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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Switzerland

Environmentally Sound Technologies Programme in China (US/CPR/02/009)

Qufu: Gate of the Confucius Temple

子曰：志于道，据于德，依于仁，游于艺。

"Never forget in your daily life, that you are part of the mother nature of our Earth, behave in peace, harmony and concord, take care of our environment and enjoy the beauty of our common world." (Confucius)

The Evaluation Mission Team was composed of the following members:

Mr. Kurt Wiesegart
Team Leader, Managing Director of Pacific Consult GmbH
Representative of the Donor (Switzerland) and Nominated by seco (State Secretariat for Economic Affairs)

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* The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

Mention of company names and commercial products does not imply the endorsement of UNIDO.

The views and opinions of the team do not necessarily reflect the views of the Government of China and Switzerland and of UNIDO.

This document has not been formally edited.

Map of Shandong Province

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Jinan. Meeting of the evaluation team with UNIDO, seco and IRC. From the right: Ms. Sanchez-Osuna, Ms. Ansermet and Mr. Wunderlin

Acknowledgment

The Evaluation team thanks the staff of the Programme, the staff of seco, of the International Reference Centre and all the other persons involved in the planning and the realization of this field mission for the excellent cooperation offered during the development of the evaluation work in Vienna, Switzerland and China.

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Finally, the Evaluation Team wish to express its thanks to Ms. Sabine Kuchner, project assistant staff of the UNIDO Programme Development and Technical Cooperation Division, Energy and Cleaner Production Branch, for her valuable support in providing the necessary documentation requested by the team before and during the development of the mission.

The Evaluation Team trusts that the proposed recommendations will allow the management of the project optimizing the utilization of the resources, with the objective to implementing the forecasted transfer of Environmentally Sound Technologies.

The respect of the environment, saving natural resources with the support of environmentally sound technologies, should be the principle the industrial world applies for increasing and optimizing the production.

As already stated in other similar evaluations, we should not forget that were not our parents who left to us the world in which we live, but our children have lent it to us, with the trust to get back later a better one.

Abbreviations and acronyms used in the report

ADB	Asian Development Bank
CDM	Clean Development Mechanism
CESTT	Center for EST Transfer (Beijing)
CHF	Swiss Francs
CIDA	Canadian International Development Agency
CP	Cleaner Production
CPC	Chief Project Coordinator
cpc	Cleaner Production Centre
CTA	Chief Technical Adviser
EMC	Energy Management Contract
EPB	Environmental Provincial Bureau
EST	Environmentally Sound Technologies
ET	Evaluation Team
EU	European Union
GDP	Gross Domestic Product
GTZ	German Agency for Technical Cooperation
ILO	International Labour Organization
IRC	International Reference Center (Consortium of companies based in Basle)
MOST	Ministry of Science and Technology
NDRC	National Development and Reform Commission
NEPA	Natural Environmental Protection Agency
NPD	National Project Director
OECD	Organization for Economic Co-operation and Development
PMO	Project Management Office (in Jinan)
POPs	Persistent Organic Pollutants
PPR	Project Progress Report
PRO.DOC	Project Document
QSA	Quick Scan Analysis
R&D	Research and Development
RMB	Chinese Currency
S&T	Science and Technology
SARS	Severe Acute Respiratory Syndrome
SC	Steering Committee
SCPC	Standing Committee of the People's Congress
SDPC	State Development and Planning Commission
seco	State Secretariat for Economic Affairs in Bern/Switzerland
SEPA	State Environmental Protection Agency
SESTPC	Shandong EST Promotion Center
SETC	State Economic and Trade Commission
SMEs	Small and Medium Enterprises
SO2	Sulphur dioxide
STSEC	Shandong Technology Stock Exchange Center
ToR	Terms of Reference
TT	Technology Transfer
UNCED	United Nations Conference on Environment and Development
UR	Unido Representative
US$	United States Dollar

1) EXECUTIVE SUMMARY

Since many years the Swiss Government through seco (State Secretariat for Economic Affairs) is financing development projects with the objective to improve the respect of the environment by the industrial processes, improving at the same time the competitiveness.
The purpose of this project is to identify demands for environmentally sound technologies in small and medium companies of specific industrial sectors in Shandong Province, matching them with Swiss or OECD suppliers, i.e. increasing the potential for environmentally sound technologies and the market for the penetration of environmental sound technologies.
To reach this objective and develop appropriate environmental management actions the Programme aims not only at the preservation of the environment but also at optimizing the industrial production as far as competitiveness is concerned. Environmentally sound technology (EST) is critical for allowing economic development without significant environmental degradation. This regards reduction of consumption of resources (water and energy) while upgrading the capacities of the institutions promoting the utilization of EST in China.
The services foreseen for the Chinese enterprises are: environmentally sound technology assessments, implementation of environmentally sound technologies, CDM, POPs and social accountability projects, technology brokerage together to economic and financial advice. These services are complemented with training, information, awareness rising, capacity building, policy advice, as well as with arranging visits or study tours to technology providers and users of the proposed technologies.
This project is not aiming at establishing a typical Cleaner Production Centre (this was expected to be already in place), but rather it is focusing its activity on the transfer of environmentally sound (adapted) technologies.
In China, most companies currently base their pollution control efforts on end-of-pipe techniques, where the waste is treated before being discharged. This is not always the most effective mean for preventing pollution, especially when these facilities are not properly maintained. Although end-of-pipe technologies result in less waste, they have costs involved while EST, by reducing input materials, fines and disposal fees, has the potential for generating undiscovered profits. Although many people consider EST to be an expensive alternative in relation to end of pipe treatment, there are many low or no-cost options that can be implemented bringing economic returns almost immediately.
EST has immense potential in China and is an emerging market. The transfer of EST may produce economic benefits for all parties involved and the environmental protection will be enhanced through pollution prevention and resources conservation.

Due to some delays (the outbreak of SARS) the project started its operations in July 2003, with the arrival of the Chief Project Coordinator (CPC).
The development objective of the project is based on a number of assumptions:

- Existence of a Cleaner Production Centre in Shandong Province, with qualified staff and promoting CP activities in the province.
- The Environmental Provincial Bureau (EPB) is the most appropriate entity to access companies for EST investments
- The EPB could generate EST projects when implementing environmental laws
- Financing for EST projects is available, existing multilateral and Swiss funds
- Sustainability of the project for Transfer of Technology (TT)

The Project Document focused on two sectors for implementation of TT, chemical and textile sectors. The focus was to “cross-cutting topics for energy and environment”.

The institutional set-up for the Project is composed of two entities in charge of the implementation: UNIDO and IRC (International Centre of Reference).

Links were foreseen to other UNIDO projects in China within the UNIDO framework for upgrading capacity and promoting technology transfer and investments.

The development of the activities was hampered from the beginning by the above-mentioned assumptions that turned out to be unrealistic and inaccurate, also due to lack of clear determination of tasks and links between the implementing institutions. There should be a clear command and responsibility line.
According to the Evaluation Team the concept should be reconsidered: new targets and a modified institutional structure should be arranged, based on realistic analysis and corrected assumptions.

The creation of the Shandong EST Promotion Center (SESTPC) has been necessary due to the practically non-existence of a real structured Cleaner Production Center for the Shandong Province (which was the main assumption to develop this Programme), for taking care of the administrative relationships with the national experts and for signing contracts for technical assessments (made by national and international experts) in the enterprises, as previous step for the transfer of technology to the Chinese enterprises.

The transfer of environmentally sound technologies to China is still a relevant issue, which deserves to be followed up in the next years. The Chinese industry is developing very fast and unfortunately is heavily polluting the environment. The EPB controls not more than 4 % of the industries in China.

Based on the experience made during this initial implementation, it is doubtful that the two selected sectors (chemical and textile) are the most appropriate, especially due to available international expertise within the IRC.

Besides that the Project Document is based on unrealistic assumptions and overoptimistic objectives, the institutional set-up does not respond adequately to the needs. It is missing a clear understanding of what has to be done regarding technology transfer of "EST".

The institutional set-up has some substantial bottlenecks like the lack of contractual links between the implementing agencies (UNIDO, IRC) and the limited access of the Chinese counterpart to potential interesting companies. In addition, the internal set-up of the IRC causes some problems. The IRC is a consortium of companies, working as independent consulting companies. During the Evaluation Mission it turned out, that some of the companies are reluctant to provide the requested services (as foreseen in the Project Document) to the Chinese companies. There is evidence of attempts of the international consulting companies to delay the services expected to be delivered in the framework of the Programme to a later stage and then charge the costs directly as consulting fee to the Chinese companies. This is a substantial conflict of interest.
The Project Document assumes that financing is available for the TT projects, developed by the Programme. It turned out that financing of TT is a crucial issue. The Chinese companies assisted by the Project expect the availability of financial resources for supporting the TT.
The success of the Project seems to be closely related to availability of funds.
The Centre and the Chief Project Coordinator signed some contracts with Chinese companies, regarding technical assistance for production improvements, financial advising or feasibility studies. UNIDO HQs should have authorized this procedure.

The name of the Centre refers clearly only to **EST Promotion, but not** to **TT**. This issue has to be clarified. It should be only promotion and matchmaking or also involvement in the financial transactions of the transfer of technology? This issue is important to measure afterwards the impact of the activities and should be decided by seco and UNIDO before starting the next phase.

The focus of the Project approach should be on "optimising production, cost saving" (energy, water, raw materials,) rather than refer only to a pure "environmental" approach. This would facilitate the access to companies who are under the current framework **more "business" than "environment" oriented**. The results would have consequently a positive impact on the environment **("commercial motivation", "business driven approach**" could be used as door openers in order to target at the same time the respect of the environment).

It would be helpful if information about the **advanced technology abroad** would be made available.

Up to now, the Project follows only a "demand driven" approach. This is according to the Project Document and encouraged by the IRC. This problem might be connected with the IRC structure (conflict of interest between being members of the consortium and independent consultants).

2) The independent joint evaluation

2.1) Purpose and scope

The tasks of this in-depth evaluation are outlined in the attached Terms of Reference of the mission. (Annex I)

The purpose of this mid-term independent in-depth evaluation, organized after 18 months of operation, is to enable the project stakeholders (Donor Government authorities, national counterpart, International Reference Centre, the participating provinces, industries and UNIDO) to take decisions on eventual reorientation of the project, through the analysis of the achievements and the shortcomings of the project and, finally, to plan for further development in the field of EST transfer and financing.

The main focus of the evaluation is to assess the current project situation and to evaluate the alternative scenarios and feasibility for the future of the EST-Program.

The evaluation process offers the opportunity to the project stakeholders to learn about the possibilities of future re-orientation of EST related activities in the Shandong Province and reconsider the alternative approaches for EST transfer. The evaluation process will provide with lessons and experiences for the eventual future design and implementation of EST transfer cooperation projects.

The evaluation is conducted in compliance with UNIDO policy of mandatory evaluation of large technical cooperation projects as specified in UNIDO/ DGB(P).72. This mid-term independent evaluation was foreseen in the project document, which was signed on 10 June 2002 on behalf of the Government of the Peoples' Republic of China, the Government of Switzerland and UNIDO, as implementing agency.

Further, this evaluation is trying to determine, as systematically and objectively as possible, the relevance, efficiency, effectiveness, impact and sustainability of the Programme on Environmentally Sound Technologies in China.

The primary purpose of any independent evaluation is:

- Assessing the achievements against the objectives and the expected results.

- Identifying factors that have facilitated the achievements of the projects objectives, as well as factors that hindered the fulfilment of these objectives.

- Determining which lessons can be learned from the existing experience, in order to improve the activities in the further phase, with particular regard to the capacity of the structures supported to become self-sustainable.

2.2) Methodology

The Evaluation Team has considered the objectives stated in the Project Document and has analysed the results obtained in the implementation of the activities foreseen.

This report is based on the following:

- The Project Document dated 10 June 2002, which indicated the basis and the strategy for the cooperation in this project, which should have focused according to the signed document

> *"on integrating cleaner and environmentally sound technologies in the design of new plants, working together with design and research centres, and in incorporating cleaner and environmentally sound technologies in existing plants. A certain number of the initiatives will be linked closer together with multilateral environmental agreements, especially the Kyoto Protocol and the POPs Convention, as well as promote sustainable industrial development through the adoption of social accountability management systems. The chemical and the textile industry sectors have been chosen as the focus of the project."*

The general approach was relying on identifying a demand for environmentally sound technologies in these specific industrial sectors and matching this demand with a Swiss or OECD supply of such a technology.
The services foreseen for the Chinese enterprises were environmentally sound technology assessments, implementation of environmentally sound technologies, CDM, POPs and social accountability projects, technology brokerage with companies in Switzerland or other OECD countries, together to economic and financial advice.

These services should have been complemented with training, information, capacity building, policy advice, as well as with the possibility of arranging visits or study tours to technology providers and users of the proposed technologies.

Further it was foreseen in the Document that: "the activities with respect to existing plants will be undertaken within the Shandong Province, while those with respect to new plants will be undertaken *through design centres in Shanghai, Beijing and Shandong. The Shandong Cleaner Production Centre, together with its affiliated institutions, will be responsible for operational activities at the provincial level. It will undertake these activities under the leadership of the Shandong Environmental Protection Bureau, which will chair a provincial steering committee on which the Shandong Economic and Trade Commission will also sit. A national advisory board will coordinate activities at the national level. The State Environmental Protection Administration will chair the board, and other national members will be the State Development and Planning Commission, the State Economic and Trade Commission, and the Ministry of Science and Technology.*

- All the documentation provided by the project parties in Vienna, Switzerland and in China.

- The Project Progress Reports, which provide the donor, the management of the project and the evaluators with a valuable tool regarding the self-appraisal of the implementing parties of the results obtained and of the difficulties or obstacles encountered.

- In-depth discussions with the UNIDO Project Manager, the Chief Technical Adviser, the coordinator of the International Reference Centre (IRC), the national and international consultants, the national Chinese counterparts and the staff of national institutions.

- Meetings with national counterpart institutions, municipal EPBs and high-ranking officials.

- Visits to some industrial plants (target beneficiaries) and meetings with their managers, discussing the problems related to cleaner production, production improvement, competitiveness, technology transfer and its application in their factories and, finally, their global experience with the project.

- Meeting with the UNIDO Office in Beijing and other institutions, national and international, operating in China in the field of transfer of technology.

- Analysis of the questionnaires prepared by the Evaluation Team and answered by the counterparts.

To prepare the report the evaluation team has followed the UNIDO's instructions for preparing independent in-depth evaluation reports.

The issues have been analyzed in an impartial and objective way, which should be helpful to the responsible authorities and project staff to improve their performance.

The issues have been presented at a final presentation meeting and have been openly and long discussed with the parties involved in a lively session. The parties were given two weeks time to prepare their written comments on the draft presented by the Evaluation Team, regarding the preliminary conclusions and recommendations of the mission and which was used as platform for the discussions.

The Evaluation Team has attempted in this report to give a comprehensive image of the activities of the Components, discussing the issues in a way, which should be helpful for the responsible authorities to decide how to orient the activities in the future.

The data derived from the management information system of the project, the interviews and the evaluators' own observations, have enabled the Evaluation Team to get important insights into the achievements of the project.

2.3) Composition and timetable of the mission

The persons nominated to conduct the evaluation have not been involved in the design, appraisal or implementation of the programme. The observations and findings of the Evaluation Team are the result of this in-depth evaluation carried out in their own capacity. The views and opinions of the team do not necessarily reflect the views of the Government of Switzerland, of the Government of the Republic of China or of UNIDO.

The mission team was composed of the following members:

Mr. Kurt Wiesegart, Team Leader. Managing Director of Pacific Consult GmbH, Representative of the Donor (Switzerland) and nominated by seco (State Secretariat for Economic Affairs).

Mr. Liu Xin, Managing Director of EED (Energy and Environmental Development Consulting Limited), nominated by the Chinese national authorities.

Mr. Mario Marchich, Senior Evaluation Officer, Office of the Comptroller General, Evaluation Services Group. Representative of UNIDO.

The evaluation team comprises all the parties involved in the implementation of the project: the donor, the executing agency and the implementing agencies in China.

This composition of the team has assured uniformity, impartiality and the guaranty that the views of the concerned parties have been considered under an informed point of view.

The mission assembled in Beijing on 13th of March 2005 to start its work. Due to some previous engagements, the national evaluator joined the team on 16th of March in Jinan. The places visited in China have been: Beijing, Jinan, Binzhou, Taian, Laiwu, Xinmen, Rizhao, Qingdao.

In Switzerland, at the beginning of March 2005, the mission has interviewed in Bern, Basel and Zurich the persons concerned with the project.

The agenda of the evaluation mission is contained in Annex II.

At the end of its work in China, the evaluation mission has presented in Jinan on 1st April 2005 its findings and related recommendations at a general debriefing meeting with the participation of all the parties concerned.

The presentation has been followed by interesting discussions with the participants. The results of these discussions and the comments made by the participants have been taken, as far as possible, into account in this report. The list of the persons interviewed in the framework of this evaluation is in Annex III.

2.4) Evaluation Terminology / Glossary

There is a generally accepted international evaluation terminology. For this reason, and having realized during the evaluation exercise that some of the parties involved misunderstood some terms, in order to help the readers, it is useful to give here some definitions/explications of the meaning of the words used in this report.

This terminology corresponds in large part to the terminology used in the evaluation methodology followed by the major international institutions.

Below are reported the explanations of the terms used in this report:

Terms	**Explanation of Terms**
Conclusions	Conclusions and findings outline the factors of success or failure of the project under evaluation, in order to point out strengths or weaknesses.
Recommendations	Advisory proposals (not binding or mandatory) of the Evaluation Team, aiming at enhancing the quality and the effectiveness of the project, redesigning objectives or suggesting re-allocation of resources. Any recommendation should be linked to a conclusion and should be directed to the party responsible for taking the respective action.
Lesson Learned	A generalization based on the results of the evaluation that abstracts from a specific circumstance to a broader situation.
Inputs	Financial, Human, and Time resources that are put at the disposal of the project to implement the activities and produce the outputs.
Effect	General term to indicate what is changed by the project. It shows what the outputs have produced.
Result	General term for the effects that result from the application of the project inputs. It indicates the performance of the project.
Output	The final product in terms of activities executed, applying the input resources. It shows the improved capabilities of the Counterparts, after the received assistance.
Outcome	Effects related to target groups assisted, showing the positive changes obtained in their performance.
Impact	The extent to which the improved performance of the counterparts and the solution of the critical issues have produced a positive effect (in quantity and quality) on the target beneficiaries. It means the changes achieved in the targeted beneficiary sector.
Criteria	Qualitatively expressed “Indicators”, when it is not possible to use quantitative data.

Activities	In the context of a project/programme activities are the main steps or actions required to reach the outputs.
Assumptions	Conditions that are necessary to ensure that the planned activities will produce the expected results and that the logical link effect - relationship between the different levels of project/programme results will occur as expected
Accountability	Obligation of project/programme managers to demonstrate that work has been conducted in compliance with defined responsibilities, rules, standards and performance expectations. For the evaluators it connotes the responsibility to provide accurate, fair and credible reports and assessments.
Objective	Is used as general term for aiming at results at different hierarchical levels (General development objective, immediate objective).
Sustainability	The capability of the counterpart/client to maintain and further develop the outputs and outcomes produced with the support of the programme and/or to adjust them in order to ensure continued benefit to the target beneficiaries, when the assistance of the programme will end.
Goal (also Purpose, or Mission)	Endeavours at general level.
Target	A specific objective. The mark at which is aimed.
Efficiency	The relationship between the inputs utilized and the outputs produced, both in terms of quantity, quality and timeliness
Self-evaluation	Process for continuous improvement by project managers and counterparts, aiming at reviewing progress and agree on reorientation requirements.
Effectiveness	The extent to which the outputs of the project are used to achieve the purposes.
Cost- Effectiveness	The ratio between the cost and the result obtained.
Performance	The extent to which the project has produced valuable and sound outputs and their contribution to the final impact. Both, efficiency and effectiveness can be considered as measures for the performance of the project.
Donor	Is the funding Organization or Government whose role in the evaluation exercise is to participate in the evaluation, ensuring together with the executing agency, through the lessons learned, the necessary feedback on programme improvements, reorientation and funding.

Relevance	The extent to which the programme is consistent with the problem area identified in relation to the country's industrial development goals, the constraints and needs of counterparts and beneficiaries and UNIDO comparative advantages and services/expertise.
Cause and Effect of environmental Aspects	**Causes** of environmental aspects are the direct consequences at plant level (in terms of emissions or natural resources used), while **Effects** are their impacts on the eco-socio environment
Beneficiaries	Individuals, enterprises or organizations/institutions, whether targeted or not, that benefit directly or indirectly from a project/programme
Indicator	Quantitative or qualitative variable that provides a simple and reliable basis for assessing results and performance
Milestones	Important events or concrete results, marking the beginning or progress or end of activities and used to keep track that the activities are implemented as planned and according to the work plan.
Critical assumptions	In the context of the logical framework refer to the general conditions under which a development hypothesis will hold true or refer to the conditions which are outside the control or influence of the implementing parties and which are likely to affect the achievement of results.
Independent in-depth evaluation	Independent assessment of performance, outcomes and impact, carried out by independent evaluators not associated with the implementation of the project/programme.
Monitoring	Continuing implementation review function to provide the main stakeholders and the management with early indications of progress or lack thereof in the achievement of outputs and objectives.
Logical framework	Management tool used to design technical cooperation projects/programmes. It identifies inputs, activities, outputs, results and their causal relationships. It includes indicators and the assumptions or risks that may influence the success or the failure in achieving the project/programme objective(s).
Project/Programme Document	A document that explains in detail and following the logical framework, the context, objectives, expected results, inputs, activities and budget of a project/programme.
Project Design	It is an analytical tool indicating and providing the conditions and the assumptions for developing a programme in support to the expressed needs of the counterparts and of the beneficiaries.

