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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Forty first Meeting
Montreal, 17 -19 December 2003

PROJECT PROPOSAL: TURKEY

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

Fumigant

- Phase-out of methyl bromide in protected tomato, cucumber and carnation crops (second tranche) UNIDO

Phase-out

- Total phase-out of CFCs plan: 2004 annual programme World Bank

Solvent

- Plan for phase-out of ODS in the solvent sector UNIDO

**PROJECT EVALUATION SHEET
TURKEY**

SECTOR: Fumigant ODS use in sector (2002): 280.8 ODP tonnes

Sub-sector cost-effectiveness thresholds: n/a

Project Title:

(a) Phase-out of methyl bromide in protected tomato, cucumber and carnation crops (second tranche)

Project Data	Phase out of methyl bromide
Enterprise consumption (ODP tonnes)	
Project impact (ODP tonnes)	58
Project duration (months)	12
Initial amount requested (US \$)	1,000,000
Final project cost (US \$):	
Incremental capital cost (a)	
Contingency cost (b)	
Incremental operating cost (c)	
Total project cost (a+b+c)	1,000,000
Local ownership (%)	100%
Export component (%)	0%
Amount requested (US \$)	1,000,000
Cost effectiveness (US \$/kg.)	29.20
Counterpart funding confirmed?	
National coordinating agency	Ministry of the Environment
Implementing agency	UNIDO

Secretariat's Recommendations	
Amount recommended (US \$)	1,000,000
Project impact (ODP tonnes)	58
Cost effectiveness (US \$/kg)	29.20
Implementing agency support cost (US \$)	75,000
Total cost to Multilateral Fund (US \$)	1,075,000

PROJECT DESCRIPTION

1. The Executive Committee, at its 31st Meeting, approved US \$479,040 (World Bank) as the total funds that will be available to Turkey to achieve the complete phase-out of methyl bromide (MB) used in the dried fig sector (30 ODP tonnes). At its 35th Meeting, the Executive Committee approved in principle an additional US \$3,408,844 (UNIDO) as the total funds that will be available to Turkey to achieve the complete phase-out of MB used in protected tomato, cucumber, and carnation crops (additional 292.2 ODP tonnes), and allocated US \$1,000,000 to UNIDO for the first tranche which would phase out 29.2 ODP tonnes.
2. In 2002, the Government of Turkey reported under Article 7 a total MB consumption of 280.8 ODP tonnes, which is below the maximum level of MB consumption agreed between the Government and the Executive Committee (293.4 ODP tonnes).
3. According to the information presented in the progress report, the following activities were implemented in Turkey:

Date	Activity
February 27-28, 2003	General meeting with all MB phase-out project personnel (45 persons)
March 5, 2003	MB office was established at Citrus and Greenhouse Crops Research Institute (CGCRI) in Antalya
June 23, 2003	Change of project coordinator and some project components (increasing personnel; establishing a computer center for data analysis and reporting; and increasing the training programme to include all MB users in the soil fumigation throughout the country)
June 26, 2003	Meeting at CGCRI on developments in MB project, selection of personnel and establishing special groups (education, computer and analytic equipment)
July 1, 2003	Preliminary interview with CGCRI personnel for determination of new project personnel
July 7, 2003	Assessing applications and expertise fields of CGCRI personnel
July 15, 2003	Designing tool and equipment specifications
September 1-2, 2003	General meeting with all project personnel in CGCRI
September 16, 2003	Sending questionnaire forms to the provinces
September 22, 2003	Interviews with the growers in Adana and Mersin
October 1-8, 2003	Training in Adana, Muğla and Antalya
October 10, 2003	Interviews with the growers in Antalya and Muğla

4. The Government of Turkey has submitted a funding request for implementation of the second phase of the project for protected tomato, cucumber, and carnation crops. UNIDO is requesting US \$1,000,000 to phase out an additional 58.0 ODP tonnes of MB. The main phase-out activities proposed include: continuing biofumigation and alternative chemicals (US \$305,000), fertilizer injection (US \$25,000), introducing solarization (US \$150,000), steam pasteurization (US \$220,000) and training (US \$200,000). The remaining US \$100,000 will be reserved for additional activities as the second phase of the project.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

5. In 2001, the Government of Turkey reported a consumption of 227.4 ODP tonnes. In 2002, MB consumption increased to 292.8 ODP tonnes (as per the data reported in the progress report). In this regard, the Secretariat sought a clarification from UNIDO for the increase in MB consumption. UNIDO indicated that it would appear that there is some confusion since the figure of 292.8 ODP tonnes is the consumption reported for 2000 in the cut flower and vegetable sector. In the period 1 January to 15 October, a total of 163.7 ODP tonnes of MB were imported in Turkey. By the end of 2003, MB imports will no longer be allowed except for quarantine and pre-shipment applications.

6. According to the progress report, the Secretariat noted that the activities so far implemented are related more to training and public awareness than to actual phase out investment activities. It is also reported that the project personnel increased from 35 to 67 and that a computer centre for the purpose of an adequate and complete database was established. While the project was approved on the understanding that, *inter alia*, "Turkey will have the flexibility in implementing the project components which it deems more important in order to meet its phase-out commitments", the Secretariat sought a clarification from UNIDO on the actual activities undertaken for the actual phase out of MB (type of equipment purchased, surface area converted to alternative technologies and number of farmers using alternative technologies).

7. Subsequently, UNIDO informed the Secretariat that while some items requested by the organization implementing the project were not foreseen in the project document; the Government of Turkey used the authorization for flexibility by requesting equipment that it considered indispensable for proper project implementation and monitoring (e.g., computers for daily reporting, analytical equipment for information on soil contamination and success of treatments, and education and awareness equipment).

8. Regarding the project's personnel component, UNIDO informed the Secretariat that this component is dictated by the necessity to cover all concerned areas in Turkey according to the needs assessed by the Ministry of Agriculture. UNIDO fully agreed that the revised personnel component substantially changes the budget lines as foreseen in the project document; however it follows needs identified in the field.

RECOMMENDATION

9. The Fund Secretariat recommends blanket approval of the project proposal with associated support costs at the funding levels shown in the table below:

	Project Title	Project Funding (US\$)	Support Cost (US\$)	Implementing Agency
(a)	Phase-out of methyl bromide in protected tomato, cucumber and carnation crops (second tranche)	1,000,000	75,000	UNIDO

PROJECT EVALUATION SHEET TURKEY

SECTOR: Phase-out ODS use in sector (2002): 698.9 ODP tonnes

Sub-sector cost-effectiveness thresholds: N/A

Project Titles:

(a) Total phase-out of CFCs plan: 2004 annual programme (third tranche)

Project Data	Multiple
	National Plan
Enterprise consumption (ODP tonnes)	698.9*
Project impact (ODP tonnes)	218.0**
Project duration (months)	12
Initial amount requested (US \$)	1,000,000
Final project cost (US \$):	
Incremental capital cost (a)	
Contingency cost (b)	
Incremental operating cost (c)	
Total project cost (a+b+c)	
Local ownership (%)	100
Export component (%)	0
Amount requested for third tranche (US \$)	1,000,000
Cost effectiveness (US \$/kg.)	
Counterpart funding confirmed?	
National coordinating agency	National Ozone Unit
Implementing agency	World Bank

<i>Secretariat's Recommendations</i>	
Amount recommended (US \$)	
Project impact (ODP tonnes)	
Cost effectiveness (US \$/kg)	
Implementing agency support cost (US \$)	
Total cost to Multilateral Fund (US \$)	

* 2002 CFC consumption in Turkey as reported to the Ozone Secretariat.

** The impact of the third tranche is 218.0 ODP tonnes.

PROJECT DESCRIPTION

The 2003 Implementation Programme of the National Plan for Total Phase out of CFCs in Turkey

10. The World Bank has submitted for consideration by the Executive Committee a report on the implementation of the National Plan for Total Phase out of CFCs in Turkey for the period from December 2002 through December 2003, combined with a request for approval of the 2004 annual implementation programme (attached to this document).

11. The Agreement on total phase out of CFCs in Turkey was approved at the 35th Meeting of the Executive Committee in December 2001 at a total cost of US \$9.0 million. At that same meeting, the Executive Committee also approved a disbursement of US \$3.5 million and agency support cost of US \$295,000 for the implementation of the 2002 annual programme covering activities undertaken in 2002. At the 38th Meeting in November 2002, the Executive Committee approved the 2003 annual implementation programme at the level of US \$2,500,000 and agency support costs of US \$175,000.

12. Part A of the report describes the implementation status of the 2003 Annual Programme in relation to the following activities:

- (a) Review and strengthening of existing phase-out policies and regulations;
- (b) Issuance of CFC import quotas for 2003 (quotas for 2002 were issued to importers consistent with the draft sector plan);
- (c) Continuation of the implementation of signed contracts with small- and medium-sized enterprises (SMEs) in commercial refrigeration;
- (d) Continuation of the implementation of re-training in the refrigeration industry as per the contract;
- (e) Continuation of the implementation of the recovery/recycling/reclamation program as per the contract;
- (f) Commencement of the training of customs officials;
- (g) Signature of contracts with eligible chiller companies as identified during 2002 and 2003;
- (h) Commencement of the end user retrofit programme.

13. A financial summary of the 2003 programme is provided in the following table:

Cost Table

Activity	Amount allocated for 2002 (US\$)	Amount Contracted (in 2002) (US\$)	Amount allocated for 2003 (US\$)	Amount Contracted (as of September 2003) (US\$)	Total Amount allocated for 2002+2003 (US\$)	Total Amount Contracted (as of September 2003) (US\$)
SME program	1,800,000	1,390,770	250,000	217,530 100,000 ¹	2,050,000	1,608,300 100,000 ¹
Recovery/recycling	600,000	1,527,484	1,100,000	10,500 100,000 ²	1,700,000	1,537,984 100,000 ²
Customs Training			200,000	50,000 ³	200,000	50,000 ³
Chiller replacement	900,000	485,388	660,000	217,798 1,050,000 ⁴	1,560,000	703,186 1,050,000 ⁴
End user		0	90,000	200,000 ⁵	90,000	200,000 ⁵
Training activities	100,000	286,329	100,000		200,000	286,329
Technical assistance program/Project management office	100,000	84,373	100,000	65,000	200,000	149,373
Total	3,500,000	3,774,344	2,500,000	2,010,328	6,000,000	5,785,172

¹ Further contracts amounting US \$100,000 are planned to be signed by late 2003 with the remaining SME's.

² Additional equipment amounting US \$100,000 will be purchased in October 2003 as explained in Item 3.

³ It is planned to be disbursed in late 2003 for customs training activities and equipment.

⁴ Contracts amounting US \$1.05 million will be signed in October 2003 for Chiller replacement as explained in Item 5.

⁵ Total contracts amounting US \$200,000 will be signed by late 2003 as explained in Item 6.

14. The total contract amount is US \$5.784 million as of the end of September 2003. Hence, the World Bank considers that the performance targets have been met for 2003.

15. A verification report for the CFC consumption in Turkey for 2002 and 2003 is provided as part of the progress report. The control targets for CFC consumption in 2002 and 2003 as established in the Agreement and also reported imports are reproduced below:

	2002	2003
Consumption limit CFC-12 (ODP tonnes)	650	334
Reported import CFC-12 (ODP tonnes)	635.2	257
Consumption limit CFC-11 (ODP tonnes)	250	200
Reported import CFC-11 (ODP tonnes)	61.8	106.8
Consumption limit CFC-115 (ODP tonnes)	9	9
Reported import CFC-115 (ODP tonnes)	2.7	N/A

16. The verification report from the independent auditor on the CFC consumption in Turkey in 2002 and 2003 concludes that imports were lower than the quotas issued in accordance with the consumption limits established in the Agreement. As per the table above, in 2002, the imports of CFC-12 (635.2 tonnes ODP) were very close to the quota issued (650.0 tonnes ODP).

The imports of CFC-11 were significantly lower than quotas established in 2002. For 2003, data were collected for the period from 1 January 2003 to 31 August 2003. The World Bank indicated that imports in 2003 will not exceed the consumption limits established by the Agreement.

17. The report also provides additional information in several annexes related to the implementation of the plan.

2004 Implementation Programme

18. The annual implementation programme for 2004 is provided in Part B. It includes references to the major performance indicators: maximum level of allowable CFC consumption and the value of contracts signed. It also contains a description of activities included in the implementation plan for 2004, which are presented in several sections: policies and regulations, import quotas, SME conversion, re-training, recovery and recycling scheme, chiller replacement programme, customs training, end-user retrofit and technical assistance and programme management. The annual programme provides a cost table with a breakdown of the total amount to be allocated for the different planning activities in 2004.

19. The World Bank is requesting the release of the second tranche of US \$1.0 million for the implementation of the 2004 Annual Programme for Turkey and associated agency support cost at US \$150,000.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

20. The allocation of US \$1.0 million for the 2004 Implementation Programme is in line with the Agreement, subject to confirmation that the agreed phase-out targets for the previous year have been achieved. It has been verified that the activities planned for the previous year were undertaken in accordance with the first annual implementation plan.

21. There is a statement in the 2003 Implementation Plan that was provided to the Secretariat by the World Bank in January 2002 whereby contracts amounting to 80% (US \$1.6 million) of the available amount (US \$2.0 million) were required to be signed before the approval of the 2004 Implementation Plan. Information provided in the table reproduced in paragraph 4 above indicates that contracts amounting to US \$1,350,000 are expected to be signed by the end of 2003. This represents 54% of the allocated funding. The World Bank was requested to clarify the progress achieved. The Secretariat has since received confirmation from the World Bank that all outstanding contracts will be signed in December 2003.

22. The information on established quotas, imports, stock and sales is provided in the verification report (attached to the progress report). It appears from comparison of the established CFC consumption limits and the reported imports that the CFC reduction targets have been met. The verification report provides information on stock, total imports, other procurements, and balances for companies that for import CFCs. There are positive and negative

balances which might occur due to accounting inaccuracies and procurement of CFCs from sister companies, as explained in the report. However, data in Table 9 of the report demonstrates that Sentinel's sales of CFC-12 for eight months in 2003 were 81.9 tonnes which significantly exceeded the established quota of 39.6 tonnes. The Secretariat sought clarification from the World Bank on this issue. The Secretariat has been advised that Sentinel's balance is likely to reflect unregistered procurements from its sister company and other sources in the domestic market. It is believed that, at the closure of the procurement sales balance for the year 2003, this difference will be legitimately accounted for.

23. The Secretariat requested additional information on the implementation modalities applied by the World Bank in relation to those formulated in the proposal (equipment lease approach for SMEs: performance contract approach for recovery/recycling/reclamation activities, revolving fund for chiller and retrofit programmes). The World Bank clarified that the equipment lease approach could not be used since SMEs were very reluctant to co-operate under lease conditions. Contracts on distribution of the recovery and recycling equipment will be based on performance. A revolving fund approach has been applied in implementation of several components of the CFC phase out plan.

RECOMMENDATION

24. The Executive Committee may wish to consider approval of the 2004 annual implementation programme for Turkey at the programmed level of US \$1,000,000 plus US \$150,000 agency support costs for the World Bank.

