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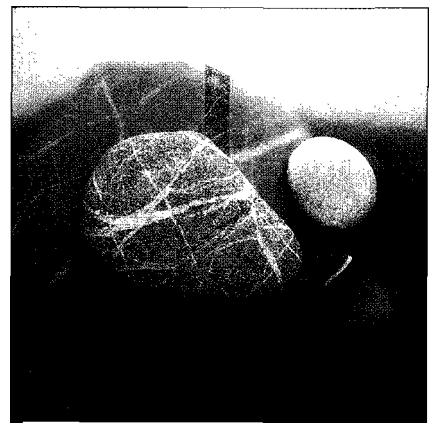

CSD

Raum und Umwelt
Geologie und Geotechnik
Ingenieurwesen
Abfall und Altlasten
Verfahrenstechnik

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION (UNIDO)

SUPPORT OF THE VIETNAM NATIONAL CLEANER PRODUCTION CENTRE

Final report December 2009

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22 January 2010

CONTENT

ANNEX

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SUMMARY

According to the Terms of Reference (TOR) and the contract 16001745, CSD Ingenieure und Geologen AG on behalf of UNIDO carried out the following activities in the contract period (January 2009 - December 2009).

- From 29 June until 3 July 2009 a 5-days training was conducted by Mr. Urs-Thomas Gerber (CSD) and Mr. Jürg Walder (CSD) at the VNCPC on Lean Management of processes. The training was attended by 16 participants mainly consultants and representatives of companies. For consolidation a practical exercise in a company was carried out.
- Long An Textile Joint Stock Company in Long An, Vietnam was audited from 6 July until 10 July 2009 by Mr. Jürg Walder and the textile expert Mr. Jürgen Ströhle (Benninger Ltd., Uzwil). One goal was the re-engineering of the existing processes and technology in the dyehouse and waste water treatment and to elaborate a proposal for their improvement on behalf of the company. A second objective was the training of consultants of the Vietnam Cleaner Production Centre (VNCPC). Therefore the re-engineering was closely accompanied by selected consultants. Moreover with the re-engineering of the processes and technology the possibility for an investment under the Green Credit Trust Fund was evaluated.
- In order to discuss future support activities on behalf of seco, UNIDO and the VNCPC as well as the status of the Swiss green credit trust fund (GCTF) the Swiss cooperation office at the Swiss embassy in Hanoi was visited on 30 June 2009 and 23 November 2009.
- With regard to new project opportunities for the VNCPC on Cleaner Production in the silk and hotel sectors representatives of VIETCRAFT, Hanoi and Passage to Vietnam, Ho Chi Minh City were met for discussions on 1 July and 10 July 2009 respectively.
- The first successful company with Swiss green credit trust funding was audited together with the VNCPC in Ho Chi Minh City on 9 July 2009. CSD accompanied the ex-post measurement of the new machines and confirms its proper realization.
- From 23 November until 25 November 2009 a training was conducted by Mr. Jürg Walder (CSD) and Mr. Michael Hartschen (Brainconnection GmbH) on technology management. The training was attended by 18 participants. These were mainly consultants and representatives of companies.
- Together with the VNCPC Mr. Jürg Walder discussed further support activities and future project opportunities in a coordination/planning meeting on 26 November 2009.

1. MISSION ACTIVITIES AND RESULTS

1.1 Training on Lean Production at VNCPC, Hanoi

CSD has conducted a 5-days training on Lean Production at the VNCPC in Hanoi from 29 June until 3 July 2009. The training was attended by 16 participants mainly consultants and representatives of companies. The lecturer Mr. Urs-Thomas Gerber was supported by Mr. Jürg Walder especially during the practical exercises and the Kaizen introduction.

The training had following objectives. All of them could be achieved:

- Capacity building in value stream design
- Getting familiar with practical lean management tools
- Structuring and time management of production processes
- Broadened knowledge on plant utilization and logistics
- Close a gap in the CP-methodology

Background

In the past years CSD has experienced that the cleaner production assessment method is mainly a static analysis and does not address specifically productivity forecasts for varying process parameters or time lapses. Moreover there is no special focus on plant utilisation/design and logistics chain to optimize time and throughput. From the perspective of re-engineering and the minimization of investment cost of new machinery these aspects have to be considered as well. Furthermore inefficient production processes generate often big intermediate inventories (stocks) that may result in solid waste (expired intermediates) and unnecessary capital cost.

In the future consultants involved in cleaner production activities will have to support customers regarding structuring of production processes, dimensioning of equipment and control of production systems. For that easy to use and established tools will have to be applied.

CSD has therefore elaborated and structured a training program and organized the course together with the VNCPC.

