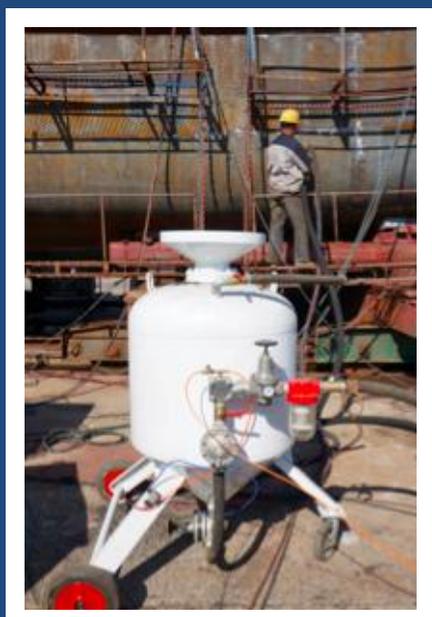


Terminal Evaluation (TE) Report of the project
“Alternatives to DDT Usage in the Production of Antifouling Paint”

GEF Project ID: 2932

UNDP PIMS Number: 3664

GEF Operation Programme: Persistent Organic Pollutants (POPs)



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This report includes the findings of the Terminal Evaluation (TE) of the Global Environment Facility (GEF) funded project “*Alternatives to DDT Usage in the Production of Antifouling Paint*” (GEF project ID: 2932 and UNDP PIMS No. 3664) which started implementation in the People’s Republic of China (“China”) in 2007. The project is being implemented by the United Nations Development Programme (UNDP) and is executed by the Foreign Economic Cooperation Office (FECO) of the Ministry of Environmental Protection in China.

The TE report has been prepared by two independent consultants, Mrs. Hilda van der Veen (Team Leader) and Mr. Zhu Jianxin (National Consultant). The Terminal Evaluation was carried out during the period 15 April - 30 June 2014. A TE mission was undertaken from 3 – 16 May during which meetings were held with project partners as well as beneficiaries and field visits were made to different project sites (see Annexes II and III).

The evaluation mission team consisted of Mrs. Hilda van der Veen (TE Team Leader) and Prof. Zhu Jianxin (TE National Consultant), who were accompanied to meetings and field visits by the FECO project manager (Ms. Qiao Yanling), the project’s National Technical Advisor (Mr. Jiang Feng) and a 2-person camera/film crew.

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ACRONYMS AND ABBREVIATIONS

APR	Annual Project Report
AWP	Annual Work Plan
CIO	Convention Implementation Office
CO	Country Office
DDT	Dichloro-diphenyl-trichloroethane
FECO	Foreign Economic Cooperation Office
GEF	Global Environment Facility
GOC	Government of China
IA	Implementing Agencies
IMO	International Maritime Organization
IR	Inception Report
IW	Inception Workshop
M&E	Monitoring & Evaluation
MEP	Ministry of Environmental Protection
MIS	Management Information System
MT	Metric ton
NIP	National Implementation Plan
OP	Operational Program
PIR	Project Implementation Review
PMO	Project Management Office
POP	Persistent Organic Pollutant
ProDoc	Project Document
SC	Steering Committee
SEPA	State Environmental Protection Administration
TBT	Tributyltin
TPR	Tripartite Review
TTR	Terminal Tripartite Review
UN	United Nations
UNDP	United Nations Development Programme
UNDP-CO	United Nations Development Programme Country Office
UNDP-GEF	Global Environment Facility, United Nations Development Programme
USD	United States Dollar
WTO	World Trade Organization

EXECUTIVE SUMMARY

Table 1: Project Summary Table

Project Title	Alternative to DDT Usage in the Production of Antifouling Paint			
GEF Project ID:	PIMS 3664		<i>at endorsement (US\$)</i>	<i>at completion (US\$)</i>
UNDP Project ID:	00053562	GEF financing:	10,365,000	10,365,000
Country:	China	IA/EA own:		
Region:	Asia & Pacific	Government:	3,750,000	3,079,548
Focal Area:	Chemicals/POPs	Other:	8,500,000	23,367,826 ¹
FA Objectives (OP/SP):	OP #14	Total co-financing:	12,250,000	26,447,374
Executing Agency:	FECO/MEP	Total Project Cost:	22,615,000	36,812,373
Other Partners involved:		ProDoc Signature (date project began):		9 October 2007
		(Operational) Closing Date:	Proposed: 31 Dec 2013	Actual: Not operationally closed yet

1. The UNDP/GEF Project “*Alternatives to DDT Usage in the Production of Antifouling Paint*” (UNDP PIMS No. 3664; GEF Project ID: 2932) is a joint initiative of the United Nations Development Programme (UNDP) and the Government of China. The Executing Agency/Implementing Partner is the Foreign Economic Cooperation Office (FECO) – Ministry of Environmental Protection China.

2. The project was approved with a total budget of USD 22,615,000, of which USD 10,365,000 was a GEF grant, USD 3,750,000 was supported by the Government of China through in-kind contributions and USD 8,500,000 was provided as in-kind contributions by the Chinese private sector.

3. The project was approved by the GEF Council in August 2006 and GEF CEO Endorsement was communicated to UNDP in its letter dated July 25, 2007. The project as approved had a duration of four years with the milestone indicated in the CEO Endorsement Letter that “*the closing date of the project grant will be no later than June 2011*” As the UNDP Project Document (ProDoc) was only signed by the National Executing Agency, the Ministry of Environmental Protection (MEP) of China and UNDP on 27 September 2007 and 9 October 2007 respectively, and the Inception Workshop only held in November 2007, for operational purposes, MEP and UNDP considered the four year project duration to end by December 2011. Subsequently, the project’s Mid-Term evaluation recommended project extension until December 2013, which was granted by the GEF.

4. The project goal is to substitute DDT based antifouling paint by technically feasible, economically viable, and environmentally friendly alternatives. The binding objective of the

¹ High co-financing as a result of the CP programmes, as well as calculating the non-incentive AFP production part.

project is to eliminate the use of 250 MT/year of DDT as additives in the production of antifouling paint by conversion to non-toxic and environmentally friendly alternatives. In addition, the prospective objective of the project is to establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint.

5. To ensure sustainability of the elimination and conversion, related regulations and standards will be established or revised, and supported by capacity building, to create an enabling policy environment for the phase out of DDT based antifouling paint and promote sustainable alternatives. In addition, the successful experience in DDT phase out will contribute to support China to accede to the IMO Convention on the Control of Harmful Anti-Fouling systems on Ships (2001) and start the elimination of TBT based antifouling paint, in order to establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems.

6. The project aims to realize its objectives on both national and global level. On the national level, it will support the implementation of the “Strategy for Phase out of POPs Pesticides in China” in order to reduce their environmental risk in China, and protect marine environment and human health from DDT hazard. On the global level, reduction of total DDT emission into the global environment will reduce the probability of the long-distance transportation of DDT to other countries.

7. The project was to be implemented in 4 years. In the first year, technically and economically feasible technologies/alternatives would be selected through open bidding and ranking process for on-ship coating experiments as well as for selection of manufacturing enterprises that possess strong technical capacity, competent management experience, and sound business development plans. Manufacturing sites would be prepared and equipment installed. Capacity will be built and policies developed leading to the creation of an enabling environment. In the second and third years of the project, production and promotion of the substitutes/alternatives in the market will be initiated and scaled-up. In the final year of the project’s implementation, results and experiences would be summarized and compiled into reports, while at the same time the production and sales of the alternatives will be further enhanced.

8. The project logical framework indicates six outcomes:

- Institutions and mechanisms for project management and coordination
- Management information system (MIS) and information management
- Enabling policy environment
- Conversion from DDT based antifouling paints to alternatives
- Environmental education and awareness raising
- Monitoring and evaluation

9. For more information on the project’s sub-components, please refer to Annex V: Project Logical Framework.

10. The project approach is based on the development and adaptation of technically feasible, economically viable, and environmentally friendly alternatives, coupled with newly established or revised regulations, standards, and an action plan supported by capacity building to create an

enabling policy and enforcement environment to facilitate phase out of DDT based antifouling paint, and the promotion of sustainable alternatives. At the time the project was developed there was no specific regulation on restriction of DDT usage in the production of antifouling paint and application of DDT based antifouling paint usage on ships.

CONCLUSIONS

11. In Table 2 is an overview presented of the ratings, which have resulted from this project’s Terminal Evaluation. Overall the project’s implementation has been rated as **Satisfactory (S)**.

Table 2: Evaluation Rating

1. Monitoring and Evaluation	Rating	2. IA& EA Execution	Rating
M&E design at entry	S	Quality of UNDP Implementation	S
M&E Plan Implementation	S	Quality of Execution - Executing Agency	S
Overall quality of M&E	S	Overall quality of Implementation / Execution	S
3. Assessment of Outcomes	Rating	4. Sustainability	Rating
Relevance	S	Financial resources:	L
Effectiveness	HS	Socio-political:	HL
Efficiency	MS	Institutional framework and governance:	L - ML
		Environmental:	HL
		Overall likelihood of sustainability:	L
Overall Project Outcome Rating			S

1. Monitoring and Evaluation

M&E Design at Entry

12. The Terminal Evaluation (TE) team felt that the Monitoring and Evaluation plan as described and included in the Project Document (See Monitoring and Reporting Section on ProDoc page 26) was very comprehensive and in line with the UNDP rules and procedures for Monitoring and Evaluation of (GEF) projects.

M&E Plan Implementation

13. Table 14 (page 22) summarizes the M & E activities planned for in the Project Document and conducted throughout the project’s implementation. The column “*Comments & Observations*” summarizes the views of the TE team for each of these M & E activities. In summary the TE team is of the opinion that the M & E during implementation can be rated as **Satisfactory (S)**.

14. Based on observations made following the TE mission as well as a desk review of M & E related reports, the TE team had a few remarks regarding monitoring and evaluations aspects: i) It was observed that the quality of Project Implementation Reviews (PIRs) was **Marginally Satisfactory (MS)**, it was felt that the yearly PIR exercise was not used as a monitoring tool; ii) At the time of the TE the project’s experiences, results and lessons-learned were not yet easily accessible for “outside stakeholders” and not yet captured for dissemination; iii) The project could have benefitted from more field visits by the UNDP Country Office .

15. The Mid-Term Evaluation (MTE) made a number of recommendations, which are presented

in Table 8 (page 17). The project's adaptive management in response to their recommendations has also been summarized. In general it can be concluded that most of the MTE's recommendations were followed up on by the project and where feasible were used to adapt the project's management.

Overall quality of M & E

16. In summary the TE team is of the opinion that the overall quality of M & E can be rated as **Satisfactory (S)**.

2. IA& EA Execution

17. Overall, the TE team felt that there were few implementation, execution, coordination or operational issues during the project's implementation. The project teams from UNDP, FECO and regional PMOs involved in the project's implementation seemed all very committed to the project's objectives. In summary the TE team is of the opinion that the overall quality of IA & EA Execution can be rated as **Satisfactory (S)**.

Quality of UNDP Implementation

18. Overall, the quality of UNDP Implementation was rated as **Satisfactory (S)**. There were a few points for improvement though: i) In coordination with FECO, UNDP should ensure frequent training as well as regular procurement support to project sub-contractors and Project Management Offices in particular related to drawing up technology and supplier specifications. For example in the case of Donghai Shipyard (a Cleaner Production Demonstration beneficiary), the manner in which the procurement was undertaken (and in particular the demonstration, testing and training of staff on the technology's use) would have benefitted from more PMO, FECO and or UNDP involvement; ii) UNDP could play a more active role in supporting FECO and GEF projects in headhunting for high quality experts in niche areas that might not be easily accessible for national partners/stakeholders. In the project this role was sometimes assumed by the National Technical Expert (NTE), but UNDP involvement

Quality of Execution - Executing Agency

19. Overall, the quality of FECO Execution was rated as Satisfactory (S). An inter-departmental coordination mechanism was formed to mobilize resources to ensure the achievement of project objectives; local project offices were established to improve local capacity for project design, management and monitoring; capacity was built to improve law enforcement and market inspection to reduce the illegal production of DDT antifouling paint; a team of experts was conveyed to provide technical support throughout the project's implementation; a large number of capacity-building, training and awareness raising activities and events were organized; and, an internal control mechanism was established to proper use and effective supervision and management of GEF-funds. There were a few points for improvement though: i) Project staff turnover (FECO project Coordinator), like for the Project Management Offices (PMOs) as well as UNDP, was high, which sometimes jeopardized the speed of project implementation and created delays; ii) Because of the three-regional approach of the project, and the decentralized approach it has taken to implement activities in each of these three regions, the project management structure involves many stakeholders and many beneficiaries. In general the evaluators felt that the involvement of the large number of stakeholders was admirable and in many cases led to good results and outreach. The TE also observed that many of the stakeholders were well informed of their tasks and responsibilities under the contracts signed with FECO/PMOs.

3. Assessment of Outcomes

Overall results (attainment of objectives) and effectiveness (HS)

20. The project has supported many different activities and has achieved important successes. To list these is not the purpose of a Terminal Evaluation. However, in order for readers who might not be that familiar with the project itself, a summary of the project's activities and achievements is provided in section 3.3.

21. The project has achieved its **objective** which was for DDT based antifouling paints to be substituted by technically feasible, economically viable, and environmentally friendly alternatives so as to help China fulfill the obligations under Stockholm Convention to control the use of DDT and protect the environment and human health. The **binding objective** of the project was to eliminate the use of 250 MT/year of DDT as additives in the production of antifouling paints by conversion to non-toxic and environmentally friendly alternatives, which was also achieved.

22. In addition the project also achieved its **prospective objective**, which was to establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint.

23. The evaluators used the project's Objectively Verifiable Indicators to validate whether project objectives had been achieved. In conclusion: i) Annual production of 250 MT of DDT used for AFP had stopped; ii) Zero DDT was detected in AFPs; iii) DDT and TBT levels in the marine environment had decreased; iv) Alternatives had been developed, produced and distributed; and, v) Barriers to commercialize the alternatives had been removed.

24. The evaluators are pleased to report that all the project's objectives have been achieved, even the project's prospective objective. More so, it is encouraging that after 5 years, DDT and TBT levels in the marine environment have shown to be decreasing, which can be attributed to projects like these as well as concerted actions the Government of China and other parties to the Stockholm Convention have taken to phase-out the use of POPs. As such this aspect of the project has been rated as **Highly Satisfactory (HS)**.

Relevance (S)

25. The AFP project is relevant in light of the Objective of the Stockholm Convention: "*to protect human health and the environment from persistent organic pollutants*", as well as National Priorities as taken up in China's National Implementation Plan (NIP). The project was also particularly well aligned with China's National "*Strategy for POPs Pesticides Reduction and Phase-Out*" and Action Plan (See also section 3.1.7). Finally, the project was also deemed relevant in light of national POPs activities supported and financed by the Government of China, the GEF and GEF implementing agencies.

26. Because of the reasons mentioned above, the Relevance of the project was rated **Satisfactory (S)**.

Efficiency (MS)

27. One of the TE's observations has been that the project was able to achieve its objectives earlier than expected. There seem to be two reasons for this, a) The Government of China actively supported the phase-out of DDT through a large number of interventions (both GEF and nationally owned), making some of the originally planned project activities obsolete, b) significant (additional) co-financing was raised from the private sector while initiative from the private sector also led to some companies undertaking activities on their own, rather than making use of the financial incentives offered by the project.

28. As a result, the project ended up spending far less funding on planned project activities to achieve project objectives than anticipated. In this sense, the project has been very efficient in the use of project funding. However, this brought about subsequent challenge: how to reallocate project funding to project activities in line with the project's goal and objectives?

29. After the MTE had been concluded, new activities, such as the Risk Assessment Capacity Building of Laboratories; the Cleaner Production Demonstration Activities in 4 shipyards and 1 ship dismantling facility; among other activities were added to the project's scope. These activities appeared to be well implemented and quite successful.

30. However, the Terminal Evaluation team was of the opinion that the project's design should have been more ambitious from the start. The duration of GEF project development and implementation averages ~ 10 years. For a rapidly changing economy like China's markets and challenges undergo significant changes during a 10-year period, and this should have been better anticipated by UNDP, FECO and the project's development team.

31. Secondly, during the project's mid-term evaluation (May 2010) it was recommended to expand project activities to additional project beneficiaries (in addition to the incentives programme for the AFP manufacturers and the fishing villages), it took until 2012 – 2013 before the project started supporting cleaner production activities at shipyards and risk assessment capacity building at 2 laboratories. This late redirecting of project activities resulted in ~46% of the budget being spent in 2013 (project year 6). This could have been avoided by earlier redirecting the project's strategy/approach and deciding on additional activities with project beneficiaries. Preferably this would have happened at the time when project management realized that the amount of project funding being spent on the incentive programme was relatively low. Alternatively such a decision could have taken immediately after the MTE.

32. Because of the two aspects highlight above, the project's efficiency has been rated as **Marginally Satisfactory (MS)**.

4. Sustainability (L)

33. In terms of the Financial Resources, the TE team felt that AFP manufacturers have produced AFP alternatives for a sufficiently long period, and the project's stakeholders have been successful in creating the required markets. Therefore it is likely that production will continue after the project comes to an end.

34. Considering that there do not appear to be sensitive issues or controversies surrounding AFPs, Socio-Political changes are unlikely to have a great impact on this sector. Therefore Socio-

political sustainability is highly likely.

35. The sustainability of the Institutional framework and governance, was rated twofold. On the one hand the regulatory framework governing the DDT ban in AFPs, in combination with continuous monitoring and regular inspections, appears quite effective, rated as **Highly Likely (HL)**. On the other hand, the regulatory framework governing Risk Assessments, support to which was taken on by the project during the final years of the project, but was not initially foreseen, is not as effective yet, while the introduction of Cleaner Production measures remains voluntary. This aspect was therefore rated as **Moderately Likely (ML)**.

36. Finally, environmental sustainability was rated as **Highly Likely (HL)** as DDT production has stopped and the use of DDT paints in AFPs has been banned, and DDT and TBT levels in environmental media had started to decrease since project start and will continue to further decrease now that DDT and TBT use in AFPs have stopped.

37. Overall, the evaluation team feels that the sustainability of the project is **Likely (L)** and thus deemed **Satisfactory (S)**.

RECOMMENDATIONS

- **Organize the TE close to operational project completion:** The project's TE was conducted at the time approximately 1.8 Million US\$ was still unspent. Although most of the remaining project funds had already been allocated to project activities that had almost come to an end (e.g. Cleaner Production activities), some project activities that would benefit from remaining project funds had not yet started. As such the TE team was unable to evaluate these activities. It would be recommended that for future TEs of GEF projects, that the TE would take place closer to operational closure of the project. That said, at the time of the TE, the project had already achieved all of its objectives and targets and the project was rated as Satisfactory. It is unlikely the project's rating will change until the project is operationally closed.
- **Extension of Project Duration:** Based on the observations of the Mid-Term Evaluation (MTE) consultants, it was recommended to extend the project's duration until December 2013. The main reasons for this extension was to make up for time lost due to the late initiation of the project and the embargo on the implementation of project activities for a significant period of time because of the Beijing Olympics. A request for extension was submitted to the GEF on May 4, 2012, which was granted.

At the time of the Terminal Evaluation the project activities had not yet been entirely completed (approximately ~20% of the project's budget - although most of it committed - had not yet been spent). Project activities that were outstanding were the satisfactory wrap-up of the five (5) cleaner production demonstration projects; capturing lessons-learned and experiences from the project and ensuring their wider dissemination; adoption of guidance materials for cleaner production and chemical risks assessment, among else. As such, the evaluators feel that if the project will be operationally closed in a rush, sustainability of project results will be seriously jeopardized. Instead it is

recommended that the project will aim to operationally close by December 2014, at which time the project has been under implementation for seven (7) years. It is recommended that in this year's Project Implementation Review (PIR) such an extension is requested after agreement has been reached on the proposed extension with the UNDP Bangkok Regional Service Center (RSC).

- **UNDP involvement:** In terms of Implementing Agency Execution the Terminal Evaluation team has a number of recommendations, which could improve UNDP's role in future GEF-POPs projects and improve its support to its national counterparts. Firstly, it would be recommended that the UNDP Country Office participates more frequently, at least twice a year, in project site/field visits. Obtaining a better understanding of challenges faced by national stakeholders and beneficiaries in implementing project activities, would allow the China UNDP Country Office to better anticipate the support FECO and national counterparts may require to speed up project implementation. In this respect two particular aspects can be mentioned: i) In coordination with FECO, UNDP should ensure training as well as continuous procurement support to sub-contractors in particular related to drawing up technology and supplier specifications; ii) Support FECO and the project in headhunting for high quality experts in niche areas that might not be easily available at national level. In light of UNDP's extensive global network and advertising possibilities, it would be able to tap into expert networks, which would be of immense value for China's rapidly growing needs in the area of Chemicals Management.
- **Project Design:** One of the TE's observations has been that the project was able to achieve its objectives (both binding and prospective objectives) earlier than expected. One of the main reasons for this has been that the Government of China actively supported the phase-out of DDT through a large number of interventions (both GEF and nationally owned), through policy and legislative interventions but also by providing funding and support to stop production of DDT and dismantling DDT producing facilities. Secondly, private sector companies benefitting from capacity building and awareness raising project activities were often able to provide significant project co-financing or opted to fund themselves the conversion to alternatives, rather than participating in the incentives programme. As a result, the project ended up spending far less funding on planned project activities, while certain activities initially foreseen by the project were cancelled because these activities were taken up and funded by the Government of China. In this sense, the project has been very efficient in the use of project funding. However, this brought about subsequent challenge: how to reallocate project funding to project activities in line with the project's goal and objectives? The latter has been done by the project team quite effectively.

GEF projects can take an average 3 years from the start of PIF development to actual project initiation, and another 7 years to implement. For a country like China, where needs change rapidly over time due to the rapid pace of the country's development, the project's implementation team should keep in mind that a project would require to be redirected more frequently than projects in countries with a slower pace of development.

Therefore future GEF Chemicals and Waste projects in China would benefit from a detailed review of project and country needs at the time of the project's Inception

Workshop (and redirect project activities at that time if necessary) and plan for a critical Mid-Term Technical Review (in lieu of a more general MTE) to help the project team align the project's activities and scope with the needs of the country and sector at that point in time. Changes to project activities and/or the project's direction, when deemed necessary, needs to be proposed during Annual Project Steering Committee meetings, that said the project should call upon the PSC members to convey more frequently, if necessary. Any changes made to the project's activities, require to be approved by the PSC, and need to be properly recorded in the yearly PIR and project steering committee meeting minutes.

- **Earlier redirection of project activities:** Although the project's mid-term evaluation recommended to redirect project activities and include additional project beneficiaries (other than AFP manufacturers participating in the incentive programme and the fishing villages benefitting from awareness raising), it took until 2012 – 2013 before the project started supporting cleaner production activities at 5 shipyards and building risk assessment capacity at 2 laboratories. This late initiation of new project activities resulted in ~46% of the budget being spent in 2013 (project year 6) and 20% of the project budget potentially being spent in 2014 (project year 7). This could have been avoided by earlier redirecting the project and deciding on additional activities with the Project's Steering Committee. Preferably this would have occurred at the time when project management realized that the amount of project funding being spent on the incentive programme was relatively low. Alternatively such a decision could have taken place immediately after the MTE.

- **FECO involvement:** Overall the evaluators felt that the support FECO had provided to the project's beneficiaries was of good quality. There are however two suggestions for improvements which could be taken on board for future Chemicals and Waste GEF projects. Firstly, FECO project staff turnover, like for the Project Management Offices (PMOs) as well as UNDP, was high (the project was lucky that it was able to benefit from the same national technical advisor who stayed involved throughout the entire duration of the project). Staff turnover is often a fact that cannot be avoided. However it was suggested that in the future FECO would, rather than appointing a single Project Coordinator, appoint a project team to oversee project management instead. Although one single person can take the lead on project implementation it would be recommended that an additional colleague is involved in the project on a part-time basis, so as to ensure that when the project coordinator might leave, the unit still contains one person who is familiar with the project.

- **Subcontracting as a means to support project beneficiaries:** In general the project was quite decentralized and implemented project activities (mostly related to awareness raising, training, etc.) through the respective three (3) PMOs. Most project activities though that involved single project beneficiaries, e.g. cleaner production demonstration, ship dis-mantling, AFP risk assessment capacity building of laboratories were implemented using sub-contracting modalities. The modality was used to select the most fitting project beneficiaries. Contracts between the PMO and FECO/PMO were signed which stipulated the responsibilities of the project beneficiaries as well as the expected deliverables. However these subcontracting modalities also allowed project beneficiaries to undertake procurement of equipment. Although for most project

beneficiaries the evaluators felt that the project activities as stipulated in the contract had been well implemented, it was felt that in the case of the Weihai Donghai Shipyard Co. Ltd., the manner in which the procurement was undertaken (and in particular the demonstration, testing and training of staff on the technology's use) would have benefitted from more PMO, FECO and or UNDP involvement. Possibly, the sub-contracting modality for project beneficiaries should be applied exclusively when beneficiaries have a minimal amount of in-house capacity to undertake procurement.

- **Large number of project stakeholders and their understanding of how they contribute to project objectives:** Because of the three-regional approach of the project, and the decentralized approach it has taken to implement activities in each of these three regions, the project management structure involves many stakeholders and many beneficiaries. In general the evaluators felt that the involvement of the large number of stakeholders was admirable and in many cases led to good results and outreach. The TE also observed that many of the stakeholders were well informed of their tasks and responsibilities under the contracts signed with FECO/PMOs. To further improve the involvement of stakeholders, encourage experiences exchanges and lessons-learned as well as understanding the role of a particular stakeholder, in the larger scheme of the project, it would be recommended that all project stakeholders and sub-contractors, meet at least once a year to exchange information on the status of project implementation (similar to the FECO organized meeting in May 2009), which would also allow for the exchange of lessons-learned between regions.
- **Capturing lessons-learned and project results:** The project has achieved many results that would be highly beneficial not only for the replication of this project's results, but also for other chemicals related projects, as well as other countries in the region that are aiming to phase-out anti-fouling paints containing hazardous components. At the time of the TE it seemed that this information was available within the project management's units (FECO and PMOs), in Chinese on the project's website: <http://afp.china-pops.org/> and potentially within FECO's Management Information System (MIS). However the evaluators felt that when the project comes to an end chances are high that valuable information and guidelines (e.g. Risk Assessment (RA) results, RA templates and Standard Operating Procedures (SOPs), Cleaner Production Guidelines, Ship Dismantling guidelines, photos, etc.) could potentially be lost if they are not captured, documented and disseminated before the project comes to an end. Currently the project's website is only available in Chinese, which doesn't allow for the dissemination of project results beyond China. It would be recommended that the most useful documents prepared under the project would be translated in English and posted on the project website. It would also be recommended that the RA results are published at national level and the ship dismantling guidelines when finalized are shared with the IMO Convention.
- **Project Implementation Reviews (PIRs):** It is strongly recommended that for future GEF funded Chemical and Waste projects, both UNDP China and FECO spend adequate time on preparing and completing a good quality PIR each year. A PIR is the document that informs the GEFSEC about the quality and progress of a project. If the quality of the PIR itself is low this reflects badly on the project itself, no matter how good its achievements have been over the reporting year.