**PROJECT EVALUATION SHEET
TURKEY**

SECTOR: Solvent ODS use in sector (2000-2002): 86.7ODP tonnes

Sub-sector cost-effectiveness thresholds: n/a

Project Title:

(a) Plan for phase-out of ODS in the solvent sector

Project Data	Solvent	
	Phase out plan	
Enterprise consumption (ODP tonnes)		
Project impact (ODP tonnes)		70
Project duration (months)		36
Initial amount requested (US \$)		2,423,303
Final project cost (US \$):		
Incremental capital cost (a)		2,021,690
Contingency cost (b)		173,019
Incremental operating cost (c)		228,594
Total project cost (a+b+c)		2,423,303
Local ownership (%)		100%
Export component (%)		0
Amount requested (US \$)		2,423,303
Cost effectiveness (US \$/kg.)		35
Counterpart funding confirmed?		n/a
National coordinating agency	National Ozone Unit	
Implementing agency	UNIDO	

Secretariat's Recommendations	
Amount recommended (US \$)	
Project impact (ODP tonnes)	
Cost effectiveness (US \$/kg)	
Implementing agency support cost (US \$)	
Total cost to Multilateral Fund (US \$)	

PROJECT DESCRIPTION

25. The Government of Turkey has submitted a national phase out plan for ODS solvents (namely, CFC-113, TCA and CTC) (solvent plan) for consideration by the Executive Committee at its 41st Meeting.

ODS solvent consumption

26. The ODS solvent consumption in Turkey varies throughout the years. The table below presents the 1997-2002 CFC-113, TCA, CTC and BCM consumption reported under Article 7 by the Government of Turkey.

ODS	Consumption (ODP tonnes)					
	1997	1998	1999	2000	2001	2002
CFC-113	4.8	10.4	0.8	0.0	0.2	0.1
TCA	8.7	45.8	44	0	11.4	10.8
CTC	70.4	168.3	90.1	0.3	16.0	13.2
BCM						21.4

27. According to the solvent plan, 5.9 ODP tonnes of CFC-113 and 2.1 ODP tonnes of TCA were used by one company (Beta Proses) in the production of aerosol degreasing of metals and cleaning products. In early 2003, the enterprise converted their production line to non-ODS technologies (the company is requesting funding of the conversion retroactively).

28. CTC is used in Turkey in the production of CTC-based fire extinguishers by one enterprise (Oknal). The 2002 annual consumption of CTC by the enterprise has been estimated at 27.9 ODP tonnes; the 2000-2002 average consumption has been estimated at 18.6 ODP tonnes. The installed capacity of the facility for 5 kg CTC fire extinguishers is 10,000 units per year. Also a very small amount of CTC is used in laboratory applications.

29. TCA was widely used in the textile and apparel industry in the past. However, since the introduction of the ODS quota system, the price of TCA has increased. As a consequence, TCA has been replaced in many applications by trichloroethylene.

30. Based on the survey conducted for the preparation of the solvent plan, nine companies in the textile and apparel industry sector reported a total consumption of 15.8 ODP tonnes of TCA (seven of the nine enterprises consume less than 0.3 ODP kg of TCA per year with a total of 0.763 ODP tonnes for all seven). An additional 30 per cent (4.7 ODP tonnes) was added to the estimated consumption to cover use by SMEs.

31. Recently, two enterprises were identified using bromochloromethane (BCM) as a process agent for the production of sultamicillin tosylate, a semi-synthetic penicillin derivative. One company commenced operations in 2002 and, therefore, was considered ineligible for funding.

ODS solvent projects so far approved

32. So far, the Executive Committee has approved for funding the phase out of 13.0 ODP tonnes of CFC-113 and 25.3 ODP tonnes of TCA in Turkey. As of December 2002, of this total consumption, 15.4 ODP tonnes of TCA still remain to be phased out and, therefore, must be subtracted from the consumption of TCA remaining to be addressed. The consumption of TCA remaining to be addressed in the approved projects is higher than the TCA consumption reported for 2002.

Alternative technologies and incremental costs

33. The investment component of the solvent plan would be implemented through a combination of individual and group sub-projects. The overall cost of the solvent plan was estimated at US \$2,131,803 (at US \$33.28/kg), distributed as follows:

- (a) Beta Proses has already converted its production line to non-ODS solvent sector. The estimated cost of the conversion (requested retroactively) was estimated at US \$196,665 (at US \$24.67/kg);
- (b) For the phase out of TCA by the textile and apparel industry, the cost-effectiveness factor of US\$ 38.5/kg for TCA was used to estimate the cost of the conversion, since numerous small users are involved and the individual investments required are usually in excess of this threshold value. On this basis, the cost for the conversion was estimated at US \$792,792.
- (c) For the phase out of CTC in the production of fire extinguishers, the company proposed the use of foam fire extinguishers with an integrated carbon dioxide overcharge as the most environmentally-friendly and efficient solution (a 9 kg foam fire extinguisher is equivalent to a 5 kg CTC fire extinguisher in terms of its fire suppressant ability). To achieve this conversion, larger extinguisher cylinders (10 litres) will be required, glass fibre reinforced polyethylene storage tank, foam and carbon dioxide filling plants and ancillary equipment. The total cost of the conversion was estimated at US \$155,599, including US \$102,953 for one-year operating costs (at US \$8.37/kg); and
- (d) In the absence of experience with phase out of BCM, the cost for the conversion was based on the cost effectiveness of the approved project for the phase out of CTC in the synthesis of 2-nitrobenzyl bromide by chlorobenzene (India), and applying a scale-up factor of 6/10, since the amount of BCM used is an order of magnitude higher (US \$58.60/kg). On this basis, the cost for the conversion was estimated US \$986,824.

Management of the sector plan

34. The overall management of the sector plan will be carried out by UNIDO. The Ozone Unit would be responsible for monitoring the implementation of the proposed activities in the solvent plan, tracking enforcement of relevant ODS policies and legislations, and assisting

UNIDO with the preparation of annual implementation plans and progress reports to the Executive Committee.

35. The investment components of the solvent plan would be implemented through a combination of individual and group sub-projects.

36. The first annual plan consists of the following key components:

- (a) Establishment of operational mechanism for management and monitoring of the solvent plan;
- (b) Formulation of detailed terms of reference and work plans for the technical support and policy and management support components;
- (c) Establishment of an operational mechanism for participation in the solvent plan and for obtaining phase-out commitments from enterprises;
- (d) A workshop for training and capacity building activities for government/industry stakeholders and decision makers;
- (e) A workshop for technology assistance to participating enterprises
- (f) A workshop for public awareness and information dissemination.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

CTC and TCA baselines

37. The CTC and TCA baselines for compliance for Turkey are 86.0 ODP tonnes and 29.9 ODP tonnes, respectively; thus, the maximum allowable levels of CTC and TCA consumption in 2005 will be 12.9 OPT tonnes and 20.9 ODP tonnes respectively. The current (2002) consumption of CTC (10.8 ODP tonnes) and TCA (13.2 ODP tonnes) are already below the 2005 phase out targets. An additional 15.4 ODP tonnes of TCA will be phased out from approved but unimplemented projects.

Issues related to ODS consumption

38. The Secretariat noted that the levels of phase-out of CTC and TCA proposed to be funded in the sector plan all exceed the reported levels of 2002 consumption reported by the Government of Turkey. In the case of CTC, for example, the claimed consumption by Oknal (fire extinguishers) increased from 11 ODP tonnes in 2000 to 25.3 ODP tonnes in 2002; similarly, the consumption of BCM at Mustafa Nevzat increased from 4.6 ODP tonnes in 2000 to 16.2 ODP tonnes in 2002. UNIDO indicated that the recent monetary and economic crisis in Turkey caused certain economic instability among the country's enterprises. Many firms had

postponed their purchase of CTC fire extinguishers so that stockpiled CTC was used in the estimated consumption for 2002. Other companies discontinued their manufacturing activities, reducing ODS consumption accordingly.

39. In regard to TCA consumption, the Secretariat pointed out that it would appear that claimed identified consumption (15.8 ODP tones) has been augmented by an assumed 30 per cent (4.7 ODP tones) to cover unidentified small scale enterprises. The claimed consumption in identified enterprises is already higher than the reported consumption before the 30 per cent augmentation. UNIDO indicated that its consumption estimate was based on its survey and the fact that chambers of commerce and other various manufacturers mentioned additional potential uses of TCA. It stated that it was confirmed that the consumption in the Plan was to a large extent from stockpiles and would therefore not appear in Article 7 consumption reports.

Retroactive funding

40. The solvent plan includes retroactive funding for incremental costs for CFC-113 phase-out and the residual TCA consumption at Beta Proses. The Secretariat requested additional information concerning corroboration of the enterprise baseline prior to conversion, the technology and equipment installed and its costs, and the basis for claimed incremental operating costs. Clarification was requested as to whether the propellant used with CFC-113 and TCA before conversion was CFC-based or whether the enterprise had already changed to hydrocarbon aerosol propellant (HAP) while it continued to use CFC-113 and TCA as the active ingredients. In the later case, the equipment will already have been designed to fill flammable substances. In this regard, UNIDO indicated that the company had already received funding from the Multilateral Fund through the World Bank for the aerosol component.

41. The Secretariat noted that all similar projects approved by the Executive Committee have been considered as aerosol project, even though CFC-113 and/or TCA are filled into the cans as the active ingredients, with a cost-effectiveness threshold of US \$4.40/kg. On this basis, the maximum eligible level of funding for the Beta Proses is US \$35,000.

CTC fire extinguishers

42. The sector plan indicates that Oknal is the sole user of CTC as a fire extinguisher agent. As such, the project should constitute the final project in the fire protection industry since Turkey has already received halon banking and through that project it indicated that no further halon sector projects would be submitted.

43. The chemical breakdown of CTC when in contact with heat and hot metal and its affinity to carbon monoxide which produced a lethal by-product that was hazardous to health caused its rapid phase out. In this regard, the Secretariat sought confirmation that CTC fire extinguishers were legal in Turkey. UNIDO confirmed that Oknal is licensed to manufacture CTC fire extinguishers.

44. The Secretariat pointed out that the cost-effectiveness threshold for fire extinguishers is US \$1.48/kg. Therefore, the maximum level of funding eligible for this type of project based on the consumption indicated in the proposal would be US \$27,528. UNIDO indicated that the

threshold was established for halon fire extinguishers and therefore it should not apply to CTC fire extinguishers.

45. The Fund Secretariat also identified other issues related to the cost of cylinders and the number of months used for calculating operating costs. These issues are still under discussion.

TCA for textile enterprises

46. The Secretariat also requested additional data for textile enterprises with TCA consumption to establish the eligibility of the enterprises (e.g., dates of establishment of production capacity and their baseline configuration) and the claim for incremental costs for the enterprises (at US \$38.5/kg). The Secretariat noted that in previous approved projects, a nominal US \$500 per enterprise was provided for enhanced ventilation or similar workplace improvement to facilitate the use of alternative spot cleaning solvents, plus modest technical assistance with ventilation and solvent specification to facilitate the phase-out.

47. In this regard, UNIDO indicated that the sector plan proposes to provide for apparel manufacturers cleaning stations with an exhaust at a cost of US \$12,000 to use specially developed hydrocarbon blend. For two of the companies, the plan includes specially designed high-power cleaning equipment and a washing machine at a total cost of US \$800,000.

48. The Secretariat notes that since the latest (2002) reported consumption of TCA is 10.8 ODP tonnes and approved but unimplemented projects will phase-out 15.4 tonnes of TCA, no further TCA phase-out appear to be eligible for Turkey. The funding claimed for the textile sector would appear to constitute double-counting.

Controlled uses of bromochloromethane

49. Turkey ratified the Montreal and Beijing amendments to the Montreal Protocol on 10 October 2003.

50. The Secretariat pointed out that BCM has not been included in Annex A to Decision X/14 of the Parties; therefore, any quantities consumed would be considered as feedstock. In this regard, the BCM component of the solvent plan (US \$986,824) is not eligible for funding or inclusion in the sector plan. The Secretariat also noted that the Parties of the Montreal Protocol at their 15th Meeting, considered the use of BCM as a controlled process agent use for the production of losartan potassium (this application will be reconsidered at the 17th Meeting of the Parties).

Project management

51. The Secretariat noted that the technical support programme which is proposed to include a government regulatory aspect such as standards and certification, plus the policy and management support component together represent 7.3 percent of the proposed investment component costs. This project is part of Turkey's national ODS phase-out programme, the CFC component of which has already been approved, including funding for institutional and management aspects.

52. In this regard, UNIDO was requested to indicate the extent to which the management aspect of this project would be co-ordinated with those for the CFC programme and would draw on the management expertise already in place. UNIDO indicated that US \$198,000 was required by the Government of Turkey for the management of the project.

53. The Fund Secretariat and UNIDO are still discussing project related issues, including eligible consumption and incremental costs. The outcome of the discussion will be communicated to the 41st Meeting.

RECOMMENDATION

Pending.

REFRIGERATION SECTOR PLAN TURKEY

2004 ANNUAL PROGRAM

TECHNOLOGY DEVELOPMENT FOUNDATION OF TURKEY
(TTGV), NATIONAL OZONE UNIT (NOU) AND

THE WORLD BANK

November 24, 2003

TABLE OF CONTENTS

Introduction

Part A: Implementation Status of the 2003 Annual Program

1. Introduction
2. Time period covered
3. Performance Indicators
 - 3.1 ODS Consumption
 - 3.2 Contracts Signed
4. Implementation in 2003
 - 4.1 Policies and Regulations
 - 4.2 Import Quotas
 - 4.3 SME Conversion
 - 4.4 Training
 - 4.5 Recovery /Recycling/ Reclaim (RRR)
 - 4.6 Customs Training
 - 4.7 Chiller Replacement
 - 4.8 End-User Retrofit
 - 4.9 Technical Assistance & Project Management
 - 4.10 Summary

Part B: 2004 Annual Program

5. Introduction
6. Time period covered
7. Performance Indicators
 - 7.1 ODS Consumption
 - 7.2 Contracts Signed
8. Implementation Plan for 2004
 - 8.1 Policies and Regulations
 - 8.2 Import Quotas
 - 8.3 SME Conversion
 - 8.4 Re-Training
 - 8.5 Recovery and Recycling Scheme
 - 8.6 Chiller Replacement Program
 - 8.7 Customs Training
 - 8.8 End-User Retrofit
 - 8.9 Technical Assistance & Project Management
 - 8.10 Cost Table

- Attachment 1. Contracted SME List**
- Attachment 2 Turkish RSP – SME Conversion – Evaluation Criteria**
- Attachment 3 Training programme**
- Attachment 4 Locations of recycling and reclaim centers**
- Attachment 5 Draft layout for reclaim centers**
- Attachment 6 Recovery / Recycling Study Tour - Report**
- Attachment 7 Selection/support criteria for first round of chiller replacement**
- Attachment 8 Selection/support criteria for second round of chiller replacement**

VERIFICATION REPORT FOR THE CFC CONSUMPTION IN TURKEY FOR 2002 & 2003

Introduction

1. In accordance with the Executive Committee's approval of the "Agreement for Turkey, Refrigeration Sector Plan (RSP)" (**Error! Unknown document property name.**, Decision and Annex), Government of Turkey is hereby requesting release of the **third tranche of US\$ 1.0 million** for the implementation of the 2004 Annual Program. With this funding, CFC consumption will be limited as per figures given Agreement for Turkey. (**Error! Unknown document property name.**, Decision and Annex). Details of the 2004 annual program are provided in Section B.

