide in the Preparation of a Hospital Health Care Waste Management Plan, by UNDP Technical Project Officer, Sta. Ana Hospital
		1.11	Sant Ana Hospital, introduction to Sta. Ana Hospital healthcare waste management
		1.12	Policy on Immunization of Health Care Facility Workers, Sta. Ana Hospital
		1.13	Form for St. Ana Hospital Health Care Waste Management Action Plan
		1.14	Sample Self-Monitoring Sheet Form (Sta. Ana Hospital)
		1.15	Sample Monitoring Tool for the Waste Collector (Sta. Ana Hospital)
		1.16	Segregation data, Sta. Ana Hospital
		1.17	Generation Data, Sta. Ana Hospital
		1.18	Logical Framework: General and Work Schedule, Sta. Ana Hospital
		1.19	Republic of the Philippines, department of Environment and Natural Resources, department of Health, joint DENR-DOH administrative order no. 02, series of 2005, Policies and Guidelines on Effective and Proper Handling, Collection, Transport, Treatment, Storage and Disposal of Health Care Wastes.
		1.20	Baseline assessment report on the model healthcare facility: Diosdado P. Macapagal Memorial Hospital Guagua, Pampanga, Philippines February 8-17, 2011
		1.21	Diosdado p. Macapagal Memorial Hospital Guagua, Pampanga, Philippines February 8-17, 2011, Individualized Rapid Assessment Tool
		1.22	DPMMH Health Care Waste Management Action Plan: 2011-2012
		1.23	Progress Reports, DPMMH, First Quarter and Second Quarter 2011
		1.24	Annual Work Plan 2011, DPMMH
		1.25	DPMMH Training Design on Health Care Waste Management for Waste Handlers, 19July 2011 Highlights of the First Waste Management Committee
		1.26	Meeting Held at DPMMH, Conference Room, 8June2011
		1.27	Minutes of Meeting of DPMMH Health Care Waste
		1.28	Medical Waste Treatment Facility, Business Plan - Sta. Ana Hospital, Manila.
		1.29	MOA between CHD-III and Government of Pampanga re UNDP-GEF Project dated May 2, 2011.
		1.30	Diosdado p. Macapagal Memorial Hospital Guagua, Pampanga, Philippines June 13, 2011, Letter of request of non mercury equipment
		1.31	Request List by DPMMH of HCWM Materials and Goods and List of Waste bins, Sharp Collectors and Needle Destroyers, July 13, 2011
		1.32	DPMMH Operation Room/Delivery Room Waste Minimization Scheme Health Care Waste Material Flow
		1.33	Health Care Waste Management and Environmental Sanitation Monitoring Checklist – used by the LGU/Province of Pampanga
		1.34	Sketch Plan of Hospital Waste Holding Area – prepared by the DPMMH Waste Management Officer, Pampanga Province
		1.35	Medical Waste Treatment Facility, Business Plan - Sta. Ana Hospital, Manila.

		1.36	Medical Waste Treatment Facility, Business Plan – Diosdado P. Macapagal Memorial Hospital, Pampanga	
		1.37	DPMMH Operation Room/Delivery Room Waste Minimization Scheme Health Care Waste Material Flow	
		1.38	Medical Waste Treatment Facility, Business Plan – Diosdado P. Macapagal Memorial Hospital, Pampanga	
2	Commercially-available, non-incineration health-care waste treatment technologies that are appropriate to the needs of the facility or cluster, and that satisfy their needs, are purchased, deployed and evaluated.	2.1	Technical Specification for 2 autoclaves and one vehicle for the transportation of HCW, April 4, 2011	
		2.2	UNDP Bid Documents for Procurement of Autoclave Housing, Medical Waste Autoclave and Transport Vehicle, February 2011	
		2.3	Proposed Medical Waste Autoclave in Pampanga – Scope of work June 2012, with drawings	
		2.4	Proposed Medical Waste Autoclave in Pampanga – Scope of work, GPT revision.	
		2.5	Proposed Medical Waste Autoclave in Sta Ana Hospita, Manila– Scope of work, GPT revision	
4	Component Procurement of Mercury Free Devices		Republic of the Philippines, Department of Health. Administrative Order 2008 – 0021. Gradual Phase-out of Mercury in all Philippine Health Care Facilities and Institutions	
			DOH DAO 2010-0067 dated March 3, 2010 re Guidelines on the Transfer of Funds of the UNDP-GEF Health Care Waste Management Project for Mercury Phase-out by the CHD Ilocos and Metro Manila	
			DOH Department Memorandum No. 2011-0145: Guidelines for the Temporary Storage of Mercury Wastes in Health Care Facilities in Accordance with Administrative Order No. 0021 on the Gradual Phase-Out of Mercury in All Philippine Health Care Facilities and Institutions, April 2011	
			Republic of the Philippines, Department of Health. Office of the Secretary, Department Memorandum 2011-0146, 11 April 2011. Guidelines for the Temporary Storage of Mercury Wastes	
			National Conference on Mercury Phase-out in Healthcare Facilities. 25 November 2010, Heritage Hotel, Pasay City, Copy of the speeches (power points) and of the Conference programme.	
			Powerpoint Presentation on Managing Mercury-containing Lamp Wastes, November 2010	
			Guide to Temporary Storage of Mercury Containing Devices in Health Care Facilities, November 2010	
			Powerpoint Presentation about DOH AO 21 Regarding the Gradual Phase-Out of Mercury in All Philippine Health Care Facilities and Institutions, November 2010	
			Powerpoint Presentation of Hospitals Best Practices in Phasing-out Mercury in Health Care Facilities, November 2010	
			Powerpoint Presentation on Alternatives to Mercury-containing Medical Devices for Health Care Facilities, November 2010	
			Powerpoint Presentation on DENR-EMB Initiatives on the Management of Mercury and Mercury Compounds, November 2010	
			Powerpoint Presentation on Case Studies on Mercury Exposure and Poisoning, November 2010	
			Powerpoint Presentation on Mercury Reduction in Health Care: Lessons from Other Countries, November 2010	
			A Guide on Mercury Phase Out in Healthcare Facilities, DOH 2010	

