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PROJECT PROPOSALS: THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

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

Phase-out

- HCFC phase-out management plan (phase I)

UNIDO

PROJECT DESCRIPTION

1. On behalf of the Government of the Former Yugoslav Republic of Macedonia (FYR Macedonia) UNIDO, as the designated implementing agency, has submitted to the 59th Meeting of the Executive Committee an HCFC phase-out management plan (HPMP) at a total cost of US \$1,530,000 for the first stage of the plan until the year 2015. It foreshadows a second stage with a duration until 2030 for an additional cost of US \$2,400,000. The HPMP follows closely the specifications of the guidelines adopted by the Executive Committee as per decision 54/39. FYR Macedonia consumes HCFC-22 and produces HCFC-141b blown polyurethane foam.

2. The HPMP for FYR Macedonia is intended to enable the Government to meet its obligations for HCFC phase-out in line with the Montreal Protocol's control measures. The HPMP is based on a survey assessing the use of HCFCs in the country, the situation of the HCFC-using manufacturing industries and the number of HCFC refrigeration and air-conditioning systems in the country. The resulting plan is developed as a two-stage approach with several activities in the years 2010 to 2015 and second stage with a limited number of activities until 2030. It indicates that in the years 2030 to 2040, no more activities would be necessary to support the phase-out of FYR Macedonia.

General information

3. FYR Macedonia is a land-locked country located in the centre of the Balkan Peninsula in Eastern Europe with, in the south, a Mediterranean climate, in the centre and north a mild continental one. Of the two million people in 560,000 households, 58 per cent live in cities, of that more than a third live in the capital Skopje. In the ten years from 1997 to 2007, the growth domestic product (GDP) of FYR Macedonia grew in total by about ninety per cent, with the GDP increasing in the years 2006, 2007 and 2008 by 4.0, 5.9 and 5.3 per cent respectively. The GDP per capita increased two folds in the decade to 2007 to a value of US \$3,710. The National Ozone Unit (NOU), located in the Ministry of Environment and Physical Planning, prepared the first country programme for the reduction and phase-out of ODS in July 1995. Since then, 12 projects in the refrigeration, foam, halon, aerosol and methyl bromide sectors as well as phase-out plans have been approved for FYR Macedonia, in addition to funds for institutional strengthening (IS) with four renewals. A refrigeration management plan (RMP) was approved in 1999, and a terminal phase-out plan (TPMP) in 2005. The country participated in the regional chiller demonstration project in 2005. In total, the direct phase-out activities funded by the Multilateral Fund lead to an ODS phase-out of 602 ODP tonnes (620 metric tonnes). The country paid special attention to the refrigerant recovery and recycling (R & R) set up, which includes also the R & R of HCFCs. The recycling programme is very successful; from 2001 to 2006, an average of 7.5 per cent of the national CFC-12 consumption was recycled; in the peak year, 2006, this value increased to 26 per cent of the national CFC consumption being recycled. Recycling continued at about the same level in 2007 and 2008 while the consumption of CFCs was reduced to zero in those years. It should be noted that these figures relate only to the recycling of CFC-12; the recycling of HCFC-22, which is also ongoing, has in the last four years recycled on average 2.8 metric tonnes per year, equal to more than 8 per cent of the annual consumption.

4. The country has ratified the Vienna Convention, the Montreal Protocol and all its amendments including the Beijing Amendment. In 1997 a general permit scheme for ODS import had been established, and in 1998 a permit scheme for import of used equipment, followed in 2008 by a permit system for import of new equipment. Any application for a permit for the import of ODS or equipment containing ODS must be submitted to the NOU for the final decision whether to grant the import or not. Environmental taxes for import of ODS and ODS-containing equipment exist since 2005 and depend on the type and quantity of the imported ODS, or the type, quantity and volume of the equipment imported. Refrigerators for example are covered by taxes between US \$4 and US \$8 per unit; CFCs are taxed at about US \$1.50/kg and HCFCs presently about US \$0.12/kg. The import of used refrigerators, freezers and other cooling and freezing equipment has been banned since 2007, and the import of CFCs

from 1 January 2009. FYR Macedonia is aiming to harmonise the regulatory framework with that of the European Union, and both the Government as well as industry strive to achieve the European-standard phase-out strategy for HCFCs. The existing legislation regarding ODS appears to be suitable for an accelerated HCFC phase-out as foreseen by decision XIX/6 of the Meeting of the Parties with only minor amendments.