2. Within the Sector Plan, Turkey agreed to the following control targets for CFC-11 consumption in the PU foam sector.

National Control Targets of Turkey for CFC-11, CFC-12 and CFC-115 consumption in ODP tones

	1999 Baseline	2001	2002	2003	2004	2005	2006	2007	2008	2009
Maximum allowable CFC-12 consumption (ODP tonnes)	736	700	650	334	166	100	0	0	0	0
Maximum allowable CFC-11 consumption (ODP tonnes)	1,049	300	250	200	150	50	0	0	0	0
Maximum allowable CFC-115 consumption (ODP tonnes)	9	9	9	0	0	0	0	0	0	0
Max allowable total ODP (ODP tonnes)		977	909	534	316	150	0	0	0	0
Total agreed funding (US \$ million)		3.5	2.5	1	0.75	0.75	0.5	0	0	0
Agency support costs (US \$ million)		0.295	0.175	0.150	0.045	0.03	0.03	0.03	0.03	0.025

Part A

Implementation Status of the 2003 Annual Program (As the end of September, 2003)

1. Introduction

The refrigeration sector was approved in December 2001. 2002 implementation has been executed as per implementation plan 2002 with some corrections and a status report has been submitted. The second implementation Plan covers the period from December 2002 through December 31, 2003. All targets set by the sector plan after its approval in December 2001.

Taking into account the short time available to reduce the import to zero, a number of activities had to be initiated already in 2002 and 2003 in order to ensure the impact in 2004 and onward.

This second annual plan consists of the following key components: a) review and strengthening of existing phase-out policies and regulations; b) issuance of CFC import quotas for 2003 (quotas for 2002 were issued to importers consistent with the draft sector plan); c) continue the implementation of signed contracts with SME commercial refrigeration companies; d) continue the implementation re-training of the refrigeration industry as per contracted; e) continue the implementation of the recovery/recycling/reclaim program as per contracted; f) start the training of customs officials; g) sign contracts with eligible chiller companies as identified during 2002 and 2003; and h) start the end user retrofit programme.

2. Time Period Covered

December 31 2002 – December 31, 2003

3. Performance Indicators

3.1 ODS Consumption

The maximum allowable CFC consumption in the refrigeration – and foams sector in 2003 is given in the table below.

ODS Substance	Consumption in refrigeration – and foams sector
	Year-2003
CFC-12	334
CFC-114 and CFC-115	0
CFC-11 consumption	200
Total ODP consumption	534

All figures in MT.

The release of the third tranche for the 2004 Implementation Plan to be approved at the last meeting in 2003 is contingent on the performance target for 2003 being met.

The 2004 implementation plan will be submitted at the third meeting in 2003 accompanied by a 2002/3 consumption verification report.

3.2 Contracts Signed

In accordance with the agreement between Turkey and the Executive Committee of the Multilateral Fund, the third performance indicator is the value of contracts signed.

It is required that contracts amounting to 80% (US\$ 2.0 million) of the available amount (US\$ 2.5 million) are signed before the approval of the 2004 Implementation Plan.

4 Implementation in 2003

RSP activities have been carried out during 2003 and the following summarizes the discussions and results: that the performance requirements for 2003 are met.

4.1 Policies and Regulations

In order to support the implementation of the sector plan, the policies and regulations in place, has been reviewed and evaluated in the context of the sector plan by MoEF. If necessary, implementations to amend existing policies, improve the enforcement the existing policies or initiate new policies has been taken.

Under the terms of the Montreal Protocol, Article 5 countries are permitted to continue to produce and consume CFCs and halons until 2010. The problem of illegal trade in ODSs are significantly exacerbated for this reason and also there are numerous potential sources and it is difficult to detect ODS in transit. Illegal production is not, however, the only possible source of illegal consumption.

MoEF is believed that the most important thing is training than policies and enforcement. Since Turkey has very long border.. This is also not enough for preventing illegal trade. At the International level, MoEF is thought a meeting with her neighbor countries. All developing countries have to be included identification codes for originating plant and labelling systems for ODS-containing equipment. However, MoEF plans to cooperate with customs, security department and judicial authorities in the national level.

4.2 Import Quotas

Quotas are issued to eligible importers on an annual basis. Each importer is entitled to a quota based on his historical imports and adjusted so the aggregate import is within the allowed annual consumption. While the 2002 quotas have been managed in accordance with the approved sector plan, the 2003 quotas was issued during the first quarter of 2003 based on specific requests from the individual importers.

The import license and realized import amounts of CFC11, CFC12, and CFC502 were given in the Verification Report, Table 7.

4.3 SME Conversion

Around 300 companies were identified in 1997-98 when the RSP was prepared. These were interviewed in 1998, 2001 and also in June 2002. Of the initial 300 companies, 40 have shifted to other business. Furthermore around 100 companies refused participation, which leaves 147 companies for the project.

Detailed information for these companies were obtained and reviewed by a technical consultant.

According the RSP, TTGV obtained prices for standardized equipment and standard costs have been applied for grant allocations to the SMEs. Additional criteria were applied for evaluation of each SME. Attachment 2 describes the evaluation criteria applied to evaluate the SME's.

TTGV informed all known SMEs that were eligible for contracting, in 2002. Of these, 61 and 8 companies have signed contracts in 2002 and 2003, respectively. In total, 69 companies have signed contracts with TTGV for a total amount of 1.6 mill US\$. as given in Attachment 1. As of September 2003, 1.0 mill US\$ has been disbursed to SME's. Additional applications from some other SME's have been received and they will be evaluated in October 2003. Hence, further contracts amounting to 100,000 US\$, will be signed ultimately, in 2003, with these SME's. The implementation of sub-projects has taken more time than expected. The reason is that implementation with larger companies is relatively smooth; implementation by smaller companies is more complicated due to lack of management capacity. It is expected, however, that the implementation of all of the sub-projects will be completed by the end of 2004.

4.4 Training

The first component of training was the train-the-trainer seminar. It was performed in 2002. The organization, KOSGEB, has been selected to manage the training as well as the recovery & recycling projects. The contract was signed at the end of October 2002. The total amount of training contract is 274.000 US\$.

The training has experienced delays, which can be explained by the change of government in Turkey, subsequent uncertainty on management at KOSGEB and the slow procedure of contracting governmental organizations

Procurement of the equipment to be used for the practical training was started by KOSGEB and will be finalized early October 2003.

KOSGEB has cooperated with Ministry of Education (MoEdu) for the implementation of training programme. 30 teachers will work for training over all Turkey. KOSGEB has contracted an experienced trainer in Turkey, Mr. Nuri Özkol, to conduct the second train-the-trainer seminar. Training materials and handouts are almost ready.

The training programme prepared by KOSGEB and MoEdu is to include a one-day course for technicians servicing smaller refrigerating applications (domestic – and serial produced commercial appliances) and a 5-day course for technicians servicing larger installations. So the training – despite the delays – can be completed by the end of 2004.

The training programme will be implemented and spread widely throughout the Turkish Education System; and will be continued after 2004. The training programme will begin in late October 2003. The training programme is presented in Attachment 3.

30 teachers would also be introduced to the equipment procured for the recovery/recycling project during the second train-the-trainer seminar.

4.5 Recovery/ Recycling/ Reclaim (RRR)

The International Competitive Bidding (ICB) process for the equipment foreseen started during summer 2002. Bid opening was September 6, 2002. Bids were received from RTI (US), ITE (Belgium) and Ekotez (Czech Republic).

Bids have been evaluated and bid evaluation report has been sent to World Bank for no objection. As per the result of Bid evaluation report RTI has been awarded the contract amounting 1.527 mill. US\$ by TTGV.

KOSGEB, has also been selected to manage the recovery & recycling projects. The contract was signed at the end of October 2002. The reclaim and recycling centers will be hosted by KOSGEB. Locations have been selected (3 reclaim centers and 24 recycling centers) according to the plan given in Attachment 4. Provision of training-related equipment is being overseen by TTGV.

The equipment from RTI arrived in Turkey in June 2003. It is currently in a warehouse west of Istanbul. The equipment was inspected and no damages were noticed. Further a rough counting verified the quantities. Finally the reclaim equipment were separated and marked for each reclaim center (Istanbul, Izmir and Ankara).

Installation of reclaim centers will be managed by the local RTI representative, PIAS, in Istanbul in October. The plan is, that for the first reclaim center (in Istanbul), PIAS will be assisted by a technical specialist from Germany representing RTI/Agramkow. The remaining two reclaim centers will be installed and commissioned by PIAS.

The Istanbul reclaim center will be located at ISISO (an association for companies involved in manufacture of refrigerating – and heating appliances). ISISO has 270 members and is located west of Istanbul, where all refrigeration companies are concentrated. A draft layout of the reclaim center is provided in Attachment 5.

The reclaim center requires a substantial amount of civil works. This includes also some equipment to facilitate the auxiliary requirements for the reclaim center. 36,000 US\$ has been allocated for the civil works and required equipment.

The scope of civil works is expected to cover the following:

- Availability of sufficient electrical power (app. 35 kW);
- Water supply and drainage;
- Voltage regulation (to avoid fluctuations which are common in Turkey) and UPS for laboratory equipment (1 kW, 10 minutes backup);
- Installation of compressed air; and
- General refurbishment of the building.

It was also agreed to procure 27 vacuum pumps to be located at the recycling and reclaim centers. The procurement has been finalized and 27 vacuum pumps were purchased by TTGV from a Turkish company, Cantas, in June 2003.

Since operation and management of a recovery/recycling/reclaim scheme is new in Turkey, TTGV and KOSGEB made a study tour to Czech Republic, Hungary and Georgia, which have different recovery/recycling schemes already in operation in March and April 2003. The main issue is how to motivate the technicians to recover refrigerant and bring it to recycling/reclaim. The report is provided in Attachment 6.

It was decided to amend the scope of equipment for the reclaim centers to facilitate optimal operation.

Amendments relate to storage of contaminated refrigerant, operation of reclaim and cylinder washing units and quality check of reclaimed refrigerant.

- Originally it was foreseen to have a central storage of contaminated refrigerant in Istanbul. For this purpose 5 tanks, a pump and a scale has been purchased. However, this will imply transfer of cylinders from other parts of Turkey. Therefore it was decided to establish smaller storages at the reclaim centers in Ankara and Izmir as well. This will require additional 2 scales and 2 pumps. 3 tanks will be located in Istanbul and one tank in Ankara and Izmir.
- The reclaim unit can operate with both small cylinders and large tanks due to its high capacity. It is found to be more practical if operation is from large tanks to minimize cylinder handling and manpower for operation. This will require additional 2 tanks for each reclaim center (1 tank for CFC-12 and 1 for HCFC-22). The tanks should be equipped with internal float switch to avoid overfilling.
- Prior to cylinder washing the cylinder valve shall be dismantled. A special tool is required for this and such tool is not part of the supply from RTI. The tool can easily be manufactured locally. Further a pump is needed to pump the wastewater through the filtering system. This pump can also be found in local market.
- It was informed during the study tour, that technicians might doubt quality of reclaimed refrigerant and therefore hesitate using it. This will naturally hamper the scheme. It was therefore decided to provide quality certificate with each batch of reclaimed refrigerant (also an argument to operate reclaim unit from tanks rather than small cylinders). Gas chromatographs are purchased to verify chemical composition. However, it was decided to also purchase Karl Fisher titration equipment (for checking of moisture) and equipment to check for residual oil.

The total amendment and its budget is as follows:

• 2 x scales @ 3,000 US\$	= 6,000 US\$
• 2 x transfer pumps @ 6,000 US\$	= 12,000 US\$
• 6 x 1000 lbs tanks with level switch @ 1,000 US\$	= 6,000 US\$
• 3 x Karl Fisher titrators @ 12,000 US\$	= 36,000 US\$
• 3 x residual oil test equipment @ 333 US\$	= 1,000 US\$
• 3 x pump for wastewater @ 333 US\$	= 1,000 US\$
• 3 x tool for valve removal @ 333 US\$	= 1,000 US\$
TOTAL	= 63,000 US\$

Procurement process for the equipment foreseen started during August 2003. It will be completed in early October 2003.

4.6 Customs training

Customs training is planned for 2003. A meeting was held at the end of January 2003 with MoEF and the Customs department in order to determine and agree strategy (phased implementation) and equipment needs.

After the meeting MoEF requested TTGV to only include customs training personnel from official ODS entry points. There are a total of 9 such personnel presently designated (5 x Istanbul, 2 x Izmit, 1 x Izmir and 1 x Ankara). This is considered insufficient, since illegal import/export likely will take place at unofficial customs points. However, the request of MoEF is considered phase I and training for officials at these 9 entry points is planned for early November 2003.

It was decided to purchase 25 refrigerant identifiers with total estimated costs of 40,000 US\$. Procurement of refrigerant identifiers, which will be needed for the customs officials, has begun during August 2003. It will be completed in early October 2003.

Phase II of customs training – pending MoEF recommendations – is planned for 2004. This will be more comprehensive and cover all major entry points into Turkey. The second phase will also involve procurement of portable refrigerant identifiers.

4.7 Chiller Replacement

The chiller replacement component has also been accelerated, which turns out to be very beneficial, since the practical chiller replacement needs to take place during winter, where there is no need for cooling.

Since all chiller installations are different and have special features, it has been decided to select a number of chillers representing different applications. It is also a reference for the second round chiller replacement, in fall 2003.

First round chiller replacement criteria have been discussed and agreed. The criteria for first round are provided in Attachment 7.

Application forms have been prepared and sent to the initially selected 5 chiller owners. 3 application forms were received from chiller owners in November 2002. All have been evaluated and contracts amounting to around 710,000 \$ were signed in January 2003. The mentioned contracts involved replacement of 6 chillers. As of September 2003, 0.69 mill US\$ has been disbursed for the first 3 chiller projects.

A survey was conducted to identify additional CFC chiller installations during February-March 2003. So far, around 80 chillers are potential for coming rounds. The 80 chillers are located at around 50 companies. It was agreed to keep a high profile on environmental issues. This means that interim technologies such as HCFC are not to be considered. Further, energy savings should be kept at a maximum.

Methods / procedures for verification of energy savings were discussed and it was agreed to measure energy savings using the method applied to a similar project in Mexico. This required procurement of some instruments, non-intrusive flow meter, wattmeter and thermometers. The equipment, which cost around 13,000 US\$, has been procured. The measured data was inserted into a simulation program and annual energy consumption was estimated. This has been done both with the old chillers and the new chillers. York International has provided the simulation software.

Lessons learned from the first round are:

- Timing is important, since chillers normally are to be replaced in off-season (winter);
- Support so far seems to be more than sufficient, and future support may be slightly reduced;
- Energy efficiency of new chillers has not been the main selection criteria for the participants. The timing factor may have influenced this, since it is of major importance that chillers are installed when cooling season starts.

Preliminary results of the verification from 3 chiller projects shows energy savings of around 20%, but more detailed calculations are required.

Two chiller seminars were conducted in Antalya and Istanbul in June 2003 to provide information about the chiller replacement project and to receive applications from potential chiller owners. Both seminars had 21 participants. The overall impression of the chiller seminars is that chiller owners are interested in such a fund for chiller replacement. Chiller suppliers also participated in the seminars.

Five application forms have been received from an additional 5 chiller owners in early September 2003. One chiller owner postponed its application to 2004. All have been evaluated and contracts amounting to around 1.05 \$ will be signed in October 2003. One application has been rejected because the old chillers operate with R-22.

For the second round chiller replacement, preliminary selection criteria are based on the following:

- Application form from chiller owner including proposed financial support;
- Chiller age (according to ICF study chillers with age around 10 years will provide optimum cost effectiveness);
- Chiller type (centrifugal) and refrigerant (only CFC's); and
- Cost effectiveness. A cost effectiveness factor being based on chiller capacity, age and energy efficiency improvements has been formulated.