LESSONS-LEARNED

- **Linking AFP manufacturers with research institutions:** One of the project's lessons-learned mentioned by project beneficiaries has been linking AFP producers with research institutions who develop AFP alternatives. Before the project some of the AFP producers only prepared AFP patented formulas. However as a result of the project, manufacturers started to work with research institutions to select alternatives that had already been developed and succumb them to tests. In some cases AFP producers in partnership with research institutions also initiated the development of new alternatives. Prior to the project such a link between small-scale AFP producers and research institutions did not exist.
- **Training of PMOs and FECO on (GEF) project management by financial and procurement experts from the UNDP China Country Office.** Although initially national counterparts felt it was unnecessary to receive training in the implementation, monitoring, financial management and procurement for project, ultimately it proved that the training of the PMOs had been a very strategic decision. Although FECO is very used to implementing projects funded/supported by bilateral donors, IFIs, trust funds and UN agencies, the decentralized PMO offices that were set-up for implementing and monitoring project activities in the three regions had no such experience. During the course of the project's implementation three training workshops on project management (finance and procurement) were organized (April 2009, December 2009 and March 2010). It would be recommended that if future GEF or UNDP project take a similar decentralized project implementation approach, this practice should be replicated. Possibly, with even more emphasis on international procurement and drawing up (technical) specifications.

1. INTRODUCTION

38. This Terminal Evaluation (TE) has been initiated by the China UNDP Country Office. In accordance with UNDP-GEF Monitoring and Evaluation guidelines all full and medium-sized UNDP supported GEF financed projects are required to undergo a TE upon completion of project implementation.

39. The TE report has been prepared by two independent consultants, Mrs. Hilda van der Veen (Team Leader) and Mr. Zhu Jianxin (National Consultant). The Terminal Evaluation was carried out during the period 15 April - 30 June 2014. A TE mission was undertaken from 3 – 16 May during which meetings were held with project partners as well as beneficiaries and field visits were made to different project sites (see Annexes II and III).

40. The objectives of the terminal evaluation were to assess the achievement of project results and objectives, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

Scope & Methodology

41. The methodology applied to conduct the terminal evaluation is compliant with international criteria and professional norms and standards; including the norms and standards adopted by the UN Evaluation Group.

42. The TE has been conducted in accordance with the “UNDP Handbook on Planning, Monitoring and Evaluating for Development Results”, the “UNDP/GEF Monitoring & Evaluation Resource Kit” the “GEF Monitoring and Evaluation Policy” and the “UNDP Evaluation Guidance for GEF Financed Projects”.

43. The TE has been undertaken in-line with GEF principles, which are: *independence, impartiality, transparency, disclosure, ethical, partnership, competencies/capacities, credibility and utility*². The TE has also considered the two GEF evaluation objectives at project level, namely (i) promote accountability for the achievement of GEF objectives; including the global environmental benefits; and (ii) promote learning, feedback and knowledge sharing on results and lessons learned among the GEF and its partners.

44. The TE has been conducted and the findings have been structured around the UNDP/GEF five (5) main evaluation criteria². These are:

Relevance	Extent to which the activity is suited to local and national environmental priorities and policies and to global environmental benefits to which the GEF is dedicated; this analysis includes an assessment of changes in relevance over time.
Effectiveness	Extent to which an objective has been achieved or how likely it is to be achieved.

² http://www.thegef.org/gef/sites/thegef.org/files/documents/ME_Policy_2010.pdf

Efficiency	Extent to which results have been delivered with the least costly resources possible.
Impacts	Extent to which there are indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status.
Sustainability	Likely ability of an intervention to continue to deliver benefits for an extended period of time after completion; projects need to be environmentally as well as financially and socially sustainable.

45. In addition to the GEF guiding principles described in the Evaluation Terms of Reference (TORs) see Annex I, the Evaluation Team also applied to this mandate their knowledge of evaluation methodologies and approaches and their expertise in global environmental issues. They applied several methodological principles such as (i) *Validity of information*: multiple measures and sources were sought out to ensure that the results were accurate and valid; (ii) *Integrity*: Any issue with respect to conflict of interest, lack of professional conduct or misrepresentation to be immediately referred to the client; and (iii) *Respect and anonymity*: All participants will have the right to provide information in confidence.

46. The evaluation has been conducted following a set of steps presented in the Table 3 below:

Table 3: Steps in the Terminal Evaluation

<p><u>I. Review Documents and Prepare Mission</u></p> <ul style="list-style-type: none"> ▪ Collect and review project documents ▪ Prepare mission: agenda and logistic ▪ Elaborate and submit <u>Inception work plan</u>
<p><u>II. Briefing / Review Work Plan / Mission</u></p> <ul style="list-style-type: none"> ▪ Teleconference / Briefing ▪ Finalize mission
<p><u>III. Collect Information</u></p> <ul style="list-style-type: none"> ▪ Mission to China for the Team Leader ▪ Interview key-Stakeholders and conduct field visits ▪ Collect further project related documents ▪ Mission debriefing in the form of a <u>presentation to UNDP/FECO</u>
<p><u>IV. Analyse Information</u></p> <ul style="list-style-type: none"> ▪ In-depth analysis and interpretation of data collected ▪ Follow-up interviews (if necessary) and emails for clarification purposes ▪ Elaborate and submit <u>draft evaluation report</u>
<p><u>V. Finalize Evaluation Report</u></p> <ul style="list-style-type: none"> ▪ Circulate draft report to UNDP/relevant stakeholders ▪ Integrate comments and submit <u>final report</u>

47. The TE findings have been triangulated through the concept of “multiple lines of evidence” using several evaluation tools and gathering information from different types of stakeholders and different levels of management. The following evaluation instruments have been applied for this purpose:

Evaluation Matrix: An evaluation matrix has been developed based on the evaluation scope presented in the TOR, the project log-frame and the review of key project documents (see Annex VI). This matrix is structured along the five UNDP evaluation criteria and includes all evaluation questions; including the scope presented in the TORs. The matrix provides overall directions for the evaluation, and has been used as a basis for interviewing stakeholders and reviewing project documents.

Documentation Review: The TE team conducted a thorough documentation review in China and in the United States. A list of documents for review was identified in preparation of the Inception Report, as well as during the mission in China, with all requested documents being provided by FECO and the China UNDP CO (for a full list of the documents, refer to Annex IV).

Interview Guide: Based on the evaluation matrix, an interview guide was developed (see Annex VII) to solicit information from stakeholders.

Mission Agenda: An agenda for the TE mission (3 – 16 May) was drafted by FECO during the preparatory phase of the TE. The list of Stakeholders was reviewed by the project team, the evaluators and the project’s Chief Technical Advisor to ensure that it was representative of the project’s scope.

Interviews: Stakeholders have been interviewed in person through semi-structured interviews using the interview guide presented in Annex VII. Some follow up has been undertaken using emails when needed.

Field Visit: A number of field visits have been conducted during the TE mission in China to provide the Evaluation Team with direct primary sources of information from the field and project beneficiaries.

Achievement Rating: The Evaluation Team has rated project achievements and outcomes according to the GEF project review criteria (Relevance, Effectiveness, Efficiency, Results and Sustainability); using the ratings: *Highly Satisfactory* (HS), *Satisfactory* (S), *Moderately Satisfactory* (MS), *Moderately Unsatisfactory* (MU), *Unsatisfactory* (U), *Highly Unsatisfactory* (HU) and *Not Applicable* (NA).

Sustainability Rating: The Evaluation Team has rated the dimensions of sustainability of the project outcomes as follows: *Likely* (L), *Moderately Likely* (ML), *Moderately Unlikely* (MU), *Unlikely* (U).

Structure of the Terminal Evaluation Report

48. The structure of the Terminal Evaluation Report can be deduced from the Table of Contents, and has been based on the structure as proposed in the TOR (see Annex I).

2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

2.1 Project start and duration

49. The UNDP/GEF Project “*Alternatives to DDT Usage in the Production of Antifouling Paint*” (UNDP PIMS No. 3664; GEF Project ID: 2932) is a joint initiative of the United Nations Development Programme (UNDP) and the Government of China. The Executing Agency/Implementing Partner is the Foreign Economic Cooperation Office (FECO) – Ministry of Environmental Protection China.

50. The project was approved with a total budget of USD 22,615,000, of which USD 10,365,000 was a GEF grant, USD 3,750,000 was supported by the Government of China through in-kind contributions and USD 8,500,000 was provided as in-kind contributions by the Chinese private sector.

51. The project was approved by the GEF Council in August 2006 and GEF CEO Endorsement was communicated to UNDP in its letter dated July 25, 2007. The project as approved had a duration of four years with the milestone indicated in the CEO Endorsement Letter that “*the closing date of the project grant will be no later than June 2011.*”

52. As the UNDP Project Document (ProDoc) was only signed by the National Executing Agency, the Ministry of Environmental Protection (MEP) of China and UNDP on 27 September 2007 and 9 October 2007 respectively, and the Inception Workshop only held in November 2007, for operational purposes, MEP and UNDP considered the four year project duration to end by December 2011. Subsequently, the project’s Mid-Term evaluation recommended project extension until December 2013, which was granted by the GEF.

53. Considering the project’s inception workshop was held in November 2007, at the time of the project’s TE the project had been under implementation for 6 years and 5 months. At the time of the project’s TE the project had not yet been operationally closed.

2.2 Problems that the project sought to address

54. In China, average annual production of DDT during 2000-2003 was about 4,500 MT. In order to minimize the release and potential risk of DDT and to meet the requirements of the Stockholm Convention on Persistent Organic Pollutants (POPs), the Government of China developed a long-term strategy as part of its National Implementation Plan (NIP) to address DDT issues.

55. Other than DDT quantities exported for malaria control and used for other purposes (including mosquito repellent) about 4% of DDT was used as additive in the production of antifouling paint (AFP). Antifouling paints are coated on the bilge of a ship to prevent the adhesion of sea organisms such as sea-mussels and algae, which would increase surface roughness and ultimately fuel consumption. It is estimated that every 10 µm increase in surface roughness caused by adhesion of sea organisms leads to 0.3% ~ 1% increase in fuel consumption, and decreased ship performance.

56. China's coastline extends 18,000 kilometres and sea transportation and fishing play important roles in the economy of coastal regions. At the time of project development, there were several kinds of AFPs used on sea ships in China, such as AFPs containing DDT, TBT (tributyltin), Cu₂O as well as Self Polishing (SP) series paints. Antifouling paints containing DDT were mainly being used on sea fishing ships.

57. In China, DDT based AFPs had been in use for more than 30 years. Because DDT is a Persistent Organic Pollutant, it can cause harm to sea organisms and sea ecosystems, and accumulate in the bodies of sea organisms when it is released into sea from the antifouling paints coated on the ships' surface.

58. At the time of project development, about 10,000 MT of antifouling paint was consumed annually by about 300,000 medium and small size fishing ships widely distributed along China's 18,000 kilometers of coastline. Approximately half, i.e. 5,000 MT of AFPs was DDT based, the other half, 5,000 MT, was Organotin based TBT AFP.

59. Although China began to limit DDT usage in all related sectors after it acceded to Stockholm Convention in 2002, DDT used for antifouling paint production started to see a decrease but at the start of the project 250 MT of DDT was still produced and used annually for DDT based AFPs.

2.3 Immediate and development objectives of the project

60. The **project's objective** is for DDT based antifouling paints to be substituted by technically feasible, economically viable, and environmentally friendly alternatives so as to help China fulfill the obligations under Stockholm Convention to control the use of DDT and protect the environment and human health.

61. The **binding objective of the project** is to eliminate the use of 250 MT/year of DDT as additives in the production of antifouling paint by conversion to non-toxic and environmentally friendly alternatives.

62. The **prospective objective of the project** is to establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint.

2.4 Baseline Indicators

63. The Project Results Framework as taken up in the Project Document did not contain any baseline indicators (See Annex V: Project Logical Framework). However the Project Document did contain an Impact Measurement Template, which has been presented in Table 4 below. The Table presents some project's baseline indicators as well as the project target results achieved at the time of the TE.

Table 4: Key Impact Indicators

Key Impact Indicator		Baseline	Target at 4 years	After 6 yrs and 5 months
Amount of DDT produced by Tianjin Chemicals Plant		1,600 MT	0	0
Amount of alternatives produced		0	At least 5,000 MT	3,258 MT ³ (IP) 6,661 MT ³
Price of Alternatives	Other biocides	45-60 RMB/kg	25-35 RMB/kg ⁴	> 40 RMB/kg ⁵
	Capsaicine based	87-140 RMB/kg	25-35 RMB/kg	> 40 RMB/kg
Content of DDT in anti-fouling paint		5% by weight in DDT AFP	0	0
Number of ships using alternatives		0	> 150,000	832,625 ⁶

2.5 Main Stakeholders

64. The project has been implemented using National Implementation (NIM) modality and involved a wide range of stakeholders.

65. The Ministry of Environmental Protection of China, through its Convention Implementation Office (CIO/MEP), in Project Management Office Division V of the Foreign Economic Cooperation Office (FECO) assumed the role of national executing agency, while the China UNDP Country Office (CO) functioned as the GEF implementing agency.

66. The project's National Technical Coordination Group (NTCG) consisted of the following agencies: State Environmental Protection Administration, National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Finance, Ministry of Commerce, Ministry of Science and Technology, Ministry of Agriculture, Ministry of Public Health, Ministry of Construction, General Administration of Customs, State Electricity Regulatory Commission.

67. The project, working through three regional Project Management Offices (Guangdong, Shandong and Ningbo) worked with a large number of project stakeholders and beneficiaries. In addition, the project also subcontracted several research institutions, universities, private sector companies and public institutions to undertake and implement specific project components. In most cases these sub-contractors can be considered as project beneficiaries, as they themselves

³ As part of the three rounds of the Project incentive programme 3,258 MT of AFP alternatives were produced. However because not all of the AFP producers who were manufacturing alternatives wanted to participate in the incentive programme, the total amount of AFP alternatives came to 6,661 MT (Source: National Coatings Industry Association)

⁴ It is unclear whether the prices indicated did take into consideration inflation.

⁵ Pricing doesn't take into account inflation

⁶ This number has been calculated by FECO based on the following assumptions: theoretical AFP consumption ~ 0.16kg/m², assuming the average bottom area of a fishing vessel is 50m², the number of ships using alternatives = (6661ton*1000kg/ton)/(0.16kg/m²*50m²) = 832,625

benefitted as “end-beneficiaries” from technical assistance and equipment provided by the project.

68. Project stakeholders and beneficiaries included: China Classification Society (CCS); China National Coatings Industry Association, The National Supervision and Testing Center of Fishery Machinery and Instrument, Zhoushan Changhong International Ship Recycling Co. Ltd, Zhejiang University; Shanghai Academy of Public Measurement; Guangdong Detection Center of Microbiology; China Southwest Shipyard, Qinghang Shipyard, Guangdong Academy of Environmental Science, Communication and Education Center of Guangdong Environmental Protection Bureau (EPB), Department of Environmental Protection of Guangdong Province, Shandong Environmental Protection Bureau (EPB), Environment Monitoring Center of Ningbo, Ningbo Association of Fishing Vessel, Fishing Machinery and Fishing Gear, Shandong University, Sanrun Environmental Technology Co. Ltd, Xinghai Shipyard, Donghai Shipyard; Shanghai SGS and the Environment Monitoring Center of Ningbo.

69. In addition, approximately 30 AFP manufacturers were beneficiaries of awareness raising and capacity building from the project. Of the 30 manufacturers, 11 participated in one or more of the three rounds of the project’s incentive programme.

70. The project also conducted extensive awareness raising among fishing communities in the three project regions, through volunteer programmes with the involvement of universities. More than 41 shipyards, involved in the maintenance and repair of fishing vessels, were also assessed as part of the Cleaner Production assessment of the project, many of which (34) also received training and were part of awareness raising activities on the CP guidelines produced as part of the project.

2.6 Expected Results

71. The project’s expected results have been extracted from the PLF (Annex V: Objectively Verifiable Indicators) and have been presented in the Table below. From the results presented in the Table below and the ratings provided for each of the project results, it can be seen that this aspect of the project has been rates as **Satisfactory (S) – Highly Satisfactory (HS)**. An explanation of the rating is provided in section 3.3 as well as Information and data on the project results achieved.

Table 5: Objectively Verifiable Indicators

Objectively Verifiable Indicators	Rating
Annual production of 250 MT of DDT used for AFP stopped	S
Zero DDT detected in AFPs	S ⁷
DDT levels in marine environment have decreased	HS ⁸
Alternatives developed, produced and distributed	S
Barriers to commercialize the alternatives removed	S

⁷ Not monitored on a regular basis

⁸ Combined result of various POPs interventions

DDT AFP phase-out replicated for TBT phase-out	HS
Concentration of TBT in the marine media reduced	HS ⁷

3. FINDINGS

3.1 Project Design / Formulation

3.1.1 Analysis of Project Logical Framework (PLF)

72. The Project’s Logical Framework (PLF) as developed for the project and included in the signed project document has been presented in Annex V. The PLF outlines the project’s overall binding and prospective objectives and presents the project’s overall Objectively Verifiable Indicators – OVI (see also Table 5), which have proved during the TE to be verifiable by external and objective sources.

73. As observed during the Mid-Term Evaluation (MTE) the project objectives are clear, however the PLF does not give an indication of the timeframe within which objectives would have to be achieved. Inclusion of a timing element (as well as a Gantt Chart as part of the ProDoc) would have improved the PLF.

74. Although the PLF contains indicators, which are Objectively Verifiable for each of the project components, and these indicators are relatively clear, the evaluators missed having baseline indicators in order to compare the project’s “before and after”. Although standard PLFs might have only started to include baseline indicators during GEF-5, which might have not yet been compulsory during GEF-4 when the project was formulated and approved, the only baseline information available to the evaluators were the Key Impact Indicators presented in Table 4 as well as the baseline indicators provided by the project’s Environmental Monitoring Programme: which provided data on the DDT concentrations in sea waters, air, sediments, and typical marine organisms at the start of the project’s implementation.

75. It should be noted that obtaining the information to verify information related to impact indicators required some additional research on behalf of the project team – which would be an indication that such indicators were not actively used.

76. Finally, the PLF (and thus the proposed project strategy) contained a few project activities and indicators, which appeared to the evaluators to be a bit unrealistic. Examples are “*the inclusion of contents on AFPs to be added to textbooks for environmental education in local middles and primary schools*”, while another was “*a fund raising activity for deformed children suffering from toxic antifouling paints*” (cause and effect relationship between AFP exposure and children’s health would be hard to prove). Otherwise project indicators and activities seemed realistic, tangible and verifiable.

Recommendation: For future GEF Chemicals and Waste projects it would be recommended to include baseline indicators in the PLF as well as incorporate a timing

element. Including a Gantt Chart as part of the ProDoc will be another way to clarify timing of project activities.

3.1.2 Assumptions and Risks

77. The PLF (see Annex V) contains the assumptions made in the project's development. In general these assumptions have been well defined and proved to be very realistic and fact based throughout the project's implementation.

78. The only assumption/risk that was not included in the PLF was a potential delay in the implementation of project activities. The project assumed that alternative technologies would be adopted within the first year of the project implementation to allow for paint production during the remaining project years. Eventually though it was the project delay caused by the Beijing Olympics which prohibited transportation of chemicals, as a result of which analysis of paint samples had to be postponed and the season to conduct on-ship patch testing passed (vessels are only serviced in the period July - September). Although this was a hard to foresee risk, the potential delay of project activities due to political, environmental or market influences should have figured among the risks listed in the PLF.

79. Secondly, when reviewing the yearly Project Implementation Review (PIR) reports, it became apparent that in none of the PIRs the section on Risks had been filled out. The conclusion that can be drawn from this observation is that the project and its management (both on UNDP's and FECO's side) are not making adequate use of the PIR monitoring tool, which when adequately used, can help identify important project risks and support project management in mitigating such risks.

Recommendation: For future GEF Chemicals and Waste project, the PLF should contain a risk description related to potential delays in project implementation. Project management should also regularly update risks in Atlas as well as report on project's risks in the yearly PIR.

3.1.3 Lessons from other relevant projects (e.g., same focal area) incorporated into project design

80. At the time of the project's development (2005), no NIP follow-up POPs projects were under implementation in China. As such the project could not draw upon experiences and lessons-learned from other POPs projects' experiences. Furthermore, the use of DDT in AFPs was exclusive to China, there have been no other countries in the world who have used DDT in that manner. For these reasons the project did not build upon lessons-learned from other POPs projects.

3.1.4 Planned stakeholder participation

81. The Project document contained a separate section entitled "Stakeholder Involvement Plan" which listed particular stakeholders (e.g. entities) which the project had engaged during the PDF-B phase as well as larger groups of project stakeholders, which would be engaged during project activities (e.g. fishermen, the public, etc.).

82. From the TE it was obvious, that not only the project had done a remarkable job in mapping and engaging potential project stakeholders as part of the project PDF-B phase, but that the

project during its implementation was able to extent involvement of stakeholders beyond the initial stakeholders and beneficiaries identified. The evaluators are of the opinion that the involvement of the large number of stakeholders as well as significant number of project beneficiaries, which benefitted from awareness raising and capacity building is unusual, and is to the credit of the project management team both at FECO as well as those in the PMOs.

3.1.5 Replication approach

83. The Project's replication approach as taken up in the project documents was founded upon three (3) assumptions.

84. Firstly, that it would take the Government until 2014 to phase-out DDT entirely and that the regulatory mechanism developed by the project would lay the foundation for other DDT applications to be eliminated. In retrospect, the Government of China introduced a DDT ban in 2009, halted DDT production at the three remaining DDT production facilities and supported their dismantling and decontamination. As such the regulatory framework developed directly by the project was not able to impact other uses of DDT, as these had been prohibited by the comprehensive ban put in place on the initiative of the GoC. However the project did provide support to the development of regulations and technical guidelines, which consequently facilitated the supervision and monitoring of the implementation and enforcement of the ban, completing the regulatory framework to ensure its successful implementation.

85. Secondly, the project anticipated to influence the GEF project entitled "*Improvement of DDT-based production of Dicofol and introduction of alternative technologies including IPM for leaf mites control in China*" which was developed and implemented co-currently. It was assumed that the AFP project would jumpstart activities under the Dicofol project. In retrospect, the DDT ban put in place by the Government of China, jumpstarted both projects.

86. Thirdly, the project aimed to replicate experiences under the project to help China establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint. Indeed the project played a part in supporting China to accede to the International Maritime Organization (IMO) Convention on the Control of Harmful Anti-Fouling systems on Ships (2001) and create important awareness and capacity which contributed to the elimination the use of TBT (organotin)-based AFPs.

87. Although not contained in the project document as an opportunity for replication, the laboratory capacity built and guidance materials developed by the project for undertaking risk assessments of chemicals (AFPs in specific), as well as the capacity built and guidance materials developed to introduce Cleaner Production practices at shipyards, has presented excellent opportunities for replication of project results beyond the demonstration sites.

3.1.6 UNDP comparative advantage

88. The project "*Alternatives to DDT Usage in the Production of Antifouling Paint*" is a one of a kind GEF/POPs project. Besides China there were/are no other countries which had applied POPs, or DDT in specific, as a co-biocide in Anti-Fouling Paints. In this regard China was an exception.

89. It is also the only GEF funded project addressing the use of POPs in paint. Very recently two GEF projects have been approved that aim to phase out lead from paint, but at the time of the AFP project's development/approval, no such projects existed. As such, even for UNDP, this was a one of a kind project at the time of its development.

90. That said, as noted in Annex L of the document "*Comparative advantages of the GEF agencies*", UNDP has a comparative advantage in the area of Persistent Organic Pollutants, specifically with respect to Capacity Building and provision of Technical Assistance. The AFP project benefitted from UNDP's experience in integrated policy development, human resources development, institutional strengthening, and non-governmental and community participation.

91. UNDP has a Country Office presence in China and works closely with FECO on a large number of GEF projects (46 national projects and 15 global/regional projects), in the areas of biodiversity, climate change, POPs, international waters as well as multi-focal areas. This presents a unique opportunity in terms of collaboration with FECO and other national partners, as well as opportunities to benefit from lessons-learned and experiences from other projects, in particular in terms of capacity building, technical assistance, procurement, awareness raising, etc.

92. The evaluators felt that UNDP (China) certainly has the comparative advantage to support the Government of China in implementing such kinds of projects.

3.1.7 Linkages between the project and other interventions within the sector

93. The AFP project is very relevant to the Stockholm Convention Objectives, National Priorities as taken up in China's National Implementation Plan (NIP) and is particularly well aligned with China's National "*Strategy for POPs Pesticides Reduction and Phase-Out*" and Action Plan (See also section 3.3 "Relevance").

94. The National POPs Strategy and Action Plan aims for 5 DDT specific targets as presented in Table 6 below. The AFP project was specifically developed to meet target no. 2. At the same time the project "*Improvement of DDT-based production of Dicofol and introduction of alternative technologies including IPM for leaf mites control in China*" was developed to meet target no. 3.

95. The two projects were considered as "sister" projects and implemented concurrently. In collaboration with on-going DDT projects the Government of China made great strides to phase-out and halt the production of DDT being manufactured in the three remaining DDT facilities. With the DDT production coming to a halt and DDT supply being cut off, the AFP and Dicofol projects were able to focus on supporting two respective sectors (fishing industry, ship repair and maintenance sector as well as agriculture) to introduce DDT alternatives that were technically feasible, economically viable, and environmentally friendly.

