

Independent review of

UNIDO MONTREAL PROTOCOL PROJECTS

Independent review to extract lessons learned
from UNIDO Montreal Protocol projects



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO EVALUATION GROUP

Independent Review

MONTREAL PROTOCOL PROJECTS

Review to extract lessons learned from UNIDO
Montreal Protocol projects



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna, 2010

Distr. GENERAL

OSL/EVA/R.20

July 2010

Original: English

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This document has not been formally edited.

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Acknowledgements

The evaluation team would like express gratitude and special thanks to all those persons involved in planning and realizing the review, especially to the management and staff of the UNIDO Montreal Protocol Branch and of the UNIDO field office in Indonesia.

The evaluation team hopes that the presented conclusions and recommendations will contribute to the continuous improvement of the MP programme and to the achievement of the expected results in UNIDO's partner countries.

Abbreviations and acronyms

CFC	Chlorofluorocarbon
CFC-11	Trichlorofluoromethene
CFC-12	Dichlorodifluoromethene
CO ₂	Carbon dioxide
EC	Executive Committee of the MLF
GEF	Global Environment Facility
GHG	Greenhouse gases
GWP	Global warming potential
HBFB	Hydrobromofluorocarbon
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
IOT	Industrial Operational Technology
LCD	Liquid carbon dioxide
MLF	Multilateral Fund for the Implementation of the Montreal Protocol
MP	Montreal Protocol
MP-S	Montreal Protocol Secretariat
MPB	Montreal Protocol Branch, UNIDO
NOU	National Ozone Unit
ODP	Ozone-depleting potential
ODS	Ozone-depleting substance
PCR	Project Completion Report
SME	Small and medium sized enterprises
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization

Glossary of evaluation related terms

Term	Definition
Conclusions	Conclusions point out the factors of success and failure of the evaluated intervention, with special attention paid to the intended and unintended results and impacts, and more generally to any other strength or weakness. A conclusion draws on data collection and analyses undertaken, through a transparent chain of arguments.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Impacts	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.
Indicator	Quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor.
Institutional development impact	The extent to which an intervention improves or weakens the ability of a country or region to make more efficient, equitable, and sustainable use of its human, financial, and natural resources, for example through: (a) better definition, stability, transparency, enforceability and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Such impacts can include intended and unintended effects of an action.
Lessons learned	Generalizations based on evaluation experiences with projects, programs, or policies that abstract from the specific circumstances to broader situations. Frequently, lessons highlight strengths or weaknesses in preparation, design, and implementation that affect performance, outcome, and impact.

Logframe	Management tool used to improve the design of interventions, most often at the project level. It involves identifying strategic elements (inputs, outputs, outcomes, impact) and their causal relationships, indicators, and the assumptions or risks that may influence success and failure. It thus facilitates planning, execution and evaluation of a development intervention. Related term: results based management.
Outcome	The likely or achieved short-term and medium-term effects of an intervention's outputs. Related terms: result, outputs, impacts, effect.
Outputs	The products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
Recommendations	Proposals aimed at enhancing the effectiveness, quality, or efficiency of a development intervention; at redesigning the objectives; and/or at the reallocation of resources. Recommendations should be linked to conclusions.
Relevance	The extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies. Note: Retrospectively, the question of relevance often becomes a question as to whether the objectives of an intervention or its design are still appropriate given changed circumstances.
Results	The output, outcome or impact (intended or unintended, positive and/or negative) of a development intervention. Related terms: outcome, effect, impacts.
Sustainability	The continuation of benefits from a development intervention after major development assistance has been completed. The probability of continued long term benefits. The resilience to risk of the net benefit flows over time.

Executive summary

Objectives and scope of review

This review has focused on the design and implementation of UNIDO technical cooperation projects in the area of ODS phase-out. It has not looked into the “global forum” activities of the Montreal Protocol Branch (PTC/MPB). The review was carried out by two external evaluators: Mr. Bjorn Bauer and Mr. Tomas Sander Poulsen.

UNIDO projects under the Montreal Protocol (MP) are subject to specific evaluation procedures defined by the Multilateral Fund. However, all projects implemented by UNIDO fall under UNIDO responsibility and the MP projects represent a large part of UNIDO technical assistance portfolio. It is thus vital to capture lessons learned and best practices for the purpose of UNIDO’s own organizational learning.

The purpose of this review has been to extract lessons learned and to collect information on UNIDO MP projects’ contribution to development results. The review has assessed to what extent the MP projects have fulfilled their direct goal – phase-out of ozone depleting substances (ODS) – and to what extent non-ODS effects have been targeted and/or achieved.

The review covered a sample of 20 projects and one field visit out of more than 1.100 UNIDO MP-projects in 85 countries and in a wide range of sectors. The size of the sample implies that the results must be seen as indicative (not representative) for the total project portfolio. However, the uniformity of findings across projects and interviews speaks for the validity of the review.

Review Methodology

The following different sources of information have been used to cross-reference and triangulate findings:

A document review has been carried out in order to extract information with regard to the results of MP projects, including non-ODS effects at enterprise level (such as productivity or local environmental benefits), as well as to compile

information that allows to describe the UNIDO MP programme theory and compare it with that of other organisations involved in ODS phase-out.

Logical models have been developed to describe the cause-effect linkages by which UNIDO ODS projects have intended to achieve their objectives.

A field validation mission in Indonesia has been carried out to validate the findings of the document review, including the draft programme theory, against the reality of project implementation. During meetings with the National Ozone Unit and key UNIDO MP staff the review team presented and discussed the findings of the desk document review and the theory of change, combined with in-depth discussions of the national ODS phase-out processes and achievements. Four enterprises having received support for substitution of ODS technology were visited and semi-structured interviews carried out with enterprise management.

In addition, around 15 interviews with UNIDO staff have been carried out complementing the findings from desk reviews and field visit. Finally, a stakeholder survey was carried out to capture non-environmental effects of MP projects and to further validate the UNIDO MP programme theory.

Conclusions, recommendations and lessons learned

Conclusion 1: UNIDO support for the phase-out of production and consumption of ozone depleting substances in developing countries has been successful in achieving the targeted ODS phase-out.

UNIDO became an Implementing Agency in the Montreal Protocol in 1992 and from 1995 has received a substantial share of the MLF programme – increasing from 4 % of the MLF total allocation in 1992 to around 25 % (or 40 million US\$) in 1995 and the following years. UNIDO has phased out more than 45,600 ODP-tonnes, representing 28 per cent of total phase-out achieved in developing countries. MLF reports and the field validation mission have given evidence that UNIDO support in general and specifically to Indonesia has been effective and highly appreciated. The specific UNIDO approach providing agency expertise directly to enterprise management has proven effective. The simplicity of the MP approach, focusing on one clearly defined objective (ODS phase out), is a key reason for the success, i.e. the good results in terms of ODS phase out. The UNIDO MPB experience could be utilised to improve efficiency in other UNIDO programmes.

Conclusion 2: All reviewed projects have been implemented in line with the underlying Theory of Change. The projects have strictly followed the MLF guidelines.

The Montreal Protocol exclusively aims at phasing out ODS. Guidelines and procedures from the MLF precisely state objectives, structure and processes of the projects carried out by all implementing agencies, including UNIDO, under the Montreal Protocol. Implicitly, intervention logic and the theory of change are given by the MLF through these precise guidelines and procedures. The theory of change is based on a number of assumptions, of which the most important in terms of UNIDO project implementation have been confirmed by the review while in some cases the causal links between outputs and outcomes/impact are weak (e.g. risk of reversal to ODS in grain storages). The rules and guidelines of the MLF do not allow implementing agencies to use MLF funds for pursuing non-ODS outcomes such as productivity, competitiveness, occupational health, or environmental issues additional to ODS phase-out. The MLF has not sought to support the implementing agencies with guidelines or examples for achieving non-ODS effects that did not entail additional costs to MLF or impinge upon the ODS phase-out objective

Conclusion 3: Lessons learned from the MP projects have not systematically contributed to learning across UNIDO branches.

There is a certain potential for UNIDO to learn from the MP projects, in particular with regard to enterprise-level technology transfer. The project completion reports (PCR) allow for recording of lessons learned from project accomplishment but project managers have given low priority to this field. More importantly, extraction and dissemination within UNIDO of lessons learned from UNIDO MP projects have not been carried out in a systematic manner.

Recommendation:

It is recommended that the MP programme should adopt a systematic approach to compile lessons learned from MP projects and to disseminate this information to other UNIDO programmes and relevant stakeholders. Extraction and dissemination of useful lessons learned should be supported by guidelines and good examples.

The experience of the MP programme, the specific approaches used and the potential linkages with UNIDO organisational objectives and outcomes should be distilled into a concise programme document.

Conclusion 4: The potential for cooperation with other initiatives and stakeholders has not been exploited.

UNIDO has conducted MP projects in many countries in which other relevant initiatives were simultaneously carried out (e.g. energy efficiency, cleaner production, POPs) and in which relevant international, national and institutional capacities for cooperation were present. However, only limited collaboration with other UNIDO programmes and branches, including field offices, or with other agencies/institutions have taken place.

Recommendation:

It is recommended that UNIDO should strengthen intra- and inter-agency cooperation. UNIDO management should formulate a clear strategy with guidelines to induce cooperation between the MP branch and other UNIDO branches and programmes. UNIDO should consider capacitating the Field Offices to enable them to play a role in pursuing non-ODS effects through local involvement and additional funding. Synergy can be achieved through a multi-disciplinary approach, in which technical experts are supported by generalists and planners. A fast track cooperation mechanism would enable swift establishment of interagency partnerships. This could also allow for co-funding from other donors to cover non-ODS components of more integrated projects and programmes.

Conclusion 5: UNIDO has not sought to target non-ODS effects in MP projects.

As some phased-out ODS are very potent greenhouse gases, the MP projects have as a side effect unintentionally provided a significant reduction of the global warming impact of industries covered by the projects. Modest non-ODS effects have been achieved on some enterprises, unintentionally or due to individual UNIDO project managers' specific efforts. Acknowledging the above, UNIDO has not sought systematically to target non-ODS effects in the projects, nor have indicators for non-ODS effects been systematically monitored.

Conclusion 6: The potential for supporting sustainable industrial development has not been exploited.

UNIDO is 'the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability'. The MP projects have contributed to industrial sustainability by phasing-out environmentally harmful ozone depleting substances. However, promoting sustainable industrial development is a complex and interdisciplinary challenge that requires multi-faceted efforts. The review has not found that UNIDO has strived to apply a universally accepted sustainability approach in the development and implementation of MP projects.

Recommendation:

It is recommended that UNIDO should use the leverage of MP projects to promote sustainable industrial development by developing guidelines for the design, implementation and monitoring of MP projects in a broader context, including institution and capacity building as well as non-ODS effects.

UNIDO should also consider initiating a dialogue with the MLF to fully clarify the present room for inclusion of cost-free (or co-funded) non-ODS targets in MP initiatives.

Lessons learned 1: UNIDO possesses the competences necessary to implement international agreements effectively and efficiently.

UNIDO's efforts within the Montreal Protocol have been effective and efficient, clearly appreciated by enterprises, national authorities and the MLF.

Lessons learned 2: The corporate UNIDO vision needs to be more thoroughly implemented in programmes funded by institutional donors.

Experience from the MP projects show that well conceived UNIDO sustainability visions and policies need to be supported by management to ensure actual application in project implementation. UNIDO management should therefore through guidelines and capacity building seek to mainstream UNIDO's own core objectives of promoting sustainable industry more thoroughly into programmes such as the MP programme.

Lessons learned 3: UNIDO systems do not ensure organisational learning from individual programmes.

Many different aspects and experiences of the MP projects' direct work with industries could be of interests and benefit for the MP Branch and UNIDO as a whole. Also, the huge programme entails clear options for cooperation between UNIDO branches. This has not happened. It seems that UNIDO systems and approaches do not ensure organisational cooperation and learning even from large scale programmes.

Lessons learned 4: Industries in developing countries do not necessarily use injection of specific technology and financial resources as a stepping stone for sustainable development.

There is no general indication that technology provision and financial support lead to more conscious production practices in terms of environment, occupational health etc. With framework conditions staying unchanged (especially regulatory framework and enforcement capacities)

enterprises have a tendency to revert to the cheaper technological options. Thus, the technology transfer experience from the UNIDO MP projects cannot be directly applied by other UNIDO programmes, where no multilateral environmental agreement (MEA) and corresponding national commitments provide the necessary framework conditions for long-term technology conversion.

I

Background

Until about a decade ago, the lack of knowledge about atmospheric chemistry led to significant depletion of stratospheric ozone. Man-made chemicals, especially chlorine and bromine compounds, such as chlorofluorocarbons (CFCs), halons, and a broad range of other industrial chemicals attack the ozone layer and are recognized as ozone depleting substances (ODS). There is a need to phase out production and consumption of ODS, and the Vienna Convention and the Montreal Protocol provide a response to that need.

The UNIDO Programme and Budget 2008 – 2009 defines the objective of Programme Component E6 “Montreal Protocol” as follows: “Countries are assisted to comply with their obligations under the Montreal Protocol through transferring non-ODS-based technologies to Article 5 countries and supporting them to meet the 2008 and 2009 targets in terms of tonnages of ODS to be eliminated.”

Outcomes and outputs of the Montreal Protocol Component are defined as:

Outcomes	Performance indicators	Sources of verification
Enterprises/farms meet international market standards owing to adoption of non-ODS-based technologies	Number of enterprises/farms having installed production lines/ alternative techniques with environmentally friendly (non-ODS based) technologies	Company records and statistics; Data reports of relevant Government agencies; UNIDO annual Business Plan and Progress and Financial Report Project Completion Reports
Countries that have been assisted comply with their obligations under the Montreal Protocol	Number of countries that sign amendments to the Montreal Protocol Number of countries that have adopted policy in accordance with Montreal Protocol Number of tons of ozone-depleting substances eliminated	
Outputs:		

- Governments assisted in strengthening their Ozone Units, legislation, monitoring, public awareness and reporting functions;
- Country based activities coordinated among implementing agencies, bilateral donors, Multilateral Fund Secretariat and Ozone Secretariat;
- Stakeholders informed and qualified;
- Conversion projects successfully completed;
- Information material made available and disseminated.

While these definitions are taken from the current programme and budget, it is assumed that these objectives, outcomes and outputs have been applied since the beginning of the UNIDO MP partnership.

While primarily concerned with the issue of eliminating ODS, it is assumed that the activities carried out by UNIDO in the area of MP also enable the industries concerned to achieve increased productivity and improved economic performance in terms of lower operating costs, less maintenance and higher product quality and reliability. Likewise, MP projects also have a potential to contribute positively to employment, both by sustaining existing jobs and by creating new ones.

1.1. Objectives and scope of review

The review was carried out by two external evaluators: Mr. Bjorn Bauer and Mr. Tomas Sander Poulsen based on the terms of reference provided by UNIDO Evaluation Group (see Annex 2).

The purpose of this review has been to extract lessons learned and to collect information on UNIDO MP projects' contribution to development results. The review has assessed to what extent the MP projects have fulfilled their direct goal – phase-out of ozone depleting substances (ODS) – and to what extent non-ODS effects have been targeted and/or achieved. This review has focused on the design and implementation of technical assistance projects in the area of ODS phase-out. It has not looked into the “global forum” activities of the Montreal Protocol Branch (PTC/MPB).

Projects under the MP are subject to specific evaluation procedures defined by the Multilateral Fund, and UNIDO implementation projects are subject to evaluations carried out by the MP Secretariat. However, since all projects implemented by UNIDO fall under UNIDO responsibility, and the MP projects encompass a large part of UNIDO technical assistance portfolio, it is vital to capture lessons learned and best practices for the purpose of organizational learning.

Furthermore, it is important for UNIDO to systematically access information about results and outcomes in line with its Results Based Management (RBM) Policy and Implementation Strategy and to convey this information to various stakeholders. The UNIDO Evaluation work programme 2008/2009 therefore includes a desk review of UNIDO completion reports and of MP evaluation reports (encompassing UNIDO interventions). The purpose of this review will be to extract lessons learned, information on UNIDO contribution to development results and impact, and other strategic information.

In 2009 the Evaluation Office of the GEF carried out an impact evaluation of projects to phase out Ozone Depleting Substances (ODS) in Economies in Transition. UNIDO Evaluation Group is committed to collaboration with the evaluation departments of partner agencies. In this context it has been agreed to use the opportunity of the desk review to compare the approaches to ODS phase-out at the level of the underlying theories of change and intervention logic.

1.2. Key review questions

The key review questions are:

Regarding design, intervention logic and underlying theory of change:

- Is/are one or several typical intervention logics applied to the projects? How can it/they be described? How do they compare with the GEF ODS projects' intervention logic?
- Is the design of the overall programme and of individual projects consistent with the underlying theory of change?

Regarding implementation and results of MP interventions:

- Are individual MP interventions implemented in line with the underlying theory of change?
- What are the effects of MP projects in terms of enterprise competitiveness, productivity and employment?
- What other effects of MP projects can be commonly observed?

Regarding learning processes:

- How are lessons learned from MP projects extracted today and how can we ensure that lessons from MP projects can contribute to UNIDO organisational learning in the future?
- Is information on MP interventions and their results sufficient and relevant for learning?

1.3. Review methodology

The review has adopted a qualitative approach and used the following methods:

Review of documents and UNIDO staff interviews

The document review has been carried in order to: a) extract information with regard to the results of MP projects, including non-environmental effects on productivity etc. at enterprise level; and b) compile information that allows to describe the UNIDO programme theory and compare it with that of other organisations involved in ODS phase-out. This component will include:

- Review of UNIDO documentation of 20 completed UNIDO MP projects: Project documents, Project Completion Reports (PCRs), Multilateral Fund (MLF) and others' ODS phase-out related evaluation reports, technical reports, etc.
- Review of methodological documents, tools and training kits, reference documents and guidelines.
- Review of ODS related documents of other organisations, including UNEP, GEF and the World Bank.
- Semi-structured interviews with UNIDO MPD staff and other relevant UNIDO staff

Development of UNIDO MP programme theory of change ¹

Based on the review of documents and discussions with project managers, logical models have been developed to describe the cause-effect linkages by which UNIDO ODS projects have intended to achieve their objectives.

Field Validation Mission

A field validation mission in Indonesia² was carried out to test and discuss the findings of the desk study. During meetings with the National Ozone Unit and key UNIDO MP staff the review team presented the findings of the desk document review and the Theory of Change, followed by in-depth discussions of the national ODS phase-out processes and achievements and of the draft material presented by the review team. Four enterprises having received support for substitution of ODS technology were visited and semi-structured interviews carried out with enterprise management.

Stakeholder survey

¹ Theory of Change defines all building blocks required to bring about a given long-term goal. This set of connected building blocks - interchangeably referred to as outcomes, results, accomplishments, or preconditions - is depicted on a map known as a 'pathway of change' which is a graphic representation of the change process.

²2. Indonesia was selected due to availability of resources.