So, selection criteria have been revised according to the lessons learned as provided in Attachment 8.

4.8 End-user retrofit

As of September 2003 this activity has not started. KOSGEB training was a pre-condition for retrofits done by the SME's. Initially the retrofit cost needs to be verified. Therefore it has been agreed to contact the companies Klimasan and Ugur and offer them participation. Klimasan and Ugur were visited in August 2003 and potential participation in the project was discussed.

Klimasan and Ugur expressed interest and agreed to investigate the potential and provide information on service organization as well as retrofit costs mid October 2003.

It is planned that the total contract amounting 200,000 US\$. will be signed with Klimasan and Ugur for retrofitting of its commercial refrigeration products late 2003.

It is also expected that KOSGEB, through their training, would identify other beneficiaries and participants for 2004.

4.9 Technical Assistance & Project Management

US\$ 65,000 has been disbursed for the activities of technical assistance & project management office.

4.10 Summaryt

The total contract amount is 5.784 mill.US\$ as the end of September 2003 as per the following table. Hence, the performance targets have been met for 2003.

Cost Table

Activity	Amount allocated for 2002 (US\$)	Amount Contracted (in 2002) (US\$)	Amount allocated for 2003 (US\$)	Amount Contracted (as of September 2003) (US\$)	Total Amount allocated for 2002+2003 (US\$)	Total Amount Contracted (as of September 2003) (US\$)
SME program	1,800,000	1,390,770	250,000	,217,530 - 100,000 ¹	2,050,000	1,608,300 - 100,000 ¹
Recovery/recycling	600,000	1,527,484	1,100,000	10,500 - 100,000 ²	1,700,000	1,537,984 - 100,000 ²
Customs Training			200,000	50,000 ³	200,000	50,000 ³
Chiller replacement	900,000	485,388	660,000	217,798 - 1,050,000 ⁴	1,560,000	703,186 - 1,050,000 ⁴
End user		0	90,000	200,000 ⁵	90,000	200,000 ⁵
Training activities	100,000	286,329	100,000		200,000	286,329 -
Technical assistance program/Project management office	100,000	84,373	100,000	65,000 -	200,000	149,373 -
Total	3,500,000	3,774,344	2,500,000	2,010,328 -	6,000,000	5,785,172 -

¹ Further contracts amounting 100,000 US\$. is planned to be signed by late 2003 with the remaining SME's.

² Additional equipment amounting 100,000 US\$ will be purchased in October 2003 as explained in Item 3.

³ It is planned to be disbursed late 2003 for Custom training activities and equipments.

⁴ Contracts amounting 1.05 Mill. US\$ will be signed in October 2003 for Chiller replacement as explained in Item 5.

⁵ Total contract amounting 200,000 US\$. will be signed by late 2003 as explained in Item 6.

MoEF will inform the secretariat by 30th September regarding official 2002 ODS imports. For 2003, licenses will not exceed the quantities specified in the agreement under the RSP.

Part B

2004 Annual Program

1. Introduction

The refrigeration sector was approved in December 2001. 2003 implementation has been executed as per implementation plan 2003 with some corrections and a status report has been submitted. The third implementation Plan will cover the period from December 2003 and through December 31, 2004. The CFC consumption target will be met for 2004 as given in the Implementation Plan (see table below). All targets set by the sector plan after its approval in December 2001.

Taking into account the short time available to reduce the import to zero, a number of activities have to be initiated and continued in 2003 and 2004 in order to ensure the impact in 2004 and onward.

This third annual plan will consist of the following key components: a) review and strengthening of existing phase-out policies and regulations; b) issue CFC import quotas for 2004 (quotas for 2003 were issued to importers consistent with the draft sector plan); c) continue for the implementation signed contracts with SME commercial refrigeration companies; d) continue the implementation re-training of the refrigeration industry as per contracted; e) continue the implementation of the recovery/recycling/reclaim program as per contracted; f) continue the implementation of customs officials training; g) sign contracts with eligible chiller companies as identified during 2003 and 2004; and h) continue the implementation of end user retrofit programme.

2. Time Period Covered

December 31 2003 – December 31, 2004

3. Performance Indicators

3.1 ODS Consumption

The maximum allowable CFC consumption in the refrigeration – and foams sector in 2004 is given in the table below.

ODS Substance	Consumption in refrigeration – and foams sector
	Year-2004
CFC-12	166
CFC-114 and CFC-115	0
CFC-11 consumption	150
Total ODP consumption	316

All figures in MT.

The release of the fourth tranche for the 2005 Implementation Plan to be approved at the last meeting in 2004 is contingent on the performance target for 2004 being met.

The 2005 implementation plan will be submitted at the third meeting in 2004 accompanied by a 2003 consumption verification report.

3.2 Contracts Signed

In accordance with the agreement between Turkey and the Executive Committee of the Multilateral Fund, the third performance indicator is the value of contracts signed.

It is required that contracts amounting to 80% (US\$ 0.8 million) of the available amount (US\$ 1.0 million) are signed before the approval of the 2004 Implementation Plan.

4 Implementation Plan for 2004

The key components of the main activities in the 2004 Implementation Plan are as follows:

4.1 Policies and Regulations

In order to support the implementation of the sector plan, the policies and regulations in place will be reviewed and evaluated in the context of the sector plan. If necessary, implementations to amend existing policies, improve the enforcement the existing policies or initiate new policies will be taken.

4.2 Import Quotas

Quotas are issued to eligible importers on an annual basis. Each importer is entitled to a quota based on his historical imports and adjusted so the aggregate import is within the allowed annual consumption. While the 2003 quotas have been managed in accordance with the approved sector plan, the 2004 quotas will be issued during the first quarter of 2004 based on specific requests from the individual importers.

4.3 SME conversion

Signature of further contracts will be continued by late 2003 with the remaining SME's.

As per the written statements in the signed agreements, project monitoring will be continued and the completed projects will be reported by visiting companies. With this contracts, SME's obliged to report with the documentary evidence that CFC's are no longer used by the company except for service purposes. Agreement also states that company baseline equipment retained for service purposes only (charging units, vacuum pumps, and /or leak detectors) shall not be used for manufacture, assembly or installation of new refrigeration appliances. The projects are planned to be completed at the end of 2004.

4.4 Re-Training

The training of refrigeration technicians will be continued during 2004 as planned.

4.5 Recovery and Recycling Scheme

The equipment from RTI arrived in Turkey in June 2003. Equipment will be distributed to the SME's after they have participated in the training.

The reclaim and recycling centers will be established according to the plan given in Attachment 4 & Attachment 5. The organization, KOSGEB, will be responsible for either hosting the centers or subcontracting suitable companies for hosting.

Finally remaining segments of the Turkish refrigeration sector will receive recovery equipment.

The process will be monitored by KOSGEB and reports of the amounts being recovered/reprocessed will be submitted to TTGV quarterly.

4.6 Chiller Replacement Program

Establishment of the chiller database began during fall 2002. From this database a number of chillers were selected and contracts signed with the chiller owners as the first round (amounts up to the budget allocation). During winter 2002/03 the new chillers were installed and commissioned.

A survey was conducted to identify CFC chiller installations during February-March 2003.. Around 80 chillers have been identified as potential replacements for coming rounds.

After the seminars conducted in Antalya and Istanbul, applications received from chiller owners were evaluated. A number of chillers were selected and contracts will be signed with the chiller owners as the second round. During winter 2003/04 the new chillers will be installed and commissioned.

Signature of further contracts will be continued in 2004 with the identified chiller owners.

4.7 Customs Training

As per the agreed strategy (phased implementation), in Phase I, training for officials at 9 entry points will be realized in early November 2003 and distribution of refrigerant identifiers will be made during the training.. Procurement of 25 refrigerant identifiers, which will be used by the custom officials, will be completed early October 2003.

After getting the result of the 1st phase, with the suggestions of MoEF and Custom Department, Customs Training part will be carried out with the new training and new procurement of refrigerant identifiers for other custom departments.

4.8 End-User Retrofit

As a result of contacting 2 commercial refrigeration producers, Klimasan and Ugur, information on service organization as well as retrofit costs will be provided mid October 2003. So, first phase of end-user retrofit the contracts amounting 200,000 US\$. will be signed with Klimasan and Ugur for retrofitting of its commercial refrigeration products late 2003.

The identification of other beneficiaries will start in parallel with the training. KOSGEB will report back on capabilities of the companies, and based on this, beneficiaries will be selected for the second phase end-user retrofit.

A strategy for the end-user retrofit including more detailed information of the cost implications will be made during spring 2004. Based on the strategy a number of companies will be invited to participate in this activity.

Results of first round end-user retrofit will be disseminated during spring 2004 to remaining companies and these will be invited to apply for participation in the subsequent phases of the component.

4.9 Technical Assistance & Project Management

Technical assistance for above activities & operation of the project management office will be continued.

4.10 Cost Table

Activity	Amount allocated for 2004 (US\$)	Activity starting	Contracts signing completed	Full ODS impact of activity
Policies and regulations	0			
Quota allocated	0	Dec. 2003	Sept. 2004	
SME program	0	Dec. 2001	Dec. 2003	25% in 2002 75% in 2003 100% in 2004
Recovery/recycling	0	May, 2002	Dec. 2003	2005
Customs training	100,000	April 2003	Dec. 2004	
Chiller replacement	600,000	Jan. 2003	Ongoing	2005
End user	200,000	Jan. 2003	Ongoing	2005
Training activities	50,000	Jan. 2002	Ongoing	NA
Technical assistance program/Project management office	50,000	Jan. 2003	Ongoing	NA
Total	1,000,000			

Attachment 1

TTGV-NO	NAME OF COMPANY	BUDGET (US\$)
6	Nurdil Teknik Soğutma San. ve Tic. Ltd. Şti.	53,850
12	Altuğ Soğutma Sistemleri Otomotiv Turizm San. ve Tic. Ltd. Şti.	2,975
14	Buzdon Soğutma Isıtma ve Dayanıklı Tüketim Malları San. ve Tic. Ltd. Şti.	47,925
15	Teknik İş Soğutma ve Isıtma San. Dayanıklı Tüketim Mamülleri Pazarlama Ltd. Şti.	5,305
18	Behzat Makina San. ve Tic. Ltd. Şti.	2,975
19	Alaska Gıda Soğutma Dayanıklı Tüketim Malları San. ve Tic. Ltd. Şti.	2,975
20	Akmaks Soğutma Isıtma Sanayi Tic. Ltd. Şti.	3,450
32	Mega Mutfak Eşyaları ve Ticari Buzdolapları	2,975
38	Gümüş Güneş Ticaret	2,975
44	Yüksel Ticaret Mutfak Cihazları ve Sanayi Buzdolapları	2,975
48	Üçkar Soğutma Mutfak Gereçleri San. ve Tic. Ltd. Şti.	2,975
50	Algaz Mutfak Cihazları San. ve Tic. A.Ş.	4,950
64	Şenol Ticari Buzdolabı Sanayii	6,925
71	Buzkap Soğutma San.Tic.Ltd. Şti.	44,925
75	Termo Ark San. ve Tic. Ltd. Şti.	4,615
77	Burak Pazarlama Gıda San. ve Tic. A.Ş.	2,975
78	Kaysu Su Arıtma San. ve Tic. Ltd. Şti.	127,400
82	Ömür Isı Sanayi ve Tic. A.Ş.	2,975
91	Buzullar Soğutma San. Ltd. Şti.	4,120
94	Ata Makina Isı San.ve Tic.Ltd. Şti.	3,450
104	Termonem Soğutma ve Süpermarket Ekipmanları San. İç ve Dış Tic. Ltd. Şti.	43,975
135	Karsan Buzdolabı San.	44,450
155	Alaska Soğutma Sanayi	2,975
158	Akçay Soğutma Klima ve Havalandırma San. Tic. Ltd. Şti.	45,950
160	Bakaçlar Soğutma San. ve Tic. Ltd. Şti.	4,950
164	Mattaş Endüstriyel Mutfak San. A.Ş.	6,255
165	Ekosan Mutfak ve Soğutma Ekipmanları San. ve Tic. Ltd. Şti.	59,775
166	Yılmaz Soğutma Sanayi	4,950
167	Öz Buz Teknik Soğutma Sanayi	6,925
169	Mertsan Isıtma Havalandırma Klima San. ve Tic. Ltd. Şti.	2,975
177	İkizler Soğutma	2,975
180	Tekso Teknik Soğutma San. Tic. A.Ş.	95,800
181	Tekno Çelik Soğutma ve Mutfak Cihazları San. A.Ş.	8,900
185	DES Soğutma	2,975
187	Buzkar Soğutma	2,975
193	Kaplanlar Soğutma San. ve Tic. Ltd. Şti.	53,850
196	Kevser Soğutma	2,975
206	Capri Soğutma San. ve Tic. Ltd. Şti.	43,975
222	Şanlı Soğutma San. ve Tic. Ltd. Şti.	44,450
226	Gama Soğutma	2,975
229	Mekso Soğutma Sanayi ve Ticaret Ltd. Şti.	49,900
233	Teknik Soğutma	45,950
255	Buz Çelik Soğutma Malzemeleri ve Metal San. ve Tic. Ltd. Şti.	44,785
261	Buzsan Buzdolapları Mühendislik Hizmetleri Kuluçka Makinaları Tekstil Hizmetleri İmalat Sanayi ve Ticaret A.Ş.	2,975
265	Bütaş Klima San. ve Tic Ltd. Şti.	2,975
277	Gültekin Teknik Isıtma Soğutma San. ve Tic. Ltd. Şti	5,425
283	Kartaş Soğutma San.Tic.	43,975
284	Ege Fen Klima Sistemleri ve Turizm San. Tic. Ltd. Şti.	3,450
289	Diktaş Soğutma ve Metal İmalat San. ve Tic. A.Ş.	49,900
294	Kar-Buz Soğutma	45,615
295	Yaz-Kar Klima Soğutma San. Tic. A.Ş.	2,975
300	Ege Soğutmacılık Klima Soğuk Hava Tes.İth. İhr. San.ve Tic. A.Ş.	33,000
302	Doğal Isıtma Soğutma Cihazları	2,975
304	Tamer Soğutma San. ve Tic. A.Ş.	53,850
305	Marso Endüstriyel Soğutma Sanayi ve Ticaret Ltd. Şti.	43,975

306	Güldem Soğutma Sistemleri Klima Tesisat Taahüt Tic. ve San. Ltd. Şti.	2,975
308	Kartek Soğutma Sanayi ve Tic. Ltd. Şti.	2,975
312	ISM Makine Elektrik Sanayi ve Ticaret A.Ş.	41,000
314	Albiso Klima Soğutma San.ve Tic. Ltd. Şti.	3,450
315	Özçil Dayanıklı Tüketim Mal. San. ve Tic. Ltd. Şti.	2,975
317	Korkmaz Soğutma	45,950
318	Teknik Soğutma	2,975
319	Ergül Teknik Soğutma ve Mutfak Dekorasyon San. Ltd. Şti.	43,975
320	Cantek Soğutma Mak. San. ve Tic. Ltd. Şti.	46,425
321	Meltem Klima	2,975
322	Asya Soğutma Isıtma Elem. Ve Gıda İşletmeleri San. Tic. Ltd. Şti.	2,975
323	Ahmet Yar Soğutma San. Tic. A.Ş.	99,200
324	Dört Mevsim Isıtma Soğutma İnş. Taah. San. ve Tic. Ltd. Şti.	56,080
325	Sepkimtaş A.Ş.	3,925
	TOTAL	1.608.300

Attachment 2

Turkish RSP – SME Conversion – Evaluation Criteria

1. Background

The most urgent component of the Turkish Refrigeration Sector Plan (RSP) is the conversion of the small and medium sized enterprises (SME), since these have been suffering from the accelerated Turkish ODS phase-out regulation.