2.5) Background, targets, definitions and purpose of the Environmentally Sound Technologies Programme

Since many years the Swiss Government through seco (State Secretariat for Economic Affairs) is financing development projects with the objective to improve the respect of the environment by the industrial processes, improving at the same time the competitiveness.

The way to reach this objective is to prepare and develop appropriate environmental management actions aiming not only at the preservation of the environment (emission of gases, discharge of polluted water, use of unfriendly inputs…. etc), but also at the same time optimizing the industrial production as far as competitiveness is concerned. This includes reducing the consumption of water, energy and, in parallel, upgrading the capacities of the institutions promoting the utilization of the most appropriate materials.

To understand the aim of this project in its global context, we have as a first thing to underline that this project is not aiming at establishing a typical cleaner production centre (CPC) but rather a Centre focusing its activity on the transfer of environmental sound (adapted) technologies.

In a way it can be said that EST is the logical following step in the implementation of the CP (Cleaner Production), with the specific aim to create a business-oriented environment for transferring/selling advanced and adapted technologies.

a) What is Cleaner Production?

According to the internationally recognized concept, "Cleaner Production" is the continuous application of an integrated environmental strategy concerning:

- Raw material choice
- Industrial processes
- Products
- Services delivered

All these inputs are the starting point for applying the principles of Cleaner Production.

All of them have to be carefully scrutinized and selected in order to enhance the economic competitiveness of the enterprises and, at the same time, increase eco-efficiency and reduce the risks for the human beings and the environment.

In order to reach a concrete impact in its application on the industrial processes, Cleaner Production requires changed attitudes from the industries, increased awareness of all the population, responsible environmental management of the respective and competent authorities and analysis by the parties involved of the most suitable and environmental adapted technological options.

In contrast to the narrow "end-of pipe strategy" or "good house keeping practice", which can be applied at plant level, the global approach of the cleaner production strategy aims at the following objectives:

Regarding the choice of raw materials: at reducing and saving raw materials and energy, at eliminating toxic raw materials, decreasing the level of toxicity and the amount of the emissions and wastes at the end of the industrial process.

Regarding the production processes: at reducing the potential toxicity of processes and of products through their whole life cycle.

Regarding the products made: at reducing the negative impacts along the entire life cycle of the finished product, from its design to its disposal.

Regarding the services: to incorporate environmental concerns and awareness in the delivering of services. For instance, reducing the quantity of water and energy used not only for producing a good but also for delivering a service/maintenance, getting the same result but with optimised efficiency.

The experience obtained so far has shown that the application of cleaner production can significantly improve the environmental performance of the production processes.

Many of these improvements can be obtained at enterprises level with minimal or little investments, or just taking some appropriate and easy to adapt corrective measures in the production process.

Only when the concept of cleaner production is well understood and established in the factories, it is possible to start thinking to EST and technology transfer.

b) What is technology?

According to the UNIDO experience in this field, technology is defined **as the technical information relevant to production activities**.

Industrial technology is the technical information relevant to the production of industrial goods. This definition includes information (and the activities performed using this information) in addition to the operation of machinery and includes the human skills, physical assets and organizational settings needed for industrial production.

The above definition avoids entering into complicated distinctions between technologies that are materially included, as hardware, or are immaterial, like software, training or guidelines for making some innovative production processes.

The technology used by industrial factories is originating in a combination of several actions, like joint ventures, licensing, purchase of machinery, consultancy and training, maintenance contracts and even new technological processes originated in the enterprises themselves.

Implementation or adaptation of technological changes normally involves investments and consequently it originates the problem of financing for the enterprises interested.

Information plays an important and supportive role in transfer of technology, like building up capacities that can provide qualified information services to the enterprises. Information advisory services contribute strongly to the transfer of technology through the provision of business and technical information.

c) What is Environmentally Sound Technology (EST) ?

According to the Agenda 21, UNCED, 1992, **environmentally sound technologies are** those which "protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes".

This EST project foresees in its design, as outlined in the Project Document, a further evolving step in the concept of environmental management.

Progressing from the basic concept of Cleaner Production, the project focuses on the promotion and transfer of environmentally sound technologies (EST) from Switzerland or other OECD countries to China.

At this point, to better understand the framework of the project's activities, it is of fundamental importance to define what is transfer of technology.

Unfortunately, the Evaluation team could not find this definition in the Project Document or in the other related papers of the project.

d) What is Technology Transfer and which are the assumptions and the conditions for its choice?

It is a process through which technical information about the best most advanced and available technologies is prepared and adapted to the specific needs of the recipient.
As already mentioned above, **technology transfer may be performed through information about advanced and adapted technological processes, joint ventures, license agreements, selling equipment (hard and software), maintenance contracts, training (further updated and higher capacity building) and technical support in awareness rising.**

The definition, in a broad way, of transfer of technology may be done taking into account the experience of failures and successes experimented in transferring technologies.
In this context, the expression "Transfer of Technology" can be misleading when it gives the impression that technologies can be transferred globally and without specific adaptation.

The development and transfer of technology is the heart of the industrial development. The technology is not always necessarily transferred, but in some cases can also be developed internally of the enterprises developing certain industrial production processes. At enterprise level, technology management should be part of the management of the enterprise itself.

We have to take into account that in developing countries the process of globalization offers more possibilities of transfer of technology over the development of local technological advanced industrial processes.

The transfer of technology involves two very important and basic components, which are the learning aspect and the related training. Both require a relevant investment from the part of the recipient.

Technology upgrading (which can involve technology transfer) is usually required by cleaner production measures and environmentally sound technologies. The application of these technologies involves investments and financing.

A common barrier for the introduction of new technologies, when they have to be expressly bought, is the lack of or the insufficiency of adequate financial instruments.

Sustainability of a transfer of technology is very strongly linked to its financial sustainability.

Enterprises are the main and final users of industrial technology. Particularly in developing countries, the enterprises want to follow technological trends by imitation, adaptation or improvement of the existing innovations.

Technology adaptation is probably the most relevant technology for developing countries companies. They are importing industrial technologies formally, through licenses, patents, joint ventures or buying hardware, or by copying them informally. Of course, in most of the cases the copied technologies are not perfect and create some problems.

Technologies cannot be implanted and successfully used without certain technical adaptations to the local conditions.

It is exactly when such adaptations are carried out, that the technological learning transfer from the seller to the buyer takes place. The recipients of the new technology have the possibility to see how a process, machine or device really functions and what are the technical parameters which are determining the improved performance, not only regarding the environment, but, more important for the factory, how to allow an increase of the industrial production process. As we have said in other part of this report, the business approach (i.e. the production gains that can be obtained) is the more interesting for the entrepreneur).

Therefore, in the light of the above, adaptation of a technology has to be seen as part of the process of technology acquisition (adaptation or improvement) and as creation of a new industrial process.

Since in most developing countries there are “skills gaps”, particularly in technical areas such as repairs and maintenance, the hardware or software transferred need to be made simpler and with less controls than in the technology originating country.

Every learning process, not only in transferring technologies, comprises different phases of learning:

- Learning by doing (e.g. for increasing the efficiency of production operations)
- Learning by interacting (e.g. involving the users of the transferred technology in an interaction with the provider of the technology, which results in product innovation)

- Learning by learning (in this case the capacity of the company to assimilate innovations developed elsewhere depends on their learning capacity and experience). This last phase of learning can be afterwards enhanced by the Research and Development capacity of the recipient company.

Any transfer of technology has to incorporate specific aspects that concern the framework into which the technology is to be transferred.

These aspects have to be considered under two angles:

1) In a narrow sense, this implies that prior to select and transfer technology, its future environment in the recipient country concerning standards policies and regulations, should be analyzed and considered as one of the key determinants in the choice of the technology.
2) In a wider sense, it implies that has to be taken into account that a technology transfer programme has to include inputs and activities, which aim at improving the infrastructure in which the technology has to operate.

Based on the above, we have to consider that this project has been designed to transfer Environmentally Sound Technology and, therefore, it has to meet three core objectives:

- **Include environmentally sound technologies in the design of new plants.** The design of new plants shall be upgraded by including environmentally sound technologies with an appropriate assessment of their economic and environmental impact on the new investment.
- **Include environmentally sound technologies in a significant number of existing plants,** including better operation and maintenance, process control as well as new technologies.
- **Upgrade the capacity of local institutions** in order to deliver services in the field of environmentally sound technologies and technology transfer, including that related to international environmental conventions as well as to sustainable industrial production, including social accountability.

e) Contracts and Negotiations for Technology Transfer

There are a variety of general technology selection criteria for companies that, of course, include among other things: financial feasibility, compatibility with existing facilities, environmental acceptability and energy and water consumption.
In technology choice, the accuracy of the selection depends on the technical capability of the recipients/end users and on the availability or data on alternative technologies.

It has to be noted on this subject, that UNIDO has developed, through its technical departments, manuals and guidelines for the preparation of technology contracts.

In the cases of procurement or licensing, the extent to which the supplier of the technology will transfer, install, customize the equipment and provide the appropriate training can depends on the details and specificities of the contract.
It has always to be taken into account that, according to the interests of the parties, in some cases a successful installation of the technology transferred may be of less interest for the supplier of the technology.

Investments in research and other areas of technological development require commercial and financing institutions.
However, development-financing institutions quite often cannot assess properly the viability of the technological content of a loan application.
The financing institutions and banks are not prepared and technically equipped to provide loans in this area. This is due to two main reasons:

- They do not possess a specific technical knowledge
- Their aversion for a risk that is difficult to be evaluated

In order to try to find an answer to these situations, the World Bank recommends looking for intermediaries who understand Research & Development, have technical expertise, are knowledgeable about the industrial sectors and, according their mandate, are committed to take risks.

Technical Centres and investment promotion agencies can facilitate in-flow of resources and transfer of technology. However, they have usually little capacity to assess the technological implications of the investment.
For this reason an appropriate revolving fund, based and ruled under certain specific, well determined and strict conditions, supporting the transfer of technology it is the "conditio sine qua non" to give to this transfer the possibility to implement these operations successfully.

The Swiss Government or a financing institution should establish this initial fund. Alternatively, the Swiss Government could guarantee this financial mechanism, which could be implemented by a commercial bank.

2.6) Financial Status of the Project

The total budget assigned to the project by the Swiss Authorities is US$ 2,858,900.
The amount is divided between UNIDO and the International Reference Centre, as follows:

UNIDO	US$ 1,627,200	(US$ 1,440,000 without agency administrative supporting costs)
International Reference Centre (IRC)	US$ 1,231,700	
TOTAL	US$ 2,858,900	

The Government of China, the Government of Switzerland and UNIDO signed the Project Document on 10 June 2002.
The planned duration of the project is five years.

Due to some delays (the outbreak of SARS) the project started its operations in July 2003, with the arrival of the Chief Project Coordinator (CPC).

2.6.1.) Inputs of UNIDO

The status of the UNIDO Operational Budget of US$ 1,440,000 reports expenditures as 28 February 2005 as follows:

	Budget line	Original Budget	Latest budget revision 09/02/2005	Total expenditures as of 28/02/05
11-00	International Consultant	600,000	540,000	372,455
13-00	Administrative Support	30,000	30,000	19,101
15-00	Travel Project Staff	30,000	64,850	54,038
16-00	Mission Costs	60,000	60,000	41,846
17-00	National Consultants	280,000	280,000	113,880
19-00	**Total Personnel**	**1,000,000**	**974,850**	**601,320**
21-00	**Subcontractors**	**160,000**	**123,650**	**8,470**
33-00	**In-Service Training**	**310,000**	**90,000**	**24,051**
45-00	**Local Procurement**	**160,000**	**135,000**	**72,976**
59-00	**Sundries and miscellaneous**	**130,000**	**116,500**	**100,169**
99-99	***Grand Total*** *(Excluding supporting costs)*	****1,760,000***	***1,440,000***	***806,986***

*The table of UNIDO inputs indicated in the signed original Project Document (pages 28-29) differs from the total budget indicated in the covering page of the same Document, i.e. total of US$ 1,440,000.

The explanation for this difference is indicated in the Letter of Agreement between the State Secretariat for Economic Affairs (seco) and UNIDO dated 17 Sept. 2002, in which is stated that seco has approved a contribution of maximum USD 1,627,200 (including programme support costs) for the implementation of the Project.

2.6.2.) Inputs of the Counterpart

According to the information provided to the Evaluation Team by the National Project Director, the budget for the inputs in kind of the national counterpart (EPB Shandong) amounts only for 2004 to an equivalent estimate of US$ 231,009.
This amount includes the cost of the extra staff attached to the project, domestic travel expenses, equipment, renting of premises, furniture, office supplies, communication expenditures, second driver, training facilities and printing.
The evaluation team has not received by the counterpart the budget for the inputs and expenditures of 2003 and 2005.

Although requested also during the presentation meeting at the end of the fieldwork, the Evaluation mission has not received a proper and detailed breakdown for 2004.

The budget for the contributions in kind calculated in US$ by the National Project Director, refers only to the year 2004 and has been elaborated by the Evaluation Team during the interview with the NPD.
It can be summarized as reported in the following table. A final clean and detailed version has never been delivered by the NPD.

Personnel Items	**Person/month**	**Unit/month**	**Total in US$**	**Notes**
Project Director	6	1,000	6,000	
Assisting staff	18	300	5,400	
Local expert	20	600	12,000	Local EPBs
Administration of local Partner	12	300	3,600	
Total Personnel Costs			**27,000**	
Domestic flights	**Quantity**	**Price**	**Total in US$**	
	50	100	5,000	
Total Domestic **Travel** Expenses			**5,000**	
Equipment	**Quantity**	**Unit/Price**	**Total in US$**	
Computer	2	2,000	4,000	
Laser Printer	2	500	1,000	
Photocopier	1	5,000	5,000	
Fax machine	1	700	700	
Furniture	5	300	1,500	
Vehicle	1	23,000	23,000	
Total Equipment			35,200 **<u>17,600</u>**	However calculated at 50%, because also utilized for activities outside the project
Operation Costs	**Months**	**Unit/Price**	**Total in US$**	**Notes**
Rent of Offices	12	1,988.5	23,862	
Furniture		10,000	10,000	
Office supply	12	200	2,400	
Communication	12	400	4,800	
Driver (salary)	12	300	3,600	
Project research and investigation on companies selected			35,700	17 cities / 3 persons
Total Operation Costs			**80,362**	

Training	Quantity	Cost	Total in US$	
Training sessions for EPB	2	13,583	27,166	17 cities / 2persons/3days
Training sessions for companies	2	20,375	40,750	17cities/ 2persons/3days
Printing		3,000	3,000	
Total Training			**70,916**	
Unforeseen expenses 15%			**30,131**	
Grand Total			**231,009,7**	

The clarifications received regard:

- the 20 local experts,
- the 12 persons/month as administration staff of Chinese Partners and
- the training sessions,

and have been explained by the National Project Director in an e-mail sent to the evaluation team leader on 15 April 2005, as follows:

Quote

"----20 local experts: 1 expert in each of 17 municipal EPBs, 4 experts in Shandong Environmental Protection Academy, they provide consulting for our project when needed.

----12 local assistants for management：Officials from Office and Service Center of Shandong EPB, municipal officials who help to arrange the visit and seminar when needed.

----Besides the 5 seminars sponsored by UNIDO in 2004, we held 2 meetings in Zhangqiu City and Jinan City to distribute EST project and exchange local informations." Unquote.

The complete list requested at the final debriefing meeting in Jinan, regarding the venues, dates and number of participants for the training sessions on EST for municipalities and companies, has not been provided.

The Evaluation Team can only take note of this explanation and refer it to the decision makers, leaving up to the project manager to judge whether these figures are correct and justified.

However, it has to be outlined an inconsistency noted by the Evaluation Team.
During the interview with the Evaluation Team on 29 March 2005, the National Director, presenting these figures, told the team that the salary of the driver recruited directly by the project, had to be "reduced" by the EPB in order to avoid disparities in salary with the other driver and paying in this way also the second driver.

It is, therefore, strange to fully understand the rationale of this cost.
Either the driver is the contribution in kind of EPB to the project or his salary is paid dividing the salary of the other driver paid by out of the budget of the project and consequently, it cannot be considered contribution in kind to the project, because the salary of the other driver is paid by the project!

2.6.3.) Inputs of the International Reference Centre (IRC)

According to the Project Document the IRC would have received by seco US$ 1,231,700.

It is not indicated when and in how many payments the IRC would have received this money.

In the Terms of Reference sent by seco and dated March 2002, the budget in US$ is reported as follows:

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
CTA (Coordinator)	180,000	180,000	180,000	0	0	540,000
Short term experts	100,000	200,000	200,000	200,000	160,000	860,000
International Training, study tours	30,000	50,000	50,000	50,000	30,000	210,000
Travel Project Office	10,000	10,000	10,000	0	0	30,000
Management fee 13%	40,000	60,000	60,000	30,000	20,000	210,000
TOTAL in US$	**360,000**	**500,000**	**500,000**	**280,000**	**210,000**	**1,850,000**

The Terms of Reference were indicating that the intermediate evaluation would consider the necessity of prolonging the contract with the CTA.

The Evaluation Team did not received any modification to this above-mentioned budget (in spite of several requests), but it has to be assumed that the budget was reduced since the CTA (then renamed CPC, Chief Project Coordinator) has been paid out of the budget assigned to UNIDO.

According to the information received by the coordinator of the IRC, seco released:

CHF 410,000 for the year 2003

CHF 520,000 for the year 2004.

Total: CHF 930,000.

Therefore, the contributions and related expenditures of the International Reference Centre for the project in the years 2003 and 2004 have been as follows:

FINANCIAL STATEMENTS OF ACCOUNTS OF IRC (In Swiss Francs CHF)		
INCOMES		
	2004	**2003**
• Received from Seco - Annual contribution	520,000.00	410,000.00
• Bank interests	213.70	563.60
Total available budget	**CHF 520,213.70**	**CHF 410,563.60**
EXPENDITURES		
	2004	**2003**
• Project management / Carbotech	121,901.20	156,494.75
• Project Technical Consultancies and travels	188,420.65	200,338.80
• International Trainings / Study Tours	125,526.55	4,230.00
• Support to the Shandong EST Promotion Center (SESTPC)	15,932.85	7,483.75
• Travel of CTA	13,159.90	11,404.60
• Various	1,035.90	1,212.95
Total expenditures	**CHF 465,977.05**	**CHF 381,164.85**
Budget left to be carried over to following year	**CHF 54,236.65**	**CHF 29,398.75**

Mr. Daniel Wunderlin, Coordinator of I.R.C.

Mr. Serge De Klebnikoff, Chief Project Coordinator

3) Economic and institutional context of the project

3.1 Generality

China's gradual transition to a market economy, which has been proceeding for two decades, has put China among the world's fastest growing economies. During the past 20 years, the average GDP growth rate has reached 9.7% in China each year. In 2000, China's GDP reached 8,900 billion RMB, per capita GDP exceeded 800 US dollars for the first time. While economic growth has increased incomes and improved health indicators, as well as reduced overall poverty levels, growth has not been totally benign. Environmental pollution from coal combustion is damaging human health, air and water quality, agriculture and ultimately the economy. The resource and energy consumption per unit of GDP in China is far higher than that of the developed countries. This not only trades off greatly the growth rate but also puts China in competitive disadvantage.

At the same time, the environmental quality has also faced great challenges. In 2003, the total amount of SO2 discharge has reached 21.58 million tons, including the industrial SO2 discharge is 17.91million tons, discharge from living is 3.67 million tons, the total discharge of dust has reached 10.49million tons including industrial dust is 8.46 MT and living dust discharge is 2.02MT.

In 2003, the total industrial solid waste production was 1 billion tons, 6.3% higher than previous year; the discharge of industrial solid waste was 1.9 MT, which is 26.3% lower than previous year. Comprehensive utilization of the solid waste is 0.56 billion tons which is 3.8 higher than the previous year.

In order to cool down the respective economies and make them more efficient and environmentally friendly, Governments of the provinces of China have adjusted their annual economic growth projections downward. More signs show that local governments are striving to shift from extensive to more intensive economic growth modes -- or qualitative rather than quantitative growth, under the direction of the Central Government.

Situated along the east coast of China, the Shandong Province is just located between Beijing and Shanghai (the two biggest cities of China), adjoining Hebei, Henan, Anhui and Jiangsu provinces. Shandong Province, with a coastline of more than 3,100 km, covers a total land area of 157 thousand square km. It is one of the important energy bases in China and produces one third of the total crude oil of China.

Shandong Province plays an important role in the sustainable, healthy and rapid growth of Chinese economy. It is forming a unique modern industrial economic zone around Bohai Sea, following Pearl River Delta and Yangtse River Delta. It ranks the third place in China in terms of total economy.

The GDP of Shandong province totalled 1,420 billion yuan in 2004, more than 15% over 2003. The gross product of agriculture, industry and service increased respectively by 6.9%, 19% and 11.6% than in 2003. The increase is the highest ever since 1996 and it is also a repeated two-digit number increase over the past 13 years. The GDP increased 10.1% and 13.3% respectively in 2001 and 2003.

Shandong Province ranks the first in terms of important agriculture output, with the yield of grain, cotton, edible oil, vegetables, fruits, meat and aquatic products leading in China. In 2004, the total agricultural production value of Shandong Province reached 290 billion yuan and ranked the first in China.

The province has been one of the driving engines of China's impressive economic growth. This was primarily the result of substantial increases in agricultural productivity and industrial output. The latter took place to a large extent in Shandong's urban areas, particularly in Jinan, the capital city and in the coastal cities of Qingdao, Yantai and Weihai.