The survey has been carried out to capture non-environmental effects of MP projects and to validate the UNIDO MP programme theory. The survey design has been developed in close cooperation with UNIDO PTC/MPB and ODG/EVA in order to ensure that appropriate terminology is used and that survey results are useful for the in-house learning process.

Methodological remarks

The review has been delimited to 20 projects and one field visit - of approximately 1000 UNIDO MLF-projects in 80 countries covering a wide range of sectors. Around 15 interviews with UNIDO staff have been carried out complementing the findings from desk reviews and field visit.

The small size of the sample implies that the results must be seen as indicative, but not representative for the total project portfolio. However, the uniformity of findings across projects and from different sources of information speaks for the validity of the review.

The survey was responded to by 27 individuals all with a close connection to the accomplished MP projects (including 18 UNIDO staff members). Thus, there is a risk that the survey is to a certain extent biased by the respondents' close relation to the programme.

Preliminary findings and the draft report have been discussed with UNIDO staff. Comments and factual corrections received were taken into account for the preparation of this final report.



UNIDO Montreal Protocol activities

During a time when UNIDO faced a significant reduction of funding for technical cooperation from its hitherto most important institutional donor, UNDP, UNIDO became an Implementing Agency in the Montreal Protocol in 1992 and from 1995 it has received a substantial share of the MLF programme – increasing from 4 % of the MLF total allocation in 1992 to 25 % (or 40 million USD) in 1995. The budget approvals under the MLF since 1997 have represented 30 to 35 % of UNIDO's total delivery of technical assistance. The total amount allocated to UNIDO implementation surpasses 420 million USD³.

Four organisations are implementing agencies of the MLF for ODS phase-out in developing countries, each have developed specific areas of strength⁴:

- The World Bank, which disburses around 45 % of the total funding, concentrates on large-scale phase-out and investment projects at plant and country levels.
- UNDP (around 30 % of the MLF's budget) organises demonstration and investment projects, technical assistance and feasibility studies.
- UNIDO (around 20 % of the MLF's budget) primarily prepares and appraises investment project proposals and implements phase-out schedules at plant level. UNIDO also supports preparation of phase-out and ODS management plans for governments.
- UNEP helps to establish the infrastructure within which projects can proceed. This includes carrying out institutional strengthening activities (such as establishing National Ozone Units within each country) and helping to prepare country programmes.

UNIDO has implemented more approximately 1000 MLF projects in 85 countries⁵, covering a wide range of sectors and particularly attending to small

³ 2007 figures from 'UNIDO and the Montreal Protocol', UNIDO 2007'. Refer to Annex 4 for a summary of the Montreal Protocol and UNIDO's efforts under the protocol.

⁴ http://www.multilateralfund.org/implementing_agencies.htm

and medium-sized enterprises, including sectors such as refrigeration, foams, aerosols, solvents, halons, fumigants and process agents. All countries UNIDO has assisted were reported to be in compliance with the Montreal Protocol.

The refrigeration sector accounts for one third of UNIDO Montreal Protocol projects, followed by the foam sector with 18 per cent of the projects. By 2007 UNIDO had contributed to the phase out of a total of 45,600 ODP-tonnes, representing 28 per cent of the total ODS phase-out achieved in developing countries.

As does the MP programme, also other UNIDO programmes and projects target environmentally conscious development of enterprises with implementation of principles, methodologies and technologies. UNIDO conducts initiatives within, among others:

- Industrial Energy Efficiency and Climate Change (including the Kyoto Protocol)
- Cleaner and Sustainable Production
- Stockholm Convention
- Strategic Approach to International Chemicals Management (SAICM) (including chemical leasing).

⁵ Maria Nolan, MLF Chief Officer, February 2009.



Findings

3.1. UNIDO – An effective implementing agency

The UNIDO Programme and Budget 2008 – 2009 defines the objective of Programme Component E6 “Montreal Protocol” as follows: “Countries are assisted to comply with their obligations under the Montreal Protocol through transferring non-ODS-based technologies to Article 5 countries and supporting them to meet the 2008 and 2009 targets in terms of tonnages of ODS to be eliminated.” The defined outcomes, performance indicators and outputs support this orientation of the efforts. The MLF and the Implementing Agencies in cooperation decide on the distribution of countries between the agencies.

Selection of sectors and companies is by and large determined by the national ozone unit and the national programmes. UNIDO has created and supported NOUs (including preparation of national ODP goals and programmes) in around ten countries. The NOUs appear to successfully having been able to direct the ODS phase-out efforts of the respective countries. All ODS projects carried out by UNIDO have targeted national goals prepared by the NOU and been aligned with and part of the national ODS policies and plans.

The MLF internal monitoring and evaluations show that UNIDO has been an efficient and effective implementing agency. The MLF monitoring states that UNIDO overall ODS phase-out targets have been met within budget and reasonable time. This is supported by the review of project completion reports and by the field validation mission in Indonesia.

The cost-effectiveness (in terms of kg ODP/US\$) of the UNIDO MP projects complies with the requirements of the MLF.

The destruction of manufacturing equipment in many investment projects (foaming, solvents etc.) provides good security for the factual phase-out of ODS. However, in some projects – for example methyl bromide, air-condition – the

easiness with which the consumer can reverse to ODS technology creates a certain insecurity about the lasting effects of a phase-out project.

The field validation mission showed that in Indonesia both the National Ozone Unit and the enterprises are in general very pleased with the MP programme and specifically with UNIDO's implementation work. Only the administrative processes from UNIDO could have been more efficient.

The design of the UNIDO MP projects is consistent with the generic theory of change presented in section 5. ODS phase-out has been reached through establishment of an NOU, substitution of technology, and training. Project objectives and components are clear, though not always feasible within the project timeframe (many projects experience delays of several months or even more than one year). Project outcomes are actually outcomes, not outputs or activities.

The project design has in general properly considered the capacities of institutions and stake-holders. Investment projects are carried out in direct cooperation between UNIDO staff and the enterprise. Lack of capacity has not been the main reason for the many delays of projects, most of these were (in the projects reviewed) caused by administrative problems with customs etc.

All projects reviewed have followed the MLF guidelines and procedures for project preparation, accomplishment, reporting and finalisation. All project documents provide baseline information based on a specific study and a sound monitoring & evaluation (M&E) plan to monitor results and track progress towards achieving project objectives, though no logical framework has been prepared.

All project documents strictly follow the MP guidelines and do not include risk assessments or assumptions. Risks and assumptions are somehow generic for all projects within a sector. In accordance herewith the PCRs do not include reporting on risks and assumptions.

Each project document includes a partnership agreement between UNIDO and the enterprise in question, including a description of roles and responsibilities. Roles and responsibilities were by and large given by the MP guidelines and reflected in the generic nature of project documents and project accomplishment.

The fact that all projects are in line with the intervention logic shows that the MP programme is really a programme, with a framework provided by the MLF.

Experience from project accomplishments has been fed back to the MLF and shared with other implementing agencies, and UNIDO MP projects have likewise gained from experience compiled in other projects under the MP.

Annual project reports have not been prepared as this is not required by the MLF. Monitoring of project ODS phase out results is carried out during project accomplishment by UNIDO MPB staff or (external) UNIDO consultants.

Subsequent to project completion the NOU is mandated to control each enterprise's production, import and consumption of ODS to ensure that reversion to ODS does not take place. The site visit to Indonesia gave evidence that some control is being carried out. However, it is a general experience from developing countries that environmental authorities very seldom inspect the enterprises.

The project completion reports provide documentation that the old ODS technology has been destroyed under control of UNIDO and/or NOU staff. Both the field validation mission and the survey support this finding.

Enterprises have received financial support to completely cover procurement and installation of the ODS technology, followed up by training. In addition, fully following MLF guidelines, enterprises have received compensation for their 'incremental operational costs' in the project period⁶. In some cases the support to incremental costs exceeded the funding of new technology. An example is one enterprise visited during the Field Validation Mission with 40 staff members, having received 190,000 USD as non-earmarked incremental operational costs.

In-kind contribution from beneficiary companies and stakeholders has been very limited or non-existing. There are isolated examples that enterprises being declared insolvent during project implementation (MP/BRA/01/217, enterprise Hornbug) or having changed production system and not needing the equipment (MP/BRA/01/217) have received UNIDO support.

3.2. Lasting impacts

The technological solutions for the individual enterprises have been selected by the enterprise in close cooperation with the UNIDO MPB staff and with subsequent endorsement by the MLF. The survey confirms that in most cases the technology selected have been relevant and has provided lasting benefits to the enterprise. The project documentation and the field mission however also gave evidence that in some cases the technology selected has not been useful for the enterprise.

⁶ The term 'Incremental costs' covers costs (additional to the normal operation cost) incurred in converting to non-ODS technologies.

The long lasting impact of the phased-out ODS in investment projects is strengthened through the (monitored) destruction of the old ODS production equipment in the beneficiary enterprises.

The long lasting impact of the methyl bromide projects is more insecure but is pursued through involvement of national training institutions, awareness raising and capacity building embracing health issues and Integrated Pest Management.

The lasting impact of initiatives within the maintenance sector is difficult to assess as reversal to ODS is technically easy.

The introduction of new and more sophisticated equipment in the enterprises give rise to need for additional training of operating staff, also in the longer term. Both the field validation mission and the survey indicate that sufficient capacity to deal with the new technology has been built at enterprise level and that the trained staff remains in position.

Neither the PCRs or other relevant project reports assess the sustainability of the implemented solutions – in terms of environment, economy or employment.

3.3. Cooperation in project implementation

Cooperation with the MLF Secretariat has been close (as required by the MLF); the MLF Secretariat comments on all project proposals, advises on the proposed choice of technology and compiles monitoring data throughout the projects.

UNIDO has at overall programme level cooperated with other implementing agencies – especially UNEP – on the MP programme. In a limited manner good practices/lessons learned are reported to the MLF and shared with other implementing agencies through the MLF.

The project documentation does not reveal any information about project level cooperation with other implementing agencies. Neither from documents, interviews or the Field Validation Mission has the review team found indications on cooperation between the UNIDO MP Branch and other branches/units of UNIDO, for example Cleaner Production, Energy and Climate Change, or Stockholm Convention. All these areas are closely related to the efforts of the MP Branch.

As an example, the capacity built through the UNIDO-UNEP CP Programme in many countries could have been enhanced in the ODS area. The National CP Centres could have been invited to support implementation of MP investment projects, hereby potentially strengthening the MP project in terms of creating sustainable industrial development. Also the option of establishing other

partnerships could have been investigated as part of the UNIDO MP efforts, including country, regional or thematic programmes.

According to interviews the UNIDO Field Offices have only to a limited degree taken actively part in MP project implementation.

There is no indication that the cooperation with other UNIDO programmes has been a high priority for management, no guidelines and no particular incentives have been provided for such a co-operation.

There is no general evidence or indication that cooperation with national institutions such as universities, sector organisations or environmental institutions has been sought. Similarly, there is no indication of involvement of regulatory bodies, regional/local environmental permit officers or environmental inspectors (apart from the NOU staff).

Given the multitude of relevant partnerships and options for cooperative initiatives, there is an unexploited potential to leverage expertise and resources at the programme and national levels.

Within a very limited context, the Field Validation Mission showed that UNIDO has in the methyl bromide sector worked with national competences including universities, relevant institutions and sector organisations.

Interviewees informed the review team that each MPB staff member has concurrently been responsible for up to 30 projects in many different countries. Thus, pursuing cooperation with other UNIDO branches or external stakeholders based on individual ambitions would have meant an additional workload added to an already full time schedule. MPB staff mentioned during interviews that a reason for not applying for additional support through the normal UNIDO project cycle was that the procedures are too time consuming, measured up to the tight MLF requirements.

UNIDO will have an active part in future ODS stock destruction. There will most likely be considerable similarities in processes and technology to the efforts within, for example, the Stockholm Convention, that could form the basis for cooperation between UNIDO programmes and branches.

The review team has not been able to identify systems or approaches supporting extraction of lessons learned from UNIDO MP projects to the benefit of both UNIDO MP branch and other UNIDO branches. The MP staff member's individual findings are briefly noted on the PCR, but do not seem to be fed into a database or in other way systematically disseminated to colleagues in the MPB nor to

UNIDO as a whole. The MLF to a certain extent carry out compilations of lessons learned (in which UNIDO has been involved) to be shared with other agencies.

3.4. UNIDO policies for sustainable industry

In 1990, the UNIDO Industrial Development Board approved an Environment Programme that directed the organisation to set up an environmental coordination unit and to integrate environmental considerations into its technical cooperation projects.

The 1995 annual report of UNIDO states the overall UNIDO objectives as 'to foster competitive industrial production, develop international industrial partnerships and promote socially equitable and environmentally sustainable industrial development'.

The 2005 UNIDO Strategic Long-term Vision states that UNIDO 'must profile itself as a competent, effective, and professional organization, contributing to relevant international development objectives and to sustainable industrial development.' And further: 'The international development objectives, in particular the Millennium Development Goals (MDGs), and the developments in the world economy, especially the complex process of economic globalization and marginalization of poor countries, will together be the major driving forces determining the future scenarios. Added to these are the problems of environment and energy which impact on industrial development'.

In 2007, UNIDO expressed that 'Promoting economic growth in developing countries and economies in transition in a sustainable manner is at the core of all of UNIDO activities'⁷. And the 2008 UNIDO Medium-term Programme Framework, 2010-2013, further strengthens the focus on sustainability with the overall development objective 'Sustainable industrial development and equitable globalization'.

The UNIDO "Position Paper on Sustainable Industrial Development"⁸ expounds 'Sustainable industrial development' as a combined effort for environmental, economic and social improvements. The Position Paper states that 'in monitoring industry's sectoral contribution to sustainable development, all three dimensions of the concept have to be taken into account'.

UNIDO today describe itself as 'The specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization

⁷ Clough, Graham, 2007.

⁸ UNIDO Position Paper: Sustainable Industrial Development, 1998.

and environmental sustainability'⁹. The web-presentation of UNIDO further states: As a leading provider of services for improved industrial energy efficiency and sustainability, UNIDO assists developing countries and transition economies in implementing multilateral environmental agreements and in simultaneously reaching their economic and environmental goals. Through this thematic priority, UNIDO mainly addresses MDG 1 (Eradicate extreme poverty and hunger), MDG 3 (Promote Gender equality and empower women), MDG 7 (Ensure Environmental Protection) and MDG 8 (Develop a Global Partnership for Development).

On the UNIDO Montreal Protocol website, UNIDO states that 'the activities also enable the industries concerned to achieve increased productivity and an improved economic performance in terms of lower operating costs, less maintenance and higher product quality and reliability. These activities also make a major contribution to generating employment, both by sustaining existing jobs and creating new ones'.

The most prominent up-to-date explanation and application of the term sustainable industrial development is that of the UN Global Compact¹⁰: '(...) businesses that are committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption'. In line with the Global Compact approach, the Global Reporting Initiative for Sustainable Industries include around 80 sustainability indicators in their reporting framework structured in themes as: Economic performance; Environmental performance; Social performance; Human rights etc.

¹¹

In contradiction to the above, the UNIDO Business Plans for Montreal Protocol Activities targets exclusively ODS phase-out, no additional environmental or non-environmental effects. Similarly, annual UNIDO reports on the MP Programme are solely concerned with ODS phase-out achieved and the dollar amount of expenditures. There is no measuring of indicators in a broader sustainability perspective.

3.5. The Multilateral Fund and non-ODS effects

The MLF's nearly 800 pages long 'Policies, Procedures, Guidelines and Criteria of the Multilateral Fund' provides very detailed information to the implementing

⁹ <http://www.unido.org/index.php?id=7840>

¹⁰ The UN Global Compact is a leadership platform, endorsed by Chief Executive Officers, and offering a strategic platform to advance their commitments to sustainability and corporate citizenship. <http://www.unglobalcompact.org>

¹¹ <http://www.globalreporting.org>

agencies on relevant matters connected to ODS phase-out project implementation. The document is updated three times per year.

The 'Policies, Procedures, Guidelines and Criteria of the Multilateral Fund' is strictly focused on ODS and does not include any requirements, targets, indicators or procedures concerning non-ODS outcome of the MP projects.

MLF-funded projects are not allowed to target any other issue than ODS phase-out in order not to distort competition or reduce the ODS phase-out outcome of the funds. Any additional non-ODS targets will cause rejection of the application or deduction of funds allocated to the project.¹²

The Executive Committee of the MLF each year reviews the performance of the implementing agencies, measured on project cycle parameters and ODS performance: Number of annual programmes and projects approved vs. planned; Milestone activities completed; ODS phased-out for individual projects vs. those planned per progress reports; Speed of financial completion vs. that required per progress report completion dates; Timely submission of project progress and completion reports. In light of the review, the Executive Committee of the MLF reconsiders the Implementing Agencies' funding shares of the investment project allocation¹³.

3.6. Sparse non-ODS effects of UNIDO MP projects

According to MLF, the MP projects can not (at least not financed by MLF funds) pursue non-ODS effects. Thus, the PCRs do not report on non-ODS outcomes or impacts achieved. There is no project design guidance for the staff of the three implementing agencies executing MLF funded investment projects on how to maximize associated benefits, i.e. sustainable development impacts, at no additional (incremental) expense to the MLF.

No UNIDO guidelines or approaches for inclusion of non-ODS targets or indicators in MP projects exist, nor have MPB staff or management expressed specific ambitions stretching beyond ODS phase-out. As a result, UNIDO does not measure the non-ODS effects of the MP projects.

¹² Confirmed by Eduardo Ganem, representative of the MLF Secretariat: 'No additional non-ODS targets can be pursued with MLF funds', August 2009.

¹³ Investment projects (technology substitution) constitute more than 95 % of the annual UNIDO MP project spending. The remaining are Non-investment activities (technical assistance, institutional strengthening etc.) Source: UNEP 2005-2007 Consolidated Project Completion Reports.

As some ODS are at the same time potent greenhouse gases (up to 10,000 times more potent than carbon dioxide), the MP projects have (un-intentionally) provided a significant reduction of the global warming impact of the countries supported. In some projects, potent CFCs have been substituted with HCFCs that also have a considerable global warming potential. This does not significantly affect the overall very positive result on global warming of phasing out ODS.

Interviews, the field validation mission and the survey show that at individual project level, occasionally positive non-ODS effects have occurred – mainly due to specific efforts from individual project managers that have communicated more directly with enterprise managers:

- Slightly improved productivity, products and competitiveness ¹⁴.
- Improved environmental performance of the enterprise due to the reorganisation and introduction of new equipment, introduction of good housekeeping measures.
- Improved occupational health, for example exhaust systems.
- Application of cleaner production approaches and managerial awareness in grain storages, where ODS phase-out is not a simple technical matter. Reversal to ODS is very easy and requires no investments, why the enterprise must have a more thorough understanding of the benefits of non-ODS technology in order not to reverse.