Around 300 SME have been identified and interviewed in 1998, 2001 and in 2002. Of the around 300 SME's 147 companies responded to the 2002 survey and they will all be included in the project.

Remaining companies have either refused to participate (98 companies), have shifted to other business or have been closed (41 companies) or were impossible to reach (8 companies).

Application forms for the 147 SME's have been evaluated and their grant allocation determined using the subsequent evaluation criteria.

2. Eligibility Criteria

The following eligibility criteria have been applied:

- All companies using or have been using CFC-11 or CFC-12 are eligible for participation; and
- Companies using only non-CFC (HCFC or HFC) with no reported CFC consumption are eligible for participation and their HCFC / HFC consumption is taken as potential CFC consumption. However, this potential consumption is not taken into account in the final ODS phase-out calculation.

3. ODS Phase-Out Evaluation

The following criteria/methods have been applied for determination of ODS phase-out:

- Baseline for ODS phase-out is taken as either 1999 consumption or average 1997-99;
- Companies not reporting ODS consumption have been evaluated on production volume, production type and number of employees. A standard charge of either 10 kg CFC-12 or 1 kg CFC-12 per unit has been applied. This estimated consumption is not taken into account in the final ODS phase-out calculation; and
- Companies providing data for only 2000 and/or 2001 are evaluated as if 1999 production was similar to 2000 or 2001 production. This may result in a conservative estimate, since Turkey suffered from economical crisis in 2001; This estimated 1999 consumption is not taken into account in the final ODS phase-out calculation.

4. Grant Allocation

Grant allocation have been determined using the following criteria:

- No Cost Effectiveness threshold have been applied;
- Export is not deducted (based on first 45 received applications, where no export exceeded 10%);
- Eligible baseline equipment will be replaced on a one-to-one basis;
- Above-mentioned criteria will be adjusted, so that companies can receive one charging unit, one vacuum pump and one leak detector per 250 units annual production. The rationale for 250 annual produced units is one unit produced per day. Units may be charged on-site and therefore

companies may have difficulties transporting the equipment from one site to another in one working day;

- If a company will be eligible to receive several charging units or vacuum pumps (using above criteria), they have the freedom to spend the money for stationary charging units with higher capacity provided the cost is within the total allocation for charging units and vacuum pumps;
- All companies having manual PU operations are eligible for one PU dispenser;
- The standard PU dispenser will be low pressure (LP) and have a capacity of 60 kg/min. The rationale for dispenser capacity of 60 kg/min is that such capacity will facilitate proper foaming of most commercial refrigerating appliances;
- Companies being eligible for one or two foam dispensers may procure dispensers of different capacity or may procure high pressure (HP) dispenser(s) at their own choice. However, potential additional costs has to be covered by the SME;
- Standard cost for refrigerant equipment is determined as the maximum of 3 quotes obtained. The rationale for using maximum cost is that the equipment should be available within reasonable distance of the SME to ensure future servicing but also to facilitate normal commercial practice by the SME. Standard costs applied are as follows: Charging unit: US\$ 1,165; Vacuum pump: US\$ 475; Leak detector: US\$ 335. (Standard cost evaluation is detailed in Item 6);
- Standard cost for PU equipment amounts to US\$ 38,000 as defined by Cannon price quotation;
- All companies are given a grant allocation of US\$ 1,000 for chemicals for test and trials of the refrigerating circuit; and
- All companies having PU operations are given a grant allocation of US\$ 3,000 for chemicals for test and trials of the foam dispenser.

5. Baseline Disposal

The following rules will be applied for CFC baseline equipment:

- Companies having refrigeration baseline equipment (charging units, vacuum pumps and/or leak detectors) are allowed to keep this equipment for servicing purposes. Companies are committed to refrain from using this equipment for production of refrigerating appliances using CFC; and
- Companies having PU foam dispensers are obliged to dispose these as per Montreal Protocol rules. Documentary evidence for disposal shall be submitted to TTGV.

6. Standard Cost Calculation For Refrigeration Equipment

Price quotations were received from the companies Wigam and Refco, both represented in Turkey. Further the company, ITE, which is about to establish representation in Turkey, provided a price list applicable for Turkey. The price quotations were based on technical requirements sent by TTGV specifying standard equipment for evacuation, charging and leak detection.

The charging unit was specified so that two configurations should be quoted as follows:

- Configuration 1: Compact unit consisting of vacuum pump, filling glass, charging manifold, manometers and hoses; and
- Configuration 2: Separate components comprising vacuum pump, charging manifold, manometers, hoses and charging scale.

The prices obtained were as follows:

Company	Description	Type	Price (US\$)
Wigam ¹	Charging unit – configuration 1	SP45D/VR/A6/4	475.40
	Charging unit – configuration 2	EPS42D/V/A6/4/EV	772.60
	Vacuum pump	DIP 402 (Including SW-68 oil for the vacuum pump)	266.40
	Leak detector	TIF XP-1	282.30
Refco ²	Charging unit – configuration 1	10705-RD-4-R-134a	991.30
	Charging unit – configuration 2	12800	708.10
	Vacuum pump	RL-4 (Including P-15-S-1 oil for the vacuum pump)	363.50
	Leak detector	XP-1	276.50
	Leak detector	ZX-1 (not including the spare sensor)	333.80
ITE ¹	Charging unit – configuration 1	CS 4D 4 22/44	1,162.10
	Charging unit – configuration 2	MK 50DS+2805 BC/4+E-348 x 3+ITE 9120	914,30
	Vacuum pump	MK 50DS (including 1 liter 500 P1 oil)	472,70
	Leak detector	ITE-5650A-FP + ITE-573	265,20
Standard cost	Charging unit		1,165.00
	Vacuum pump		475.00
	Leak detector		335.00

¹ Prices given in Euro: Conversion: 1 Euro = 0.9905 US\$

² Prices given in Swiss Franc: Conversion: 1 CHF = 0.6744 US\$

Attachment 3

TENTATIVE PROGRAM

Train-the-trainer seminar

Lesson duration: 40 minutes

Course hours: 09:30 (First day, 10:00)-17:30

Lunch break: 12:30 to 13:30

Practical work on used refrigerator

Lecturers: Mr. Nuri OZKOL (Mech.Eng) / Mr. Ole Nielsen (Mech.Eng)

Course Material: Revised translation of UNEP Document

First day

Lesson no.	Description	Background material
1		
2	Start of the seminar	
3	Presentation of participants Presentation of the course History of refrigeration	
4	Components of Vapor Compression Refrigeration Systems	
Lunch break		
5	Analysis of vapor Compression Refrigeration Cycle on Ph diagram	
6	Refrigerants, Types	
7	Lubrication Oils	
8	Contamination of Refrigerant systems (with water,air, noncondensable gases, acids, etc.)	

Second day

Lesson no.	Description	Background material
1	Description of ozone layer Ozone depletion (cause / results)	UNEP Document &/or overheads,software
2	-skin cancer, cataract, damage on the life, weakening of human immune system	
3	Environmental legislation against ozone depletion	“
4	Local legislation about refrigerants	“
Lunch break		
5	Montreal, Beijing, Kyoto protocols	“
6	Control of ozone depleting refrigerants Types of ODR, control	“
7	Calendar on limiting usage and production of ODS's	
8	Alternative refrigerants	“

Third day

Lesson no.	Description	Background material
1	Installation of refrigerant systems	“
2	Service applications on Refrigerant Systems	
3	Service and maintenance equipment of Refrigerant systems, hand tools	
4		
Lunch break		
5	True Applications of servicing Refrigerant Systems	
6	False Applications of servicing Refrigerant Systems - Recovery, flushing, oil change, charging	
7		
8	Discussion	

Fourth day

Lesson no.	Description	Background material
1	Examination and demonstration of service equipment	Practical sessions
2		
3	Running the equipment	Practical sessions
4	Recovering the refrigerant	Practical sessions
Lunch break		
5	Reclaim / reuse of the refrigerant	
6	Leak detection, evacuation, exchange of components	Practical sessions
7		
8	Discussions and conclusions	

Fifth day

Lesson no.	Description	Background material
1	Summary of the seminar	
2		
3	Questions	
4	Exam (if required)	
Lunch break		
5	Conclusion	
6	Introduction of technician course notes Explanations on technician training	
7		
8	Presentation of certificates to the participants	

Program model

NO	PROVINCE	2003		2004				TOTAL PERSON	AUTHORIZED SERVICES NUMBER (REFRIGERANT SECTOR)	MINISTRY OF EDUCATION SCHOOLS (Industrial Technical Teachers School)	TRAINER NUMBER	TOTAL COURSE HOUR
		1 DAY (5 Hr)		I. HALF		II. HALF						
				5 DAY (25 Hr)		5 DAY (25 Hr)						
		Technicians		Technicians		Technicians						
Course Number	Minimum Person	Course Number	Minimum Person	Course Number	Minimum Person							
1	ADANA	2	20	1	15			55	49	Yeşilevler EML	1	35
2	ANKARA	3	20	3	15			105	100	Yapı Meslek L	3	90
3	BURSA	2	20	2	15			70	64	Atatürk YTEM	1	60
4	DENİZLİ	1	20	1	15			35	25	Atatürk Tes. Tek.	1	30
5	G.ANTEP	1	20	1	15			35	23	Mehmet Akif Ersoy EML	1	30
6	İSTANBUL 1	11	20	8	15			680	694	Küçükçekmece İsmet Aktar EML	2	255
7	İSTANBUL 2	11	20	8	15					Yakacık EML	2	255
8	İZMİR	10	20	4	15			260	262	Bornova Seyit Şanlı EML	2	150
9	KAYSERİ	1	20	1	15			35	25	Mimar Sinan EML	1	30
10	KONYA	2	20	1	15			55	51	Meram EML	1	35
11	SAMSUN	1	20	1	15			35	35	Atakum EML	1	30
12	Ş.URFA	1	20	1	15			35	23	Şanlıurfa EML	1	30
13	ANTALYA	2	20			2	15	70	57	Atatürk EML	1	60
14	AYDIN	2	20			1	15	55	43	Mimar Sinan EML	1	35
15	BALIKESİR	2	20			2	15	70	56	100.Yıl EML	1	60
16	DİYARBAKIR	1	20			1	15	35	26	Burhanettin Yıldız EML	1	30
17	İSPARTA	1	20			1	15	35	22	İsparta EML	1	30
18	KOCAELİ	2	20			1	15	55	44	Atatürk EML	1	35
19	KÜTAHYA	1	20			1	15	35	25	Kütahya EML	1	30
20	MANİSA	2	20			1	15	55	48	Manisa EML	1	35
21	MERSİN	2	20			1	15	55	53	Mersin EML	1	35
22	MUĞLA	2	20			2	15	70	65	Muğla EML	1	60
23	TRABZON	1	20			1	15	35	23	Trabzon EML	1	30
24	ZONGULDAK	2	20			1	15	55	47	Zonguldak EML	1	35
TOTAL		66	1320	32	480	15	225	2025	1860		29	1505

Attachment 4

Locations of recycling and reclaim centers

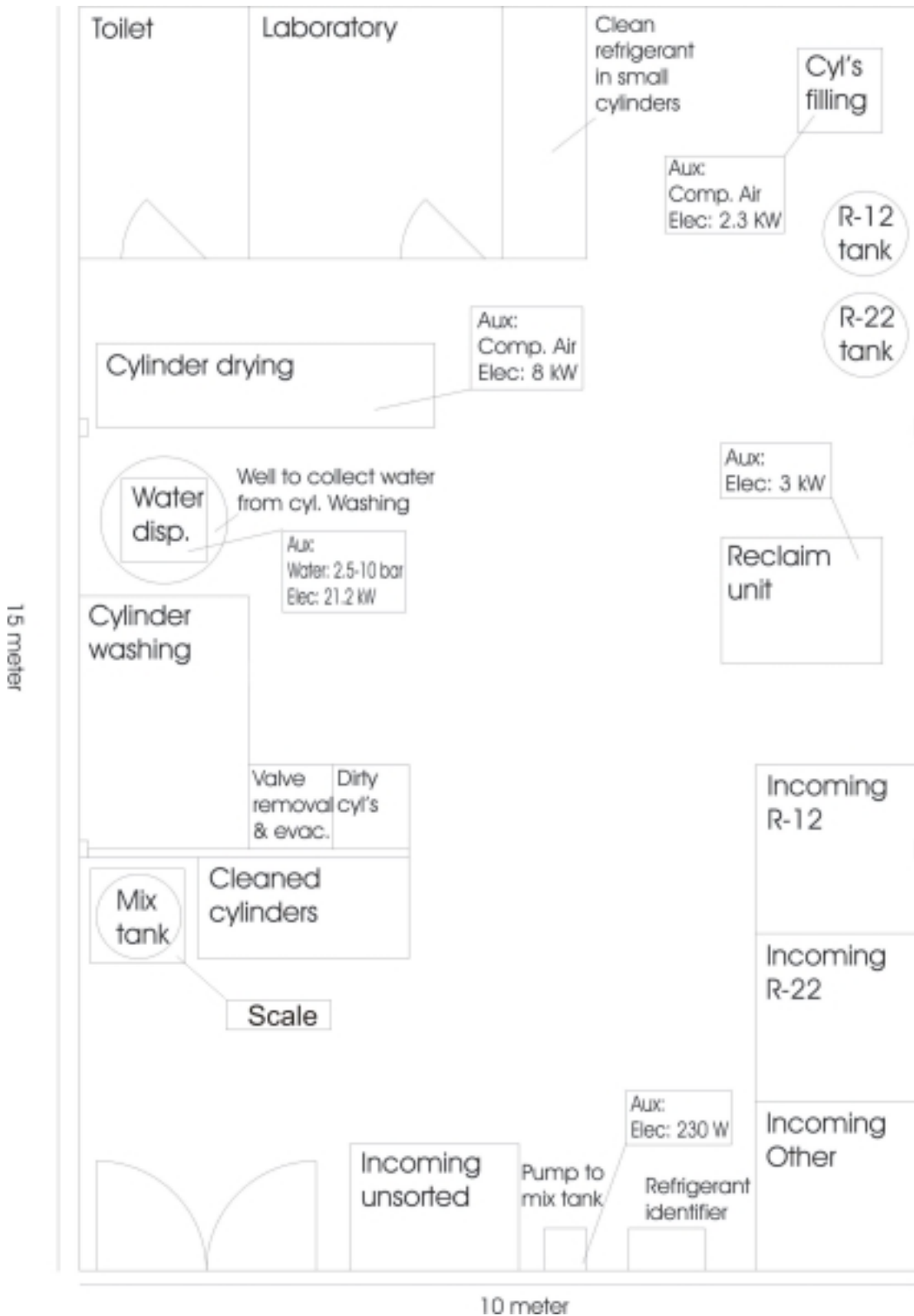
Recycling centers will be located in the following cities:

- Adana
- Ankara
- Antalya
- Aydin
- Balikesir
- Bursa
- Diyarbakir
- Gaziantep
- Icel
- Isparta
- Istanbul (2)
- Izmir
- Kayseri
- Kocaeli
- Konya
- Kütahya
- Manisa
- Mugla
- Samsun
- S. Urfa
- Sivas
- Tekirdag
- Zonguldak

Reclaim centers and storages will be located in the following cities:

- Istanbul
- Ankara
- Izmir

Attachment 5
Draft layout for Istanbul reclaim center and storage



Attachment 6

Recovery / Recycling Study Tour - Report

Turkish Refrigeration Sector Plan

In the period March 24 to April 5, 2003 Mr. Senol Ataman / TTGV, Mr. Nusret Özgünaltay / KOSGEB and Mr. Ole R Nielsen / RE-A-CT visited Czech Republic, Hungary and Georgia to collect experiences from implementation and operation of a recovery / recycling scheme as well as experiences from a re-training scheme for refrigeration service technicians.