5	National Training Program		Modules of the Pilot Training on HCW Management, May 16-20, 2011, prepared by the Department of Environmental and Occupational Health, College of Public Health, University of the Philippines Manila	
			MOA on Development of Training Modules for the Project “Demonstrating and Promoting Best Techniques to Reduce Health Care Wastes and to Avoid Dioxins and Mercury Releases” between the DOH and the University of the Philippines College of Public Health, January 7, 2011	
			List of Participants for the Pilot Training on HCWM conducted by UP CPH, 16-20May2011	
			List of Participants for the Pilot Training on HCWM conducted by UP CPH, 11-15July2011	
			Sample – Certificate of Participation in the Pilot Training Course on Health Care Waste Management, awarded by the UP CPH	
6	National review of HCWM policy		Terms of Reference for a National Working Group on the Formulation of a National Roadmap on Healthcare Waste Management. (2011, not dated)	
			3rd edition of the HCW Management Manual, Draft, DOH 10 June 2011	
			Minutes of the meeting for the revision of the 3rd edition of the HCW Management Manual, (October 2010 to March 2011)	
			List of Attendees: Technical Working Group Minutes of Meetings: 3rd Edition Health Care Waste Management Manual (October 2010- March 2011, 7 TWG meetings, 4 consultation meetings including that with DENR-EMB)	
			Introduction to the 3rd Edition Health Care Waste Management Manual, Key Issues, Photo Documentation of Consultations in Visayas, and Luzon and Final Writeshop ,December 2010-February 2011	
			Powerpoint Presentation of Consultation with DENR-EMB on the 3rd Edition Health Care WasteManual, March 2011	
			Healthcare Waste Managenent Manual, 3rd Edition, Philippine Department of Health (2012)	
			HCWH – Position Paper on the 3 rd edition of the Health Care without Harm Manual, August 2012	
			Letter from Ms. Rebecca Penafiel to Ms. Montecillo, HCWH, on the comments on HCWM manual, nov. 7 2012, with annexes (Response on HCWH Position Paper)	
	Component 7 – Global / Regional dissemination		Communication Plan For Advocacy Activities Under The Gef Project (Mercury And Health Care Waste Management) (Draft)	

6.1. SENEGAL

Project Output	Logframe reference	#	Documents	English / Filipino
0	Management	0.1	UNDP / Ministère de l’Environnement et de la Protection de la Nature du Senegal. Bilan du 1 ^{er} Janvier au 31 Décembre 2010 du projet de gestion des Dioxines et Du Mercure.	
			UNDP. Senegal Mission Report April 4-13, 2011 By Mohamad-Ali Hamandi and Jorge Emmanuel	

			Steering Committee Meeting for 2009 Annual Workplan and Budget Validation, September 07, 2009	
			Steering Committee Meeting for 2010 Annual Workplan November 9, 2009	
			Ministry of Health Circular	
			Cumulative Report on expenses made by Project	
			Audit Reports	
			Senegal mission report of mr. Jorge Emmanuel. October 2011	
			Senegal mission report of mr. Mohamad-Ali Hamandi, September 2011	
			Extract from the GPT weekly conference calls (2011-2012)	
			Quarterly Progress Report 2010-2011	
			Quarterly Work Plan 2010 - 2011	
			Annual Work Plan 2009 - 2011	
1	Best practices for health-care waste management demonstrated, documented and made replicable	1.1	Protocole d'Accord pour l'érection du Centre de Santé Youssou Mbargane Diop de Rufisque comme établissement modèle dans le cadre du Project de Gestion des Dioxines et du mercure au Sénégal (janvier 2010)	
		1.2	Protocole d'Accord pour l'érection du Poste de Santé Sangalkam comme établissement modèle dans le cadre du Project de Gestion des Dioxines et du mercure au Sénégal (Janvier 2010)	
			Protocole d'Accord pour l'érection du Hopital General de Grand-Yoff comme établissement modèle dans le cadre du Project de Gestion des Dioxines et du mercure au Sénégal (janvier 2010)	
			MOU Validation Meeting for the 3 Project Sites, December 02 2009	
			Standard MOU	
			Workshop on Validation of The Project's Procedures' Administrative and Financial Manual, March 23 thru 25 2010	
2	Commercially-available, non-incineration health-care waste treatment technologies that are appropriate to the needs of the facility or cluster, and that satisfy their needs, are purchased, deployed and evaluated.	2.1		
4	Component Procurement of Mercury Free Devices	4.1	Rapport de la Journee de sensibilisation sur le Mercure a L'Hopital General de Grand Yoff, 09 Juin 2010 (80 people trained). Rapport de la Journee de sensibilisation sur le Mercure a Youssou Mbargane , 09 Juin 2010 (50 people trained).	

5	National Training Program	5.1	Republique Du Senegal, Ministère de la Santé e de la Prévention, Centre de Sante Youssou Mbargane Dlop de Rufisque. Termes de Reference: Atelier de Formation en Tri Conditionnement des Midicaux et personnel de Soutien dans le cadre du Progedime. June 2011.	
			Republique Du Senega, Ministère de la Santé e de la Prévention Médicale, Direction des établissement de santé Hopital Youssou Mbargane Dlop. Rapport D'activité de formation du personnel de l'Hopital Youssou Mbargane Dlop et du Poste de Sante de Sangalkam. (16, 17 and 18 june 2011) That was a replication training performed after the TOTs and involved 225 people.	
			Republique Du Senegal, Ministère de la Santé e de la Prévention, PRONALIN . Atelier de formation des formateurs et managers de Youssou Mbargane Dlop and Samgalkam. (7, 8 and 9 June 2010). Presence sheets: (December 7, 8, and 9 2010); Rapport d'activité de la session de formation de formateurs. 60 people trained.	
			Republique Du Senegal, Ministère de la Santé e de la Prévention, PRONALIN . Atelier de formation des medicaux et paramedicaux at Hoggy. Presence sheets: (June 1-14 to , 2010). Around 400 people trained.	
			Republique Du Senegal, Ministère de la Santé e de la Prévention, PRONALIN . Atelier de formation des formateurs at Hoggy. (November 22-24, 2010). Presence sheets: (November 22, 23 and 24 2010); Rapport d'activité de la session de formation de formateurs. 60 people trained; Rapport d'activité de la session de formation de formateurs.	
			Republique Du Senegal, Ministère de la Santé e de la Prévention, PRONALIN . Atelier de formation des managers at Hoggy conducted for managers of Hoggy, Youssou Mbargane Dlop and Samgalkam. (December 1-3, 2010).	
			Presence sheets: (December 1, 2 and 3 2010); 60 people trained. Rapport d'activité de la session de formation de formateurs. 60 people trained; Rapport d'activité de la session de formation de managers.	
			Republique Du Senegal, Ministère de la Santé e de la Prévention, PRONALIN . Atelier de formation at Youssou Mbargane. Presence sheets (16, 17 and 18 June 2010). (189 people trained)	
			Inception Meeting Report on Project (PROGEDIME) beginning, November 25, 2009	
			Report on Planning Meeting of the Project (PROGEDIME) October 29, 2009	
			Audit Report of PROGEDIME December 31, 2010	
			Scope of Work for Pronalin Training	
6	National review of HCWM policy	6.1		
7	Global / Regional dissemination	7.1		