As a consequence of this development, the volumes of pollutants emissions are very large and the ecological environment is still vulnerable.

In 2003, the total amount of sewage discharge in the whole province reached 2.46 billion tons, which represents an increase of 6. 5%, on that of the previous year. COD (Chemical Oxygen Demand) in the sewage was 0.829 million tons and ammonia nitrate was 78,000 tons, which respectively decreased by 4.4% and 7.4% compared with the previous year.

In 2002, among the 17 cities releasing air quality daily, 9 cities met the standard for Grade II, 3 cities met the standard for Grade III and 4 cities were below the standard for Grade II.
In 2003, the numbers of cities that met the standard for Grade II and III were 9 and 8 respectively. In 2003, the total emission volume of SO2 was1.836 million tons, more than 8.6% over 2002; the total emission volume of SO2 was 0.624 million tons, more than 0.8% over 2002. In 2003, the amount of municipal waste was 67.864 million tons, which increased by 3.5% compared with the previous year.

3.2 Institutional context of the project

The National People's Congress has the power to approve legislation and is the only entity able to alter the Constitution. Its permanent working body is the Standing Committee of the People's Congress (SCPC).

The State Council, which is the highest level of the executive part of government, also has legislative powers (e.g. decrees, ordinances, regulations). The State Environmental Protection Agency (SEPA) is the environmental protection administration. It is responsible for the environmental protection and supervision of the whole country.

In every province, there is a provincial Environmental Protection Bureau, which is a specific institution for environmental protection. In Shandong, the Shandong Provincial Environmental Protection Bureau (EPB) has the delegated responsibility for the overall supervision and management of the environmental protection work.

a) The State Environmental Protection Administration (SEPA)

The State Environmental Protection Administration of China (SEPA) was set up as a ministry at the end of March 1998 when the National Environmental Protection Agency (NEPA) was upgraded from a sub-ministry to a ministry and its name was changed. The following are the main responsibilities of SEPA regarding EST.

The State Environmental Protection Administration of China (SEPA) was set up as a ministry at the end of March 1998 when the National Environmental Protection Agency (NEPA) was upgraded from a sub-ministry to a ministry and its name was changed. The following are the main responsibilities of SEPA regarding EST.

●Formulate the national policy, laws and administrative regulations for the environmental impact assessment of major economic and technological policies, development planning and key economic development plans.

●Formulate the national environmental protection plans; formulate and monitor the implementation of the national plan for pollution control and ecological conservation in key regions and river basins and organize the competencies for environmental functions of different regions.

● Be responsible for the environmental supervision, management and administrative inspection of the environmental protection; organize and undertake the examination of the enforcement of environmental laws and regulations at national level.

● Organize the development of environmental science and technology, important research and technical demonstration projects.

● Manage the national environmental management system and the certification of environmental label; establish and organize the implementation of the rules of accreditation for the environmental market access.

● Organize the procedure of accreditation for the agencies engaged in Environmental Protection Products test and identification; promulgate the Catalog of Environmental Protection Products.

● Develop demonstration projects on cleaner production audit in enterprises. The environmental protection administration may also organize cleaner production audit training according to the local circumstance. NDRC (National Development and Reform Commission) and SEPA are responsible for building national database on cleaner production expertsand offering the appropriate information and technology support for cleaner production in enterprises.

The responsibilities of each department of SEPA are the following:

Department of Planning and Finance is responsible for **formulating** general and specific policies, laws and administrative rules and regulations; formulating national environmental protection programs; organizing the formulation and supervision of pollution prevention plans in key regions and river basins identified by the Central Government.

Department of Policies, Laws and Regulations is responsible for formulating and organizing the **implementation** of laws, rules and regulations on pollution prevention of air, water, soil, noise, solid wastes, toxic chemicals and vehicle emissions; coordinating and supervising marine environmental protection.

Department of Nature Conservation is responsible for supervising the **utilization** of natural resources with impact on natural environment, major eco-environmental construction work and rehabilitation of ecological damages.

Department of Pollution Control is responsible for **formulating national standards** of environmental quality and pollutant discharge determined by the State; releasing national bulletin on environmental status; and participating in formulating national outline of sustainable development.

Department of Environmental Impact Assessment Management is responsible for **formulating the regulatory regime of environmental management** and organizing its implementation; guiding the establishment of ecological demonstration zones and ecological agriculture in the entire country.

Department of Science, Technology and Standards is responsible for **organizing researches,** development and technical demonstration projects for environmental protection, guiding and promoting the development of environmental friendly industries.

Bureau of Environmental Supervision is responsible for **environmental monitoring, statistics, and information**; formulating environmental monitoring system and norms; management of national environmental monitoring network and national environmental information network.

Department of International Cooperation drawing up basic national principles on global environmental issues; **administrating international cooperation** and exchanges on environment; involved in coordinating important international environmental activities; coordinating and implementing relevant overseas funded projects; responsible for liaison with international environmental organizations.

Department of Nuclear Safety and Radioactive Management is responsible for the management of **nuclear safety**, radiation environment and radioactive wastes, and drawing up relevant general and specific policies, laws, rules and regulations, and standards; involved in emergency response work of nuclear accidents and radiation environmental accidents.

b) The National Development and Reform Commission (NDRC)

The National Development and Reform Commission (NDRC) is a department of the State Council. NDRC is a macro-economic regulatory organization, with a mandate to develop national economic strategies and plans and to report on the national economy situation and social development to the National People's Congress.

NDRC has fourteen major areas of responsibility, one of which is China's sustainable development strategy, which includes environmentally sound technology. The important aspects of NDRC's mandate and responsibilities in this context are:

- Advancement of China's sustainable development strategy;
- Research for the comprehensive utilization and conservation of resources;
- Coordinate the establishment of a plan for rebuilding China's ecology;
- Policy creation for the comprehensive utilization and conservation of resources;
- Coordinate issues related to the rebuilding of ecology and the utilization of resources;
- Coordination of environmental protection concerning the industry.

NDRC enacted with SEPA in 2004 Provisional Measures on Cleaner Production Audit. . They may organize cleaner production audit training according to the local circumstance. NDRC and SEPA are responsible for building national database on cleaner production experts, promulgating Guidance Catalogue for Cleaner Production Technologies in Key Sectors and Guidebook for Sectoral Cleaner Production Audit, offering information and technology support on cleaner production in enterprises.

c) The State Economic and Trade Commission (formerly NETC)

The SETC was responsible for promulgating Guidelines for Cleaner Production Technologies in Key Sectors. The State Economic and Trade Commission adjusts the industry structure on the base of Cleaner Production Promotion Law and put forward policy proposals on regulations in key sectors. SETC has developed Pilot Projects on Cleaner Production Demonstration with SEPA in 10 cities (Beijing, Shanghai, Tianjin, Chongqing, Shenyang, Taiyuan, Jinan, Kunming, Lanzhou and Fuyang) and in 5 industrial sectors (petroleum, metallurgy, chemical engineering, light industry and shipping).

SETC has developed Demonstration Projects on Economizing Resources and Environmental Protection, which involved economizing water and energy (oil), resources recycling, cleaner production, etc.

In the recent institutional arrangement the SETC and the NDRC have been combined into the new NDRC, but in some provinces, the SETC still exists.

d) Ministry of Science and Technology of China

With the support of the Ministry of Science and Technology of China and the technical assistance of the Asian Development Bank, the Center for Environmentally Sound Technology Transfer (CESTT) was established in Beijing to provide integrated intermediary services for the emerging EST needs of China's SMEs and to strengthen the ability of China's SMEs to access, develop and apply EST.

Tasks of the Ministry of Science and Technology in terms of EST are:

- Set forth guidelines, policies and measures for the reform in the science and technology system. Promote science and technology innovation mechanisms and the intrinsic laws of science and technology development.

- Implement National Key Technologies R&D Program.

The Key Technologies R&D Program is the first national S&T program in China. It aims to address major S&T issues in national economic construction and social development. One of the tasks of the Program correlative with EST is to develop key technologies in urban environmental pollution control, push forward the rational utilization of water resources, develop and demonstrate technologies for the improvement of regional ecology and environment, intensify technical research in exploration and development of oil and gas fields and strategic solid mineral resources, establish technical supporting systems for the disaster prevention and mitigation.

The provincial related organizations have similar functions with the state consistent organization.

3.3 Legislation and regulations for EST in China

A legislation and regulations system for EST has been established, which includes Cleaner Production Promotion Law, the Energy Conservation Law, Measures on the Certification Management of Environmental Products (Revised 2001), and Guidance Catalogue for Cleaner Production Technologies in Key Sectors etc.

a. Cleaner Production Promotion Law (2002)

This new law is the most significant of a number of initiatives the Chinese government has taken to establish Cleaner Production nationwide as one of China's key strategies for sustainable development. It lays out a strategy for its promotion and implementation.

The adoption of Cleaner production is the effective measure to approach lower energy consumption. From the raw materials selection to end of pipe treatment measures for reducing the pollution will be adopted.

b. The Energy Conservation Law (1997)

The scope of this law covers energy from coal, crude oil, natural gas, electric power, coke, coal gas, thermal power, biomass power and other sources. This law may be the harbinger to strengthen the efforts of the Chinese Government to prohibit certain industrial projects that seriously waste energy and employ outmoded technologies.

c. Measures on the Popularization of Practical Technologies of Environmental Protection (1999)

This legislation was formulated to promote the progress of environmental science and technologies, to encourage the use of advance and economically feasible technologies for environmental protection.

d. Recovery Economy

Currently, the NDRC in association with SEPA is making the pilot study in recovery economy nationwide. The pilot projects are selected first in the high-energy consumption sectors including papermaking, chemicals, steel etc.

The concept of recovery economy will be the main one in the 11^{th} five-year plan, and the NDRC will promulgate some new standards and norms to support the plan. In the future new incentives will be adopted to facilitate the recovery economy; the most important is to use the subsidies, taxation reduction and some other incentives to the enterprise, which make use of the EST.

e. Environmentally Friendly enterprise selection

SEPA selects the environmentally friendly enterprises in high-energy consumption sectors. The indicators used for selection of environmental friendly enterprises are the average energy consumption, water consumption, whether pollution discharge has met the environmental standard and whether the enterprises have used EST.

Every year, according to the environmental technology development needed by the enterprises, the State governmental agencies including NDRC, MOST, SEPA publicize the environmental equipment to be developed. This is the guideline for the development of the environmental technology, which is including EST.

3. 4 Situation of EST in China

China is a developing country with limited resources; environmentally sound technology (EST) is critical for allowing economic development without significant environmental degradation.

In China, most companies currently base their pollution control efforts on end-of-pipe techniques where the waste is treated before discharged. This is not always the most effective mean for preventing pollution, especially when these facilities are not properly maintained. Although end-of-pipe technologies result in less waste, they have costs involved while EST, by reducing input materials, fines and disposal fees, has the potential for generating profits. EST also allows improved efficiency and

quality in the production, allowing many Chinese companies to expand into the international market.

According to a research done recently by Tsinghua University, there are many factors affecting enterprise to adopt environmentally sound technologies. Efficient ways to promote policies on EST make the policy's role very important. Financial support plays the role of "first force" in EST adoption.

Although many people consider EST to be an expensive alternative in relation to end of pipe treatment, there are many low or no-cost options that can be implemented and which bring economic returns almost immediately. Major renovations can be avoided by improved management, raw materials substitution and recycling of wastes.

With the liberation of markets, small and medium-sized enterprises (SMEs) have increased their industrial power. SMEs are now responsible for 60 percent of China industrial output and employ 70 percent of the workforce. However, their emphasis on production quantity and not on quality or resource efficiency has made them very resource intensive and resulted in severe environmental pollution. During the last years, the government has taken steps to control this problem by placing regulations and standards on emissions and mandating the closure of 60,700 small factories that were highly polluting. This pressure has made SMEs a market for EST, as they want to increase profits, reduce costs in raw materials and disposal, expand markets, improve safety and avoid closure.

The government is forming an economic environment, which is conducive to importation of EST from foreign markets. By reducing tariffs and taxes, financing demonstration projects, utilizing foreign investments, running publicity campaigns and creating centers for technological promotion, many domestic enterprises have become more aware of the benefits of EST and are seeking to adopt them into their own operations.

The domestic need for EST has created an excellent opportunity for international cooperation and investment. The foreign community can fulfil many of China technological needs by transferring those technologies suited to the Chinese situation. Foreign consultants, institutes and governments have a wealth of experience and knowledge gained from their own environmental crisis that could be applied to China. The potential EST market present in SMEs is large and growing, especially considering the growing concern on environmental protection and desire to expand into international markets.

Adoption of environmentally sound technologies is timely in China. Enhancing circular economy is a practical measure for achieving sustainable development, especially in energy intensive and highly polluting sectors, such as iron & steel industry, cement industry and pulp & paper industry. At present, the total amount of pilot projects in these areas is too small for the large industrial system in China. A pilot project can have the function of information center, training center and technological diffusion. It is the best advertisement of new EST.

EST has immense potential in China and is an emerging market. As SMEs become more aware of the benefits of EST, the market will grow dramatically. Not only the

transfer of EST will result in economic benefits for all parties involved, but also environmental protection will be enhanced through pollution prevention and resources conservation. EST transfer is a critical step on the path of sustainable development and it is clear that international involvement will play a key role.

The EST related projects have been carried out in China are shown as following.

- The Project "Promoting Cleaner Production" (1993-1996) funded by World Bank.

- The Project "The popularization of International Pollution Prevention Technologies in China" (1995-1997) funded by World Bank

- The Project "China-Norway Promoting Cleaner Production Technologies" (1993-1994) funded by Science and Technology Commission of China, NORAD and Beijing EPB

- Environmental management Cooperation Program financed by EU.

3.5 Particular situation of EST transfer in Shandong province

Shandong Province has the largest agricultural output amongst China's provinces. In terms of GNP and gross industrial output it holds the second rank. In terms of total exports, Shandong ranks fourth. As mentioned above the environmental situation in Shandong is "serious" due to its extremely fast industrial growth as result of its transition to the market economy. To combat further environmental deterioration, the province has mapped out environmental policies and programs, which are aimed at reducing the main pollution problems, including EST.

Although the amount of pollution generated has decreased over the past ten years in Shandong specifically as a result of industrial efficiency measures cleaner technology and environmental regulation, the absolute level of industrial growth has swamped this relative improvement. With the industrial capital stock in Shandong doubling on average every 4 or 5 years, the province has placed primary emphasis on cleaner production and technology for the new industries. One of the participating cities in this project, Yantai, is the national pilot city for a cleaner production program. The Xiaoqing River Basin, which includes the provincial capital city of Jinan, has also been selected by the national government as the pilot provincial river basin for a concerted clean-up program.

Insufficient finance input and information are bottlenecks for the adoption of EST in Shandong province.

Ms. Hua Fang, Vice Director of SESTPC and
Mr. Liu Xin, national evaluator

Jinan. The three national experts for chemicals and textile: Ms. Lin Chunlan, Ms. Yan Yan and
Ms. Xie Jun

Binzhou. The evaluation team meets the management of the Yaguang Textile Group (LOFTEX Industries).
Mr. Hongxing Wang General Manager.
Mr. Liming Ding, Vice General Manager

Meeting with the EPB of Binzhou.
Mr Sun Shou Ming, EST Delegate and
Mr. Zhang Hongxun, Senior engineer

4) Analysis of Project Implementation

The objective of the project as determined in the project Document is the transfer of environmentally sound technologies from OECD countries to small and medium size companies in Shandong province.

The objective is based on a number of assumptions:

- Existence of a Cleaner Production Centre in Shandong province, with qualified staff rather comprehensively promoting CP activities in the province
- The EPB being the most appropriate entity to get access to companies for EST investments
- The EPB to generate EST projects when implementing environmental laws
- Financing of EST projects is available – including multilateral and Swiss funds
- Sustainability of the project for TT
- Besides, the Centre to carry out POPs, CDM and SA 8000

The Project Document focused on two sectors for implementation of TT – the chemical and the textile sector. The sectoral focus was specified to "cross-cutting topics for energy and environment" (Project Document 2.3.)

The Project approach was

- To increase the potential for environmentally sound technologies

and

- To increase the market penetration of environmental sound technologies.

The institutional set-up for the Project is composed by the establishment of two entities in charge of implementation of the Project: the UNIDO and the IRC.

Links to other UNIDO projects in China should be used within the UNIDO framework for upgrading capacity for industrial governance and promoting technology transfer and investments.

The Evaluation Team is of the opinion, that the implementation of the Project was hampered from the very beginning – due to the above-mentioned assumptions which turned out to be unrealistic or even wrong and also due to a lack of clear determination of tasks and links between the institutions in charge of project implementation.

Accordingly, the issues regarding the set-up of the Project directly influence relevance, efficiency and management of the project.

The ET is of the opinion that the concept should be reconsidered. New targets and a modified institutional structure should be set up and based on realistic assumptions.

4.1. Concept and Relevance of the Programme

The transfer of environmentally sound technologies to China is still a relevant issue to be followed up in the years to come. As described in paragraph 3 of the Report, the Chinese industry is developing tremendously fast – unfortunately by heavily affecting the environment. This being more or less unavoidable in an economic system which is in a transformation period and which still lacks of a comprehensively and sufficiently established system of protecting the environment.

China has already a more or less comprehensive legislative system related to environmental protection. However, the respective apparatus to enforce environmental laws and regulations is not sufficiently in place yet. This comprises not only the institutions themselves, but also the requested manpower, which is insufficiently trained and also not independent enough to carry out the respective tasks.

According to the information provided by the Head of the UNIDO office in Beijing/China, SEPA and its entities on provincial level and below (the EPBs) up to now control not more than 4 % of the industries in China. This is one company out of 25! We need to assume that this is due to lack of institutional capacities and to lack of sufficiently trained manpower resources.

Taking the above-mentioned issues in account, the ET considers the relevance of EST as important. However, the concept as described in the Pro.Doc needs some adaptations.

Due to the fact that the Cleaner Production Centres are not comprehensively in place in Shandong province – there is evidence that the Cleaner Production Centres has more or less a "virtual" character – it will be impossible to realise more than 44 (!) implementations of EST within the five years of the scheduled implementation of the Project (please refer to the Pro.Doc par. 6.4).

The Pro.Doc foresees the focus on two sectors only. The limitation of sectors is still relevant, especially the focus on potentially cross-sectoral approaches. Based on the experience made during the implementation it needs to be checked whether the selected sectors (chemical and textile) are the most appropriate sectors – regarding the available expertise within the Centre but also regarding the accessible expertise through external (foreign) experts.

In addition to the fact that the Pro.Doc is based on unrealistic assumptions and objectives, the institutional set-up is not adequate. There is furthermore a lack of a clear understanding on what is to be done regarding "EST".

4.2. Management of the Project

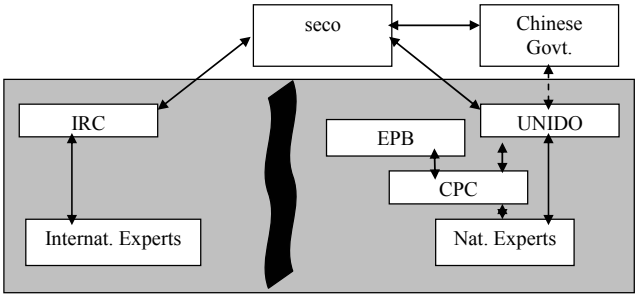
The Pro.Doc foresees to have two entities in charge of implementing the project. This is UNIDO (which is basically in charge of administrative issues including the recruitment / contracting the CPC and the local experts) and the IRC in charge of technical issues and contracting the international experts. The counterpart on the Chinese side is the provincial EPB.

The institutional set-up has some substantial bottlenecks – mainly

1. The lack of (contractual) links between the implementing agencies (UNIDO, IRC)
2. The lack of access of the Chinese counterpart to Chinese companies

The present institutional set-up of the Project is demonstrated in the diagram below.

Contractual relationship between the entities involved



The major problems concerned with the existing institutional set-up can be summarized as follows:

- There is no formal link between the CPC (contracted by the UNIDO) and the IRC
- The institutional structure does not foresee a clear definition of the cooperation between the implementing agencies (UNIDO, IRC).
- There is a lack of coordination between the implementing agencies. The coordination should be arranged by the CPC who has however no formal link to the IRC (and, accordingly, no direct influence on the selection of international expertise).
- There is no clarification of the link regarding the requirements of international and of local experts (both selected and contracted by different entities)
- The lack of coordination is substantially jeopardizing the planning process of the Centre.
- Further, some international travels of the CPC are organized by the IRC, sometimes without previous agreement of the responsible part (UNIDO), who is in charge of the administration of the CPC.

In addition to these bottlenecks, the ET sees some problems regarding the internal set-up of the IRC. The IRC is a consortium of companies, each one working as a consulting company. During the Evaluation Mission it turned out, that some of the companies are at least reluctant to provide the requested service (as per Pro.Doc) to the Chinese companies.
There is some evidence of attempts to delay the requested service to a later stage and to charge service costs as consulting fee separately to the Chinese companies.
We consider this is a substantial conflict of interest.

Regarding the institutional set-up there should be a clear command and responsibility line.

The EPB as counterpart

The EPB is the counterpart of the Project. Based on the above-mentioned assumptions of the Pro.Doc. the EPB is considered to have access to Chinese companies, which can be an advantage for matchmaking with suppliers of EST.

The ET considers the EBP as the institution in charge of designing and implementing laws and regulations on environmental protection and also in charge of controlling the enforcement of the respective laws and regulations.

Based on these facts and considering that the EPB has access to a limited number of companies only, the management of the project should involve also other entities which are considered by the companies as business driven entities and institutions.