5. The HPMP provides an overview of the consumption of HCFCs in the country. The country does not have any HCFC production, therefore the consumption is completely covered by imports. Two HCFCs are imported, HCFC-22 and HCFC-141b. The HCFC-141b is imported into the country as part of a polyol foam blowing mixture (pre-blended polyol) and is not under the control of the licensing system. Consequently, the official customs data does not contain information regarding pre-blended polyols with HCFC-141b. The HCFC-22 data reported regularly to the Ozone Secretariat and the HCFC-141b data established during the survey¹ on the basis of import of pre-blended polyols is shown in Table 1:

Table 1: HCFC consumption 2002 to 2008

Substance	HCFC consumption [metric tonnes per year/ (ODP tonnes per year)]						
	2002	2003	2004	2005	2006	2007	2008
HCFC-22 (ODP=0,055)	69.27 / (3.81)	108.36 / (5.96)	86.55 / (4.76)	33.82 / (1.86)	42.91 / (2.36)	22.72 / (1.25)	36.86 / (2.03)
HCFC-141b (ODP=0,11)	13.00 / (1.43)	16.00 / (1.76)	14.00 / (1.54)	18.00 / (1.98)	11.00 / (1.21)	14.50 / (1.60)	13.00 / (1.43)
Calculated use of HCFC total ²	(5.24)	(7.72)	(6.30)	(3.84)	(3.57)	(2.85)	(3.46)

6. The survey showed that the consumption of HCFC-22 is exclusively related to the service and equipment assembly sectors, and that no manufacturing capacity producing equipment with HCFC-22 exists in the country.

7. The survey identified three companies in the foam sector using HCFC-141b. The company "Sileks AD Co." received support from the Multilateral Fund for the phase-out of CFC-11 and its replacement by HCFC-141b at the 22nd Meeting in 1997. There are several companies, in addition to Sileks, namely Koper and Zlatna Raka which are using HCFC-141b for foam blowing. Koper and Zlatna Raka have not previously received support from the Multilateral Fund. Koper was established in 1990 and is a factory for the production of domestic appliances and commercial refrigerators, while Zlatna Raka, established in 1970, is a producer of insulated segment doors. All three manufacturers import polyol mixtures containing HCFC-141b. It should be noted that the calculated annual use of HCFC-141b, measured in ODP tonnes, is larger than the HCFC-22 consumption in more than a quarter of the years covered by Table 1. The use of HCFC-141b in pre-blended polyols was 9.9 metric tonnes (1.09 ODP tonnes) at the largest manufacturer Sileks, 3.3 metric tonnes (0.36 ODP tonnes) at the company Koper and another metric tonne (0.11 ODP tonnes) at the company Zlatna Raka. The HPMP pointed out that the installed capacities were significantly higher, at an aggregated figure of 106 metric tonnes of HCFC-141b in pre-blended polyol per year.

8. The forecast for the use of HCFCs in the future assumes that the air conditioning and refrigeration sector will grow by 15-20 per cent during the coming years. However, it is also acknowledged that since about three to four years ago, alternatives have been introduced in many traditional HCFC-22 applications, mainly due to the fact that most of the importers have had easiest access to the units sold in the European market. The HPMP document points to a risk of turning back to HCFC-22 equipment if

¹ The HCFC-141b imports within pre-blended polyols have been established on the basis of importers data and company purchase records of the pre-blended polyols, and product data specifying the average HCFC-141b content.