Mentioned countries were selected, since the R&R schemes have their own specialties as well as each has faced problems during implementation. It is the aim to utilize this experience during implementation of the Turkish R&R and training project.

During the visit to Georgia, a potential cooperation on customs training was also discussed.

The study tour participants wish to express thanks to all persons met for their willingness to share experience as well as help in organizing meetings and site visits.

The following summarizes the discussions and findings:

Czech Republic

Background

The first Czech law on ODS was introduced in 1993. The law was connected with the Czech ODS production closure, which happened by January 1, 1994. According to this law, an environmental tax of 5 US\$/kg refrigerant was applied, bringing the CFC-12 price at 6 US\$/kg. This high tax led to substantial stockpiling of CFC-12. In 1995 the tax was further increased to 7 US\$/kg. This led to a high activity in refrigerant recovery.

Recovery/recycling

The Czech recovery/recycling scheme was one of the first in Eastern Europe approved by the GEF in 1994. The scheme provided for 500 recovery units, 250 pieces with 50% grant support and 250 pieces with 25% grant support. In addition 2,000 recovery cylinders was included in the project (100% grant support). The scheme also included 13 collection centers as well as a refrigerant reclaim center (100% grant support).

Initially no refrigerant was collected. A questionnaire was sent to all companies having received recovery equipment and these confirmed that no refrigerant is recovered. However, it was realized that a certain practice has occurred. The technicians recovered and re-sold the refrigerant "unofficially". A second survey was conducted where companies were allowed to be anonymous. This showed that the recovery operation actually was ongoing. The weakness of this practice is, that there is no quality control, since "unofficial" recovered refrigerant is either not cleaned or maybe only partly cleaned, which leads to increased failure rate of the refrigerating systems, especially those utilizing hermetic

compressors. It has been proven that the failure rate of hermetic compressors in Czech republic in mid 1990'ies was substantially higher than in other European countries. Therefore it was recommended only to use recovered and recycled refrigerant for semi-hermetic and open-type compressors. However, with the improvement of the financial situation in Czech republic, the "unofficial" practice became less frequent and an increase of collected amounts of refrigerant was also experienced.

As of today, the only reclaim center, located at the company Ekotez in Prague, has turned out to be a profitable business. Actual profit amounts were shown to the study tour participants, but it was requested not to disclose these. A total of around 3 MT ODS is reclaimed annually.

The quality check at the reclaim center comprises a rough check of incoming refrigerant by means of a refrigerant identifier. Outgoing refrigerant is randomly (3-4 times per month) checked by means of a gas chromatograph and a Karl Fischer titrator (for water content). A more structured quality test, e.g. of all outgoing refrigerant was discussed and the Czech experience has shown, that in the case where a refrigerating system running with reclaimed refrigerant has a failure, the failure may often be claimed to relate to improper quality of the reclamation.

Training

A training manual was also prepared as part of the Czech recovery/recycling project. This manual is used for the technician re-training, which is followed by an exam. If the exam is passed, the technician gets the "green card". The "green card" has been promoted through a public awareness raising campaign. A copy of the training manual was obtained and it was endorsed that excerpts from the manual could be used for a Turkish training manual.

Lessons learned

The Czech recovery / recycling scheme has initial problems in getting the proper function. It was experienced that a certain period is required for the technicians to understand the benefits. As for Czech republic, this period was around 5 years.

Czech republic has experienced refrigerating appliances using hydrocarbons as refrigerants. Cases where CFC-12 systems have been retrofitted into hydrocarbons are also reported. Unfortunately some of these retrofits have taken place without any marking of the refrigerating system telling that it contains a highly flammable refrigerant. This malpractice should be avoided through training.

The Czech Refrigeration Association has played an important role in the Czech recovery/recycling scheme, since this organization has regular meetings where initiatives and information can be conveyed.

Hungary

Background

The Hungarian ODS phase-out project was approved by the GEF in 1996. The project included a recovery/recycling/reclaim scheme as well as a training component for refrigeration technicians. The project was initiated prior to approval, so that preparatory work was done when the grant became effective.

Recovery/recycling

The R&R project included initially 650 recovery units, 50 recycling units and 1 reclamation center. However, it was revised during implementation since combined recovery/recycling units were very popular as all operations could be performed on-site. Procurement was very comprehensive (61 companies were invited to bid) and evaluation very complicated. It was decided as a first step to buy only 150 recovery and recycling units.

A second order was placed at another supplier comprising 150 recovery units and 175 recycling units. This procurement went smoother.

A mishandling of the recovery units was experienced. Both types utilize the so-called “oil-less” compressor, which gets its lubrication from the oils contained in recovered refrigerant. However, if this compressor is used with virgin refrigerant, compressor is left without lubrication and will soon be damaged. Unfortunately this happened in Hungary and more unfortunately both suppliers disappeared from the market, so spare compressors were not available. As of today around 100 recovery units are damaged and not used.

The reclaim center is located at a refrigerant distributor in Budapest. Reclaim facilities include reclaim unit, gas chromatograph and Karl Fischer titrator. So far no major problems were experienced with the reclaim equipment. All incoming and all outgoing refrigerant is tested with above equipment. No information was given on the profitability of the reclaim center, except that around 12 MT refrigerant (CFC-12, HCFC-22 and HFC-134a) was processed annually. However, it was informed, that it was very difficult to sell reclaimed refrigerant since Hungary has extensive illegal import from former Yugoslavia. The price of the illegally imported CFC-12 is around one-third of the price of reclaimed CFC-12, so only larger companies, which are following legislation, do utilize this.

Training

The development of a training program was part of the Hungarian ODS phase-out program. This turned out to be very successful and as of now a total of 5,100 technicians have been trained and subsequently certified by a “green card”. The Hungarian Refrigeration has administered the training and has now started to renew the “green cards”. Of the 5,100 certified technicians it is expected that around 3,000 are active in servicing refrigerating appliances.

The “green card” was strongly supported by a public awareness raising campaign – also part of the Hungarian ODS phase-out program.

Lessons learned

Hungary faced two major problems. First is related to the procured equipment, where both suppliers disappeared. Second problem was the illegal import of CFC-12, which emphasizes the importance of a comprehensive customs training program.

The reclaim operation seems costly, since both incoming and outgoing refrigerant is subjected to laboratory tests. Incoming refrigerant should only be screened for mixtures, which will reduce the operational costs of the reclaim center.

The trend in Hungary is, that former large state-owned service companies are not split-up into small companies. These small companies do lack time for education/training purposed and might also not see the need, since ODS operations can continue with illegally imported CFC-12.

The Hungarian Refrigeration Association has been the key player in both recovery/recycling project as well as the training project.

Georgia

Background

Georgia was originally a non-Article 5 country due to it being part of Soviet Union in 1987 when Montreal Protocol was agreed upon. In 1996 Georgia request re-classification and was subsequently “granted” A-5 status. Since Georgia has no manufacturing industries using ODS, the Montreal Protocol activities so far has been a refrigerant management plan (RMP) implemented by UNEP/UNDP; a customs training project – under implementation with UNEP and a Methyl Bromide project jointly implemented by UNIDO and Government of Canada. Recently an end-user project was approved – to be implemented by UNDP.

Recovery/recycling

The Georgian recovery/recycling project was relatively small. A total of 2 recycling units, 15 recovery units and 45 manual recovery pumps were procured. The recycling units are located at the Georgian Refrigeration Association (in Tbilisi and Kutaisi) and the recovery equipment distributed among service companies. Companies receiving equipment are obliged – through their contract - to recovery at least 150 kg (recovery unit) or 25 kg (manual recovery pump) annually. Some companies were not able to meet these requirements and some went out of business and equipment was returned to the Georgian Refrigeration Association. This returned equipment (6 recovery units and 5 manual recovery pumps) can now be rented on a daily basis for technicians in need of such equipment. Rent is between 0.5 and 1 US\$ per day.

The recycling units are processing around 1 MT CFC-12 in total per year. It was informed that there is a demand for recycling of HCFC-22, but the equipment supplier, RTI, has informed that this is not possible with the equipment delivered. The recycling center offers two options: a) Centers can recycle for technicians: price is 1.5 US\$ per kg; and b) Recycling center can buy refrigerant: Price 1.5 US\$ per kg. When recycling centers sell recycled refrigerant sales price is 3.5 US\$ per kg. Virgin refrigerant is 4.5 US\$ per kg. As of today around 100 kg contaminated refrigerant is stored. However, Georgia does not have any facility for refrigerant incineration.

It was informed, that since the Georgian recovery/recycling project is small, there is no RTI representative in Georgia, which makes spare parts very expensive. Spare parts are especially filters for the recycling units.

It was also informed that some refrigerant cylinders have leakages and finally some refrigerant identifiers were supposed to give wrong results.

However, a decrease in CFC-12 import has been realized which indicates that recovery actually happens.

Training

The Georgian Refrigeration Association has implemented training. A total of 30 training workshops covering around 300 technicians have been conducted. Each workshop had a duration of 30 hours basically following the UNEP training manual: "Good Practices in Refrigeration". It is planned to update the training with improved methods for retrofit. The trainees were all certified and this certificate is now supported by legislation (May 8, 2002). The training was advertised on boards, Internet and through a public awareness raising campaign (part of the institutional strengthening project). The certificate has a validity of 3 years. Further it is planned to require a certificate for persons handling ODS. This will also be supported by legislation; however, the law is not signed yet.

Customs training

Georgia is currently implementing a customs training program in cooperation with UNEP. The customs train-the-trainer seminar is scheduled for April 30 to May 2, 2003. Georgia has also substantial illegal import and customs training has high priority at MoE. Cooperation with the Turkish customs training component was discussed and it was agreed that this should happen through direct contacts between MoE's. Turkish representatives were invited to the Georgian train-the-trainer seminar.

End-user retrofit

Georgia expressed interest in the Turkish end-user retrofit component, which will commence during 2003. Whereas situations in Turkey may be different from Georgia, where majority of refrigerating installations are Russian, retrofit procedures and experience exchange can be valuable for both countries. It was therefore agreed to keep contact on this subject.

Lessons learned

The Georgian recovery/recycling project has problems with equipment service and costly spare parts since the supplier is not represented in Georgia. The Turkish recovery/recycling project may improve situation, since RTI will be represented in Istanbul.

Equipment reliability is important. Georgia has faced problems with refrigerant identifiers (low cost model) and do not fully trust results.

Legislative support and active role of MoE is an important factor in successful implementation.

The Georgian Refrigeration Association has played a central role in implementation of both the recovery/recycling as well as the training project.

Findings

The study tour provided good advise on both training and recovery/recycling. Findings are as follows:

Training

All countries performed very well in respect to training of technicians. Each trainee – after examination – was provided with a certificate. Such practice should also be adopted for Turkey. The public should be aware that technicians are educated and should ask for certified technicians when in need for service of their refrigerating appliances. Such awareness should be raised through

advertisements or campaign. Furthermore a legislative support, e.g. by allowing only certified technicians to handle ODS, is also strongly recommended.

Customs training

Except for Czech Republic, all countries reported major problems with illegal import of ODS, which hampers the operation of the recovery/recycling scheme. Such situation could also appear in Turkey. Therefore it's recommended to make the customs training component as comprehensive as possible. Furthermore, it's recommended to cooperate with neighboring countries on such activities. Georgia has already invited Turkey to participate the Georgian customs training. Turkey should take initiative to share with other countries as well.

Recovery/recycling

Countries visited have all different kind of problems with the equipment. Czech Republic has only partly funding of equipment; Hungary had major problems with after-sales service; and Georgia has problems with spare-part availability. None of these issues are expected for Turkey.

Acceptance by the technicians of the quality of recycled/reclaimed refrigerant has been problematic in all countries visited. This will reduce the amounts of refrigerants collected for recycling. It is therefore recommended that the 3 Turkish reclaim centers provide certificates for all refrigerant reclaimed. In order to make certification feasible, it is proposed to invest in additional equipment for the reclaim centers as follows:

- 3 pcs of Karl Fischer titrators (one for each center); and
- 12 pcs of 500 kg refrigerant tanks (4 for each center: 2 for incoming refrigerant, e.g. CFC-12 and HCFC-22; and 2 for reclaimed refrigerant).

Costs for this additional equipment is estimated at around 50,000 US\$.

The 24 recycling centers should advice that recycled refrigerant is particular useful for refrigerating installations having semi-hermetic or open-type compressors.

Motivation of the technicians is very important in order to have the recovery/recycling scheme working. All countries visited reported, that the recycling/reclaim centers could buy recovered refrigerant from technicians. This option should also be considered by KOSGEB. In any case, if illegal import is minimized, the recycling/reclaim operation can be profitable.

April 15, 2003
Ole Reinholdt Nielsen

Attachment 7

Selection/support criteria for first round of chiller replacement

For the demonstration part of the project, it's proposed to select chillers and determine financial support as follows:

- Only chillers running with CFC's are eligible for participation. All CFC's are eligible, i.e. CFC-11, CFC-12, CFC-113, R-500 or others if present.
- Only chillers using turbo/centrifugal compressors are eligible for participation, since the energy saving potential is related to the improved design of these compressors.
- Only chillers that are in operation are eligible for support. Chillers, which are physical present but not operated, cannot be supported.
- The funding level will be determined based on either installed capacity or required capacity whichever is the lowest. It should be noted, that chiller owners having overcapacity are not encouraged to request replacement of this overcapacity, since overcapacity means that the chiller will run part-load more frequent, which will substantially worsen the energy efficiency.
- Funding per chiller is determined by the following:
 - Low pressure chillers: Nominal capacity upto 2,500 kW:
Support = 40 \$ x nominal capacity (in kW) + 70,000 \$
Nominal capacity above 2,500 kW
Support = 68 \$ x nominal capacity (in kW)
 - High pressure chillers: 75 % of the support for low pressure chillers.
- Funding level is determined such, that HFC-134a technology can be utilized. This means that for low pressure chillers a complete chiller replacement is foreseen. For high pressure chillers retrofit is foreseen. The rationale for such criteria is, that HCFC-123 is an interim technology and the Montreal Protocol already controls HCFC's.
- The funding level is planned to cover all required costs, including freight, installation and refrigerant /oil costs.
- Chillers having seasonal load profile, which are basically chillers used for comfort cooling will also be offered funds for frequency regulation. Each company participating the project can only have one frequency regulator no matter how many chillers they have installed. The funding is determined by:
 - Support = 7.5 \$ x nominal capacity (in kW) + 16,250 \$
- The total support resulting from above is the maximum funding. Actual funding will be adjusted according to the capacity of the new chillers being installed.
- Funding will be a combination of grant and soft loan. The grant part is 25 %.