Project Output	Logframe reference	#	Documents	English / Filipino
0	General management	0.10	Minutes from the Inception Workshop	E
		0.20	Annual Project Workplan 2010, 2011, 2012	E
		0.30	Annual Project Report 2010, 2011	E
		0.40	Quarterly project progress reports Quarter III, IV (2010), Quarter I, II, III, IV (2011), Quarter I, II, III (2012)	E
		0.50	Formal letter by MoH on commitment for implementation of the project	V
		0.60	Report on co-financing provided by MONRE	V
		0.70	Report on co-financing provided by URENCO	V
		0.71	Communications between the Global Team and the project	E
		0.80	Report on co-financing provided by MoH	
		0.90	Report on co-financing provided by Ninh Binh General Hospital	
		0.100	Report on co-financing provided by Viet Duc Hospital	
1	Best practices for health-care waste management demonstrated, documented and made replicable ..	1.10	Formal letters with 2 hospitals and URENCO	
		1.20	adapted tool for assessment	
		1.30	Guidelines for baseline assessment	E
		1.40	baseline assessment report	E
		1.50	Health-care waste management plan in Ninh Binh and Viet Duc	E
		1.60	HCWM plan implementation records (Ninh Binh and Viet Duc) x2 = 4 records	V
		1.70	• Training curricula and programs	V
		1.80	• List of training attendees	V
		1.90	• Facility-wide training reports	V
		1.10	• Quarterly and final reports on facility activities	see 1.60
		1.11	• Replication materials (guidelines on health care waste management)	V
		1.12	• Replication toolkits and their evaluation	n.a
		1.13	• Project website	
2	Commercially-available, non-incineration health-care waste treatment technologies that are appropriate to the needs of the facility or cluster, and that satisfy their needs, are purchased, deployed and evaluated.	2.10	Technical specifications for Ninh Binh and URENCO	E
		2.20	Minutes of meeting for starting Component II	V
		2.30	Request for proposals for Ninh Binh and URENCO	E
		2.31	Minutes of meetings between URENCO, PMU, UNDP and auto-clave installer	V
		2.40	Survey report on sharp waste practices at Viet Duc hospital	V
		2.50	Training curriculum for sharp waste management practices	V
		2.51	Minutes of handover sharp-boxes for Viet Duc hospitals	V
		2.60	Sharp waste management plan for Viet Duc hospital and selected hospitals in Hanoi	V, E
		2.61	Procedure for sharp waste handling in URENCO	V
		2.70	Report on WMP implementation	
		2.80	Report on using autoclave Ninh Binh	V
		2.90	Training autoclave – Ninh Binh	E

4	Procurement of mercury-free devices	4.10	Assessment report on mercury-containing devices and mercury practices	V&E
		4.11	Minutes of handover non-mercury thermometers and sphygmomanometers for Ninh Binh hospital	V
		4.11	Minutes of handover non-mercury thermometers and sphygmomanometers for Viet Duc hospital	V
		4.20	Recommended policy and Plan for mercury replacement in Ninh Binh hospital and Guidelines for handling and disposal of phased-out mercury devices	V & E
		4.30	Recommended policy and Plan for mercury replacement in Viet Duc hospital and Guidelines for handling and disposal of phased-out mercury devices	V
		4.40	• Training report	V
		4.60	• Mercury practices implementation report	V
		4.70	• Awareness-raising and educational materials on mercury	V
		4.80	• Conference minutes, agenda and participants list	V
5	National Training	5.20	• Core curriculum documents	V
		5.30	• MOU with host training institution	V
		5.40	• Training reports with lists of attendees	V
		5.50	• Test scores and copy of test if applicable	V
		5.60	• Copies of student certificates,	V
		5.70	• Training evaluation forms	V
6	National policies	6.10	• Review and recommendation reports	E
		6.20	• Government working papers and documents (circular 12 on Hazardous waste management)	V
		6.30	• Conference minutes with participants list	V
		6.40	Decision 170/QD-Ttg on 08/02/2012 and Decision 2038/QD-Ttg on 15/11/2011	V
		6.50	Circular No. 26/2011/TT_BTNMT of Ministry of Natural Resources and Environment on EIA	V
		6.60	Circular No 1/2012/TT-BTNMT dated 16/3/2012 by Ministry of Natural Resources and Environment on Provisions on establishment, appraisal, approval and Inspection, certification of the implementation detailed environmental protection proposal; establishment and Registration simple environmental protection proposal	V
		6.70	Comments from MONRE for Decision 170/QD-TTg	V
		6.80	Comments from MONRE for WB Projects	V
Output 7	National dissemination	7.10	Video: project launching (on the news of the national TV channel)	V
		7.21	Article on MONRE's volume on environmental management on non-burning technology	V
		7.22	Article on MONRE's volume on environmental management on health care waste management	V
		7.23	Article on Vietnam News	E
		7.24	Article on Vietnam Investment Review	E
		7.25	Program on Vietnam Television (DVD)	V
		7.26	News on Hanoi Radio Television	V

		7.27	Mercury minimization on Online Newspapers	V
		7.28	Poster on HCWM	V
		7.29	Diagram on HCWM	V
		7.30	Leaflets on HCWM Plan	V

7. ANSWERS TO THE COMMENTS RECEIVED FROM THE GPT AND UNDP HQ

7.1. COMMENTS FROM THE PROJECT COUNTRIES

In addition to interviews, consultation and meeting, to ensure that the evaluation fully reflected the status of the project implementation in each participating country, the evaluators circulated the chapters concerning project countries (chapters 8.1.1 to 0) to the project teams (NPC and UNDP CO) of each relevant country before the December meeting in Dar es Salaam. All the project country teams provided their comments and feedback which were fully incorporated in the evaluation report. All the comments provided by the countries were accepted by the evaluators. As the processing (receiving, answer, further clarification) of the comments provided by the project countries required an intensive exchange of documents by mail, these comments are not included in this annex. Detailed comments from the project countries are however available upon request.