Training content

To reach the aforementioned goals the training had following components:

- Introduction into the topic
- Cleaner Production vs. Lean Production
- Kaizen philosophy, Toyota production system (TPS): basis for continuous improvement
- Value stream design/mapping: tool for the design of as-is and target status of production processes
- Poka Yoke: methodology and tools for the identification, assessment and avoidance of errors
- Kanban: methodology and tool for reduction of stocks and lead time of products (pull production)
- Single-minute exchange of die (SMED): methodology for reducing the set-up time of machines
- 5S: methodology for workplace order and cleanliness
- Lean Production Case Study in Austrian Company

Several exercises for value stream design, Poka Yoke and Kanban were carried out to demonstrate the methods and effects.

In addition a short company audit was carried out at Hai Duong Porcelain Company (HAPOCO) to collect information for a 5S-exercise. Eventually the participants were required to present their results to the audience.

All presented material was translated into English and Vietnamese, printed as handouts and given to the participants in hardcopy and electronic version. In addition useful excel tools for calculation and presentation were handed over. The VNCPC has all material and can use it for their own purposes (train-the-trainer, application in companies).

The training was a success. The participants understood the way how the tools can be applied in their daily work and will offer the new service to their customers.

For more details about the training please refer to interim report July 2009.

1.2 Re-engineering Long An Textile Joint Stock Company, Nhi Thanh, Long An

Long An textile JSC was audited from 7 July until 10 July 2009 together with the textile expert Mr. Jürgen Ströhle (Benninger Ltd., Uzwil). The main purpose of this audit was the assessment of the existing dyehouse processes and technology as well as waste water treatment and to elaborate a proposal for their improvement on behalf of the company. Moreover with the re-engineering of the processes and technology the possibility for an investment under the Green Credit Trust Fund was evaluated. A second objective of the initiative was the training of consultants of the Vietnam Cleaner Production Centre (VNCPC). Therefore the re-engineering was closely accompanied by selected consultants.

Long An textile JSC was founded in 1977 and produces different types of textiles made of polyester and viscose like shawls, T-Shirts, Polos etc. The company would like to extend its current capacity of 1.1 million meters/month fabric and also include production of cotton. At present the products are sold on the national market and exported to the Middle East and India.

The state owned Long An textile JSC was one of the biggest companies of its kind in Vietnam before it went bankrupt in the early 2000. In 2007 the company was privatized and started production again in weaving with 250 employees. The company disposes of two locations in Nhi Thanh commune, one for weaving the other for textile wet processing. Long An textile JSC would like to restart again the dyehouse processes with improved technology and waste water treatment by the end of 2009. That way the outsourced dyeing activities will be carried out completely in-house.

The textile wet processing consists of all relevant steps like desizing, drying, washing, jet and jigger dyeing, printing. Nevertheless, most of the equipment is outdated or broken and can not be reused again. Furthermore all wastewater from the dyehouse was collected and discharged directly via two small ponds to the river nearby. No proper treatment took place.

During the company assessment it became obvious that most of the wet processes are obsolete. Some of the equipment even do not fit with the fabrics to be produced in the future. There are three boiler systems that produce steam for the dyehouse. The boilers were adjusted and only run on renewable husk and, if needed, coal.

During the re-engineering the textile expert examined all relevant processes and compiled production data. The products were analysed as well. Due to energy cost Long An would like to renovate and where needed substitute wet processing equipment that are used for PES and viscose. For that reason all upstream processes were analysed and the possible adjustment verified. At present there is no recirculation system for hot water and steam condensate installed.

The relevant plans, national waste water threshold value and possible contamination of waste water were investigated by CSD. Since the dyehouse is not operating at present and reliable analytical data of the former effluent is not available the separate re-engineering report of the textile expert will serve as data base for the layout of a new waste water treatment plant. It turned out that Long An textile JSC already asked for a waste water treatment plant tender at an Italian supplier. CSD pointed out that it is essential to plan the treatment system according to the findings of the textile expert and the new layout of the dyehouse respectively. It seems that the elevated temperature of the waste water and the location (sandy ground, frequent floodings) were not considered so far for the construction of a new treatment plant. All expert input is therefore greatly appreciated by Long An textile JSC management.

Regarding environmental impact the energy loss of the equipment and the respective generation of greenhouse gases seem to be most relevant besides the contamination of surface water.

All analysis and results of the re-engineering activities at Long An textile JSC were summarized in a separate report on behalf of the company and UNIDO.

CSD and VNCPC also carried out a survey at Long An on the obligatory screening criteria for GCTF applicants.

For more details about the re-engineering please refer to interim report July 2009.

1.3 Meeting at Swiss embassy, seco cooperation office, Hanoi

Representatives:

30 June 2009: Mr. Stephan Lauper (interim director), Ms. Nguyen Giang

23 November 2009: Ms. Brigitte Bruhin, Ms. Nguyen Giang

Reference centre:

Mr. Jürg Walder

Two meetings were held on the green credit trust fund (GCTF) and its improvement. In one year of operation only two projects could be realized in Vietnam although the target was set at 10 and marketing efforts were undertaken by the VNCPC. For this situation different causes are relevant:

- High interest rates for bank loans hindered companies to invest in new technology
- Inappropriate marketing campaign could not reach potential customers
- Long lasting application procedure discouraged companies to participate in the GCTF
- Added value for local banks not obvious, therefore low promotion of the GCTF by banks

Seco informed that interest rates for bank loans decreased in the last weeks and reached a rate of 8-9%. In addition the state subsidises industrial (environmental) credits by 4%. Interest rates will therefore not be the main reason for companies' reluctance on GCTF finance in the future.