Also negative effects have occurred:

- The technologies implemented in some projects, including one of the visited enterprises during the field validation mission, was neither environmentally nor financially rational. A traditional ODS technology was substituted with a new ODS technology using HCFC which is also an ODS (though less potential than the previously used CFC) and a potent greenhouse gas. This new technology is to be substituted in the next phase of the Montreal Protocol programme.
- Luken and Grof (2005) refer to a case of a Chinese ODS phase-out project causing severe problems with hazardous waste.
- MPB staff mentioned during interviews that a highly flammable isobutane storage in one project was placed in the immediate vicinity of a village.

¹⁴ Improved productivity is mentioned in a few project reports and observed at the field validation mission. Luken (2008) states: "Only in a few cases did these ODS projects improve the competitiveness of enterprises in domestic and international markets and sustain or actually increase employment opportunities. These few cases occurred because some project managers implemented their projects with this aim in mind".

Enterprises having received MP support vary significantly in size. The field validation mission included enterprises in the size from 30 employees to more than 20,000 employees. Relatively, in small and medium-sized enterprises the support has been substantial with a potential positive impact on the enterprise performance. Not least the considerable support to cover 'Incremental costs' have in some cases meant significant benefits for the enterprise.

The field validation mission did not provide indications that the induction of considerable funding and environmentally advanced technology in general has encouraged the beneficiary enterprises to work more proactively on improving their environmental performance or technology.

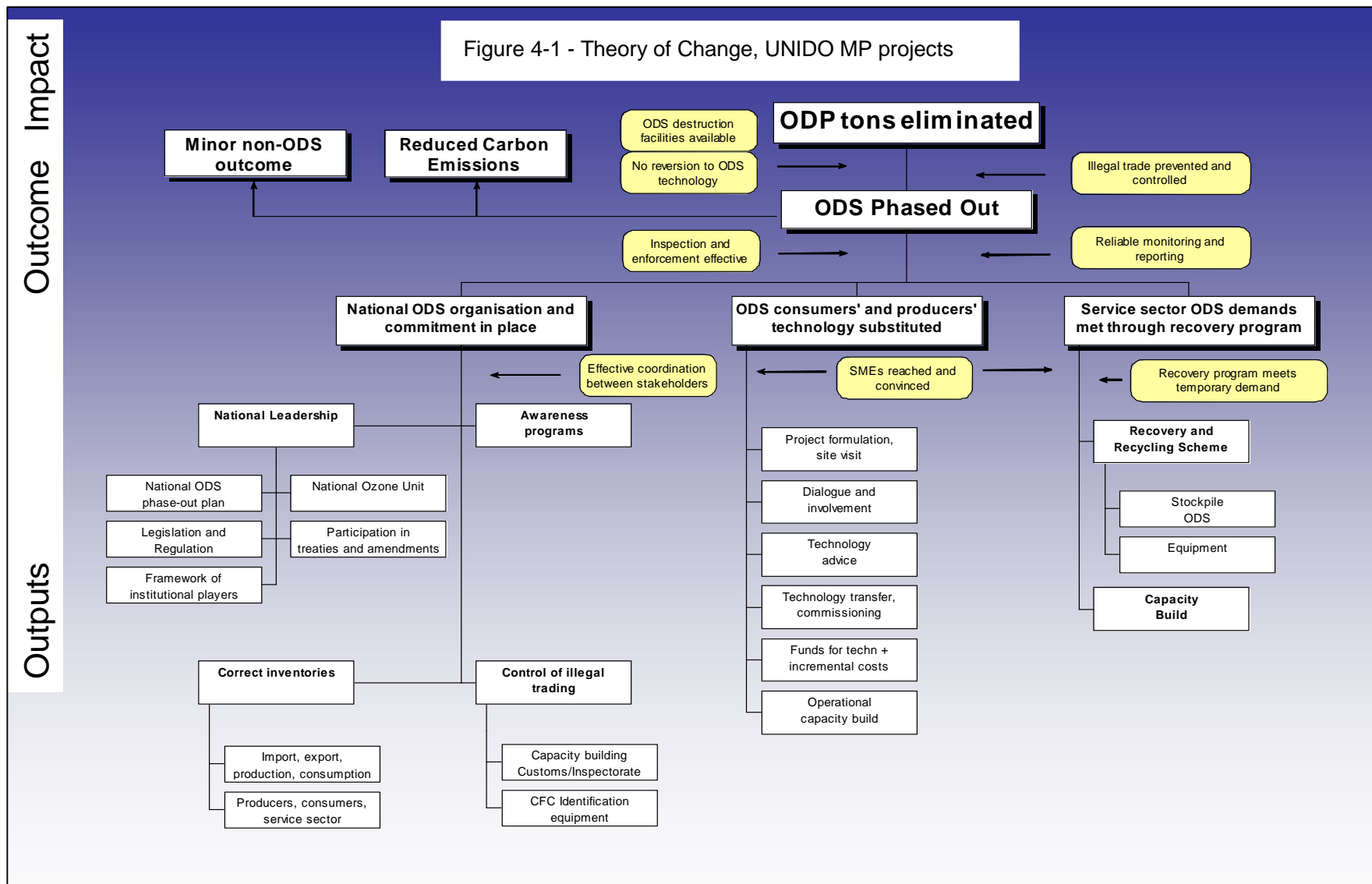
3.7. Design and Theory of Change

An overall intervention logic characterises the UNIDO MP programme as illustrated in the figure below. The basic cause-effect chain can be described as follows:

- a) a1 Establishment of an NOU has provided national commitment, plans, regulation and monitoring systems necessary for targeting total phase-out of ODS.
a2 Financial and technical support to ODS producers and consumers has ensured substitution of technologies.
- b) Due to substitution of technologies for production and use of ODS, supply and demand have been eliminated, and the ODS consumption phased out.
- c) This will lead to a healthier ozone layer.

The figure describes the logic of the interventions in more detail, exposing a number of assumptions and drivers (in yellow boxes) and the three typical types of MP projects:

- Formation of NOU with all its activities
- Substitution of production and consumption technology
- Establishment of an ODS recovery scheme.



The figure describes the logic of the interventions in more detail, exposing a number of assumptions and drivers (in yellow boxes) and the three typical types of MP projects (National ODS organizations support, ODS technology substitute, Service sector), all of which are dealt with by UNIDO:

The assumptions underlying the Theory of Change are crucial for understanding the intervention logic and for delivering or non-delivering the outcomes of the programme. Some of the assumptions included in the theory of change (TOC) are

- Nations receiving ODS phase-out support from UNIDO must in practice demonstrate commitment to establish and effectively operate a National Ozone Unit, the organisational framework necessary for phasing out and controlling consumption of ODS. The organisational framework is needed to ensure, among others: National phase-out plans; An effective regulatory cycle (legislation, licenses, compliance control, enforcement); Control of illegal trade; Awareness raising. The organisational and individual capacities built should be maintained to address ODS issues.
 - The field mission validated this assumption as far as the Indonesian Ministry of Environment through the establishment and operation of the NOU has demonstrated willingness and capability to carry out the tasks envisaged by the MLF. The survey has confirmed the view that national regulation and control hinders enterprises from reversing to or starting up with ODS technologies.
- In contradiction to the above messages, it is a common experience from developing countries that environmental regulation is not effective in hindering or putting an end to violations of environmental law.
- The baseline inventory of substances (import, export, ODS production volumes, ODS consumption) and ODS-actors (producers, consumers and service sector enterprises) must be reliable as this forms the basis for identification of enterprises and interventions. As all stakeholders in the chain have an economic, organisational and/or environmental interest in identifying and phasing out ODS, the inventories are assumed to be correct.
 - It has not been possible to verify or substantiate this assumption during this review.
- According to MP requirements the implementing agency shall in all investment projects (foaming, cleaning etc.) control the destruction of old ODS technology when new equipment has been installed. This will hinder reversal to previous production methods.

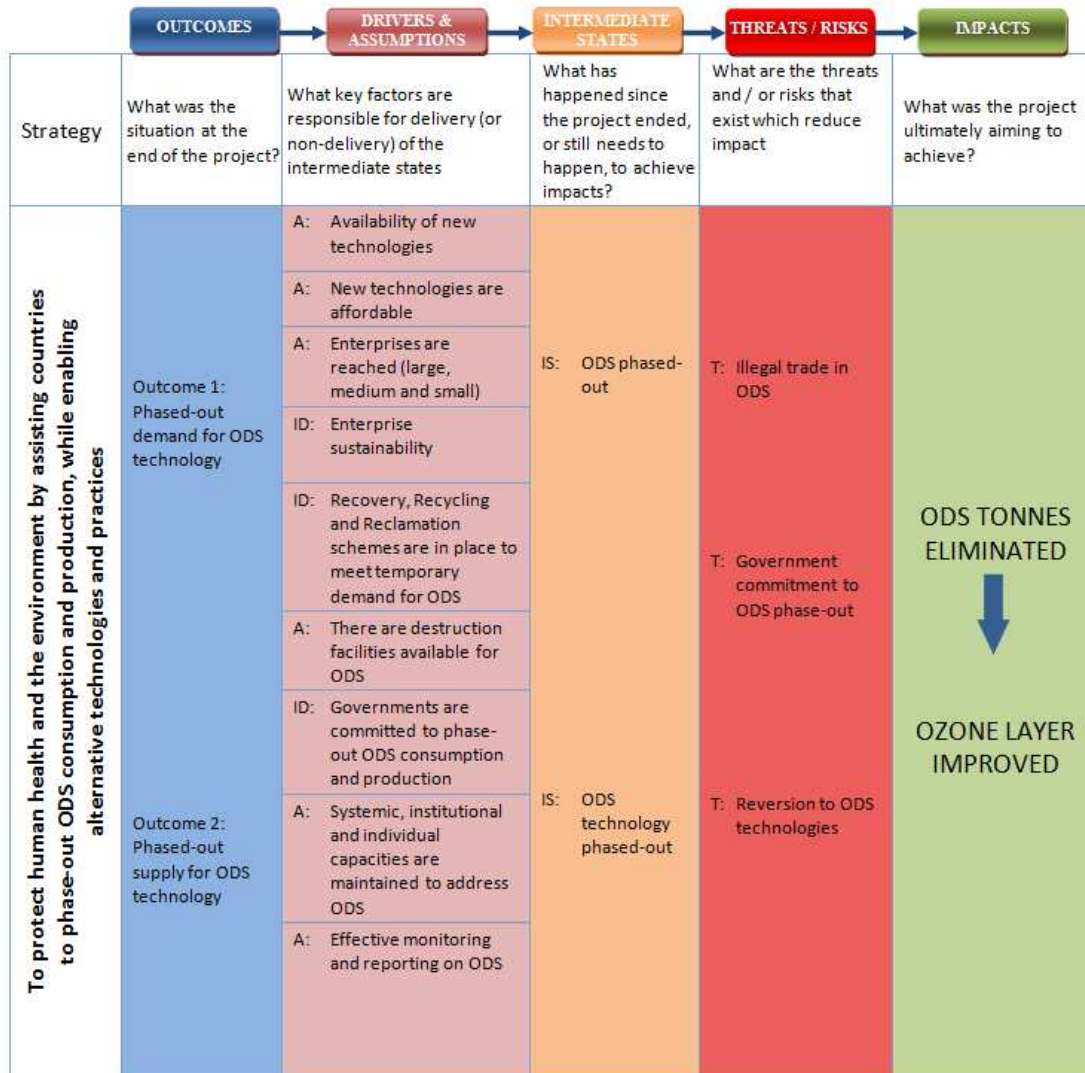
- The field mission validated this assumption. Old ODS equipment in manufacturing enterprises has as a rule been destroyed (controlled by the project staff) after implementation of the non-ODS technology. Also the survey clearly supports the assumption that old ODS equipment is destroyed after installation of non-ODS technology.
- Two of four enterprises visited during the field validation mission were unable to utilise all the provided equipment due to financial constraints. This illustrates a weakness in the generic theory of change, namely the assumption that firms can afford using the equipment.
- Within two sectors of UNIDO intervention, tobacco farming and grain storage, the phased-out ODS methyl bromide can relatively easily be re-introduced. It is assumed that UNIDO staff is able to convince the managers that the overall benefits (occupational health, sound practices etc.) of non-ODS control of pests are superior to the often less complicated and non-costly use of methyl bromide.
 - The field visit showed that to reduce risk for reversal to ODS in grain storages, the UNIDO staff worked intensively with emphasising additional positive aspects of non-ODS technology, including improved occupational health and reduced risks.
- Especially in relation to refrigeration, air-conditioning and the agricultural sector (grain storage and tobacco farming) it is important to combat and control illegal trade with ODS. UNIDO has not been deeply involved in these sectors. Smuggling of CFCs has been said to be the second most lucrative smuggling operation after illegal drugs. The size of the CFC black market is estimated by the United Nations to range from 20,000 to 30,000 metric tonnes annually. In late 1995, as much as 20% of CFCs then in use in the world were believed to have been obtained on the black market, with a similar picture reported in 2006 .
 - Illegal trade is a less important problem with respect to the industrial target group for UNIDO interventions as the substituted ODS technology in the manufacturing enterprises has as a rule been destroyed after implementation of the new equipment.
 - The field validation mission did not encompass visits to grain storages. According to the Indonesian UNIDO expert in grain storage it is not possible to assess the sector's compliance with phase-out plans. The survey points out that illegal trade with ODS is a problem that must be effectively dealt with to further eliminate the use of ODS in the mentioned sectors.

- Many of the enterprises using ODS technology in UNIDO supported sectors as cleaning and foaming are small or medium sized – and the dominance of SMEs is even more evident in the servicing sector (where UNIDO has played a minor role). ODS phase-out initiatives should specifically include SMEs to ensure that the considerable ODS consumption in these enterprises is also phased out.
 - The field mission supported the assumption that SMEs are included in the phase-out activities. According to the NOU, all relevant enterprises including SMEs have been reached through the national efforts, and this is confirmed by the list of enterprises having received UNIDO MP support. Also several of the enterprises visited during the field mission were SMEs, and the survey supports this assumption. A specific challenge in relation to SMEs is that environmental inspection is often insufficient to follow up on the ODS phase-out achieved – why the lasting effects of the efforts is rather insecure.
- The refrigerant recovery, recycling and reclamation programme established should have sufficient volume to meet temporary demands, or new (possibly illegal) ODS will be purchased.
 - The field validation mission and the survey have supported this assumption. However, the field mission also gave evidence that a large amount of ODS is illegally imported to Indonesia every year, especially for air-condition systems and household cooling equipment. Thus, within these sectors there is a risk that more ODS than registered is being consumed.

Comparison with GEF Theory of Change

- The ongoing GEF Impact Evaluation of the Phase Out of ODS presents a Theory of Change mapping out the logical sequence of means-ends linkages in the GEF MP programme .
- Although the GEF is not linked formally to the Montreal Protocol, its Ozone Layer Depletion Focal Area and the subsequent strategic revisions are an operational response to the Montreal Protocol and its adjustments and amendments. GEF focuses on supporting economies in transition that are parties of the Montreal Protocol that are not eligible for funding under the MLF.
- The GEF TOC presented in figure 4.3 is to a large extent similar to the above presented UNIDO Theory of Change (figure 4.2). The GEF TOC does not include non-ODS effects.

Overview of the GEF Theory of Change for ODS projects



VI

Conclusions, recommendations and lessons learned

5.1. Conclusions and recommendations

CONCLUSION
UNIDO support for the phase-out of production and consumption of ozone depleting substances in developing countries has been successful in achieving the targeted ODS phase-out.
CONTRIBUTING CONCLUSIONS
<ol style="list-style-type: none">1. UNIDO became an Implementing Agency in the Montreal Protocol in 1992 and from 1995 has received a substantial share of the MLF programme – increasing from 4 % of the MLF total allocation in 1992 to around 25 % (or 40 million US\$) in 1995 and the following years. UNIDO has implemented more than 1.100 MLF-projects in 85 countries, covering a wide range of sectors, including refrigeration, foams, aerosols, solvents, halons, fumigants and process agents. In 2007, all countries that UNIDO has assisted were in compliance with the Montreal Protocol, though these nations need further guidance to meet the final targets and schedules of the Protocol.2. UNIDO has phased out more than 45,600 ODP-tonnes, representing 28 per cent of total phase-out achieved in developing countries. MLF reports and the field validation mission have given evidence that UNIDO support in general and specifically to Indonesia has been effective and highly appreciated. The specific UNIDO approach in which agency expertise cooperate directly with enterprise management has proven effective.3. The simplicity of the MP efforts, focusing on one clearly defined objective (ODS phase out), is a key reason for the success, i.e. the good results in terms of ODS phase out. The experience supports that single purpose programmes are typically easier to implement successfully than multi purpose and complex efforts.4. The UNIDO MPB experience could be utilised to improve efficiency in other UNIDO programmes.

CONCLUSION
All reviewed projects have been implemented in line with the underlying Theory of Change. The projects have strictly followed the MLF guidelines.
CONTRIBUTING CONCLUSIONS
<ol style="list-style-type: none"> 1. The Montreal Protocol exclusively aims at phasing out ODS. Guidelines and procedures from the MLF precisely state objectives, structure and processes of the projects carried out by all implementing agencies, including UNIDO, under the Montreal Protocol. The MP projects carried out by UNIDO each have an individual project document. The similar structure (no specific logframes have been developed) and approach of these documents demonstrate the existence and value of the intervention logic. 2. Implicitly, also the intervention logic and the Theory of Change are given by the MLF through the precise guidelines and procedures. The Theory of Change is based on a number of assumptions, of which the most important in terms of UNIDO project implementation have been confirmed by the review while in some cases the causal links between outputs and outcomes/impact are weak (e.g. risk of reversal to ODS in grain storages).. 3. There are weak parts of the theory of change (risk of reversion in some sectors, illegal trade), which only affect UNIDO little, since UNIDO mainly works in other sectors. 4. The rules and guidelines of the MLF do not allow implementing agencies to use MLF funds for pursuing non-ODS outcome such as productivity, competitiveness, occupational health, or environmental issues additional to ODS phase-out. Non-ODS initiatives will be questioned by the MLF and project funding reduced corresponding to the funds allocated to non-ODS efforts. 5. The MLF has not sought to support the implementing agencies with guidelines or examples for achieving non-ODS effects that did not entail additional costs to MLF or impinge upon the ODS phase-out objective.