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7.2. COMMENTS FROM UNDP HQ

The following comments from the UNDP HQ have been all accepted and the report has been modified accordingly.

Comments received by mail on January 11, 2013

- 1) It is appropriate to state “upfront” that in mid-course of the final evaluation exercise, a proposal was made and adopted at the Steering Committee to allow for another year of implementation to enable some countries to finish the work. It may thus be mentioned that a revision of the final evaluation report is anticipated by the end of 2013 to take these last activities into account. This added evaluation-mandate would be limited in time, and would only consist of a desk-study (no missions).
- 2) It is noted that the direct project results in terms of g TEQ and amount of mercury could not be assessed yet. It may however be good to indicate that more information would in fact become available by end of 2013, and that it is hoped that this will be incorporated into the finalized eval report. This is especially important because It is not possible for us to obtain funding from GEF for reducing dioxins and mercury and not reporting in the final evaluation how much we have achieved and how much we expect at the end of the project we have achieved with direct project outcomes and how much release reduction we believe that replication will bring (i.e. how convincingly have we transformed/changed the countries’ approach). Are we tinkering with a couple of facilities or are we catalyzing change? This part, both direct result reporting and analysis of the wider implication, needs to be strengthened. (If unavailable now, can be done by end-2013)
- 3) Relating to the results, we need to get a clearer extraction of the key results under which UNDP is compiling cumulative POPs results, the annual tracking tool in PIRs. In this regard, we wonder if following table could be compiled for the entries other than N/A (if unavailable now, can be done by end-2013):

Indicator	Result
Number of national POPs regulative instruments adopted	??
Number of people trained in POPs management /alternatives	????
POPs disposed (metric tons)	N/A
POPs safeguarded (metric tons)	N/A
Annual reduction of un-intentionally produced POPs released (g TEQ/year)	???
Same for mercury	???
Number of people for which high risk of POPs exposure reduced (annual)	???
Tonnes of ozone-depleting substances eliminated	N/A
Cumulative climate benefits: tonnes of CO ₂ -eq reduction[1]	????????

- 1) While the role of many stakeholders is mentioned in various section of the report, we believe that the inputs by UNDP-MPU to assist the Global Team is somewhat overlooked. Together, Jacques, Klaus and I did devote quite some time to attend the weekly teleconference calls with the Global Team and follow up on very many implementation issues with the country offices, etc. We also were present at the steering committee meetings and the Global Team Meetings and

contributed to them. Etienne also went to a workshop in Dakar in 2012. It would be good if these inputs by UNDP-MPU could be recognized somehow.

- 2) Section 5.2.4 has a table 6 which lists the co-financing of the various components. As you are aware, co-financing reporting is not voluntary; these are to be inserted into the final PIR and will be used by GEF in their reporting to donors. If there is no proper structure established during project implementation, then the GPT may wish to make an estimation of these amounts (consulting with countries if need be) so that the evaluator(s) can incorporate those during the finalized revision by end-2013.
- 3) In paragraph 6.1 the report states that the President of Tanzania himself, visited the UDSM pavilion to see the autoclave that was built. Is this really so? If so, we believe we should make an article about this on UNDP's website (and others). Could Jorge confirm?
- 4) It would be good to also include the scoring definitions in the Executive Summary. Although the explanation of the scoring is on page 11, many people just read the Executive Summary and would not know where to look for this explanation.

7.3. COMMENTS FROM THE GPT

Most of the comments provided by the GPT were fully accepted by the evaluators. Below, all the detailed comments kindly provided by the CTA and the are reported, with replies from the LTEC.

Sentence commented (pag 5): Both Lebanon and Latvia provided limited information on component 2 (Technology) which for these countries represents a significant amount of counterpart funds

Comments: *Lebanon's technology component is not a significant amount of funds since they already had technologies in place before the project.*

Our reply: accepted. The text has been amended as following:

Both Lebanon and Latvia provided limited information on component 2 (Technology) which for these countries represents a significant amount of counterpart funds (2.5 MUSD for Latvia and 0.25 MUSD for Lebanon)

Sentence commented (page 6): . Difficulties among DOH and HCWH in the Philippines and MOEF and Toxic Links in India where observed, mainly due to the different views on HCWH policies

Comment: *Is this supposed to be HCW Management not Health Care Without Harm?*

Our reply: accepted. The text has been amended as following:

Difficulties among DOH and HCWH in the Philippines and MOEF and Toxic Links in India where observed, mainly due to the different views on HCW Management policies

Sentence commented (page 7): The whole text concerning Argentina.

Comment: *Please see notes on the Argentina section*

Our reply: mostly not accepted. See answer on the Argentina section.

Sentence commented (page 13): proposed insertion in chapter "Project Start and Duration"

Proposed insertion: *At the Dec 4, 2012 GPSC meeting in Dar es Salaam, the GPSC agreed to continue work plan activities into 2013 for countries who need more time to complete project objectives. No exact date was set. However, a final Project Implementation Report (PIR) will be made in August 2013 for submission in September. Any activities completed afterwards will not be in the final PIR.*

Our reply: accepted. The proposed insertion has been completely inserted at the end of the chapter "Project Start and Duration."

Sentence commented (Page 16): . The deadline set for submission of final measurement was set by the GPT as October 17, 2012, however none of the countries, as of December 4, 2012, completed that report (or at least evaluators where not provided with that report).

Comment: *Argentina submitted their information but it was in a 700 page report. We will send you the information. Similarly, Lebanon submitted its report during the GPSC meeting on December4, 2012. India, Philippines, Senegal and Vietnam submitted incomplete reports*

Our reply: partially accepted. The evaluator received very late (December 2012, just before the mission in Argentina) the report from Argentina fragmented in several PDF files, some of which were incomplete, and which were not easily merged into a single report. CTA provided the Argentina report on January 24. The text has been therefore amended as following.

"Argentina submitted their information but it was in a 700 page report, which was firstly sent to the evaluators in December 2012 fragmented in several parts, and finally provided by the CTA on January 26, 2013. Lebanon submitted its report during the GPSC meeting on December4, 2012. India, Philippines, Senegal and Vietnam submitted incomplete reports. "

Sentence commented (page 16): Moreover, although policy review was carried out in most project countries, only in two countries (Latvia, Vietnam) it resulted in the formal approval and promulgation of new healthcare waste legislation, whilst in at least 2 countries the efforts on policy review were very limited (Senegal, Argentina).