96. It was therefore concluded by the TE that complementarity between POPs interventions was very well achieved and that linkages between various POPs interventions were well established since the project's conception phase.

Table 6: National POPs Strategy DDT related Targets

In the first 10 years after the date of entry into force of the Convention (before 2014) do best to reduce the production and consumption of DDT, try to eliminate the emission of new DDT.
1. To assist the enterprises which produce mosquito-repellent incense, to adopt alternative immediately, and stop DDT as raw materials to produce mosquito-repellent incense.
2. To assist the enterprises which produce paint to adopt alternatives, and stop DDT as additives to produce paints.
3. Take measures to control emission during the course of Dicofol production and residue of DDT; study the feasibility of Dicofol phase-out in order to phase out DDT.
4. Apply for exemption for sanitary and epidemic prevention purposes, and produce DDT for disease vector control when epidemic prevention is urgent.
5. Develop a plan for phase-out of DDT production, and phase-out excrescent production gradually.

97. With respect to linkages between the project and other interventions in the sector (in which case the TE considers as relevant sectors the AFP production sector; the shipyard repair and maintenance sector; the fishing industry; the R & D sector and Risk Assessment sector), the two most significant linkages observed are the following:

- A prospective objective of the project was to establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint. In this respect, one of the project aims was to support China in acceding to the IMO Convention. China became a party to the Convention in June 2011 and at the time of the TE (although no particular regulations were put in place), voluntary compliance to phase out the use of TBT (organotin)-based AFPs, which started in 2000, resulted in Chinese commercial vessels being in compliance with the convention [Source: CCS].

In addition the project also demonstrated environmentally friendly AFP removal at one ship dismantling facility and four shipyards and developed guidance materials for ship dismantling facilities and cleaner production practices at shipyards.

Recommendation: The project should ensure that the guidance materials that have been developed and the experiences and lessons-learned from the ship dismantling and Cleaner Production demonstrations are documented in both Chinese and English. The guidance developed on AFP removal for ship dismantling practices should be shared with the IMO Convention Secretariat and submitted by China as an information document to the next meeting of the parties.

- Secondly, the project also built the capacity of two laboratories in undertaking risk assessments for AFPs. China recently put in place regulatory requirements for compulsory RAs, which apply to new chemicals being brought onto the market (chemicals already on the market will undergo RAs using a phased approach). However the capacity of laboratories to undertake these RA was very low. Considering the

number of chemicals being required to undergo RAs will soon be very high, as such the project interventions, which aimed to increase laboratory capacity in this respect, will be very beneficial for future RAs.

3.1.8 Management arrangements

98. The management arrangements as presented in the project document (Section II: Organigram of the Project) were pretty well adhered to during project implementation. Considering the project was being implemented in 3 different regions, the evaluators felt that the establishment of Project Management Offices (PMOs) to implement project activities such as awareness raising, training, etc., was the right way to go. An inter-departmental coordination mechanism was formed to mobilize resources to ensure the achievement of project objectives; local project offices were established to improve local capacity for project design, management and monitoring; capacity was build to improve law enforcement and market inspection to reduce the illegal production of DDT antifouling paint; a team of experts was conveyed to provide technical support throughout the project's implementation; a large number of capacity-building, training and awareness raising activities and events were organized; and, an internal control mechanism was established to proper use and effective supervision and management of GEF-funds. Overall the evaluators felt that the support FECO had provided to the project's beneficiaries was of good quality.

99. There are however three suggestions for improvements which could be taken on board for future Chemicals and Waste GEF projects.

- **Staff Continuity:** Firstly, FECO project staff turnover, like for the Project Management Offices (PMOs) as well as UNDP, was high (the project was lucky that it was able to benefit from the same national technical advisor who stayed involved throughout the entire duration of the project). Staff turnover is often a fact that cannot be avoided.

Recommendation: It was suggested however that in the future FECO would, rather than appointing a single Project Coordinator, appoint a project team to oversee project management instead. Although one single person can take the lead on project implementation it would be recommended that an additional colleague is involved in the project on a part-time basis, so as to ensure that when the project coordinator might leave, the unit still contains one person who is familiar with the project.

- **Subcontracting as a means to support project beneficiaries:** Most project activities which involved single project beneficiaries, e.g. cleaner production demonstration; ship dismantling; AFP risk assessment capacity building of laboratories; etc. were implemented using sub-contracting modalities used to select the most fitting project beneficiaries.

Contracts between the PMO and FECO/PMO were signed which stipulated the responsibilities of the project beneficiaries as well as expected deliverables, and applied a performance based payment system.

Subcontracting modalities placed the responsibility on project beneficiaries to (among else): undertake procurement of equipment, civil and auxiliary works, equipment installation, operational training, mechanical maintenance, etc., For most project

beneficiaries the evaluators felt that the project activities as stipulated in the contract had been well implemented and the subcontracting modality had been a fitting approach. However, it was felt that in the case of Weihai Donghai Shipyard Co. Ltd., the manner in which the procurement was undertaken (and in particular the demonstration, testing and training of staff on the technologies' use) would have greatly benefitted from more PMO, FECO and or UNDP involvement.

Recommendation: For future projects it would be recommended that the sub-contracting modality for project beneficiaries should be applied exclusively when beneficiaries have a minimal amount of in-house capacity to undertake procurement.

- Large number of project stakeholders and their understanding of how they contribute to project objectives:** Because of the three-regional approach of the project, and the decentralized approach it has taken to implement activities in each of these three regions, the project management structure involved many stakeholders and many beneficiaries. In general the evaluators felt that the involvement of the large number of stakeholders was admirable and in many cases led to good results and outreach. The TE also observed that many of the stakeholders were well informed of their tasks and responsibilities under the contracts signed with FECO/PMOs.

Recommendation: However, for future projects, it would be recommended that direct project stakeholders and sub-contractors, meet at least once a year to exchange information on the status of project implementation and their respective roles. This would also allow for the exchange of lessons-learned and experiences between regions.

3.2 Project Implementation

3.2.1 Adaptive management (changes to the project design and project outputs during implementation)

100. Most of the information presented in this section has been extracted from the yearly Project Implementation Reviews (PIRs) as well as the Mid-Term Evaluation (MTE) report.

101. A few minor and major modifications were made to the project's design and its outputs during project implementation. The changes made to the project's design have been presented in the Table below, as well as the reason(s) for such changes:

Table 7: Changes made to the project design and outputs during implementation

Planned Activity	Ultimate Project Activities	Reason for change
Outcome 2: Management information system (MIS) and information management		
Activity 2: Establish an MIS and website for the project		
Act. 2.1 Establish an MIS.	A Management Information System was set-up for internal FECO use.	As FECO was developing an internal MIS it preferred not to create an additional system exclusively for the AFP project.
Act. 2.2 Establish a mechanism for effective information transmission	As such, FECO officers have access to	

<p>and sharing.</p> <p><i>Purpose:</i> To support information collection, processing and transmission among sectors and between central and local PMOs.</p>	<p>the system, but other project partners, such as PMOs and project beneficiaries do not.</p>	<p>Considering FECO is a government entity it could not grant access for its MIS to external entities.</p>
<p>Outcome 4: Conversion from DDT based antifouling paints to alternatives.</p> <p>Activity 4: Adopt multiple means of technological support, policy induction, market regulation, and awareness raising and education to promote the conversion from DDT/TBT based antifouling paints to alternatives.</p>		
<p><i>Act. 4.1</i> Test, select and acquire alternative technologies.</p>	<p>The project did not acquire alternative technologies but redirected efforts to supporting AFP producers in identifying technically feasible, economically viable, and environmentally friendly AFP alternatives in collaboration with R & D institutes.</p> <p>During the later phases of the project, support was also extended to two laboratories in building necessary capacity to conduct Risk Assessments of AFPs.</p>	<p>Considering the development of AFP alternatives takes approximately 5 years from start to finish, the project opted to link AFP producers to R & D institutes, which had already developed alternatives.</p> <p>The reason for this change was that the Government of China adopted regulations that stipulate that new chemicals introduced onto the market need to undergo a compulsory RA. As capacity in conducting RAs was very low, in particular related to AFPs, this would create a potential barriers to the introduction of new AFP alternatives on the market. As such laboratories procured necessary laboratory equipment, prepared Standard Operational Procedures (SOPs) and guidance materials to carry out AFP RAs.</p>
<p><i>Act. 4.4</i> Conduct environmental sound management of DDT at contaminated sites and on equipment.</p>	<p>The project did not support the closing of the Tianjin Chemical Plant nor the disposal of production equipment. Instead it opted to support 4 shipyards and 1 ship dismantling facilities in adopting cleaner production measures related to AFP paint removal and application.</p>	<p>While conducting assessments of the degree of DDT contamination, it was observed that DDT contamination at the shipyards was significant. In the mean time the Government of China already started to support the closing, dismantling and decontamination of the Tianjin Chemical Plant. As such the project opted to redirect its attention to supporting shipyards in adopting CP</p>

measures.

102. Although some of the project activities were changed (see table 7 above), the changes made to the project's design and outputs were deemed in line with the project objectives.

3.2.2 Partnership arrangements (with relevant stakeholders involved in the country/region)

103. As previously mentioned the project went about the engagement of project stakeholders by entering into contracts with them ("Sub-contracting") after a competitive bidding process. Contracts stipulated responsibilities of the subcontractor as well as deliverables to be achieved as part of the contract.

104. Considering the extensive number of project stakeholders that were engaged in the project and to keep the project manageable, this was most likely a wise approach to take, as FECO or the PMOs would not have had the manpower or the capacity. There are only two minor drawbacks for this type of engagement. First and foremost, some project stakeholders should have been engaged as project beneficiaries rather than project sub-contractors. Secondly, most entities that had been subcontracted by the project, reported specifically on the deliverables as stipulated in the contracts.

105. In the case of Weihai Donghai Shipyard Co. Ltd., the equipment purchased had not yet been put to use until the day the TE mission visited the Shipyard. It should be mentioned that the season for ship and vessel repairs (July – August) had not yet approached, but on the other hand it was also clear that the shipyard was unable to handle and run the equipment. It was indicated that this was due to a lack of training that had not been provided by the equipment supplier (most likely because equipment installation, operationalization and training on its use had not been included in the equipment specifications for procurement). It was felt by the TE team, that sub-contracting modalities should be used when the sub-contractor has sufficient capacity and can indicate a sufficient level of transparency in its procurement procedures. If the capacity of the entity is insufficient, activities can be supported by the PMO, or the project could provide additional training to increase the capacity of a sub-contractor.

106. Sub-contractors seemed not always to have a good sense of where in the overall scheme of the project, they, or the activities they supported, fitted in. For further projects it would therefore be recommended to organize yearly meetings for all stakeholders/beneficiaries during which each stakeholder has an opportunity to present its work.

107. However, the TE evaluators felt that without the sub-contracts in place the deliverables stipulated therein would not have achieved within such a short timeframe.

3.2.3 Feedback from M&E activities used for adaptive management

Project Implementation Reviews (PIRs)

108. The TE team was provided with PIRs for 2008, 2009, 2010, 2011, 2012 and 2013. It should be noted that none of the sections on adaptive management had been filled out. Even though it was clear from the TE that changes had been made to the project's design, activities and outputs during the period 2010 – 2014. Of the five changes proposed by the MTE only one had

been reflected in the relevant section of the 2011 PIR.

109. The conclusion that can be drawn from this observation is that the project and its management (both on UNDP’s and FECO’s side) are not making sufficient use of the PIR monitoring tool, which when adequately used, can point out important project aspects and challenges to its management, which otherwise could be overlooked.

110. Indeed as was noted by the UNDP PIR Quality Review (since 2013 UNDP reviews the quality of PIR report before submitting them to the GEF), the China AFP (2932) PIR was qualified as **Satisfactory (S) for 2012 and Marginally Satisfactory (MS) for 2013**. For 2013, the evaluation made the following observations “A weak DO report page and weak comments to justify ratings by raters render this report not convincing”.

*Recommendation: It is strongly recommended that both UNDP China and FECO spend adequate time on preparing and completing a good quality PIR for 2014 and insert the relevant information on changes made to the project. A PIR is **the** document that informs the GEFSEC about the quality and progress of a project. If the quality of the PIR is low this reflects badly on the project itself, no matter how good its achievements have been over the reporting year.*

Mid-Term Evaluation

111. The MTE made a number of recommendations, which are presented in Table 8 below. The project’s adaptive management in response to their recommendations has also been summarized. In general it can be concluded that most of the MTE’s recommendations were followed up on by the project and where feasible were used to adapt the project’s management.

Table 8: MTE Recommendations and Project Response

MTE Recommendations	Project Response
<p>1. Project Management: Review the coordination mechanism between and amongst the national project management team and the three local PMOs to simplify coordination and reporting structure. As and when possible, delegate more functions to the local PMOs.</p>	<p>Before the MTE the PMO had only been in charge of awareness raising and coordination work.</p> <p>After the MTE the management of the cleaner production demonstrations at the shipyards was decentralized and assigned to the PMOs.</p>
<p>2. Alternatives Selection: The project should establish a long-term and sustainable mechanism for conducting selection of future new alternatives after project completion.</p>	<ul style="list-style-type: none"> ▪ The project started building the capacity of two laboratories to undertake RA of AFP alternatives for particular active ingredients. Capacity building as well as guidance materials and SOPs for RA will continue to be applied after project completion. ▪ The project has drafted a regulation for adoption by the CCA and/or Shipping Vessel Registration of RA requirements for AFPs, which would make it compulsory

	<p>for AFP producers to undergo a RA for each new AFP put on the market.</p> <ul style="list-style-type: none"> ▪ Now that AFP producers are used to be working with R & D institutions for the development and selection of environmentally friendly alternatives, it is expected that this practice will continue in the future.
<p>3. Monitoring Programme: Based on the preliminary monitoring results and experts' comments, DDT content in sediment and sea organisms could not be used as an effective indicator to show a decreasing trend within a short monitoring duration to reflect a global environmental benefit after the ban of DDT usage. At the time of the MTE it was suggested that the project indicator or the monitoring program be adjusted according to the current situation.</p>	<p>Eventually however, the project did opt to use DDT/TBT content in sediment and sea organisms to determine whether DDT and TBT levels had gone down since the project's start.</p> <p>A renowned entity was engaged (SGS) which analyzed samples at the end of 2013, 5 years after the similar analysis had been conducted by Ningbo Environmental Monitoring Center.</p>
<p>4. Incentive Programme: Reconsider the incentive programme mechanism - The programme should consider different targets: producer enterprises, shipyards, ship owners as a result of the Ban on DDT production and usage in China that took effect on May 17, 2009.</p>	<p>In addition to supporting AFP producers, the project also started working with shipyards and ship dismantling facilities. Furthermore, extensive awareness raising and training activities aimed at ship/vessel owners as well as shipyards were conducted to create awareness on alternatives as well as cleaner production measures.</p> <p>It was mentioned by the AFP producers that the main incentive for buying an alternative AFP was the price. Besides lowering the base price of AFPs through the incentive programme for the AFP producers, no other incentive approaches were introduced after the MTE.</p>
<p>5. Extension of Project Completion: As project activities were delayed, due to late initiation of the project, and the embargo on the implementation of project activities for a significant period of time due to the 2008 Beijing Olympics. it is recommended that the closing of the project as stipulated by the GEF/CEO be extended from June 2011 to October 2012.</p>	<p>A project extension request was sent to the GEFSEC on May 4, 2012, for an extension until December 2013, which was granted.</p>

3.2.4 Project Finance

112. In this section, two aspects related to project finance are reviewed, firstly project co-financing and secondly project expenditures.

Co-financing

113. In Table 9 below is summarized the co-financing that was anticipated when the project was submitted to the GEF for approval, as well as the co-financing that was actually mobilized during the project's duration.

Table 9: Co-financing Anticipated and Mobilized

Entity	Anticipated (US\$)	Mobilized (US\$)
GEF	10,365,000	10,365,000
Government	3,750,000	3,079,548
Private Sector	8,500,000	23,367,8261
TOTAL	22,615,000	36,812,373

114. As can be noticed, the contribution to the project by the Government of China ended up being a little lower than anticipated, however on the other hand the Government of China supported the shut-down, dismantling and decontamination of three DDT production facilities, which directly benefitted the project as it no longer had to allocate funding for the "closing of the Tianjin Chemical Plant and the disposal of production equipment" as foreseen during project development.

115. On the other hand, co-financing contributions provided by the private sector ended up being much higher than anticipated. Significant co-financing was provided in 2012 by the private sector entities, which benefitted from the incentive programme (AFP alternative producers, 2 shipyards and one laboratory).

116. For a complete oversight of the co-financing raised over the duration of the project's implementation kindly refer to Table 11 below.

Table 10: Co-financing raised over the duration of the project

		2007	2008	2009	2010	2011	2013	TOTAL
Central Government	In-cash	88,106	293,686	51,395	992,821	992,821		2,418,829
	In-kind	80,000	80,000	80,000				240,000
Local Government	In-cash							0
	In-kind			154,185	88,106	88,106	90,323	420,719
Private Industry Contribution	In-cash							0
	In-kind		851,689	1,395,007	1,395,007	2,055,800	1,767,0323	23,367,826
TOTAL		168,106	1,225,374	1,680,587	2,475,934	3,136,727	17,760,645	26,447,374

117. It can be concluded that the amount of co-financing raised over the duration was **Highly Satisfactory (HS)**. Close to 4 million US\$ in co-financing was leveraged during project implementation in addition to anticipated co-financing amount. The co-financing ratio achieved

by the project was 1: 2.55.

Project Expenditures

118. Based on the Combined Delivery Reports (CDRs) provided by UNDP China for the years 2007 until 2014⁹, a summary of project expenditures by year can be found in Table 12 below.

Table 11: Project Expenditures for the period 2007 – 2014 (up to 5 May 2014)

	Expenditures ¹⁰ [US\$]	[%]
2007	149,539	1 %
2008	410,614	4 %
2009	772,281	7 %
2010	641,119	6 %
2011	1,010,738	10 %
2012	625,270	6 %
2013	4,723,095	46 %
2014	127,814	1 %
Unspent Balance @ TE	1,904,530	19 %
TOTAL	10,365,000	100 %

119. As can be deduced from the Project Expenditures, the project started very slowly in terms of project expenditures, besides initial project delays discussed earlier, this seems due to a few reasons:

- **Subcontracts that were drawn up at the beginning of the project used cautious payments terms** (20%, 30% and 50%) with the majority of funds disbursed at the time all the project activities had been completed to the satisfaction of project management (see also MTE findings). The MTE recommended to adjust the payment terms to 30%, 40% and 30%.
- **The Government of China initiated many DDT related activities itself**, in addition to the GEF funded DDT and Dicofol projects. As a result funding that was to be spent by the project on for example the closing and dismantling of a DDT facility – could not be allocated to this activity.
- In the three project regions, there were only 22 AFP manufacturers, of which three international companies. Although all companies benefitted from training, awareness raising and other project activities, not all alternative AFP producers participated in the incentive programme. Some opted to apply gained knowledge through the project using their proper funds. As such the incentive programme was not able to spend as much funding as foreseen.

120. Although during the project's mid-term evaluation it was recommended to redirect project activities to additional project beneficiaries (in addition to the incentives programme for the AFP

⁹ The 2014 CDR summarizes expenditures up to May 5th, 2014

¹⁰ Expenditures have been rounded off.

manufacturers and the fishing villages), it took until 2012 – 2013 before the project started supporting cleaner production activities at 5 shipyards and risk assessment capacity building at 2 laboratories. This late redirecting of project activities resulted in ~46% of the budget being spent in 2013 (project year 6). This could have been avoided by earlier redirecting the project’s strategy/approach and deciding on additional activities with project beneficiaries. Preferably this would have happened at the time when project management realized that the amount of project funding being spent on the incentive programme was relatively low. Alternatively such a decision could have taken immediately after the MTE.

Recommendation: Redirect project activities as soon as possible when project management becomes aware of the fact that planned project activities require far less funding than anticipated or the project receives high volumes of co-financing.

121. It should be noted that at the time of the project TE (May 2014), **the project had an unspent balance of 1,904,530 US\$ which represents close to 19% of the entire project budget.** It is unusual for a TE to be conducted when such a large amount of project funds are still unspent. Although most of the outstanding funds had already been committed (see Table 13), some outstanding project activities had not yet started and their impact could not be assessed/evaluated by the TE team.

Recommendation: The TE was unable to evaluate project activities that were to be funded by remaining project funds and had not yet started at the time of the TE. Therefore, it would be recommended that for future TEs of GEF projects, the TE would take place closer to operational closure of the project.

122. According to FECO’s Project Coordinator the following financial commitments (based on the project’s Annual Work Plan – AWP) have been made for 2014.

Table 12: Annual Work Plan (AWP) commitments for 2014 [Source: FECO]

Description	Executing partners	Budget allocation (US\$)
Committed for project activities	FECO	897,045
Commitments for Incentive Programme (FECO)	FECO	312,274
Project Management Costs (FECO, PMO)	FECO	242,200
Committed by UNDP for project activities	UNDP	580,826
		2,032,345

123. Project activities that were outstanding at the time of the TE were the satisfactory wrap-up of the five (5) cleaner production demonstration projects; development of a POPs communication strategy and action plan; capturing lessons-learned and experiences from the project and ensuring their wider dissemination (e.g. project documentary, photo exhibition, POPs song, and a travelling exhibit); adoption of guidance materials for cleaner production and chemical risks assessment, among else.

124. The evaluators feel that if the project will be operationally closed in a rush, sustainability of project results will be seriously jeopardized. It is therefore recommended that the project will aim to operationally close by December 2014, at which time the project has been under

implementation for seven (7) years.

Recommendation: Based on the remaining project commitments for 2014, it is high recommended that the project would be extended until December 2014. It is recommended that in this year's Project Implementation Review (PIR) such an extension is requested after agreement has been reached on the proposed extension with the UNDP Bangkok Regional Service Center (RSC).

3.2.5 Monitoring and evaluation: design at entry and implementation (S)

125. The TE team felt that the Monitoring and Evaluation plan as described and included in the Project Document (See Monitoring and Reporting Section on ProDoc page 26) was very comprehensive and in line with the UNDP rules and procedures for Monitoring and Evaluation of (GEF) projects.

126. Rather than repeating the M&E framework as presented in the ProDoc, Table 14 below summarizes the M & E activities planned for in the Project Document and conducted throughout the project's implementation.

127. The column "Comments & Observations" summarizes the views of the TE team for each of these M & E activities. In summary the TE team is of the opinion that the M & E of the project, both at project design phase and during implementation, can be rated as **Satisfactory (S)**.

Table 13: Project Monitoring and Evaluation Tools

Type of M & E Activity	Responsible Parties	TE Comments and Observations
Inception Workshop	Project Team	Satisfactory (S)
Inception Report	Project Team	Satisfactory (S)
Measurement of Means of Verification for project purpose indicators	Project Team	Satisfactory (S)
Measurement of Means of Verification for Project Progress and Performance	Regional Officers and local IAs	Satisfactory (S)
Annual Progress Report (APR) and Project Implementation Review (PIR)	Project Team	APR: Highly Satisfactory (HS) PIR: Marginally Satisfactory (MS). Remarks: the PIRs are not of a very high quality.
Tripartite Review (TPR) and TPR Report (TPR meetings are the same as Project Steering Committee Meetings)	Project Team UNDP-GEF	Records of Annual Meetings are available for 2010, 2011 and 2012, but should also be available for other project years.
Quarterly Progress Reports	Project Team	Satisfactory (S)
Technical Reports	National Consultants	Highly Satisfactory (HS)

Mid-Term External Evaluation	External Consultants	Satisfactory (S)
Final External Evaluation	External Consultants	NA
Terminal Report	Project Team	NA
Lessons-Learned	Project Team	Marginally Unsatisfactory (MU). As previously mentioned, it will be important for the project to capture the lessons-learned from the project, which so far has not yet been done.
Audit	Independent Audit Entity	Satisfactory (S). Audits have taken place in 2008, 2009, 2010, 2011, 2012 and 2013.
Visits to field sites	UNDP CO UNDP GEF (as appropriate) Government Representatives	Marginally Satisfactory (MS). Although the NTA and the FECO Project staff often went on field trips it would be recommended that UNDP CO staff makes more regular field visits to project sites – it is recommended that a UNDP project manager visits a project sites at least twice a year.

128. Based on observations made following the TE mission as well as a desk review of M & E related reports, the TE team has a few main remarks and suggestions for improvements:

- **PIRs (see also section 3.2.3 on PIRs):** It was observed that the quality of PIRs was substandard and was rated by UNDP’s PIR quality Review as Marginally Satisfactory (MS).

*Recommendation: Both UNDP China and FECO should spend sufficient time on preparing and completing a good quality PIR for 2014. A PIR is **the** document that informs the GEFSEC about the achievements and progress of a project. If the quality of the PIR is low, this reflects badly on the project itself, no matter how successful a project has been over the reporting year.*

- **Capturing lessons-learned and project results:** The project has achieved many results that would be highly beneficial not only for the replication of this project’s results, but also for other chemicals related projects, as well as other countries in the region that are aiming to phase-out anti-fouling paints containing hazardous components. At the time of the TE it seemed that this information was available within the project management’s units (FECO and PMOs), in Chinese on the project’s website: <http://afp.china-pops.org/> and potentially within FECO’s Management Information System (MIS). However the evaluators felt that when the project comes to an end chances are high that valuable information and guidelines (e.g. Risk Assessment (RA) results, RA templates and Standard Operating Procedures (SOPs), Cleaner Production Guidelines, Ship Dismantling guidelines, photos, etc.) could potentially be lost if they are not captured, documented and disseminated before the project comes to an end. At the time of the TE evaluation, the project’s website was only available in Chinese, which

doesn't allow for the dissemination of project results beyond China.

Recommendations: It would be recommended that the most useful documents prepared under the project would be translated in English and posted on the project website. It would also be recommended that the RA results are published at national level and the ship dismantling guidelines when finalized are shared with the IMO Convention.

- **Field visits:** It was mentioned by project beneficiaries that visits to the various project stakeholders, project beneficiaries and project sites were frequently attended by FECO staff and the NTA, however that UNDP had only participated in field visits once or twice over the duration of the project.