The limitation to access companies jeopardizes the planning process: the selection of companies by the EPB often lacked of a sufficiently comprehensive preparation prior the visits of the international experts to the selected companies. It was reported to the ET that in some cases the international experts were informed about the characteristics of the companies selected only short before the visit. .

During the evaluation process the ET met several entities, which would be in a position to support the EST approach of the Project, at least in the medium and long term.

Coordination between the CPC and the Chinese counterpart

The CPC is expected to advise the Chinese counterpart. The ET considers the existence of a CPC of predominant importance for the implementation of the Project. This is based on the fact that most of the entities contacted (as there are the different institutions or the companies involved) consider the CPC as the driving force of the Project implementation.

Establishing of the SESTPC

Early in 2004 the Project has established the Shandong EST Promotion Center, thus providing the basis for the sustainability of the project. The Chinese director of the Shandong EPB, who is in charge of the Project, heads the Centre. (for further comments see below under paragraph “Possibilities of Sustainability”)

Availability of Financing

The Pro.Doc assumes that financing should be made available for the TT projects, which are initiated during the implementation period.

It turned out that financing of TT is a crucial issue. The Chinese companies selected and contacted by the Project expect the availability of financial sources for the TT.

The success of the Project seems to be closely related to availability of funds.

Binzhou. The textile factory Yaguang

Meeting with the EPB of TAIAN.
Mr. Zhang Zhuajin, Vice Director, and
Mr. Zhang Luming, EST Delegate

Taian. Meeting with Mr. Wang Lin, General Manager of TAISHAN Asia food Co.LTD

Meeting with the EPB of LAIWU. Mr. Liu Zuoli,
Director and EST Delegate, and
Mr. Yang Rongquan, Chief Environment Section

4.3. Status of the foreseen outputs in the Project Document

The outputs of the Programme are seven:

1) Project capacities and structures established
2) Chinese service providers perform EST services for enterprises
3) Chinese design centers integrate EST in the design of new plants
4) Provision of training services for institutions, consultants and companies employees
5) Strategic and policy advice services
6) Information and dissemination services
7) Regional outreach

The Pro.Doc specifies the activities and the expected achievements for each output.

Below we report an assessment of the outputs produced by the Project.

This analysis is based on the interviews held with the CPC and the PM.

Output 1: Project capacities and structures are established

In spite initial delays, within four months an adequate structure was put in place and a vigorous marketing campaign started to promote EST. Today, each one of the selected sectors has a national expert in PMO, a Task Force as well as a clear road map, a list of potential clients.

IRC is deeply involved in supporting the technical work. Only the CDM/POPs related issues have not yet been developed.

Assessment of the progress based on work plan 2003 & 2004: 100%, based on the Pro.Doc : 60%

Comments

In the fast moving environment characterizing today China's development, EST project had to go through several adjustments of both business plan and action plans, in order to cope with the reality of the demand for EST.

Together with UNIDO and IRC, and thanks to very positive flexibility from all partners, workable programs were put together allowing a successful start of the project.

Shandong EST Promotion Center (SESTPC) was established to develop structured and focused services to companies, staff was recruited, budget management was simplified through an imprest account, working conditions were improved.

A Steering Committee has been created.

Efforts are now made to engage companies, both international and national, to sponsor SESTPC in order to increase its "business oriented" approach towards Shandong clients.

CDM/POPs related activities have not been started yet because of the lack of local expertise, and also because concrete projects have not yet been finalized. SESTPC

fully rely on EST partners (primarily UNIDO and seco) to help "accessing" these attractive but complex programs. SA 8000 is to be tackled with care and only with companies, which have already good records with SESTPC. A large awareness raising campaign needs to be launched: seco and Migros, together with Beijing ILO office are prepared to develop a new program for Shandong.

Output 2: Chinese service providers perform environmentally sound technology services for enterprises

All the respective activities have started and first results are showing up. But it requests a lot of "marketing" to be accepted by local companies primarily concerned about fast money making initiatives.

More important, most companies are not prepared to pay for activities offered or suggested by an international organization, which they consider should offer free of charge advises.

Assessment of the progress based on work plan 2003/2004: 90%, based on the Pro.Doc.: 50%

Comments

As stated before, companies need very strong incentives to undertake the proposed services, which are not always perceived as immediately benefiting their objectives.

Any paying service has to be directly related to clear and quick return on investment, and environmental challenges are hardly taken into consideration in corporate strategy (certainly not in medium and small companies). So, SESTPC clients will have to go for a long learning and awareness raising process.

The best justification to be used is, for export-oriented companies (which are the only one SESTPC is targeting for the moment) the need to comply with western regulations or even the need to take into consideration western suppliers or customers environmental policies.

In some cases, the companies know exactly what they need and directly ask for new technologies or equipments, as well as for financial support. This is where SESTPC is facing a major weakness since it cannot rely on any mechanism that could help companies financially. This issue impacts on the project results.

According to the Chief Project Coordinator, CDM / POPs and SA 8000 issues have already been addressed. However, there is no evidence, that this is the case.

Output number 3: Chinese design centers integrate environmentally sound technologies in the design of new plants

According to the CPC, this Output is not longer relevant since Design centers have lost their "exclusive" role in 2002 and are now even competitors of SESTPC.

Only ad hoc technical cooperation (sub contract) is envisaged for the time being

Assessment of the progress: 0% since the issue did not look relevant to the PMO

Output number 4: Provision of training services for institutions, consultants and company employees

Awareness campaigns and training seminars have been the main focus of the first months of activity. Government officials and public administrations overlooking companies have been the first priority in order to secure their support when developing EST transfer strategies.

Most of the time, government officials are involved in companies program and attend meetings and even trainings. Consultants being SESTPC competitors are not yet included in the program.

Assessment of the progress based on work plan 2003/2004: 100%, based on the Pro.Doc: 70%

Comments

Training is an important service provided by SESTPC, but it can hardly be charged when it is not directly part of a technical package offered to a company.

Government officials and administrations may share with SESTPC the cost of organizing these sessions, but participants usually are invited. Therefore, for SESTPC, training is most of the time not source of any income.

As already mentioned, extensive efforts have to be made targeting EST/TT stakeholders: Local municipalities government, economic development zones, local EPBs etc…

Output number 5: Strategic and policy advice services

To be implemented in year 4, but it has already started.

Assessment of the progress: 0% planned for year 3 and 4.

Comments

It is too early to really impact policy dialogues, but extensive contacts have already been organized – primarily in Beijing but also in Shanghai, with OECD Foreign export promotion offices, trade commissions, embassies, financial institutes and universities, foreign assistance programs (GTZ, CIDA,) in order to structure the network needed when implementing this issue.

SESTPC is now invited to attend meetings on EST promotion in other regions (in Kunming, Yunnan Province).

Industry oriented issues are dealt with by the companies sponsoring the center.

Output number 6: Information and dissemination services

Information and dissemination are free of charge services that are vital to set up the adequate scene to develop EST program. Because of its size, Shandong province requests a lot of efforts, which imply large expenses in travel costs or promotional activities. This may be an area where sponsors will be needed.

The entrepreneurs are contributing to the costs.

Assessment of the progress based on work plan 2003/2004: 100%, based on the Pro.Doc: 75%

Comments

This issue raises a fundamental question about the exact mission given to the EST project.

The project document keeps underling " promotion " of EST as the key target to be achieved. That means that "Information and dissemination " as stated here become the main activity to be developed by SESTPC. This would certainly create a strong base for a capacity building strategy but then it implies a different agenda for SESTPC since it may take quite some time before companies' demands for EST are really developing.

The outputs suggested by the Pro.Doc are over-optimistically quantified and do not meet the real local conditions, especially in the proposed timetable.

To be realistic, the work plan should start with two to three years of training, promotion and dissemination –to create the demand – and that would then be the core mission of SESTPC.

In the meantime, of course, a few case studies could have been developed but, then, at least 12 to 18 months are anyhow needed to finalize technically and financially an EST transfer.

If these arguments are acceptable, then the output needs to be revised.

Output number 7: Regional outreach

This issue needs to be confirmed and then planned starting in mid-2005 in order to be implemented in mid-2006.

Actually, SESTPC has already been invited to attend promotion seminars in other Chinese provinces and demand is growing.

Assessment of the progress based on work plan 2003/2004: 0%, to be postponed.

In addition to these seven outputs foreseen in the Pro.Doc, the following activities reported by the CPC have to be mentioned:

1. A SESTPC website has been developed
2. A photo library on the EST program activities has been set up (more than 600 pictures can be made available upon outside demand)
3. According to the CPC an active support from 5 to 8 multinational corporations active in Shandong "has been secured".
4. Support form major Swiss players in China has been confirmed (Embassy, SwissCham or SwissHub ..).
5. Partnerships have been signed with several local institutions (Everbright Bank, Shandong Technology Stock Exchange Center.)
6. Several public conferences and TV programs on UNIDO and EST have been organized.

Remarks of the Evaluation Team:

Regarding bullet 3 to 5: It could not be clarified during the mission, what kind of support has been provided in detail. We assume however, that the approach of contacting large companies for support might have influence on the potential sustainability of the Project.

The Evaluation Team especially considers a close relationship with the existing framework (including the Swiss based industrial associations) as very helpful to provide links to potential technology suppliers.

4.4. Efficiency of the activities

As described above: the inputs of UNIDO have been delivered on time.

The in-kind contribution of the Chinese counterpart was reported only for the year 2004 (as budget), but no yet for 2003 and 2005.

The Evaluation Team understands that until February 2005 the following activities have been carried out:

- 27 Quick Scan Analysis in companies

- Out of the 27 companies analysed, 8 companies were contacted for follow up

- 5 agreements with companies have been signed (Taishan Paper Co., Rizhao Liquor, Taishan Asia Food, Yaguang Towel, Mitsui); Total contracts/agreements value: RMB 150.000

- Approximately 100 persons have been trained in QSA and EST

- EST key persons have been established at different EPBs on municipal level

- A Study tour to Europe has been organized (in 2004).

The QSA was conducted as part of the training programme mainly for the EST key staff of the municipal EPBs. The duration of the training courses was between 1 day and one week.

According to the CPC, the persons trained are still active in the field. During the Mission the ET talked to a number of EST key persons in the municipal EPBs. Most of them confirmed their appreciation for the efficiency of the training programmes.

Cooperation agreements have been signed with entities, which are in a position to support the work of the Center –e.g. the Everbright Bank or the Shandong Technology Stock Exchange Center –, and also with several companies. The agreements with the companies mainly refer to technical and financial assessment with the objective to prepare matchmaking with potential suppliers of technologies. Several companies, however, informed the ET, that they do not consider the contracts as binding; because the companies do not expect any technical benefits. The companies mainly target at the financial funds made available by the Center.

All the participants consider the Study Tour in Europe (which was organized for 12 persons) as very effective. Among the participants there were only 4 participants coming from companies, the other participants represented the Center and local EPBs. This proportion in the future should be reverted.

Selection of companies

The companies selected for participation are in a range from several hundred to several thousand employees.

The Evaluation Team got the impression that there are no clear selection categories established. The criteria used so far are:

- Up to 5000 employees
- Access to the General Manager
- Export oriented
- Financial viability
- Business oriented

The companies finally selected included however, e.g. also daughter companies of China's largest petroleum group or one of China's largest breweries, who are primarily interested in gaining the latest state of the technology for expansion of production facilities.

4.5. Effectiveness of the Project

A provincial Steering Committee was established. It is chaired by the EPB represented by the Shandong Cleaner Production Center and by the International Cooperation Department, the Shandong ETC and the management groups of the two selected sectors (chemical, textiles), furthermore the Financial sector, UNIDO and the donor. The major task of the Steering Committee is – according to the Pro.Doc - determined to provide strategic guidance, to establish links to important institutions and partners and provide the ground for dissemination of successful project approaches.

Until now only one meeting was held – end of 2003. We understand that the links to different institutions so far mainly depended on the efforts of the CPC.

According to the Pro.Doc, the leadership of the Project is with the counterpart, the CPC having an advisory role to the EPB. The ET understands that the EPB should play an active role when carrying out the tasks. Accordingly, the director (partly) as well as two vice directors, is paid by the UNIDO to implement the Project.

According to the ET's observation, however, the pushing role of the project work is carried out by the CPC. The EPB staff of the Project seems to be only part time involved. Furthermore, the local personnel paid directly by UNIDO, has to transfer a substantial part (between 23% and approx. 60 %) of their salary to the EPB – for "managerial reasons" (as explained by the EPB director). The ET considers that neither the selection of local experts is appropriate (as mentioned above: no coordination and direct links with the international experts) nor the fact, that the salary is deducted, last of which is directly influencing the motivation of the staff.

The selection of international experts is determined by the composition of the IRC members. This fact is limiting the accessible expertise to the available experts of the consortium. The bottlenecks of these limitations became obvious during the implementation process. This was for example the cases when the (international) brewery expert was selected to provide advise to a foodstuff company or also to a liquor company (last of which not requiring specific advise on liquor production but

requesting advise on fertilizing residuals and on generating and use of biogas). The selection of companies, arranged by the EPB, did also not fit with the available international expertise. Limitations were also in the case of the international financial expert, who was not familiar with the situation in China.

It has to be mentioned that also the coordinator of the IRC was not always very happy with the services of the Swiss companies. However, it seems that some international experts were selected on the basis of the Chinese demands, which later turned out to be wrong. Whether this has to be attributed to the companies or to the national experts of the Centre, the Evaluation Team had no time or possibility to verify it.

In several cases the IRC companies were not able to find out what were the real demands of the Centre. An important reason was the project planning process. To carry out an EST programme involving national and international experts, the programme of the visits must be fixed and committed by all partners well in advance.

This planning is part of the job of the Chief Project Coordinator (CPC) in cooperation with his team. It is the opinion of the coordinator of the IRC that this was not properly done and, therefore, also the support of the IRC failed in the technical inputs and feasibility checks. According to the IRC, strict project planning would have led to better and appropriate services.

The Pro.Doc foresees also the implication of the UNIDO Office in Beijing.
UNIDO, "..through its Country Framework… will focus its interventions on … promoting technology transfer and investments; increasing capacity for environment and energy management,…" and: "… ensure regular co-ordination of activities… in the area of cleaner production ..together with the Shandong CPC".
The ET understands that this kind of support is still rather limited. There is no evidence that the Project has been integrated in the countrywide activities and has synergies with other projects.

4.6. Impact of the Activities

The impact of the Project activities is not directly measurable. Based on the (unrealistic) objectives (technology transfer from OECD countries to Chinese companies) there is so far no impact at all.

Influence might be given (according to the CPC) on the policy of the province or at municipal level. According to some of the municipal EPBs visited by the ET: awareness rising is important and was diffused by the training programmes and especially by the Study Tour.

Impact is initially obtained on the companies selected, –however, later the companies themselves carry out the activities through other channels - e.g. the Liquor Company, the Tai'an Asia food company, or the Yaguang (Loftex) Textile Company.

The Study Tour has obtained the major impact. Especially for the companies, which participated in the Tour: new initiatives were taken to establish EST activities (The Rizhao Yaowang Liquor Group, the Tai'an Taishan Asia Food Company).

Laiwu: Meeting with the management of the pulp and paper factory TAISHAN.
Mr. Zhao Guangxi, Chief Engineer and
Mr. Diao Tingke, Chief Environment Division

Ximen: Meeting with the management of the pulp and paper factory BAICHUAN.
Mr. Chen Guozhi, Vice Chairman and
Mr. Zhan Dao Yong, Deputy General Manager.

Rizhao. Premises of the EPB

Rizhao. Meeting with the local EPB.
Mr. Liu Yuhai, Director.
Mr. Fan Jinliang, Deputy Director.
Mr. Fang Cheng Wei, Section Chief

4.7. Possibilities of Sustainability

The sustainability of the Project is reached when the partner is able to continue the Project after the end of the financial support of the donor. According to the target of the Pro.Doc: a mechanism has to be established to continue to generate EST from OECD countries to Chinese companies.

Based on the unrealistic assumptions of the Pro.Doc we doubt that there is chance to ensure sustainability in this sense. This is due to the following reasons:

- There are limited chances to realize TT without providing financial sources – at least in the short and medium term during the Project period. So far financial sources have not been made available for the selected projects.
- Experience from other, similar projects (e.g. the EU EST project as well as the CESTT project, last of which initiated by the ADB seven years earlier) so far still lack of relevant success stories – mainly due to the facts, that
    - There is no reliable CP structure established, which could provide the basis for EST (this is, according to the EU project manager and also the CESTT project manager, the case country-wide and not only in the Shandong Province)

    and

    - the legal framework (including the framework for enforcing environmental laws) is still not appropriate to initiate the company's investments in environment protection activities.
- The Chinese companies might be convinced to invest in EST only if a commercial approach is followed up. This could be for example an up-stream approach: investments in energy saving or other resource saving (water), which within short periods are paid off. Investments in downstream activities, if not requested by laws, will have no chance to be realized.
- Last not least: the counterpart should be a business oriented entity and not an entity which is considered by the companies as "counter-business-oriented" while putting fines or closing down factories if not conform with environmental rules and regulations.

4.8. Indicators of Success

Referring to the targets as set-up in the Pro.Doc there are no success indicators as far as TT is concerned. These targets turned out to be unrealistic.

We see however some success indicators worthwhile to mention:

- Awareness raising through training courses on EST
- Activities of some of the companies towards environmentally sound investments (without however realizing TT from OECD countries)
- The positive response of the participants to the training courses
- The positive opinion of the Chinese participants regarding the study tour

The major factors negatively impacting on the success are, beside the wrong assumptions in the Pro.Doc,

- The lack of financial resources for EST and TT
- The restricted access to companies
- The lack of a business oriented approach
- The lack of a clear concept regarding EST and TT
- The lack of coordination – between UNIDO and IRC, within the IRC consortium and between EPB and the CPC

5) Findings/Conclusions and respective Recommendations

Analysis of the Project Document

Generally: the ET is of the opinion that the Project Document does not reflect the situation in China within the framework of the Project. Several of the assumptions turned out to be not appropriate or even wrong thus leading to at least overoptimistic setting of project objectives. The ET recommends to review some of the basic assumptions and to adjust the objectives of the Project accordingly. This should be immediately done. When continuing the first Project phase and, based on the results achieved so far, it should be decided how and under which conditions to proceed with a further phase.

Findings

Incorrect assumptions stated in the Project Document

The ET is of the opinion that the following (major) assumptions, on which the objectives of the Pro.Doc are based, are not reflecting the situation:

- **The existence of a Cleaner Production Centre in Shandong Province**
    - It seems that there are Cleaner production activities in Shandong Province (CP trainings, CP audits), however, there is only a "virtual" Cleaner Production Centre in Shandong Province. One of the members of the Shandong EPB is considered as the "Cleaner Production Centre". The CP activities are carried out by some competing entities. The CP activities are carried out case by case with experts of external units (e.g. departments/members of the Universities).
- **EPB is the mostly appropriate entity to get access to companies for EST Investments**
    - However, the EPB being a governmental agency is the driving force for environmental regulation and its enforcement. EPB is not considered by the companies to "push" business oriented activities, since does not operate according to market mechanism. Therefore, the ET concludes that the generation of business activities coming from the EPB is rather limited in relation to the expectations of the Project Document.

- **It was further assumed, that EPB could have generated projects when implementing environmental laws.**
    - However, according to the ET findings, so far no project was generated by the PMO following the EPB implementing environmental laws.

- **Financing of EST projects available**
    - It has resulted that financing for investments is difficult on the Chinese market, especially for SMEs. Engineering of financing from foreign sources (as expected by the Chinese companies) is difficult as long there is no specific fund for this purpose available.

- **Foreign multilateral and Swiss funds would have been available**
    - The Project Document foresees the creation of "… a special facility for investment in environmentally sound technologies… in the range of 100,000 to 1 million USD…that could have been helpful for implementing environmentally sound technologies." (Refer to paragraph. 2.5). This issue was put up in the Pro.Doc as a proposal, not as being in place. However, it is understood by the Chinese side, that the financing is available.
    - This assumption has created a misunderstanding among the Chinese partners – including the companies involved. It is expected that the Center will provide convenient conditions for foreign financing of technology transfer. Now, the Chinese side attach high importance to this issue.

- **Besides, the Center should also have carried out POPs, CDM and SA 8000 activities.**
    - The Project Document did not consider the limited human resources of the Project. It will be hardly possible to utilize those mechanisms, because – according to information provided also from other international entities working in China - it will be difficult to find sufficiently knowledgeable staff in Shandong province.

- **Sustainability of the project for Technology Transfer (TT).** The ET understands that the Pro.Doc focuses more on the implementation of TT as environmental sound hardware deliveries from OECD countries, than on awareness raising and training.
    - The ET considers this assumption as overoptimistic, because other preconditions are not in place yet – such as a well-established CP or appropriate framework conditions (e.g. comprehensive enforcement of environmental laws). It appears that the companies selected are only interested in increasing the production. The environmental costs are not internalized, i.e. not included in the production costs.

Rizhao. Mr. Wang Chen Hai, Director of the Rizhao YAO WANG LIQUOR GROUP.

Rizhao. Liquor Factory of YAO WANG GROUP, Waste Water Treatment System

Rizhao. The biogas tank utilizing the waste water of the liquor production

Rizhao. The fertilizers produced by the liquor factory, utilizing the biological waste of the liquor production

Objectives stated in the Project Document

The Project Document focuses on **TT as its major objective**. This is mainly based on the above-mentioned assumptions.

As the understanding of "TT" in the Pro.Doc is the implementation of the technology transfer – contracting between Chinese companies and Swiss or OECD based companies – the ET considers this as too optimistic. (Pro.Doc foresees as target: 44 EST implementations in existing and new plants during the 5 years of project activities, in addition it is foreseen the implementation of POPs, CDMs and SA projects).