The existing procedure for VNCPC payment is questionable. At present the selected company pays VNCPC for the full assessment only if the predicted impact reduction occurs. If the ex-post measurement reveals no or less reduction the VNCPC has to cover the cost for its services. There is obviously a conflict of interest.

According to the cooperation office marketing for GCTF has to be improved and increased. Important is a 3-pilars approach: promotion via involved banks, via business and industrial associations and through ongoing CP-assessments of the VNCPC. If the VNCPC can not realize the PR efforts with its existing staff it is recommended to hire a marketing person.

Since the GCTF was introduced to help the private sector to access finance it should be focused on private SME only. The GCTF-guidelines do not specifically exclude state owned companies. This has to be considered for the adjustment of the guidelines in the future.

According to the cooperation office a loan for a company is normally approved within 7 days in Vietnam. In comparison the duration for GCTF grant approval is 60 days and therefore much too long. The procedure has to be simplified.

The list of core indicators relevant for GCTF-funding shall be adjusted since the existing selection does not reflect all important industry sectors in Vietnam. CSD will inform seco Switzerland about this and a possible adjustment.

Nam Hung Company (bricks manufacturer) applied for GCTF support in 2008 for the construction of 6 new kilns. Irregularities in the assignment of funds occurred raising the donor's suspicion. Thus, the installation of the kiln has to be witnessed by the VNCPC right after installation in January 2010. At that time the ex-post measurement has also to be carried out.

According to the VNCPC Tan Phu plastics processing company has not yet received the reimbursement for the new installations. Seco is kindly asked again to clarify the situation with Techcombank and RBC.

Further topics:

- CSD was asked about a short review of activities and an opinion on the Hai Duong Porcelain Company in Hai Duong City. The company was visited by the Swiss Secretary of State, Mr. Gerber with a business delegation on 7 July 2009. The delegation got a good impression of the CP support to this enterprise. All relevant information was provided to seco by CSD.
- Seco cooperation office was informed about further project possibilities with the VNCPC in Vietnam. Among these are the following:
    - CP in silk production and silk processing
    - CP in tourism (hotel management)

1.4 CP in silk production

In a meeting with VIETCRAFT on 1 July 2009 in Hanoi, an organisation that promotes handicraft businesses in Vietnam, the CP-initiative for the silk sector was discussed. CSD handed in a project proposal at Syngenta foundation that involves VNCPC, VIETCRAFT and CSD and consist of three main components:

- Improvement of silk supply chain: mulberry cultivation and silkworm rearing
- CP in silk processing
- Marketing and sales promotion of silk products

In the past small-scale silk production in rural Vietnam was analysed by the VNCPC and FHNW[1] revealing many environmental problems including water contamination and water use. Furthermore the quality of the silk products is rather low due to inappropriate processing of the intermediates and leads to low competitiveness of the businesses on the world market. Based on this it was decided in the year 2007 to consult silk processing as a new market field. The Swiss foundation of Syngenta company showed interest in supporting the activities, however, insisted on having the agricultural supply chain included. This entailed the present project design.

It is foreseen to involve VIETCRAFT in organisation and realization of the agricultural component, VNCPC and CSD in the realization of CP in silk processing and the UN-agency ITC (International Trade Centre, Geneva) in marketing and sales promotion of silk products. ITC disposes of relevant know-how gained from similar silk projects in Laos and Cambodia. It is expected that this constellation of project partners will bring in the required competences and will reduce the project risk to a minimum. The overall project management will be provided by CSD.

In the meantime Syngenta foundation has evaluated the proposal and refused to finance the project in its existing form. The main reason according to the foundation was the lack of direct involvement of Syngenta's products and services. The proposal shall be explained again to Syngenta's country director in Vietnam. In parallel other sources of finance will be looked for.

1.5 GCTF Ex-post measurement at Tan Phu plastics, Ho Chi Minh City

Tan Phu Plastics Joint Stock Company a company that processes thermoplastic with injection moulding machines was founded in 1977 and belongs to the most important factories of the sector in HCMC. Due to the energy intensive manufacture the energy consumption reached approx. 6'400 MWh in the year 2008. The management would like to reduce the significant energy cost by equipment replacement. At present 32 injection moulding machines are installed.

Currently there is a significant difference in energy consumption of new injection moulding machines. Low price standard machines still consume a lot of electrical energy for the closing mechanism and heating. Energy saving machines are sold on a high price but are more economic calculated on the whole life span and future increasing energy cost.