Comment: *The legal framework in Argentina is such that regulations are done on the provincial level. Nevertheless, the national project reviewed the numerous provincial regulations on medical waste and made major efforts to harmonize the varying definitions and color-coding of medical waste in the provinces and developing recommended guidelines related to medical waste and mercury*

Our reply: partially accepted. The issue is that the analysis made by the Project in Argentina remained at the status of an internal project report, without significant discussion with the stakeholders. The text was therefore amended as following: “Moreover, although policy review was carried out in most project countries, only in two countries (Latvia, Vietnam) it resulted in the formal approval and promulgation of new healthcare waste legislation; in Senegal, no substantial effort on policy review was made, whilst in Argentina the review carried out on the national and provincial regulations remained at the stage of internal project report.

Sentence commented: the whole sub-chapter 5.1.3, with special reference with the quoted World Bank comment to the project, and the sentence “The project indeed starts from the assumption that reduction of the release of dioxin can be only achieved by substituting incineration with non-combustion technologies, by adopting BEP at the level of waste management in the hospital, and by deploying non-combustion technologies for the treatment of waste”

Comments “We had difficulty finding any reference to an objective of eliminating incineration except in the section of the ProDoc that described the work of HCWH, not the perspective of the project. It seems that the World Bank comment wrongly interpreted the phrase “demonstrating ... technologies that ... eliminate the burning of health-care waste” to mean that we want to eliminate all incineration. The phrase “that eliminate the burning etc.” refers to the “technologies”, that is, we are demonstrating technologies that do not involve burning of the waste (page 16, not page 14 as noted in the WB comment). All throughout the document, the perspective and stated objective is to promote non-incineration technologies, which at the time the document was written were not well known in developing countries. As noted in your section, the project worked on improving the CTF incinerator in Tamil Nadu and provided on-line monitoring to help operators adjust operating parameters to reduce UPOPs. Unfortunately, we are still waiting for the dioxin tests to determine how successful the improved incinerator design and monitoring system are in lowering UPOPs”

Our reply: partially accepted. It is true that the project did not mean to eliminate all incineration. It is however a fact that the improvement of existing incinerators as a possible way to reduce U-POPs was not among the objectives of the project, although in the end a limited intervention was made on the incinerator in Tamil Nadu. However the WB comment was probably addressed to the following sentence contained in the project document (page 16):

“In the absence of interventions such as those planned by this Project, the decisions made in those countries to move away from the incineration of health-care wastes would be difficult or impossible to sustain.”

The text is therefore changed as following:

“On the side of reduction of U-POP release, the project document is mainly focused on the promotion of non-burning technologies and on the adoption of adopting BEP at the level of waste management in the hospital waste. The option to reduce U-POP dioxin by upgrading existing incinerators (BAT), adoption of best practices for incineration management (BEP) or building capacity in the field of U-POP monitoring was not pursued or explicitly considered in the project document. The evaluators consider relevant the following comments provided at PDF-B stage by WB (Annex 7a of the project document, Comment 5):..”
The remaining part of the chapter is kept unchanged.

Sentence commented: (page 18) Proposed insertion to the Chapter “Replication approach” *“Senegal is another good example. The written medical waste management procedures developed for the model facilities are now being used by PRONALIN as a reference to be replicated by all Senegalese hospitals in the country. (Email from Dr. Ndoeye, to the CTA, 1/19/13)”*

Our reply: accepted. The proposed sentence is inserted in the text.

Sentence commented: (page 19) Proposed insertion to the Chapter “5.1.7. Linkages between project and other interventions within the sector”. *“Other activities with major linkages include: (1) major revision of the WHO main reference guideline on medical waste (“Safe management of wastes from health-care activities” to be released 2013) which incorporated lessons from the project and is the reference for countries around the world; (2) WHO guidelines on replacement of mercury thermometers and sphygmomanometers (2012) which directly adopted the UNDP GEF project’s guidance document; (3) the various Inter-governmental negotiating committee meetings for the mercury treaty which benefitted from mercury-related data from the project; and (4) a WHO-Ghana Health Service sharps waste recycling project in Ghana which uses lessons from the project to deal with immunization waste.*

Our reply: accepted. The proposed sentence is inserted in the text.

Comments on chapter 6.1.1 “Project component 3. Design of non-incineration technology for the african needs (Tanzania)”, as following: (Page 26)

Comment: *“I suggest making the “Autoclavable containers” a separate technology because of its uniqueness. The latest version of the aluminum containers, demonstrated at the Technology Launching at CCBRT Hospital on December 5, 2012, attended by*

government and international representatives, uses special plugs that allow steam to enter and sterilize the waste. Elimination of plastic bags is a big advantage for poor countries and further reduces waste. The second prototype of the autoclavable sharps container (for facilities that do not want to use a sharps cutter) was completed also on December 5 and the sharps container design is now being transferred to Vietnam.

With regards to the initial contradictory results, the subsequent tests by Ed Krisiunas gives definitive results of complete decontamination”

Our reply : accepted, The following text has been added to the chapter: “Autoclavable container. The latest version of the aluminum containers, demonstrated at the Technology Launching at CCBRT Hospital on December 5, 2012, attended by government and international representatives, uses special plugs that allow steam to enter and sterilize the waste. Elimination of plastic bags is a big advantage for poor countries and further reduces waste. The second prototype of the autoclavable sharps container (for facilities that do not want to use a sharps cutter) was completed also on December 5 and the sharps container design is now being transferred to Vietnam. “

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Sentence commented (page 26): construction of a shade, installation of power, water supply and drainage systems and later extended testing of the equipment were projected to begin in the earliest possible time. The testing is going to last for at least six months where the cost-effectiveness, practical issues such as weight of waste per

Comments. *These were completed in time for the formal launching on December 5, 2012 which was also the start of the extended field testing for six months or more at CCBRT Hospital.*

Accepted: Text modified accordingly.

Sentence commented: (page 26) The work will be presented in the first international Conference of Ministers of Health in Francophone for the Prevention and Control of Infection in Africa scheduled for October 15-19 in Cotonou, Benin. On November 26th the work will be presented in the Infection Control African Network.