Pay-back terms

The soft loan support will be paid back utilizing the energy savings. However, for practical reasons, pay back will be in fixed installments. The following apply: After chiller replacement completion, pay back period starts. Payback period will be 3 years with a grace period of 6 months followed by 5 equal installments.

Attachment 8

Selection/support criteria for second round of chiller replacement

- Only chillers running with CFC's are eligible for participation. All CFC's are eligible, i.e. CFC-11, CFC-12, CFC-113, R-500 or others if present.
- Only chillers using turbo/centrifugal compressors are eligible for participation, since the energy saving potential is related to the improved design of these compressors.
- Only chillers that are in operation are eligible for support. Chillers, which are physical present but not operated, cannot be supported.
- Project participants are requested to submit a proposal for financial support. This proposal will be evaluated and ranked according to the following criteria:
 - Funding level: The requested financial support will be compared to standard chiller costs and lowest requests will be given priority;
 - Chiller age: Environmental impact is reverse proportional to chiller age according to an American survey done by ICF Kaiser. Therefore "young" chillers will be given priority. 10 years of age will be used as reference;
 - Chiller efficiency: The main aim of the project is to apply technical solutions that would ensure energy savings. Therefore energy efficient solutions will be given priority. Chillers having constant annual load profile will be evaluated only on the COP (Coefficient Of Performance), whereas chillers with seasonal load profile will be evaluated on both COP and NPLV (Non-standard Part Load Values). Chiller efficiencies shall be specified at normalized conditions according to ARI 550/590. COP of 0.6 kW/TR and NPLV of 0.5 kW/TR will be used as reference.
 - A ranking factor incorporating above criteria will be calculated (the lower factor – the higher ranking).
- Standard chiller costs will be determined on either installed capacity or required capacity whichever is the lowest.
- Standard chiller costs are determined such that HFC-134a technology can be utilized. This means that for low-pressure chillers a complete replacement is foreseen, whereas for high-pressure chillers retrofit is foreseen. Interim technologies, e.g. HCFC-123, will not be considered eligible for support.
- Determination of standard chiller costs for chillers with seasonal load profile will include allocation for improvement of part load operation, e.g. by means of frequency regulated motor for one chiller.
- Support will be a combination of grant (25%) and soft loan (75%).
- Payback terms for the loan part will be 5 equal installments in USD, first one due 6 months after completion of the project. Interest rate is 0%.

VERIFICATION REPORT FOR THE CFC CONSUMPTION IN TURKEY FOR 2002 AND 2003

PREPARED BY

Prof. Dr. A. Metin GER

KARAR Consultants Ltd.

September 2003

This report was prepared to document the findings of the series of tasks carried out for the verification of annual CFC (11, 12, and 502) consumption in Turkey for the years 2002 and 2003.

To this purpose,

- the Ministry of Environment,
 - the CFC 11, 12 importer companies
 - the CFC 502 importer companies (even though importation of the material is not permitted after 2002, interviews were made to check the sales and the stocks)
 - a polyol supplier to the foam industry
 - companies which completed or are carrying out MLF projects (present and past consumers)
- were contacted. In Table 1, the details about the contacts are summarized.

Table 1. The contacts made for the verification report

<i>Date of Visit</i>	Company	Person(s) Interviewed	Category	Mode of contact
August 20, 2003	Ministry of Environment and Forestry, ANKARA	Mrs. Rezzan Katircioglu	Ministry	Interview
August 25, 2003	CETINEL Sogutma San. ve Tic. A.S. Kurabiye Sok. No:21 Beyoglu ISTANBUL Phone: 0 212 252 58 58 Fax: 0 212 251 75 19	Mr. Jirayir Dagdevirenel Mr. Sinan Ozkaratas	Importer CFC11 CFC12 CFC502	Interview
August 25, 2003	TERMO Sogutma San. Tic. A.S. Kurabiye Sok. No:21 Beyoglu ISTANBUL Phone: 0 212 252 58 58 Fax: 0 212 251 75 19	Mr. Jirayir Dagdevirenel Mr. Sinan Ozkaratas	Importer CFC11 CFC12 CFC502	Interview
August 25, 2003	ANATEKS Isitma ve Sog. Sis. San. Dis. A.S. Tarlabası Cad. No: 80 Taksim ISTANBUL Phone: 0 212 256 00 33 Fax: 0 212 235 68 18	Mr. Metin Terzibasogullari Ms. Hulya Kizir	Importer CFC12	Interview
August 25, 2003	TEKNION San. Mam. Paz. Tic. A.S. Tarlabası Cad. No: 80 Taksim ISTANBUL Phone: 0 212 256 00 33 Fax: 0 212 235 68 18	Mr. Metin Terzibasogullari Ms. Hulya Kizir	Importer CFC12	Interview
August 25, 2003	FLOGAZ Florlu Gazlar San. ve Tic. A.S. Yapi Kredi Plaza C Blok Kat 18 Levent IST Phone: 0 212 279 70 71 Fax: 0 212 279 07 36	Mr. Aksel Keribar	Importer CFC12	Interview
August 25, 2003	MESPA End. Paz. Ltd. Sti. Tarlabası Cad. Yaya Alt. Geçidi No:1-3 Taksim ISTANBUL Phone: 0 212 235 70 64 Fax: 0 212 256 98 34	Mr. Taner Senkardes	Importer CFC12	Interview

August 26, 2003	SOGUK TEKNİK San ve Tic. A.S. Tarlabasi Cad. No: 48 Taksim ISTANBUL Phone: 0 212 250 05 72 Fax: 0 212 250 87 76	Mr. Murat Yılmaz Mr. Ali Turhan	Importer CFC11 CFC12 CFC502	Interview
August 26, 2003	TURA Sog. San. Tic. A.S. Dereboyu Cad. No: 27 Dolapdere ISTANBUL Phone: 0 212 237 50 00 Fax: 0 212 255 58 65	Mr. Murat Yılmaz Mr. Ali Turhan	Importer CFC11 CFC12 CFC502	Interview
August 26, 2003	BIRSAN Mak. San. Tic. A.S. Sadabat Cad. No: 6 Kagithane ISTANBUL Phone: 0 212 294 11 00	Mr. Murat Yılmaz Mr. Ali Turhan	Importer CFC12	Interview
August 26, 2003	BIRMAK Sogutma. San. Tic. A.S. Sadabat Cad. No: 6 Kagithane ISTANBUL Phone: 0 212 294 11 00	Mr. Murat Yılmaz Mr. Ali Turhan	Importer CFC12	Interview
August 26, 2003	CANTAS Ic ve Dis Tic. Sog. Sis. San. A.S. Dolapdere Cad., No:155 Pangalti ISTANBUL Phone: 0 212 232 91 22 Fax: 0 212 225 81 11	Mr. Erim Eksioglu	Importer CFC11 CFC12 CFC502	Interview
-----	Uzman Demir Celik Sanayi A.S. Fazlipasa Cad. No:8 Topkapi ISTANBUL Phone: 0 212 567 65 63	Mr. Suat Yildiz	Importer CFC12	Contact cannot be established
-----	TEKGAZ Tek. Gaz. ve Mal. San. Mum. A.S. Fazlipasa Cad. No:8 Topkapi ISTANBUL Phone: 0 212 567 65 63	Mr. Suat Yildiz	Importer CFC12	Contact cannot be established
August 27, 2003	TEKPOL Poliuretan San. Tic. A.S. Eski Ankara Cad. No: 54 Seyhli Pendik IST Phone: 0 216 378 64 51 Fax: 0 216 378 64 56	Ms. Nergis Demir Ms. Arzu Kapikıran	Importer CFC11	Interview
August 27, 2003	ELASTOGRAN Poliuretan San. ve Tic. Ltd. Sti. Eski Ankara Cad. No:54 Seyhli, Pendik ISTANBUL Phone: 0 216 378 64 43 Fax: 0 216 378 64 56	Ms. Nergis Demir Ms. Binnur Tulumbacı	Polyol Supplier	Interview
September 1, 2003	AKCAY Sogutma, Klima ve Havalandırma San. Tic. Ltd. Sti Trabzon Organize Sanayi Bölgesi, Arsin, TRABZON Phone: 0.462.223.26.58 Fax: 0.462.223.03.75	Mr. Serdar Akcay Mr. Kadir Akcay Mr. Ahmet Salih Akcay	Ongoing MLF project	Fax
September 1, 2003	EKOSAN Mutfak ve Sogutma	Mr. M. Serdar Koç	Ongoing	Fax

	Ekipmanlari San. ve Tic. Ltd. Sti. Küçükbalikli Mahallesi, Fevzibey Caddesi No:25, BURSA Phone: 0.224.215.92.00/01 Fax: 0.224. 215.92.02	Mr. Vehbi Varlik	MLF project	
September 1, 2003	CAPRI Sogutma San. ve Tic. Ltd. Sti. Cali Sanayi Bolgesi, Cakalinleri Sok., No:8, Cali, BURSA Phone: 0.224.271.01.50/51/52 Fax: 0.224.482.39.13/14	Mr. Mehmet Topak Ms. Ayse Topak	Ongoing MLF project	Fax
September 1, 2003	TEKNIK SOGUTMA Yenimahalle, 643 Sok., No:18, MERSIN Phone: 0.324.231.46.91 0.324.233.73.36 Fax: 0.324.232.09.04	Mr. Abdulkadir Kil	Ongoing MLF project	Fax
September 1, 2003	DORT MEVSIM Isitma Sogutma Ins. Taah. San. ve Tic. Ltd. Sti. 1145/9 Sok., No:3/D 35110 Yenisehir, IZMIR Phone: 0.232.459.65.01 0.232.469.25.22 0.232.231.84.22 Fax: 0.232.459.65.19	Mr. Yilmaz Pala	Ongoing MLF project	Fax

During these visits, except the one with Ms. Rezzan Katircioglu of Ministry of Environment and Forestry, the import licenses and custom records were collected/reviewed, quotas and realized import amounts were determined, the sources of import were questioned, the sales and stocks were determined, and the general comments of the persons interviewed on different aspects of the quota system, illegal imports, etc. were taken. It must be noted that the data on the sales and stocks were provided by the importer companies themselves and could not be double-checked due to time limitation. The outputs based on these data/information were organized in a way to verify the annual CFC (11, 12, and 502) consumption in Turkey for the years 2002 and 2003 and assess the strengths and weaknesses of the present quota system in the following sections.

During the interviews, the copies of the import licenses were obtained and reviewed. The import figures gathered from the importer company records were also compared with the records of the Custom Office and the Ministry of the Environment for confirmation. The import amounts from all these sources (company, Custom Office and the Ministry of the Environment's records) were in good agreement.

The Tables 2-5 summarizes the import licenses and realized import figures for CFC11 and CFC12 for 2002 and 2003.

Table 2. The Import License and Realized Import Amounts of CFC11 for 2002

THE IMPORT LICENSE (QUOTA) AND IMPORT REALIZATION IN KGS FOR CFC11 FOR 2002					
COMPANY	COUNTRY OF IMPORT	LICENSE NUMBER	IMPORT LICENSE / QUOTA (kg)	REALIZATION source MoEF (kg)	REALIZATION source company (kg)
CANTAS İç ve Dış Tic. Soğ. Sis. San. A.Ş.	GREECE	169	79754,0	18000,0	18000,0
ÇETİNEL Soğutma San. ve Tic. A.Ş.	BELGIUM	172	34094,0	24640,0	24640,0
SOĞUK TEKNİK San ve Tic. A.Ş.	ITALY	168	34352,0	19200,0	19200,0
TEKGAZ Tek. Gaz. ve Mal. San. Mum. A.Ş.	-	170	12500,0	0,0	0,0
TEKPOL Poliüretan San. Tic. A.Ş.	-	171	76800,0	0,0	0,0
UZMAN Demir Çelik Sanayi A.Ş.	-	167	12500,0	0,0	0,0
TOTAL			250000,0	61840,0	61840,0

Table 3. The Import License and Realized Import Amounts of CFC11 for 2003, as of 31st August.

THE IMPORT LICENSE (QUOTA) AND IMPORT REALIZATION IN KGS FOR CFC11 FOR 2003					
COMPANY	COUNTRY OF IMPORT	LICENSE NUMBER	IMPORT LICENSE / QUOTA (kg)	REALIZATION source MoEF (kg)	REALIZATION source company (kg)
CANTAS İç ve Dış Tic. Soğ. Sis. San. A.Ş.	GREECE	222	50000,0	-	36000,0
ÇETİNEL Soğutma San. ve Tic. A.Ş.	ITALY	217	24983,0	19040,0	19040,0
TEKPOL Poliüretan San. Tic. A.Ş.	GERMANY	218	57120,0	-	38080,0
TERMO Soğutma San. Tic. A.Ş.	ITALY	216	11897,0	11760,0	11760,0
TURA Soğ. San. Tic. A.Ş.	SPAIN	220	2000,0	-	2000,0
TOTAL			146000,0	30800,0	106880,0

Table 4. The Import License and Realized Import Amounts of CFC12 for 2002

THE IMPORT LICENSE (QUOTA) AND IMPORT REALIZATION IN KGS FOR CFC12 FOR 2002					
COMPANY	COUNTRY OF IMPORT	LICENSE NUMBER	IMPORT LICENSE / QUOTA (kg)	REALIZATION from MoEF (kg)	REALIZATION from Company (kg)
ANATEKS Isıtma ve Soğ. Sis. San. Diş. A.Ş.	ENGLAND	181	29875,0	29866,0	29866,0
BİRSAN Mak. San. ve Tic. A.Ş.	-	-	10000,0	9996,0	9996,0
CANTAS İç ve Diş Tic. Soğ. Sis. San. A.Ş.	GREECE	179	150647,0	150647,5	150647,5
ÇETİNEL Soğutma San. ve Tic. A.Ş.	BELGIUM	185	78043,0	78036,8	78036,8
FLOGAZ Florlu Gazlar San. ve Tic. A.Ş.	ENGLAND	182	98246,0	84320,0	84320,0
MESPA End. Paz. Ltd. Şti.	INDIA	178	75292,0	75276,0	75276,0
SOĞUK TEKNİK San ve Tic. A.Ş.	ITALY	176	113191,0	113180,0	113180,0
TEKGAZ Tek. Gaz. ve Mal. San. Mum. A.Ş.	INDIA, SPAİN, ENGLAND	173	36662,0	36448,0	36448,0
TEKNİON San. Mam. Paz. Tic. A.Ş.	ENGLAND	180	19946,0	19938,0	19938,0
TERMO Soğutma San. Tic. A.Ş.	BELGIUM	183	12871,0	12865,6	12865,6
TURA Soğ. San. Tic. A.Ş.	ITALY	184	13790,0	13776,8	13776,8
UZMAN Demir Çelik Sanayi A.Ş.	INDIA, SPAİN, ENGLAND	175	11478,0	10880,0	10880,0
TOTAL			650041,0	635230,7	635230,7

Table 5. The Import License and Realized Import Amounts of CFC12 for 2003, as of 31st August.