[1] FHNW... Fachhochschule Nordwestschweiz (former reference centre of VNCPC)

However, due to the high initial investment Tan Phu plastics had opted for the standard equipment since the energy saving machines would have gone beyond its financial possibilities. Tan Phu was informed about the Swiss green credit trust fund (GCTF) and applied for the grant in 2008 in order to purchase the energy saving injection moulding equipment.

The GCTF screening criteria were fulfilled and a full assessment carried out by the VNCPC in 2008 and the credit disbursed by the local bank. In order to comply with the GCTF-guidelines ex-ante measurement on the existing equipment was carried out in constant intervals from February until August 2008. At the beginning of 2009 Tan Phu replaced two hydraulic injection moulding machines with electrical ones.

According to the GCTF guidelines the VNCPC has to measure the consumption figures 3-6 months after project realization (ex-post measurement). On 9 July 2009 CSD accompanied the VNCPC during the ex-post measurement at the company's premises.

The measurement of electricity consumption revealed that the reduction of electricity and CO_2 at both machines is in the predicted range of the full assessment (>50%). The GCTF requirements could be completely fulfilled. The exact figures will be calculated by VNCPC and listed in the monitoring report on behalf of seco. The reimbursement for Tan Phu was calculated at 25% of the total investment cost (33'275 USD). Further positive impacts on environmental aspects are:

- Rejects could be reduced by more than 3%
- Waste plastic can be recycled completely. Rejects of other companies are reprocessed on the new machines as well
- Hydraulic oil could be eliminated totally

1.6 Coordination/planning meeting with VNCPC

In a meeting with the VNCPC director, Mr. Tran Van Nhan and Ms. Ngo Thi Nga the follow-up of existing cooperation activities as well as new initiatives were discussed. In the following a summary of the discussions and agreements is listed:

1.6.1 CP in the tourism sector

CSD has implemented CP especially in hotels in Bulgaria and Romania on behalf of UNIDO. The project started in 2007 and is still ongoing. The initiative was a combined action with services on corporate social responsibility (CSR). In CP it encompassed training of local consultants and further implementation of measures in hotels. Significant improvements in energy and water efficiency could be achieved. Green procurement and substitution of toxic materials was also addressed and improved.

The VNCPC is interested in extending its service portfolio and to access also the tourism sector. Several important touristic resorts are developing with related problems in energy efficiency and use of natural resources. However, the VNCPC's consultants would have to learn about the specific requirements of CP in hotel management. CSD could easily adapt its training concept to Vietnamese requirements and carry out courses with practical orientation for VNCPC consultants. The added value for the consultants and the tourism sector is obvious. Most of the training material is already available and could be combined with CSR as well.

1.6.2 CT assessments/Re-engineering of processes

It is regarded as very useful to insert sectoral experts for detailed process and equipment analysis in companies. The know-how and technology transfer has proved to be very effective and the VNCPC consultants absorbed relevant knowledge for their future expertise. Many technical solutions could be implemented and energy as well as material consumption could be reduced substantially in the porcelain and galvanizing sector. E.g. in the case of Xuan Hoa electroplating company the activities could be extended with support services for product design. The company has participated in the so-called CP4BP-programme of the European Union. The re-engineering activities at Long An textile company are expected to develop similar advantages.

It would be appreciated by the VNCPC if the re-engineering support could be maintained in the future. It is a reasonable contribution to strengthen the Vietnamese private sector by training of consultants and application at the same time.

1.6.3 Industrial contaminated sites

The VNCPC agrees on the relevance of the topic since many industrial companies are to be moved out of the big cities to the outskirts letting behind contaminated land which is to be reused for private household construction. At present no adequate measures are taken to dispose off or treat the contaminated soil. In a first step the responsible authority MONRE (ministry of environment and natural resources) should be approached and integrated in an awareness raising program. In a second step industries would have to be informed about appropriate preventive and corrective measures including analysis and remediation of contaminated soil.

According to the VNCPC the relationship to the responsible people at MONRE is difficult. It is doubted that such a project procedure would be successful at present. It was emphasized that a demonstration project in another country should be realized first whose results could be used in Vietnam later on.

1.6.4 Hazardous waste management

In the past the VNCPC realized together with the Swiss firm Colenco a hazardous waste project in different industry sectors. This project was funded by SDC. The VNCPC would like to replicate such a project in other provinces that would encompass relevant enterprises of chemical industry, metal industry etc. The service to be offered was consultancy on handling hazardous waste, correct disposal, treatment and storage. CSD could support such services with own expertise where needed. There is great opportunity to combine this initiative with the new CP project for industrial zones to be launched by UNIDO. However, funding of the hazardous waste initiative is open at present.