These **targets are not realistic** because of the above-mentioned assumptions, but also because matchmaking between companies is rather time consuming. Furthermore, the Chinese side (the selected Chinese companies) expects the **availability of favourable financing** from foreign sources. This is presently not in place and has not been arranged so far.

The project document includes and quantifies **indicators** related to the outputs. But they are **overoptimistic and some even not realistic**. No technology has been transferred in nearly two years of operations. No impact indicators have been determined.

Additional relevant inconsistencies of the Project Document

Project Organization: It is stated (Para 3.1) that the "The International Reference Centre (IRC) will be selected and contracted by UNIDO upon Agreement with the donor". However, the **IRC has not contractual relation with UNIDO**.

No specific indication of the "**managerial function**" expected by the two parties (UNIDO / IRC)

The Project Document foresees the integration of "**Design Centers**" (correct name: Engineering & Design Center) (refer to Output 3). However, the role of design centres is no longer relevant. In the meantime they have lost the role they had at the time of formulation of the project. They are no longer part of the regional government structure. In 2003 they became autonomous. Now they charge for their services and can operate in all regions of China and in a certain way they are now competitors of the Center.

Recommendations

The **objectives of the ProDoc should be modified** – adjusting them to the present situation in China in the framework of the activities of the Project.

In general:

- The IRC should operate under a contractual relation with UNIDO (under reimbursable loan or under a cooperation agreement, establishing a project management relationship with a management fee).

- "Technology Transfer" should include also a **training component on EST** (please refer to the definitions of TT above); appropriate training programmes should be designed and carried out.
- The PMO should **seek additional support from other related entities** (business oriented institutions and companies) of Shandong Province to identify companies for EST issues (e.g. the Economic and Trade Bureau, the Bureau of Financing, GeoHope, Shandong Technology Stock Exchange Center (STSEC), SEMC (Shandong Energy Conservation Engineering, Co. Ltd.).
- The Center should construct its reputation as **provider of services and partnership exchange** in the selected target sectors. This can be the brand name (slogan) for the implementation of the activities.
- Concentrate on **core sectors maximum two**, or on cross-sectoral activities in order not to overload the center.
- It should be considered by the stakeholders whether the support of the Project should end after **matchmaking between companies or assist them also during the negotiation phase.** The ET is of the opinion that the Project should not spend time for further follow-up (e.g. negotiations between companies etc.). This kind of support might be provided by other Chinese entities (e.g. commercially oriented consulting companies having an appropriate knowledge and experience with negotiations and contracting in China.)
- The Project should also consider a **supply driven approach** instead of only a demand driven approach as currently done. Therefore, not only identify the demand of selected companies but also to provide information on technology available in Switzerland/selected OECD countries for the targeted sectors.
- The IRC should offer an **inventory of the Swiss technology available**, through pamphlets and brochures, last of which also to be used when visiting Chinese companies. Something similar is made by the Swiss Hub, the Office Suisse d´Expansion Commerciale (the commercial section of the Embassy in Beijing),which has a database on the Swiss industries, accessible by everybody via Internet with direct links to the companies. Ten thousand companies are included in the database and also a periodical newsletter is published
- Additionally, the Center should investigate for existing market niches and should play a role as **facilitator between foreign and Chinese industries**.
- In parallel, the role of the IRC should be of **facilitator among Swiss/OECD enterprises** to match the demand on new technology requests coming from China.
- In order to carry out effectively an EST programme involving national and international experts, the programme of the visits to the factories must be fixed and committed by all partners well in advance. This planning should be part of the job of the Chief Project Coordinator (CPC) in cooperation with his team. Strict project planning will lead to better and appropriate services.

Institutional set-up

The ET considers the institutional set-up of the Project a **major weak point**, which is seriously jeopardizing the success of the project. It is an impediment throughout the project's implementation process because not foreseeing precise and well-defined links between as well as **responsibilities of the parties**. The lack of a well established command line affects the implementation of activities because the parties act in an insufficient coordinated manner.

UNIDO / IRC (International Reference Centre)

Due to the establishing of two entities in charge of implementing the Project (UNIDO, IRC) there are two parallel command lines:

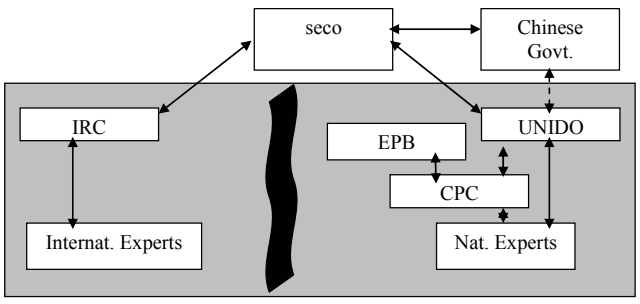
- UNIDO → CPC and national experts
- IRC and international experts.

UNIDO taking care of "managerial functions" (refer to the Pro.Doc), IRC taking care of " all international assistance of technical and managerial nature" (please refer to the TOR of the contract seco/IRC). There is however no precise allocation of tasks and responsibilities.

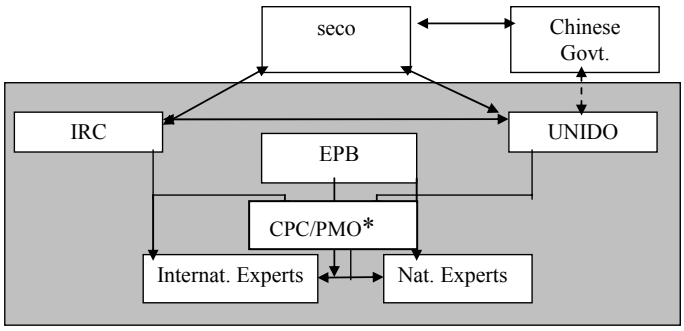
There are furthermore no contractual links between UNIDO and IRC. The CPC, who is formally reporting to UNIDO, has a coordinating advisory function but without formal links to the IRC.

This insufficiently **structured institutional set-up** leads to a gap of coordination, which causes **undefined areas of responsibility**. This institutional bottleneck cannot be corrected in spite of the coordinating efforts of the CPC.

Present contractual relationship between the entities involved



Desirable Operational Relationship



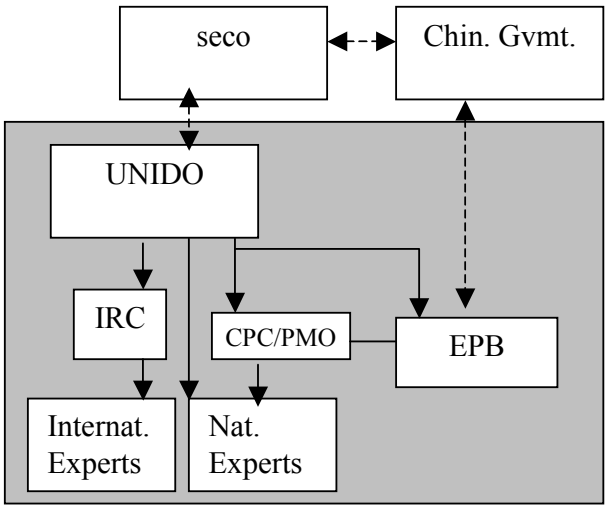
* The CPC has only an advisory and coordinating function being internationally recruited by UNIDO.

Recommendations

The ET recommends establishing clear command lines with precise definition of respective responsibilities.

The contractual relationship should be modified. A possible option would be to have the IRC contracted by the UNIDO under budget Line 21. In fact the original Project document states " IRC should be contracted by UNIDO"

Recommended Contractual Relationship – Clear Command Lines



IRC structure

Findings

The IRC is a consortium of consulting companies with specialisation in the priority sectors selected. The ET is of the opinion that **the delivery of the services of some**

consortium members is not made as indicated in the Project Document and the TOR (seco → IRC). Instead, the advisory services provided – as reported by several visited Chinese companies – have been considered as "very general advice" only. Part of the technical advice, which should have been provided as service of the project, has been proposed by those technical consulting companies under separate agreements directly signed with them and fees to be paid directly to them by the companies. This reflects a **conflict of interest** between the consulting companies and the purpose of the Project.

Recommendations

The members of the Consortium should deliver the **consulting service according to the TOR** of the Project.
The IRC should not be simply a coalition made of consulting firms just selling advises and assessments, sometime without knowledge of a big and complex country like China.

Findings

The **set-up of the IRC** seems to impede a direct access of the IRC coordinator to the members.

This is especially the case regarding follow up inquiries of the Chinese companies visited. It has been reported to the ET by several Chinese companies, that **long delays** have occurred in the communications with the IRC members (no answers to questions and/or long delays in providing technical solutions, etc.)

It has also been reported to ET by several interviewed parties that in some cases the level or the **appropriateness of the international technical expertise** was not up to the level expected by the companies (background of some experts was not in line with the respective field to be assessed, delays in the technical responses, lack of knowledge of the Chinese situation, non-in-depth analysis of technical assessments).

It should also be reported that the Evaluation Team has noted that in some cases the inappropriate technical international expertise was also due to the non-accurate translation or imprecise preparation on the Chinese side of the mission.

Recommendations

The IRC should make clear to its members the **mandate of the Project** and respond faster to the respective requests.

Centre and IRC should establish a **cooperation network with their respective partners**. As mentioned above, the approach should not be purely demand but also supply driven.

In line with above: the centre should receive from the IRC available information about respective advanced technologies from Western companies.

The level of **communication between the Project Centre and IRC** has to be improved (poor translations bring to misunderstandings on the needs of the companies and on the selection of the right technologies, causing delays in responses).

Rizhao. The fertilizer production section of the liquor factory

Rizhao. The evaluation team with the Director of the liquor factory, Mr. Wang Cheng Hai and the interpreter Ms. Weiling Duan.

Qindao. Meeting at the Local EPB. Mr. Shi Lei and Mr. Guo Yong Xing

Jinan. Ms. Sun Hong, Chairperson General Management of GEOHOPE

SESTPC

Finding

The creation of the Promotion Center has been necessary due to the practically non-existence of a real structured Cleaner Production Center for the Shandong Province, and, also to run the project as well as for taking care of the administrative relationship and of the contracts with the national experts.

Recommendations

The name of the Centre refers clearly only to **EST Promotion, but not** to **TT**. This issue has to be clarified. It should be only promotion and matchmaking or also involvement in the financial transactions of the transfer of technology? This issue is very important to measure afterwards the impact of the activities and should be faced by seco and UNIDO before the start of the next phase.

All the necessary documentation on Chinese Government Policies and incentives on EST should be provided by EPB to the Center. In case this documentation is not available it is recommended to have a study prepared on this topic.

Potential additional entities supporting the Project activities

Findings

EPB is responsible, among other tasks, for the **enforcement of environmental laws and regulations.** Therefore is generally considered by the companies as the authority collecting money and charging fines.

Furthermore, the companies consider EPB as an entity, which is not primarily supporting business activities. This is, by the way, the situation worldwide for institutions carrying out these tasks. Although the ET realized, that this is not always the situation, this seems to be the reason why EPB has access only to a limited number of companies.

Recommendations

The Project should **seek for support** of other institutions and entities that are considered by the companies to have a specific business oriented approach. The ET during its fieldwork held meetings with a number of such concerned entities.

The ET recommends in the framework of continuation of the Project activities **the following entities be considered as potential partners**, such as:

- the Economic and Trade Bureau
- the Bureau of Financing
- Geohope
- SEMC (Shandong Energy Conservation Engineering, Co. Ltd.)
- Shandong Technology Stock Exchange Center (STSEC)

All of those entities are mostly willing to participate in the activities of the Project. These entities should be actively used to meet the objectives of the Project, identifying more appropriate Chinese companies for matchmaking and possible transfer of technologies.

EST Promotion Center and Central level authorities

Findings

The **Steering Committee** for directing the activities of the Project was foreseen in the Project Document to meet at least once per year. So far the Steering Committee met only once in 2003.

The Project Document indicates the establishment of a **National Advisory Board** including key players, namely SEPA, SDPC, SETC and MOST. This has not been applied.

The National Project Director claims that **SEPA** has completely delegated the responsibility concerning the implementation of the Project **to the Shandong EPB**.

Administrative Issues

Findings

The **national staff**, locally recruited under UNIDO contract, has to sign a second contract with the EPB giving the authorization to the EPB to **withdraw part of the emoluments** paid under the UNIDO contract. This withdrawal is not the same for all the staff and goes from 23 % up to 63%. The Evaluation Team saw the second contract of all the Staff Members of the center, except for the directors.

The National Director claims that this arrangement is done only for managerial purposes, like insurances, taxes etc.

The ET consider these "arrangements" as having a **negative impact on the motivation of the staff** and bearing the risk that the present trained staff could leave the Centre because attracted by better paid opportunities. Recruiting new staff will again require comprehensive training to perform the requested duties. This includes also the scarcity of people in China having English skills, although also in the case of some staff, the language skills are not up to the expected requirements.

Recommendations

EPB should reconsider this issue in **consultation with the UNIDO Representative Beijing Office** and according to the current practice recognized by the UR office.

Findings

The National Project Director has given the list of the inputs regarding the contribution in kind of the EPB to the Evaluation Team. Please refer to paragraph 2.6.2.

Recommendations

A properly prepared list of the budget of the inputs foreseen should be given not only for the year 2004, but also for the years 2003 and 2005.

Some of the **items need to be further clarified**.

It is not clear what function have accomplished the 20 man/months indicated as "local experts" for a total of USD 12,000 per year. According to the NPD they provided consulting advises when needed. It should be verified by the P.M. whether the amount indicated correspond to the need of their utilization

- The same clarification is needed for the 12 man/months indicated as "Administration staff of Chinese Partner" for al total of USD 3,600.

According to the NPD they are municipal officials who help to arrange the visits and seminars when needed.

- Further clarification is needed for the item "5 Training" which is reporting a total expenditure of USD 70,916. The ET has been informed by UNIDO, that normally these costs have been paid out of the UNIDO budget.

The NPD replied: "Besides the 5 seminars sponsored by UNIDO in 2004, we held 2 meetings in Zhangqiu City and Jinan City to distribute EST project and exchange local informations."

The UNIDO Project Manager has to give her position on this point.

- The ET would appreciate also to receive a list indicating the venue and the number of participants for the two training sessions on EST for the 17 municipalities and also for the two training sessions for the companies.

An answer on this point has not been given by the NPD.

Findings

According to the parties interviewed it is claimed that the CPC is travelling internally too frequently and without previous authorization.

A leave monthly report has never been presented, although required. It was also subsequently discovered that the CPC left the duty station for duty and leave travels abroad, without previous UNIDO HQs authorization.

Recommendations

The ET suggests that the **CPC** presents to the UNIDO Project Manager an advanced tentative **quarterly travel plan**.

Furthermore, the ET is of the opinion that for travels within the Shandong Province, the CPC should enjoy certain **flexibility** within the budget of the quarter plan. This is necessary to carry out the tasks of the Project (developing new contacts, PR, etc.) and also to cope with urgent requests.

It is imperative that after each **travel a report** indicating the purpose and the results of the travel is presented to UNIDO with copy for information to the national counterpart.

A monthly leave report has to be regularly presented, not only by the CPC, but also by every staff member of the Center. A "NIL" report shall be submitted where no leave has been taken during the month (Staff Rule 207.01 (b)).

All the travels abroad of the CPC have to be previously authorized. Also in case of annual leave. Not abiding to this staff regulation can be considered as to have abandoned the post and the staff member could be separated from service without indemnities.

Findings

The ET has noticed that all the **agreements/contracts** (e.g. Feasibility Studies, technical assessments) signed with the companies are signed by the CPC for UNIDO; some also having a stamp with the name of UNIDO.

This practice is not acceptable since it is exposing UNIDO to legal consequences.

Furthermore, the ET has noticed that the **contract** signed with the **Tai'an Taishan Asia Food Company** and the EST Promotion Center (Nat. Project Director and CPC) indicates the following:

Quote "Tai'an Taishan Asia Food Company is requiring Shandong EST Promotion Centre to look for the following financial support:

1. The total investment of 17,000,000 RMB *(around USD 2 Mio.)* should be based on an eight-year loan period with payback starting from the fifth year; with an interest rate of less than 5%.
2. The financial support should be made available as early as possible and in less than two years after the date of signature of the contract. " Unquote

The ET is wondering whether this kind of clause is appropriate, considering that the above-mentioned conditions are not realistic.

Furthermore, the **Chinese version of the contract differs substantially from the English one**. The English version states "… to look for … financial support..", whereas the Chinese version indicates "… to provide … financial support".

Recommendations

It should be clarified, **whether the CPC is entitled to sign** these contracts. It is recommended that the CPC have the agreement of the PM or of the UNIDO Beijing Office if so required.

The **National Director** of the Center should pay due attention to the **appropriate and correct Chinese translation** of the contracts.

Furthermore, the parties of the Project contacting Chinese companies and signing contracts should be aware that **UNIDO is not a financial institution** and therefore cannot "provide" loans.

Jinan. Presentation of conclusions and recommendations

Jinan. Debriefing of evaluation team.
Mr. Ma Jian, National Programme Coordinator UNIDO Beijing,
Mr. De Klebnikoff (CPC) and
Mr. Wunderlin coordinator IRC

TT – Implementation modalities

Technical Issues

Focus sectors

Findings

The focus of sectors, upon request of the Chinese counterpart, has been expanded from the **two sectors** (chemical, textile), initially foreseen in the Project Document, to five (plus: food, paper and energy). It was reported to the ET that this was done because these sectors are representing the most important environmental polluters in Shandong province.

The **expansion to five sectors** implies a **tremendous challenge** to the Center. It will be not possible for the Center and consequently for the IRC, to find all those expertise

(internationally and nationally), which will be required by those five sectors in order to comprehensively meet the expectations of the Chinese companies.

It should be noted that there is not a general "expert" covering all "food issues". Each branch requires a bunch of full expertise; e.g. referring only to beverages –this branch is to be divided into sub-branches as beer, different soft drinks, liquor, milk,…. etc., each of which is requiring again a bunch of specific experts (raw material, processing, bottling, …).

This refers also to other food branches.

The technical advice provided by the Project to the **Rizhao Liquor Company** was performed by a brewery expert but would have required a team of experts covering fertilizing organic waste as well as generation and utilization of biogas.

Recommendations

The ET recommends either to

- **Limit the focus of activities** to two sectors maximum in order to be able to provide appropriate expertise (internationally and nationally),

or

- Follow **a cross sectoral approach** by focusing on energy and water resources saving issues, which can cover several sectors. The authorities consider energy and water supply as the utmost relevant bottleneck for the future. This would facilitate the search of experts (energy saving and water saving experts) to cover companies of different industrial sectors.
- Furthermore, an **"upstream" oriented** focusing of the services provided by the Center would also enlarge the possibility of approaching Chinese companies. Energy and water saving have direct impacts on the production costs of the companies. Applying this strategy, the Center will have an enlarged range of opportunities to awake the interest of companies because of providing "**business oriented" advices**, in the framework of the objective of transfer of EST.
- The focus of the Project approach should be "optimizing production, cost saving" (energy, water, raw materials,…) rather than refer only to a pure "environmental" approach. This modification of the wording would facilitate the access to companies who are under the current framework **more "business" than "environment" oriented**. The results would have consequently a positive impact on the environment **("commercial motivation", "business driven approach**" are door openers in order to target at the same time the respect of the environment).
- It has to be reported that the NPD suggests keeping all five foreseen sectors at least for training purposes.

Selection of Companies (criteria)

Findings

The focus of the **Project Document is on small and medium enterprises**. However, the majority of the companies selected by the counterpart are large companies with – in general –either several thousand employees or with technologically rather advanced equipment.

It was reported to the ET, that this was done because only large companies would potentially be able to pay back loans for TT.

According to the **Classification Standards on the Small and Medium-Sized Enterprises** (Published on www.china.org.cn, August 18, 2003, with the approval of China State Council) the SMEs (medium-size enterprises) of the Industrial Sectors are defined according the following categories:

Number of employees: 300-2,000;
Annual Revenue (turnover) (RMB million) 30-300;
Total assets (RMB million): 40-400.

Enterprises below these figures are classified as small enterprises.

Recommendations

It is recommended for the future to establish **precise selection policies** specifying whether also the financial turnover could be considered as a criterion for selection of the companies.

The criteria should respond to some parameter, covering a) number of employees, b) production capacity, c) export orientation, d) awareness regarding environment protection, e) access to the general management of the company, f) financial viability of the company.

The **selection of companies** should be **limited only to a reduced number of sectors** or to the above-mentioned **cross-sectoral approach**. Both should focus only on those companies, where expertise can be provided by the Center, e.g. when there is international and national expertise available as well as adapted technology.

Demand and supply driven approach

Findings

The ET was asked during several meetings that it would be helpful if information would be made available about the **advanced technology abroad**. Up to now, the PMO follows only a "demand driven" approach. This is according to the ProDoc and encouraged by the IRC. The ET considers this a problem connected with the IRC structure (see above: conflict of interest between member of the consortium and independent consultant. The consultant's main objective is not to provide comprehensively TT free of charge).

So far the ET was not able to discover any success story on TT facilitated by the project.

In some cases it appears that the market analysis does not represent the views of the concerned companies, but more the approach of a "western specialist", who has not a specific knowledge of the Chinese situation.