CONCLUSION	RECOMMENDATION
Lessons learned from the MP projects have not systematically contributed to learning across UNIDO branches.	Exploit the learning potential of MP projects
CONTRIBUTING CONCLUSIONS	SUPPORTIVE RECOMMENDATIONS
<ol style="list-style-type: none"> 1. There is a certain potential for UNIDO to learn from the MP projects, in particular with regard to enterprise-level technology transfer, including: The relatively standardised approach combined with a specific method for enterprise analysis; the close cooperation with enterprises; the joint (UNIDO/enterprise) selection of quality technology; the provision of capacity building along with technology implementation; the inclusion of 	<p>UNIDO should more systematically pursue sharing of lessons learned between programs and branches.</p> <p>The MP Programme should adopt a systematic approach to compile lessons learned from MP projects (cooperation, technology transfer, institution building, subcontracting, role of UNIDOs experts etc.) and to disseminate this information in the MP Branch and to other UNIDO</p>

<p>national institutions specifically in methyl bromide projects.</p> <ol style="list-style-type: none"> 2. Project indicators in MP project completion reports (PCRs) focus on implementation of the project according to plans and ODS phase-out achieved. The PCR also allows for recording of lessons learned from project accomplishment but project managers have given low priority to this field. The communication between UNIDO staff and enterprises ends with the final transfer of equipment to the enterprise, and there is no recording of the projects' subsequent possible impact on enterprise performance. 3. Extraction and dissemination of lessons learned from UNIDO MP projects within UNIDO have not been carried out in a systematic manner, and neither the UNIDO MP branch nor related branches of UNIDO – e.g., Cleaner Technology – have benefitted from knowledge compiled from MP projects. 4. Extraction of useful lessons learned could have been supported by guidelines and good examples, illustrating the benefits of learning from experience. 	<p>programmes and relevant stakeholders.</p> <p>The experience of the MP programme, the specific approaches used and the potential linkages with UNIDO's organisational objectives and outcomes should be distilled into a concise programme document. Such a document could be used as a tool for communication with project staff, national stakeholders, new UNIDO MP staff and other UNIDO branches who currently know little about the MP approaches.</p>
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CONCLUSION	RECOMMENDATION
The potential for cooperation with other initiatives and stakeholders has not been exploited	Enhance Synergy & Collaboration within UNIDO and with other stakeholders
CONTRIBUTING CONCLUSIONS	SUPPORTIVE RECOMMENDATIONS
<ol style="list-style-type: none"> 1. UNIDO has conducted MP projects in many countries in which other relevant initiatives were simultaneously carried out, and in which relevant international, national and institutional capacities for co-operation were present. Among the most relevant options appears to be cooperation with the Industrial Energy Efficiency and Climate Change programme, the Cleaner and Sustainable Production programme, the Stockholm Convention initiatives and the Strategic Approach to International Chemicals Management (SAICM). 2. The review found only limited evidence on ongoing collaboration with other UNIDO programmes and branches. UNIDO Field Offices have only to a limited degree taken actively part in MP project implementation. There are also only few examples of cooperation with other UN Agencies, donor institutions, universities, sector institutes, environmental authorities or other initiatives in the field of industry, environment and sustainability. 3. There are significant differences between the MP approach and culture on the one side and the CP approach and culture on the other side. MP delivers technology aiming at solving a specific problem, whereas CP delivers concepts and approaches, aiming at supporting the enterprise in assuming responsibility for reducing its environmental impact. These to approaches should be seen as complementary and not as competitive. 4. The potential benefits of cooperation include: Capacity building in the 	<p>UNIDO management should formulate a clear strategy to induce cooperation between the MP branch and other UNIDO branches and programmes aiming at synergetic benefits. Also institutional guidelines for intra- and inter-agency cooperation should be prepared.</p> <p>The Programme should pursue a culture in which program managers take advantage of the multitude of potential partnerships and collaborative efforts that can be established with international, national and local stakeholders.</p> <p>UNIDO should consider capacitating the Field Offices and enable them to play an important role in pursuing non-ODS effects through local involvement and additional funding. Field Offices could also be instrumental in involving stakeholders and for post-project monitoring of outcome.</p> <p>Synergy can be achieved through a multi-disciplinary approach, in which technical experts are supported by generalists and planners.</p> <p>Paving the road for increased internal and external cooperation UNIDO MPB should compile good case stories, initiate pilot projects, develop and test tools and approaches for cooperative efforts, and prepare a MPB guideline for cooperation.</p> <p>A fast track cooperation mechanism is needed to enable swift establishment of interagency partnerships. This</p>

<p>involved institutions and at enterprises in order to ensure lasting and sustainable results; Awareness raising, process knowledge and monitoring skills for environmental authorities; Synergies through joint efforts at enterprise level for a more holistic impact on the enterprises' environmental performance, for example: implementation of cost free / low cost environmental or other approaches in investment projects (including Good Housekeeping measures).</p> <p>5. The review has not found information documenting that UNIDO has in guidelines or otherwise strived to encourage the MP Branch to create synergies and achieve additional impact through cooperation with other institutions and stakeholders.</p> <p>UNIDO will have an active part in future ODS stock destruction. There will be considerable similarities to the efforts within other international agreements on chemicals, Stockholm POP that could form the basis for cooperation between UNIDO programmes and branches.</p>	<p>could also allow for co-funding from other donors to cover non-ODS components of more integrated projects and programmes.</p>
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CONCLUSION	RECOMMENDATION
UNIDO has not sought to target non-ODS effects in MP projects.	Use the leverage of MP projects to promote sustainable industrial development
CONTRIBUTING CONCLUSIONS	SUPPORTIVE RECOMMENDATIONS
<ol style="list-style-type: none"> 1. As some phased-out ODS are very potent greenhouse gases, the MP projects have as a side effect unintentionally provided a significant reduction of the global warming impact of industries covered by the projects. 2. Modest non-ODS effects have been achieved on some enterprises, un-intentionally or due to individual UNIDO project managers' specific efforts: Slightly improved productivity, products and competitiveness; improved environmental performance due to the reorganization and introduction of new equipment and good housekeeping measures; improved occupational health, for example exhaust systems; application of cleaner production approaches and managerial awareness specifically in grain storages. The examples show that it has been possible for some project managers to look beyond ODS effect in the implementation of MP projects. 3. Acknowledging the above, UNIDO has not sought to target non-ODS effects in the projects, nor have indicators for non-ODS effects been systematically monitored. Such efforts have been regarded as against MLF guidelines and a potential threat to UNIDO's position as implementing agency. 4. UNIDO has not tried to incorporate in projects non-ODS benefits that would not entail additional costs to MLF or impinge upon the ODS phase-out objective. This could most probably have been done without conflict with MLF guidelines 	<p>In this context UNIDO should consider formulating guidelines for the design, implementation and monitoring of MP projects. In order to ensure maximum impact of MP projects on sustainable industrial development, such guidelines should address especially the issues of a) how to address non-ODS issues and b) how to cooperate with other UNIDO branches and initiatives on the ground.</p> <p>The Programme should adopt a broader management model and develop a comprehensive system to monitor performance in a broader context, including institution- and capacity building as well as non-ODS effects.</p> <p>UNIDO should initiate a dialogue with the MLF to fully clarify the present room for inclusion of cost free non-ODS targets in MP efforts.</p>

<p>and could have been promoted by complementary UNIDO MP implementation and monitoring guidelines. There is no evidence on UNIDO management requirement or support to such additional efforts that could include initiatives embraced by the Millennium Development Goals and/or the UN Global Compact Initiative, for example:</p> <ul style="list-style-type: none"> • Promotion of health and safety measures and systems, including specific protection of females and youngsters • Elimination of all forms of forced and compulsory labour and child labour • Application of a precautionary approach to environmental challenges; initiatives to promote greater environmental responsibility; and development and diffusion of environmentally friendly technologies. • Introduction of basic Good Housekeeping measures and energy saving initiatives with short pay-back time and/or immediate environmental benefits 	
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CONCLUSION	RECOMMENDATION
The potential for supporting sustainable industrial development has not been exploited	UNIDO should exploit the potential of the MP programme to promote sustainable industrial development.
CONTRIBUTING CONCLUSIONS	SUPPORTIVE RECOMMENDATIONS
<ol style="list-style-type: none"> 1. UNIDO is 'The specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability'. UNIDO policies and documents express the role of UNIDO as promoting sustainable industrial development. 2. The MP projects have contributed 	<p>With sustainable industrial development as an overarching goal, UNIDO could consider fledging out visions and strategy to provide more clear directions for UNIDO branches.</p> <p>UNIDO efforts for promoting sustainable industrial development in MP projects could embrace many different measures, including:</p>

<p>to industrial sustainability by phasing-out environmentally harmful ozone depleting substances.</p> <p>3. However, promoting sustainable industrial development is a complex and interdisciplinary challenge that requires multi-faceted efforts. This is clearly acknowledged by UNIDO in its web-published mission statement – and supported by the concepts of the UN Global Compact and the Global Reporting Initiative.</p> <p>4. The review has not found evidence that UNIDO has strived to apply such a universally accepted sustainability approach in the development and implementation of MP projects.</p>	<ul style="list-style-type: none"> - Management techniques, incentives and motivation - Guidelines, case stories, tools, pilot projects - Capacity building - Establishment of a monitoring and indicator systems <p>The potential contributions from UNIDO MP investment projects to sustainable development could probably be amplified with explicit project design guidance on sustainability potential for the technical staff executing the projects.</p> <p>UNIDO could have initiated a management level dialogue with the MLF to clarify to which extent such guidance could include additional factors to be considered in project documents and project completion reports, for example (as proposed by Luken (2008)): Other positive and negative environmental consequences, proposed supplementary investments by plants current and estimated future domestic and market shares and current and estimated future technical skills of plant personnel. In addition, plants would have been required to maintain records on changes resulting from the investment project, such as air emissions and hazardous wastes, market shares and employment.</p> <p>For example, in the future, MP branch could submit their projects to MLF and at the same time submit to UNIDO a complementary note on how the project will contribute to sustainable development. This would include possible linkages to other UNIDO activities in the country.</p>
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5.2. Lessons Learned

Lesson learned 1: UNIDO possesses the competences necessary to implement international agreements effectively and efficiently.

UNIDO's efforts within the Montreal Protocol have been effective and efficient, clearly appreciated by enterprises, national authorities and the MLF.

Lesson learned 2: The corporate UNIDO vision needs to be more thoroughly implemented in programmes funded by institutional donors.

Experience from the MP projects show that well conceived UNIDO sustainability visions and policies need to be supported by management to ensure actual application in project implementation.

UNIDO management should therefore through guidelines and capacity building seek to mainstream UNIDO's own core objectives of promoting sustainable industry more thoroughly into programmes such as the MP programme. This should be accompanied by a set of sustainability indicators to be adopted in all programmes.

Lesson learned 3: UNIDO systems do not ensure organisational learning from individual programmes.

Many different aspects and experiences of the MP projects' direct work with industries could be of interests and benefit for the MP Branch and the UNIDO as a whole. Also, the huge programme entails clear options for cooperation between UNIDO branches. This has not happened. It seems that UNIDO systems and approaches do not ensure organisational cooperation and learning even from large scale programmes.

Lesson learned 4: Industries in developing countries do not necessarily use injection of specific technology and financial resources as a stepping stone for sustainable development.

There is no general indication that technology provision and financial support lead to more conscious production practices in terms of environment, occupational health etc. With framework conditions staying unchanged (especially regulatory framework and enforcement capacities) enterprises have a tendency to revert to the cheaper technological options. Thus, the technology transfer experience from the UNIDO MP projects cannot be directly applied by other UNIDO programmes, where no multilateral environmental agreement (MEA) and corresponding national commitments provide the necessary framework conditions for long-term technology conversion.

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Annex 2: Terms of Reference



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Terms of Reference

Review to extract lessons learned from UNIDO Montreal Protocol projects

December 2008

10-12-2008

I. Background and overview

Origin and context of UNIDO Montreal Protocol

Until about a decade ago, the lack of knowledge about atmospheric chemistry and processes led to a significant depletion of stratospheric ozone levels. Man-made chemicals, especially chlorine and bromine compounds, such as chlorofluorocarbons (CFCs), halons, and a broad range of industrial chemicals attack the ozone layer and are recognized as ozone depleting substances (ODS). Moreover, by enhancing the process of climate change they disturb food chains and so have an effect on agriculture, fisheries and biological diversity. Without the Montreal Protocol the levels of ozone-depleting substances would have been five times higher than they are today, and surface ultraviolet-B radiation levels would have doubled at mid-latitudes in the northern hemisphere. On current estimates the CFC concentration in the ozone layer is expected to decline to pre-1980 levels by 2050.

The Montreal Protocol-related activities are closely linked to activities carried out under other UNIDO service modules with the common aim of ensuring sustainability. These include:

- • Phasing-out of methyl-bromide, which is used for soil fumigation and post-harvest protection treatment, thereby contributing to a better development of the food processing industry through the use of safer raw materials;
- • Conversion of technologies used by refrigerator manufacturers, which enables them to produce more efficient appliances and achieve energy reductions at national levels consistent with UNIDO's approach to industrial energy efficiency;
- • Identification and application of non-ODS production technologies consistent with the objective of the service module for investment and technology promotion to bring advanced and more appropriate technologies to the marketplace;

- • Assistance to local authorities in institutional strengthening for the preparation of regulations, codes of good production and maintenance practices, environmental protection, and occupational health and work place safety, which is consistent with UNIDO's goal to strengthen the legal and regulatory framework for conformity; and
- • Provision of capacity building services to strengthen SMEs, which is consistent with UNIDO's goal to assist developing countries in providing an enabling environment for the growth of the private sector.

This service module has a significant “global forum” component, involving in particular the participation at various meetings to assess the progress of the Montreal Protocol activities. Most of the meetings in which UNIDO participates are gatherings of the policy-making bodies of the Protocol, and are the most important occasions for consultations with government officials, members of the Executive Committee (ExCom) and Secretariat of the Protocol, and the implementing agencies of the Multilateral Fund. These meetings comprise meetings of the Parties, meetings of the ExCom and its sub-committees on project review and on monitoring, evaluation & finance, and meetings of the Implementation Committee. At these meetings policy decisions are made on the current and future activities of the Fund. Furthermore, they give the Parties the possibility to make a comparative analysis among the implementing agencies based on their reported performance and provide the possibility for our Organization to be consulted on these and other substantive issues.

The objectives of UNIDO MP initiatives

There is a need to phase out production and the consumption of ozone-depleting substances (ODSs), which are leading to the continuing degradation of human health and the natural environment. The Vienna Convention and the Montreal Protocol provide a response to that need. This programme component assists the Governments of developing countries that are signatories to the Montreal Protocol to comply with its requirements through projects financed by the Multilateral Fund of the Protocol.

Accordingly, the UNIDO Programme and Budget 2008 – 2009 defines the objective of Programme Component E6 “Montreal Protocol” as follows:

“Countries are assisted to comply with their obligations under the Montreal Protocol through transferring non-ODS-based technologies to Article 5 countries and supporting them to meet the 2008 and 2009 targets in terms of tonnages of ODS to be eliminated.”

Outcomes and outputs are defined as:

Outcomes	Performance indicators	Sources of verification
Enterprises/farms meet international market standards owing to adoption of non-ODS-based technologies	Number of enterprises/farms having installed production lines/ alternative techniques with environmentally friendly (non-ODS based) technologies	Company records and statistics Data reports of relevant Government agencies UNIDO annual Business Plan and Progress and Financial Report Project Completion Reports
Countries that have been assisted comply with their obligations under the Montreal Protocol	Number of countries that sign amendments to the Montreal Protocol Number of countries that have adopted policy in accordance with Montreal Protocol Number of tons of ozone-depleting substances eliminated	

Outputs

- Governments assisted in strengthening their Ozone Units, legislation, monitoring, public awareness and reporting functions;
- Country based activities coordinated among implementing agencies, bilateral donors, Multilateral Fund Secretariat and Ozone Secretariat;
- Stakeholders informed and qualified;
- Conversion projects successfully completed;
- Information material made available and disseminated.

While these definitions are taken from the current programme and budget, it can be assumed that objective, outcomes and outputs have been applied since the beginning of the UNIDO MP partnership.

While primarily concerned with the issue of eliminating ozone depleting substances (ODS), it is assumed that the activities carried out by UNIDO in the area of MP also enable the industries concerned to achieve increased productivity and an improved economic performance in terms of lower operating costs, less maintenance and higher product quality and reliability. Likewise, MP projects also have a potential to make contributions to generating employment, both by sustaining existing jobs and creating new ones.

II. Objectives and scope of the review

The review will focus on the design and implementation of technical assistance projects in the area of ODS phase out. It will not look into the “global forum” activities of the Montreal Protocol Branch (PTC/MPB).

Projects of the Montreal Protocol (MP) are subject to specific evaluation procedures, defined by the Multilateral Fund and UNIDO interventions are covered by evaluations carried out by the MP Secretariat. However, since all projects implemented by UNIDO fall under its responsibility and the MP projects encompass a large part of UNIDO’s technical assistance portfolio, it is vital to capture lessons learned and best practices, for the purpose of organizational learning.

Furthermore, it is important for UNIDO to, systematically, access information about results and outcomes, in line with its Results Based Management (RBM) Policy and Implementation Strategy and to convey this information to various stakeholders. The UNIDO Evaluation work programme 2008/2009 therefore includes a desk review of UNIDO completion reports and of MP evaluation reports (encompassing UNIDO interventions). The purpose of these reviews will be to extract lessons learned, information on UNIDO’s contribution to development results and impact and other strategic information.

The Evaluation Office of the GEF is carrying out an impact evaluation of project to phase out Ozone Depleting Substances (ODS) in Economies in Transition. UNIDO Evaluation Group is committed to collaboration with the evaluation departments of partner agencies. In this context it has been agreed to use the opportunity of the desk review to compare the approaches to ODS phase out at the level of the underlying theories of change and intervention logic.

EVA will continue its dialogue with the evaluation offices of the Montreal Protocol and of the GEF in order to ensure that lessons learned from the evaluations of these funds are fed back to UNIDO and that UNIDO’s evaluations and this include self evaluations meet the standards adhered to by these funds.

III. Key review questions

The key evaluation questions are:

Regarding the design, intervention logic and the underlying theory of change:

- Is there one or several typical intervention logics applied to the projects? How can it/they be described? How do they compare with the GEF ODS projects’ intervention logic?
- Is the design of the overall programme and of individual projects consistent with the underlying theory of change?

Regarding the implementation and the results of MP interventions

- Are individual MP interventions implemented in line with the underlying theory of change?
- What are the effects of MP projects in terms of enterprise competitiveness, productivity and employment?
- What other effects of MP projects can be commonly observed?

Regarding the learning processes

- How are currently lessons learned from MP projects extracted and how can we ensure that lessons from MP projects can contribute to UNIDO organisations learning in the future?
- Is the information on MP interventions and their results sufficient and relevant (M&E) for learning?

IV. METHODOLOGY

The review will consist of three main components:

Review of documents and UNIDO staff interviews

The document review will be carried in order to: a) extract information with regard to the results of MP projects, including non-environmental effects on productivity, etc. at the enterprise level; and b) compile information that allows to describe the UNIDO programme theory and compare it with those of other organisations involved in ODS phase out. This component will include:

- Review of UNIDO project related documentation: project documents, project completion reports, MLF and others' ODS phase out related evaluation reports, technical reports from subcontractors, etc.
- Review of methodological documents, tools and training kits, reference documents and guidelines.
- Review of ODS related documents of other organisations, including UNEP, GEF and World Bank.

With regard to project related documentation a sample of approximately 20 completed UNIDO MP projects will be drawn. The sample will comprise the most recent completed projects implemented by each of the two MP units of PTC/MPB. The pre-selection of these projects will be done by PTC/MPB.