1.7 Technology Management Training

The VNCPC offers companies technology gap assessments which encompass the evaluation of current technology against best available/applicable technology. Moreover information on efficient technology for specific industrial processes shall be provided and detailed studies on the technical and economic feasibility of an investment elaborated for interested customers. Technology sourcing and assistance in financial engineering will be provided upon request too. Moreover, the VNCPC would like to offer technology implementation services including supervision and control of the installation as well as training in technology change management to support in the continuous technical optimization of a factory and to multiply the projects under the green credit trust fund (GCTF) of seco.

It had been experienced that in general CP-consultants lack of know-how concerning the elaboration of project proposals and the way how most appropriate technology can be identified and selected. A first training in 2007 covered these subjects. However, since the VNCPC would like to further foster technology transfer and offer comprehensive services on clean technology CSD organized and carried out together with the technology expert, Mr. Michael Hartschen (Brainconnection GmbH) a second technology management training from 23 November until 25 November 2009. This training was attended by 18 participants, mainly consultants and representatives of companies

The training had following objectives. All of them could be achieved:

- Capacity building in technology assessment
- Getting familiar with assessment tools
- Insight in managing technology risks

Training content

To reach the aforementioned objectives the training was structured as follows:

- Introduction into the topic

- Technology and Business Development
- System engineering methodology
- Technology audit (rapid check, gap assessment, benchmark)
- Value-Benefit Analysis
- Identifying technology risks

Several exercises for value-benefit analysis and technology risk management were carried out to demonstrate and consolidate the methods. For that purpose a virtual company producing steel pipes was presented and used for the exercises. All exercises had to be carried out as team work with subsequent presentations of the group results.

All presented material was translated into English and Vietnamese, printed as handouts and handed over to the participants in hardcopy and electronic version. All consultants dispose of the relevant documents for reference and further trainings in companies.

The participants rated the training as very useful for their work in industry and appreciated the modular structure of the technology gap assessment training in 2007 and the present technology management training. That way the topics could be presented separately avoiding confusion and misunderstandings.

For further details on the training program, participants and VNCPC course evaluation please refer to Annex A and Annex B.

2. CONCLUSION AND RECOMMENDATIONS

2.1 CP in tourism sector

Since the VNCPC has changed its legal status into a private entity the acquisition of new customers is essential. For that reason it is recommended to extend the CP services to service providers like hotels. The UNIDO project for the analysis and improvement of hotel processes in Bulgaria and Romania carried out by CSD has proven to be successful. Positive results in energy and water efficiency as well as better working conditions could be achieved. Since CSD was responsible for the implementation of CP in the hotel sector the know-how for replication in Vietnam and elsewhere is readily available.

It is recommended to continue this activity on sustainable hotel management with CSD in the new phase of the global CP-programme.

2.2 Re-engineering and Technology management

It became again apparent that a critical element in the implementation of Clean Technologies in industries is the know-how of state-of-the-art practices and technologies. To enable the technology transfer, thorough knowledge of the transfer process and of best applicable techniques is essential.

With specific re-engineering services as demonstrated at Long An textile JSC carried out by an external sectoral expert the best applicable technology can be chosen and the relevant up- and downstream production processes be improved. The VNCPC could profit from the know-how transfer at Long An textile JSC. This consultancy and training approach has already been demonstrated successfully in other companies e.g. the electroplating company Xuan Hoa and at Hai Duong Porcelain Company in Vietnam.

The VNCPC will consult companies in technology transfer projects in the future e.g. under the Swiss green credit trust fund (GCTF). For that a deeper understanding of selected industry sectors is very important. Only that way the technology transfer potential can be credibly evaluated and appropriate technology suppliers involved.

CSD therefore recommends UNIDO to further support industrial re-engineering projects and technology management trainings for consultants in other selected developing countries and industry sectors.

2.3 Industrial contaminated sites

An important CP related topic is the assessment and remediation of contaminated sites. Unfortunately, in Vietnam the legislation is currently not sufficient to force industry for analysis and proper remediation of contaminated sites. Nevertheless, the topic should be addressed anyway since it contributes substantially to sustainable industrial production. CSD proposes a parallel approach. Together with the supply chain of international retailers (IKEA etc.) a program could be started on analysis and remediation of contaminated sites. Thereby the international retailer will accelerate the process at its suppliers for image reasons. On the other hand awareness raising at governmental level will enhance understanding and advance the policy dialogue. Latter is crucial for future development of legislation on the topic.

CSD therefore recommends UNIDO to conduct a demonstration project in a selected developing country which could also be replicated in Vietnam in the future. CSD would elaborate a concept for such a project upon request.

2.4 Lean Production

Lean Production supplements Cleaner Production and enhances the added value for the customer. Lean Production targets on the elimination of wasting especially on internal stocks, errors/rejects, wrong

maintenance and time. By doing this consistently significant reduction of environmental impact can be achieved together with an increase of productivity.

In the future consultants involved in cleaner production activities will have to support customers regarding structuring of production processes, dimensioning of equipment and control of production systems. For that they may use the tools presented by CSD in the VNCPC training.

It is recommended to further adjust the lean production training program and to apply it at other cleaner production centres for the same purpose. CSD could assist UNIDO in doing this.

