UNITED NATIONS DEVELOPMENT PROGRAMME

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**PROJECT DOCUMENT**

***Islamic Republic of Iran***

**Project Title:** HCFC Phase Out Management Plan (HPMP) Stage-II of Islamic Republic of Iran

**Project Number: 00090621/00096302** **(MLF Reference Number: IRA/PHA/77/INV/226)**

**Implementing Partner:** Islamic Republic of Iran (represented by Department of Environment),

**Start Date:** 2017 **End Date:** 31 December 2022 **PAC Meeting date:** 22 November 2017

**Brief Description**

Iran is a signatory to the Montreal Protocol on Substances that Deplete the Ozone Layer (MP) and its amendments; hence eligible to receive assistance from the MP's Multilateral Fund (MLF) to phase out MP controlled substances as per the phase-out schedules set forth under the MP including hydrochloroflurocarbons (HCFCs). At the 63rd Meeting of the Executive Committee of MLF in April 2011, HCFC Phase Out Management Plan (HPMP) Stage I of Iran was approved with UNDP as the lead implementing agency and UNIDO, UNEP, Governments of Italy and Germany (GIZ) as the cooperating agencies. Total funding approved was USD 10,393,388 for all the agencies combined. Through the HPMP, Iran Government committed itself to HCFC freeze in 2013 and 10% reduction in 2015 (Stage I targets). The Stage I is nearly complete. At the 77th Meeting of the Executive Committee, in November-December 2016, HPMP Stage II of Iran was approved, UNDP as the lead implementing agency and UNIDO, UNEP, Italy and Germany (GIZ) as the cooperating agencies. Total funding approved was USD 11,288,177 with UNDP share being USD 4,905,361[1]. A first tranche of USD 3,020,440 was approved through a multi-year Performance based Agreement between the Government of the Islamic Republic of Iran and the Executive Committee. UNDP share of the first tranche is USD 1,298,170; second tranche USD1,593,980; third tranche USD1,307,980; fourth tranche USD464,231 and last fifth tranche USD241,000. Implementation of the project will assist Government of the Islamic Republic of Iran in reducing HCFC consumption to 266.35 ODP Tonnes in 2018, 247.33 ODP Tonnes in 2020 and 95.13 ODP Tonnes in 2023 in RAC and foam sector.

Contributing Outcome (UNDAF/CPD, RPD or GPD):

UNDAF: 1.2 - **Low carbon economy and climate change** - Responsible GOI agencies formulate, implement and monitor low carbon economy and climate change policies and programmes more effectively.

Indicative Output(s): The Islamic Republic of Iran's institutional capacities to meet HCFC and POP phase out commitments are enhanced.

**UNDP Strategic Plan:** 1.3

| | | |
|---|---|---|
| **Total resources required:** | USD 4,905,361 | |
| **Total resources allocated:** | **UNDP TRAC:** | $0.00 |
| | **Donor** (Multilateral Fund for the implementation of the Montreal Protocol (MLF)): | USD 4,905,361 |
| | **Government:** | $0.00 |
| | **In-Kind:** | |
| **Unfunded:** | | |

Agreed by (signatures):

| Government | UNDP |
|---|---|
| Dr. Masoud Tajrishi<br>Deputy Head for Human Environment<br>Department of Environment | Mr. Gary Lewis<br>UNDP Resident Representative |
| Date: | Date: |

[1] See APPENDIX 1-A in the Grant Agreement for share of each Implementing Partner in the total budget

## TERMS AND ABBREVIATION

| | |
|---|---|
| CFC | Chlorofluorocarbon |
| DoE | Department of Environment |
| EPR | Extended Product Responsibility |
| ExCom | Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol |
| GIZ | Deutsche Gesellschaft fur Internationale Zusammenarbeit GmbH |
| GWP | Global Warming Potential |
| HC | Hydrocarbon |
| HCFC | Hydrochlorofluorocarbon |
| HFC | Hydrofluorocarbon |
| HPMP | HCFC Phase-Out Management Plan |
| ISIRI | Institute of Standards & Industrial Research of Iran |
| MEA | Multilateral Environment Agreement |
| MOC | Ministry of Commerce |
| MoIM | Ministry of Industry and Mines |
| MLF | Multilateral Fund |
| MP | Montreal Protocol |
| MT | Metric Tonne |
| NGO | Non-Governmental Organisation |
| NOU | National Ozone Unit |
| ODP | Ozone Depleting Potential |
| ODS | Ozone Depleting Substances |
| PMU | Project Management Unit |
| RAC | Refrigeration and Air-Conditioning |
| SDG | Sustainable Development Goals |
| SME | Small and Medium Enterprise |
| TVTO | Technical Vocational Training Organizations |
| UNDAF | United Nations Development Assistance Framework |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNIDO | United Nations Industrial Development Organisation |

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# I. DEVELOPMENT CHALLENGE

Stratospheric ozone depletion and climate change are known to be two major mutually reinforcing phenomena that threaten the global environment. The Montreal Protocol (MP) on Substances that Deplete the Ozone Layer is the internationally agreed instrument laid down by the global community to safeguard the ozone layer against human induced impacts that threaten the natural resource base and affects the health and wellbeing of peoples across the globe.