Recommendations

Information material about foreign technology should be available in the target sectors. This could be done by:

- Providing **website** addresses containing suppliers of the respective technology demanded
- Having **brochures** of the potential suppliers, available at the Center, also to be used when approaching the Chinese companies
- When arranging **seminars/conferences** in Shandong with speakers from the respective suppliers presenting their technology to a selected number of Shandong companies. We assume that this would (and should) be done by the international companies without charging a fee, just travel expenses could be covered (this being a well prepared "acquisition" approach also in the interest of the offering companies)
- **Matchmaking** should continue to be an objective but should not go beyond the introduction of the companies to each other.
- The **Center should organise seminars, conferences on environmental issues** supported by Switzerland and OECD companies on:
    - How to present the image as a green company / how to fulfil the western requirements on "clean" materials
    - Invite large Western Companies CEO (WalMart, Metro) holding presentations on green products

In general: **other promotion entities**, as SwissCham or Swiss Hub could be also used as an intermediate support for this issue and could be used for matchmaking between companies.

- An additional focus could be on companies interested in exporting their products and will have to abide regulations as **SA 8000 or eco label**.

Training

Recommendations

Organize **training programmes** for cost reduction production processes (resources savings).

The continuation of further **capacity building** and awareness rising should continue and be considered as part of the TT.

The NPD suggests arranging trainings for all the five sectors presently assisted. The Evaluation Team, however, expressed already its opinion that the focus should be maximum to two sectors or cross sectoral.

Jinan. Debriefing from left: Mr. Wunderlin, Ms. Sanchez-Osuna and Ms. Ansermet

Jinan. Debriefing from the right:
Mr. Peng Zhenhua NPD.
Mr. Ji Ming deputy director.
Ms. Duan Weiling, interpreter of the evaluation mission.

Financial Issues

Findings

Financing on the Chinese capital market is – as the visited Chinese Institutions informed the ET – **difficult** especially to get financing for investments on production purposes. This is especially the case for SMEs. Short-term loans are available with high interest rates and short payback time (max. one year) only.

The Chinese companies and institutions (e.g. municipal EPBs) expect the Centre to arrange foreign **financing at favourable conditions** for the selected projects. A special facility for investments was also foreseen in the Project Document (see above). A **favourable financial mechanism** could not be effectively arranged so far. The international financial experts did not put forward concrete and feasible proposals adapted for the Chinese situation.

The selected companies are interested in realizing TT only, if the TT improves their production capacity. They are less or even not interested if they are approached only regarding to take care of the environment.

So far, the Project has not established any cooperation with **other UNIDO projects** under implementation in China to find out any potential synergies, POPs, energy conservation, etc.

Recommendations

The ET recommends for the next phase to realize the facility for **a fund to support the TT**.

This fund, in order to involve more deeply the Chinese side should be negotiated as mixed fund with 50% participation of Chinese capital.

This facility could represent a financial incentive for the adoption of environmentally sound technologies. It should be established as a **revolving fund** with a maximum total amount of one million US dollar. Its regulation should be very well detailed, e.g. maximum financing available, interest rate, pay back period, conditions for eligibility; authority entrusted with its administration, and indicating who will administer this fund after the Project has been concluded.

Another additional option could be to follow the approach of the "**Energy Management Contract" (EMC)**. This is based on an available initial fund (could be foreign together with Chinese contribution), which is used to finance e.g. energy saving facilities in a selected company. The payback of the investment to the provider (e.g. EST or a cooperating institution) comes from the energy costs savings realized by the installed energy saving equipment. This model could also be used for water or other resource saving opportunities.

GeoHope Group (belonging to the Economic and Trade Bureau of Shandong Province) is successfully applying this model.

It is strongly recommended to have a close **cooperation with GeoHope** if following this approach.

GeoHope should be taken as partner in the Project for the practical implementation of the TT to the companies. During the meeting with the ET, the Chairperson of GeoHope declared her strong interest in participating into such a scheme.

Furthermore, another approach could be the one which is followed for instance in Colombia under a bilateral seco project (having an **initial fund** provided by a financial institution and guaranteed by the Swiss government).

The Swiss International Financial Expert described a similar financial mechanism.

In this financial mechanism a Chinese financial entity could take over the role of the financial institution (refer to the Mission Report on financial Instruments, Feb. 27, 2004, page 16). The ET recommends to further considering the following:

a) Which entity could provide the technical expertise and

b) Which Chinese financial institution could act as bank.

The ET understands that the Everbright Bank would be interested to do it as soon as concrete steps are undertaken by the Center.

Due to the above explained business oriented interests of the Chinese companies, the ET recommends – as mentioned already above – to focus the **TT approach also more towards a business oriented approach** (which is the reduction of production costs by saving of resources – e.g. energy, water). This would meet the request for return of the investment, giving at the same time the possibility to meet the objectives of the Project.

The ET recommends that the UNIDO Office in Beijing coordinate the activities of the Center in order to find synergies with other UNIDO projects under implementation in China (POPs, energy conservation, CDM mechanism, in order to enlarge the implication of the Center in these activities).

Establish immediately cooperation links with the EU project in Beijing on Environmental Management Cooperation Programme, in order to explore the possibility to continue some activities since this project will finish next September 2005.

COMMENTS TO THE REPORT BY THE CPC and IRC COORDINATOR

The Chief Project Coordinator and the Coordinator of the International Reference Centre presented comments and proposals through seco regarding the draft final report and possible adjustments to the Programme. Annexes IV and V respectively refer.
While the proposals made by the CPC concern the structure of the Programme and are mainly for the donor and the stakeholders, the comments of the IRC coordinator concern the report and have been answered directly by the evaluators.
Annex VI refers.

6. LESSONS LEARNED

(Lessons learned are generalizations, positive or negative, based on evaluation experiences with projects and programs. The lessons are derived from this evaluation and abstract from specific circumstances to broader situations.
Frequently the lessons highlight strengths or weaknesses in formulation, design and implementation that can affect performance and results. Therefore, the lessons can be retained for improving the quality and effectiveness of the assistance in future projects.
In this sense the Evaluation Group of UNIDO makes all the possible efforts to divulgate inside the organization and to the Donors Community all the lessons learned from an evaluation.
However, it has to be considered that the lessons learned in the evaluation of a Programme are not always applicable to other countries or other programmes, which can have a different situation under the political, socio-economic and industrial point of view.)

The following lessons refer to:

Formulation of the programme

- Environmentally Sound Technology (EST) is the logical following step in the implementation of the CP (Cleaner Production).
  The specific aim of a project designed to promote EST is to create a business-oriented environment for transferring/selling advanced and adapted technologies.
  This point should be explicitly indicated in the Project Document and the appropriate environment for developing this action should be suggested. If this environment does not exist, the project document should foresee its establishment.

- In formulating a technology transfer programme for EST, it has to be considered that industrial technology is the technical information relevant to the production of industrial goods. This includes information (and the activities performed using this information) in addition to the operation of machinery. The technology includes also the human skills, the equipments, the physical assets and the organizational settings needed for the industrial production.

- The designers of a project should take into account the economic and financing support infrastructure needed by the project and not only considering the technical aspects. Based on such analysis, it should be assessed if the target beneficiaries need financial instruments to implement the assistance requested and the transfer of the technologies. If some measures are required to ensure this, such as changes in legislation or national policies, the donor or the executing agency, before finalizing the project document, should discuss with the beneficiary institutions, whether such measures can be taken and whether the arrangements expected are feasible.

- When a Project Document is prepared it should reflect the situation of the country in the framework of the programme. The assumptions have to be precise, accurate, realistic and reliable. If they are not correct it will have a negative impact on the project objectives. The risks of the project have to be taken into account and indicated in the project document.

Concept and Design

- Cleaner Production requires changed attitudes from the industries, increased awareness of all the population, responsible environmental management authorities and analysis by the parties involved of the most suitable and environmental adapted technological options. After all these steps, the negotiations for the transfer of technology can be initiated.

- The project document should include appropriate and specific indicators for analysing and evaluating the outputs to be produced. This will facilitate the fair and objective monitoring of the activities of the project and allowing the measurement in quantitative and qualitative terms of the achievements obtained.

- The counterparts should be the most appropriate if you want to have a successful implementation. The possibility to add other stakeholders, also during the implementation of the activities, should be foreseen.

- If the project has a business-oriented character, the institutions involved should be able to operate according to the market mechanisms.

- The project planning for transferring technologies has to be comprehensive. The supply and installation of equipment alone is not enough for a successful transfer of technology. The process has to be adapted to the local conditions and the capabilities and needs of the receiving enterprises.

- The experience obtained so far has shown that the application of cleaner production can significantly improve the environmental performance of the production processes. Only when the concept of cleaner production is well understood and established in the factories, it is possible to start thinking to Environmentally Sound Technologies and about their transfer.

Implementation of the activities

- In technology choice, the accuracy of the selection depends on the technical capability of the recipients/end users and on the availability of data on alternative technologies.

- The development and transfer of technology is the heart of the industrial development. At enterprise level, technology management is part of the management of the enterprise itself.

- Only when the technology is materially transferred, the recipients have the possibility to see how the process, machine or device really functions, not only regarding the environment, but, more important for the factory, how it can increase the industrial production process. The business approach (i.e. the production gains that can be obtained) is the more interesting argument for the entrepreneur.

- When the objective of the project is to improve the respect of the environment by industrial processes, it has to be taken into account that the participating companies are mainly interested in increasing their production containing the costs. In developing countries the environmental costs are not "internalized", i.e. included in the production costs. Therefore, in order to arise the interest of the companies, they have to be approached presenting them the business side: how much they will save in terms of energy and water consumption and which benefits will have their production process.

- The technology transfer has to be consistent with the national programmes of the country, its priorities and objectives. It has to complement the national strategies related to industrial development. The technical broker role of UNIDO has to guarantee that old and outdated technologies are not transferred. Part of this role is also to avoid that recipients are convinced to accept not convenient or inappropriate technologies.

- Implementing technological transfer and preparing related investments of enterprises could be very time consuming. Once transfer and investment has been made, corresponding environmental and economic effects may come at an additional delay. The time factor may have to be well assessed and planned.

Relevance

- Engineering of financing for the transfer of technologies from foreign sources (as expected by the companies assisted by the programme) is difficult as long as there are not specific funds available for this purpose. This point is relevant for the successful realisation of the objectives.

- The market forces and the competitiveness are of paramount importance in influencing the decision of the companies regarding the technology needed or its alternatives. In this context, the impartial technical assistance advice of UNIDO can play a very relevant influence in the decision of the company to select the technology.

- Normally the National Cleaner Production Centers (NCPCs) are oriented to a technological approach and run by technology experts and engineers. Environmental financing services, in turn, appear to be not very well developed and there is limited expertise available in the Centers (Promotion Centers or Cleaner Production Centers). There should be a critical mass of financing expertise available in these Centers, in order to not only preparing investment proposals but also to realize them. In addition, on company level, the Center needs to address not only staff responsible for technology and processes, but also administrative/commercial staff responsible for implementing investments.

- For a Centre promoting transfer of technology it is relevant to be connected to the worldwide network of UNIDO Cleaner Production Centers. The executing agency should offer instruments that allow the technological centers to be continuously updated about technological developments and for receiving periodical methodological guidance. On the other side, the Centers should periodically formulate their needs and expectations, and request corresponding services to the executing agency.

Strategy

- The technology used by industrial factories is the result of the combination of several actions, like joint ventures, licensing, purchase of machinery, consultancy and training, maintenance contracts and even new technological processes originated in the enterprises themselves.

- Since in most developing countries there are “skills gaps”, particularly in technical areas, such as repairs and maintenance, the hardware or software transferred need to be made simpler and with less controls than in the technology originating country.

- A close relationship between technology supplier and buyer, like in the case of a joint venture, ensures that the equipment installations and the training foreseen for the operation of the new technology is adequate and according to the needs. A successful transfer is based on full trust between the parties and

on a clear and realistic understanding of the financial support that can be received by the buyer.

- Technology transfer is a common collaborative effort. Partnership and synergy between all stakeholders are necessary and an honest consultation on the market needs, between stakeholders and clients (suppliers and recipients), is crucial.

- The enterprises cannot be expected to successfully implement technology transfer by themselves. This is especially the case for developing countries. The process requires a supportive environment with actions in this regard. This has to be jointly taken by the central authorities and the industries. The role of the international organization has to be of brokerage and supportive, as far it concerns information and technical assistance.

- While foreign expertise may be needed to ensure the most appropriate choice of new technology, it is necessary that foreign experts know the country and the local entrepreneurial culture.

- Transfer of technology requires genuine willingness for cooperation between the two parties.

Monitoring and Reporting

- In case of a complex and long-term project, and where the duty station is not in the Capital of the country, the Chief Project Coordinator (CPC) has to be very familiar with the basic administrative rules and procedures of UNIDO. In this case, due to some unforeseeable circumstances, the project coordinator had to stay for briefing more than one month at the Headquarters in Vienna, prior to start working in the field. However, in spite of such a long period, it is evident that also one month of briefing/induction on the administrative structure of the organization is not sufficient, because the daily practice of managing a project presents situations that may be have not been explained during the briefing. Furthermore, the capacity of assimilation, understanding and application of any instruction requires time and the opportunity to put them into practice. For this reason, it is necessary a strong monitoring, not only on the part of the project manager, but also on the part of the personnel administration.

- The monitoring of the local personnel administration, especially when several staff members are employed, has to be continuous and a reporting system for the leave taken has to be systematically controlled by the personnel administration at the Headquarters. A monthly report has to be submitted and, in this particular case, the national project director should countersign it.

- The Project Performance Report (PPR) or self-assessment report, which should be completed by the CPC at least every six months to monitor the progress of the project implementation, has to be filled in by the CPC in consultation with the National Project Director. The PPR is a basic instrument for the evaluation mission to help in ascertaining the situation of the results of the achievements of the project and, examined in comparison with the project document, allows having a picture of the results foreseen and of the ones really achieved.

Awareness rising and training

- An integral part of any technology transfer process is the training. It will reduce time and money spent between commissioning and start of the production. It is necessary for a profitable transfer that the technicians of the recipient enterprises are extensively trained in utilizing and understanding the new technologies that have been designed in a foreign country by foreign technicians under different economic, environmental and technical situations.

- The information dissemination is very important. Increasing consumer awareness is leading to an increase demand of the products. Information disseminated specifically to potential recipients facilitates the technology transfer.

- In order to achieve a sustainable and lasting application of the CP and following TT concept in a company, it may be necessary that the company management is fully aware of the concept and dedicated to its continuous implementation. In this way, the management can transpose the corresponding spirit to the employees. Similarly important may be that following the CPCs advice and the subsequent transfer of technologies, company employees have developed a full understanding and appreciation of saving resources and limiting pollution whenever possible and affordable. Such thinking should become standard business practice.

Technology Transfer and Financing

- Implementation or adaptation of technological changes normally involves investments and consequently it originates the problem of financing for the interested enterprises. In this project, like in all other technical assistance programmes requiring investment of the enterprises, a common barrier to the transfer of technology is the lack of adequate financial instruments. Sustainability of a transfer of technology is very strongly linked to the financial sustainability.

- Financing institutions quite often cannot assess properly the viability of the technological content of a loan application. The financing institutions and banks are not prepared and technically equipped to provide loans in this area. This is due to two main reasons: they do not possess a specific technical knowledge and their aversion for a risk that is difficult to be evaluated.

Investments in research and other areas of technological development require commercial and financing institutions. To find an answer to these situations, it is imperative looking for intermediaries who understand Research & Development, have technical expertise, are knowledgeable about the industrial sectors and, according their mandate, are committed to take risks.

- The role of financial intermediaries is imperative for a positive conclusion of a technology transfer. They should understand Research & Development; have technical expertise; be knowledgeable about the industrial sectors and committed to take risks. If the project has a business-oriented character, the institutions involved should be able to operate according to the market mechanisms.

- In assisting companies with the financing of cleaner production investments, it is decisive that the promotion centre can offer comprehensive assistance, including: advice on which of the existing co-financing sources may be most suitable, advice on writing successful and specific applications to relevant co-financing sources, advice on the internal planning of the investment, advice on convincing the company management about the need and benefits (including financial, economic and compliance benefits) of the investment, etc.

- It is very important that a Promotion Centre diffuses and distributes such specific knowledge by providing appropriate training to local consultants and relevant staff (of larger companies).

ANNEX I

TERMS OF REFERENCE FOR THE

MID-TERM INDEPENDENT IN-DEPTH EVALUATION

Project Number: US/CPR/02/009
Project Title: Environmentally Sound Technologies Programme in China

I. THE PROJECT

The Environmentally Sound Technologies programme in China, designed to be implemented in Jinan is the first programme in the field implemented by UNIDO in cooperation with the Swiss Reference Centre selected by seco. The project document was prepared by seco consultant, based on the previously acquired experience in the implementation of CP projects both bilaterally and through cooperation agreements with UNIDO.

International Executing Agency:	UNIDO
International Reference Centre (IRC):	Carbotech
National Executing Agency (counterpart):	Shandong EPB
Donor:	State Secretariat for Economics Affairs Switzerland (seco)
Project Document signed:	10 June 2002
PAD issued:	20 September 2002
Planned Starting date:	October 2002
Real Starting Date:	1 July 2003 (as agreed in Vienna by all partners)
Planed duration:	60 months
Total UNIDO budget (excl. support costs) as per project document:	US$ 1,440,000
Total IRC budget:	US$ 1,231,700

Total Government inputs as per project document: The expected in-kind contribution of the
National Executing Agency to the project is indicated in the project document.

The project document is approved for shared implementation between UNIDO and the IRC. UNIDO is responsible of project organization and implementation in the field and IRC is responsible of the technical assistance services offered by international experts. The UNIDO budget is reflected in the attached Annex 1.

The first Steering Committee Meeting of the project was organized with some delay in November 2003 (due to delays in the project beginning of project activities and SARS). A Project Progress Report covering the period from July 2003 to April 2004 was prepared by the Chief Project coordinator (CPC) and cleared by UNIDO substantive officer. A second Project Progress Report covering the period from April 2004 to 31 December 2004 will be made available by 15 February 2005. See attached reports as Annexes 2 and 3

II. PROJECT DEVELOPMENT AND IMMEDIATE OBJECTIVES

The project aims at:

- Including EST in the design of new industrial facilities
- Assist existing plants to introduce EST in their practices
- Upgrading the capacities of local institutions to promote and introduce Environmentally sound technologies (EST), Clean Development Mechanism (CDM) and Persistent Organic Pollutants (POPs) related activities.

A. Immediate objectives (as per project document):

To reduce environmental pollution and improve the competitiveness of industrial entities through the adoption of environmentally sound technologies.

B. Expected Project Outputs (as per project document):

1. Project capacities and structure established.
2. EST services for enterprises offered by Chinese service providers.
3. Chinese design centres integrate EST in the design of new industrial facilities.
4. Training services to institutions, consultants and companies employees provided.
5. Strategic and policy advisory services provided.
6. Information and dissemination services provided.
7. Regional outreach.

The Project performance Evaluation Report (PPER) prepared by the Chief Project Coordinator (CPC) on January 2005 resumes the activities undertaken by the project during the last 18 months of project implementation period.

III. PROJECT COVERAGE

The project is expected to offer the services to the Shandong Province enterprises on EST promotion, transfer, adaptation and assimilation.

IV. THE MID-TERM IN-DEPTH EVALUATION

A. Purpose, scope and methods:

The purpose of the mid-term in-depth evaluation – organized after 18 months of operation - is to enable the project stakeholders (Government authorities, the national counterpart, the participating provinces, cities and industries, UNIDO and donor) to take decisions on eventual reorientation of the project to gain experiences through the achievements and the shortcomings of the project design and to plan for further development in the field of EST transfer and financing. One of the main focus

of the evaluation shall be to assess the current project situation and to evaluate the alternative scenarios and feasibility for the future of the EST-program.

The evaluation process will allow the project stakeholders to learn about the possibilities of future orientation of EST related activities in the province and tailor design the alternative approaches for EST transfer all around the province. The evaluation process will provide with lessons and experiences for the eventual future design and implementation of EST transfer cooperation projects in other regions in China.

The evaluation is conducted in compliance with UNIDO policy of mandatory evaluation of large technical cooperation projects as specified in UNIDO/ DGB(P).72. It is foreseen in the project document.

B. Scope:

The mid-term in-depth evaluation is an activity planned as part of the project cycle which attempts to determine as systematically and objectively as possible the relevance, efficiency, effectiveness, impact and sustainability of the project. The evaluation will assess the achievements of the project against its objectives, including a re-examination of the relevance of the objectives and of the project design as well as recommendation on possible adjustments on objectives. It will also assess to what degree the assumptions/risks as identified in the project document held true/occurred and identify other factors that have facilitated or impeded the achievement of the objectives. The mid-term in-depth evaluation process should also evaluate the relevance and functionality of the institutional set up for the project in the Shandong province. While a thorough review of the past is in itself very important, the mid-term in-depth evaluation is expected to lead to detailed recommendations and lessons learned which could be considered in the process of institutional and conceptual adjustment of the current project as well as in the design, formulation and implementation of eventual future EST projects.

C. Design and Relevance:

During the design process it was assumed that Cleaner Production (CP) concept and its application were well known and introduced in the industrial sector in Shandong province and the main focus of the planned services was to assist to transfer environmentally sound technologies to the industrial sector in Shandong and to contribute to assist the local authorities to overcome the environmental risks that the rapid industrial growth in the province could pose. The project implementation activities are focused in promoting and transferring environmentally sound technologies to the industries in Shandong Province.

The evaluation team should assess whether the project document includes and quantifies the proper indicators related to the outputs. How the project document addresses the modalities of implementation of the Environmentally Sound Technologies (EST) transfer processes and their financing.

By evaluating the answers provided to the questions indicated below, the evaluation team should conclude about the relevance of the project, especially whether the strategy applied for EST transfer in the Shandong province in the selected sectors is the most appropriate. The evaluation team should assess the viability and sustainability of the strategy for EST transfer recommended by IRC and provide recommendations for improvement on the above.