2.5 Future cooperation of CSD with UNIDO

CSD's UNIDO-mandate in Vietnam is terminated by the end of 2009. A new contract with UNIDO on the specific topics mentioned above (CP and tourism, technology management/re-engineering, contaminated sites) or other related fields would be necessary and very much appreciated. CSD disposes of relevant staff that has been working successfully for UNIDO during the last 10 years on CP-assignments and as technical reference centre. CSD staff has a deep understanding for CP-issues and UN-procedures. CSD's added value is its complete range of services from one hand that can be offered in all relevant fields of environmental consultancy. On behalf of and upon request of UNIDO CSD would propose its support activities in a written proposal.

At this point we would like to express our sincere thanks for the good cooperation with UNIDO's CP-Branch and the results that could be achieved for the partners in developing countries.

Jürg Walder

Head of branch
Senior consultant

Basel, 22 January 2010

ANNEX A:

TRAINING PROGRAM TECHNOLOGY MANAGEMENT

C'S'D'

Training on

TECHNOLOGY MANAGEMENT

Place: Vietnam CPC, Hanoi, Vietnam **Date:** 23 - 25 November 2009

Objectives:

- Capacity building in technology assessment
- Getting familiar with assessment tools
- Insight in managing technology risks

Main topics:

- Technology and Business Development
- System engineering methodology
- Technology audit (rapid check, gap assessment, benchmark)
- Value-Benefit Analysis
- Identifying technology risks

TRAINING PROGRAM

Time	Topics	Resource Person
Day 1: 23 November 2009		
Morning 8:00-8:30	Registration and Opening	Prof. Dr. Tran Van Nhan (VNCPC) Dr. Ngo Thi Nga (VNCPC)
8:30-10:00	**Introduction** • Welcome and Opening address • Introduction into Technology Management	**Mr. Jürg Walder** (CSD) Dr. Michael Hartschen (Brain Connection)
10:15-10:30	Photo session	Lecturer and Participants
10:30-10:45	**Coffee break**	
10:45-12:00	**Technology and Business Development** • Lecture • **The World Café Workshop**	Dr. Michael Hartschen (Brain Connection)
12:00-13:30	**Lunch break**	
Afternoon 13:30-14:00	**Methodology of system engineering** • Lecture	Dr. Michael Hartschen (Brain Connection)
14:00-14:30	**Rapid technology check** • Lecture	Dr. Michael Hartschen (Brain Connection)

C'S'D'

Time	Topics	Resource Person
14:30-15:00	**Technology gap assessment** • Lecture	Dr. Michael Hartschen (Brain Connection)
15:00-15:30	**Coffee break**	
15:30-16:00	**Benchmarking** • Lecture	Dr. Michael Hartschen (Brain Connection)
16:00-17:00	**Workshop: "The Morphology Matrix"**	Dr. Michael Hartschen (Brain Connection) Mr. Jürg Walder (CSD)
Day 2: 24 November 2009		
Morning 8:30-10:00	**Introduction: Value-Benefit Analysis** • Lecture	Dr. Michael Hartschen (Brain Connection)
10:00-10:30	**Coffee break**	
10:30-12:00	**Case Study: Value-Benefit Analysis**	Dr. Michael Hartschen (Brain Connection)
12:00-13:30	**Lunch break**	
Afternoon 13:30-15:00	**Case Study: Value-Benefit Analysis**	Dr. Michael Hartschen (Brain Connection)
15:00-15:30	**Coffee break**	
15:30-16:30	**Workshop: Establishing Basic Criteria for Value-Benefit Analysis Tools in the Cleaner Production Centre**	Dr. Michael Hartschen (Brain Connection) Mr. Jürg Walder (CSD)
16:30-17:00	**Measuring the results of value benefit analysis** • Lecture	Dr. Michael Hartschen (Brain Connection)
Day 3: 25 November 2009		
Morning 8:30-10:00	**Introduction: Managing Technology Risks** • Lecture	Dr. Michael Hartschen (Brain Connection)
10:00-10:30	**Coffee break**	
10:30-12:00	**Case: Identifying Technology Risks** • Lecture	Dr. Michael Hartschen (Brain Connection)
12:00-13:30	**Lunch break**	
Afternoon 13:30–15:00	**Film: The Management of Technology Risks Based on a Case Study**	Dr. Michael Hartschen (Brain Connection) Mr. Jürg Walder (CSD)
15:00-15:30	**Coffee break**	
15:30-16:00	**Film: The Management of Technology Risks Based on a Case Study**	Dr. Michael Hartschen (Brain Connection) Mr. Jürg Walder (CSD)

C'S'D'

Time	Topics	Resource Person
16:00-16:30	**Conclusion**	Dr. Michael Hartschen (Brain Connection)
16:30-17:00	**Training evaluation**	Participants