Recommendation: The UNDP Country Office should participate more frequently, at least twice a year, in project site/field visits. Obtaining a better understanding of challenges faced by national stakeholders and beneficiaries in implementing project activities would allow the China UNDP Country Office to better anticipate the support FECO and national counterparts may require to speed up project implementation.

3.2.6 UNDP and Implementing Partner implementation / execution, coordination, and operational issues (S)

129. Overall, the TE team felt that there were few implementation, execution, coordination or operational issues during the project's implementation.

130. The project teams from UNDP, FECO and regional PMOs involved in the project's implementation seemed all very committed to the project's objectives. Throughout the duration of the TE requested information was easily accessible or provided when asked for, indicating a high level of effectiveness and organized work styles.

131. However, with respect to implementation, execution, coordination and operational issues, a few remarks are in place to ensure that higher quality services can be provided by both UNDP and FECO to future GEF projects:

UNDP:

- In coordination with FECO, UNDP should ensure frequent training as well as regular procurement support to project sub-contractors and PMOs in particular related to drawing up technology and supplier specifications. For example in the case of Donghai Shipyard (a Cleaner Production Demonstration beneficiary), the manner in which the procurement was undertaken (and in particular the demonstration, testing and training of staff on the technology's use) would have benefitted from more PMO, FECO and or UNDP involvement.

Recommendation: UNDP should provide more frequently training to PMOs and FECO on (GEF) project management by financial and procurement experts from the UNDP China Country Office or Bangkok RSC.

- UNDP could play a more active role in supporting FECO and GEF projects in headhunting

for high quality experts in niche areas that might not be available at national level. In light of UNDP's extensive global network and advertising possibilities, UNDP would be able to tap into expert networks, which would be of immense value for China's rapidly growing needs in the area of Chemicals Management and Waste Management.

Recommendation: UNDP should make more use of its global networks to headhunt for international expertise in niche areas necessary to support China in a rapidly changing chemicals management environment.

FECO:

- Project staff turnover, like for the Project Management Offices (PMOs) as well as UNDP, was high (the project was lucky that it was able to benefit from the same national technical advisor who stayed involved throughout the entire duration of the project). Staff turnover is often a fact that cannot be avoided.

Recommendation: For future GEF projects FECO could, rather than appointing a single Project Manager, appoint a project team to oversee project management instead. Although one single person can take the lead on project implementation it would be recommended that an additional colleague is involved in the project on a part-time basis, so as to ensure that when the project manager might leave, the unit still contains one person who is familiar with the project.

- Because of the three-regional approach of the project, and the decentralized approach it has taken to implement activities in each of these three regions, the project management structure involves many stakeholders and many beneficiaries. In general the evaluators felt that the involvement of the large number of stakeholders was admirable and in many cases led to good results and outreach. The TE also observed that many of the stakeholders were well informed of their tasks and responsibilities under the contracts signed with FECO/PMOs.

Recommendation: For future projects, it would be recommended that direct project stakeholders and sub-contractors, meet at least once a year under the organizational leadership of FECO and UNDP to exchange information on the status of project implementation. This would also allow for the exchange of lessons-learned between regions.

3.3 Project Results

Project Achievements

132. The project has supported many different activities and has achieved important successes. To list these is not the purpose of a Terminal Evaluation. However, in order for readers who might not be that familiar with the project itself, a summary of the project's activities and achievements is provided below – organized by project outcome.

133. This particular section of the TE report, does not provide an opinion on the activities conducted, it aims simply to provide a snapshot of conducted activities.

Outcome 1: Institutions and mechanism for project management and coordination

Activity 1: Establish project management institutions and build operational capacity.

Activity 1.1	Establish project management institutions and coordination mechanisms.
Activity 1.2	Establish a national expert team to provide technical and consulting supports to project implementation.
Activity 1.3	Conduct trainings to improve managerial and technical capabilities for project implementation.
Activity 1.4	Conduct study tour abroad.

134. At the time of the Mid-Term Evaluation the above listed project activities had already been implemented and completed. After the MTE, established structures continued to be a good foundation and provided efficient and effective technical support and project management to the project.

135. The cross-sectoral steering committee (TPR) with high-level (division director) officials from the Ministry of Environmental Protection (MEP), the Fishing Boat Inspection Bureau under the Ministry of Agriculture, and the China Classification Society (CCS) met on a regular and irregular basis during the project's implementation. TPR Meetings were held to provide guidance and coordination on important policy issues, such as the ban on DDT use in antifouling products, international experiences, establishment and enforcement of new regimes for antifouling paint product certification, creation of synergies with other international conventions such AFS Convention and Hong Kong Convention.

Act. 1.1: Establish project management institutions and coordination mechanisms: The national project management team, established at the Convention Implementation Office (CIO), Project Management Office Division V within FECO/MEP, comprises of a project manager, a project coordinator, and a project assistant, to undertake overall project management and coordination functions to ensure smooth project implementation. In addition to managing contractual arrangements for consultants and subcontractors, which are providing support to the project at national and local levels, the national project management team has organized meetings for exchange of experiences, discussions, evaluations and review with participation of key project experts and stakeholders. On behalf of the project management team, the national project coordinator has undertaken many field visits to project beneficiaries and regional PMOs to help coordinate project implementation, monitor project progress, including review of inputs provided by consultants and subcontractors.

Recognizing the importance to leverage the support from local partners and the close interaction and intervention with the targeted beneficiaries and participants, three (3) local project management offices (PMOs) were established in Shandong Province for the North Sea Area, Ningbo city of Zhejiang Province for the East Sea Area, and Guangdong Province for the South Sea Area, based on their geographic advantage and existing foundation of their involvement in Stockholm Convention implementation.

TORs for the local project management offices were prepared on a yearly basis by identifying the needs of local support according to the project document. The local PMOs were established in 2009, and continued to function until the project's

completion in 2014. The local PMOs were established with human resources seconded from the local Environmental Protection Bureau and local Fishing Boat Inspection Bureau (Ningbo).

PMOs were particularly active in interacting with local stakeholders (such as AFP manufacturers, research institutions, universities, shipyards, fishing villages, vessels owners) and organized, coordinated and monitored on-ship patch tests, training, workshops, facilitated the development of the MAM-PEC scenario, promoted the incentive program, supported contaminated site investigation, supported joint enforcement of revised regulations, raised awareness within their jurisdictions, etc.,

Act. 1.2: Establish a national expert team to provide technical and consulting supports to project implementation: A Chief Technical Advisor (CTA) and a National Technical Advisor (NTA) were recruited, they paired up to provide overall technical guidance to project implementation. In addition, a number of national and international experts were recruited to provide thematic expertise in areas of anti-fouling paint efficacy tests, risk assessments, policy and regulatory review, environmental monitoring, socio-economic assessment, incentive program design and awareness raising (see Table 14 below).

Table 14: National and International Experts recruited to provide TA

No.	Consultant	Scope of the Contract
1	William Kwan	CTA (after MTE)
2	Gunnar Bengtsson	CTA (before MTE)
3	Jiang Feng	NTA
4	Zheng Minghui	DDT content monitoring in the environment
5	Huang Jun	Test and analysis method of DDT, TBT and copper
6	Xia Youfu	Socio-economic impact assessment
7	Cao Jingyi	Alternative selection support - ship test
8	Cao Aocheng	Alternative selection support - biocide
9	Wang Jianbing	Alternative assessment on environmental friendliness-environment exposure
10	Huang Jun	Publicity material preparation and campaign strategy
11	Gong Xuanwei	Policy on commercial ships
12	Zhang Zhuli	Policy on fishing vessels
13	Liu Xiang	AFP contaminated sites assessment
14	Xu Yunxi	Incentive Program Development
15	Wang Jian	Alternative Production management
16	Hans Blanck	Antifouling paint formulation and production
17	Shan I Cheng	Development of Chinese emission scenario in MAMPEC
18	Kevin Long	AFP Risk Assessment

National experts in environmental risk assessment were lacking in China due to the loose regulation of AFPs in terms of their environmental risks. Therefore, an international expert in environmental risk assessment was recruited since 2009 to transfer international experience to the national counterparts and other stakeholders in the industry.

Act. 1.3: Conduct trainings to improve managerial and technical capabilities for project implementation: Trainings and workshops on project implementation, task planning,

progress tracing, contracting, procurement and financial management, and Monitoring and Evaluation were conducted for the national and local project management teams and technical teams. During the course of the project's implementation three such training workshops were organized (in April 2009, December 2009 and March 2010). Training improved the capacity of PMOs in their managerial and technical capabilities for project management and manage project activities and outputs to meet expected results.

Annual workshops between the national project management team and the local project management offices have been held to share information, better understand the progress, issues, problems, and develop corrective measures during the project implementation.

Act. 1.4: Conduct study tour abroad: Two study tours abroad were organized during the project's duration.

In May-June 2009, a delegation consisting of members representing the Fishing Boat Inspection Bureau under the Ministry of Agriculture, the China Classification Society, and the Ministry of Environmental Protection visited research institutions, regulatory agencies, and production and application plants in Sweden and UK under the auspices of Swedish Chemical Agency (KEMI). The then CTA from Sweden and the Environmental Risk Assessment Expert from UK technically assisted the local visits. The delegation learned about advanced experience and technologies in researching and developing new anti-foulants and antifouling mechanisms, phasing out of TBT based AFP, pleasure boat marina management, capsaicin use, biocide and AFP regulations, risk assessments, alternatives to chemically acting antifouling paints, and environmentally sound development and production of antifouling paints in Sweden and UK.

Following the study tour observations, an international workshop for information exchange was held in October 2009, with participation of resource persons and representatives of the international paint industry, biocide manufacturers, the European Paint Association, and international consultants, in order to present topics on research and development, registration, and risk assessment of antifouling paint. The national expert on risk assessment presented the risk assessment process and methods to seek comments and suggestions from the meeting participants.

An international workshop between China and Sweden was held in October 26-27, 2010 to learn from experience from Sweden in regulating antifouling paint products and exchange information about the progress and results of the project. The workshop was organized in the framework of the bi-lateral cooperation program between China and Sweden on chemicals management. More than 60 representatives from governments, industries, enterprises, and research institutions participated in the workshop. The workshop covered a wide range of topics including regulations, technologies, risk assessment, environmental labeling standards, and awareness raising.

During November 20-27, 2013, CIO organized a delegation consisting of an official in charge of chemicals management at Ministry of Environmental Protection, the project director at FECO, the project officer and 2 project officers from the local project

management offices to visit US and Canada to gain experience in antifouling biocide management in specific and chemicals management in general. The delegation was received by the US EPA, Canadian Paint and Coatings Association, Akzo Nobel, and Sherwin Williams Chemical Group Co., Ltd., and was able to gain experience in biocide registration, risk assessment, and environment care for the industry.

Outcome 2: Establish an MIS and a website

<i>Activity 2: Establish an MIS and website for the project</i>	
Activity 2.1	Establish an MIS.
Activity 2.2	Establish a mechanism for effective information transmission and sharing.
Activity 2.3	Establish a website to disseminate project information to the public.

Act. 2.1: Establish an MIS: Development of MIS was completed and launched at the beginning of 2009. Information, documents, contracts, work plans, progress reports etc. necessary for project management were uploaded into the MIS to facilitate monitoring implementation progress, policy and regulations related activities.

In 2012, FECO incorporated the project’s MIS into the overall architecture of its POPs MIS. Access to the MIS system is limited to FECO project managers. It is estimated that approximately 15 staff make use of the system. PMOs or other project stakeholders do not have access.

Act. 2.2: Establish a mechanism for effective information transmission and sharing: The project supported an environmental monitoring programme as well as a socio-economic impact evaluation.

Socio-economic impact assessment: Two rounds of socio-economic surveys provided data and analysis for all the three sea areas to characterize the socio-economic profile of the sector as well as its key stakeholders, including AFP producers, suppliers, distributors and end users. The report also reported on the potential socio-economic impacts resulting from the introduction of alternatives to the market, focused on the estimation of total costs between DDT AFP and alternatives, and on potential technical, economic, and administrative instruments to help close up the cost gap. The environmental, health, and social benefits from deploying alternatives in the market were also analyzed in the report. The draft report was reviewed and discussed end of January 2009.

The outcomes of the report of the socio-economic surveys were used throughout the project’s implementation as basis for the development and implementation of the incentive programme for promotion of the alternatives.

Environmental Monitoring Programme: The environmental monitoring program aimed to compare the DDT concentrations in sea waters, air, sediments, and typical marine organisms before and after the substitution of DDT AFP. In November 2008, the project commissioned the Ningbo Municipal Environmental Monitoring Station to collect and analyze samples in South Sea and East Sea, in accordance with national standards and applying proper quality control measures.

DDT and metabolites including p,p'-DDE, p,p'-DDD, p,p'-DDT, and o,p'-DDT as well as their total concentrations were analyzed. The results showed moderate to severe exceeding of the DDT standards in almost all collected seawater, sediment, and sea organism samples.

To verify the impact of the project, in 2013 CIO commissioned SGS to carry out the sampling and analysis of DDT concentrations in seawater, sediment, and organisms. The sampling points were identical with the ones for baseline monitoring so that the results could be compared to reflect the project performance and impacts.

The results of both studies have been presented in Table 19. The result show that for most sampling points concentrations of DDT and metabolites have significantly reduced over the project's duration, and that the measured concentrations are within the limits stipulated by the quality standards for sea water, sediment, and organisms.

The 2013 study also included the sampling and monitoring of TBT and copper concentrations in seawater, sediment, and organisms, with the purpose of establishing a baseline for future environmental monitoring initiatives.

Act. 2.3: Establish a website to disseminate project information to the public: A website was developed in Chinese <http://afp.china-pops.org/>. Although the website has an English version, it has not been populated, which doesn't allow for the dissemination of project results beyond China. It would be recommended that the most useful documents prepared under the project would be translated in English and posted on the project's website.

Outcome 3: Enabling policy environment

Activity 3: *Establish or revise regulations, standards, and action plan supported by capacity building to create an enabling policy environment for phase out of DDT based antifouling paint and promotion of sustainable alternatives.*

Activity 3.1	Establish or revise related regulations, standards, and rules.
Activity 3.2	Revise compulsory rules of inspection of ship products.
Activity 3.3	Establish and promote a voluntary certification and labeling program in the antifouling paint sector.
Activity 3.4	Sustain DDT phase out by reducing the potential risk of TBT use in antifouling paint.
Activity 3.5	Strengthen capacity of related departments to effectively implement and enforce regulations and standards.

Act. 3.1: Establish or revise related regulations, standards, and rules: *General Specification for Antifouling Paint on Ship Bottom (GB/T 6822-1986)* was the technical standard for the Fishing Boat Inspection Bureau under the Ministry of Agriculture and the China Classification Society (CCS) to certify antifouling paint products.

Since 2002, the National Technical Committee for Coating and Pigment Standardization (TC5), which is responsible for the establishment and revision of national and industrial

standards of coatings, started the revision of the standard for AFP. Initially they adding an organotin indicator to the standard, but DDT had not been specially addressed.

TC5 representatives were invited to attend the technical meetings of the AFP project to with the objective to ensure that DDT concerns and its future elimination would also be addressed by the standard.

The resulting “*Anticorrosive and Antifouling Paints System for Ship Hull (GB/T 6822-2007)*” which is the updated version of GB/T 6822-1986, becoming effective on April 1, 2008. DDT is explicitly banned in this standard.

The ban allowed the project to achieve the project’s objective to eliminate 250 MT DDT per year used for production of DDT based antifouling paints. However, the ban was not anticipated to be imposed that early during the project’s implementation, and created considerable pressure on the project for the rapid identification and deployment of feasible alternatives to DDT based antifouling paints.

In order to support the ban on DDT use in the antifouling paint, a method to detect the DDT content in AFPs had to be developed. Tsinghua University was commissioned by the project to develop a method for DDT content detection in AFPs, which was reviewed and approved by the State Standardization Administration after iterative use and validation of the alternatives through lab analyses conducted by Tsinghua University. The “*Method to Detect the DDT Content in AFPs*” standard is now officially published as a GB coded national standard (GB/T 25011-2010).

A ban on the production, distribution, uses and import of POPs pesticides, including the use of DDT in the production of AFPs, was issued jointly by ten ministries on May 17, 2009 (before the end of the exemption of DDT uses granted by the Stockholm Convention).

Act. 3.2: Revise compulsory rules of inspection of ship products: Following the coming into force of standard (*GB/T 6822-2007*) in 2008, the project coordinated with the Fishing Boat Inspection Bureau (FBIB) and China Classification Society (CCS) to ensure that the “*Rules on Fishing Boat Product Inspection*” (implemented by the Fishing Boat Inspection Bureau) and “*Rules on Ship Product Inspection*” (implemented by China Classification Society) were revised by incorporating the requirement for DDT elimination from the antifouling products. Accordingly, both FBIB and CCS removed DDT containing AFPs from the list of certified ship products.

Act. 3.3: Establish and promote a voluntary certification and labeling program in the antifouling paint sector: The China Environmental Product Certification and Labeling Center, which receives technical guidance from the Ministry of Environmental Protection on environmental labels, was engaged by the project to establish and monitor the voluntary certification and labeling program.

The standard developed by the China Environmental Product Certification and Labeling Center “*Technical Requirements for Environmental Labeling of Products*” bans or limits the use of certain substances that were previously used in large quantities in AFPs as

solvents (such as Di-n-octylphthalate, Dibutylphthalate, 2-Methoxyethanol 109-86-4, 2-Methoxyethyl acetate, 2-Ethoxyethanol, 2-Ethoxyethyl acetate, 2-(2-Butoxyethoxy) ethyl acetate, n-Hexane) or biocides (such as DDT, TBT, copper, and some heavy metals). Risk assessment principles and procedures developed by the project were included in the standard to help determine the level of risks of the active substances added to the AFPs. The standard was the first of its kind in China addressing concerns related to environmental risks of AFPs.

The environmental labeling standard is supposed to be met by the top 20% of AFP products, which is expected to lead to the remaining 80% of AFP products to catch up with the higher standard. The standards are expected to be updated on a dynamic basis.

In the process of the standard's preparation, representative samples from AFP manufacturers were used to verify the 20% criterion. FECO and the three PMOs assisted in the collection of all samples that would undergo efficacy tests and risk assessments. Final values for the limits have been readjusted based on the results from the certified laboratory tests.

A workshop on the environmental labeling standard and environmental risk assessment of antifouling paints was held in Beijing on March 2009. More than 30 participants from the MEP Certification Center (responsible for the review and approval of applications from enterprises), enterprises, which produced AFP alternatives, the China Coating Industry Association, and international enterprises who show interests in the standard attended the workshop. Feedback received on the standard was addressed in its subsequent version, which was published on the official website of MEP for comments from the stakeholders and the general public in the country and abroad.

The standard coded HJ 2515-2012 has been promulgated and was made effective by the Ministry of Environmental Protection.

To encourage antifouling paint manufacturers to upgrade their technologies and products to meet the standard, a 50,000 RMB incentive will be reimbursed upon successful certification of each product.

At the time of the TE, 6 companies had applied for the voluntary labeling certification, wanting to label 16 AFPs. The certification results are expected to be available by end of September 2014.

Act. 3.4: Sustain DDT phase out by reducing the potential risk of TBT use in antifouling paint: The project also aimed to use successful experiences in DDT AFP phase out to support China to accede to the IMO Convention on the Control of Harmful Anti-Fouling systems on Ships (2001) and start the elimination of TBT based antifouling paint, with the ultimate aim to establish a long-term mechanism to protect the marine environment and human health from pollution of harmful antifouling systems.

The project was able to support the commercial ship (CCS) and fishing ship inspection authorities (FBIB) by building their capacity on inspection, certification, reporting/monitoring for effective enforcement through training and raising awareness

on the harmful effects of certain AFPs, while the policy instruments established and strengthened by the project facilitated the accession and implementation of the TBT Convention.

On June 7, 2011, the AFS Convention entered into force in China. Although no particular regulations were put in place, voluntary compliance to phase out the use of TBT (organotin)-based AFPs started in 2000 (mostly to avoid unnecessary economic losses later on). CCS believes that currently, all its commercial vessels are compliant.

Act. 3.5: Strengthen capacity of related departments to effectively implement and enforce regulations and standards:

Environmental authorities: To inspect the enforcement of the ban on production, distribution, consumption, import, and export of POPs pesticides, including DDT in China following the issuance of the ban jointly by 10 ministries, a training workshop involving national and local environmental inspectors was held on May 25, 2009 to introduce the methodology, tools, and responsibilities for the inspection on the production, distribution, consumption, import, and export of POPs pesticides. Following the training, 15 chemical plants which produced DDT in the past, 11 AFP manufacturers, and dozens of fishing shipyards were inspected and it was found no DDT has been produced or used since the issuance of the ban in July 2009.

Ship product certification authorities: China's Register of Fishing Vessels issued an order to its subordinates to strengthen the registration and certification of antifouling paints in accordance with the upgraded regulations regarding the ban on DDT and other harmful substances.

Rounds of dialogues have been initiated by the project with the China Fishing Vessel Register under the Ministry of Agriculture and the China Classification Society, to encourage them to incorporate risk assessments into the certification system for antifouling paint products. The ultimate purpose of such incorporation is to ensure the sustainable adoption and application of risk assessment criteria after the project's completion, and establish a long-term mechanism for preventing harmful high-risk antifouling paint products from entering the market.

In addition, the project advocated for the designation of qualified laboratories for ecotoxicological tests and risk characterization, and to encourage the two ship product certification authorities in China to review all issued certificates and certificate new products against risk assessment criteria.

The China Fishing Vessel Register revised its certification rules for antifouling paints to ban the use of DDT and TBT. On September 26, 2013, a training workshop was organized to inform stakeholders (fish product inspectors, antifouling paint manufacturers, and shipyards) from 11 coastal provinces on the new requirements. More than 100 people participated in the workshop.

Three laboratories were accredited and contracted for the detection of DDT and TBT contents in antifouling paints after the inspection and validation of their equipment,

staffing, and QA/QC system.

Samples of 17 AFP products were collected, prepared, and analyzed in terms of the DDT and TBT concentrations. The analysis demonstrated that none of the samples indicated DDT and TBT concentrations exceeding the limits stipulated by the national product standard GB/T 6822-2007 for AFPs.

The China Classification Society developed a special guideline for certification of AFPs containing biocides. The guideline incorporated the risk assessment methodology.

Two laboratories (Shanghai Academy of Public Measurement and Guangdong Detection Center of Microbiology) were supported by the project to build their capacity for hazard and exposure assessment and risk characterization of antifouling paints.

A comparative study has identified a list of active substances for which there is adequate toxicological and eco-toxicological data available from the public domain. AFP manufactures are exempted from carrying out risk assessment for these substances, but the risk assessment of antifouling paint products containing these substances is still needed.

Should any paint manufacturer use active substance not listed, risk assessments of the active substances and the AFP product would have to be carried out.

In October 2013, a training workshop to inform project stakeholders on the requirements and methodology for risk assessment was organized. 68 representatives from 52 manufacturers participated.

Outcome 4: Conversion from DDT based antifouling paints to alternatives.

Activity 4: Adopt multiple means of technological support, policy induction, market regulation, and awareness raising and education to promote the conversion from DDT/TBT based antifouling paints to alternatives.

Activity 4.1	Test, select and acquire alternative technologies.
Activity 4.2	Select demonstration enterprises.
Activity 4.3	Produce, distribute and promote alternatives.
Activity 4.4	Conduct environmental sound management of DDT at contaminated sites and on equipment.

Act. 4.1: Test, select and acquire alternative technologies:

AFP Efficacy tests: Efficacy tests were necessary to verify the technical performance of AFP alternatives to ensure that they meet the functional needs of the end users.

The project team organized 2 rounds of panel tests for testing efficacy of AFP alternatives. The first batch of 58 alternatives was submerged in East Sea in July 2007, and the second batch of 40 alternatives was submerged in North Sea, East Sea and

South Sea in May 2008. AFP alternatives had to be tested in all the three regions because of the differences in water composition and marine life. Data on antifouling rates, antifouling species, and the physicochemical performances of the alternatives was recorded on a quarterly basis in the first half year and on a bi-annual basis remaining test period, according to requirements of the national standard “Method for Testing Antifouling Panels in Shallow Submergence (GB/T 5370-2007)”. The panel test data was subsequently used to support the selection of alternatives for the on-ship patch test.

Based on the analysis of the data from the panel test during the 2 first rounds, and the data from the lab tests on physicochemical properties, for most of the alternatives technical flaws in efficacy or physicochemical properties were detected. Although no alternatives were found to have a total-tin content exceeding limits specified by the AFS Convention, some alternatives contained a too high content of copper, which give rise to concerns. To address these concerns, the project organized one more round of panel test for improved formulations, so that enterprises and research institutes had the opportunity to improve efficacy and physicochemical performance of their products. This third testing round took an additional 1-year, which led to a delay in project implementation.

For the on-ship patch tests, a standard method for efficacy evaluation was used based on GB/T 5370-2007 and ISO standard 4628 for Paint and Varnish Evaluation.

The 3 local PMOs made recommendations for the selection of shipyards would had expressed interest to participate in the project by undertaking ship hull surface preparation and painting of the alternatives as well as providing “test” vessels. “Preselected” shipyards docks were visited by the project management team and on-ship patch test consultant to verify their qualifications.

On-ship tests were carried out in Yangjiang City in the South China Sea, Ningbo City in the East China Sea, and Weihai City in the North China Sea. In the South China Sea, 4 alternatives were painted on two 35- meter long steel ships and 8 alternatives on four 35-meter long wooden ships. In the East China Sea, 18 alternatives were painted on 4 45-meter long steel ships. In the North China Sea, 12 alternatives were painted on 6 steel ships and 7 alternatives on four 35-meter long wooden ships.

Subsequently, efficacy data of 3 months on-ship patch tests in the South Sea, 6 months and 12 months in all seas were checked, recorded and reported. FECO organized a workshop to review the efficacy tests on September 3, 2010.

A final efficacy assessment workshop was held on October 14, 2010. Based on the efficacy results from the on-ship patch tests and the results from the lab tests for mechanic-physical properties and DDT, TBT, copper contents, 11 samples were selected as alternatives with superior efficacy for North Sea Area, 8 samples for East Sea Area, and 7 samples for South Sea Area. (there were duplicate alternatives in three areas, and in total 14 different alternatives were selected). Some alternatives, while considered effective for 6 months, could not meet the one-year effectiveness requirement but could be considered for use on wooden boats that generally do not require antifouling effect for one full year.

