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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Fifty-ninth Meeting
Port Ghalib, Egypt, 10-14 November 2009

PROJECT PROPOSALS: DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

This document consists of the comments and recommendation of the Fund Secretariat on the following project proposals:

Process agents

- Phase-out of CTC as process agent at 2.8 Vinalon Complex UNIDO
- Phase-out of CTC as process agent at Sinuiju Chemical Fibre Complex UNIDO

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECT**DEMOCRATIC PEOPLE’S REPUBLIC OF KOREA****PROJECT TITLE(S)****BILATERAL/IMPLEMENTING AGENCY**

(a) Phase-out of CTC as process agent at 2.8 Vinalon Complex	UNIDO
(b) Phase-out of CTC as process agent at Sinuiju Chemical Fibre Complex	UNIDO

NATIONAL CO-ORDINATING AGENCY	National Coordinating Committee for Environment, Ozone Cell
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LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT**A: ARTICLE-7 DATA (ODP TONNES, 2007, AS OF OCTOBER 2009)**

Annex B, Group II	0		

B: COUNTRY PROGRAMME SECTORAL DATA (ODP TONNES, 2008, AS OF OCTOBER 2009)

ODS	Subsector/quantity
CTC	Not reported

PROJECT TITLE:	2.8 Vinalon Complex	Sinuiju Chemical Fibre Complex
ODS use in sector (ODP tonnes):	0	0
ODS to be phased out (ODP tonnes)*:	172.7 (140.8)	108.9 (90.89)
ODS to be phased in (ODP tonnes):	n/a	n/a
Project duration (months):	21	21
Local ownership (%):	100	100
Export component (%):	0	0
Requested grant (US \$):	1,769,614	1,301,952
Cost-effectiveness (US \$/kg)*:	10.24 (12.57)	11.95 (14.32)
Implementing agency support cost (US \$):	132,721	97,646
Total cost of project to Multilateral Fund (US \$):	1,902,235	1,399,598
Status of counterpart funding (Y/N):	Y	Y
Project monitoring milestones included (Y/N):	Y	Y

*as per original CTC phase-out plan approved at the 41st Meeting (as per consumption average 2002-2005)

SECRETARIAT’S RECOMMENDATION	For individual consideration
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PROJECT DESCRIPTION

1. UNIDO, on behalf of the Government of the Democratic People's Republic of Korea (D.P.R. Korea) has submitted for consideration at the 59th Meeting two project proposals related to the phase out of CTC in process agent applications in D.P.R. Korea. One project relates to the phase out of CTC as a process agent in Sinuiju Chemicals Fibre Complex (SCFS), requesting support from the Multilateral Fund at the level of US \$1,301,952 plus support costs for UNIDO of US \$97,646. The second project is the phase out of CTC as a process agent at 2.8 Vinalon Complex (VNL), requesting a grant of US \$1,769,614 plus support costs for UNIDO of US \$132,721. The total funding requested is therefore US \$3,071,566 plus support costs of US \$230,367. Both project proposals are related to the CTC phase-out plan of D.P.R. Korea approved at the 41st Meeting.

Background

2. At its 41st Meeting, the Executive Committee approved in principle an agreement with the Government of D.P.R. Korea to phase-out the consumption of CTC at a total cost of US \$5,684,840 plus support costs of US \$426,363 for UNIDO. The Committee also approved funding of US \$3,500,000 plus support costs of US \$262,500 for the first tranche of the project. Further tranches were approved at the 46th, 49th, 52nd, and 55th Meetings. With the approval at the 55th Meeting, all tranches for the plan have been funded.

3. The phase-out plan included a variety of activities in the solvent cleaning, process agent and fumigation sectors. It is supplemented by individual projects in the solvent cleaning sector that were approved prior to preparation of the plan. The plan foreshadowed the submission of additional requests for funding for the phase-out of CTC applications that were not at the time classified as process agents by the Parties. At its 49th Meeting, the Executive Committee approved a separate project for the phase-out of CTC consumption associated with two process agent applications in the pharmaceutical sub-sector, with associated cost of US \$884,399 plus US \$66,330 in support costs, bringing the total approved for the plan to US \$6,569,239 plus support costs of US \$492,693.