Criteria for the selection of projects are:

- Most recent completed projects
- Main project categories to be covered (National phase out plans, stand alone investment projects, umbrella investment projects, capacity building & institutional strengthening, methyl bromide, etc.)
- Availability of comprehensive information and documentation (for some older projects documentation has been lost in the building renovation of UNIDO)
- Availability of MLF evaluation reports preferable

Development of UNIDO MP programme theory

Based on the review of documents and discussions with project managers, logical models will be developed to describe the cause-effect linkages by which UNIDO ODS projects intend to achieve their objectives¹⁵.

When developing the programme theory, emphasis will be placed on describing also the non-environmental effects of MP projects, i.e. effects on productivity and economic performance in terms of lower operating costs, less maintenance and higher product quality and reliability, employment generation by sustaining existing jobs and creating new ones, etc.

15 GEF IS CARRYING OUT AN IMPACT EVALUATION OF PROJECT TO PHASE OUT OZONE DEPLETING SUBSTANCES (ODS) IN ECONOMIES IN TRANSITION. THE TOR OF THIS EVALUATION CONTAIN A DRAFT PROGRAMME THEORY. THIS WILL SERVE AS A BASIS FOR DRAFTING THE UNIDO PROGRAMME THEORY.

The draft programme theory will be discussed with UNIDO project managers before it is validated through a survey.

Stakeholder survey

The survey will be carried out for two main purposes:

- capture non-environmental effects of MP projects
- validate the UNIDO MP programme theory

The survey design will be developed in close cooperation with UNIDO PTC/MPB and OSL/EVA in order to ensure that appropriate terminology is used and that survey results are useful for the in-house learning process. PTC/MPB will provide a list of stakeholders for the selected sample projects.

Project level review parameters

The following is a generic reference framework to be applied for the assessment of individual technical cooperation projects within the review.

A. Effectiveness and Impact: attainment of objectives and planned as well as unplanned results:

The assessment of project results seeks to determine the extent to which the project objectives were achieved, or are expected to be achieved, and assess if the project has led to any other positive or negative consequences, in particular the non-environmental effects on productivity and enterprise competitiveness as well as employment effects.

B. Assessment of sustainability of project outcomes:

Sustainability is understood as the probability of continued long-term project-derived outcomes and impacts after the project funding ends. The review will verify whether information on sustainability of project results can be extracted from project documentation.

C. Assessment of Monitoring and Evaluation Systems:

- **M&E design.** Does the project have a sound M&E plan to monitor results and track progress towards achieving project objectives? Is the project document and the logical framework useful as a management and M&E tool? Was a baseline study carried out at inception?
- **M&E implementation.** Assessment of the quality of project monitoring and (self-) evaluation, including an assessment of risk management based on the assumptions and risks identified in the project document. Are annual project reports complete, accurate and with well justified ratings? Has the information provided by the M&E system been used during the project to improve project performance and to adapt to changing needs? Are the main assumptions of the programme theory being monitored?
- **Budgeting and Funding for M&E activities.** Have adequate budget provisions been made for M&E made and have such resources made available in a timely fashion during implementation?

D. Assessment of quality at entry

Was the design consistent with the methodologies, strategies and the overall theory of change of UNIDO MP initiatives?

Were the project's objectives and components clear, practicable and feasible within its timeframe? The review should also assess whether outcomes specified in the project document and/or logical framework are actually outcomes and not outputs or activities.

Were capacities of the executing institutions and counterparts properly considered when the project was designed? Were lessons from other relevant projects properly incorporated in design? Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to implementation? Was availability of counterpart resources (funding, staff, and facilities), passage of enabling legislation, and adequate project management arrangements in place at project entry?

V. REVIEW AND TIMING

The review team will be composed of an international expert evaluation of technical assistance in the area of industry and the environment acting as team leader and one staff member of UNIDO Evaluation Group (OSL/EVA). The tasks of the international consultant are specified in the job descriptions attached to these terms of reference in annex 2.

UNIDO evaluation group will be responsible for the quality control of the review process and report. It will provide inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations, ensuring that the final report is useful for UNIDO in terms of organisational learning (recommendations and lessons learned) and its compliance with UNIDO evaluation policy and these terms of reference.

Members of the review team must not have been directly involved in the design and/or implementation of the programme/projects.

Timing

The review is scheduled to take place in the period December 2008 to March 2009.

VI. REPORTING

The report should be brief, to the point and easy to understand. It must explain; the purpose of the review, exactly what was evaluated and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should provide information on when the review took place, the places visited, who was involved and be presented in a way that makes the information accessible and comprehensible. The report should include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination.

Evidence, findings, conclusions and recommendations should be presented in a complete and balanced manner. The review main report shall be written in English and follow the structure given in annex 1.

Review of the Draft Report: Draft reports submitted to UNIDO Evaluation Group are shared with the corresponding Programme or Project Officer for initial review and consultation. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks agreement on the findings and recommendations. The evaluators will take the comments into consideration in preparing the final version of the report.

Quality Assessment of the report: All UNIDO evaluations are subject to quality assessments by UNIDO Evaluation Group. These apply evaluation quality assessment criteria and are used as a tool for providing structured feedback. The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality (annex 3).

Annex 3: Field Validation Mission Report



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Report on Field Validation Mission in Indonesia

UNIDO Montreal Protocol projects

**Bjørn Bauer & Tomas Sander Poulsen, PlanMiljø
2nd draft – August, 2009**

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1. Introduction

The present report presents minutes of meetings and findings of the field validation mission carried out in Indonesia in connection to the internal UNIDO review of UNIDO Montreal Protocol projects.

The review is carried out as part of UNIDO's systematic assessment of results and outcomes of UNIDO's technical assistance portfolio. The overall aim of the review has been to capture lessons learned and best practices, for the purpose of organizational learning.

The overall aim of the field validation mission has been to validate findings and lessons learned from the review.

The mission has been thoroughly planned by Mr. Nahrudin Alie, National Consultant based in UNIDO Indonesia, and discussed with the team leader.

The mission was carried June 29 – July 7 2009 by Bjørn Bauer (Team Leader) and Tomas Sander Poulsen, PlanMiljø, Denmark, and Nahrudin Alie, UNIDO consultant.

The team wishes to thank Mr. Nahrudin Alie for an excellently planned and conducted validation mission.

ODS Phase-Out in Indonesia

In November 2004, Indonesia entered into a performance-based agreement with the Executive Committee of the Multilateral Fund for Implementation of the Montreal Protocol, to address the phase-out of all remaining consumption of Annex-A, Group-I and Annex-B Group II & III Ozone-depleting Substances (ODS) in Indonesia. This agreement included a total funding of US\$ 20,645,507 provided to Indonesia in annual tranches, and targets the complete phase-out of these ODS in Indonesia before 01 January 2010.

The implementing efforts have been divided by the National Ozone Unit at the Ministry of Environment (NOU/KLH) between UNDP, UNIDO and WB with UNDP as the lead implementing agency assisting the National Ozone Unit (NOU) through a Institutional Capacity Building programme. UNIDO has played a substantive role by creating two project management teams at the NOU/KLH office for both Solvent and Methyl Bromide projects.

The ODS consuming sectors have been divided between the implementing agencies:

- Refrigerant Air Conditioning Manufacturing sector: UNDP
- Individual foam industry projects: UNDP, UNIDO and WB
- Foaming sector phase-out: WB
- Refrigerant Air Conditioning Servicing: UNDP and WB
- Methyl Bromide: UNIDO
- Solvents: UNIDO
- Aerosols and Firefighting (Halon) sectors and Mobile Air conditioning: WB

UNIDO has been responsible for a total of 23 projects ¹⁶with a total phased out 848.73 MT ODP. Funds approved summarise to US\$ 5,786,161, about 25 % of the total MLF funding to Indonesia.

The overall achievement of ODS consumption and phase out sector targets is verified annually as part of the Montreal Protocol procedures¹⁷.

The performance verification 2006 concludes that 'Indonesia has appeared to meet or very nearly achieve the overall ODS consumption and phase-out targets and thus meets its obligations under the above-referred agreement'. It is also concluded that the implementation and technical assistance have

¹⁶ Refer to annex 3 for a list of UNIDO projects.

¹⁷ Performance Verification of 2005 and 2006 activities; Hatfield Indonesia for KLH and UNDP, January and October 2007.

overall been satisfactory. The verification report does not distinct between support provided by the different agencies.

Key evaluation questions

The key evaluation questions of the review are commented on in section 3.

Regarding design, intervention logic and underlying theory of change:

- Is/are one or several typical intervention logics applied to the projects? How can it/they be described? How do they compare with the GEF ODS projects' intervention logic?
- Is the design of the overall programme and of individual projects consistent with the underlying theory of change?

Regarding implementation and results of MP interventions

- Are individual MP interventions implemented in line with the underlying theory of change?
- What are the effects of MP projects in terms of enterprise competitiveness, productivity and employment?
- What other effects of MP projects can be commonly observed?

Regarding learning processes

- How are lessons learned from MP projects extracted today and how can we ensure that lessons from MP projects can contribute to UNIDO organisations' learning in the future?
- Is information on MP interventions and their results sufficient and relevant (M&E) for learning?

2. Interviews and site visits

The programme of the mission embraced meetings with the relevant deputy minister, the National Ozone Unit, responsible local consultants, and enterprises having received support from the UNIDO MP program.

1. Nahrudin Alie, UNIDO National ODS Project Manager

Mr. Nahrudin Alie presented the well prepared programme (already agreed upon) and joined the review team during the complete mission.

2. Ms. Sulistiyowati, Assistant Deputy Minister on Climate Control, KLH

The assistant deputy minister welcomed the mission and expressed her appreciation of the efforts conducted by UNIDO.

3. Mr. Hasoloan Panjaitan, staff of National Ozone Unit in charge of solvent projects.

Mr. Panjaitan expressed his appreciation of the work carried out by UNIDO. WB has supported the NOU with capacity building and organisation, and UNIDO, UNDP and WB have implemented projects in different sectors and regions. The efficiency of all three implementing agencies has been high and ODS have been phased out as planned for. Mr. Panjaitan mentioned that the paper work from UNIDO's side has not in all cases lived up to the NOU's expectations.

Meetings 3-5 took place at the premises of KLH.

The figure prepared by the consultant presenting the intervention logic of the UNIDO Montreal Programme projects was discussed and agreed upon with Mr. Alie, Mr. Panjaitan, Mr. Hidayat, Mr. Haridin.

4. Mr. Purnama Hidayat, Former National Project Coordinator for UNIDO/KLH Methyl Bromide project

Ms. Isi Wydayanti and Mr. Sunjaya, SEAMEO Biotrop.

Mr. Hidayat presented facts and findings from the UNIDO Methyl Bromide project covering storage of grains.

- The project has introduced Integrated Storage Pest Management (ISPM) and a value chain perspective, providing a holistic approach to pollution prevention and pest management as opposed to simple substitution of pesticides.

- The project has included motivation of managers, changing mindsets of managers and technicians, capacity building, delivery of fumigation equipment for 40 grain storages and ISPM equipment for ten beneficiaries.
- The implementing institution SEAMEO (South East Asian Ministers of Education Organisation) Biotrop has in depth knowledge on pests and pesticides and training experience from South East Asia. Financed by the national budgets, SEAMEO has increased the sustainability of the project and gained the opportunity to disseminate the knowledge to further stakeholders.
- The national organization BULOG, ensuring food security in Indonesia with 1,300 grain storages spread over the country, has taken actively part in the project, including training, and is the organization to sustain the efforts of ensuring non-ODS in grain storage.
- UNIDO HQ has delivered technical knowledge to the project team.
- For a country like Indonesia with many islands, one of the biggest problems the many ports (harbors). Strong marine patrolling is needed to combat smuggling.
- In Indonesia, it is very challenging to coordinate many parties such as Department of Environment, Department of Agriculture, Department of Industry, Department of Trade, customs, quarantine, industries, importers, and traders.
- Outcomes and impacts of the project are:
 - ODS substances are phased out from grain storage – except from quarantine and shipment storage. More than 100 trainers have been trained.
 - The number of storage managers and technicians that have received training is around 200
 - Awareness have been raised in BULOG Grain Storages and in flour mills, food industries, feed stock industries, fumigation companies, government officials, importers and traders of pesticides and other stakeholders.
- Reversal to Methyl Bromide fumigation is technically not a problem and several factors make MB a still attractive pesticide for non-QPS purposes, however forbidden by law: MB is non-corrosive, has much faster exposure, similar price and is still available on the market (for QPS purposes).
- Thus, continued motivation, incentives, training, regulation, control and enforcement is needed to ensure complete phase-out of MB from non-QPS storage.
- As QPS storage consumption of MB in 2007 constituted 20 fold the amount of MB used in non-QPS storage in the peak year 2005, there is a huge need for non-QPS initiatives.
- In Indonesia there is one only facility to destroy ODS, belonging to the HOLCHIM cement company in Bogor. The facility had destroyed several tons of ODS.
- Reliable data is available if all importers, traders, and customers are registered. In Indonesia importers are registered, but only few traders and customers, and reliable data is a somewhat luxurious requirement. Monitoring is the task of both central and local governments.

5. Mr. Augustinus Hariadi DP, Former National Project Manager for UNIDO/KLH Solvent project

Mr. Hariadi presented facts and findings from the Solvent project in Indonesia phasing out ODS solvents in cleaning processes.

- The baseline has been based on information compiled through visits to all ten enterprises identified through initial survey, workshops, contacts with sector organizations and environmental authorities, and site visits.
- The project has included institutional building, regulation, incentives, awareness raising, information exchange, investments, technical assistance and monitoring of results and outcome.
- The project has been coordinated with relevant ministries and national institutions,
- Outcome of the project: All ODS has been phased out in the sector.
- UNIDO HQ technical experts visited all enterprises and non-ODS technologies have been selected in cooperation between UNIDO HQ technical experts and the individual enterprises.
- All old ODS-equipment has been destroyed.

6. Enterprise Solindah Kita, Mr. Thon, director

Shoe sole manufacturer, 100,000 pair of soles /month, 40 staff members; received non-ODS support to both foaming and cleaning processes; incremental operational costs 190.000 usd

reimbursed; 50 % reduced production since introduction of the non-ODS technology due to changing market conditions.

- Non-ODS foaming technology installed and in use, good support provided by the project to overcome initial problems with the technology.
- Closed circuit non-ODS cleaning technology installed and in use. ODS is not available on the market.
- Technologies selected in cooperation between UNIDO consultant and enterprise.
- So far no problems with the technology.
- Consumption of solvents and related costs much reduced
- The capacity building fulfilled the needs
- Old ODS-equipment destroyed
- Have in addition achieved improved occupational health for staff working with the cleaning process
- No additional requirements or conditions to environmental performance or occupational health were stipulated in the project.
- Environmental control from authorities is very sparse.
- Observation: The painting processes following the cleaning are carried out with solvent based paint with insufficient workers' protection.

7. Enterprise PT Trias, Mr. Soetopo, director

Shoe sole manufacturer, 30,000 pairs/month, 30 staff members, received non-ODS support to both foaming and cleaning processes; incremental operational costs 50,000 usd; 50 % reduced production since introduction of the non-ODS technology due to changing market conditions

- Non-ODS foaming technology installed. Some problems with technology both initially and at present, and the new foaming mill is not in use. However, an additional mixing plant and a dispenser are in use.
- Faster operation and better quality of foaming achieved, but the new foaming mill can not produce the smallest sized soles.
- Closed circuit non-ODS cleaning technology installed, good quality of cleaning, no savings in solvent use achieved, but consumption of electricity doubled compared with ODS-technology.
- Observation: Doubtful whether the cleaning technology is presently in use.
- The capacity building fulfilled the needs
- ODS-foaming equipment destroyed.
- Observation: ODS-cleaning technology is still apparent in the enterprise – but not in use nor technically ready for immediate use.
- No additional requirements or conditions to environmental performance or occupational health were stipulated from UNIDO's side in the project
- Observation: The painting processes following the cleaning are carried out with solvent based paint with adequate workers protection.
- Observation: The enterprise appears in general relatively unclean and unsystematic with rudimentary measures for protection of environment and occupational health.

8. Enterprise Maspion, Mr. Fransiskus Oey, Plant Manager

Very large manufacturer of engines for air condition (10.000 per month), kitchen appliances and many other product groups, 20,000 staff members; received two non-ODS cleaning plants for air condition engines late 2008.

- Technology fully implemented and in use 24/7. One (of the two) cleaning plant(s) not in operation due to failure in electricity supply.
- Cleaning process very good, quality much better than previously. No problems with implementation or maintenance of the equipment.
- Mr. Oey stated that the technology was selected by the UNIDO consultant without consulting with the company (refer to footnote 1)¹⁸
- The enterprise has achieved limited cost savings.

¹⁸ This statement can not be verified. On the opposite, both Mr. Alie and Mr. Hariadi from the UNIDO project refer to talks between UNIDO and Maspion on the optional technology, exchange of written information on the technology, talks on the necessary power supply and exchange of contact data on the supplier.

- Only 25 % of the capacity need has been fulfilled with the new cleaning plant.
- The other 75 % of the products are cleaned manually in open solvent baths not acceptable in an occupational health perspective.
- No additional requirements (for example concerning occupational health) were discussed.

9. Enterprise PT Aneka Citra Refrigraha, Mr. Fuco Chandra, director

Manufacturer of polyurethane panels for cooling containers, 50 staff in this enterprise, another 150 in Indonesia, and also enterprises abroad. OMS foaming machine with agent 141B (HCFC) was delivered in 2005

- The technology implemented is a transitional technology as the use of HCFC is to be phased out according to the Montreal Protocol.
- According to the director, no other technology (like cyclo pentane) was discussed, nor was other brands of technology discussed.
- The overall performance of the new technology is much superior to the old technology: Capacity has increased three times and the quality has also improved, production costs are the same, waste amounts reduced drastically, and the new technology does not need cleaning with methyl chloride.
- Sufficient training was delivered by the supplier, no problems at all with operation.
- During UNIDO support also occupational health was briefly discussed.
- Have had only very small problems with the technology.
- Destruction of the old equipment was controlled by KLH.
- Customers have been satisfied with the new technology.
- Observation: Very neat enterprise and manufacturing premises and a very professional appearance. This enterprise might very well be able to work with more sustainable technology than the HCFC-based foaming equipment.