4th round of alternatives selection: Recognizing the advancement of technologies since the inception of the project and to encourage more qualified alternatives to enter the market, the project organized a final round of alternative selection in 2013. This selection round adopted the same methodology as previous rounds, however this time around efficacy have to be supported by a test report prepared by an authorized test institutions. In total, 24 products from 11 manufacturers have passed the selection.

Risk Assessments: In conjunction with the analysis of AFP samples during panel tests, enterprises and research institutes were also required to prepare an environmental risk assessment (ERA) for AFP alternatives. The ERA dossier and a draft method were developed by the national environmental risk assessment consultant, based on the PEC/PNEC ratio principal and technical guidance adopted by the OECD countries for environmental risk assessment of antifouling products containing active ingredients.

The enterprises and research institutes had challenges filling out the ERA dossiers, in particular with the required literature review and necessary experiments. The marine environment also had to be surveyed, to provide data for running the MAM-PEC model, developed to predict environmental concentrations of AFP active ingredients. As a solution an international environmental risk assessment expert was hired who provided training on data collection and data generation.

With data available from the public domain and information provided by the project's AFP's manufacturers and research institutions, project experts were able to finish the preliminary risk assessments. Six AFP alternatives were assessed to have a low environmental risk. Alternatives containing capsaicin and TPBP as active ingredients were assessed to be of risk, resulting from a lack of sufficient hazard/effect data from eco-toxicological tests.

The project then contracted a qualified eco-toxicological institution to conduct necessary datasets to allow for more reliable and convincing risk assessments to be undertaken reviewing these alternatives containing capsaicin and TPBP. The results, which came out in the first quarter of 2011, indicated that capsaicin containing alternatives are of low risk concern, while TPBP containing alternatives were of high risk concern.

Act. 4.2: Select demonstration enterprises: A project consultant was engaged to design the incentive programme to promote conversion to the manufacturing of feasible AFP alternatives. The incentive programme described general principles, subsidization model, eligibility, scale, monitoring, verification, and distribution. In addition, an application dossier with instructions for the provision of required data and information about the applicant, the product information, and production and distribution promotion models was also developed.

Three rounds of the incentive programme were supported through the project. In preparation for each incentive round, training was provided to candidate enterprises. Following the training, enterprises prepared and submitted business plans (in FECO template), which were subsequently reviewed by a FECO organized expert group.

Feedback was provided to the enterprises and if comments were properly addressed, a contract was signed between FECO and the enterprises.

During round II the incentive programme was adapted a bit to various beneficiaries (e.g. AFP producers as well as AFP users, both shipyards and ship owners), as it became apparent that the most influential incentive to shift to the use of DDT-free alternatives was the price of the alternatives. As such the incentive programme aimed to keep the price of the alternative lower by funding 10% of their production costs, and encourage AFP producers to use a combination of promotional activities, such as discounts, free samples and coupons, to market AFP alternatives.

In table 15 are presented the details on the number of the incentive programme’s beneficiaries.

Act. 4.3: Produce, distribute and promote alternatives: Following the approval of the manufacturers business plan and the signing of the contracts, the enterprises started the production and distribution of alternatives according to the business plans.

For the first round of the incentive programme, FECO contracted a professional accounting firm supported by technical individuals to inspect and verify the implementation of the business plans (audit and verify actual AFP alternative production volumes against production volumes stipulated in the FECO contract). The technical review process focused on: 1) The manufacturing process and equipment; 2) The raw material storage and inventory; 3) The manufacturing records and quality control records; 4) The product type certificate; 5) The storage and inventory of finished products; 6) On-site quality control tests, and 7) The enterprise product standard. The accountants reviewed the financial transaction materials including orders, contracts, inventories, sales invoices; cash receipt invoices, and end user invoices in order to determine the actual production and distribution of alternatives.

For the second and third rounds of the incentive programme, FECO commissioned the China Coating Industrial Association for technical verification of alternatives production and consumption, and Ruihua Certified Public Accountants (an accounting firm) for financial verification for the second and third stages of incentive program.

In table 15 are presented the details on the quantities of the AFP manufactured as part of the incentive programme.

Table 15: Outcomes of the alternatives incentive programme

Round	Timing	Number of manufacturers	Alternative production/circulated tonnage
I	July 1 – Nov 30, 2011	7	971
II	Feb 1 – July 31, 2013	7	864
III	Aug 1 – Nov 30, 2013	14	1423

In total the incentive programme supported the production of 3,258 MT of AFP alternatives through three rounds of the incentive programme.

In addition to the incentive programme, AFP manufacturers also produced AFP alternatives “outside” of the incentive programme. According to the National Coatings Industry Association it was estimated that this quantity totaled approximately 3,403 MT over the project’s entire duration. Therefore, in total 6,661 MT of AFP alternatives were produced with the support of the project.

Act. 4.4: Conduct environmental sound management of DDT at contaminated sites and on equipment:

The project initially envisaged undertaking the environmental sound management of DDT and DDT contaminated equipment at contaminated sites, through the decommissioning of DDT production equipment at Tianjin Chemical Plant (DDT production facility) and subsequent environmentally sound disposal.

A technical expert on DDT contaminated sites was engaged by the project, who worked with the Marine Chemical Research Institute of Qingdao on a preliminary survey of DDT contaminated sites. Based on a preliminary survey, four companies (2 AFP manufacturers and 2 shipyards) were temporarily labeled as high-risk priority “A”, indicating a requirement for regular monitoring.

Further investigation indicated that the 2 AFP manufacturing plants did not have serious DDT pollution, however at the 2 shipyards surprisingly high levels of DDT contamination were found as a result of the discharge of DDT containing slag waste, resulting from the painting and removal process.

The project completed the risk assessment for typical contaminated sites of DDT antifouling paint (shipyards and DDT antifouling paint manufacturing factories) and recommendations were made for the improvement of the environmental management of such sites. The project also supported the identification of priority sites that need to be investigated in details for the development of remediation plans. In addition, a list of shipyards that have ever applied and removed DDT based antifouling paint in open space, was also established.

Cleaner production in shipyards: As such, the project decided to support shipyards in adopting Cleaner Production measures to minimize the amount of DDT and other harmful biocides contained in AFPs from entering the environment. Four (4) demonstration shipyards (China Southwest Shipyard and Qinghang Shipyard in Guangzhou, and Xinghai Shipyard and Donghai Shipyard in Weihai) were selected as well as one (1) ship dismantling facility (Zhoushan Ship dismantling Plant).

The project, in partnership with 4 entities (Shangdong University; Sanrun Environmental Technology Co. Ltd; Guangdong Academy of Environmental Science; Communication & Education Center of Guangdong Environmental Protection) assessed practices at dozens of shipyards, both in China (to obtain a sense of current practices) and abroad (to obtain a sense of best practices). Based on observations, cleaner production manuals and

templates for two regions (Guangzhou and Weihai) were developed.

The project also supported the implementation of CP measures and technologies at 4 selected shipyards. The CP interventions focused on the ship hull surface processing and painting, meanwhile also looking at areas for energy and resources efficiency and pollution abatement. Audit reports indicated that the piloted cleaner production measures have generated significant economic and environmental benefits.

Guidelines have been prepared by distilling experiences and lessons-learned from the pilots, and have been promulgated at the provincial level. In the 2014, training workshops have been organized to impart the experience to other shipyards.

Environmentally sound removal and management of antifouling paint residues from ship recycling process: Recognizing that ship recycling can be a significant source of harmful releases to the environment (AFP residue containing harmful biocides such as DDT and TBT), the project supported an initiative for environmentally sound removal and management of antifouling paint residues from ship hulls.

Zhoushan Changhong International Ship Recycling Co., Ltd. was selected to implement the initiative in association with Zhejiang University. The consortium first detected the types and contents of harmful AFs in the paint residue. The surface covered with paint residue was then transferred to a closed negative-pressured space for mechanical removal of the paint residue. The dust and VOCs from this process were collected into a baghouse and active carbon bed for filtration and purification before emission into the air. All residues were collected and contained in special containers with labels pasted indicating the components and hazards of the materials, and finally transferred for disposal at a licensed incineration facility. Experience from the initiative implementation was summarized for the formulation of a guideline.

For all the 5 demonstration sites, the project supported the training and awareness raising of shipyard personnel and also provided funding for equipment for AFP removal, and in some cases funding for equipment for AFP application and air pollution treatment devices, among else (see photos and descriptions in Annex XII).

Outcome 5: Environmental education and awareness raising

Activity 5: *Conduct environmental education to promote the environmental awareness of the key stakeholders and the public, improve their understanding of the harm of DDT/TBT based antifouling paints and the benefits of alternatives.*

Activity 5.1	Prepare publicity materials for environmental education and awareness raising purpose targeting government officials, personnel in the industrial field and the public through multiple media of TV, radio, newspaper, magazine, journal, Internet, CD-ROM, and printing materials.
Activity 5.2	Mobilize NGOs to conduct community based environmental education and awareness raising

Act. 5.1: An overall strategy for awareness raising was developed to implement awareness raising activities. The strategy envisaged awareness raising tasks as cost-

effective means to change behaviors towards DDT free alternatives and improving the project's viability and impacts among its key stakeholders and the general public, with the ultimate aim to ensure the sustainability of the DDT based AFP phase out.

Posters and brochures for raising environmental awareness among the general public as well as AFP users (shipyards and shop owners), were prepared, printed and distributed.

Large-scale training workshops aiming at awareness raising and education among antifouling paint users were organized in the three seas areas jointly by national and local project management offices. These workshops targeted fishermen, fishing ship owners and operators who are the primary users of AFPs. They were introduced to the harm of DDT based antifouling paint and the benefits of choosing alternatives with the aim to create awareness and foster acceptance of alternatives to DDT based AFPs.

A documentary containing all milestones events of the project, highlighting good practices and experiences from the project and knowledge/experience resulting from the selection of alternatives was under production at the time of the TE (May 2014). A special issue of professional magazine "Paints in China" is also being published. The magazine's special issue will summarize the outcomes and experiences of the project, and project stakeholders will write about their participation in the project as well as the ways in which they have contributed to the success of the project, and share experiences and benefits gained as a result of the project. A publication summarizing the risk assessment technologies/processes, as well as outcomes of the AFP risk assessments is also under development. During the remainder of 2014, it is also envisaged to engage sub-contractors to support FECO's POPs communication strategy and action plan; organize a photo exhibition and dissemination strategy; write a POPs song; and organize a travelling exhibit campaign.

Act. 5.2: The PMO, with the engagement of local community based organizations, universities and their students, undertook community based environmental education and awareness raising through outreach and visits to fishermen villages by project experts, stakeholders as well as volunteers.

For example, on June 5 2010, the 38th World Environment Day, taking advantage of the fishing ban from June 1st to September 16 in the East Sea Area, the LPMO organized an awareness raising event in Xiangshan County, where fishing ships are concentrated. The event targeted fishermen and general public. Brochures and posters introducing harms of DDT antifouling paint and protection of the marine environment were distributed as well as other awareness raising materials (t-shirts, hats, etc.).

From September 15 to 16, Guangdong Provincial Environmental Protection Department, supported by Guangdong Provincial Environmental Awareness and Education Center, organized a workshop in Zhanjiang, a coastal city in Guangdong province. More than 70 representatives of shipyards, ship-owners, fishermen, and college volunteers attended the meeting.

Volunteers from the Environmental Protection Association of Zhanjiang University, were trained in the project's objectives and awareness raising approaches. Posters and brochures were then distributed by hand to fishermen, ship-owners, and the public in

ports. Such community based environmental education and awareness raising activities were also carried out in other coastal cities of the province by mobilizing the environmental protection associations of the local universities.

Finally, a training workshop was held at Weihai City targeting the officials from the environmental EPBs of the six coastal cities in Shandong Province.

Outcome 6: Monitoring and evaluation

<i>Activity 6: Effective monitoring and evaluation on project implementation and achieved results</i>	
Activity 6.1	Conduct regular meetings to review progress and project result review.
Activity 6.2	Launch field investigations and inspections to monitor and evaluate progress of project implementation.
Activity 6.3	Prepare progress reports for measurement of Means of Verification to monitor project purpose indicators, project progress and performance.
Activity 6.4	Conduct annual project audit

Act. 6.1: Conduct regular meetings to review progress and project result review: The project’s Inception Workshop was held in October 2007 involving a wide range of stakeholders from government entities, industry, and industrial associations.

Annual work plans (AWPs) were prepared and discussed amongst and between all project participants, in particular, local, national project management teams and UNDP and then finalized each year to guide the work of the project. Quarterly operational reports, annual project reports, project implementation review, annual project review reports, quarterly financial expenditure reports, funding authorization and certification of annual expenditures were prepared, reviewed and endorsed. Frequent meetings were conducted to keep trace of project progress, to verify that project activities were implemented as planned to achieve expected results.

In June 2009, FECO organized a meeting to have all consultants and subcontractors present progress and results for peer review. All local project management staff attended to understand their roles in co-executing project activities. All antifouling paint enterprises that submitted samples for testing and evaluation under this project also attended to understand the methods, criteria and procedures for efficacy test, risk assessment, cost estimation, and incentives for production and distribution of the selected qualified alternatives. Other significant issues identified at this meeting include the monitoring of DDT concentration in sediment and seawater in and around the shipyards to determine if contamination of DDT exists. By presenting the progress, results and plans of the project implementation to relevant stakeholders, project implementation has enjoyed the support from stakeholders and achieved substantial progress.

Act. 6.2: Launch field investigations and inspections to monitor and evaluate progress of project implementation: The FECO project coordinator and the National Technical Advisor as well as the local PMOs and other key partners, undertook frequent site visits to evaluated progress of project implementation.

Act. 6.3: Prepare progress reports for measurement of Means of Verification to monitor project purpose indicators, project progress and performance: The project team prepared and submitted to UNDP on a yearly basis: the annual project review, the project implementation review, the annual work plan, 4 quarterly operational reports, and 4 quarterly project reports according to UNDP M&E requirements.

An independent mid-term evaluation was carried out from April to July 2011. The evaluators conducted desk reviews, stakeholder interviews, site visits, and participated in meetings and presentations to review the relevance, progress, impacts, and sustainability of the project’s design, management and implementation. Recommendations were made regarding project management, selection of alternatives, the monitoring program, incentive program, and extension of project completion.

An independent terminal evaluation has been carried out before the project completion in 2014. A similar methodology as applied for the mid-term evaluation was used. The TE report was finalized and published in September 2014.

Act. 6.4: Project audits were conducted every single year.

3.3.1 Overall results (attainment of objectives) (HS)

136. With respect to the project’s objective, binding objective as well as prospective objective (See also Section 2.3 “*Immediate and development objectives of the project*”), the evaluators are pleased to report that all the project’s objectives have been achieved, even the project’s prospective objective. As such this aspect of the project has been rates as **Highly Satisfactory (HS)**.

137. In Table 15 below, the project’s objectives have been presented as well as information detailing why the evaluators believe that objectives have been achieved.

Table 16: Project Objectives and Proof of their Attainment

1. Project Objective:
DDT based antifouling paints substituted by technically feasible, economically viable, and environmentally friendly alternatives to help China fulfill the obligations under Stockholm Convention to control the use of DDT and protect the environment and human health.
Proof of achievement:
<ul style="list-style-type: none"> ▪ A Ban on using DDT in AFPs was put in place in 2009. ▪ Since 2009 the three remaining DDT manufacturing facilities in China had to cease their production and were dismantled. ▪ The project supported the introduction of 38 technically feasible, economically viable, and environmentally friendly AFP alternatives.
2. Binding Project Objective:
Eliminate the use of 250 MT/year of DDT as additives in the production of antifouling paint by conversion to non-toxic and environmentally friendly alternatives.
Proof of achievement:
<ul style="list-style-type: none"> ▪ A Ban on using DDT in AFPs was put in place in 2009. ▪ Since 2009 the three remaining DDT manufacturing facilities in China ceased their production and were dismantled.

<ul style="list-style-type: none"> ▪ The project supported the introduction of 38 technically feasible, economically viable, and environmentally friendly AFP alternatives. ▪ The Fishing Boat Inspection Bureau (FBIB) conducts yearly vessel inspections, which also verify the type of AFP used.
<p>3. Prospective Objective:</p> <p>Establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint.</p>
<ul style="list-style-type: none"> ▪ China signed the IMO Convention in July 2011 ▪ China started phasing out TBT based AFP for use on commercial vessels on a voluntary basis since 2000 ▪ DDT and TBT levels – based on the reports of Environment Monitoring Center of Ningbo and SGS, have indicated that observed DDT and TBT levels in the environment have decreased. ▪ Capacity of laboratories was built to conduct Risk Assessments of AFPs. ▪ A Green AFP Labeling Certification Programme was established. To date 6 AFP producers have applied for certification. ▪ A regulation has been drafted to require AFPs to undergo RAs.

Overall Project Results (S - HS)

138. The overall product results have been extracted from the PLF (see Objectively Verifiable Indicators) and have been presented in the Table below. From the results presented in the Table below and the ratings provided for each of the project results, it can be seen that this aspect of the project has been rates as **Satisfactory (S) – Highly Satisfactory (HS)**.

Table 17: Overall Project Results

Objectively Verifiable Indicators	Rating	Explanation
Annual production of 250 MT of DDT used for AFP stopped	S	DDT production in China has ceased since May, 2009
Zero DDT detected in AFPs	S	<ul style="list-style-type: none"> ▪ Spot checks have been conducted at the AFP production facilities, no DDT was detected. ▪ Inspection agencies require shipyards and vessel owner to provide – during yearly inspections - a certificate that no DDT AFPs have been used on the ship/vessel. ▪ However spot checks have not been conducted at shipyards, or at distributors. However, considering the DDT has been taken off the market it is assumed changes are low that DDT is still used in AFPs.
DDT levels in marine environment have decreased	HS	The reports prepared respectively by “Ningbo Municipal Environmental Monitoring Center” in 2008 and “SGS” in 2013 indicated that DDT levels have gone down (see Table 19).
Alternatives developed, produced and distributed	S	<ul style="list-style-type: none"> ▪ The project supported 18 AFP producers in developing 38 alternatives, of which 38 DDT-free alternatives have been put on the market. ▪ Over the project’s time span, AFP producers, which participated in one or more of the 3 rounds of the incentive programme, produced 3,258 MT of alternatives.

		<ul style="list-style-type: none"> An additional 3,403 MT of DDT-free alternatives were produced “outside” of the incentive programme.
Barriers to commercialize the alternatives removed	S	<ul style="list-style-type: none"> Incentive programme put in place to support AFP producers in reducing the base price of alternatives. AFP producers linked with R & D institutions to identify, select and test alternatives. Capacities of laboratories built to undertake risk assessments of new AFPs.
DDT AFP phase-out replicated for TBT phase-out	HS	<ul style="list-style-type: none"> China signed the IMO Convention in July 2011 China started phasing out TBT based AFP for use on commercial vessels on a voluntary basis since 2000 Currently no TBT based AFP are being applied on commercial vessels in China.
Concentration of TBT in the marine media reduced	HS	The reports prepared respectively by “Environment Monitoring Center of Ningbo” in 2008 and “SGS” in 2013 indicated that TBT levels have gone down (see Table 19).

3.3.2 Relevance (S)

Relevance: “Extent to which the activity is suited to local and national environmental priorities and policies and to global environmental benefits to which the GEF is dedicated.”

139. The AFP project is very relevant to the Objective of the Stockholm Convention: “to protect human health and the environment from persistent organic pollutants”, as well as National Priorities as taken up in China’s National Implementation Plan (NIP).

140. The project is also particularly well aligned with China’s National “Strategy for POPs Pesticides Reduction and Phase-Out” and Action Plan (See also section 3.1.7). The National POPs Strategy and Action Plan aims for 5 DDT specific targets as presented in Table 6 in section 3.1.7. The AFP project was specifically developed to meet target no. 2.

141. Finally, the project was also deemed highly relevant in light of national POPs activities supported and financed by the Government of China, the GEF and GEF implementing agencies.

142. Because of the reasons mentioned above, the Relevance of the project was rated Satisfactory (S).

3.3.3 Effectiveness (HS)

Effectiveness: “Extent to which an objective has been achieved or how likely it is to be achieved.”

143. As already discussed in section 3.2.1, all the project’s objectives (project objective, project binding objective as well as the project’s prospective objective) have been achieved (see also

Table 15. As such the evaluators are pleased to rate this aspect of the project as **Highly Satisfactory (HS)**.

3.3.4 Efficiency (MS)

Efficiency: "Extent to which results have been delivered with the least costly resources possible."

144. One of the TE's observations has been that the project was able to achieve its objectives (both binding and prospective objectives) earlier than expected.

145. One of the main reasons for this has been that the Government of China actively supported the phase-out of DDT through a large number of interventions (both GEF and nationally owned), through policy and legislative interventions but also by providing funding and support to stop production of DDT and dismantling of DDT producing facilities.

146. Secondly, private sector companies benefitting from capacity building and awareness raising project activities were often able to provide significant project co-financing or opted to fund the conversion to alternatives themselves, rather than participating in the incentives programme funded by the project.

147. As a result, the project ended up spending far less funding on planned project activities to achieve project objectives than anticipated. In this sense, the project has been very efficient in the use of project funding. However, this brought about subsequent challenge: how to reallocate project funding to project activities in line with the project's goal and objectives?

148. After the MTE had been concluded, the project in coordination with the national project partners and the Project's Steering Committee, identified additional/new project activities to widen the scope of the project through the involvement of additional beneficiaries and stakeholders and increase further the reach of the project's impact. Additional/new activities, such as the Risk Assessment Capacity Building of Laboratories; the Cleaner Production Demonstration Activities in 4 shipyards and 1 ship dismantling facility; among other activities were added to the project's scope.

149. Although the new activities appeared to be well implemented and quite successful, in retrospect, the Terminal Evaluation team concluded that because of the particular development pace of China, it can be assumed that projects require to be redirected more frequently than projects in countries with a slower pace of development.

Recommendation: Future GEF Chemicals and Waste projects in China would benefit from a detailed review of project and country needs at the time of the project's Inception Workshop (and redirect project activities at that time if necessary) and plan for a critical Mid-Term Technical Review (in lieu of a more general MTE) to help the project team align the project's activities and scope with the needs of the country and sector at that point in time. In between the Inception Workshop, the MTR and the closure of the project, changes to project activities and/or the project's direction, need to be proposed during Annual Project Steering Committee meetings, when deemed necessary following

developments in the country or the project's sector. If necessary the project should call upon the PSC members to convey more frequently. All this in order to ensure that the project keeps up with the development pace of the country and the sector, and keeps ensuring that it addresses the most pressing needs.

3.3.5 Country Ownership

150. China signed the Stockholm Convention on POPs in May 2011, and Congress ratified the Convention in June 2004. The Stockholm Convention entered into effect on November 11, 2004. Implementation of the Stockholm Convention is in conformity with the China State Policy on Environmental Protection.

151. With the financial support of the GEF and Technical Assistance provided by UNIDO, China started the preparation of its National Implementation Plan (NIP) in 2004, which was submitted to the Stockholm Convention Secretariat in April 2007. The NIP has served as overall guidance to the Government of China for the implementation of the Convention.

152. As part of the process for the preparation of the NIP, with the support of the Government of Italy and implemented by UNDP/UNOPS, an assessment related to the production, distribution, use, import/export and (obsolete) stockpiles of nine types of POPs was conducted. Based on the assessment results, a Strategy for the phase-out of POPs pesticides was drafted in June 2004. Table 6 summarizes the five main priorities and targets of the Strategy related to DDT. Target 2 of the Strategy is to *“Assist the enterprises which produce paint to adopt alternatives, and stop DDT as additives to produce paints”*. Since its adoption the Strategy has become part of China's NIP to guide the implementation of the Stockholm Convention.

153. Based on the Strategy and the NIP's findings, baseline information was used to develop the GEF AFP project (see also section 3.1.7). The project's development was led by FECO and a national expert team in collaboration with UNDP. The project was implemented using the National Implementation Modality (NIM) with FECO assuming the role of executing agency and UNDP assuming the role of implementing agency. Throughout the project's implementation, FECO and its project management unit, has taken the lead in the project's implementation, with UNDP providing specific support and guidance upon request of FECO.

154. Based on the observations made during the TE mission, and the manner in which the project was developed, the evaluators are of the opinion that the country's ownership for this project is very high, and that the project is entirely driven by the China's objectives for the phase-out of harmful AFPs.

3.3.6 Mainstreaming

155. For the purpose of this TE, the definition for *“mainstreaming”* as defined in the *“UNDP Guide for Integrating the Sound Management of Chemicals into Development Planning (2012)”* has been used.

Mainstreaming is used to signify the integration of Sound Management of Chemicals Priorities into a country's development plans, but also in sector strategies, local level implementation and programmes.

Incorporating or "mainstreaming" the sound Management of Chemicals into National Development Plans and Processes involves establishing the links between poverty and sound chemicals management – such as improved human and environmental health, and increased economic security and income opportunities for the poor – and then identifying the policies and programmes needed to bring about pro-poor chemical management.

The overall aim is to establish enduring institutional processes within government ministries and the wider stakeholder community to bring about sound management of chemicals – focusing on the government bodies responsible for poverty reduction and growth policies, and also strengthening the role of environmental agencies and non-governmental actors.

It also involves looking at potential chemical risks arising from implementing sections of the development plans, and trying to mitigate such risks at the planning stage. The integration of chemicals management priorities into national development planning processes will be a means to help government foster national budget commitments as well as bi-lateral donor assistance.

[UNDP Guide for Integrating the Sound Management of Chemicals into Development Planning, September 2012]

156. It should be mentioned that the project did not contain a specific mainstreaming component when it was developed. The project concept was developed in 2005, when the understanding of the mainstreaming of SMC related priorities (like POPs) was not that widespread yet, as the Strategic Approach to International Chemicals Management only was adopted in 2006.

3.3.7 Sustainability (HL)

Sustainability: "Likely ability of an intervention to continue to deliver benefits for an extended period of time after completion; projects need to be environmentally as well as financially and socially sustainable."

157. In Table 18 below, the four aspects of sustainability (Financial Sustainability; Socio-Political; Institutional Framework and Governance; and Environmental Sustainability) are presented as well as the rating provided by the evaluators.