4. At the 52nd Meeting, the Executive Committee was informed that in two of the four process agent plants to be converted, some parts of the equipment were deemed to fall under the dual-use restrictions of the International Chemical Weapons Convention and had been detained at the Chinese port. Subsequently, in October 2006 the UN Security Council adopted Resolution 1718 (2006), which also contains similar trade restrictions. In its decision 52/40 the Executive Committee urged UNIDO to find a solution, compliant with UN Security Council Resolution 1718 (2006) and the conditions of the Chemical Weapons Convention, to overcome the impediments and complete the implementation of the process agent sector activities. At the same time, it requested UNIDO to provide a status report on the progress achieved with the activities at SCFC and VNL.

5. The Executive Committee discussed during its 55th Meeting the status report on the implementation of the phase-out of CTC in D.P.R. Korea at SCFC and VNL. In its related decision 55/12, the Executive Committee noted that some equipment items required for the conversion had been purchased but were deemed to fall under the dual-use restrictions of the International Chemical Weapons Convention, to which D.P.R. Korea had not yet adhered. Based on this, the Executive Committee requested UNIDO to carry out a number of activities such as:

- (a) To sell the relevant equipment items and to report back to the Executive Committee, presenting a financial report on all disbursements so far incurred, including storage cost. At the 57th Meeting, the Executive Committee was advised in document UNEP/OzL.Pro/ExCom/57/15 that a buyer. The buyer offered a total of US \$50,000 for the equipment, and would pay the transport cost. The original cost of the equipment was US \$400,000; and

- (b) To continue with the implementation of all other components of the plan for the terminal phase-out of CTC, without using any remaining funds associated with CTC phase-out activities at SCFC and VNL. UNIDO has provided a progress report to the Secretariat, which contained information indicating that all other activities foreseen under the plan will be completed by end of April 2009.

6. At the request of the Executive Committee, the Secretariat sent a letter to the Government of D.P.R. Korea advising of the possible cancellation of the plan for terminal phase-out of CTC if all the activities proposed in the plan or the approved annual work programmes, including those related to SCFC and VNL, were not completed by 30 April 2009. The Secretariat informed the Government of the D.P.R. Korea accordingly in a letter dated 11 August 2008.

7. The Executive Committee left open the possibility that, in the event that D.P.R. Korea was not able to complete the conversion at SCFC and VNL, the country could resubmit, no later than the 59th Meeting of the Executive Committee, a funding request for the conversion of these two enterprises (decision 55/12). This was on the understanding that an alternative approach could be found to be technically feasible and economically viable, and that the country will in any event achieve compliance with the CTC phase-out schedule under the Montreal Protocol.

8. The two submissions to the 59th Meeting relate to the decision 55/12 and present two alternative approaches to the implementation of activities of the CTC phase-out plan for D.P.R. Korea at the two companies SCFS and VNL.

Technical description of the SCFS project

9. The project at SCFC will complete the phase out of 99.0 metric tonnes (108.9 ODP tonnes) of CTC, based on the 2002 consumption by the company; 2002 was the base year for the preparation of the CTC phase-out plan. At SCFC, CTC had been used to make chlorinated rubber, which was further processed to chlorinate rubber enamel, an anti-corrosive paint. According to the information provided by UNIDO, the plant was closed in 2006 to allow the dismantling of the plant in preparation for the arrival of the goods subsequently deemed to fall under the dual-use provision of the UN Security Council Resolution 1718. UNIDO proposed to avoid the chlorination processes with the associate need for glass-lined reactors, by changing the end product from chlorinated rubber enamel to polyacrylate resin. The reaction to that new end product is through an intermediate product, methyl methacrylate, which also needs to be produced.

10. SCFC is a nationally-owned company manufacturing a variety of basic chemicals with manufacturing facilities originating from China; the manufacturing of chlorinated rubber by SCFC started in 1984. In the manufacturing of the anti-corrosive paint with chlorinated rubber, CTC is used in the chlorination of the rubber and as a formulation agent in the manufacturing of the enamel. The company produces on average 24.75 metric tonnes of chlorinated rubber and 272.15 metric tonnes of chlorinated rubber enamel per year. The production figures from 2002 to 2005, which were enclosed with the project submission and used for the above averages, show a continuously declining production of chlorinated rubber and of the associated enamel. Both, including the associated CTC consumption, declined in the order of 30 per cent between 2002 and 2005.