Among others but not limiting its efforts to, the evaluation team should assess the following issues:

- Are the problems identified and addressed by the project document still valid? If so, is the expected external support from International Reference centre (IRC) and UNIDO still relevant for the sustainable project implementation?
- Are the project and the services the project aims to offer demand driven?
- Are the services offered by the IRC and UNIDO relevant and adjusted to the needs?
- Have the project team eventually identified "new relevant" issues not covered in the original project design?
- Have there been significant changes in the institutional framework? Are the project partners (counterparts) and target beneficiaries still relevant? Should a different institutional setting of the project be considered?
- Have other programmes evolved which may duplicate this project? Is the project coordinated with and linked to similar programmes and projects in the country?
- In view of the experience from implementation, is the project design still adequate? Are the outputs realistic? Can the project purpose be achieved? What would be the adjustments if needed?
- Is there a clear understanding about the EST transfer needs for competitiveness and market access of the locally manufactured products?
- Is the EST strategy well defined? Is the database for potential EST to be transferred to the priority industrial sectors available? Is the benchmarking approach and promotion strategies for the selected/recommended EST technologies in place?
- Is it relevant to consider gender and other social issues (employment, regional development)?
- Is it necessary to offer CP services as part of the project activities to the project partners in addition to the EST services?
- Are the training services offered relevant to the project needs and adjusted to the sectoral requirements? How the IRC approaches the demands for training services? Are the training services offered focused on EST?
- Content of the information and dissemination services offered by the project.
- Is it relevant to consider technical cooperation among other provinces in the country?
- Are the strategic and policy advisory services offered by IRC relevant to the project needs?

D. Ownership and partnership

- What are the operational relationships between State Environment Protection Agency (SEPA) and Environment protection Bureau (EPB) in the process of project implementation?
- What is the acceptance of the industrial sector about EPB participation in leading the project?
- Project partners and stakeholders, their role in the process of project implementation. Relevance of the partners and stakeholders contribution. How the cooperation within partners is established?
- Recommendations about potential involvement of other stakeholders who could participate in the future development and implementation of the project.

E. Implementation:

After 18 months of project implementation, the evaluation team should assess the project achievements in terms of output, documenting the results if possible with signed or foreseeable contracts, results of feasibility studies, technical and financial assessment reports etc.

Taking into consideration the fact that the implementation of project activities are distributed among UNIDO and IRC under two different budgets both financed by Switzerland, the evaluation team should also assess the efficiency and effectiveness in the utilization of project financial resources

F. Efficiency:

The answers provided to the questions indicated below would allow the evaluation team conclude about the efficiency of the provided services.

- How have the UNIDO inputs been delivered (quantity, quality, timeliness)?
- How have the IRC inputs been delivered (quantity, quality, timeliness)?
- How have the Government (Province) inputs been delivered (quantity, quality, timeliness)?
- How have the inputs been used? Are the people who participated in training/study tours financed by the project still associated with the project? Are the experts' advisory services for EST transfer followed up? Is the equipment used for the purpose for which it was procured?
- ***What is the status of outputs (main activities/milestones completed)? Are the results commensurate to expenditures?***

G. Effectiveness:

- How has the project been managed (frequency and role of the Steering Committee review meetings, cooperation between the Shandong EST Promotion Centre (SESTPC), the Chief Project Coordinator and the Project Director

nominated by Shandong EPB, intensity and role of UNIDO backstopping, assistance received from UNIDO field office)?

- How has the IRC offered the technical and managerial services? Intensity and role of the IRC. Adaptability and applicability of the international experts services to the project needs and technology transfer process to Shandong industrial sector. How they have been applied in the selected industrial sectors?
- Cooperation between the SESTP, the Chief Project Coordinator, the international IRC experts, and the Project Director.
- Are UNIDO technical and managerial services suitable to the project and province needs? Is the role assigned to UNIDO relevant for the achievement of project outputs in the framework of the current project design?.
- Profile of the national experts selected for the project for the project needs and selected sectors. Adaptability and applicability of the local experts services. How they have been applied in the industrial sector?
- Usefulness of having a resident CPC in Jinan.
- Has the organizational set-up been suitable or are any adjustments required?
- Is the project likely to achieve its purpose (immediate objective?) The above implies:
- Is the SESTPC likely to strengthen its technical, managerial, advisory, information and training capabilities in the field of EST and make use of the acquired capacities? How relevant are the services so far offered by the SESTPC?
- Can such advisory, information and training services be at least partly cost recovering?
- Are the involved enterprises likely to pay for the EST services the project could offer and implement the recommended options?
- Has EST-Transfer been realized?

H. Impact:

- What has been/will be the environmental impact resulting from implementation of measures/recommendations offered by the project? Refer to agreements, report etc.
- Is it likely that the capacities developed by the project will influence the provincial policies on EST transfer? What are the possibilities of dissemination to other provinces in China? If so, what type of impact is most likely?
- Which proposed EST has been implemented and how?
- How has the cooperation with other EST service-providers been developed?
- What impact has the project on the enterprises?

I. Sustainability:

- Are the partner organizations likely to continue to exist/operate (maintain their role in the institutional framework) after the project contribution stops?
- If the answer is positive how it is expected the project management to be organized and project activities to be implemented?
- Is there any possibility for further developments after completion of the project (professional and managerial competence, financing, demand)?

J. Lessons Learned:

Based on mission findings, the team should indicate the main lessons learn from the project and recommend actions to be taken for eventual continuation of the project or for other similar EST projects in China.

V. METHOD

The evaluation team will follow the procedures listed below to perform the evaluation process:

- Briefing by the UNIDO Project Manager at UNIDO HQs in Vienna and at IRC premises in Bern/Basel.
- Briefing of the new strategically EST-Design of seco (seco and involved IRC experts) in Bern.
- Studying documentation at UNIDO HQs and IRC premises in Bern/Basel.
- Briefing by seco project officer in Bern.
- Briefing by IRC.
- Briefing by Swiss Embassy and Swiss Chamber in Beijing.
- Briefing by the CPC and by national experts in Jinan.
- Briefing by local partner (Shandong EPB).
- Visits of partner organizations including some of the demonstration enterprises.
- Interviews with staff of partner organizations, potential stakeholders and other staff associated with the project (such as participants at study tours enterprises etc). Mission plan to be prepared.
- Visits of other organizations involved in the project. Visits of potential target beneficiaries (users of services developed by the project, enterprisers, other EST service-providers).
- Consultation with UNIDO Office in Beijing.
- Consultation in Beijing with the waste management project CTA.

The proposal for the evaluation mission plan of visits and interviews will be prepared by CPC and UNIDO Project Manager and submitted to the evaluation team for consideration. The project CPC should assist the team in preparing and coordinating the mission agenda. The project staff should participate only in the meetings/interviews the evaluation team considers would be advisable/necessary.

After completion of interviews and consultations the team will present in draft the preliminary main findings and recommendations at a meeting with the stakeholders in the country. An Ad Hoc Steering Committee Meeting will be organized to allow the evaluation team present its preliminary findings and recommendations to project stakeholders. Any eventual clarification obtained during the SCM could be taken into consideration in the report if considered necessary by the evaluation team.

Although the evaluation mission should feel free to discuss with the authorities concerned all matters relevant to its assignment, it is not authorized to make any commitment on behalf of UNIDO or of the donor.

VI. COMPOSITION OF THE EVALUATION TEAM

The evaluation team will be composed of the following:

- One nominee of the donor (with industrial, environment and EST background), who will act as team leader.
- One nominee of the local Government (with knowledge of the institutional framework and policies).
- One nominee of UNIDO (with background in evaluation methodology).

These members of the evaluation team should not have been directly involved in the designing or implementation of the project.

VII. TIMETABLE

The evaluation team will work in the evaluation process for 38 days during a period of 3 months. The proposed timetable for the evaluation is as follows:

From 21/2/05 to 10/3/05 the Team Leader and the UNIDO nominee will:

- Meet in Vienna with UNIDO substantive officer, recruitment section, finance department and other relevant to the project departments and collect the necessary information for the evaluation process (2 days).
- Visit seco office in Bern for one (1) day for interviews with seco representatives involved in the project.
- Visit to Basel for one day (1) for discussions with Carbotech representatives and IRC partners.

- 13.3.05 Arrival in Beijing
- 14.3.05 Meeting with Swiss Embassy, Swiss Chamber and Swiss HUB
- 15.3.05 Meeting with UNIDO Beijing and the CTA of the Waste Management Project
- 15.3.05 Travel to Jinan
- 16.3.05 Meeting with the Chief Project Coordinator and Shandong EPB.
- 17.3.05 Meeting with SESTPC staff and experts
- 18.3.05 –26.3.05 Meeting with SESTPC partners and visits to SESTPC contacted companies.
- 28.3.05-30.3.05 Elaboration of draft preliminary conclusions
- 31.3.05 Debriefing the CPC and project manager about the conclusions
- 1.4.05 Presentation of draft conclusions to Stakeholders
- 1.4.05 Travel to Beijing
- 2.4.05 Travel to Europe.
- 3.4.05-20.5.05 Preparation of the final report, consultations with the Project Manager and seco (two weeks)

VIII. REPORT

The evaluation report should follow a standard structure. In order to ensure that the report considers the views of the parties concerned and is properly understood and followed up by them it is required that:

- the main conclusions and recommendations are presented to and discussed with the development partners in the field;

- the draft report is presented for comments by the Project Manager and the donor (seco) prior to its finalization.

As the report is the product of an independent team acting in their personal capacities, it is up to that team to make use of the comments made by the parties involved and to reflect them in the final report. However, the evaluation team is responsible for reflecting any factual corrections brought to their attention prior to the finalization of the report.

The final report is to be submitted within eight weeks after the end of the field mission in three hard copies and the full text on a diskette (in Word) to the Office of the Comptroller General.

ANNEX II

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Shandong EST Promotion Center
Project Management Office
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E-mail: ctapmojinan@yahoo.fr
Project No.: US/CPR/02/009

Schedule of the "EST Program Midterm Project Evaluation" in China, Vienna and Switzerland

Working Principle and Preconditions:

All discussions shall be interpreted. The team will draft protocols of all meetings held.

Participants (based on the interviews' list)

Name	Function	Organisation	Contact number	Comments
Dr Kurt Wiesegart	Evaluation Team (ET) Leader	Mandated by SECO	+49.6201590118	
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Xu Debin	**Vice Director**	**Shandong Department of Finance**	**0531-2669809**	
Duan Dongxing	**Section Chief**	**Shandong Department of Finance**	**0531-2669808 13954162889**	
Wu Xiao'ou	**Vice Director**	**EverBright Bank,Jinan Branch,ShunGeng Subbranch**	**13808931016**	
Zhang Jianguo	**Vice Director**	**EverBright Bank,Jinan Branch**		
Wang Jifu	**President**	**Shandong Techonology Stock Exchange Center (STSEC)**	**0531-3196199**	
Zhu Weidong	**Vice President**	**STSEC**	**0531-3196166**	
Zhang Hongxun	**Section Chief**	**Binzhou EPB**	**0543-3275957**	
Wang Hongxing	**General Manager**	**YaGuang Textile Group**	**0543-3512928 13905430302**	
Ding Libing	**Deputy General Manager**	**YaGuang Textile Group**	**0543-3512582 13705434886**	
Zhang Luming	**Section Chief**	**Tai'an EPB**	**0538-8229847**	
Wang Lin	**General Manager**	**Tai'an Asia Food Co.**	**0538-6616669 13583878767**	
Lv Gengxing	**CEO**	**TaiShan Paper Mill**	**0634-6611122**	
Chen Guozhong	**Deputy Manager**	**BaiChuan Paper Mill**	**0538-7866147/148**	
Wang Chenghai	**General Manager**	**RiZhao Liquor Co.**	**0633-8222012 13863339588**	
Lu Libing	**Section Chief**	**RiZhao EPB**	**0633-8779210**	
Huang Jieqing	**Sectorion Chief**	**Qingdao EPB**	**0532-2870509**	
		Construction Bureau		

Wu Zhenhua	**Section Chief**	**ZiBo EPB**	**0533-3187432**	
		Economy and Trade Committee		
Edwin Lüthi	**Director**	**Swiss Business Hub**	**+86.10.65322736**	
		Geohope		

Program

ET: Evaluation Team PMO: Project Management Office CPC: Chief Project Coordinator

Date	Time	Place	Involved Authorities, Parties	Involved Persons	Issues to be discussed			
13.03 Sunday	Noon	Arrival Beijing	Ma Jian	Evaluation team (ET)	None			
14.03 Monday	08h00	Beijing City Hotel	Mr Mao Textile consultantt	ET	Suppport to SESTPC Lessons			
14.03 Monday	10h00	Beijing Swiss Embassy	Swiss Emb.	ET Amb. Martinelli P.Freymond (counselor)	Swiss Embassy support to SESTPC project. Joint potential activities.			
	11h00	Beijing Swiss Embassy	Swiss Cham	ET F.Furrer Director Swiss Cham	Cooperation between both organisations. Mutual added value.			
	14h30	Beijing UNIDO Office	EU-China Envt. Mangt. program	ET Jennifer Colemann Project leader	Possible cooperation between both entities. Lessons learned by the EU program			
	16h00	Beijing UNIDO Office	UNIDO HWM project	ET R.Walder CTA HWM program	Synergies between the two projects. Lessons learned.			
15.03 Tuesday	09h30	Beijing UNIDO Office	Chinese ESTT Center	ET Peng Sizhen Director of the Center	Possible synergy between the two centers. Lessons to be learned in Jinan.			
	11h00	Beijing UNIDO Office	UNIDO ITPO China Office	ET Hu Yuandong Director UNIDO/ITPO	Role of ITPO in the EST project			
	14h00	Beijing UNIDO office	UNIDO Beijing office	ET S.Miranda da Cruz /UR	Role of UNIDO Beijing Office in the EST project			
	19h20	Transfer to Jinan	Ma Jian	ET	None Check-in at Jihua hotel			

16.03 Wednesday	**10h00**	**Jinan**	**Shandong EPB**	**ET Zhang Bo (EPB Vice-director) Peng Zhen Hua (SESTPC Acting director)**	**Opinion, comments and recommenda-tions of the Chinese partner concerning the EST project**			
	12h00	**Lunch**	**Organized by SESTPC**					
	14h00	**Jinan**	**SESTPC PMO**	**ET CPC**	**-Same for CPC-**			
	18h00	**Official welcoming Dinner**	**Organized by SD EPB**					
17.03 Thursday	**09h30**	**Jinan**	**SESTPC PMO**	**ET PMO staff and experts**	**-Same for PMO (timing to be confirmed)**			
	14h00	**Jinan**	**SESTPC PMO**	**ET PMO staff and experts**	**-Same for PMO (timing to be confirmed)**			
18.03 Friday	**09h00** **11h00**	**Jinan** **Jinan**	**Jinan city** **Jinan City**	**ET Depart. of Finances** **Everbright bank**	**Cooperation modalities between the partners and SESTPC**			
	12h30	**lunch**	**Organized by The Bank**					
	15h30	**Jinan**	**Jinan city**	**Shandong Technology Exchange Center**	**Cooperation modalities with SESTPC**			
	18h00	**Dinner**	**Organized by STSEC**					
19/20.03 Saturday/Sun day	**During the day**	**Jinan**	**ET choice**	**Wrap-up with CPC Preparation of draft notes and presentations. Eventual clarifications between the members of the Ev. Team for further actions if needed.**	**PMO staff interviews to complete** **Eventual adjustments for following week** **Internal to ET**			
21.03 Monday	**10h00**	**Binzhou**	**Binzhou EPB**	**ET**	**a) Opinion, comments and recommenda-tions to be made by municipal EPBs (local EST delegates)**			
	12h00	**lunch**	**Organized by Yaguang Co**					
	14h00	**Binzhou**	**Yaguang textile group**	**ET**	**b) Opinion, comments and recommenda-tions to be made by EST companies (clients)**			
	17h00	**Jinan**	**Back to hotel**	**ET**	**None**			

22.03 Tuesday	**10h00**	**Taian**	**Taian EPB**	**ET**	**Same as a)**			
	12h00	**lunch**	**Organized by Taian Asia food**					
	14h00	**Taian**	**Taian Asia Food**	**ET**	**Same as b)**			
	17h00	**Transfer to Laiwu**	**transfer**	**ET**	**None**			
	18h30	**Dinner**	**Organized by Laiwu EPB**					
23.03 Wednesday	**09h30**	**Laiwu**	**Taishan paper mill**	**ET**	**Same as b)**			
	11h30	**lunch**	**Organized by Taishan paper Mill**					
	14h00	**Xinmen**	**Baichuan paper mill**	**ET**	**Same as b)**			
	15h30	**Transfer to Rizhao**	**transfer**	**ET**	**None**			
	18h30	**Dinner**	**Organized by Rizhao EPB**					
24.03 Thursday	**09h00**	**Rizhao**	**Rizhao Liquor company**	**ET**	**Same as a)**			
	11h30	**lunch**	**Organized by Rizhao Liquor**					
	13h30	**Rizhao**	**Rizhao EPB**	**ET**	**Same as b)**			
	17h00	**Transfer to Qingdao**		**ET**	**None**			
25.03 Friday	**All day**	**Qingdao**	**Qingdao EPB**	**ET**	**Same as a)**			
26.03 Saturday/	**14h00**	**Transfer to Jinan**	**transfer**	**ET**	**none**			
27.03 Sunday	**All day**	**Jinan**	**Meeting with CPC**	**ET**	**Intermediate wrap-up with CPC. Adjustment for the following week**			
28.03 Monday	**10h30**	**Jinan**	**Construction Bureau**	**ET**	**Same as a)**			
	14h00	**Jinan**	**Tph interview Edwin Lutthi SwissHub**	**ET**	**Possible cooperation with SESTPC**			
	15H00	**Jinan**	**Meeting with ZiBo EPB**	**ET**				
	16h00	**Jinan**	**Meeting with Economy and Trade Committee**	**ET**				

29.03 Tuesday	**09h00**	**Jinan**	**Meeting with Geohope management**	**ET**				
	14h00	**Jinan**	**Meeting with Mr. Peng**	**ET**				
30.03 Wednesday	**All day** **20h35**	**Jinan** **Arr. In Jinan**	**Draft evaluation conclusions** **Transfer**	**ET** **UNIDO M. Sanchez-Osuna (MSO)**	**Internal to ET** **None**			
31.03 Thursday	**All day**	**Jinan**	**Draft Evaluation Conclusions**	**ET**	**Internal to ET**			
01.04 Friday	**09h00**	**Jinan**	**Sofitel hotel**	**ET UNIDO/CPC**	**Internal coordinating meeting**			
	14h00	**Jinan**	**Shandong EPB**	**UNIDO SESTPC**	**Plenary session**			
02.04 Saturday	**08h00**	**Transfer to**	**Beijing**	**All**	**None**			
03.04 Sunday	**???**	**Transfer to**	**Europe**	**All**	**None**			

ANNEX III

List of Persons, Institutions and Companies met and contacted

In Switzerland and Austria: seco, UNIDO and International Experts		
Seco (State Secretariat for Economic Affairs)	Mr. Hans-Peter Egler	Head, Trade and Clean Technology Co-operation
Seco	Ms. Ariane Sotoudeh	Programme Manager Trade and Clean Technology Cooperation
Seco	Ms. Lorence Ansermet	Programme Manager Trade and Clean Technology Cooperation
UNIDO	Ms. Mayra Sanchez Osuna	Project Manager
	Mr. Ned Clarence Smith	Industrial Development Officer
	Mr. Adrie De Groot	Director Funds Mobilization Dept.
	Mr. Christoph Yvetot	Ind. Development Officer Funds Mobilization Dept.
	Mr. Klaus Billand	Dep. Director Asia Bureau Desk Officer for China
Carbotech (environmental projects/ consulting/ analysis)	Mr. Daniel Wunderlin	Environmental scientist Coordinator of IRC (International Reference Centre)
Chemgineering AG	Mr. Siegbert Weber	Projektleiter Verfahrenstechnik
Grütter Consulting	Mr. Dr. Jürg M. Grütter	General Manager
Gherzi Textiles Consulting	Mr. Giuseppe Gherzi	General Manager (Phone Interview)
Brugger and Partner AG Consulting	Mr. Prof. Ernst A. Brugger	Managing Director (Phone interview)
UNIPEC	Mr. Jianhe Mao	Managing Director International Textile Expert
COUNTERPARTS		
Embassy of Switzerland	Mr. Dante Martinelli	Ambassador
	Mr. Alain Guidetti	Minister Deputy Head of Mission
	Mr. Patrick Freymond	Counsellor for Environment, Science and Technology

E.P.B. Binzhou	Mr.Sun Shou Ming	Chief of Planning and Finance Section. EST Delegate
	Mr. Zhang Hongxun	Senior Engineer Planning & Finance Section
E.P.B. Taian	Mr. Zhang Zhuajin	Vice Director
	Mr. Zhang Luming	Chief of Monitoring Section EST Delegate
E.P.B. Laiwu	Mr. Liu Zuoli	Director and EST Delegate
	Mr.Yang Rongqwan	Chief of Section Environment and Management
E.P.B. Rizhao	Mr. Liu Yuhai	Director
	Mr. Yan Jinliang	Deputy Director
	Mr. Fan Cheng Wei	Section Chief Environment Dept.
E.P.B. Qingdao	Mr. Guo Yong Xing	Head of International Dept.
	Mr. Shi Lei	Section Chief for International Affairs
	Mr. Wu Jun Sheng	Chief Division Policy and Law Dept.
E.P.B. Zibo	Mr. Du Wenjiang	Engineer, member of the Environment Protection Fund Department
INSTITUTIONS, ASSOCIATIONS and COMPANIES		
Swisscham.Org	Mr. Fabian Furrer	**Executive Director**
UNIPEC GmbH	Mr. Jianhe Mao	Managing Director
EU-China Environmental Management Cooperation Programme (EMCP)	Ms. Jennifer Coleman	Team Leader Industry Development
OSEC (Office Suisse d´Expansion Commerciale) Swiss Hub. Governmental Agency	Mr. Erwin Lüthi	Director (Phone interview)
China Everbright Bank	Mr. Cui Qiang	General Manager Business Department
	Ms. He Wei	Vice General Manager International Business Department
	Ms. Wu Xiaoao	Branch Vice Director
Geohope Group	Ms.Sun Hong	Chairperson General Manager
SEMC (Shandong Energy Conservation Engineering, Co. Ltd.)	Ms. Wang Yanling	Vice Director Comprehensive Management Dept.