3. Key findings and conclusions

The key findings of the validation mission are:

- a. UNIDO has been responsible for a part of the Montreal Protocol programme efforts carried out in Indonesia; WB, UNDP and UNEP have each had their share of the total programme.
- b. The UNIDO ODS projects in Indonesia have been effective in phasing out ODS from the participating enterprises within foaming, cleaning and grain storage, the Indonesian phase-out targets are being met.
- c. Both the National Ozone Unit and the enterprises are in general very pleased with the programme and specifically with UNIDO's implementation work that has resulted in the planned phase-out of ODS.
- d. Fully satisfied with UNIDO's technical efforts – rated equal to the other implementing agencies' work – the NOU points at only one option for minor improvement of UNIDO's support: The paper flow from UNIDO could have been a bit more efficient.
- e. The efforts within grain storages (use of methyl bromide) has included application of cleaner production and has targeted managerial awareness, product chain considerations and pollution prevention beyond ODS phase-out. The reasoning behind is that ODS phase-out in grain storage is not a simply technical matter. Reversal to ODS is very easy, and the enterprise must have a more thorough understanding
- f. The solvents and foaming projects have to a limited degree resulted in non-ODS results specifically connected to implementation of the new technology, including reduced exposure to organic solvents and reduced waste amounts.
- g. The foaming technology implemented in one of the visited enterprises is not environmentally or financially sustainable. The CFC ODS technology has been substituted with a HCFC ODS technology (however with a lower potential for ozone layer depletion) which is going to be substituted in the next phase of the Montreal Protocol programme. In addition the HCFC is a potent Greenhouse Gas technology. This is sub-optimal as environmentally preferable alternative technologies were available at the market at the time of the implementation project.
- h. Enterprises having received MP support vary significantly in size, from 30 employees to more than 20.000 employees. Relatively, in smaller enterprises the support has been substantial with a significant positive impact on the annual account.
- i. Some enterprises have received very considerable, not earmarked reimbursement of 'incremental operational costs' (190.000 USD to an enterprise with 40-60 employees), and

- there is no control or influence on the enterprise's use of these funds. This is completely in accordance with MLF guidelines and thus raises the question whether the MLF in their procedures should have opened up for connection these means to non-ODS targets¹⁹.
- j. UNIDO has not systematically strived to – by own means – include additional non-ODS targets or measures in the ODS projects. It is not obvious that UNIDO policies on promoting competitive and sustainable industries have been actively pursued in these projects.
 - k. The induction of considerable funding and environmentally advanced technology has not encouraged the enterprises to work more proactively with their environmental performance or technology (though the possibility that this situation has occurred in some enterprises can not be excluded).
 - l. The capacity of the technology provided from the UNIDO project in two cases go far beyond the present production volume and also exceeds the production volume at the time of the technology transfer. Market fluctuations can not be predicted but the situation emphasises the importance of a proper enterprise analysis and a very close dialogue with enterprise management.
 - m. The interventions reviewed have followed the intervention logic described in the main report, and the key stakeholders agree on the intervention logic. ODS phase-out has been reached through establishment of an NOU, substitution of technology, and training.
 - n. The key assumptions of the intervention logic have by large been confirmed by the field visits (*field visit comments in italics*):
 - National willingness to establish the organisational framework necessary for controlling and phasing out ODS.
The Indonesian Ministry of Environment has with establishment and operation of the NOU demonstrated willingness and capability to carry out the tasks envisaged by the MLF;
 - National phase-out activities include both larger and smaller enterprises.
According to the NOU, all relevant enterprises including SMEs have been reached through the national efforts. Several of the enterprises visited are SMEs.
 - Illegal trade does not undermine the phase-out activities.
Combat of illegal trade is difficult and illegal trade threatens to undermine some of the gains achieved in ODS phase-out – specifically within refrigeration and air conditioning. Illegal trade is not a large problem in terms of the industrial target group for UNIDO interventions as the substituted ODS technology in the manufacturing enterprises has been destroyed after implementation of the new equipment. Illegal trade may though constitute a problem for the grain storage phase-out activities as the grain storages can without any technical problems revert to previous methodologies. The field validation mission did not encompass visits to grain storage and according to the UNIDO expert on the field it is not possible to assess the degree of the sector's compliance with phase-out plans.
 - Enterprises do not revert to ODS-technology after termination of the support project.
The old ODS equipment in manufacturing enterprises has as a rule been destroyed (controlled by the project staff) after implementation of the non-ODS technology why reversal to ODS practices in these enterprises is not likely at an industrial scale. As mentioned, there is a risk that grain storages revert to ODS technology. To reduce this risk, the UNIDO staff has worked intensively with emphasising additional positive aspects of non-ODS technology, including improved occupational health and reduced risks.

Key evaluation questions

The relevant key evaluation questions of the review are commented below:

Regarding design, intervention logic and underlying theory of change:

- Is the design of the overall programme and of individual projects consistent with the underlying theory of change?

¹⁹ Eduardo Ganem, representative of the MLF Secretariat, confirms that no additional non-ODS targets can be pursued with MLF funds, August 2009.

The design of the individual projects reviewed during the field validation mission is consistent with the theory of change. The assumptions of the theory of change are by large met in Indonesian sectors in which UNIDO has been active with ODS phase-out.

Regarding implementation and results of MP interventions

- Are individual MP interventions implemented in line with the underlying theory of change?
The individual UNIDO MP interventions in Indonesia are implemented in line with the theory of change.
- What are the effects of MP projects in terms of enterprise competitiveness, productivity and employment?
There can be drawn no general conclusions on the effects of UNIDO MP projects in terms of competitiveness, productivity or employment. Two of four enterprises have increased their production volume since implementation of the new technology, one of these refer to the new technology as an important parameter in terms of improving the production system. The other two enterprises have drastically reduced their production volume (up to 50 %), and one enterprise only utilises part of the technology provided.
- What other effects of MP projects can be commonly observed?
It has not been possible to observe any other common effect of MP projects. There is no indication that the enterprises have strengthened their environmental or occupational health performance in general, nor do neither the enterprises, the NOU or the UNIDO staff report on any other common effects observed.

Annex 1 – Programme

**Itinerary of UNIDO Evaluation to Indonesia for Montreal Protocol projects 29 June – 4 July, 2009
(Mr. Bjorn Bauer and Mr Tomas Sander Poulsen, UNIDO Evaluation Experts)**

Date	Time *	Schedule
Monday, 29 June, 2009		
P.M.		Arriving Jakarta: Mr. Bjorn Bauer and Mr. Tomas Sander Poulsen
Tuesday, 30 June, 2009		
09:00 a.m. – 10:00 a.m.		Meeting at UNIDO office with Nahrudin Alie, UNIDO National ODS Project Manager
10:30 a.m. – 11:00 a.m.		Meeting with Ms. Masnellyarti Hilman, Deputy Minister, Ministry of Environment
11:00 p.m. – 15:00 p.m.		<ul style="list-style-type: none"> • Meeting with Mr. Hasolan Panjaitan, Manager of National Ozone Unit • Meeting with Mr. Purnama Hidayat, Former National Project Coordinator for UNIDO/KLH Methyl Bromide project, Drs. Sunjaya and Ir. Sri Widayanti, SEAMEO Biotrop; • Meeting with Mr. Agustinus Hariadi, Former National Project Manager for UNIDO/KLH Solvent project
Wednesday, 1 July, 2009		
08.00 – 16.00		Bandung, site visit PT Solindah Kita and meeting with Mr. Tjong, Director,
Thursday, 2 July, 2009		
06.00 – 16.00		Surabaya, site visit PT Trias Rantai Mas and meeting with Mr. Sutopo, Director
Friday, 3 July, 2009		
07.00 – 15.00		Surabaya, site visit Maspion and meeting with Mr. Gunawan Listiono, Manager
Saturday, 4 July, 2009		
06.00 – 17.00		Tangerang, Site visit PT Aneka Citra Refrigeratama, meeting with Mr. Fuko Chandra, Director

*: Timing includes transportation

Annex 2 - Example of interview questions – Shoe Sole Factory

1. What is the quantity of shoe soles produced since 1995?
2. What is the quantity of solvents and foaming agents consumed
3. Which companies and origins (country) are the main competitors? What percentage of the Indonesian market share is enjoyed by your company? And what are the main features that keep your enterprise competitive? How have these factors changed before and after the Project
4. Do you have any information on the situation in competing companies in terms of ODS consumption?
5. Is illegal trade with ODS significant in Indonesia?
6. What percentage of the production is marketed locally, which countries are key customers
7. Was the MLF/UNIDO funding important for your enterprise? How?
8. Did you and the consultants specifically target any non-ODS results, and how (– environmental, economic, # workplaces, competitiveness etc.)
9. In addition to the ODS phase-out results, what other results have you achieved – environmental, economic, # workplaces, competitiveness etc.)
10. How many product types were produced before the Project started, and how many are produced now?
11. Were there difficulties or delays in getting the new technology operational, considering the safety, training and other requirements?
12. What was the impact of the funding on the suppliers? Did the supply volume increase after the funding for these companies?
13. Please describe the equipment selection procedures that you had in the project, and if the selection was good or not. For example, did the consultant involve you in this aspect, or did the equipment just arrive? How easy is it to maintain the equipment and to get affordable spare parts?
14. Have you used the non-ODS technology for promotion of your products, or have the GoI or other institutions paid specific attention to your enterprise after ODS phase-out?
15. How often do the NOU, environmental inspectors or other public officials take contact to your enterprise?
16. Could anything have been done better in the project?

Annex 3 - UNIDO ODS phase out projects in Indonesia

PROJECT NO. / TITLE	ODP PHASED-OUT (CFC 11 and 12))	FUNDS APPROVED	CURRENT STATUS
1) MP/INS/96/007- Phasing out ODS at PT. Airtech BSO: Mr. E. Puerto-Ferre	30.10 MT	US\$409,850 18 th ExCOM Meeting (November 1995)	Completed and handed over the equipment, (March 1998)
2) MP/INS/96/116 – Phasing out ODS at PT. Naviri Kencana Perdana BSO: Mr. E. Puerto-Ferre	47.80 MT	US\$ 377,382 19 th ExCOM Meeting (May 1996)	Completed, and handed over the equipment (January 1998)
3) MP/INS/97/103- Phasing out CFC-11 at PT Elastindo Satyajaya Flexible Polyurethane Foam Plant BSO: Mr. M. Demko	18.0 MT	US\$75,943 22 nd EXCOM Meeting (May 1997)	Completed, and handed over the equipment (27 May 1999)
4) MP/INS/97/104- Phasing out CFC-11 at PT Winnerfoam Abadi BSO: Mr. M. Demko	40.0 MT	US\$79,472 22 nd ExCom Meeting (May 1997)	Completed, and handed over the equipment (27 May 1999)
5) MP/INS/97/105- Phasing out CFC-11 at Panca Duta Foam Industry BSO: Mr. M. Demko	45.0 MT	US\$ 86,955 22 nd ExCom Meeting(May 1997)	Completed, and handed over the equipment (27 May 1999)
6) MP/INS/97/106- Phasing out ODS at PT Jalur Sejuk BSO: Mr. M. Demko	30.85 MT	US\$ 171,470 22 nd ExCom meeting (May 1997)	Completed, and handed over the equipment (27 May 1999)
7) MP/INS/99/056 - Preparatory Assistance for Demonstration Projects on Alternatives to Methyl Bromide (Demonstrate project with BULOG). BSO: Mr. Si Ahmed	146 MT	US\$ 332,200 26 th EXCOM Meeting (November 1998)	Completed Jan 2002 (Final Report produced)

8) MP/INS/99/171- Phasing out CFC-11 at PT Meta Presindo Utama BSO: Mr. M. Demko	30.15 MT	US\$ 213,603 29 th ExCOM Meeting (November 1999)	Completed, January /February 2002.
9) MP/INS/99/172 – Phasing out ODS at PT Nirwana BSO: Mr. M. Demko	34.0 MT	US\$ 206,911 29 th ExCom Meeting (November 1999)	Completed, January /February 2002.
10) MP/INS/00/019- Phasing out CFC-11 at PT Trias Rantai Mas BSO: Mr. M. Demko	18.43 MT	US\$ 141,319 31 st EXCOM Meeting (May 2000)	Completed, January 2003
11) MP/INS/02/017- Phasing out CFC-11 at PT Morodadi, Malang BSO: Mr. M. Demko	15.60 MT	US\$89,310 36 th ExCom Meeting(March 2002)	Completed, 2004
12) MP/INS/02/017- Phasing out CFC-11 at PT Tentrem, Malang BSO: Mr. M. Demko	12.0 MT	US\$85,470 36 th ExCom Meeting (March 2002)	Completed, 2004
13) MP/INS/02/018- Phasing out CFC-11 at PT Solindah Kita, Bandung BSO: Mr. M. Demko	48.0 MT	US\$390,760.- 36 th ExCom Meeting (March 2002)	Completed, 2003
14) MP/INS/02/019- Phasing out CFC-11 at PT Wulansari Raharja, Cibinong Average Use of CFC 11/year: 10.8 MT BSO: Mr. M. Demko	10.8 MT	US\$101,301 36 th ExCom Meeting (March 2002)	Completed, 2003
15) MP/INS/02/072- Phasing out CFC-11 at PT Accurai, Tangerang BSO: Mr. M. Demko	50.0 MT	US\$523,943 37 th ExCom (July 2002)	Completed, 2004
16) TF/INS/02/002- Phasing out CFC-11 at PT Aneka Citra Refrigeratama, Tangerang BSO: Mr. M. Demko	20.0 MT	US\$142,506 Under Japan bilateral 37 th ExCom Meeting	Completed, 2004
17) TF/INS/02/001- Phasing out CFC-11 at PT Bina Teknik, Sidoarjo, East Java BSO: Mr. M. Demko	25.0 MT	US\$117,889 Under Japan bilateral 37 th ExCom Meeting	Completed, 2004

18) MP/INS/02/151- Phasing out CFC-11 at PT Delta Atlantik Indah, Medan BSO: Mr. M. Demko	15.0 MT	US\$70,813 39 th November 2002 ExCom Meeting	Completed, 2004
19) MP/INS/02/151- Phasing out CFC-11 at PT Samudra Plastics, Jakarta PD for Samudra and Delta BSO: Mr. M. Demko	10.0 MT	US\$75,575 39 th November 2002 ExCom Meeting	Completed, 2004
20) MP/INS/02/152 – Phasing out CFC at PT Ganesha Rattesko Prima, Jakarta PD for Ganesha and Sindari BSO: Mr. M. Demko	42.0 MT	US\$183,472 39 th November 2002 ExCom Meeting	Completed, 2004
21) MP/INS/02/152 – Phasing out CFC at PT Sindari Nusatama, Jakarta PD for Ganesha and Sindari BSO: Mr. M. Demko	15.0 MT	US\$100,017 39 th November 2002 ExCom Meeting	Completed, 2004
22) MP/INS/04/137 – Phase-out of the use of Methyl Bromide in Grain Storage in Indonesia	27.0 MT	US\$350,000 44 th ExCom meeting	Completed, 2007
23) MP/INS/04/138 – Plan for terminal phase-out of ODS in Solvent sector	118.1 MT	US\$1,460,000 44 th ExCom Meeting	Completed, 2008
TOTAL completed(23 projects)	848.73 MT Sectors: CFC 11, (Solvent -CFC 113, CTC, TCA,) and Methyl Bromide (including demo phase)	Note: Total projects completed: 23 Total funds approved: US\$ 5,786,161.--	

Annex 4: UNIDO MP Activities

1. This annex is based on 'UNIDO and the Montreal Protocol', UNIDO 2007.
2. Chlorofluorocarbons (CFCs) were first developed in 1928 by a U.S. scientist, Thomas Midgley Jr., as a non-toxic, non-flammable substitute for ammonia in refrigeration uses. In the decades that followed, a large variety of new uses were found for these chemicals. By the early 1970s an entire industrial system had grown up around them, in both developed and developing countries.
3. In 1974, however, two U.S. scientists, Sherwood Rowland and Mario Molina, realized that the chemically inert CFCs could be transported high into the atmosphere, where exposure to ultraviolet light would separate them into their constituents, most notably chlorine atoms, which were able to decompose ozone catalytically. This would inevitably cause a depletion of the ozone layer, a thin layer of gas that protects the Earth and its inhabitants from the hazards of ultraviolet radiation. Rowland and Molina predicted that without strong action to abate emissions of these chemicals, the ozone layer would be at severe risk. Subsequent studies have confirmed this hypothesis and have identified a range of related substances that have the potential to deplete the ozone layer.
4. As concern over these chemicals grew, the world community responded with collective action. In 1985, a group of countries negotiated the Vienna Convention for the Protection of the Ozone Layer, by which they agreed to increase coordinated research and to consider the development of a protocol aimed at reducing emissions of ozone-depleting substances (ODS). With the alarming discovery of a large hole in the ozone layer above Antarctica adding impetus to the process, the Montreal Protocol on Substances that Deplete the Ozone Layer was opened for signature in September 1987 and entered into force on 1 January 1989.

Dealing with ozone-depleting substances

5. After the discovery that CFCs had a destructive effect on the ozone layer it became clear that these chemicals were widely employed in a range of diverse uses, including refrigeration, air conditioning, solvents, aerosol, foam, blowing agents and sterilants. There was a need to find a baseline for assessing the diverse chemicals and their potential to damage the ozone layer, as not all substances had the same effect. Therefore, it was necessary to establish a common benchmark, known as the ozone-depleting potential (ODP) of a particular substance. The reference gas chosen for this purpose was CFC-11, which therefore has an ODP of 1.0, while more harmful substances have a higher index. A related reference is the global warming potential (GWP), a measure of the global warming effect of the emission of a given quantity of greenhouse gas relative to carbon dioxide (CO₂), which has a GWP of 1.0.
6. Substances with a relatively low ODP have been recommended as alternatives to CFCs. These include hydrochlorofluorocarbons (HCFCs), used as an alternative to CFCs and carbon tetrachloride in electronic and chemical industries as a solvent; hydrobromofluorocarbons (HBFCs), used as a fire-fighting agent; and methyl bromide, used (for example) in pesticides. The search goes on, however, for substances with even lower ODP, and in recent years natural substances such as cyclopentane, isobutane and ammonia have been shown to have potential to replace HCFCs in certain uses. The use of natural substances has an economic and ecological advantage for developing countries, as it does not depend on the import of chemicals produced in developed countries, with their attendant high international transportation costs and specific storage requirements.
7. This search for substitutes with lower or even insignificant ODP has been a challenge for the MLF, United Nations organizations, implementing agencies and the scientific community in general. It has contributed to the enlargement of the list of substitutes and the greater range of choices available to industries in developing countries, enabling them to select alternatives according to their particular circumstances and conditions.

Regional framework

8. Developing countries whose annual per capita consumption and production of ODS is less than 0.3 kilograms, and who need assistance to comply with the control measures of the Protocol, are dealt with in Article 5 of the Protocol, hence the term Article 5 countries. Over 140 countries are eligible to receive assistance from the MLF to replace technologies using ODS. The MLF Secretariat located in Montreal became operative in 1991. 49 industrialized countries committed themselves to providing the necessary funding to ensure by 2010 total phase-out of CFCs, carbon tetrachloride and halons in developing countries. Since 1991 the MLF has received contributions of over USD 2.2 billion, and the disbursement of these funds had enabled the elimination of 85 % of ODS by the end of 2006.
9. In order to implement the Montreal Protocol and its provision for assisting developing countries, the MLF contributed to setting up “ozone units” at national and regional levels to coordinate the ODS phase-out strategy in 131 countries. The national ozone units are primary focal point for the flow of assistance from the MLF. In the initial stage UNEP created eight Regional Networks of Ozone Officers in which 148 developing countries and 14 developed countries are represented.
10. It is the national Ozone Unit's responsibility to design, monitor and implement the ODS phase-out Country Programme and to select the enterprises to be assisted by the Multilateral Fund. Such capability is a precondition for countries to receive MLF project financing. All specific ODS phase-out projects should thus be carried out following the national ODS phase-out plan.