158. The ratings used for sustainability aspects of the project are the following: Highly Likely; Likely; Moderately Likely; Moderately Unlikely; Unlikely; Highly Unlikely.

Table 18: Project Sustainability Ratings

Sustainability	Rating
<p><i>Financial Resources:</i></p> <ul style="list-style-type: none"> Manufacturers of alternatives have the financial resources to continue their production. One of the Cleaner Production (CP) demonstration sites seems unlikely to continue CP practices (due to a lack of training for the use of equipment received). The other 4 demonstration sites are highly likely to continue their CP practices. Risk Assessments of Anti-Fouling Paints (AFPs) and chemicals in general can be quite costly, in particular for smaller sized manufacturing companies. Without the introduction of financial incentives in combination with active enforcement/monitoring of the regulations stipulating compulsory RA for AFPs, it is unlikely that many companies will start undertaking RAs. Initial investments for the introduction of CP measures at shipyards can be relatively expensive and environmentally friendly paint removal can be labor intensive and thus costly, in particular for smaller sized shipyards that mostly service and repair fishing vessels. Without the necessary financial incentives to cover (partially) initial investment costs it is unlikely that CP practices will be widely adopted by other small shipyards. 	Likely
<p><i>Socio-Political:</i></p> <ul style="list-style-type: none"> Considering that there do not appear to be sensitive issues or controversies surrounding AFPs –Socio-Political changes are unlikely to have a great impact on this sector. 	Highly Likely
<p><i>Institutional Framework and Governance:</i></p> <ul style="list-style-type: none"> The regulatory framework, in combination with continuous monitoring and regular inspections, all supporting the ban on DDT use in AFPs, appear quite effective. Although by law chemicals introduced onto the market need to undergo a Risk Assessment, in practice only ~100 RAs are submitted to the Chemical Registration Center of MEP each year, of which most are of a relatively weak quality. Certain project stakeholders expressed that the development of RAs for chemicals is expected to really take off in 10 yrs. CP remains voluntary. Its application might not replicate far beyond the project’s demonstration sites, as initial investments can be high. Until regulations are put in place that enforce shipyards to remove hazardous AFPs in an environmentally sound manner, it creates a possibility for unfair competition for the shipyards that adhere to environmental best practices. China ratified the IMO International Convention on the Control of Harmful Anti-Fouling systems on Ships (2001) on June 7, 2011. Although no particular regulations were put in place, voluntary compliance started in 2000 to avoid unnecessary losses later on, and CCS believes that all China’s large commercial vessels are compliant by now. 	Likely (related to DDT) Moderately Likely (related to RA and CP project aspects)
<p><i>Environmental:</i></p> <ul style="list-style-type: none"> DDT production has stopped and the use of DDT paints in AFPs has been banned. Yearly ship inspections check the type of AFPs applied. On a voluntary basis all registered commercial vessels are no longer using 	Highly Likely

TBT based AFPs.

- DDT and TBT levels in environmental media have decreased since project start and will continue to further decrease now that DDT and TBT use in AFPs have stopped; DDT manufacturing facilities have closed down; remaining DDT / TBT in the environment is slowly being broken down and in China in general concerted actions in various sectors had led to a significant decrease of DDT use.
- 38 environmentally friendly alternatives to DDT containing AFP have been developed/produced (making up ~ 10% of the AFP market)– mostly targeting small fishing vessels). The production of these AFP alternatives will continue in the future solely based on market demand.
- A green labeling programme for AFP alternatives has been introduced creating additional opportunities for manufacturers.
- CP initiatives supported by the project have started to use environmentally friendly methods in removing and disposing of AFPs during maintenance/repair work. While CP demonstration sites have also adopted more environmentally methods of applying AFPs.

159. Overall, the evaluation team feels that the sustainability of the project is Likely (L) and thus deemed Satisfactory (S).

160. The only aspect, which could be enhanced in terms of sustainability are related to RAs and the introduction of Cleaner Production measures.

Recommendation: Encourage the Government of China to introduce financial incentives and ensure active enforcement/monitoring to encourage the replication of CP measures beyond the project's demonstration sites, and at the same time monitor/enforce the regulations stipulating compulsory RA for AFPs and other chemicals, to ensure that in the near future RAs for newly developed AFPs and other chemicals will be undertaken before they enter the market.

Recommendation: It is recommended that additional technical assistance would be provided by Guangdong PMO to the Qinghang Shipyard, to ensure that workers are able to use and operate the equipment provided by the project before the maintenance/repair season starts in July.

3.3.8 Impact (HS)

Impact: "Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?"

161. In order to rate project aspects related to "impact" the TE was expected to review whether the project has demonstrated:

- a) Verifiable improvements in ecological status;
- b) Verifiable reductions in stress on ecological systems; and/or
- c) Demonstrated progress towards these impact achievements.

162. The promulgation of the ban on the production, distribution, uses, and import of POPs pesticides (May 17, 2009), including the use of DDT in the production of AFPs, resulted in the decommissioning and dismantling of the three remaining DDT production facilities in China.

163. As a result the project achieved its target, which was to eliminate the use of 250 MT of DDT per year used for production of DDT based antifouling paints. With the ban in effect, no DDT based antifouling paint will ever be commercially produced again in China.

164. The project also supported the development, testing and introduction onto the market of 38 DDT-free technically feasible, economically viable, and environmentally friendly DDT-free alternatives. Over the duration of the project 6,661 MT of alternatives were produced. Not only did the development, testing and use of such alternatives help users transition away from DDT-containing AFPs, the alternatives introduced onto the market by manufacturers supported by the project also ensured that DDT in AFPs was not substituted by other highly harmful co-biocides and that the AFP alternatives developed were able to pass Risk Assessments.

165. In parallel, the support that was provided to the 4 shipyards and the 1 ship dismantling facility introduced Cleaner Production measures and BAT technologies to reduce the negative environmental impacts of AFP removal and application. Prior to introduction of CP measures, paint slag was washed away by the tides.

166. In July 2011, China ratified the IMO Convention on the Control of Harmful Anti-Fouling systems on Ships (2001). Although no particular regulations were put in place, voluntary compliance to phase out the use of TBT (organotin)-based AFPs started back in 2000. CCS believes that currently, all its commercial vessels are compliant.

167. Two studies were commissioned to monitor the levels of DDT and TBT before and after the project. The initial study was conducted by Ningbo Environmental Monitoring Center in 2008. The second study was conducted by SGS and conducted in 2013. The results of the two studies have been presented in Table 19 below.

168. TBT levels were not assessed during the initial study. With respect to DDT levels, it is clear from the figures presented in table 19 that DDT levels have significantly reduced between 2008 and 2013. Part of this is due to the phase-out of DDT AFPs, but this DDT reduction can also be the result of concerted national and global efforts to phase out DDT.

Table 19: Summary of the DDT & TBT content reduction in the marine environment from 2008 to 2013

Environmental Medias	Year	East China Sea			South China Sea		
		DDT	TBT	Samples	DDT	TBT	Samples
Sea water (ng/L)	2008	4.41	-	8	1.03	-	8
	2013	1.96	0.02	9	0.60	0.02	4
Sediment (µg/kg)	2008	119.58	-	8	24.91	-	8
	2013	37.93	0.02	9	2.35	0.01	4

Aquatic ($\mu\text{g}/\text{kg}$)	2008	32.60	-	14	9.16	-	8
	2013	6.15	0.05	24	1.42	0.05	9

* The contents of DDT & TBT are the average values.

Table 20: Overview of DDT and Cu standards for different environmental media*

Media	standard	DDT concentration	Cu
Water	GB 3097-1997	$\leq 0.00005\text{mg}/\text{L}$ (first class water)	$\leq 0.005\text{mg}/\text{L}$ (first class water)
Sediment	GB 18668-2002	$\leq 0.02\text{mg}/\text{kg}$	$\leq 35\text{mg}/\text{kg}$
Aquatic organism	GB 18421-2001	$\leq 0.02\text{mg}/\text{kg}$ (first level, strictest)	$\leq 10\text{mg}/\text{kg}$ (first level, strictest)

* TBT limits in environmental media have not been set.

169. The impact of the project has been evaluated as **High Satisfactory (HS)**.

4. CONCLUSIONS, RECOMMENDATIONS & LESSONS

4.1 Conclusions

170. In Table 20 is an overview presented of the ratings, which have resulted from this project's Terminal Evaluation. Overall the project's implementation has been rated as **Satisfactory (S)**.

Table 21: Evaluation Rating

1. Monitoring and Evaluation	Rating	2. IA& EA Execution	Rating
M&E design at entry	S	Quality of UNDP Implementation	S
M&E Plan Implementation	S	Quality of Execution - Executing Agency	S
Overall quality of M&E	S	Overall quality of Implementation / Execution	S
3. Assessment of Outcomes	Rating	4. Sustainability	Rating
Relevance	S	Financial resources:	L
Effectiveness	HS	Socio-political:	HL
Efficiency	MS	Institutional framework and governance:	L - ML
		Environmental:	HL
		Overall likelihood of sustainability:	L
Overall Project Outcome Rating			S

1. Monitoring and Evaluation

M&E Design at Entry

171. The Terminal Evaluation (TE) team felt that the Monitoring and Evaluation plan as described and included in the Project Document (See Monitoring and Reporting Section on ProDoc page 26) was very comprehensive and in line with the UNDP rules and procedures for Monitoring and Evaluation of (GEF) projects.

M&E Plan Implementation

172. Table 14 (page 22) summarizes the M & E activities planned for in the Project Document and conducted throughout the project's implementation. The column "*Comments & Observations*" summarizes the views of the TE team for each of these M & E activities. In summary the TE team is of the opinion that the M & E during implementation, can be rated as **Satisfactory (S)**.

173. Based on observations made following the TE mission as well as a desk review of M & E related reports, the TE team had a few remarks regarding monitoring and evaluations aspects: i) It was observed that the quality of Project Implementation Reviews (PIRs) was **Marginally Satisfactory (MS)**, it was felt that the yearly PIR exercise was not used as a monitoring tool; ii) At the time of the TE the project's experiences, results and lessons-learned were not yet easily accessible for "outside stakeholders" and not yet captured for dissemination; iii) The project could have benefitted from more field visits by the UNDP Country Office .

174. The Mid-Term Evaluation (MTE) made a number of recommendations, which are presented in Table 8 (page 17). The project's adaptive management in response to their recommendations has also been summarized. In general it can be concluded that most of the MTE's recommendations were followed up on by the project and where feasible were used to adapt

the project's management.

Overall quality of M & E

175. In summary the TE team is of the opinion that the overall quality of M & E can be rated as **Satisfactory (S)**.

2. IA& EA Execution

176. Overall, the TE team felt that there were few implementation, execution, coordination or operational issues during the project's implementation. The project teams from UNDP, FECO and regional PMOs involved in the project's implementation seemed all very committed to the project's objectives. In summary the TE team is of the opinion that the overall quality of IA & EA Execution can be rated as **Satisfactory (S)**.

Quality of UNDP Implementation

177. Overall, the quality of UNDP Implementation was rated as **Satisfactory (S)**. There were a few points for improvement though: i) In coordination with FECO, UNDP should ensure frequent training as well as regular procurement support to project sub-contractors and Project Management Offices in particular related to drawing up technology and supplier specifications. For example in the case of Donghai Shipyard (a Cleaner Production Demonstration beneficiary), the manner in which the procurement was undertaken (and in particular the demonstration, testing and training of staff on the technology's use) would have benefitted from more PMO, FECO and or UNDP involvement; ii) UNDP could play a more active role in supporting FECO and GEF projects in headhunting for high quality experts in niche areas that might not be easily accessible for national partners/stakeholders. In the project this role was sometimes assumed by the National Technical Expert (NTE), but UNDP involvement

Quality of Execution - Executing Agency

178. Overall, the quality of FECO Execution was rated as **Satisfactory (S)**. An inter-departmental coordination mechanism was formed to mobilize resources to ensure the achievement of project objectives; local project offices were established to improve local capacity for project design, management and monitoring; capacity was built to improve law enforcement and market inspection to reduce the illegal production of DDT antifouling paint; a team of experts was conveyed to provide technical support throughout the project's implementation; a large number of capacity-building, training and awareness raising activities and events were organized; and, an internal control mechanism was established to proper use and effective supervision and management of GEF-funds. There were a few points for improvement though: i) Project staff turnover (FECO project Coordinator), like for the Project Management Offices (PMOs) as well as UNDP, was high, which sometimes jeopardized the speed of project implementation and created delays; ii) Because of the three-regional approach of the project, and the decentralized approach it has taken to implement activities in each of these three regions, the project management structure involves many stakeholders and many beneficiaries. In general the evaluators felt that the involvement of the large number of stakeholders was admirable and in many cases led to good results and outreach. However, the TE also observed that many of the stakeholders were well informed of their tasks and responsibilities under the contracts signed with FECO/PMOs, however they did not always understand their role and contribution to the ultimate goals and objectives of the project.

3. Assessment of Outcomes

Overall results (attainment of objectives) and effectiveness (HS)

179. The project has supported many different activities and has achieved important successes. To list these is not the purpose of a Terminal Evaluation. However, in order for readers who might not be that familiar with the project itself, a summary of the project's activities and achievements is provided in section 3.3.

180. The project has achieved its **objective** which was for DDT based antifouling paints to be substituted by technically feasible, economically viable, and environmentally friendly alternatives so as to help China fulfill the obligations under Stockholm Convention to control the use of DDT and protect the environment and human health. The **binding objective** of the project was to eliminate the use of 250 MT/year of DDT as additives in the production of antifouling paints by conversion to non-toxic and environmentally friendly alternatives, which was also achieved.

181. In addition the project also achieved its **prospective objective**, which was to establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint.

182. The evaluators used the project's Objectively Verifiable Indicators to validate whether project objectives had been achieved. In conclusion: i) Annual production of 250 MT of DDT used for AFP had stopped; ii) Zero DDT was detected in AFPs; iii) DDT and TBT levels in the marine environment had decreased; iv) Alternatives had been developed, produced and distributed; and, v) Barriers to commercialize the alternatives had been removed.

183. The evaluators are pleased to report that all the project's objectives have been achieved, even the project's prospective objective. More so, it is encouraging that after 5 years, DDT and TBT levels in the marine environment have shown to be decreasing, which can be attributed to projects like these as well as concerted actions the Government of China and other parties to the Stockholm Convention have taken to phase-out the use of POPs. As such this aspect of the project has been rated as **Highly Satisfactory (HS)**.

Relevance (S)

184. The AFP project is relevant in light of the Objective of the Stockholm Convention: "to protect human health and the environment from persistent organic pollutants", as well as National Priorities as taken up in China's National Implementation Plan (NIP). The project was also particularly well aligned with China's National "Strategy for POPs Pesticides Reduction and Phase-Out" and Action Plan (See also section 3.1.7). Finally, the project was also deemed relevant in light of national POPs activities supported and financed by the Government of China, the GEF and GEF implementing agencies.

185. Because of the reasons mentioned above, the Relevance of the project was rated **Satisfactory (S)**.

Efficiency (MS)

186. One of the TE's observations has been that the project was able to achieve its objectives

earlier than expected. There seem to be two reasons for this, a) The Government of China actively supported the phase-out of DDT through a large number of interventions (both GEF and nationally owned), b) Significant (additional) co-financing was raised during the project's implementation from the private sector which greatly facilitated project activities related to in particular the introduction of CP measures. In addition certain AFP alternative manufacturers, who benefitted from the project's capacity building efforts, did not take part in all the three rounds of incentive programmes, but in producing AFP alternatives contributed to the project's ultimate goals and objectives.

187. As a result, the project ended up spending far less funding on planned project activities to achieve project objectives than anticipated. In this sense, the project has been very efficient in the use of project funding. However, this brought about subsequent challenge: how to reallocate project funding to project activities in line with the project's goal and objectives?

188. After the MTE had been concluded, new activities, such as the Risk Assessment Capacity Building of Laboratories; the Cleaner Production Demonstration Activities in 4 shipyards and 1 ship dismantling facility; among other activities were added to the project's scope. These activities appeared to be well implemented and quite successful.

189. However, the Terminal Evaluation team was of the opinion that the project's design should have been more ambitious from the start. The duration of GEF project development and implementation averages ~ 10 years. For a rapidly changing economy like China's markets and challenges undergo significant changes during a 10-year period, and this should have been better anticipated by UNDP, FECO and the project's development team.

190. Secondly, during the project's mid-term evaluation (May 2010) it was recommended to expand project activities to additional project beneficiaries (in addition to the incentives programme for the AFP manufacturers and the fishing villages), it took until 2012 – 2013 before the project started supporting cleaner production activities at shipyards and risk assessment capacity building at 2 laboratories. This late redirecting of project activities resulted in ~46% of the budget being spent in 2013 (project year 6). This could have been avoided by earlier redirecting the project's strategy/approach and deciding on additional activities with project beneficiaries. Preferably this would have happened at the time when project management realized that the amount of project funding being spent on the incentive programme was relatively low. Alternatively such a decision could have taken immediately after the MTE.

191. Because of the two aspects highlight above, the project's efficiency has been rated as **Marginally Satisfactory (MS)**.

4. Sustainability (L)

192. In terms of the Financial Resources, the TE team felt that AFP manufacturers have produced AFP alternatives for a sufficiently long period, and the project's stakeholders have been successful in creating the required markets. Therefore it is likely that production will continue after the project comes to an end.

193. Considering that there do not appear to be sensitive issues or controversies surrounding AFPs, Socio-Political changes are unlikely to have a great impact on this sector. Therefore Socio-

political sustainability is highly likely.

194. The sustainability of the Institutional framework and governance, was rated twofold. On the one hand the regulatory framework governing the DDT ban in AFPs, in combination with continuous monitoring and regular inspections, appears quite effective, rated as **Highly Likely (HL)**. On the other hand, the regulatory framework governing Risk Assessments is not as effective yet, while the introduction of Cleaner Production measures remains voluntary. This aspect was therefore rated as **Moderately Likely (ML)**.

195. Finally, environmental sustainability was rated has **Highly Likely (HL)** as DDT production has stopped and the use of DDT paints in AFPs has been banned, and DDT and TBT levels in environmental media had started to decrease since project start and will continue to further decrease now that DDT and TBT use in AFPs have stopped.

196. Overall, the evaluation team feels that the sustainability of the project is **Likely (L)** and thus deemed **Satisfactory (S)**.

4.2 Recommendations

- **Organize the TE close to operational project completion:** The project's TE was conducted at the time approximately 1.8 Million US\$ was still unspent. Although most of the remaining project funds had already been allocated to project activities that had almost come to an end (e.g. Cleaner Production activities), some project activities that would benefit from remaining project funds had not yet started. As such the TE team was unable to evaluate these activities. It would be recommended that for future TEs of GEF projects, that the TE would take place closer to operational closure of the project. That said, at the time of the TE, the project had already achieved all of its objectives and targets and the project was rated as Satisfactory. It is unlikely the project's rating will change until the project is operationally closed.
- **Extension of Project Duration:** Based on the observations of the Mid-Term Evaluation (MTE) consultants, it was recommended to extent the project's duration until December 2013. The main reasons for this extension was to make up for time lost due to the late initiation of the project and the embargo on the implementation of project activities for a significant period of time because of the Beijing Olympics. A request for extension was submitted to the GEF on May 4, 2012, which was granted.

At the time of the Terminal Evaluation the project activities had not yet been entirely completed (approximately ~20% of the project's budget - although most of it committed - had not yet been spent). Project activities that were outstanding were the satisfactory wrap-up of the five (5) cleaner production demonstration projects; capturing lessons-learned and experiences from the project and ensuring their wider dissemination; adoption of guidance materials for cleaner production and chemical risks assessment, among else. As such, the evaluators feel that if the project will be operationally closed in a rush, sustainability of project results will be seriously jeopardized. Instead it is recommended that the project will aim to operationally close by December 2014, at which time the project has been under implementation for seven (7) years. It is

recommended that in this year's Project Implementation Review (PIR) such an extension is requested after agreement has been reached on the proposed extension with the UNDP Bangkok Regional Service Center (RSC).

- **UNDP involvement:** In terms of Implementing Agency Execution the Terminal Evaluation team has a number of recommendations, which could improve UNDP's role in future GEF-POPs projects and improve its support to its national counterparts. Firstly, it would be recommended that the UNDP Country Office participates more frequently, at least twice a year, in project site/field visits. Obtaining a better understanding of challenges faced by national stakeholders and beneficiaries in implementing project activities, would allow the China UNDP Country Office to better anticipate the support FECO and national counterparts may require to speed up project implementation. In this respect two particular aspects can be mentioned: i) In coordination with FECO, UNDP should ensure training as well as continuous procurement support to sub-contractors in particular related to drawing up technology and supplier specifications; ii) Support FECO and the project in headhunting for high quality experts in niche areas that might not be easily available at national level. In light of UNDP's extensive global network and advertising possibilities, it would be able to tap into expert networks, which would be of immense value for China's rapidly growing needs in the area of Chemicals Management.
- **Project Design:** One of the TE's observations has been that the project was able to achieve its objectives (both binding and prospective objectives) earlier than expected. One of the main reasons for this has been that the Government of China actively supported the phase-out of DDT through a large number of interventions (both GEF and nationally owned), through policy and legislative interventions but also by providing funding and support to stop production of DDT and dismantling DDT producing facilities. Secondly, private sector companies benefitting from capacity building and awareness raising project activities were often able to provide significant project co-financing or opted to fund themselves the conversion to alternatives, rather than participating in the incentives programme. As a result, the project ended up spending far less funding on planned project activities, while certain activities initially foreseen by the project were cancelled because these activities were taken up and funded by the Government of China. In this sense, the project has been very efficient in the use of project funding. However, this brought about subsequent challenge: how to reallocate project funding to project activities in line with the project's goal and objectives? The latter has been done by the project team quite effectively.

GEF projects can take an average 3 years from the start of PIF development to actual project initiation, and another 7 years to implement. For a country like China, where needs change rapidly over time due to the rapid pace of the country's development, the project's implementation team should keep in mind that a project would require to be redirected more frequently than projects in countries with a slower pace of development.

Therefore future GEF Chemicals and Waste projects in China would benefit from a detailed review of project and country needs at the time of the project's Inception Workshop (and redirect project activities at that time if necessary) and plan for a critical Mid-Term Technical Review (in lieu of a more general MTE) to help the project team

align the project's activities and scope with the needs of the country and sector at that point in time. Changes to project activities and/or the project's direction, when deemed necessary, needs to be proposed during Annual Project Steering Committee meetings, that said the project should call upon the PSC members to convey more frequently, if necessary. Any changes made to the project's activities, require to be approved by the PSC, and need to be properly recorded in the yearly PIR and project steering committee meeting minutes.

- **Earlier redirection of project activities:** Although the project's mid-term evaluation recommended to redirect project activities and include additional project beneficiaries (other than AFP manufacturers participating in the incentive programme and the fishing villages benefitting from awareness raising), it took until 2012 – 2013 before the project started supporting cleaner production activities at 5 shipyards and building risk assessment capacity at 2 laboratories. This late initiation of new project activities resulted in ~46% of the budget being spent in 2013 (project year 6) and 20% of the project budget potentially being spent in 2014 (project year 7). This could have been avoided by earlier redirecting the project and deciding on additional activities with the Project's Steering Committee. Preferably this would have occurred at the time when project management realized that the amount of project funding being spent on the incentive programme was relatively low. Alternatively such a decision could have taken place immediately after the MTE.
- **FECO involvement:** Overall the evaluators felt that the support FECO had provided to the project's beneficiaries was of good quality. There are however two suggestions for improvements which could be taken on board for future Chemicals and Waste GEF projects. Firstly, FECO project staff turnover, like for the Project Management Offices (PMOs) as well as UNDP, was high (the project was lucky that it was able to benefit from the same national technical advisor who stayed involved throughout the entire duration of the project). Staff turnover is often a fact that cannot be avoided. However it was suggested that in the future FECO would, rather than appointing a single Project Coordinator, appoint a project team to oversee project management instead. Although one single person can take the lead on project implementation it would be recommended that an additional colleague is involved in the project on a part-time basis, so as to ensure that when the project coordinator might leave, the unit still contains one person who is familiar with the project.
- **Subcontracting as a means to support project beneficiaries:** In general the project was quite decentralized and implemented project activities (mostly related to awareness raising, training, etc.) through the respective three (3) PMOs. Most project activities though that involved single project beneficiaries, e.g. cleaner production demonstration, ship dis-mantling, AFP risk assessment capacity building of laboratories were implemented using sub-contracting modalities. The modality was used to select the most fitting project beneficiaries. Contracts between the PMO and FECO/PMO were signed which stipulated the responsibilities of the project beneficiaries as well as the expected deliverables. However these subcontracting modalities also allowed project beneficiaries to undertake procurement of equipment. Although for most project beneficiaries the evaluators felt that the project activities as stipulated in the contract

had been well implemented, it was felt that in the case of the Weihai Donghai Shipyard Co. Ltd., the manner in which the procurement was undertaken (and in particular the demonstration, testing and training of staff on the technology's use) would have benefitted from more PMO, FECO and or UNDP involvement. Possibly, the sub-contracting modality for project beneficiaries should be applied exclusively when beneficiaries have a minimal amount of in-house capacity to undertake procurement.

- **Large number of project stakeholders and their understanding of how they contribute to project objectives:** Because of the three-regional approach of the project, and the decentralized approach it has taken to implement activities in each of these three regions, the project management structure involves many stakeholders and many beneficiaries. In general the evaluators felt that the involvement of the large number of stakeholders was admirable and in many cases led to good results and outreach. The TE also observed that many of the stakeholders were well informed of their tasks and responsibilities under the contracts signed with FECO/PMOs. To further improve the involvement of stakeholders, encourage experiences exchanges and lessons-learned as well as understanding the role of a particular stakeholder, in the larger scheme of the project, it would be recommended that all project stakeholders and sub-contractors, meet at least once a year to exchange information on the status of project implementation (similar to the FECO organized meeting in May 2009), which would also allow for the exchange of lessons-learned between regions.
- **Capturing lessons-learned and project results:** The project has achieved many results that would be highly beneficial not only for the replication of this project's results, but also for other chemicals related projects, as well as other countries in the region that are aiming to phase-out anti-fouling paints containing hazardous components. At the time of the TE it seemed that this information was available within the project management's units (FECO and PMOs), in Chinese on the project's website: <http://afp.china-pops.org/> and potentially within FECO's Management Information System (MIS). However the evaluators felt that when the project comes to an end chances are high that valuable information and guidelines (e.g. Risk Assessment (RA) results, RA templates and Standard Operating Procedures (SOPs), Cleaner Production Guidelines, Ship Dismantling guidelines, photos, etc.) could potentially be lost if they are not captured, documented and disseminated before the project comes to an end. Currently the project's website is only available in Chinese, which doesn't allow for the dissemination of project results beyond China. It would be recommended that the most useful documents prepared under the project would be translated in English and posted on the project website. It would also be recommended that the RA results are published at national level and the ship dismantling guidelines when finalized are shared with the IMO Convention.
- **Project Implementation Reviews (PIRs):** It is strongly recommended that for future GEF funded Chemical and Waste projects, both UNDP China and FECO spend adequate time on preparing and completing a good quality PIR each year. A PIR is the document that informs the GEFSEC about the quality and progress of a project. If the quality of the PIR itself is low this reflects badly on the project itself, no matter how good its achievements have been over the reporting year.