Resource persons

Prof. Dr. Tran Van Nhan	VNCPC (Director)
Dr. Ngo Thi Nga	VNCPC (Managing director)
Dr. Michael Hartschen (International Expert)	Brain Connection GmbH, Wangen/Switzerland
Mr. Jürg Walder (Programme manager)	CSD Ingenieure und Geologen Ltd., Basel/Switzerland

Participants approx. 20 consultants from VNCPC, companies and external consultancies

Translation The seminar will be in English, simultaneous English-Vietnamese translation provided

Venue To be organized by VNCPC

ANNEX B:

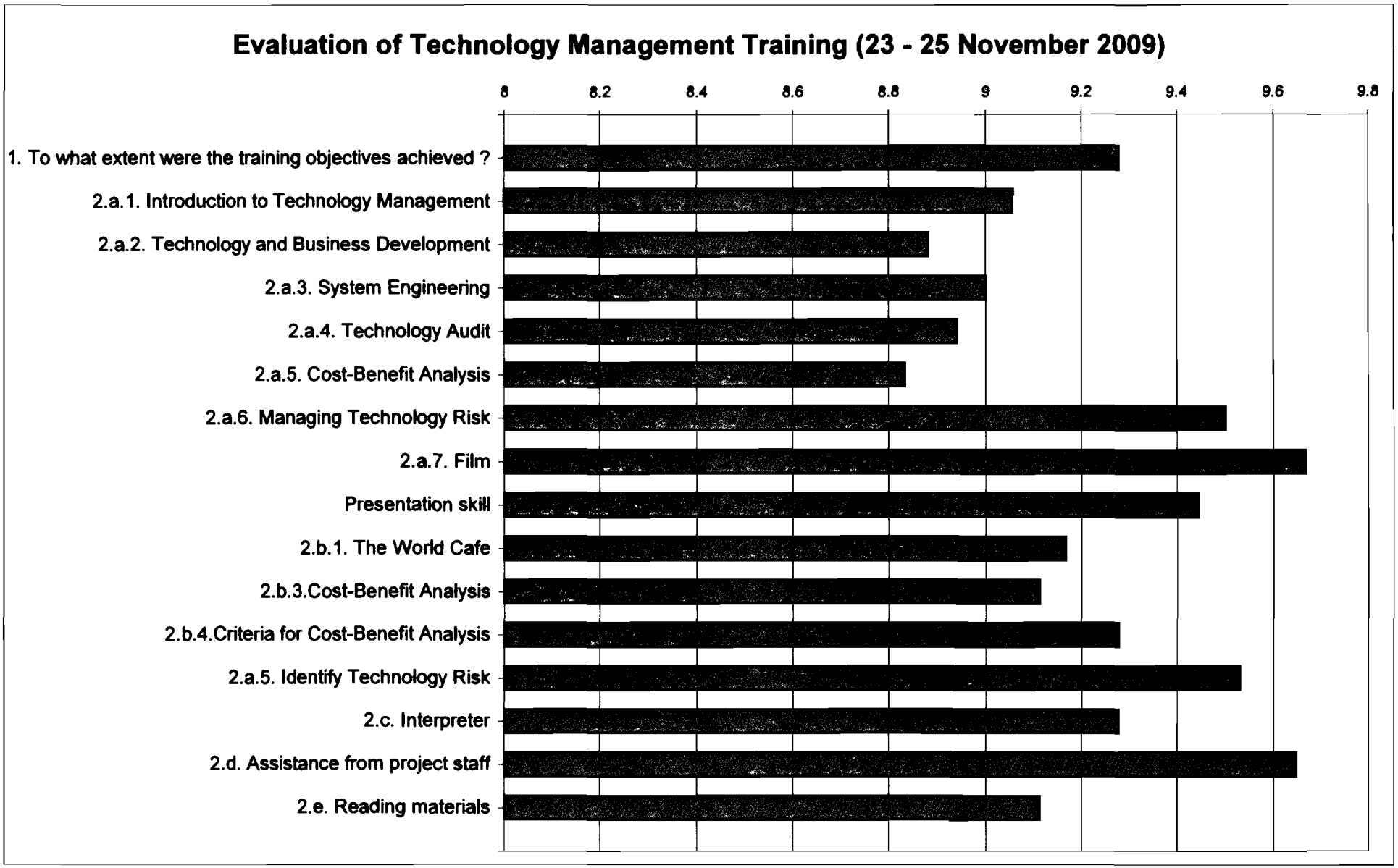
EVALUATION AND PARTICIPANTS LISTS

TECHNOLOGY MANAGEMENT TRAINING

Evaluation results - Technology Management course, Hanoi, 23 - 25 November 2009

Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Average
1. To what extent were the training objectives achieved ?	8	9	9	10	9	8	10	10	10	10	9	10	9	10	9	10	9	8	9.28
2. Rate the following aspects of training design																			
2.a. Topic evaluation																			
2.a.1. Introduction to Technology Management	8	7	8	10	8	8	10	9	10	10	9	9	9	9	10	10	10	9	9.06
2.a.2. Technology and Business Development	8	7	9	10	9	8	10	9	9	7		9	9	9	9	10	10	9	8.88
2.a.3. System Engineering	8	8	9	10	9	9	9	10	9	8		9	9	8	10	10	9	9	9.00
2.a.4. Technology Audit	8	9	8	10	9	9	10	10	10	8		9	8	8	9	10	8	9	8.94
2.a.5. Cost-Benefit Analysis	8	9	9	10	9	8	8	9	10	7	10	9	10	7	10	8	9	9	8.83
2.a.6. Managing Technology Risk	10	9	9	10	10	9	10	9	10	8	10	9	10	9	10	10	9	10	9.50
2.a.7. Film	10	10	9	10	9		10	10	10	9	10	9	10	9		10	10		9.67
Presentation skill	10	9	10	10	9	8	10	10	10	10	10	10	9	9	9	10	9	8	9.44
2.b Caseworks																			
2.b.1. The World Cafe	9	8	9	10	9	9	10	9	10	10	9	10	9	8	9	10	9	8	9.17
2.b.3.Cost-Benefit Analysis	9	9	9	10	9	9	9	9	9	8	9	10	10	8	10	10	9	8	9.11
2.b.4.Criteria for Cost-Benefit Analysis	9	8	9	10	9	9	10	9	9	10	10	10	10	8	10	10	9	8	9.28
2.a.5. Identify Technology Risk	9	9	10	10	10	9	10	9	10		10	10	10	8	10	10	10	8	9.53
2.c. Interpreter	9	8	9	10	9	9	10	10	10	8	10	10	9	9	9	10	9	9	9.28
2.d. Assistance from project staff	9	9	9	10	10		10	10	10	9	10	10	9	10	10	10	10	9	9.65