Illegal trade

11. A major obstacle faced by both developed and developing countries in their efforts to phase out ODS is illegal production, consumption and trade. Article 4 of the Protocol seeks to deal with this issue, for example by reinforcing the skills of customs officers so that they can more clearly recognize and understand the trade requirements of the Protocol. Under the Refrigeration Management Plan, and with the support of the implementing agencies, over 90 national workshops and training programmes for ‘green customs officers’ have been conducted. Further, UNEP has extended its collaboration with other organizations, such as the World Customs Organization, Interpol and the secretariats of various multilateral environmental agreements, in the development of trade provisions for more effective implementation of the green customs initiative.

Small-scale industries

12. The MLF originally provided assistance principally to large industries in order to achieve the objectives of the Protocol. However, in the course of implementation, it became apparent that a significant amount of ODS remained in use in small and medium-sized industries of developing countries, especially in the sectors of refrigeration CFCs and agricultural applications for methyl bromide. In 1998, the Executive Committee decided to target small and medium-sized industries for effective phase-out of ODS, providing US\$10 million to assist small industries in Article 5 countries in conversion projects in the aerosol and foam sectors, with a more flexible cost-effectiveness threshold than that applied to larger industries. It has proved challenging, however, to implement this programme, as the relevant industries in developing countries are dispersed both sectorally and geographically, making it very difficult to accurately target them and to monitor the success of activities.

The Montreal Protocol Set-up

13. The Montreal Protocol was based on an understanding that the ozone problem was a classic case of “tragedy of the commons” where the global community was being threatened by the production of substances that depleted the ozone layer. In the light of this, the Protocol was developed with a view to facilitating the participation of all countries of the world. It included trade provisions that were designed to encourage non-Parties who wanted to use ODS to join the Protocol and be bound by the specific requirements to reduce production and consumption of the chemicals. In addition, it included provisions that gave developing countries additional time (a grace period of ten years) to comply with the requirements.

Thus, it was the first of many examples of the application of the concept of common but

differentiated responsibility in the drawing up of international agreements; all States have a responsibility to protect the environment, but the contributions that States make must depend on their specific circumstances. The Protocol included provisions recognizing that technology transfer and financial support were essential to enable developing countries to participate fully in the protection of the ozone layer.

14. The Protocol's initial recognition of the need to support developing countries was not turned into specific action until 1990, when the Parties to the Protocol negotiated the London Amendment. The amendment, which also expanded the group of chemicals controlled by the Protocol, included a provision establishing the Multilateral Fund for the Implementation of the Montreal Protocol. It was designed to enable developing countries to comply with the Protocol's control measures to reduce and eventually eliminate the production and consumption of ODS. The amendment also introduced a new article on technology transfer, the aim of which was to assist the expeditious transfer of best available environmentally safe substitutes and related technologies to developing countries.

Multilateral Fund: Structure and operation

15. The Multilateral Fund (MLF) was the first funding mechanism of its kind established to facilitate implementation of a global environmental agreement. It was run by an Executive Committee made up of seven developed countries and seven developing countries. Equity in participation was further ensured by the decision to have the chair of the Executive Committee alternate between representatives of developed and developing countries.
16. MLF was a pioneer in developing the concept of incremental costs – costs on countries that are beyond those strictly necessary to achieve their own development goals, but which nevertheless generate additional benefits that the world as a whole can share. This concept would become a funding guideline adopted by other environmental financial mechanisms, including the Global Environment Facility.

Multilateral Fund Secretariat and Mechanism

17. The MLF Secretariat was established in 1991 in Montreal, Canada, and it assists the Executive Committee in its daily operations. In 2007, the Secretariat comprised 11 internationally recruited professionals and 11 general staff and was headed by a Chief Officer, who reports directly to the Executive Committee.
18. Among other functions, the Secretariat develops budget and fund disbursement plans, manages the business plan cycle of the MLF, drafts policy papers and other documents, and monitors the activities and expenditures of the implementing agencies by reviewing and assessing investment projects and preparing country programmes and business plans. Since May 1997 the Secretariat has also undertaken monitoring and evaluation tasks, a function established by the Executive Committee.
19. It was intended that the MLF pay the incremental costs of activities for reduction and elimination of ODS with time-based reduction targets. For example, developing countries were required to eliminate their production and consumption of CFCs by 2010.
20. Eliminating the consumption of CFCs in many cases necessitated converting certain industrial infrastructure in developing countries to the use of more ozone-friendly substitutes. For example, hundreds of plants in the world were producing refrigerators. In the process they were using CFCs both as a refrigerant and in the production of the insulating foam that was found in the walls of the refrigerator cabinets. The conversion of these plants could require changes such as the introduction of new designs, the engineering of a new compressor and condenser, and the replacement of machines used for charging the refrigerant and for foaming the cabinets. When originally negotiated, the related Protocol provision seemed to envision UNDP and the World Bank providing the technical assistance, but UNIDO entered as implementing agency in 1992.

UNIDO and the Montreal Protocol

21. Two major developments in UNIDO in the period 1990–1992 contributed to the entry of the organization into the Montreal Protocol programme: In 1990, UNDP announced that it was going to

end financial support for UNIDO's technical assistance delivery programme, and several Member States expressed their intention of separating themselves from UNIDO. This would have the effect of reducing the regular budget of the organization, and UNIDO was eager to identify appropriate sources of finance to make good for this loss.

22. UNIDO became an Implementing Agency in the Montreal Protocol in 1992 and from 1995 it has received a substantial share of the MLF programme – increasing from 4 % of the MLF total allocation in 1992 to 25 % (or 40 million USD) in 1995 and even slightly more in the following years. The budget approvals under the MLF since 1997 have represented 30 to 35 per cent of UNIDO's total approvals and delivery of technical assistance. The total amount allocated to UNIDO implementation today surpasses 420 million USD.
23. UNIDO has implemented more than 930 MLF projects in 80 countries, covering a wide range of sectors, including refrigeration, foams, aerosols, solvents, halons, fumigants and process agents. Today, all countries UNIDO has assisted are in compliance with the Montreal Protocol, though these nations need further guidance to meet the final targets and schedules of the Protocol. Therefore UNIDO was still in 2007 involved in over 150 projects focusing on the implementation of phase-out plans at the national and sectoral levels.
24. The UNIDO Programme and Budget 2008 – 2009 defines the objective of Programme Component E6 "Montreal Protocol" as follows: "Countries are assisted to comply with their obligations under the Montreal Protocol through transferring non-ODS-based technologies to Article 5 countries and supporting them to meet the 2008 and 2009 targets in terms of tonnages of ODS to be eliminated."

UNIDO has predominantly implemented large-scale projects in Asia and the Pacific and Latin America and the Caribbean, and small-scale projects in Africa and Europe, particularly attending to small and medium-sized enterprises in these regions. The largest sector UNIDO is involved in is the refrigeration sector, accounting for one third of UNIDO Montreal Protocol projects, followed by the foam sector with 18 per cent of the projects. UNIDO has phased out a total of 45,600 ODP-tonnes, representing 28 per cent of the total phased-out amounts of OSD through the Montreal Protocol.

Annex 5: UNIDO ODS Projects and Phase-Out

Year Approved/ Implementation Characteristic	Number of Approvals*	Number Completed	Per Cent Completed	Consumption ODP to be Phased Out*	Consumption ODP Phased Out	Per Cent of Consumption ODP Phased Out	Production ODP to be Phased Out*	Production ODP Phased Out	Per Cent of Production ODP Phased Out	Approved Funding (US \$)	Adjustment (US \$)	Funds Disbursed (US \$)	Per Cent of Funds Disbursed	Balance (US \$)	Estimated Disbursement in Current Year (US \$)	Administrative Support (US\$)	Administrative Support Adjustment (US\$)	Interest earned & reported (US\$)
Disbursement during Implementation																		
1991	0	0	0%	0	0	0%	0	0	0%	0	0	0	0%	0	0	0	0	0
1992	0	0	0%	0	0	0%	0	0	0%	0	0	0	0%	0	0	0	0	0
1993	20	20	100%	994	981	99%	0	0	0%	5,601,270	5,714,734	11,316,004	100%	0	0	728,165	742,916	82,813
1994	52	52	100%	2,793	3,206	115%	0	0	0%	31,434,516	-829,184	30,605,332	100%	0	0	4,086,488	-107,794	597,192
1995	56	56	100%	4,210	4,210	100%	0	0	0%	25,716,623	-1,389,587	24,327,036	100%	0	0	3,343,164	-180,645	2,486,948
1996	45	45	100%	2,764	2,883	104%	0	0	0%	20,408,498	-760,130	19,648,368	100%	0	0	2,653,106	-98,818	3,550,981
1997	127	127	100%	6,617	6,617	100%	0	0	0%	43,809,669	-2,620,034	41,077,500	100%	112,135	0	5,695,254	-345,135	3,147,059
1998	85	85	100%	2,526	2,526	100%	0	0	0%	23,871,778	-1,150,796	22,720,982	100%	0	0	3,051,781	-143,859	4,418,659
1999	120	118	98%	4,041	4,042	100%	0	0	0%	35,759,190	-2,378,274	33,258,464	100%	142,461	101,385	4,322,008	-291,612	3,844,710
2000	93	90	97%	3,510	3,347	95%	0	0	0%	28,406,650	1,150,753	28,293,592	95%	1,353,811	132,118	3,367,464	123,290	2,431,724
2001	115	108	94%	3,678	3,589	98%	0	0	0%	24,703,733	-790,595	22,075,129	92%	1,838,011	1,373,132	3,095,347	-99,695	2,308,799
2002	73	67	92%	4,310	4,256	99%	0	0	0%	31,913,225	2,479,881	30,080,111	87%	4,312,995	1,827,086	5,141,848	310,752	682,967
2003	47	35	74%	1,950	2,633	135%	0	0	0%	27,883,690	1,954,240	24,761,884	83%	5,081,046	3,043,183	3,661,942	145,437	581,257
2004	41	24	59%	1,454	1,151	79%	1,250	1,250	100%	33,314,748	-452,170	26,113,039	79%	6,749,539	2,735,730	3,990,383	-33,913	813,953
2005	74	27	36%	4,740	2,352	50%	12,591	12,381	98%	53,210,599	-716	27,046,776	51%	26,163,107	8,639,148	5,712,224	-54	1,123,410
2006	44	6	14%	2,525	150	6%	2,877	2,530	88%	21,366,237	0	729,811	3%	20,636,426	7,536,002	3,349,734	0	2,887,492
Sub-Total	892	860	87%	46,111	41,946	91%	16,718	16,161	97%	487,485,457	928,122	342,034,028	84%	66,569,532	25,387,792	52,189,912	20,866	28,957,962
Disbursement after Completion																		
Sub-Total	0	0	0%	0	0	0%	0	0	0%	0	0	0	0%	0	0	0	0	0
Retrospectively Funded	10	10	100%	517	517	100%	500	500	100%	5,224,410	-208,575	5,015,831	100%	0	0	518,960	-26,884	0
Time-sensitive Accounts	27	19	70%	30	30	100%	0	0	0%	3,767,300	61,864	3,074,156	80%	755,008	318,701	415,967	8,043	0
GRAND TOTAL	1,029	889	86%	46,627	42,502	91%	17,218	16,661	97%	416,487,147	781,407	350,114,015	84%	67,144,539	25,706,492	53,133,539	2,025	28,957,962
* Does not include transferred and closed projects.																		

Summary of projects, ODP Phase-Out and Funding by Year. (Source: 'UNIDO and the Montreal Protocol 1992-2007'; UNIDO 2007)

Annex 6: Project review matrixes

REVIEW form for UNIDO MP projects – 1

Project number	MP/BRA/00/018
Country	Brasil
Title	National Incentive to phase out 20% of Methyl Bromide used in the Tobacco Sector
In-kind contribution	Considerable in-kind contribution 5.3 mio \$.
Duration	2001-2005
Substance	Methyl Bromide, 84.4 tons in tobacco
ODP effect, verification	All MB phased out as planned – and additional remarkable phase out achieved.
Cost effectiveness, \$/ton ODP	39,53 \$ /t
Compliance with time schedule	OK
Sound monitoring and verification of project outcome	UNIDO monitored the effective phasing-out of MB throughout the project. National Ozone Unit monitors progress on phasing out through statistics
Lesson learnt	Close and lengthy cooperation with all relevant stakeholders during project preparation provide for good results. Long term training and involvement of both tobacco plants and farmers very successful. Technology very reliable and no risk for reverting back to MB. No operational savings achieved, but farmers' working time reduced.
Additional impacts	Technology known from other projects, based on broad analysis of impacts and measures to avoid these. Pilot project carried out. Selection of substitute methods providing additional impacts. Also occupational health benefits.
Demonstration effect	Very impressive demonstration effect, the number of farmers participating was increased with more than 300 % during the project.
Competitiveness, productivity and employment considerations	Increased productivity, but sophisticated technology requires on-going training.
Phase out completion	Completed
Stakeholder definition, involvement	Involvement of stakeholders from start of programme, including pilot project implementation and assessment.

REVIEW form for UNIDO MP project nr. 2

Project number	MP/IND/03/057
Country	India
Title	Conversion of CFC-113 cleaning solvent to TCE at Bharat Electronic Limited at Bangalore
Programme theory	Investment project
Start / Finalisation	2003 - 2005
Budget	151,291 USD
In-kind contribution	6,200 USD
Duration	Delayed more than 15 months
Substance	CFC-113 trichloroethylen
ODP effect, verification	Expected ODS effect – 16 ODP tonnes
Cost effectiveness, \$/ton ODP	9,45 USD/kg/year
Compliance with time schedule	No – emphasize excellent cooperation on design and quality
Sound monitoring and verification of project outcome	PCR issued, certification of dismantle of old equipment
Lesson learnt	A technical improvement issue described in PCR Good performance and cleanliness is improved
Evaluation (incl. stakeholders)	PCR issued 2005
Additional impacts	Occupational health and work environment improved in line with closed cleaning zone. The old with open process has substituted to TCE which are harmful/carcinogen .
Competitiveness, productivity and employment considerations	Work environment/productivity reflected in memo correspondance
Phase out completion	Phase out completed and documented immediately after project end
Stakeholder definition, involvement	Company
Remarks	Pay attention to the problems with substitutions to TCE without using appropriate equipment and the PM UNIDO memo criticising the MLF secretariats point of view on this subject. Example of active discussion.

REVIEW form for UNIDO MP projects - 3

Project number	MP/MCD/00/163
Country	Macedonia
Title	Phase out Methyl Bromide in Tobacco Seedling and Horticulture Production Sector
Budget	1,075,207 \$
In-kind contribution	None
Duration	2000-2005
Substance	Methyl Bromide, 42,3 tons in tobacco and 4.1 tons in horticulture
ODP effect, verification	All MB phased out as planned.
Cost effectiveness, \$/ton ODP	39,53 \$ /t
Compliance with time schedule	Carried out faster than envisaged.
Sound monitoring and verification of project outcome	UNIDO will monitor the effective phasing-out of MB throughout the five year long project. National Ozone Unit monitors progress on phasing out through statistics
Lesson learnt	Close cooperation with all relevant stakeholders provide for good results.
Evaluation (incl. stakeholders)	Very successful, farmers confident – ongoing training needed.
Additional impacts	Broad analysis of impacts and measures to avoid these. Pilot project carried out. Selection of substitute methods providing additional impacts. Also occupational health benefits.
Demonstration effect	All relevant farmers included in the project.
Competitiveness, productivity and employment considerations	Increased productivity, but sophisticated technology requires on-going training.
Consider the regulatory cycle	
Phase out completion	Completed
Stakeholder definition, involvement	Involvement of stakeholders from start of programme, including pilot project implementation and assessment.
Involvement of institutions and competences	Involvement of training institution and technicians.

REVIEW form for UNIDO MP project 4

Project number	MC/04/028
Country	Macedonia
Title	Renewal of institutional strengthening project, Phase IV
Budget	198,347, UNIDO 132,347
In-kind contribution	66,000
Duration	3/2004 – 6/2006 – however progress report from 2007 ?
Objective	Prepare country program – a pre-condition for later investment support and institutional strengthening.
Substance	Create National Ozone Unit; adopt alternative ODS technologies, Establish reliable data system, produce annual reports on ODS, phase out ODS timely.
Project rationale	Rationale is clear, but generic (presumably for all Phase out plan-projects)
Sound monitoring and verification of project outcome	No indicators or milestones in prodoc, relatively loose monitoring arrangement
Evaluation (incl. stakeholders)	2006-progress report and 2007-progress report are very much alike.
Additional impacts	Regulation in place; system in place to monitor ODS import; workshops and meetings conducted; training conducted for service technicians, custom officers; recovery and recycling equipment received delivered to end users, and used; chiller demonstration project; promotion and media.
Stakeholder definition, involvement	Who are actually doing what – very difficult to see from progress reports – what is UNIDO role here?

REVIEW form for UNIDO MP project 5

Project number	MP/mal/97/187
Country	Malaysia
Title	Phasing out ODS at Summer Technologies Sdn Bhd.
Start / Finalisation	11/1997 – 12/1998
Budget	89,407 \$
In-kind contribution	0
Substance	CFC-11 to HCFC-141b
ODP effect, verification	12.1 t
Cost effectiveness, \$/kg ODP	7.36
Project rationale	Procurement, commissioning, start-up trial, on-the-job and basic maintenance of foaming equipment training, incremental operation costs.
Lesson learnt	Close cooperation with enterprise, Ministry of Environment / Ozone unit, and UNDP enabled very effective implementation. Leadership from implementing agency is crucial. Proactive arrangement for customs clearance of procured equipment significantly contribute to the smooth execution of project.
Disposal	Old equipment not scrapped at time of visit by evaluation team.
Stakeholder definition, involvement	Counterpart closely involved in implementation.
	Praise of the national ozone unit and UNIDO from evaluation team. Comment that small enterprises are left rather alone. No market distortions, but one example of expansion financing

REVIEW form for UNIDO MP project 6

Project number	MP/mal/97/188
Country	Malaysia
Title	Phasing out ODS at Visdamax Sdn. Bhd.
Start / Finalisation	11/1997 – 06/1999
Budget	139,959
In-kind contribution	0
Substance	CFC-11 to HCFC-141b
ODP effect, verification	18.5 t
Cost effectiveness, \$/kg ODP	7.57
Project rationale	Procurement, commissioning, start-up trial, on-the-job and basic maintenance of foaming equipment training, incremental operation costs.
Lesson learnt	Close cooperation with enterprise, Ministry of Environment / Ozone unit, and UNDP enabled very effective implementation. Leadership from implementing agency is crucial. Proactive arrangement for customs clearance of procured equipment significantly contribute to the smooth execution of project.
Stakeholder definition, involvement	Counterpart closely involved in implementation.