4.3 Lessons-Learned

- **Linking AFP manufacturers with research institutions:** One of the project's lessons-learned mentioned by project beneficiaries has been linking AFP producers with research institutions who develop AFP alternatives. Before the project some of the AFP producers only prepared AFP patented formulas. However as a result of the project, manufacturers started to work with research institutions to select alternatives that had already been developed and succumb them to tests. In some cases AFP producers in partnership with research institutions also initiated the development of new alternatives. Prior to the project such a link between small-scale AFP producers and research institutions did not exist.
- **Training of PMOs and FECO on (GEF) project management by financial and procurement experts from the UNDP China Country Office.** Although initially national counterparts felt it was unnecessary to receive training in the implementation, monitoring, financial management and procurement for project, ultimately it proved that the training of the PMOs had been a very strategic decision. Although FECO is very used to implementing projects funded/supported by bilateral donors, IFIs, trust funds and UN agencies, the decentralized PMO offices that were set-up for implementing and monitoring project activities in the three regions had no such experience. During the course of the project's implementation three training workshops on project management (finance and procurement) were organized (April 2009, December 2009 and March 2010). It would be recommended that if future GEF or UNDP project take a similar decentralized project implementation approach, this practice should be replicated. Possibly, with even more emphasis on international procurement and drawing up (technical) specifications.

ANNEX I: TERMINAL EVALUATION TERMS OF REFERENCE

INTRODUCTION

In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation. These terms of reference (TOR) sets out the expectations for a Terminal Evaluation (TE) of the project “Alternative to DDT Usage in the Production of Antifouling Paint” (UNDP PIMS No. 3664).

The essentials of the project to be evaluated are as follows:

PROJECT SUMMARY TABLE

Project Title	Alternative to DDT Usage in the Production of Antifouling Paint			
GEF Project ID:	PIMS 3664		<i>at endorsement</i> <i>(Million US\$)</i>	<i>at completion</i> <i>(Million US\$)</i>
UNDP Project ID:	00053562	GEF financing:	10.365	
Country:	China	IA/EA own:	10.365	
Region:	Asia & Pacific	Government:	3.75	
Focal Area:	Chemicals/PO Ps	Other:	8.50	
FA Objectives, (OP/SP):	OP #14	Total co-financing:	12.25	
Executing Agency:	FECO/MEP	Total Project Cost:	22.615	
Other Partners involved:	ProDoc Signature (date project began):			9 October 2007
	(Operational) Closing Date:		Proposed: 31 Dec 2013	Actual: 31 March 2014

OBJECTIVE AND SCOPE

The project goal is to substitute DDT based antifouling paint by technically feasible, economically viable, and environmentally friendly alternatives. The binding objective of the project is to eliminate the use of 250 MT/year of DDT as additives in the production of antifouling paint by conversion to non-toxic and environmentally friendly alternatives. In addition, the prospective objective of the project is to establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint.

To ensure sustainability of the elimination and conversion, related regulations and standards will be established or revised, and supported by capacity building, to create an enabling policy environment for the phase out of DDT based antifouling paint and promote sustainable alternatives. In addition, the successful experience in DDT phase out will contribute to support China to accede to the IMO Convention and elimination of TBT based antifouling paint, in order to establish a long-term mechanism to protect marine environment and human health from pollution of harmful antifouling systems.

The project aims to realize its objectives on both national and global level. On the national level, it will support the implementation of “Strategy for Phase out of POPs Pesticides in China” in order to reduce their environmental risk in China, and protect marine environment and human health from DDT hazard. On the global level, reduction of total DDT emission into the global environment will reduce the probability of the long-distance transportation of DDT to other countries.

The project results and resources framework consists of six components, with anticipated outputs specified for each component:

- Institutions and mechanism for project management and coordination
- Management information system (MIS) and information management
- Enabling policy environment
- Conversion from DDT based antifouling paints to alternatives
- Environmental education and awareness raising
- Monitoring and evaluation

The TE will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects.

The objectives of the evaluation are 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.

EVALUATION APPROACH AND METHOD

An overall approach and method¹¹ for conducting project terminal evaluations of UNDP supported GEF financed projects have developed over time. The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact**, as defined and explained in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects. A set of questions covering each of these criteria have been drafted and are included with this TOR (*Annex C*). The evaluator is expected to amend, complete and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.

The evaluation must provide evidence-based information that is credible, reliable and useful. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with government counterparts, in particular the GEF operational focal point, UNDP Country Office, project team, UNDP GEF Technical Adviser based in the region and key stakeholders. The evaluator is expected to conduct a field mission to Beijing, and project sites in Guangdong, Zhejiang, Shanghai and Shandong Provinces. Interviews will be held with the following organizations and individuals at a minimum with the Ministry of Finance, three Local Project Management Offices (PMOs) at Zhejiang, Guangdong and Shandong Provinces, including provincial Environmental Protection Bureaus (EPBs), and research institutions involved in the project activities, etc.

The evaluator will review all relevant sources of information, such as the project document, project reports – including Annual APR/PIR, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, project files, national strategic and legal documents, and any other materials that the evaluator considers useful for this evidence-based assessment. A list of documents that the project team will provide to the evaluator for review is included in *Annex B* of this Terms of Reference.

EVALUATION CRITERIA & RATINGS

An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework (see *Annex A*), which provides performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation will at a minimum cover the criteria of: **relevance, effectiveness, efficiency, sustainability and impact**. Ratings must be provided on the following performance criteria. The completed table must be included in the evaluation executive summary. The obligatory rating scales are included in *Annex D*.

¹¹ For additional information on methods, see the [Handbook on Planning, Monitoring and Evaluating for Development Results](#), Chapter 7, pg. 163

Evaluation Ratings:			
1. Monitoring and Evaluation	<i>rating</i>	2. IA& EA Execution	<i>rating</i>
M&E design at entry		Quality of UNDP Implementation	
M&E Plan Implementation		Quality of Execution - Executing Agency	
Overall quality of M&E		Overall quality of Implementation / Execution	
3. Assessment of Outcomes	<i>rating</i>	4. Sustainability	<i>rating</i>
Relevance		Financial resources:	
Effectiveness		Socio-political:	
Efficiency		Institutional framework and governance:	
Overall Project Outcome Rating		Environmental :	
		Overall likelihood of sustainability:	

PROJECT FINANCE / COFINANCE

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator(s) will receive assistance from the Country Office (CO) and Project Team to obtain financial data in order to complete the co-financing table below, which will be included in the terminal evaluation report.

Co-financing (type/source)	UNDP own financing (mill. US\$)		Government (mill. US\$)		Partner Agency (mill. US\$)		Total (mill. US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Actual	Actual
Grants								
Loans/ Concessions								
• In-kind support								
• Other								
Totals								

MAINSTREAMING

UNDP supported GEF financed projects are key components in UNDP country programming, as well as regional and global programmes. The evaluation will assess the extent to which the project was successfully mainstreamed with other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and gender.

IMPACT

The evaluators will assess the extent to which the project is achieving impacts or progressing towards the achievement of impacts. Key findings that should be brought out in the evaluations include whether the project has demonstrated: a) verifiable improvements in ecological status, b) verifiable reductions in stress on ecological systems, and/or c) demonstrated progress towards these impact achievements.¹²

CONCLUSIONS, RECOMMENDATIONS & LESSONS

The evaluation report must include a chapter providing a set of **conclusions, recommendations** and

¹² A useful tool for gauging progress to impact is the Review of Outcomes to Impacts (ROtI) method developed by the GEF Evaluation Office: [ROtI Handbook 2009](#)

lessons.

IMPLEMENTATION ARRANGEMENTS

The principal responsibility for managing this evaluation resides with the UNDP CO in Beijing, People's Republic of China. The UNDP CO will contract the evaluators and ensure the timely provision of per diems and travel arrangements within the country for the evaluation team. The Project Team will be responsible for liaising with the Evaluators team to set up stakeholder interviews, arrange field visits, coordinate with the Government etc.

EVALUATION TIMEFRAME

The total duration of the evaluation will be 30 days according to the following plan:

Activity	Timing	Completion Date
Preparation	3 days (<i>recommended: 2-4</i>)	April 21-23, 2014
Evaluation Mission	15 days (<i>r: 7-15</i>)	April 28- May 16, 2014
Draft Evaluation Report	10 days (<i>r: 5-10</i>)	May 19-Jun 6, 2014
Final Report	2 days (<i>r: 1-2</i>)	June 27, 2014

EVALUATION DELIVERABLES

The evaluation team is expected to deliver the following:

Deliverable	Content	Timing	Responsibilities
Inception Report	Evaluator provides clarifications on timing and method	No later than 2 weeks before the evaluation mission.	Evaluator submits to UNDP CO
Presentation	Initial Findings	End of evaluation mission	To project management, UNDP CO
Draft Final Report	Full report, (per annexed template) with annexes	Within 3 weeks of the evaluation mission	Sent to CO, reviewed by RTA, PCU, GEF OFPs
Final Report*	Revised report	Within 1 week of receiving UNDP comments on draft	Sent to CO for uploading to UNDP ERC.

*When submitting the final evaluation report, the evaluator is required also to provide an 'audit trail', detailing how all received comments have (and have not) been addressed in the final evaluation report.

TEAM COMPOSITION

The evaluation team will be composed of 1 international evaluator and 1 national evaluator. The consultants shall have prior experience in evaluating similar projects. Experience with GEF financed projects is an advantage. The international evaluator will be the team leader and responsible for finalizing the report. The evaluators selected should not have participated in the project preparation and/or implementation and should not have conflict of interest with project related activities.

The Team members must present the following qualifications:

- Minimum 10 years of relevant professional experience
- Knowledge and UNDP and GEF

- Previous experience with results-based monitoring and evaluation methodologies;
- Technical knowledge in the POPs and Chemical areas
- Previous experience of UNDP/GEF programme evaluation is asset

EVALUATOR ETHICS

Evaluation consultants will be held to the highest ethical standards and are required to sign a Code of Conduct (Annex E) upon acceptance of the assignment. UNDP evaluations are conducted in accordance with the principles outlined in the [UNEG 'Ethical Guidelines for Evaluations'](#)

PAYMENT MODALITIES AND SPECIFICATIONS

The payment will be in a lump sum covering the consulting fee of 30 working days and the travel cost (transportation, DSA and terminal allowances) for international travel. Transportation costs for local sites visits will be arranged and paid by UNDP.

%	Milestone
28.6%	After contract signed (advance of total travel cost)
71.4%	Following submission and approval (UNDP-CO and UNDP RTA) of the final terminal evaluation report (consulting fee for 30 working days)

APPLICATION PROCESS

Applicants are requested to apply online (<http://cn.undp.org>) by March 31, 2014. Individual consultants are invited to submit applications together with their CV for these positions. The application should contain a current and complete C.V and an updated P11 UNDP Personal History Form (for Service Contracts and Individual Contracts) in English with indication of the e-mail and phone contact. Shortlisted candidates will be requested to submit a price offer indicating the total cost of the assignment (including daily fee, per diem and travel costs).

UNDP applies a fair and transparent selection process that will take into account the competencies/skills of the applicants as well as their financial proposals. Qualified women and members of social minorities are encouraged to apply.

ANNEX II: ITINERARY

Table 22: Itinerary for Final Evaluation Mission of Alternative to DDT-Usage in the Production of Anti-fouling Paint Project

Date	Places to visit	Itinerary/site visit arrangement	Project activities undertaken	Travel arrangement	Remarks
May (3) Sat	Beijing	Arrival 6:20 pm			
May 4(Sun)	Beijing	14:00-17:00 Terminal Evaluation kick-off meeting in FECO building	National implementing agency	/	
May 5(Mon)	Weihai	am: Beijing – Weihai pm(14:00-17:30) visit 2 shipyards (Xinghai Shipyard, & Donghai Shipyard) and meet with Shandong PMO	1. Cleaner production demonstration of ship hull painting process in shipyard, 2. complete technical guidance based on above experiences, 3. assist the screening and promotion of AFP alternatives, 4. undertake the awareness raising and education activities	CA4852 Boeing 737 09:40-10:55 (landing at Yantai airport, then head to Weihai by coach)	Meeting venue: one of the shipyard
May 6(Tue)	Weihai	9:30-17:00 Continued meeting with Shandong PMO, and its subcontractors: <ul style="list-style-type: none"> ▪ Shandong EPD, Shandong University ▪ Sanrun Environmental Technology Co. Ltd ▪ Xinghai Shipyard ▪ Donghai Shipyard 		/	

Date	Places to visit	Itinerary/site visit arrangement	Project activities undertaken	Travel arrangement	Remarks
May 7 (Wed)	Guangzhou	<u>am:</u> Weihai – Guangzhou <u>pm(14:30-17:30)</u> <ul style="list-style-type: none"> ▪ Meeting with Guangdong PMO, and its subcontractors, including: ▪ Guangdong Academy of Environmental Science ▪ Communication & Education ▪ Center of Guangdong EPD ▪ China Southwest Shipyard ▪ Qinghang Shipyard ▪ Visit to China Southwest Shipyard. 	1. Cleaner production demonstration of ship hull painting process in shipyard, 2. Complete technical guidance based on above experiences, 3. Assist the screening and promotion of AFP alternatives, 4. Undertake the awareness raising and education activities	CA4897 Boeing 737 08:10-11:20 (Yantai airport-Guangzhou)	meeting venue: one of the shipyard
May 8 (Thu)	Guangzhou	<u>pm(14:30-17:30)</u> Meeting with Guangdong Detection Center of Microbiology	Establish or strengthen the capacity to carry out environmental risk assessment of anti-fouling paints active substances, including hazard identification, exposure assessment and risk characterization three aspects, and to support enterprises and government departments to carry out the risk management of antifouling paint products.	MU5334 Boeing 737 11:20-13:35	

Date	Places to visit	Itinerary/site visit arrangement	Project activities undertaken	Travel arrangement	Remarks
May 10 (Sat)	Shanghai	<u>9:30-17:00</u> Meeting with Shanghai Academy of Public Measurement, then heading to Zhoushan	Same as above, plus establishment of the database frame of persistency, bio-accumulation, eco-toxicity of the relevant active substances	High speed train G7525 (19:00-20:58) to Ningbo, then heading to Zhoushan by coach	
May11 (Sun)	Zhoushan	<u>9:30-12:00</u> Meeting with Zhoushan ship dismantling plant <u>12:00 – 16:00</u> Meeting with Zhejiang Feijing Paint Co. LTD.	1. Conduct research on relevant international and domestic laws and regulations of AFP management within the industry, and make a demonstration plan 2. Construct a demonstration facility to handle ships with toxic paint 3. Complete the dismantling of one abandoned ship with new facility and operation standards.	/	
May 12 (Mon)	Ningbo	<u>am:</u> Heading to Ningbo <u>14:00-17:00</u> Meeting with Ningbo PMO	1. assist the screening and promotion of AFP alternatives, 2. undertake the awareness raising and education activities	By coach	
May 13 (Tue)	Beijing	Return to Beijing		(CA1854 Boeing 737 08:20-10:30)	

Date	Places to visit	Itinerary/site visit arrangement	Project activities undertaken	Travel arrangement	Remarks
May 14 (Wed)	Beijing	<p><u>9:30-12:00</u> Meeting with China Classification Society, China Coatings Industry Association, The National Supervision and Testing Center of Fishery Machinery and Instrument</p> <p>14:00 – 16:00 Wrap-up meeting: debriefing to UNDP and FECO on key findings and conclusions of this mission.</p>	<p>China Classification Society, The National Supervision and Testing Center of Fishery Machinery and Instrument: institutional capacity building for phasing out harmful antifouling systems including DDT and TBT.</p> <p>China Coatings Industry Association: screening and evaluation of 10-15 newly developed AFP products as the environment friendly alternatives, providing technical support to anti-fouling paint alternatives incentive program implementation</p>	/	in FECO building

ANNEX III: LIST OF ORGANIZATIONS, ENTITIES AND INDIVIDUALS INTERVIEWED

During the course of terminal evaluation, 3 – 16 May

Sunday May 4

Project Management Division V, Foreign Economic Cooperation Office, Ministry of Environmental Protection

Ms. Ding Qiong, Division Chief

Ms. Qiao Yanling, Project Coordinator

United Nations Development Programme - China

Mr. Peng Wu, Programme Officer

Consultants

Mr. William Kwan – Chief Technical Advisor

Mr. Jiang Feng, National Technical Advisor

Monday May 5

Xinghai Shipyard

Mr. Song, Division director, Xinhai Shipyard

Ms. Yannan Hou, Engineer, Sanrun Company

Donghai Shipyard

Mr. Wenjie Zhang, Manager, Donghai Shipyard

Tuesday May 6

Shandong Project Management Office (PMO)

Ms. Chanying Shao, Deputy Director, Shandong Department of Environmental Protection

Weihai Environmental Protection Bureau (EPB)

Mr. Feng Zhang, Director, Weihai EPB

Shandong University

Mr. Rutao Liu, Professor, Shandong University

Sanrun Environmental Technology Co. Ltd.

Ms. Yannan Hou, Engineer, Sanrun Company

Xinghai Shipyard

Mr. Song, Director, Xinhai Shipyard

Donghai Shipyard

Names to be provided

Wednesday 7 May:

Guangdong Project Management Office (PMO)

Mr. Guoqiang Zhang, Division director, Environmental Education and Cooperation Division, Department of Environmental Protection of Guangdong Province

Guangdong Academy of Environmental Science

Mr. Gang Wang, Director, Cleaner Production Center, Guangdong Provincial Academy of Environmental Sciences

Communication and Education Center of Guangdong Environmental Protection Bureau (EPB)

Ms. Fan Wu, Guangdong Provincial Environmental Education Center

China Southwest Shipyard

Mr. Ke Dong, Factory director, Guangzhou South China Shipyard

Qinghang Shipyard

Mr. Huanhui Lin, Qinghang Dockyard, Dongping Town, Yangdong County

Thursday 8 May:

Guangdong Detection Center of Microbiology

Prof. Guoping Sun – Guangdong Institute of Microbiology

Prof. Guoqu Zeng – Director of the Laboratory of Ecotoxicity and Environmental Safety

Mrs. Mei Chengfang – Technology Director and Study Director - Laboratory of Ecotoxicity and Environmental Safety (*Chief Scientist*)

Saturday 10 May:

Shanghai Academy of Public Measurement

Mr. Haowen Yin, Lab Director, Bioassay and Safety Assessment Laboratory

Mr. Yihuai Liang, Engineer, Bioassay and Safety Assessment Laboratory

Ms. Yunyun Deng, Study Director, Engineer, Bioassay and Safety Assessment Laboratory

Sunday 11 May:

Zhoushan Changhang International Ship Recycling Ltd.

Mr. Yafeng Huang, Assistant of Chairman, Zhoushan Changhong International Shipping Recycle Co., LTD

Mr. Shengyong Lu, Professor, The Institute for Thermal Power Engineering (ITPE) of Zhejiang University

Mr. Yan Li, Institute of Energy & Power Engineering, Zhejiang University of Technology

Ms. Yunyun Deng, Study Director, Engineer, Bioassay and Safety Assessment Laboratory

Zhejiang Feijing Paint Co. LTD.

Mr. Bingang Lu, General Manager, Zhejiang Feijing Paint Co. LTD.

Monday 12 May:

Ningbo PMO

Mr. Caiping Hu, Environmental Monitoring Center

Mr. Shiyong Zong, Ningbo Fishing Vessel Inspection Division, Ningbo Ocean and Fishery Bureau

Mr. Dexiang Fu, Ningbo Fishing Vessel, Fishing Mechanical & Fishing Gear Association

Wednesday 14 May:

China Classification Society (CCS)

Mr. Jie Liu, Director, Industrial Development Sector, China National Coatings Industry Association

Mr. Goujie Liu, Senior Engineer, Industrial Development Sector, China National Coatings Industry Association

Mr. Jun Ma, Industrial Development Sector, China National Coatings Industry Association

China coatings Industry Association

Mr. Xuanwei Gong, Marine Product Management Department, Headquarters of China Classification Society

National Supervision and Testing Center of Fishery Machinery and Instrument

Mr. Zhuli Zhang, The National Supervision and Testing Center of Fishery Machinery and Instrument

ANNEX IV: LIST OF DOCUMENTS REVIEWED

I. Project Documents

- UNDP ProDoc signed with China MEP
- GEF Project Information Form (PIF), Project Document and Log Frame Analysis (LFA)
- Project Implementation Plan
- Implementing/executing partner arrangements
- List and contact details for project staff, key project stakeholders, including Project Boards, and other partners to be consulted
- Meeting minutes of Yearly Progress Report Meetings as well as Project Steering Committee Meetings; Quarterly Progress Reports (QPRs); Annual Progress Reports (APRs)
- Project sites, highlighting suggested visits
- Midterm evaluation (MTE) and other relevant evaluations and assessments
- Annual Project Implementation Reports (PIR) for 2008, 2009, 2010, 2011, 2012 and 2013
- Project budget, broken out by outcomes and outputs
- Project Tracking Tool
- Financial Data (Combined Delivery Report – CDRs; Annual Work Plans – AWP; Two Year Work Plans - TYWP)
- Sample of project communications materials, i.e. press releases, brochures, documentaries, etc.
- Copies of pieces of legislation/regulations developed with the support of the project
- Guidance materials developed under the project (Cleaner Production, Risk Assessments, Ship Dismantling, etc.)

II. UNDP Documents

- Development Assistance Framework (UNDAF)
- Country Programme Document (CPD)
- Country Programme Action Plan (CPAP)

III. GEF Documents

- GEF focal area strategic program objectives

ANNEX V: PROJECT LOGICAL FRAMEWORK

Project Strategy	Objectively verifiable indicators		
Goal	DDT based antifouling paint is to be substituted by technically feasible, economically viable, and environmentally friendly alternatives so as to help China fulfill the obligations under Stockholm Convention to control the use of DDT and protect the environment and human health.		
	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>Objective</p> <p><u>Binding objective:</u> Use of 250 MT DDT per year in the production of DDT based antifouling paints will be stopped.</p> <p><u>Prospective objective:</u> A long-term mechanism is to be established to protect the marine environment from pollution of harmful antifouling systems by supporting China to sign International Convention on the Control of Harmful Antifouling Systems on Ships (the IMO Convention), based on the technologies, experience and instruments gained from the phase out of DDT based antifouling paint.</p>	<ul style="list-style-type: none"> ➤ Annual production of 250 MT DDT used as additives will be reduced at Tianjin Chemical Plant. ➤ Zero DDT should be detected in antifouling paint. ➤ Residual or enrichment of DDT in the marine environmental media and sea organisms will be found to decrease. ➤ Alternatives which are technically feasible, economically competitive, and environmentally friendly will be developed, produced and distributed. ➤ Barriers to commercialize the alternatives will be removed. ➤ Laws, regulations and standards will be revised or established. ➤ Experience in phasing out DDT antifouling paint will be replicated to phase out organotin based antifouling paints. ➤ Concentration of organotin in the marine media will be reduced. 	<ul style="list-style-type: none"> ➤ Tender documents to request for proposals of procurement of technical service and capital equipment. ➤ TORs for recruiting consulting services. ➤ Work plans. ➤ Revised or newly promulgated laws, regulations and standards. ➤ Thematic study reports. ➤ M & E reports. 	<ul style="list-style-type: none"> ➤ Phase out and substitution actions will be supported by the nation, society and sector. ➤ Barriers can be effectively removed with necessary support of the project. ➤ Alternatives production can become financially sustainable after the completion of the project. ➤ Implementation and enforcement of policy and management mechanisms can continue to work effectively after the completion of the project.
Outcome 1: Institutions and	➤ A cross sectoral Steering Committee will be	➤ Name list of Steering	➤ Smooth coordination and sound

<p>mechanism for project management and coordination</p> <p>Activity 1. Establish project management institutions and build operational capacity.</p> <p><i>Act. 1.1</i> Establish project management institutions and coordination mechanisms.</p> <p><i>Act. 1.2</i> Establish a national expert team to provide technical and consulting supports to project implementation.</p> <p><i>Act. 1.3</i> Conduct trainings to improve managerial and technical capabilities for project implementation.</p> <p><i>Act. 1.4</i> Conduct study tour abroad.</p>	<p>established at the national and local levels.</p> <ul style="list-style-type: none"> ➤ A cross sectoral project team will be established at the national level for daily project management and coordination. ➤ 3 local Project Management Offices (PMOs) will be established drawing upon resources from related departments. ➤ CTA, NTA and other consultants recruited. ➤ Government research agencies or private consulting firms will be selected to provide technical and consulting services. ➤ Materials for technical and management training will be compiled. ➤ Plan for study tour abroad will be developed and mission report will be drafted and share to build capacity. 	<p>Committee.</p> <ul style="list-style-type: none"> ➤ Agendas and minutes of Steering Committee meetings. ➤ Name list of the national project team, responsibility defined and work reports. ➤ Name list of the local PMOs, responsibility defined, work plan finalized and work reports. ➤ TORs for CTA, NTA and other consultants. ➤ Training materials for technical and management training. ➤ Work plan for study tour abroad. 	<p>cooperation can be achieved among sectors and between central and local levels.</p> <ul style="list-style-type: none"> ➤ Various stakeholders can reach consensus and recognition of the project objectives and activities. ➤ Qualified CTA, NTA and other consultants can be recruited and fielded in time. ➤ Trainees can be well organized and mobilized. ➤ Countries with advanced technologies and experience are cooperative to host the study tour and share information.
<p>Outcome 1 Management information system (MIS) and information management</p> <p>Activity 1 Establish an MIS and website for the project</p> <p><i>Act. 2.3</i> Establish an MIS.</p> <p><i>Act. 2.4</i> Establish a mechanism for effective information transmission and</p>	<ul style="list-style-type: none"> ➤ A comprehensive evaluation will be conducted on the management information systems of the departments of fishing boat inspection, commercial ship inspection, and hazardous chemicals management, and marine environment management. ➤ Needs of data and information, software and hardware to implement this project will be assessed. ➤ Data exchange protocol will be developed to support information collection, processing and transmission among sectors and between 	<ul style="list-style-type: none"> ➤ An on-line operational project MIS. ➤ An on-line operational project website. ➤ Documentation series for MIS development. 	<ul style="list-style-type: none"> ➤ The needed data can be made available. ➤ The hardware and software configuration of the MIS for Sino-Italian Cooperation Project on Pesticidal POPs can be extended to accommodate the MIS for this project.