² The total HCFC use in the country is the result of import of bulk HCFC-22 as reported under Article 7 plus the imports of HCFC-141b in pre-blended polyol

importers bring in low priced HCFC-22 units from Asia, since “the concern for the environmental difference among many end users appears to be lower than the desire to pay the lowest price”. The plan points to the risks posed by an increase in installed HCFC-22 stock for achieving the freeze level in 2013. As a result of these considerations policy measures are under development to curb the supply of new equipment (see below); on the basis of this curbed demand, the plan includes an estimate for the increase in consumption of HCFC-22 until 2012. An estimate for the increase in HCFC-141b use indicates a substantial increase of 10 per cent per year, based on the presently low utilization of the installed capacity at the companies and the general expected growth of the economy of the country. The forecasts for the years until 2015 are presented in Table 2.

Table 2: Forecast of HCFC consumption for the years 2009 to 2015

Substance		Base	Year						
			2009	2010	2011	2012	2013	2014	2015
HCFC-22									
Increase			5%	5%	5%	5%	Baseline	-5%	-10%
Consumption	(metric tonnes)	58.65	61.58	64.66	67.89	71.28	63.12	59.96	56.81
	(ODP tonnes)	3.23	3.39	3.56	3.73	3.92	3.47	3.3	3.12
HCFC-141b									
Increase			10%	10%	10%	10%	Baseline	-5%	-10%
Consumption	(metric tonnes)	14.2	15.7	17.3	19	21	16.5	15.68	14.85
	(ODP tonnes)	1.56	1.73	1.9	2.09	2.31	1.82	1.72	1.63
Total HCFC									
Consumption	Reported (ODP tonnes)	3.23	3.39	3.56	3.73	3.92	3.47	3.3	3.12
	Reported plus pre-blended polyol (ODP tonnes)	4.79	5.12	5.46	5.82	6.23	5.29	5.02	4.75

9. The HPMP recognizes the growing trend towards alternatives in new installations on the European market towards with low impact on the climate. The document points out that alternatives are available for all applications and that a replacement of HCFCs is possible in new systems at relatively low cost, but that there are significant challenges to phase out HCFCs in particular in existing refrigeration and air conditioning equipment. The alternatives presently available for the refrigeration and air conditioning sector in FYR Macedonia include the most prominent HFCs (HFC-134a, HFC-404A, HFC-407A, and HFC-410A); Table 3 shows the costs of these alternatives. The use of isobutane in domestic refrigeration servicing and ammonia in industrial refrigeration assembly and servicing is also common in the country. The imports of the different refrigerants and the associated wholesale prices are shown in Table 3. All refrigerant uses are either related to servicing or to assembly and charging of refrigeration equipment.

Table 3: Import of alternative refrigerants in 2008 (issue permits) and whole sale prices

Refrigerant	HCFC -22	R-507	R-404A	R-407C	R-410A	HFC-134a
Price (US \$)	2.27 – 2.87	5.32 – 6.0	5.3 – 6.7	5.5 – 6.0	5.6 – 6.0	4.27 – 5.6
Import (metric tonnes)	36.860	15.297	71.699	10.193	11.704	51.610

Strategy and plan for the implementation HCFC phase-out

10. The submission of the HPMP consists of a differentiated plan for the years until 2015 and also information about the activities and implementation from 2016 to 2040. The plan contains policy instruments such as import quotas and taxes, activities such as the conversion of three foam manufacturers and the further improvement of a R & R scheme as well as activities related to waste disposal. Finally, the HPMP submitted foresees also IS funds.

11. The introduction of an annual import quota for new air-conditioning equipment (split and unitary) containing HCFCs is planned by the Ministry of Environment and Physical Planning. The baseline will be the number of imported units during the year 2008, standing at 36,000. It is expected that this number will remain constant for the years 2009 and 2010, reduced to 20,000 in the year 2011, and from the year 2012 onwards a ban is planned on imports of new air-conditioning equipment containing HCFC into the country. It is also planned to establish an import quota for the import of bulk HCFC-22 for the years 2011 and 2012 at the presently forecasted level of HCFC-22 consumption, as presented in Table 2. Imports in the year 2013 will be limited to the baseline value, in 2014 at 5 per cent and in 2015 the reduction of 10 per cent required to achieve compliance will be applied to the import licenses of HCFC-22. The introduction of mandatory reporting for importers and exporters related to the total quantities of imported or exported goods under the issued permits, for cross-checking the data with information received from customs is also foreseen. The Government plans a tax on HCFC-using air-conditioning equipment being imported, at a level of approximately US \$5/kW of cooling capacity. The tax on HCFCs will be raised from the current US \$0.12/kg to about US \$1.40/kg, and those taxes will be imposed from 2011 onwards. The import of HCFC-containing equipment will be banned from January 2012, and of non-refillable HCFC containers from January 2015. Finally, it is planned to introduce a mandatory log book for users of equipment containing more than three kilogrammes of HCFCs starting in 2012 onwards.