REVIEW form for UNIDO MP project 7

Project number	MP/OMA/01/044
Country	Oman
Title	Institutional Strengthening
Budget	78,950 \$
Objective	Prepare country program – a pre-condition for later investment support and institutional strengthening.
Substance	Create National Ozone Unit with two staff members and implement country programme.
Project rationale	Rationale is clear, but generic (presumably for all Phase out plan-projects).
Compliance with time schedule	No progress reports available
Sound monitoring and verification of project outcome	No indicators or milestones in prodoc, relatively loose monitoring arrangement
Evaluation (incl. stakeholders)	Brief reports, not much evidence on results achieved.

REVIEW form for UNIDO MP project 8

Project number	MP/ROM/03/105
Country	Romania
Title	Terminal umbrella project the the phase out of ODS solvents
Start / Finalisation	12/2003 – 12/2005

Budget	242,000 (budget 220,000)
In-kind contribution	22,000 (not budgeted)
Objective	Phase out CTC from production
Substance	From CTC to Tetrachloroethylene and various other technologies
ODP effect, verification	11.10 tons
Cost effectiveness, \$/ton ODP	21.79 \$ / kg
Compliance with time schedule	Almost one year delayed.
Sound monitoring and verification of project outcome	CTC cleaning tubs discarded No CTC provided by Oltchim to small users in 2005.
Lesson learnt	Insufficient planning caused one year delay due to lack of space for new equipment purchased in the project
Evaluation (incl. stakeholders)	Enterprises and ministry satisfied.
Stakeholder definition, involvement	Survey by Romanian R&D Institute for Environmental Protection identified all OD solvents consuming enterprises and a strategy for phase out of CTC was prepared.
	Why did the enterprise Arpechim not want the IOC 5000\$? Any conditions? Any evaluation or control of installed equipment? Tetrachloroethylene is considered carcinogenic – how is this dealt with?

REVIEW form for UNIDO MP project 9

Project number	MP/VEN/99/108
Country	Venezuela
Title	Fandec EPSR foam
Programme theory	Investment project
Start / Finalisation	1999 - 2001
Budget	290,481 USD, actual 447,017 USD
In-kind contribution	156,650 USD
Duration	Delayed more than 15 months
Substance	CFC-12 to butane
ODP effect, verification	Expected ODS effect – 45 ODP tonnes
Cost effectiveness, \$/ton ODP	6,46/9,93 USD/kg/year
Compliance with time schedule	No – emphasize excellent cooperation on design and quality
Sound monitoring and verification of project outcome	PCR issued, certification of dismantle of old equipment
Lesson learnt	Company very committed despite the economical situation in the country and project was a success.
Evaluation (incl. stakeholders)	PCR issued 2003
Additional impacts	Occupational health and work environment improved – counterpart invested 65,000 USD in safety systems, ventilation, fire protection and power supply
Remarks to environmental demands	More waste from extruder?, increasing hour of production stop?, more electricity?, less production quality?
Phase out completion	Phase out completed before project finalization – but not consistence documented – look at the remarks below
Stakeholder definition, involvement	Fandec
Remarks	Unit production goes from 375 (45ODP t) using ODS to 260 units in 2003 (29 ODP tonnes) – it means still producing ODS based units. Units produced with non ODS is 12! Does it mean that 45 ODP tonnes is achieved through variations in yearly consumption or..? General Strike in Venezuela caused lack of supply (polystyrene and isobutene). The production therefore closed in the period and increased slowly afterwards

REVIEW form for UNIDO MP project 10

Project number	MP/VEN/02/160
Country	Venezuela
Title	Phasing out CFC-11 by conversion to HCFC-141b
Budget	1,041,932
Duration	2001-2003
Substance	CFC-11
ODP effect, verification	135 ODP tons/year
Cost effectiveness, \$/ton ODP	6,21 \$/kg

Note: No PCR available !!

REVIEW form for UNIDO MP project 11

Project number	MP/ALB/06/002
Country	Albania
Title	National phase out plan,
Budget	
In-kind contribution	
Duration	2002-2007
Substance	
ODP effect, verification	No PCR
Cost effectiveness, \$/ton ODP	21.3 \$/kg in refrigerant recovery project
Compliance with time schedule	No PCR, but emails express delays due to customs challenges.
Sound monitoring and verification of project outcome	Performance targets on ODP/tonnes for the complete NPOP, 2003-2009, with indicators specified for each year.
Lesson learnt	No PCR.
Evaluation (incl. stakeholders)	No PCR
Additional impacts	
Remarks to environmental demands	
Phase out completion	
Stakeholder definition, involvement	

Note: No PCR available, fragmented documentation, several projects in one.

REVIEW form for UNIDO MP project 12

Project number	MP/ARG/04/018
Country	Argentina
Title	National CFC phase out plan
Programme theory	Phase out/national capacity
Start / Finalisation	2004 - 2007
Budget	Approx 8 mio USD in total – separate yearly budgets
In-kind contribution	500,000 from IBRD in 2005
Duration	2004-2007
Substance	CFC's
ODP effect, verification	Not applied. 2,729 ODP tonnes estimated demands for all sectors. Target is the ODS consumption pr. year seems to increase from 2003-2004 and further but target is stabilization of growth, then reduction.
Cost effectiveness, \$/ton ODP	Not applied
Compliance with time schedule	Not evaluated – a 7 years country programme
Sound monitoring and verification of project outcome	Material and analysis distributed to UNIDO. No project specific indicators as such. Monitoring of CFC consumption etc. made by OPROZ agency – Gov. are developing af consistens system based on licences.
Lesson learnt	Not reported
Evaluation (incl. stakeholders)	No project completion report provided (project still in duration?). So far no consistent procedure identified
Additional impacts	Contribute to general improvement of technologies and knowledge en sectors
Phase out completion	Follows the national agenda – 2010
Stakeholder definition, involvement	OPROZ (national ozone programme), sectors/companies, authorities
Remarks	Coordination case: UNIDO run a bid round without coordination with OZPROZ, having a procedure requiring necessary documentation fro adequate ownership and economical sound busines for allowing participation in such bids under MLF.

REVIEW form for UNIDO MP project 13

Project number	MP/BRA/01/217
Country	Brasil
Title	Umbrella Project for two enterprises converting from CFC-11 to HCFC 141b and CFC-12 to HFC-134a at Argi and Hornburg
Start / Finalisation	12/2001 - 5/2004
Budget	108.000 \$ / 95.457 realised (more than 10% savings).
In-kind contribution	0
Duration	12.2001 – 10.2004
Substance	CFC 11 /HCFC-141b; CFC-12/HFC-134a
ODP effect, verification	11.21 tons, ODS free production started. Totally ODS free since March 2003.
Cost effectiveness, \$/ton ODP	8.52 \$/kg
Compliance with time schedule	Very good
Sound monitoring and verification of project	CFC Equipment destroyed in presence of UNIDO consultants.

outcome	
Lesson learnt	Umbrella project for two enterprises was cost effective.
Evaluation (incl. stakeholders)	Enterprise: Pleased to have received the equipment, now offers better quality and environmentally friendly products, strengthen position on market.
Additional impacts	Advice provided on use of safety equipment when painting
Remarks to environmental demands	No additional env. Requirements
Demonstration effect	None
Phase out completion	
Stakeholder definition, involvement	Management involved all way through.
	One enterprise, Hornburg, was declared insolvent during the project. The equipment delivered was substituted with two smaller foaming devices. The other enterprise did not need the equipment purchased as they did not any longer produce the large foam elements. Is the success mainly due to production stop? Six bids on major equipment

14. REVIEW form for UNIDO MP project 14

Project number	MP/CPR/96/042
Programme Theory	Investment
Country	China
Title	Phasing out ODS at the NN refrigerator company
Budget	2.8 mio USD
In-kind contribution	0 USD in project proposal – 725.000 USD actual
Duration	1996-2001
Lesson learnt	Track records of suppliers should be checked and only the best selected for bid invitations
Evaluation	Yes – using project completion scheme
Substance	CFC-11 to cyclopentane CFC-12 to butane
ODP effect	338 tonnes – CFC-11 = 285 t, CFC-12 = 53 t in baseline year = 338 ODP
Cost effectiveness	8,37 USD/ODP kg
Delays	Over 15 month
Additional impacts	Workers trained, workshop held, capacity improved at factory level More energiefficient products and production
Remarks to environmental demands	Decrease over year 1994-2000 the consumption of CFC's but are still using CFC-11 (30% of 1994 consumption) in 2000. Have used a two step implementation where first step was HCFC-22/HFC-152a, next step was cyclopentane – first introduced in 2000.
Phase out completion	Not achieved fully at project completion report in 2001.
Sound monitoring and verification of project outcome	Unido PM has certified test of new processing technologies. Handover protocol signed ODS phase out approved (pre condition for completion) Conversion completed Certified equipment dismantel Photographic evidence
Remarks	Project based on overall UNIDO phase out strategy for refrigeration sector in China Company participated in Chinas phase out programme

REVIEW form for UNIDO MP project 15

Project number	MP/CPR/95/040
Country	China
Title	Conversion of Halon 1211 to ABC powder at NN factory.
Budget	500.000 USD – annual turnover is 3,5 mio USD
In-kind contribution	none
Duration	1994-1996
Substance	Halon 1211
ODP effect, verification	1,480 ODP tonnes (one years consumption of halon 1211 – 1993 is reference year)
Project rationale	Implementation of ODS free production technology
Sound monitoring and verification of project outcome	No documentation
Lesson learnt	Faster duration if better coordination with national stakeholders
Evaluation (incl. stakeholders)	No
Additional impacts	new 5.000 m2 plant constructed other place. No information on eventually planning criteria

Remarks to environmental demands	Increased production of ODS unit but in same time also substituted units are produced. (reported 1999). Increase of ODS consumption from 1800 to 2380 ODP tonnes 1994-1996
Phase out completion	Unknown when phase out at plant is fully introduced - 1999 due to China overall regulation?

REVIEW form for UNIDO MP project 17

Project number	MP/IND/00/158
Country	India
Title	Umbrella Project for the conversion of three commercial refrigeration enterprises in New Delhi: Gaurav, Thermoking, Western
Budget	371,650 \$, including 52450 incremental operating costs 50,000 \$ in incremental operating cost for Thermoking, only receiving 22,000 \$ equipment.
In-kind contribution	12,450 \$
Duration	11/2000 – 08/2004
Objective	Eliminate use of CFC-11, CFC-12 and CTC in the production and service of refrigerators and freezers at the three companies.
Substance	CFC-11/HFC-134a, CFC-12/HFC-134a and CTC/HCFE-141b.
ODP effect, verification	27.32 ODP
Cost effectiveness, \$/ton ODP	12.04 \$/kg / 10.23 \$/kg
Compliance with time schedule	Implementation two years delayed
Lesson learnt	Useful umbrella approach, but one sub-project delayed the whole umbrella project. Sufficient competencies necessary to deal with new technology.
Evaluation (incl. stakeholders)	No
Additional impacts	None
Remarks to environmental demands	Good housekeeping introduced to reduce use of CTC.
Phase out completion	Photographic evidence of equipment destroyed
Stakeholder definition, involvement	Technology selected by enterprises. Indian Ozone Cell involved in implementation, review of TOR for consultants etc.

Annex 7: Survey of UNIDO's Montreal Protocol Programme

This appendix presents the results of a survey of UNIDO's Montreal Protocol Programme carried out in the period January-February 2010.

The questionnaire was sent in digital format to 62 selected persons with connection to the UNIDO Montreal Protocol Programme from whom 27 responses have been achieved (specified with numbers in brackets):

- UNIDO Montreal Protocol Staff (14)
- UNIDO Montreal Protocol Consultant (3)
- National Ozone Unit Staff (9)
- Other relevant UNIDO staff (1)

The key points from the survey are summarised below.

The outcome of UNIDO's Montreal Protocol Programme

- More than 95 % of the respondents find that the programme has delivered sufficient phase out of ODS.
- Nearly 80 % of the respondents state that the programme has had considerable positive socio-economic and environmental effects, whereas very few have experienced negative socio-economic or environmental effects.
- The respondents have identified a large number of non-ODS effects of the ODS programme. Three positive effects dominate the responses: Reduced climate impact; Improved productivity, competitiveness and products; and Implementation of environment friendly and cleaner technologies. Other effects include Improved occupational health; Reduced waste amounts; Capacity build in enterprises; Public awareness.
- Almost 90 % strongly agree or agree that sufficient capacity has built at enterprise level (the remaining 11 % slightly agree).
- All respondents strongly agree or agree that the enterprises still benefit from the technology conversion and the project.

The logic of UNIDO's Montreal Protocol Programme

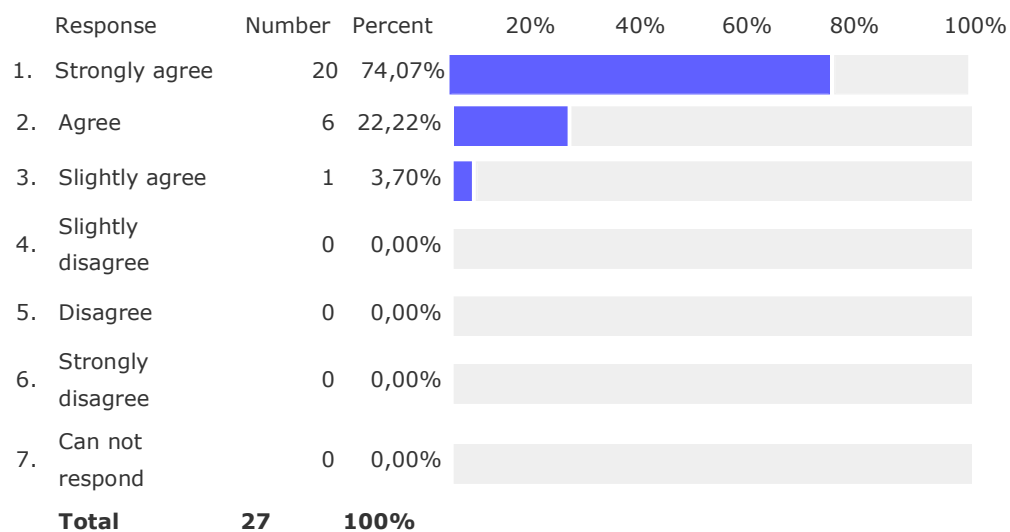
- More than 90 % of the respondents strongly agree or agree that enterprises will not reverse to ODS technology, whereas 7 % slightly disagree with this viewpoint.
- More than 80 % of the respondents strongly agree or agree that the old ODS technology has been properly destroyed, whereas 15 % only slightly agree and 4 % disagree with this viewpoint.
- 74 % of the respondents strongly agree or agree that the programme has reached all relevant enterprises (the remaining 26 % slightly agree with this statement).
- More than 90 % of the respondents strongly agree or agree that national regulation and control hinder enterprises from reversing to or start up with ODS technology (the remaining 10 % slightly agree with this statement).
- 26 % of the respondents strongly agree or agree that Illegal trade with ODS is a problem, and additional 33 % slightly agree with this statement.
- 40 % of the respondents strongly agree or agree that the national recovery and recycling scheme fully covers the demand for ODS, and additional 26 % agree with this statement.

General comments and remarks

The respondents have provided the following additional comments:

- The MP Programme has showed the way for other Multilateral Environmental Agreements.
- The MP Programme cannot directly target increased productivity, as this would be against the MP rules, but increased productivity may have occurred as side effect.

Do you find that the UNIDO Montreal Protocol Programme has led to sufficient phase-out of ODS?



Do you find that sufficient capacity has been built at enterprise level for operation and maintenance of the new technology?

Response	Number	Percent	20%	40%	60%	80%	100%
1. Strongly agree	11	40,74%					
2. Agree	13	48,15%					
3. Slightly agree	3	11,11%					
4. Slightly disagree	0	0,00%					
5. Disagree	0	0,00%					
6. Strongly disagree	0	0,00%					
7. Can not respond	0	0,00%					
Total	27	100%					

Do you agree that enterprises having been supported through the UNIDO MP programme still benefit from the technology conversion and the project?

Response	Number	Percent	20%	40%	60%	80%	100%
1. Strongly agree	13	48,15%					
2. Agree	14	51,85%					
3. Slightly agree	0	0,00%					

4.	Slightly disagree	0	0,00%	
5.	Disagree	0	0,00%	
6.	Strongly disagree	0	0,00%	
7.	Can not respond	0	0,00%	
Total		27	100%	

According to your experience, do you agree that enterprises that have changed to non-ODS technology will not reverse to previous ODS technologies?

	Response	Number	Percent	20%	40%	60%	80%	100%
1.	Strongly agree	12	44,44%					
2.	Agree	13	48,15%					
3.	Slightly agree	0	0,00%					
4.	Slightly disagree	2	7,41%					
5.	Disagree	0	0,00%					
6.	Strongly disagree	0	0,00%					
7.	Can not respond	0	0,00%					
Total		27	100%					

Do you in general find that the old ODS technology has been properly destroyed?

	Response	Number	Percent	20%	40%	60%	80%	100%
1.	Strongly agree	6	22,22%					
2.	Agree	16	59,26%					
3.	Slightly agree	4	14,81%					
4.	Slightly disagree	0	0,00%					
5.	Disagree	1	3,70%					
6.	Strongly disagree	0	0,00%					
7.	Can not respond	0	0,00%					
Total		27	100%					

Do you find that the ODS phase-out programme has reached all relevant enterprises, including SMEs?

	Response	Number	Percent	20%	40%	60%	80%	100%
1.	Strongly agree	7	25,93%					
2.	Agree	13	48,15%					
3.	Slightly agree	7	25,93%					
4.	Slightly disagree	0	0,00%					
5.	Disagree	0	0,00%					
6.	Strongly disagree	0	0,00%					
7.	Can not respond	0	0,00%					
	Total	27	100%					

Do you find that national regulation and control hinder enterprises from reversing to or starting up with ODS technology?

	Response	Number	Percent	20%	40%	60%	80%	100%
1.	Strongly agree	6	22,22%					
2.	Agree	19	70,37%					
3.	Slightly agree	2	7,41%					
4.	Slightly disagree	0	0,00%					
5.	Disagree	0	0,00%					
6.	Strongly disagree	0	0,00%					
7.	Can not respond	0	0,00%					
	Total	27	100%					

Do you believe that illegal trade with ODS is of significant magnitude and constitutes a threat to ODS phase-out?

	Response	Number	Percent	20%	40%	60%	80%	100%
1.	Strongly agree	3	11,11%					
2.	Agree	4	14,81%					

3.	Slightly agree	9	33,33%	
4.	Slightly disagree	2	7,41%	
5.	Disagree	5	18,52%	
6.	Strongly disagree	3	11,11%	
7.	Can not respond	1	3,70%	
Total		27	100%	

Do you believe that the national recovery and recycling scheme for ODS refrigerants is sufficient to fully cover the temporary demand for ODS (e.g., no need for import)?

	Response	Number	Percent	20%	40%	60%	80%	100%
1.	Strongly agree	2	7,41%					
2.	Agree	9	33,33%					
3.	Slightly agree	7	25,93%					
4.	Slightly disagree	4	14,81%					
5.	Disagree	5	18,52%					
6.	Strongly disagree	0	0,00%					
7.	Can not respond	0	0,00%					
Total		27	100%					