2.e. Reading materials	9	9	9	10	9	8	9	10	10	9	10	10	9	7	10	10	9	7	9.11
3. Did you feel the duration of training (too short, too long, just about right)	OK	OK	OK	OK	OK	TS	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	
a. Too short						1													5.6%
b. Too long																			0.0%
c. Just about right	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	94.4%

Evaluation scale for questions 1 and 2: 0-10 points
0 points: not fullfilled at all
10 points: completely fullfilled


Evaluation of Technology Management Training (23 - 25 November 2009)
8
8.2
8.4
8.6
8.8
9
9.2
9.4
9.6
9.8
1. To what extent were the training objectives achieved ?
2.a.1. Introduction to Technology Management
2.a.2. Technology and Business Development
2.a.3. System Engineering
2.a.4. Technology Audit
2.a.5. Cost-Benefit Analysis
2.a.6. Managing Technology Risk
2.a.7. Film
Presentation skill
2.b.1. The World Cafe
2.b.3.Cost-Benefit Analysis
2.b.4.Criteria for Cost-Benefit Analysis
2.a.5. Identify Technology Risk
2.c. Interpreter
2.d. Assistance from project staff
2.e. Reading materials

Trung tâm Sản xuất sạch Việt Nam

DANH SÁCH ĐẠI BIỂU KHÓA ĐÀO TẠO „QUẢN LÝ CÔNG NGHỆ“

TT	Họ và tên	23/11	24/11	25/11
1.	Hoàng Tuấn Anh			
2.	Trần Đức Chung			
3.	Lý Thị Thùy Dương			
4.	Trần Minh Đức			
5.	Bùi Thị Hồng Hà			
6.	Vũ Hà			
7.	Nguyễn Lê Hằng			
8.	Lê Mạnh Hiếu			
9.	Dương Thị Liên			
10.	Nguyễn Hồng Long			

11.	Vũ Bá Minh (*) Khoa Công nghệ Hóa học - ĐHBK Tp. Hồ Chí Minh			
12.	Ngô Thị Nga			
13.	Trần Văn Nhân			
14.	Nguyễn Văn Nhớ			
15.	Tăng Bá Quang (*) Viện Công nghệ Hóa học (Tp. Hồ Chí Minh)			
16.	Nguyễn Ngọc Minh Thảo (*) Trung tâm SXSH Tp. Hồ Chí Minh			
17.	Đinh Mạnh Thắng			
18.	Hồ Công Thiện (*) Công ty Cổ phần Nhựa Tân Phú			
19.	Lê Xuân Thịnh			
20.	Nguyễn An Toàn Ban Kỹ thuật Đầu tư (VINATEX)			
21.	Vũ Minh Trang Trung tâm Sản xuất Sạch - Viện ICH&CN Môi trường			
22.	Nguyễn Thị Truyền (*) Trường Cao đẳng Tài nguyên & Môi trường Tp. Hồ Chí Minh			

23.	Vũ Đức Hiếu Phòng Kỹ thuật-Đầu tư (HANOSIMEX)	x	x	x
24.				
25.				
26.				
27.				
28.				
29.				
30.				