Comments:*The Benin conference ended up being moved to Dec 10-14, 2012. Presentation was made by both Dr. Tito Mwinuka of UDSM and Abdoulaye Faye, Senegal consultant. The UNDP GEF project also had a booth on the new technologies in Benin. The booth was visited personally by the Ministers of Health of Benin, Niger, Gabon, and Comoros, as well as the Director of Healthcare Institutions of Togo.*

Comments: *The technologies were presented by Dr. Emrod Elisanted of UDSM and by the CTA at the Infection Control Africa Network in Cape Town, South Africa. Dr. Babacar Ndoeye also presented on the outcomes of the GEF project in Senegal at the same conference*

Our reply: accepted: the sentence has been modified as following: On November 26th the work has been presented in the Infection Control African Network. The technologies were presented by Dr. Emrod Elisanted of UDSM and by the CTA at the Infection Control Africa Network in Cape Town, South Africa. Dr. Babacar Ndoeye also presented on the outcomes of the GEF project in Senegal at the same conference.

The work has been presented in the first international Conference of Ministers of Health in Francophone for the Prevention and Control of Infection in Africa in Dec 10-14, 2012 in Cotonou, Benin. Presentation was made by both Dr. Tito Mwinuka of UDSM and Abdoulaye Faye, Senegal consultant. The UNDP GEF project also had a booth on the new technologies in Benin. The booth was visited personally by the Ministers of Health of Benin, Niger, Gabon, and Comoros, as well as the Director of Healthcare Institutions of Togo.

Sentence commented: (page 27) As any technology development, the transition from the design stage to the commercial stage may be uncertain and risky; however it seems that the GPT is adopting the correct countermeasures by planning the steps for patenting the technology and at the same time creating expectations by presenting the technology in the IPCAN

Comments *The GPT organized several consultations and meetings in 2012 of different stakeholders and interested parties, including UDSM, HCWH and FHI360. Those involved agreed to form a non-profit entity that will commercialize the new technologies, work with manufacturers, create a supply and distribution chain, develop quality control standards and certification testing, and register an international trade name for the technologies (instead of obtaining a patent which could be delayed by complicated IP rights issues). The groups that are forming the non-profit entity have consulted with legal and financial experts and have hired a business writer and an MBA/strategic planner who has completed a first draft of a business plan which includes analyses and plans on manufacturing, distribution, repair, post-manufacture servicing, licensing and certification, quality control, training and technical assistance, marketing and demand projections, start-up plan, growth plan including hub selection, system requirements, management, staffing, revenue streams, detailed financial analysis, legal structure of the non-profit entity, etc. FHI360 which operates in 60 countries including Tanzania, HCWH with members in 50 countries, and UDSM have all signified their interest in funding or co-financing the rollout of the new technologies in Africa and Asia beginning in 2013. The next conference call of the group with the CTA is schedule for January 30 to finalize the business plan*

Our reply: accepted. The information provided by the CTA have been summarized as following:

“The GPT organized several consultations and meetings in 2012 of different stakeholders and interested parties, including FHI360 which operates in 60 countries including Tanzania, HCWH with members in 50 countries, and UDSM, which have all signified their interest in funding or co-financing the rollout of the new technologies in Africa and Asia beginning in 2013. Those

involved agreed to form a non-profit entity that will make all the necessary legal and technical step to commercialize the new technologies. The next conference call of the group with the CTA is schedule for January 30 to finalize the business plan”

Sentence Commented (page 28): The boiler and the autoclave are presently under construction by the selected bidders. The Reconquista municipality has selected and made available a plot of land where the technology could be located, An agreement with the local MOH and the province of Santa Fe, who should support the infrastructure and logistics, and a physical building, which will be co-financed by the province in the amount of about \$450,000, is not reached yet. As of December 2012 the public-private partnership agreement between the province and SOMA was not yet ready

Comment: *The significance of this PPP arrangement, despite the delays, is that it is seen as a financially viable approach that could be used as a model by other provinces that do not have a central treatment facility and currently have to transport waste very long distances. The disadvantage is that the arrangement is subject delays due to local government bureaucracy.*

Our reply: not accepted. In the view of the evaluator, agreements with the administration must be practicable and feasible. In this case the evaluators were told, during several meetings with key project stakeholders, that it is not possible to even predict when the agreement would be finally signed. Therefore, although the PPP arrangements would be theoretically good, it seems not practicable in Argentina and therefore cannot be proposed as a model.

Sentence commented (page 29). During in the second half of 2011 and the first quarter of 2012 UTN, with the technical support of the PWT, implemented the 45 hours training-of-trainers (TOT) program, accounting for a total of 17 teachers and 32 participants coming from 9 provinces and an evaluation through the presentation of elaboration of healthcare waste projects in 6 different hospitals.

Comments: *The national TOT program in Argentina was the most in-depth TOT I have seen, with each student trainer spending about 80 hours of course work in 8 months plus a 3-month practicum totaling about 145 hours for each student. The challenge is sustaining and supporting these master trainers as they conduct local training in the coming years.*

Our reply: accepted. Indeed the evaluators were impressed about the training course and the enthusiasm and motivation of the trainers and proposed it as a success story for Argentina.

Sentence commented(page 29):the Garrahan Hospital has been considered by a recent visit (June 2012) of the Global Team as the best model hospital of the global project. Indeed, the hospital had already in place,

Comment: *“one of the best...”*

Our reply: accepted – sentence modified accordingly

Sentence commented (page 29 to 30): based on the outcome of the visit to the hospital, on the meetings with UTN and UFI, and on the examination of procurement documents, it can be affirmed that the project failed to provide the hospital with most of the support initially planned, and more specifically: on site training (the hospital HCWM clarified that the training was not delivered, which is conflicting with what the evaluator saw in the report where the training was reported as completed in august 2012); technical assistance and HCWM manuals; automatic doors for the storage of waste (initially intended to be provided by the project but eventually fully paid by the hospital due to project delays). Most of the improvement achieved in this hospital in term of waste management should therefore be attributed to the independent efforts of the hospital rather than to the project.

Comments: *This is puzzling. According to the report, they had a 10-hour training on August 11, 13, 18 and 20, 2012 at the hospital. It was focused on the workers collecting and transporting waste. According to the report, training was led by the HCWM committee chair and General Services manager.*

Our reply: mostly not accepted. The evaluators – as they were also surprised – asked repeatedly for confirmation that the training was not delivered to the hospital during the meeting with the chair of HCWM committee. Therefore it seems that there are inconsistencies with the version provided in the manual.