<p>sharing.</p> <p><i>Act. 2.5</i> Establish a website to disseminate project information to the public.</p>	<p>central and local PMOs.</p> <ul style="list-style-type: none"> ➤ Database and base model will be developed to collect and process technical, socio-economic, and environmental data in MIS. ➤ A project website will be developed, maintained and promoted. 		
<p>Outcome 2 Enabling policy environment</p> <p>Activity 2 Establish or revise regulations, standards, and action plan supported by capacity building to create an enabling policy environment for phase out of DDT based antifouling paint and promotion of sustainable alternatives.</p> <p><i>Act. 3.1</i> Establish or revise related regulations, standards, and rules.</p> <p><i>Act. 3.2</i> Revise compulsory rules of inspection of ship products</p> <p><i>Act. 3.3</i> Establish and promote a voluntary certification and labeling program in the antifouling paint sector.</p> <p><i>Act. 3.4</i> Sustain DDT phase out by reducing the potential risk of TBT use in antifouling</p>	<ul style="list-style-type: none"> ➤ General Specification for Antifouling Paint on Ship Bottom will be revised taking into account environmental indicators. ➤ Method to Detect DDT Content in Antifouling Paint and Paint Film will be developed. ➤ Regulation to Ban DDT Usage for Antifouling Production Paint and Prohibit Ships to Use DDT Based Antifouling Paint will be drafted and made into effect. ➤ Rule for Inspection of Ship Products and Rule for Inspection of Fishing Boat Products will be revised. ➤ Rule for Voluntary Certification and Labeling of Antifouling Paints will be developed. ➤ Dossier for China to accede to the IMO Convention will be prepared. ➤ Action Plan for China to Implement the IMO Convention will be developed. ➤ Capacity of various departments will be strengthened. 	<ul style="list-style-type: none"> ➤ Revised General Specification for Antifouling Paint on Ship Bottom. ➤ Method to Detect DDT Content in Antifouling Paint and Paint Film. ➤ Regulation to Ban DDT Usage for Antifouling Production Paint and Prohibit Ships to Use DDT Based Antifouling Paint. ➤ Rule for Inspection of Ship Products and Rule for Inspection of Fishing Boat Products. ➤ A Voluntary Certification and Labeling Program for Antifouling Paints. ➤ Dossier for China to accede to the IMO Convention. ➤ Action Plan for China to Implement the IMO Convention. 	<ul style="list-style-type: none"> ➤ Regulations, standards, and policies can be approved and made into effects by related administrative departments. ➤ Voluntary certification and labeling program can exert complementary functions with compulsory inspection rules to promote the alternatives. ➤ Active cooperation and smooth coordination can be achieved among different departments.

<p>paint.</p> <p><i>Act. 3.5</i> Strengthen capacity of related departments to effectively implement and enforce regulations and standards.</p>			
<p>Outcome 3 Conversion from DDT based antifouling paints to alternatives.</p> <p>Activity 3 Adopt multiple means of technological support, policy induction, market regulation, and awareness raising and education to promote the conversion from DDT/TBT based antifouling paints to alternatives.</p> <p><i>Act. 4.2</i> Test, select and acquire alternative technologies.</p> <p><i>Act. 4.3</i> Select demonstration enterprises.</p> <p><i>Act. 4.4</i> Produce, distribute and promote alternatives.</p> <p><i>Act. 4.5</i> Conduct environmental sound management of DDT at contaminated sites and on equipment.</p>	<ul style="list-style-type: none"> ➤ R & D institutes able to synthesize alternative biocides, active chills ingredients, or other environmentally friendly antifoulants that will be selected. ➤ Applied researches will be conducted to promote the maturity of the alternative technologies for use by the project. ➤ On-ship coating experiment and scale-up production experiment will be conducted. ➤ Alternatives will prove to be technically feasible, environmentally friendly and can be produced at scale of economy. ➤ Antifouling paint manufacturers having strong technical and managerial competence and sound business plan will be selected. ➤ Feasibility study and EIA will be conducted according to related construction project approval procedures in China. ➤ Full scale production of alternatives will be started. ➤ Handbook to apply alternatives will be compiled and distributed. ➤ Incentives will be provided to mass production and purchase. ➤ Part of DDT production equipment will be closed and disposed at Tianjin Chemical Plant. 	<ul style="list-style-type: none"> ➤ Dossier of request for proposal and bidding proposals. ➤ Technologies for synthesizing alternative biocides, active chills ingredients, or other environmentally friendly antifoulants. ➤ Technologies for full scale production of alternative antifouling paints. ➤ Feasibility study reports and EIA reports. ➤ Approval documents from Government ➤ Certificates and labels granted to enterprises. ➤ Enterprise records of production and sale. ➤ Handbooks to apply alternatives. ➤ Feasibility study reports on disposal of DDT based antifouling paint equipment and part of 	<ul style="list-style-type: none"> ➤ Results from applied research can be completed on time to be used by the project. ➤ Issues of intellectual property rights can be effectively addressed in time for existing alternative technologies or products that can be promoted by this project. ➤ Application and EIA reports for alternative production projects can be approved by authorities. ➤ Active cooperation among enterprises, dealers and users can be achieved. ➤ Alternative production industry can be commercialized after the completion of the project. ➤ Medium and small sized enterprises can be well supported and guided to produce alternatives and provide distribution and after-sale services.

		DDT production equipment.	
<p>Outcome 4 Environmental education and awareness raising</p> <p>Activity 4 Conduct environmental education to promote the environmental awareness of the key stakeholders and the public, improve their understanding of the harm of DDT/TBT based antifouling paints and the benefits of alternatives.</p> <p>Act. 5.1 Prepare publicity materials for environmental education and awareness raising purpose targeting government officials, personnel in the industrial field and the public through multiple media of TV, radio, newspaper, magazine, journal, Internet, CD-ROM, and printing materials.</p> <p>Act. 5.2 Mobilize NGOs to conduct community based environmental education and awareness raising.</p>	<ul style="list-style-type: none"> ➤ Publicity materials for TV and film media for marine environmental protection and antifouling systems will be made. ➤ Special programs will be made on local radio stations. ➤ A special column will be arranged in a professional journal. ➤ Contents introducing marine antifouling system will be added to the textbook for environmental education in local middle and primary schools. ➤ The project website will be regularly updated. ➤ 2 press conferences will be held for milestone events. ➤ Nation wide traveling exhibition will be launched to disseminate the project results. ➤ A fund raising activity will be organized for deformed children suffering from toxic antifouling paints. ➤ Joint exhibitions will be held with local marine exhibition halls. ➤ NGOs, universities and civil society will be mobilized to popularize knowledge about antifouling paints and raise their environmental awareness in community level. ➤ Focal points in communities and fishermen organizations will be established for long-term alternative promotion and environmental 	<ul style="list-style-type: none"> ➤ Publicity materials of DDT/TBT based antifouling paints and marine environmental protection. ➤ News reported on media. ➤ Materials for training of administrative staff of local government agencies. ➤ Materials for training of NGOs in universities and civil society. ➤ Focal points of the communities. ➤ Contents in middle and primary school textbooks introducing antifouling paints and marine environmental protection. ➤ Articles in special column of professional journal. ➤ Plan for joint exhibition with local marine exhibition halls. ➤ Work plan for nation wide exhibition. 	<ul style="list-style-type: none"> ➤ Good quality publicity materials of various forms and targeting various audiences can be produced in time. ➤ Active public participation.

	<p>awareness raising.</p> <ul style="list-style-type: none"> ➤ Environmental education will be conducted systematically in local middle and primary schools. ➤ Training materials will be compiled and training workshops held for the local administrative staff from departments of economic trade, fishery, navigation, and environmental protection. 		
<p>Outcome 6: Monitoring and evaluation Activity 6: Effective monitoring and evaluation on project implementation and achieved results <i>Act. 6.1</i> Conduct regular meetings to review progress and project result review. <i>Act. 6.2</i> Launch field investigations and inspections to monitor and evaluate progress of project implementation. <i>Act. 6.3</i> Prepare progress reports for measurement of Means of Verification to monitor project purpose indicators, project progress and performance. Act. 6.4 Conduct annual project audit.</p>	<ul style="list-style-type: none"> ➤ Inception meeting, annual steering committee meetings, annual project review meetings and tripartite project review meetings will be held. ➤ Special inspections on enforcement of regulations, rules, and standards will be launched. ➤ Independent mid-term and final project evaluations will be held. ➤ Memorandum or minutes of meeting for each field mission, annual progress and experience review reports, and the final project result and experience review reports will be prepared. 	<ul style="list-style-type: none"> ➤ Meeting minutes or memorandum. ➤ Annual project reviews. ➤ Final project review. ➤ Reports of independent project evaluation. 	<ul style="list-style-type: none"> ➤ Materials for monitoring and evaluation can be provided sufficiently in advance of the actual inspections, investigations, and various review meetings. ➤ The related staff at national and local levels for implementing the project can be available for making presentations assisting field investigations. ➤ There is open, transparent, and effective communication between the M & E staff and the project implementation staff.

ANNEX VI: EVALUATION MATRIX & QUESTIONS

Evaluative Criteria Questions	Indicators	Sources	Methodology
Relevance: How does the project relate to the main objectives of the GEF focal area, and to the environment and development priorities at the local, regional and national levels?			
<ul style="list-style-type: none"> • How does the Project support the objectives of the Stockholm Convention (SC) • How does the Project support the related strategic priorities of the GEF? 	<ul style="list-style-type: none"> • Existence of a clear relationship between project objectives and GEF POPs focal area 	<ul style="list-style-type: none"> • Project documents • GEF focal area strategies and documents 	<ul style="list-style-type: none"> • Document analysis • GEF website • Interview with government, Project Team, UNDP and other project partners
<ul style="list-style-type: none"> • How does the Project support the development objectives of People’s Republic of China? • Does the Project adequately take into account the national realities, both in terms of institutional framework and programming, in its design and its implementation? • To what extent were national partners involved in the design and implementation of the Project? • Were the capacities of executing institutions and counterparts properly considered when the project was designed? • Does the Project participate in the implementation of the SC in China? • How country-driven is the Project? 	<ul style="list-style-type: none"> • Degree of coherence between project objectives and national development priorities, policies and strategies • Level of involvement of government officials and other partners in project design and implementation • Coherence between needs expressed by national stakeholders and UNDP-GEF criteria 	<ul style="list-style-type: none"> • Project documents • China POPs National Implementation Plan • Key project partners 	<ul style="list-style-type: none"> • Document analyses • Interview with government officials and project partners
<ul style="list-style-type: none"> • How does the Project support the objectives of UNDP in this sector? 	<ul style="list-style-type: none"> • Consistency between project objectives and UNDP strategies and development objectives 	<ul style="list-style-type: none"> • Project document • UNDP strategies and programme 	<ul style="list-style-type: none"> • Document analyses • Interviews with government, UNDP, other partners
<ul style="list-style-type: none"> • How does the Project support the needs of target 	<ul style="list-style-type: none"> • Strength of the link between expected project results from the project and the 	<ul style="list-style-type: none"> • Project partners and 	<ul style="list-style-type: none"> • Document analysis

<p>beneficiaries?</p> <ul style="list-style-type: none"> • Is the implementation of the Project been inclusive of all relevant Stakeholders? • Are local beneficiaries and stakeholders adequately involved in Project design and implementation? 	<p>needs of relevant stakeholders</p> <ul style="list-style-type: none"> • Degree of involvement and inclusiveness of stakeholders and beneficiaries in project design and implementation 	<p>stakeholders</p> <ul style="list-style-type: none"> • Needs assessment studies • Project documents 	<ul style="list-style-type: none"> • Interviews with relevant stakeholders
<ul style="list-style-type: none"> • Are there logical linkage between expected results of the project (log frame) and the project design (in terms of Project components, choice of partners, structure, delivery mechanism, scope, budget, use of resources etc.)? • Is the length of the project sufficient to achieve project outcomes? 	<ul style="list-style-type: none"> • Level of coherence between expected project results and project design internal logic • Level of coherence between project design and implementation approach 	<ul style="list-style-type: none"> • Program and project documents • Key project stakeholders 	<ul style="list-style-type: none"> • Document analysis • Key interviews
Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?			
<ul style="list-style-type: none"> • Has the project been effective in achieving its expected outcomes? <ul style="list-style-type: none"> ○ Institutions and mechanism for project management and coordination; ○ Management information system (MIS) and information management; ○ Enabling policy environment; ○ Conversion from DDT-based antifouling paints to alternatives; ○ Environmental education and awareness raising; ○ Monitoring and evaluation. 	<ul style="list-style-type: none"> • Indicators in project document results framework and logframe 	<ul style="list-style-type: none"> • Project documents • Project Team and relevant stakeholders • Data reported in project annual and quarterly reports 	<ul style="list-style-type: none"> • Document analysis • Interviews with Project Team • Interviews with relevant stakeholders
<ul style="list-style-type: none"> • What lessons have been learned from the project regarding achievement of outcomes? • What changes could have been made (if any) to the design of the project in order to improve the achievement of the 		<ul style="list-style-type: none"> • Data collected through evaluation 	<ul style="list-style-type: none"> • Data analysis

project's expected results?			
Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?			
<ul style="list-style-type: none"> • Was adaptive management used or needed to ensure efficient resource use? • Did the project logical framework and work plans and any changes made to them use as management tools during implementation • Were the accounting and financial systems in place adequate for project management and producing accurate and timely financial information? • Were progress reports produced accurately, timely and responded to reporting requirements including adaptive management change? • Did the leveraging of funds (co-financing) happen as planned? • Was procurement carried out in a manner making efficient use of project resources? 	<ul style="list-style-type: none"> • Availability and quality of financial and progress reports • Timeliness and adequacy of reporting provided • Planned vs. actual funds leveraged • Occurrence of change in project design / implementation approach (i.e. restructuring when needed to improve project efficiency) 	<ul style="list-style-type: none"> • Project documents and evaluations • UNDP • Project Team 	<ul style="list-style-type: none"> • Document analysis • Key interviews
<ul style="list-style-type: none"> • To what extent partnerships/linkages between institutions / organizations were encourage and supported • What partnerships/linkages were facilitated? Which ones can be considered sustainable? • What was the level of efficiency of cooperation and collaboration arrangements? 	<ul style="list-style-type: none"> • Specific activities conducted to support the development of cooperative arrangements between partners • Examples of supported partnership? • Evidence that particular partnership/linkages will be sustained • Types/quality of partnership cooperation methods utilized 	<ul style="list-style-type: none"> • Project documents and evaluations • Project partners and relevant stakeholders 	<ul style="list-style-type: none"> • Document analysis • Interviews
<ul style="list-style-type: none"> • Did the project take into account local capacity in design and implementation of the project? • Was there an effective collaboration between institutions 	<ul style="list-style-type: none"> • National expertise utilized • Number/quality of analysis done to asses local capacity potential and 	<ul style="list-style-type: none"> • Project documents and evaluations • UNDP 	<ul style="list-style-type: none"> • Document analysis • Interviews

responsible for implementing the project?	absorptive capacity	<ul style="list-style-type: none"> Beneficiaries 	
<ul style="list-style-type: none"> What lessons can be learned from the project regarding efficiency? How could the project have more efficiently carried out implementation (in terms of arrangement structures and procedures, partnership arrangements etc.)? What change could have been made (if any) to the project in order to improve its efficiency? 		<ul style="list-style-type: none"> Data collected throughout evaluation 	<ul style="list-style-type: none"> Data analysis
<ul style="list-style-type: none"> How and to what extent have project implementation process, coordination with participating stakeholders and important aspects affected the timely project start-up, implementation and closure? 	<ul style="list-style-type: none"> Relationship and coordination mechanism of project partners Timeliness of project activities implemented 	<ul style="list-style-type: none"> Project documents Project Team and relevant stakeholders 	<ul style="list-style-type: none"> Document analysis Key interviews
<ul style="list-style-type: none"> Do the outcomes developed during the project formulation still represent the best project strategy for achieving the project objectives? 	<ul style="list-style-type: none"> Extent of relevance of project outcomes and objectives to changing circumstances 	<ul style="list-style-type: none"> Project documents Project Team and relevant stakeholders 	<ul style="list-style-type: none"> Document analysis Key interviews
<ul style="list-style-type: none"> Does the project consult and make use of skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the implementation and evaluation of project activities? 	<ul style="list-style-type: none"> National capacities utilized Number/type of partnership formed 	<ul style="list-style-type: none"> Project documents Project Team and relevant stakeholders 	<ul style="list-style-type: none"> Document analysis Key interviews
Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?			
<ul style="list-style-type: none"> Was project sustainability strategy developed during the project design? How relevant was the project sustainability strategy? 	<ul style="list-style-type: none"> Evidence/quality of sustainability strategy Evidence/quality of steps taken to address sustainability 	<ul style="list-style-type: none"> Project documents Project Team and relevant stakeholders Beneficiaries 	<ul style="list-style-type: none"> Document analysis Key interviews

<ul style="list-style-type: none"> Are there any financial risks that may jeopardize sustenance of project outcomes? What is the likelihood of financial and economic resources not being available once the GEF assistance ends (resources can be from multiple sources, such as the public and private sectors, income generating activities, and trends that may indicate that it is likely that in future there will be adequate financial resources for sustaining project's outcomes)? 	<ul style="list-style-type: none"> Financial resources available after project completion to support and sustain project outcomes 	<ul style="list-style-type: none"> Project Team and relevant stakeholders Project partners Beneficiaries 	<ul style="list-style-type: none"> Document and data analysis Key interviews
<ul style="list-style-type: none"> Are there any social or political risks that may jeopardize sustenance of project outcomes? What is the risk that the level of stakeholder ownership will be insufficient to allow for the project outcomes/benefits be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there a sufficient public/ stakeholder awareness in support of the long term objectives of the project? 	<ul style="list-style-type: none"> Social and political risk assessment data to support sustainability of project outcomes 	<ul style="list-style-type: none"> Project Team and relevant stakeholders Project partners Beneficiaries 	<ul style="list-style-type: none"> Document and data analysis Key interviews
<p>Impact: Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?</p>			
<ul style="list-style-type: none"> What are the main positive and negative impacts of the project? 	<ul style="list-style-type: none"> Project impacts (e.g. capacity, policy enabling framework, etc.) 	<ul style="list-style-type: none"> Project documents GEF focal area tracking tools 	<ul style="list-style-type: none"> Document analysis Key Interviews
<ul style="list-style-type: none"> How has the project contributed to global environmental benefits or reductions in stress to ecological systems, or is there evidence that the project has put in place processes that will lead to such impact? 	<ul style="list-style-type: none"> Levels of reduction of POPs release Systems, structures and capacities that contribute to changes in POPs release 	<ul style="list-style-type: none"> Project documents GEF focal area tracking tools 	<ul style="list-style-type: none"> Document analysis Key Interviews

ANNEX VII: INTERVIEW GUIDE

Note: This is only a guide for the interviewers and a simplified version of the evaluation matrix. Not all questions will be asked to each interviewee; it is a reminder for interviewers about the type of information required to complete the evaluation exercise and a guide to prepare the semi-structured interviews.

I. RELEVANCE - *How does the Project relate to the main objectives of the Stockholm Convention, UNECE POPs Protocol, GEF and to the environment and development challenges faced by China?*

- I.1. Is the Project relevant to the SC, UNECE POPs Protocol and GEF objectives?
- I.2. Is the Project relevant to UNDP objectives?
- I.3. Is the Project relevant to China's development objectives?
- I.4. Does the Project address the needs of target beneficiaries?
- I.5. Is the Project internally coherent in its design?
- I.6. How is the Project relevant in light of activities supported by other donors?

Future directions for similar projects

- I.7. What lessons have been learnt and what changes could have been made to the Project in order to strengthen the alignment between the Project and the Partners' priorities and areas of focus?
- I.8. How could the Project better target and address the priorities and development challenges of targeted beneficiaries?

II. EFFECTIVENESS – *To what extent are the expected outcomes of the Project being achieved?*

- II.1. How is the Project effective in achieving its expected outcomes?
- II.2. How is risk and risk mitigation being managed?
- II.3. How are results and progress towards achieving project objectives being managed?

Future directions for similar projects

- II.4. What lessons have been learnt for the project to achieve its outcomes?
- II.5. What changes could have been made (if any) to the design of the Project in order to improve the achievement of the project' expected results?
- II.6. How could the project be more effective in achieving its results?

III. EFFICIENCY - *How efficiently is the Project implemented?*

- III.1. Were the project roles properly assigned during project design?
- III.2. Are the project roles in line with UNDP and GEF programming guidelines?
- III.3. Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry?
- III.4. Was adaptive management used or needed to ensure efficient resource use?
- III.5. Did the Project logical framework and work plans and any changes made to them use as management tools during implementation?
- III.6. Were the accounting and financial systems in place adequate for Project management and producing accurate and timely financial information?

- III.7. Were progress reports produced accurately, timely and respond to reporting requirements including adaptive management changes?
- III.8. Was Project implementation as cost effective as originally proposed (planned vs. actual)
- III.9. Did the leveraging of funds (co-financing) happen as planned?
- III.10. Were financial resources utilized efficiently? Could financial resources have been used more efficiently?
- III.11. Was procurement carried out in a manner making efficient use of project resources?
- III.12. How was RBM used during program and project implementation?
- III.13. Were there an institutionalized or informal feedback or dissemination mechanism to ensure that findings, lessons learned and recommendations pertaining to Project design and implementation effectiveness were shared among Project stakeholders, UNDP and GEF Staff and other relevant organizations for ongoing Project adjustment and improvement?
- III.14. Did the Project mainstream gender considerations into its implementation?
- III.15. To what extent were partnerships/ linkages between institutions/ organizations encouraged and supported?
- III.16. Which partnerships/linkages were facilitated? Which one can be considered sustainable?
- III.17. What is the level of efficiency of cooperation and collaboration arrangements? (between local actors, UNDP/GEF and relevant government entities)
- III.18. Was an appropriate balance struck between utilization of international expertise as well as local capacity?
- III.19. Did the Project take into account local capacity in design and implementation of the Project?

Future directions for the Project

- III.20. What lessons can be learnt from the Project on efficiency?
- III.21. How can the project more efficiently address its key priorities (in terms of management structures and procedures, partnerships arrangements etc...)?

IV. IMPACTS - *What are the potential and realized impacts of activities carried out in the context of the Project?*

- IV.1. Will the project achieve its objective?
- IV.2. How is the Project effective in achieving the objectives of the SC and of the UNECE POPs Protocol such as impacts or likely impacts on the local environment; on poverty; and, on other socio-economic issues?

Future directions for the Project

- IV.3. How can the project build on its apparent successes and learn from its weaknesses in order to enhance the potential for impact of its own activities as well as other ongoing and future initiatives?

V. SUSTAINABILITY - *Are the initiatives and results of the Project allowing for continued benefits?*

- V.1. Are sustainability issues adequately integrated in Project design?
- V.2. Did the Project adequately address financial and economic sustainability issues?
- V.3. Is there evidence that Project partners will continue their activities beyond Project support?

- V.4. Are laws, policies and frameworks being addressed through the Project, in order to address sustainability of key initiatives and reforms?
- V.5. Is the capacity in place at the national and local levels adequate to ensure sustainability of the results achieved to date?
- V.6. Are Project activities and results being replicated elsewhere and/or scaled up?
- V.7. What are the main challenges that may hinder sustainability of efforts?

Future directions for the Project

- V.8. Which areas/arrangements under the project show the strongest potential for lasting long-term results?
- V.9. What are the key challenges and obstacles to the sustainability of results of the project initiatives that must be directly and quickly addressed

ANNEX VIII: RATING SCALES

<p>Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution</p> <p>Highly Satisfactory (HS): no shortcomings Satisfactory (S): minor shortcomings Moderately Satisfactory (MS) Moderately Unsatisfactory (MU): significant shortcomings Unsatisfactory (U): major problems Highly Unsatisfactory (HU): severe problems</p>	<p>Sustainability ratings:</p> <p>Likely (L): negligible risks to sustainability Moderately Likely (ML): moderate risks Moderately Unlikely (MU): significant risks Unlikely (U): severe risks</p>	<p>Relevance ratings</p> <p>Relevant (R) Not relevant (NR)</p> <p>Impact Ratings: Significant (S) Minimal (M) Negligible (N)</p>
<p><i>Additional ratings where relevant:</i> Not Applicable (N/A) Unable to Assess (U/A)</p>		

ANNEX IX: EVALUATION CONSULTANT CODE OF CONDUCT AGREEMENT FORM – MRS. HILDA VAN DER VEEN

Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and: respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

Evaluation Consultant Agreement Form (www.unevaluation.org/unegcodeofconduct)

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Hilda van der Veen

Name of Consultancy Organization (where relevant): NA

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at **New York City, U.S.A.** on **28 April, 2014**

Signature:  _____

ANNEX X: EVALUATION CONSULTANT CODE OF CONDUCT AGREEMENT FORM – MR. ZHU JIANXIN

Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation

Evaluation Consultant Agreement Form (www.unevaluation.org/unegcodeofconduct)

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Zhu Jianxin

Name of Consultancy Organization (where relevant):

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at **Beijing, China** on **April 29th, 2014**



Signature: _____

ANNEX XI: MANAGEMENT RESPONSES