12. Activities foreseen under the HPMP consist of training of users and service technicians in non-HCFC refrigeration technologies and in Recovery and recycling (R&R) of HCFCs as well as in the keeping of log books of HCFCs equipment. Further training activities are planned for the customs officers to ensure the enforcement of the new HCFC-related regulations. The HPMP proposes to add another 40 sets of R & R equipment to the already existing fleet. The country further proposes to undertake waste disposal activities. A waste disposal facility is intended to recover HCFCs from equipment at the end of its useful life. The dismantling of equipment, discharging and storage and refrigerants would be part of this undertaking; the HPMP for the years until 2015 foresees the start-up funding for this activity and the operational costs for the set-up period.

13. The conversion of the manufacturing industry using pre-blended polyol is also proposed to take place under the first step of the HPMP. The alternatives selected are CO₂-water technology for the conversions at Sileks and Zlatna Raka, and the use of pentane technology at Koper. The operating costs have been calculated in the proposal, but no increase was made; consequently, no incremental operating costs are being requested. The cost for the institutional strengthening is also covered in the HPMP.

14. Phase II of the HPMP from 2016 to 2030 foresees a number of activities in addition to management, import quota setting and monitoring at a total cost, on average, US \$50,000 per year.

15. These activities include awareness-raising work, including issuing of brochures, organization of technical seminars and workshops and awareness of the broad public such as press releases, television spots, radio broadcasts, and the distribution of leaflets, posters and movies. Finally, the plan foresees significant expenses for the IS within the HPMP and suggests to discontinue IS outside the HPMP. The operation of the waste disposal centre is planned until 2040 with costs of, on average, US \$60,000 per year; these costs include all other operational costs of the programme, i.e. operation of the recovery and recycling system and other activities. Finally, monitoring and verification costs are foreseen for the

second phase with a total of US \$150,000. The total costs for phase II are estimated at US \$2,400,000, or US \$96,000 per year.

16. The coordination of the national activities will be undertaken by the NOU, and also the management of the implementation of the planned project activities will be allocated to the NOU in corporation with UNIDO as an implementing agency. The monitoring of the development of the HPMP and the verification of the achievements of the performance targets will be assigned to an independent local company or independent local consultants. The establishment of a separate National Ozone Unit is not foreseen.

17. The budget overview of the first and second phase of the HPMP is provided in Table 4 below, the costs per year for the first phase in Table 5.

Table 4: Budget overview of the HPMP

Activities /project	Funds requested (US \$)
Phase I	
1. Cost estimate for the refrigeration service sector as well as legislative, enforcement and monitoring activities	
Legislation	10,000
Customs training	40,000
Technicians training	60,000
Technical assistance - improvement of recovery and recycling scheme	100,000
Monitoring	40,000
Sub-Total	250,000
2. Institutional strengthening support	
until 2015	300,000
3. Conversions in manufacturing industries	
- Company Sileks, Kratovo	248,000
- Company Koper, Negotino	252,000
- Company Zlatna Raka, Sk	50,000
Sub-Total	550,000
4. Establishment of Waste Disposal Center and collection of ODSs	
Establishment and start-up	430,000
Total for Phase I	1,530,000
Phase II	
1. Institutional support, policy instruments, awareness raising - until 2030 (15 years)	750,000
2. Waste disposal center - collection and destruction - until 2040 (25 years)	1,500,000
3. Monitoring and verification - until 2040 (25 years)	150,000
Total for Phase II (forecast)	2,400,000
Total cost for the HCFC phase-out (forecast)	3,930,000