To take into account the two versions, the sentence is however modified in this way:

“based on the outcome of the visit to the hospital, on the meetings with UTN and UFI, and on the examination of procurement documents, it can be affirmed that the project did not provide the hospital with most of the support initially planned, and more specifically: on site training (the hospital HCWM clarified that the training was not delivered, which is conflicting with what the evaluator saw in the report where the training was reported as completed in august 2012); technical assistance and HCWM manuals; automatic doors for the storage of waste (initially intended to be provided by the project but eventually fully paid by the hospital due to project delays). Most of the improvement achieved in this hospital in term of waste management should therefore be attributed to the independent efforts of the hospital rather than to the project”

Sentence commented (Page 30)

Comment *The Argentina report has details on HCWM procedures which together could form the manual. I’m surprised this was not shared with Garrahan. Both Ashley and I were quite surprised by this. The Garrahan officials I met did not mention that they paid for the doors, etc. The Argentina report (in Spanish) show photos of improvements in classification, collection, temporary storage, labeling, PPE use, an active HCWM committee, etc. In addition to the new carts specially designed for Garrahan to fit their existing rail transport, the renovated final on-site storage area, etc., they even have a unique UV disinfection system for the on-site storage plus a cart washing system – none of which existed before the project. Were these not paid by the project? Is it*

possible that the source of information was complaining because they did not get everything they wanted but under-emphasized the contributions of the project? This is worth investigating further.

Reply: not accepted. As the evaluators were surprised too, they decided carrying out an independent cross-check with UFI (the Unidad Financiera Internacional) to check what was procured and delivered. What the evaluators found confirmed their findings.

Sentence commented (page 39): . This manual has to be adopted by law through a DOH Department Administrative Order for all the generators of HCW in the Philippines. In the implementation stage, there could be differences in the content of the training modules and the Manual that have to be reconciled.

Comments: *I think it is important to mention the GPT/UNDP's grave concern regarding the UNDP is concerned that having the UNDP and GEF logos in the cover of the manual may be interpreted as endorsement of uncontrolled pyrolysis technologies which would defeat the purpose of the project. The DOH never responded to the communication from UNDP-NY.*

Our reply: accepted. The following sentence was added to the text:

“The GPT reported to the evaluators its grave concerns regarding HCWM Manual listing pyrolysis as the first choice for waste treatment technologies without any qualifications, caveats or additional guidance. Indeed, the evaluators consider that, in the absence of the above, having the UNDP and GEF logos in the cover of the manual may be interpreted as endorsement of uncontrolled pyrolysis technologies.”

Sentence commented (page 40): The UNDP Regional Advisory Committee for Procurement does not favor the GPT's being involved in the evaluation of bids and the drafting/commenting on technical specifications because they are supposed to evaluate the project itself

Comment: *I looked back at the emails from UNDP CO. They noted that the RAC did not favor our involvement in the evaluation of the bids because we were involved in developing the specifications. For that reason, an independent evaluator from PAPP evaluated the specifications, as I understand it, so that the GPT can still be involved in the evaluation of bids. Also, according to emails from UNDP CO, the DOH did not respond to the recommendations of the PAPP evaluator so nothing has happened. A GPT mission is planned tentatively for late March to resolve this issue. The fact that a mission could not be scheduled immediately as requested by UNDP NY seems to indicate a lack of interest or lack of appreciation by the DOH of the urgency of this matter. Considering how long it took for the first bid, it is doubtful at this point if this component can be implemented successfully even with an extension to end of 2013.*

Our reply: accepted – but summarized. The text: was modified as following: The UNDP Regional Advisory Committee for Procurement does not did not favor GPT involvement in the evaluation of the bids because GPT was involved in developing the specifications, therefore an independent evaluator from PAPP evaluated the specifications.

Sentence commented (page 43): Posters for HCW management and replication materials on best practices distributed. A system for measurement and documentation established.

Comment: *Written procedures have also been completed for HOGGY and Youssou Mbargane. I will send you the Youssou Mbargane HCWM procedures (in French). This may be the most significant outcome in terms of impact since the written procedures will now be used by all Senegal hospitals as a reference document to help them develop their own procedures.*

Our reply: accepted. The text was added.

Sentence commented (page 43): Cost effectiveness of the pre-treatment need to be measured; if a recycling strategy is not put in place, there is the risk that the waste pre-treatment is not sustainable

Comment: There has now been direct communications between Senegal and Tanzania with the perspective of transferring the Tanzania technologies to Senegal. UNOPS is working on using remaining funds to develop a manufacturer in Senegal to fabricate the Tanzania technologies at much lower cost than the imported technologies at the model facilities (i.e., the autoclaves from India, shredders from Germany). We think the Tanzania approach is more financially viable even if the recycling infrastructure is not available.

Our reply: accepted. Additional text added as following: There has now been direct communications between Senegal and Tanzania with the perspective of transferring the Tanzania technologies to Senegal. UNOPS is working on using remaining funds to develop a manufacturer in Senegal to fabricate the Tanzania technologies at much lower cost than the imported technologies at the model facilities

Sentence commented (page 46): . The “city wide sharp component” scaled up to the use and recycle of sharp waste containers in other Hospitals in Hanoi through URENCO

Comment: *During the GPSC meeting on December 5, 2012, the CTA and WHO representatives expressed concern with the “citywide sharps management system” component for Hanoi. Apparently, the single-use plastic sharps containers are manually opened and the contents are dumped into bins containing hypochlorite solution. The containers are then washed and reused. The sharps are removed and buried. Concern was expressed regarding the risk of injury when opening sharps containers not designed to be opened, the problems with hypochlorite including possible lack of decontamination if hypochlorite concentrations are low or not replenished or there is a high organic load, and the danger of reusing containers not meant to be reused (i.e., the container covers could be weakened and eventually fall out during use. Also, there is the danger of not destroying sharps. The*

CTA is re-designing the Tanzania sharps container for Vietnam and will work with UNOPS, UNDP CO and the Vietnam project team to improve the city-wide sharps system by developing a local manufacturers for the aluminum, autoclavable, reusable sharps container to be used with the URENCO autoclave and a shredder with the possibility of recycling the plastics parts. This sub-project is expected to be completed by June 2013.

Our reply: noticed and accepted. **The following text added in the table:** The “citywide sharps management system” has been considered of concern by the CTA and WHO due to possible risk of injuries for the operator and risk of incomplete decontamination.

Sentence commented: (page 46) Viet Duc hospital not yet fully acquainted with the use of non-mercury devices, and only half of the distributed non-mercury thermometers and sphygmomanometers have been placed in use.