11. The submission included a detailed description of the presently used CTC-based chlorinated rubber production process. In addition, the replacement process has been described in detail. The anti-corrosion properties of the replacement product are slightly lower than those of chlorinated rubber. UNIDO argued in the project submission that lower anti-corrosive characteristics of the polyacrylate resin as compared to the chlorinated rubber enamel will lead to an increased demand for the product to make up for the shortcomings in the properties, so that the plant of 371 tonnes capacity for chlorinated rubber enamel needs to be replaced with by one plant with 600 tonnes capacity for polyacrylate resin in order to

provide paint on an equal performance basis. The implementation of this project is supposed to take 21 months.

12. UNIDO provided a cost calculation for the project consisting of incremental capital costs (ICC) and incremental operating costs (IOC) for one year. The project submission includes a list of equipment and the exact value of the equipment to be delivered, a break down of the IOC and savings before and after the conversion, a list of dismantled equipment to be destroyed, and a list of the equipment delivered by UNIDO under the original replacement project. The project proposal also includes a calculation of compensation for the closure at SCFC, from 2006 to date, stating a loss in annual gross profit of US \$248,469 plus wages for 34 employees of US \$102,000 per year, leading to a total loss of US \$1,226,641 for three and a half years due to the closure of the plant. However, neither the IOC nor the compensation for the closure have been requested as part of the submission. The project costs have been provided in a very detailed way and lead to costs of US \$574,293 for establishing the production of the intermediate chemical methyl methacrylate and US \$609,300 for establishing the facility for the polymerisation of the monomer to unsaturated polyacrylate resin. The ICC of US \$1,301,952 includes also a contingency of 10 per cent. The cost effectiveness of the activity is 14.32 \$/kg ODP.

Technical description of VNL project

13. The project at VNL will complete the phase out of 157 metric tonnes (172.7 ODP tonnes) of CTC, based on the 2002 consumption of the company. At VNL, CTC had been used to produce chlorosulphonated polyethylene (CSPE), chlorinated polyethylene (CPE) and chlorinated lacquer (CPEL). According to the information provided by UNIDO, this plant was also closed in 2006 to allow dismantling in preparation for the arrival of the goods subsequently deemed to fall under the dual-use provision of the UN Security Council Resolution 1718. Similar to the project at SCFS, UNIDO also proposes in this case to avoid the chlorination process with the associated need for glass-lined reactors, by changing the end product from CSPE, CPE and CPEL to a non-saturated polyester resin.

14. VNL is a state-owned company manufacturing a variety of basic chemicals such as caustic soda, hydro chloric acid, vinylon fibre, vinyl chloride, dyes, pesticides, etc.; the output of chlorine is about 25,000 tonnes/year. In the past, there had been CTC production at VNL which had been closed in 2006 with support of the phase-out plan. The enterprise was founded in 1978 and is operating with equipment bought from the former German Democratic Republic. The installed annual capacities for the products made using CTC as a process agent are 100 metric tonnes/year of CSPE of which, on average, 26.43 metric tonnes were produced; 500 metric tonnes of CPE of which, on average, 211.49 metric tonnes were produced; and 500 metric tonnes of CPEL, of which, on average, 180.28 metric tonnes were produced. The production of CSPE and CPE started in 1982, and of CPEL in 1983. The production figures for the years 2002 to 2005 for the three products manufactured, CPE, CSPE and CPEL, as well as the figures for the associated CTC use are part of the project proposal, and have formed the basis for the above averages. While, contrary to CPEL, CPE and CSPE and the associated CTC use increase from 2002 to 2003, for all products and all associated CTC consumption there is a continuous decrease from 2003 onwards. For CPE and CPSE the output in 2005 is lower by about 50 per cent, and for CPEL by more than 40 per cent as compared to the maximum.