THE IMPORT LICENSE (QUOTA) AND IMPORT REALIZATION IN KGS FOR CFC12 FOR 2003					
COMPANY	COUNTRY OF IMPORT	LICENSE NUMBER	IMPORT LICENSE / QUOTA (kg)	REALIZATION from MoEF (kg)	REALIZATION from Company (kg)
ANATEKS Isıtma ve Soğ. Sis. San. Diş. A.Ş.	ITALY	236	14531,0	0,0	14524,8
BİRMAK Soğutma San. ve Tic. A.Ş.	SPAIN	234	2000,0	0,0	1992,2
BİRSAN Mak. San. ve Tic. A.Ş.	SPAIN	233	3621,0	0,0	3917,6
CANTAS İç ve Diş Tic. Soğ. Sis. San. A.Ş.	GREECE	232	79796,0	79796,0	79796,0
ÇETİNEL Soğutma San. ve Tic. A.Ş.	ITALY	231	39608,0	31824,0	31824,0
FLOGAZ Florlu Gazlar San. ve Tic. A.Ş.	FRANCE	229	50360,8	50360,8	50360,8
MESPA End. Paz. Ltd. Şti.	SPAIN	227	35906,0	0,0	32640,0
SOĞUK TEKNİK San ve Tic. A.Ş.	ITALY	230	55483,0	0,0	35890,0
TEKGAZ Tek. Gaz. ve Mal. San. Mum. A.Ş.	-	228	17783,0	0,0	0,0
TEKNİON San. Mam. Paz. Tic. A.Ş.	-	226	8781,0	0,0	0,0
TERMO Soğutma San. Tic. A.Ş.	-	225	5539,0	0,0	0,0
TURA Soğ. San. Tic. A.Ş.	ITALY	224	6151,0	0,0	6147,2
TOTAL			269199,0	161980,8	257092,6

In Table 6, the import licenses and realized import figures for CFC502, are summarized only for 2002, since the import of CFC502 is not permitted beginning from 2003.

Table 6. The Import License and Realized Import Amounts of CFC502

THE IMPORT LICENSE (QUOTA) AND IMPORT REALIZATION IN KGS FOR CFC502 FOR 2002					
COMPANY	COUNTRY OF IMPORT	LICENSE NUMBER	IMPORT LICENSE / QUOTA (kg)	REALIZATION soource MoEF (kg)	REALIZATION source company (kg)
BİRMAK Soğutma San. ve Tic. A.Ş.	-	-	500,0	0,0	-
BİRSAN Mak. San. ve Tic. A.Ş.	-	-	500,0	0,0	-
CANTAS İç ve Dış Tic. Soğ. Sis. San. A.Ş.	CHINA	191	1889,0	1876,0	1876,0
ÇETİNEL Soğutma San. ve Tic. A.Ş.	BELGIUM	192	2037,0	2026,4	2026,4
SOĞUK TEKNİK San ve Tic. A.Ş.	ITALY	197	8551,0	1360,0	1360,0
TERMO Soğutma San. Tic. A.Ş.	BELGIUM	193	500,0	489,6	489,6
TURA Soğ. San. Tic. A.Ş.	-	195	4022,0	0,0	-
TOTAL			17999,0	5752,0	5752,0

As depicted in Tables 2, 4, and 6 the agreement between the realizations as reported by MoEF and importers/companies, for the year 2002, is 100%. Yet, for the year 2003, there is a disagreement between the realizations as reported by MoEF and importers/companies as depicted in Tables 3 and 5. This is due the fact that there is a time lag of 1 to 3 months between the import of the materials by the importers/companies and receipt and processing of this information by Customs and MoEF. However, a verification study that will be carried after March 2004, will prove that the agreement between the realizations reported by MoEF and importers/companies for the year 2003 is acceptable, if not 100%, as is the case for the year 2002.

The import license (quota) and realized import amounts, and ratio of realized import to quota were given in Table 7.

Table 7. The Import License and Realized Import Amounts of CFC11, CFC12, and CFC502

	2001			2002			2003		
	QUOTA (kgs)	IMPORT (kgs)	IMPOR T (% of quota)	QUOTA (kgs)	IMPORT (kgs)	IMPOR T (% of quota)	QUOTA (kgs)	IMPORT (kgs)	IMPOR T (% of quota)
CFC11	260040,0	108500,0	41,7	255000,0	61840,0	24,3	146000,0	106880,0	73,2
CFC12	700000,0	662810,0	94,7	650041,0	635230,7	97,7	269199,0	257092,6	95,5
CFC502	-	6868,0	#	17999,0	5752,0	32,0	-	-	-

There is no quota to compare and/or all imports were realized prior to the quota limitations

Examination of the percentage realization of CFC11 and CFC12, one may conclude that the market is adapting to the quota system well. It is clear from Table 7 that the quota values set for CFC 11 are well over the Turkey's need; the ratio of realized import to quota for CFC11 changes between 24.3% to 73.2% of the quota of the respective years with an average value of almost 50% of the quota. The import realization for CFC12 is almost 100% of the quota, ranging between 94.7% to 97.7% of the quota of the respective year. This may be due to the fact that CFC11 and CFC12 are consumed for different purposes. While CFC11 is used mostly for foam productions for which there are feasible alternative technologies of production, CFC12 is still in demand for the service of coolers and refrigerators of former technologies. Furthermore, it is worth noting that the company officials stated that CFC12 is the only CFC in the quota system the demand for which is higher than the quota. Note that the quota system was implemented on May 2002 for CFC502 and the import figures for CFC502 before the implementation of the quota system in May 2002 are not covered in this report mainly due to the difficulty of collecting consistent and reliable data during the time frame of the study.

Furthermore, any source of CFC import other than the legally permitted sources was investigated during the interviews conducted at the importer companies; there was no evidence of illegal import of CFC.

During the company visits, the stocks of the companies were also recorded for January 1, 2002 and 2003 and as of August 31st 2003 and tabulated in Table 8-10.

Table 8. The stocks and sales for CFC11 for 2002 and 2003

COMPANY	STOCK AS OF 01.01.2002	TOTAL IMPORT DURING 2002 (kg)	OTHER PROCUREMENTS DURING 2002 (kg)	TOTAL SALES DURING 2002 (kg)	STOCK AS OF 01.01.2003	TOTAL IMPORT DURING 2003 (kg)	OTHER PROCUREMENTS DURING 2003 (kg)	TOTAL SALES DURING 2003 (kg)	STOCK AS OF 31.07.2003	BALANCE
CANTAS İç ve Dış Tic. Soğ. Sis. San. A.Ş.	0,0	18000,0	0,0	18000,0	0,0	36000,0	0,0	24000,0	12000,0	0
ÇETİNEL Soğutma San. ve Tic. A.Ş.	324,0	24640,0	0,0	21751,6	9638,9	19040,0	0,0	32634,0	7735,0	-18117
SOĞUK TEKNİK San ve Tic. A.Ş.	0,0	19200,0	0,0	19200,0	0,0	0,0	0,0	0,0	0,0	0
TEKPOL Poliüretan San. Tic. A.Ş.	54600,0	0,0	0,0	44100,0	10500,0	38080,0	0,0	26740,0	21840,0	0
TERMO Soğutma San. Tic. A.Ş.	15680,0	8595,0	0,0	0,0	0,0	11760,0	0,0	11760,0	0,0	24275
TURA Soğ. San. Tic. A.Ş.	612,0	0,0	21569,6	10716,8	11464,8	0,0	0,0	6582,4	4882,4	0

Table 9. The stocks and sales for CFC12 for 2002 and 2003

COMPANY	STOCK AS OF 01.01.2002	TOTAL IMPORT DURING 2002 (kg)	OTHER PROCUREMENTS DURING 2002 (kg)	TOTAL SALES DURING 2002 (kg)	STOCK AS OF 01.01.2003	TOTAL IMPORT DURING 2003 (kg)	OTHER PROCUREMENTS DURING 2003 (kg)	TOTAL SALES DURING 2003 (kg)	STOCK AS OF 31.07.2003	BALANCE
ANATEKS Isıtma ve Soğ. Sis. San. Diş. A.Ş.	2584,0	29866,0	0,0	16864,0	15585,6	14524,8	0,0	16864,0	8160,0	5086,8
BİRMAK Soğutma San. ve Tic. A.Ş.	0,0	0,0	0,0	0,0	0,0	1999,0	0,0	1999,2	0,0	-0,2
BİRSAN Mak. San. ve Tic. A.Ş.	0,0	9996,0	0,0	9996,0	0,0	3617,6	0,0	3617,6	0,0	0,0
CANTAS İç ve Dış Tic. Soğ. Sis. San. A.Ş.	0,0	150647,5	0,0	150647,5	0,0	79796,0	0,0	79796,0	0,0	0,0
ÇETİNEL Soğutma San. ve Tic. A.Ş.	3890,0	78036,8	0,0	83816,8	367,2	31824,0	0,0	81994,0	2216,8	-54276,8
FLOGAZ Florlu Gazlar San. ve Tic. A.Ş.	53108,0	84320,0	0,0	82724,0	35170,0	50360,8	0,0	31050,0	54440,8	19574,0
MESPA End. Paz. Ltd. Şti.	1523,0	75276,0	0,0	98042,0	612,0	32640,0	13200,0	44961,0	1686,0	-22050,0

SOĞUK TEKNİK San ve Tic. A.Ş.	1849,6	113179, 2	12852,0	127812, 8	68,0	35890,0	5752,8	39589,6	2121,6	-0,4
TEKGAZ Tek. Gaz. ve Mal. San. Mum. A.Ş.	!	36448,0	!	!	!	0,0	!	!	!	!
TEKNİON San. Mam. Paz. Tic. A.Ş.	4950,0	19938,0	15803,0	39712,0	979,2	0,0	18373,6	19352,8	0,0	-0,2
TERMO Soğutma San. Tic. A.Ş.	367,0	12865,6	0,0	12865,6	0,0	0,0	0,0	0,0	0,0	367,0
TURA Soğ. San. Tic. A.Ş.	17544,0	13776,8	75833,6	107154, 0	0,0	6147,2	33578,4	35849,6	3876,0	0,4
UZMAN Demir Çelik Sanayi A.Ş.	!	10880,0	!	!	!	0,0	!	!	!	!
!	No contact could have been made									

Procurements of CFC12 listed above other than the quotas were found to be domestic exchange between the sister companies such as Anateks-Termo Sogutma, and Birsan-Birmak-Tura-Soguk Teknik.

Table 10. The stocks and sales for CFC502 for 2002 and 2003

COMPANY	STOCK AS OF 01.01.200 2	TOTAL IMPOR T DURIN G 2002 (kg)	OTHER PROCURE - MENTS DURING 2002 (kg)	TOTAL SALES DURIN G 2002 (kg)	STOCK AS OF 01.01.200 3	TOTAL SALES DURIN G 2003 (kg)	STOCK AS OF 31.07.200 3	BALANC E
CANTAS İç ve Diş Tic. Soğ. Sis. San. A.Ş.	0,0	1876,0	0,0	1876,0	0,0	0,0	0,0	0,0
ÇETİNEL Soğutma San. ve Tic. A.Ş.	1659,0	2026,4	0,0	1564,0	391,2	1068,0	1128,8	-75,4
SOĞUK TEKNİK San ve Tic. A.Ş.	27,0	1360,0	2053,6	2162,4	1278,4	380,0	897,6	0,6
TERMO Soğutma San. Tic. A.Ş.	0,0	489,6	0,0	489,6	0,0	0,0	0,0	0,0
TURA Soğ. San. Tic. A.Ş.	612,0	0,0	21569,6	10716,8	11464,8	6582,4	4882,4	0,0

In evaluating the balances between the realized import amounts, stocks and the sales for 2003, it must be noted that this report does not cover the last three months of the year. A verification report to cover 2003 as a whole must be conducted on March 2004, the earliest. In evaluating the results given in Tables 1-10, it is worth noting that all the sales and stock records were provided by the companies and cannot be double-checked by reviewing their records. This is simply due to the fact that, as seen in Table 1, within a very short period of time, effectively 2 ½ days, there were quite a few companies visited such that on the average 1 ½ hours were spent per visit. Therefore, the existing imbalances for some of the companies must further be investigated with a more comprehensive study.

Based on the data presented in Tables 2-10, it is possible to drive some conclusions.

- Examination of the percentage realization of CFC11 and CFC12, one may conclude that the market is adapting to the quota system well.
- The quota values set for CFC 11 are greater than the need suggesting that the alternative technologies and/or materials have diminished the demand for CFC11.
- The import realization for CFC12 is almost 100% of the quota, suggesting that CFC12 will be still in demand for the service of coolers and refrigerators of former technologies, for some time in the future.
- Note that the amount of reported sales of CFC-502 is larger than the total quotas. This is due to import of these materials prior to the implementation of quotas.

Furthermore, any source of CFC import other than the legally permitted sources was investigated during the interviews conducted at the importer companies; there was no evidence of illegal import of CFC.

Polyol suppliers and consumers have also been contacted. ELASTOGRAN Poliuretan San. ve Tic. Ltd. Sti., an example of polyol supplier to the foam industry, was the only one visited while others were reached by using some other means. ELASTOGRAN imports a small amount, only 10% of their polyol consumption preblended, while they blend 90% of it with HCFC. Ms. Nergis Demir and Ms. Binnur Tulumbacı of ELASTOGRAN stated that Huntsman-Shell imports all its consumption as preblended from Italy. Moreover, a fax message from Shell-Turkey stated that Shell has no CFCs in any of its products.

The companies which completed or are carrying out MLF projects (present and past consumers) were also contacted in order to confirm whether the market are procuring from the legal importers. The companies contacted were also listed in Table 1. Among five of these companies, only Teknik Sogutma used, for service purposes, total of 285 kg of CFC12 during 2002 and 2003 to date. The origin of the material is Tura Sogutma San. ve Tic. Sti., a legal importer.

During the company visits, the persons interviewed stated their general comments of on different aspects of the quota system, illegal imports, etc. These comments are summarized below:

- For CFC12 a greater portion of the imported amount is used by small scale service providers rather than in manufacturing industry. This is due to large number of refrigerators in use which use CFC12; this demand for CFC12 for servicing is not expected to decrease significantly in the near future.

- Companies with completed or ongoing MLF projects use almost no CFC11, 12 or 502 for production purposes.
- The smaller foam producers are suspected to use CFC11. It is understood that large foam manufacturers, if not already use water or pentane based technologies, use HCFC.
- There is an illegal transport of CFC12 into Turkey. This illegal traffic into the country is suspected to be mainly from the Southeastern border via Syria. It is claimed to be mostly from India. Another suspected illegal input is from Dubai.
- It is believed that illegally imported CFC's are mostly manufactured in India. Yet, it is suggested that there are illegal imports of origin of Italy, Germany and USA.
- The most common mode of the illegal transport of CFC12 is by passenger busses in disposable containers (Atoken-France and Refron-India). Some of the containers are not labeled at all. Some of them are labeled as generic refrigerant. The labels may also be in Arabic.
- The price of the illegally imported CFC12 is compatible with that of legally imported CFC12 while the CFC12 alternatives are relatively expensive.
- Five Turkish importer companies filed a complaint in 1999 to let the Turkish legal authorities know this situation and make them take the necessary precautions to prevent this illegal input. Yet, as stated, the situation did not change and the illegal input of CFC12 is still a reality.
- It is also stated that the rate of this illegal import gets higher especially towards the end of the year when the quota limits get lower.
- The illegal input is mainly consumed locally in the South East region.
- Even though there are no concrete figures, the total amount is thought to be significant and may be about 35% of the quotas.
- It is suggested that illegal traffic of CFC's into Turkey can be stopped if the use of disposable containers is banned as is the case in Europe.
- Some importer company officials pointed out that a considerable amount of CFCs are imported to free zones in Turkey which are not covered in the quota system. Then, they are sold to countries like Bulgaria, Kosova, Azerbaijan, Romania, etc.
- Some of the CFC12 which is imported legally under the quota system to Turkey is exported mainly to Bulgaria and some other European countries.