Table 5: Planned expenditures by calendar year for the first phase of the HPMP

Year	2011	2012	2013	2014	2015	Total – Phase I
Investment costs (US \$)		275,000			550,000	825,000
Running costs (US \$)	60,000	135,000	170,000	170,000	170,000	705,000
Total	60,000	410,000	170,000	170,000	720,000	1,530,000

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

18. In the view of the Secretariat, this HPMP presents in its phase I an example for an exceptionally well formulated, strategic programme, using the experiences of past programmes as well as the legal and organisational basis built by the country during the phase-out of CFC and other ODS in the country. The approach appears targeted and effective and, given the ongoing work on the creation of legal instruments, is likely to succeed in controlling the consumption, curbing the growth in consumption in the years 2011 and 2012 to a maximum of 5 per cent, and phasing the consumption down to 90 per cent of the baseline by 2015. The very successful implementation of the R & R system in the country in the past makes it likely that the reduction can be carried out without premature abandonment of HCFC-22 based infrastructure before the end of its useful life. However, as pointed out below, the eligibility of some of the elements of both phases of the HPMP remains uncertain.

19. The HPMP foresees the conversion of three foam companies from their use of HCFC-141b blown foam to alternatives. The total cost of these three conversions is US \$550,000, and consists only of capital costs. The total costs appear high but, in the overall context of the HPMP, acceptable for the phase-out of, on average, 14.2 metric tonnes of HCFC-141b to low GWP alternatives. The conversion of the company Sileks, associated with a consumption of 9.9 metric tonnes (1.09 ODP tonnes) and a cost of US \$248,000, constitutes a second conversion after the phase-out of CFC-11 in a Multilateral Fund project approved in 1997. The Secretariat draws attention to the general question on whether the use of HCFC-141b in imported pre-blended polyols establishes eligibility for funding. The related issue is presented in a generic form in document UNEP/OzL.Pro/ExCom/59/11 as a policy issue. It should be noted that FYR Macedonia is a low-volume-consuming country, and the enterprises concerned are clearly falling into the category of small and medium size enterprises. Both categories are referred to explicitly as in need of assistance when directing the Executive Committee in decision XIX/6 regarding support to be provided for HCFC-phase-out. The Government has, in addition, informed the Ozone Secretariat of its HCFC-141b consumption in pre-blended polyols in the years 2001 to 2008.

20. The legal set-up includes measures related to curbing rising demand through import limits of equipment depending on HCFCs as early as 2009 with a ban in 2012, and curbing demand through import restrictions on HCFCs as early as 2011. The HPMP does not foresee a licensing system for the import or use of HCFC-141b in pre-blended polyols. The measures foreseen for the refrigeration sector focus largely on training and R & R, which in the specific case of FYR Macedonia has proven to be quite effective. The Secretariat fully supports the planned set-up and the measures contained in the HPMP.

21. Phase I of the HPMP includes the set-up of a waste disposal centre; for phase II, the waste disposal centre is the only operational activity foreseen. It is a combination of a disposal and storage facility and at the same time provides support for the R & R programme³. The Executive Committee has in the past funded in a number of cases similar programmes under phase-out plans, for example the recovery of CFCs from cars and from ships at the end of their useful life under the service sector plan for China. However, the total cost associated with this activity in the FYR Macedonia HPMP, while justifiable, appears very significant at a level of US \$430,000. The Secretariat believes that any efforts for collection of ODS should be, in line with the interim guidelines for the funding of demonstration projects for the disposal of ODS (decision 58/19), funded within a national or sectoral phase-out plan to ensure effective integration with the sectoral efforts in the country. However, there is presently no indication if and to what degree the Executive Committee will fund such an activity. UNIDO, when asked by the Secretariat, pointed out that the environmental impact of the HCFCs to be collected is considerable and would warrant, in the opinion of the country, the related costs.