Shandong Technology Stock Exchange Center (STSEC)	Mr. Wang Ji Fu	President
	Mr. Zhu Wei Dong	Vice President
	Mr. Kevin Yu	General Manager
	Mr. Huang Yanfeng	Project Manager
Shandong Provincial Finance Bureau	Mr. Xu Debin	Deputy Director Department Debt & Finance Management Division
	Mr. Duan Dongxing	Section Chief Department Debt & Finance Management Division
Shandong Provincial Construction Bureau	Mr. Zhang Yuzhao	Section Chief Comprehensive Finance Division
Department of Foreign Trade & Economic Cooperation of Shandong Provincial Government	Mr. Hongyu Hui	Representative for German Speaking Countries in Europe
CESTT (Centre for Environmentally Sound Technology Transfer)	Mr. Dr. Peng Sizhen	Director of the Centre
UNIDO Project Municipal Solid Waste	Mr. Rudolf Walder	CTA of the project
YAGUANG TEXTILE Group (Lotex Industries)	Mr. Hongxing Wang	General Manager
	Mr. Liming Ding	Vice General Manager
TAIAN TAISHAN ASIAFOOD Co. Ltd	Mr. Wang Lin	General Manager
Shandong Taishan Paper Co. Ltd.	Mr. Zhao Guangxi	Chief Engineer
	Mr. Diao Tingke	Chief Environment Protection Division
Baichuan Paper Co.	Mr. Chen Guozhi	Vice Chairman
	Mr. Zhan Dao Yong	Deputy General Manager, Senior Engineer
	Mr. Chen Ren Hai	Assistant General Manager
Shandong Rizhao Yao Wang Liquor Group	Mr. Wang Chen Hai	Director
Shandong Rizhao Yao Wang Liquor Group	Mr. Dong Shu Hui	Engineer Power Generation Sector
	Mrs. Zhang Yian	Head Administration Dept.

NATIONAL EXPERTS of SESTPC		
Ms. Lin Chun Lan	**Food Expert**	EST Promotion Center
Ms. Yan Yan	**Textile Expert**	EST Promotion Center
Ms. Jane J. Xie	**Chemical Expert**	EST Promotion Center
Mr. Prof. Ma Chynyuan	**Energy Expert (part time)**	EST Promotion Center
Mr. Wang Ziyuan	**Pulp & Paper expert (part time)**	EST Promotion Center
Mr. Liu Xiang Yu	**Financial Expert**	EST Promotion Center
Staff of the Project and of the Shandong EST Promotion Center (SESTPC) and of the UNIDO Beijing Office		
Mr. Sergio Miranda da Cruz	UNIDO Representative	
Mr. Ma Jian	National Programme Coordinator	UNIDO OFFICE
Mr. Ralf Bredel	International Programme Officer	UNIDO OFFICE
Ms. Zhang Yujuan	National Consultant	UNIDO OFFICE
Mr. Serge De Klebnikoff	Chief Project Coordinator	EST Promotion Center
Ms. Yang Lei	IT Manager	EST Promotion Center
Ms. Zhu Youlian	Administrative Assistant	EST Promotion Center
Mr. Shang Qing	Interpreter	EST Promotion Center
Ms. Zhang Chen	Translator	EST Promotion Center
Mr. Tian Li	Driver	EST Promotion Center
Mr. Dr. Zhang Bo	Vice Director General	Environmental Protection Bureau of Shandong Province
Mr. Peng Zhenhua	Acting Director	SESTPC
Mr. Ji Ming	Vice Acting Director	SESTPC
Ms. Hua Fang	Vice Acting Director, Senior Engineer, Section Chief EPB	SESTPC
Mr. Wang Wei	Vice Acting Director, Chief Director of Goodlink	SESTPC

ANNEX IV

CPC Comments concerning possible adjustments to the present EST project

06 May 2005
Serge de Klebnikoff

While several EST partners are in the process of initiating necessary adjustments to the EST program, it seems to me useful to offer a first contribution to this important debate.

Having carefully read and agreed with the evaluation draft findings, I would invite all EST partners to consider the following summarized points as having an important impact on any future decision:

a) **Points which can hardly be changed:**

- **Shandong EPB is a partner of the EST program.** ***It may not remain the only one, but it cannot be excluded because of contractual and political reasons..***
- **SESTPC is now a reality and has a growing reputation in Shandong province.** ***Its image needs to be reinforced by a new relevant program and measurable business successes.***
- **The five sectors initially selected by Shandong EPB DG cannot be ignored** ***now that all the SESTPC marketing and work program has been structured on that base. However respective sectoral activities will have to be revised based on a new adjusted work plan (for example, provide technical EST datas for all five sectors, but focus technical support on only two selected sectors)***
- **The municipal EPB/EST provincial network is almost in place.** ***It has to be reinforced based on attractive challenges for its members.***
- **The network of international and national corporate sponsors is growing.** ***It will be crucial for the sustainability of SESTPC and cannot be offered a weak program to support.***
- **The network of international partners (IGOs as well as NGOs), primarily based in Beijing and Shanghai, is to be developed and used** ***in the best possible way to allow the EST program to benefit from their experience or support.***

b) **Points that may be changed:**

- **New SESTPC partners (as listed in the Evaluation document) need to be invited to strengthen the EST program.** ***They should be contracted directly by UNIDO and not by SESTPC.***
- **PMO staff and experts status will have to be revised:** ***While the PMO junior staff deserves confirmation (if not enhancement) of its status, senior staff and experts status will have to be reconsidered based on new tasks. PMO structure will probably change after receiving new guidance.***

- **Shandong EPB may be invited to create a real structured CP center for the province** ***which would then be recognized as the command and control center of all CP activities. UNIDO may help organizing such a center which will then be in a position to identifying and managing possible EST transfers out of good professional CP audits.***
- **SESTPC has to better meet Chinese companies demand** ***by integrating in its services more training about EST advantages, by offering more information about best available ESTs, by selectively helping best candidates to achieve EST/TT.***
- **IRC contribution to the EST project will have to be optimized, based on the demand expressed by local companies.** ***This may imply to extend or revise the choice of present IRC partners in order to allow more flexibility to match that demand.***
- **UNIDO HQ procedures may have to accept further adjustments to meet local working conditions.** ***While important support has already been provided by allocating an imprest account, authorizing global MODs or repeatedly accepting to justify/endorse exceptional local initiatives, the project still needs more flexibility to be run efficiently.***

c) <u>Points that have to changed</u> :

- **Individual contracts with PMO members have to be in line with UNIDO rules as well as local employment legislation.** ***No extra deduction of salary should be allowed and effective payments are to be requested. If not, we may have to come back to RL contracts.***
- **SESTPC financial reporting schemes need to be clarify.** ***It will be difficult to remain with the present situation where expenses are left to the project budget while incomes are allocated to the local partner.***
- **Available financial mechanisms supporting EST transfers are to be developed urgently,** ***as repeatedly mentioned from the very beginning of the project. If not, the EST program would have to revise its objectives.***
- **Active support on POPs, CDM and SA 8000 need to be organized** ***in order for the EST program to benefit from other existing programs and develop promising synergies. If not, these points are to be withdrawn from the ProDoc.***

This memo is not addressing other important issues like project institutional setting, UNIDO and IRC respective contributions and responsibilities or CPC personal status. However, answers to these issues will clearly derive from the strategic and working options decided by the EST program owners.

ANNEX V

COMMENTS OF IRC TO THE DRAFT FINAL EVALUATION REPORT

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Sotoudeh Effingerstrasse 1
3003 Bern
Basel, **May 3, 2005**

Comments on the Draft Evaluation Report

Dear All

I very much appreciate the big work done by the evaluation team. The report assesses many aspects of the implementation phase of the EST Project in China and gives some valuable recommendations for a future phase.

Considering that an evaluation report is the external view of a situation I will not make any suggestions for modifications of the current draft. Whatever, it does not mean that I share neither all the opinions about the project nor I agree with all the conclusions and recommendations of the evaluation team (e.g. "The demand driven approach…encouraged by IRC…": This approach is fixed through the ProDoc. As for the IRC, we never encouraged nor prevented this path. However, the question must be solved on the level of seco, because it can be delicate for the donor when favouring single technologies or even promoting single supply companies).

When the evaluation report is definite I would like to make detailed comments about the findings and recommendations of the report. The current draft which is not formally edited yet is not a basis to discuss different contents or even a new project approach. However, I would like to make some general comments about the report in order to give my inputs for further discussions towards a new project approach:

. • Due to the lacking list of contents it is difficult to get an overview about the structure of the report. Generally, I would appreciate if the finalized report contained a list of contents as well as a list of abbreviations (e.g. CPC = cleaner production centre as well as

chief project coordinator).

. • Unfortunately, the report is very long. The extensive general parts as well as the confusing report structure (e.g. place of chapter 2.6 or title levels of chapter 5) make it difficult to understand and to judge the importance of the different conclusions and recommendations.

. • The differences between chapter 4 and 5 are difficult to understand because analyses in chapter 4 are mixed with findings and recommendations. Furthermore, there is no structure within the recommendations according to importance. I would appreciate if the evaluation team could insert an understandable hierarchy of the recommendations in order to show the relevance of the mentioned points.

IRC is aware that the evaluation team had very little time to process (and digest!) all data collected during the tiring missions and to write the current draft report. IRC is convinced that the edited version will be more comprehensible.

The concept of the EST-Project is based on multilateral partners who signed also the initial project document. In this respect a project evaluation must integrate all involved partners. In the current version of the evaluation report most of the organisational findings are concerning IRC. In contrast to this, the evaluation of the role and the performance of UNIDO as a signing partner cannot be found (e.g. lacking steering committee meetings due to UNIDO data conflicts). This evaluation gap could lead to rather wrong decisions about the future of the project (e.g. If UNIDO takes over more operational tasks in future it will not be compatible that during a 7 weeks absence of the project manager no authorized deputy is available). Furthermore, the findings and analysis (strong and weak points) about the Chief Project Coordinator as the key player in the game are not appropriate according to his important role. Thus, also recommendations how to design this key role in future are lacking.

Generally, concepts can be built top down or bottom up. It is not clear on which of these approaches the recommendations of the evaluation team are based. Whereas the first-mentioned defines objectives, followed by the methodology and then the most appropriate partners, the bot-tom-up method starts with existing partners and defines the objectives and approaches according to the competences of the stakeholders. If the new project concept is based on the current stakeholders, the strong and weak points of the stakeholders should be described. If the project is top down, the stakeholders might be interchangeable.

I take the liberty to send the valid IRC project budget to the evaluation team (see draft report chapter 2.6), because the described budget is an outdated version. In order to compare budgets and financial figures it would be advisable to always calculate with the same currency and express the spent money as a percentage of the whole budget amount of the different stakeholders.

All mentioned points are not considered to be criticism of the evaluation. It is intended to give some inputs for the final report and we had never the intention to influence the external picture of the evaluation team.

According to the current draft I interpret that the evaluation team proposes to elaborate a new project document. In order to enforce a new project document many negotiations between the

signing partners will take place. This process will be time consuming. Successful elements reached so far could be lost during this transition time. Therefore, it should be discussed if a well defined business plan for reduced sectoral activities could be a solution in order to save time and keep good running elements alive.

I am looking very much forward to a joint meeting with all the involved partners in order to define the general framework of a new project approach.

With very best regards

Daniel Wunderlin, Carbotech AG

Attachment mentioned above

ANNEX VI

EXCHANGE OF CORRESPONDENCE BETWEEN EVALUATION TEAM AND IRC ON ITS OBSERVATIONS TO DRAFT EVALUATION REPORT

Vienna 6 May 2005. 1:38 PM

Dear Mr. Wunderlin,

First of all, thanks for your prompt reply and your words of appreciation for our work.

We are not displeased with your observations to our report. At the contrary, it shows that our work has been red in detail and this can only please an evaluator. Of course, sometime it is not possible to share the same view.

The report follows a well-established structure, suggested by the donor countries dealing with international technical assistance.

Allows me please, once more, to underline the explanations we gave yesterday to your remark that "....differences between chapter 4 and 5 are difficult to understand because analyses in chapter 4 are mixed with findings and recommendations", once more please note that:

Chapter 4 of the report analizes:
1) the concept and the relevance of the project in the present circumstance.
2) how the project is managed in relation to the financing and counterparts.
3) the status of achievement of every single product.
4) the efficiency in implementing the activities.
5) the effectiveness of the project
6) the impact of the activities, their possibilities of sustainability and the indicators of success.

These are the main and most important principles to evaluate the achievements of a project, while:

Chapter 5 looks at the achievements of the project under a different angle, analyzing the findings related to the assumptions of the programme document, the objectives, the institutional set up, the counterparts, the administrative, technical and financial issues related to the transfer of technology.
On the basis of the conclusions on these findings the related recommendations are proposed.

If for you the report is "unreadable" (I do not understand what you mean, because in English it means incomprehensible),I hope the table of contents, which you will find in the final version, will help you.

As we pointed out, we are an independent consulting team and we put forward the recommendations in our own personal capacity. It is up to the donor and the implementing parties whether to follow them.

I trust we have explained the basis for each recommendation made. Each recommendation is linked to a conclusion that explains the background and the reason for the recommendation.
This is done following a scientific methodological approach.

It is human and understandable that the addressed party is not so keen on accepting criticisms to its work (the opposite would not be normal!). We have done our work in a methodological way and, as already said several times, we have simply an impartial and independent advisory function.
This is the reason why, to assure to the maximum possible extent objectiveness, evaluators cannot have been involved previously in the design, appraisal or implementation of the programme they have the task to evaluate.

Finally, as we wrote at page 20 of the draft, the evaluation team did not receive until now (from you or from seco) any paper reporting the modification of the budget reported in the table at the same page. For this reason we stated that we assumed the budget was subsequently reduced as indicated in the official signed project document, reported at page 16.

If you can provide this document by today, I will try to include it in the report, which is ready for printing.

I trust the matter is now clarified and I am personally very happy to have had the opportunity to know you and appreciated your sincere and open cooperation given, in answering to our questions during all our meetings.

Thanks again and I am at your disposal for any further information you can need.

Yours sincerely

Mario Marchich

Thu 5/5/2005 9:57 PM

Dear Mr. Wiesegart, dear Mr. Marchich

Thank you for the quick answer, and I would like to reaffirm that I am still impressed about your profound report and particularly about the intensity and quality of our cooperation when you were here in Basel and when we met in China.

I understand that my critique displeased you; however, even if I am aware that you followed the usual UNIDO structure I still must insist that the current version is, to me, rather unreadable.

As for your recommendations I wrote that I disagree with only a few of them,and I particularly agree with you that the donor has to set the priorities among your recommendations.
Best regards

Daniel Wunderlin

Am 5.5.2005 17:07 Uhr schrieb "Wiesegart - Pacific Consult" unter wiesegart@pacific-consult.com>:

Dear Lorence,

Mario and I discussed the comments of Mr. Wunderlin. We would like to comment as below.

Let's start with the budget.
In the report at page 20, second paragraph after the table we wrote that the Evaluation Team did not receive any modifications to the budget indicated in the Tor, but we assumed that it had been modified, because different from the one indicated in the Prodoc. We met in Basel, Bern, Zurich and Jinan and in now two months time, never we got this revision. What we wrote at page 20, is the budget in US$ reported in the ToR (given in Basel by Mr. Wunderlin) of the IRC.

We put all the figures in US$ and only the expenditures (received from IRC) were indicated in Swiss francs since were reported by the IRC in this currency. See financial status of Accounts of IRC.
It is not up to the ET to convert these figures in US $. This is a further demonstration that the structure of the project was not coherent!

Second para page1:
Mr. Wunderlin says that he does not want to make any suggestions for
modifications, but than he says he does not share the ET opinions or he does not agree with our conclusions and recommendations. Well, he is free to have a different opinion, but then why he did not submit (as we requested) officially to the ET, within 2 or 3 weeks after our presentation at Jinan his comments?
The demand driven approach was indicated in the Prodoc, but if it was not producing positive results, why the IRC continued to follow it and sent experts not qualified to assist in the needs required by the project?
The comments of Mr. Wunderlin imply, in our opinion, his doubts regarding the approach, and that he thinks seco should solve the problem in case there is the impression the donor is promoting single supply companies.
Why then, he did not take this point to the attention of seco before?
Third paragraph, first page: We consider the Report presented last week in Bern as the final one. It enlarges and explains more in detail what has been already discussed during the long final presentation in Jinan. What more than this Report to have a basis for discussion? Why the comments were not given before?
It is anyhow considered to add the content of table and a list with the abbreviations.

Second page first paragraph, two bullets:
It is not clear what Mr. Wunderlin wants to say. Why confused report structure? It is the agreed structure at international level for the evaluation of technical assistance projects.
Furthermore: We consider all recommendations are important. It is not up to us to say what is more important or what has to be implemented first.

We consider Chapters 4 and 5 are clearly structured:

Chapter 4 of the report analyzes:
1) concept and relevance of the project in the present circumstance.
2) how the project is managed in relation to the financing and counterparts.
3) the status of achievement of every single product.
4) the efficiency in implementing the activities.
5) the effectiveness of the project
6) impact of the activities, their possibilities of sustainability and indicators of success.

Chapter 5 looks at the achievements of project under a different angle, analyzing:
- the findings related to the assumptions of the prodoc,
- objectives, institutional set up, counterparts, administrative technical and financial issues related to the transfer of technology.

On the basis of the conclusions on these findings the related recommendations are proposed.

Second page third paragraph:
the role of Unido was different from the one of the IRC.
Unido employs the CPC. The report has also analyzed the performance of the national experts, of the CPC and of the national counterpart.
The fact that the Steering Committee met only once is to be addressed to all the parties.
Of course we scrutinized deeply the activities of the IRC because from its international experts was depending the implementation of the transfer of EST.
We wonder why the findings regarding the CPC should not be appropriate? The CPC is under the command line of Unido. Mr.Wunderlin himself admitted, during our meeting with him, that the CPC had not the technical capacities required for his role and criticized the way the missions of the international experts were prepared.
We add the following in the report, based on the first comments received from Wunderlin in his e-mail dated 19 April 2005 at 18,10.
"It has to be mentioned that also the coordinator of the IRC was not always very happy with the services of the Swiss companies. However, it seems that some international experts were selected on the basis of the Chinese demands, which later turned out to be wrong. Whether this has to be attributed to the companies or to the national experts of the Centre, the Evaluation Team had no time or possibility to verify it.
In several cases the IRC companies were not able to find out what were the real demands of the Centre. An important reason was the project planning process. To carry out an EST programme involving national and international experts, the programme of the visits must be fixed and committed by all partners well in advance.
This planning is part of the job of the Chief ProjectCoordinator(CPC) in cooperation with his team. It is the opinion of the coordinator of the IRC that this was not properly done and, therefore, also the support of the IRC failed in the technical inputs and feasibility checks. According to the IRC, strict project planning would have led to better and appropriate services."

The following is also what Mr. Wunderlin wrote after the presentation of our findings in Jinan: "Wir haben Ihren Draft in unserem Teamintensiv diskutiert. Zu Ihren Vorschlägen und für die Neuaufgleisung lässt sich viel sagen. Nach einigen Versionen

einer Replik bin ich aber endgültig zum Schluss gekommen, dass diese Kommentare nicht Teil des Evaluationsberichts sein müssen. Vielmehr müssen diese Ideen eingebracht werden, wenn seco entschieden hat, welches die overall objectives sind, mit welchem approach und Wer diese Projekt umsetzen soll (mit oder ohne Carbotech)"

Second page, para 4:
It is not up to the ET to give a new programme concept, but just to outline the obstacles and the advantages of the project set up, which we are evaluating.

Second page, para 5 :
Regarding the budget, please refer to our comments above regarding the currency, I explain above why we reported the expenditures in CHF.

Reference last paragraph, we suggest to elaborate a new set up for the project. We cannot understand what Mr. Wunderlin is meaning that it would be time consuming! Better to continue with a wrong approach, which did not bring any positive results? Not a single transfer of technology was done or even initiated! Which are the successful elements that could be lost?

Finally, and as already said several times, we are an independent team with an independent consulting function and we provide our independent consulting advise, which the parties are not obliged to follow if not in agreement.

Kurt Wiesegart, Mario Marchich

Sent: **Dienstag, 3. Mai 2005 13:44**
From: Lorence.Ansermet@seco.admin.ch
To: wiesegart@pacific-consult.com
Cc: M.Marchich@unido.org; msanchez-osuna@unido.org;
Hans-Peter.Egler@seco.admin.ch; Ariane.Sotoudeh@seco.admin.ch;
d.wunderlin@carbotech.ch
Subject: TR: Comments on the draft evaluation report

Dear Mr. Wiesegart,
I thank you very much for this meeting last week.
In order to finalize the evaluation report, I am sending you the comments of Mr. Daniel Wunderlin (based on the full report) as well as the valid IRC-budget.
The latter should be integrated in the final report.
I hope this will help and remain at your disposal for any further
Information with my best regards

Lorence