Comment: *The project team reported that the reason why there has not been a complete phase-out of mercury devices at the hospital is the lack of guidance on testing, maintenance and calibration. The CTA is developing such a guidance for completion in February 2013. It will be shared with all countries and posted on the website.*

Also, comments sentence on page 47: *As noted in JE37, we followed up with the national project coordinator when we first heard of this and suggested sending our mercury expert who has been successful in changing the minds of fellow physicians about the non-mercury devices in Latvia, India, etc. However, we were then told that the real problem was that the health professionals wanted a testing and calibration protocol so that they could be confident in the accuracy of the measurements. I am currently developing a guidance on this based on previous technical assistance I provided to the Philippines on calibration and testing. We also agreed to provide both model hospitals with the basic equipment for calibration.*

Our reply: accepted. The following information added: “A testing and calibration protocol is being developed by the CTA.”

Sentence commented: (page 50) Tanzania (extension required for establishing commercial scale production of the experimental autoclave)

Comment: *Technically speaking, establishing commercial scale production was not part of the project objectives. We just needed to show that the technologies could be manufactured locally. However, work is proceeding through co-financing by UDSM, HCWH and FHI360 towards commercial production in 2013. A short extension is needed to finalize the construction, installations, operation, etc. manuals and final report*

Our reply: accepted: the sentence modified as following: Tanzania (extension required for demonstrating that the technologies could be manufactured locally, with the purpose to establishing commercial scale production of the experimental autoclave)

Sentence commented (page 50): or in the Philippines, where agreement on the siting of the autoclave is completed, however the procurement of the equipment is still ongoing.

Comment: *The procurement process has completely stopped since around September pending resolution (hopefully) of major issues in late March, after which the procurement process could begin again.*

Our reply: accepted. The sentence has been modified accordingly.

Sentence commented (page 50). . At the country level indeed the project has a limited budget which is further fractioned in 7 components; in each country activities were carried out in a minimum of 3 model facilities, plus centralized facilities for waste treatment, and institutions where training and legislation had to be carried out. The results is that project monitoring at national level was limited in most cases; that shortcoming was only partially addressed by the very careful and continuous monitoring and technical supervision carried out by GPT

Comment. *You might consider one other recommendation I have mention to others. During the PDF-B, the countries agreed to arbitrarily select an urban and a rural model facility and a central facility as appropriate, demonstrate non-incineration technologies, select some entity to develop national training, etc. I think a better approach is to start by helping countries develop a national HCWM plan or roadmap, with several phases and set priorities. That plan should then be the basis for decisions on policy changes, selecting model facilities, selection of types and sizes of treatment technologies, waste collection system, training institutions, recycling infrastructure, etc. This will be the approach for the new UNDP GEF project in Africa.*

Our reply: we thank for the information. We are not going however to include this recommendation as it would require further details and analysis.

Comment: *Another approach that was not made possible by the shift from direct agency execution to a complicated mixed execution modality was our ability to build capacity among national and local consultants. National execution resulted in countries starting work at different times. The GPT spent a lot of time and effort during missions to make sure the technical consultants and some coordinators were fully capable. It would have been better if, at the start, all national and local technical consultants and coordinators were brought together, trained at the same time on technical issues and project implementation, and discussed work plans together. The countries would have benefited from interacting among each other and would have resulted in more uniform approaches and understandings of what needed to be done. This too will be the approach for the next UNDP GEF project in Africa.*

Our reply: very good suggestion, included in our report as following: Another approach for future projects, as suggested by the CTA, could be to have, at project starting, all national and local technical consultants and coordinators brought together, trained at the same time on technical issues and project implementation, and discussed work plans together. The countries would

benefit from interacting among each other and a more uniform approach and understandings of what need to be done would be achieved.

Comment: One final comment related to procurement. So much of the delays (Argentina, India, Philippines, Senegal, Vietnam) had to do with problems in procurement, with each country having its own procurement policies and procedures. In the Philippines and Senegal, the countries proceeded with procurement using technical specifications that did not meet international technology standards and the GPT had to intervene. Vietnam's bidding documents did not clarify installation obligations, etc. For the new UNDP GEF Project in Africa, I recommended that procurement be done by a central agency, such as UNDP or UNOPS. This will avoid differences in the quality of the technical specifications and bidding documents, eliminate multiple national and local bureaucracies (although UN bureaucracies can also be problematic), and the purchase of higher quantities may result in cheaper purchase costs. It remains to be seen if this regional approach to procurement will be an improvement.

Our reply: we do not think centralized procurement may solve all the issue, as from our experience (both as evaluator and technical expert) several projects with centralized procurement experienced significant delay too. However is clear that a procedure for development of technical specification and drafting of bidding documents should be agreed among project partners at the very beginning of the project.

Sentence commented (page 52). In Argentina, all the project activities were very late at MTE. The recommendation was to agree among project partners, monitor and enforce, a detailed workplan for securing the completion of all the project activities is missing. One year later, progresses were noted only on the national training and on testing of the Fenton technology, whilst the issues blocking the installation of non combustion equipment and other activities remained unresolved

Comment: *All in all, our assessment of Argentina is less pessimistic and less negative in view of the major obstacles the national team had to deal with – difficulties with UFI, provincial politics (one reason for the delay at Reconquista was the provincial elections and they could not move on the PPP work until the governor was elected), the national ban on technology imports (which delayed our Fenton work and also the procurement of the boiler for the autoclave), and the lack of communication with UNDP CO. From our end, we found the national team very cooperative and responding quickly to our communications and we had frequent skype calls with the national consultant who updated us regularly on their frustrations and reasons for the delays. During missions, we sat in NPSC meetings and noted the enthusiasm of the national team. And unlike Senegal, Philippines, Latvia and Lebanon (where you could visit all the model facilities in one day by just driving), the model facilities in Argentina (and India) are very far apart and it requires the national director or the consultant a full day's travel just to get to Reconquista, General Roca or UTN-Resistencia (where the Fenton work was done) because of the limited flights to those cities. So Ashley and I see the outcomes in Argentina more positively in light of the difficulties they faced many of which were outside their control (e.g., provincial politics, national import ban, etc.).*

Our reply. Our evaluation is not about people, but about project results. Notwithstanding the enthusiasm we also found during our visit, we observed an extraordinary lack of communication, unreasonable bureaucracy, and a significant difference in views among all the parties. This is confirmed in your comment. The result, is that the project in Argentina moved very slowly. We strongly wish the Argentina project team could solve all the issues by making proper use of the further project extension.