22. The total cost of the HPMP for the first phase stands at US \$1,530,000. The level foreseen for activities in the refrigeration sector is exactly as that forecasted by the Secretariat, not taking into account the additional activities related to the disposal centre and IS integrated into the plan, and the foam projects with presently uncertain eligibility. Given the current limited experience with such projects, the cost review which the Secretariat was able to carry out was only limited; as a result, the Secretariat believes that the costs requested are justifiable and appropriate.

23. The HPMP proposes a significant change in the structure of the funding for the IS in FYR Macedonia. At the 57th Meeting, funding for IS was approved for two years at the level of US \$132,347, i.e. US \$66,174 per year; the next request could be submitted for the first meeting in 2011. Instead, the HPMP proposes to include the funding in the HPMP starting from January 2012 until December 2015, on a basis of US \$75,000 per year, and not to request IS separately. Upon request from the Secretariat, the country confirmed that they will not seek IS funding for the time between April and December 2011. In comparison, the extension of the IS from April 2011 to December 2015, on a pro rata basis, would lead to costs of US \$308,812, versus requested cost of US \$300,000. It is noteworthy that the IS requested is also the only funding foreseen for implementation support, i.e. the HPMP does not foresee a separate project management unit. With this set-up, the IS will be subject to the performance characteristics of the proposed agreement, which will probably include suspending and/or reducing funding for the HPMP in case of non-compliance with the agreement⁴.

24. Phase II of the HPMP, from 2016 to 2040, consists of activities related to the waste disposal centre, as well as institutional costs and monitoring and verification:

- (a) The cost for the waste disposal center in phase II covers the operational costs of the centre, after its set-up during phase I. The Secretariat pointed out that operational costs are typically not covered by the Multilateral Fund, and questioned whether waste disposal alone would be sufficient as an activity to reach the complete phase-out of HCFCs in the country by 2040. The Secretariat further pointed to the taxes to be raised on the import of HCFCs and HCFC-containing equipment, and requested whether such taxes could not be used to fund at least the operational cost of the waste disposal center. UNIDO responded on behalf of the country that income from the import tax could contribute as additional funding to this activity. UNIDO, on behalf of the Government, expressed the understanding that preventing the emission of surplus ODS has a high priority. The

³ The R & R programme has in 2001 to 2008 collected in total 1.95 metric tonnes of non-recyclable ODS for future destruction; this is equivalent to 4.3 per cent of the material starting the recycling process.

⁴ At this point in time the Draft Agreement has not been finalized, although FYR Macedonia informed the Secretariat that the proposed draft, shown in document UNEP/OzL.Pro/ExCom/59/11, is fully acceptable regarding the conditions mentioned therein. Consequently, the remarks regarding the consequences of the IS funding under the HPMP are presently preliminary, until the work on the Draft Agreement has been finalized.

existence of a waste disposal center and the planned integration into the overall organisational set-up in the country would at the same time also ensure that other activities, in particular the R & R, would be sustainable in the country;

- (b) The concept for IS for phase II follows the concept of phase I, i.e. the IS appears to be integrated into the performance-based plan. The level requested for the IS drops to US \$50,000 per year, i.e. about 25 per cent lower than the present level of IS; the IS would presumably continue to be under a performance-based agreement; and
- (c) It should be noted that all information regarding phase II is, at this point in time, preliminary, and that no concept, no funding and no activities for phase II will be before the Executive Committee for discussion at this point in time.

25. The Draft Agreement, starting point and proposed reduction steps have not been finalised at the time of writing this document. The Secretariat can therefore presently not comment on the Draft Agreement, the starting point, the phase-out schedule, and the annual implementation plan. Even after the finalisation of these issues, the Secretariat will still refrain from a funding recommendation due to the various policy issues unresolved at this point in time.

26. The document UNEP/OzL.Pro/ExCom/59/11 “Overview of issues identified during project review” contains information regarding the following policy issues related to the HPMP for FYR Macedonia:

- (a) Consumption arising from HCFC-141b contained in pre-blended foam chemicals (polyols);
- (b) Preliminary template for draft agreements for HPMPs; and
- (c) Funding of institutional strengthening projects as part of an HPMP.

RECOMMENDATION

27. Pending.