15. In VNL, CPE and CSPE were used as additives to polyvinyl chlorine and rubber to produce paint for chemical process facilities, pipes and other items. The replacement product, unsaturated polyacrylate (UP) resin, has similar anti-corrosion qualities as CPE/CSPE and favourable aspects in terms of production and environmental effects. The proposed production capacity of the UP resin is 600 tonnes which corresponds to the production capacity of CSPE plus CPE.

16. The ICC of the conversion is US \$1,769,614, and UNIDO provided a detailed break down of the ICC as well as of the IOC. The solution using UP resin has substantially higher IOCs of US \$1,837,621/year. UNIDO also provided information on the list of equipment to be decommissioned

and destroyed, and on a list of equipment delivered by UNIDO under the production of the original replacement project. Finally, the project description includes a calculation of lost profit of CPE, CPEL and CSPE from 2006 to 2009. Including the necessary staff costs, the annual profit is US \$279,172, leading to an aggregated loss of US \$977,102 for 3.5 years. The project does not request the payment of IOC or lost profit. The cost effectiveness of the activity is 12.57 \$/kg ODP.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

17. In decision 55/12 the Executive Committee had decided that in the event that the D.P.R. Korea was not able to complete the conversion at VNL and SCFC the country could resubmit, no later than the 59th Meeting of the Executive Committee, a funding request for the conversion of these two enterprises should an alternative approach to be found technically feasible and economically viable, on the understanding that the country will at any event achieve compliance with the CTC phase-out schedule under the Montreal Protocol. The Secretariat accessed the project submissions for SCFC and VNL on the basis of this decision, and in light of a number of conditions to be fulfilled, specified in that decision:

- (a) Since the decision at the 55th Meeting and as reported to the 57th Meeting, the originally envisaged conversion of the two enterprises could not be completed and the associated equipment has in the mean time been sold. The underlying reason, UN Security Council Resolution 1718, remains in force, therefore, the conversions of the manufacturing facilities at the two enterprises cannot be completed as originally planned when submitting the phase-out plan for CTC in D.P.R. Korea to the 41st Meeting;
- (b) UNIDO submitted the two project proposals to the 59th Meeting, fully in line with the request by the Executive Meeting; and
- (c) The compliance of the country with the CTC phase-out schedule under the Montreal Protocol and also under the Agreement has been achieved, since the manufacturing facilities using CTC in SCFC and VNL were disassembled in 2006 in expectation of the arrival, in particular, of glass-lined reactors, at the manufacturing sites, and have consequently discontinued using CTC. In addition, the country ceased the production of CTC. Therefore, according to the information available, D.P.R. Korea is in compliance with the CTC phase-out schedule under the Montreal Protocol and is in compliance with the Agreement related to the CTC phase-out plan for D.P.R. Korea.

18. The technical feasibility of the proposed conversions was assessed by the Secretariat. From the impression of the Secretariat as well as according to the repeated reassurance by UNIDO - both in the proposals submitted as well as in subsequent correspondence between the Secretariat and UNIDO - the proposed conversions seemed to be possible without breach of the UN Security Council Resolution 1718. This is essentially the case because the products have been changed from chlorine-containing substances to alternatives, removing chlorine from the production process, and therefore, avoiding the installation of banned equipment.

19. The Secretariat looked into the general applicability of the solution proposed by UNIDO. It appears that, given the restrictions of the UN Security Council Resolution 1718, the selected solution to replace the end product instead of looking for different ways for chlorination is technically the most meaningful way forward. However, replacing the end product lead to the need to establish substantive manufacturing capacity to replace existing capacity. The Secretariat discussed with UNIDO the question to what degree the replacement constitutes a technology upgrade. UNIDO replied that different

replacement products are used in the process and not new, technologically upgraded processes for the old products. Therefore, UNIDO believes that the selected technology at SCFC can not be considered as a technology upgrade; it is rather seen as a technology downgrade. UNIDO views the solution provided at VNL as equivalent in technology, but not as an upgrade.

20. The replacement products chosen seem to be suitable for the application and are acceptable to the country. The costs of the equipment and conversion appear to the Secretariat to be acceptable in both cases, given the challenges of implementation in D.P.R. Korea. The country claims that the total project cost is a multiple of the requested grant, since the lost profits from the standstill in production as well as IOCs are not included in the request for a grant from the Multilateral Fund.

21. The Executive Committee mentioned the economic viability of the approach as a criterion to decide on funding. For this particular project, being located in a country with a planning economy, with limited involvement in international trade, the economic viability is difficult to assess. However, the Secretariat has provided below some observations in the hope that these will give additional insight for the members of the Executive Committee:

- (a) The original plan as presented to the 41st Meeting foresaw for the process agent sector expenditures of US \$1,258,146; the project proposals submitted by UNIDO to the 59th Meeting cover two of the four companies in the sector at that time; these companies represented 51.7 per cent of the sector consumption. On a pro rata basis, the combined funding originally foreseen for these two projects was in the order of US \$650,000. However, the funding requests for these two projects, at SCFC and VNL, are substantially higher than originally envisaged for these activities, at US \$1,301,952 and US \$1,769,614; the cost increase as compared to the solution originally negotiated is about 4.7-fold. In a reply to related comments from the Secretariat, UNIDO pointed out that the most cost-effective solution was proposed in the original submission, before the resolution of the UN Security Council. The new cost calculation is based on the actual costs of the best possible technical solution taking into account UN Security Council Resolution 1718;
- (b) The Secretariat discussed with UNIDO the possibility to close the plants and purchase the products on the world market at competitive prices. UNIDO advised that the possibility of production closure had been investigated during the preparation of the projects. The Government had decided to keep the production capacities open, since these factories are deeply integrated in the chemical production chain in the country and are important for the employment of the population. Moreover, the compensation for production closure would potentially be higher than the conversion costs; and
- (c) The capacity of the facilities planned for the production of the replacement products at SCFC and VNL are miniscule in comparison with the plants operating to deliver cost effectively to the world market, and if D.P.R. Korea would have to recover the cost for investment into their new plant, it is unlikely that the facilities would be economically viable if used to compete in an open market.

22. When decision 55/12 was taken, the Executive Committee expressed its willingness to look into alternative ways to support D.P.R. Korea in the CTC phase out in the two enterprises. However, at that time it was unclear which costs might be involved; consequently, the Secretariat prepared the table below to compare the cost of the conversion with related cost within the project.

Item	Absolute costs (US \$)	Relative to submission to 59th Meeting
Original project proposal for SCFC and VNL	650,000	21.2%
Phase-out plan in total	6,569,239	213.9%
Original equipment value of goods under the dual use provision / Security Council Resolution 1718	400,000	13.0%
Cost recovery from selling already purchased goods under the dual use provision / Security Council Resolution 1718	50,000	1.6%
Cost of planned conversion	3,071,566	100%

23. The Executive Committee might wish to consider whether the liability for the substantial cost increase of the overall plan, since before the 55th Meeting, US \$6,569,239 to US \$9,590,805 in case of approval of the projects at the level requested, should rest with the Multilateral Fund. The Secretariat is not in a position to provide guidance regarding the eligibility of such costs under these circumstances. However, the technical feasibility of the projects seems to be given, and the costs for the approach taken are reasonable.

24. At the time of writing of this document, DPR Korea has not submitted its 2008 country programme data to the Secretariat. The Executive Committee had noted in its decision 52/5 that country programme implementation data had to be submitted in advance of the last meeting of the year and subsequent meetings as a precondition for the approval and release of funding for projects. The Secretariat will inform the Executive Committee whether this data has been received in advance of the 59th Meeting; otherwise, the precondition for an approval of these projects has not been fulfilled. The Secretariat has advised UNIDO accordingly, and UNIDO has forwarded the information to the NOU.

RECOMMENDATION

25. The Executive Committee may wish to consider whether to approve the project “Phase-out of CTC as process agent at Sinuiju Chemical Fibre Complex” at a cost of US \$1,301,952 plus agency support costs of US \$97,646; and the “Phase-out of CTC as process agent at 2.8 Vinalon Complex” at a cost of US \$1,769,614 plus agency support costs of US \$132,721 in light of the comments provided by the Secretariat in this document.