It is widely agreed that the poor and vulnerable would suffer the most from the impacts of the climate change and atmospheric calamities. Hence, any contribution to safeguarding the integrity of the atmosphere and reducing greenhouse gas emissions will have a positive impact on the life of the poor.

Certain groups of synthetic chemicals, used to be widely utilised in various industrial and service sector practices, are known to adversely impact the stratospheric ozone layer when released in the atmosphere. These so called ozone depleting substances (ODSs) have been put under a control regime by the MP. While the developed countries have already eliminated the production and consumption of ODS under Article One of the MP, its Article Five provides for developing country parties to receive technical and financial assistance through the Multilateral Fund for the Implementation of the Montreal Protocol (MLF) to substitute the ODS-based technologies with ozone friendly ones. In the absence of this shift, the concerned industries and service sectors (mainly refrigeration and foam sectors) will not be able to remain in the market due to the global ban to be put on the use of the ODSs; hence the impact on the domestic industrial development, market prices of relevant equipment/services and employment.

Iran is a signatory to the MP and therefor committed to meeting the MP targets vis-a-vis the gradual phase-out of the production and consumption of ozone depleting substances (ODS). Under Article Five of the Protocol, Iran is eligible to receive technical and financial support from the Multilateral Fund for the Implementation of the Montreal Protocol (MLF). Over the past two decades, Iran has shown commitment in contributing to achieving the MP objectives.

The development challenge that this project seeks to address is threefold. First, the project aims to help Iran's industries to receive support for a smooth shift to ozone friendly technologies, hence retaining their market niche, viability and employment. Successful implementation of the project will help the beneficiary enterprises to receive ozone friendly technologies; hence retaining their position in the local market. The project will ensure sustainable employment and economic viability for direct project beneficiaries, namely the private sector manufacturers appliances and systems of refrigeration, air conditioning, foam production, and related servicing including small and medium sized (SME) enterprises.

Secondly, the project will help Iran to continue meeting its obligations under the MP as regards the time-bound phase-down of the consumption of the target ODSs.

Thirdly, by successful phase down of the ODSs, Iran will contribute to the global efforts concerning the protection of the environment against potential climatic disasters that would otherwise impact the poor and vulnerable disproportionately across the world.

# II. STRATEGY

The theory of immediate development changes (TOC) the project is aiming will address the three-pronged challenge as described in the previous chapter.

By establishing a multiparty partnership of national and international partners, the present project aims:

1. To assist Iran in successfully mobilising and effectively using MLF resources for the country's beneficiary production sub-sectors to switch to new ozone friendly and climate smart technologies as a prerequisite for developing markets and generating employment;

2. For the Government of Iran to meet its international environmental obligations as a member to MEAs; and

3. Also for Iran to contribute to the global partnership concerning the conservation and sustainability of atmosphere.

The partnership to be led by UNDP, will bring together a host of international parties, namely the United Nations Environment (UN Environment), the United Nations Industrial Development Organisation (UNIDO) and the Governments of Germany (represented by GIZ Proklima) and Italy to work, in a concerted manner, with GOI as represented by the Department of Environment.

Iran still consumes HCFCs, and will continue to phase out gradually till 2030. Stage II of the HPMP will continue to support Iran in its HCFC phase out efforts, as well as to introduce as far as practical and economically viable, low GWP technologies.

Iran's HPMP Stage II was approved at the 77th Meeting of the Executive Committee (ExCom) of the Multilateral Fund for the Implementation of the Montreal Protocol (MLF) in November/December 2016. It covers the period 2016 to 2023 to reduce HCFC consumption by 75 per cent of the baseline. The total agreed funding for the entire project is $11,288,177 with UNDP share being $4,905,361. The remainder of the funding is distributed between UNIDO, UNEP, GIZ and Italy. UNDP will serve as the lead implementing agency for the project.

See Annex 1 for TOC diagram

As per the Agreement with the Multilateral Fund (attached at Annex 8) Iran is committed to the following reduction targets in ODP Tonnes:

**Table 1: Reduction Targets**

| Particular | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|
| Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes) | 342.45 | 342.45 | 342.45 | 342.45 | 247.33 | 247.33 | 247.33 | 247.33 |
| Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes) | 342.45 | 342.45 | 266.35 | 266.35 | 247.33 | 247.33 | 247.33 | 95.13 |

Stage II of the HPMP builds on the achievements of Stage I. The focal areas for actions identified are as follows:

- HCFC phase-out in foam sector resulting in complete phase-out of HCFCs in foam application by 1st January 2023. This will include phase-out of HCFCs from formal sector as well as informal sector.
- Addressing HCFC consumption in refrigeration and air-conditioning sector (manufacturing) on priority basis given the high consumption levels as well as consumption growth coupled with availability of low GWP energy efficient technologies. It must be noted that technical assistance support would be made available to a large number of SMEs to facilitate the process of their adoption of low GWP and commercially viable alternatives.
- Technical assistance to SMEs combined with technology and equipment.

- Full conversion of companies in the commercial refrigeration sector.
- Addressing service sector to build capacity of service agencies for reducing HCFC use in servicing.
- Adopting a sectoral/sub-sectoral approach in the phase-out strategy to offer a level playing field to all market players.
- Providing project-monitoring support to ensure that HCFC phase-out activities are implemented in a systematic and phased-manner.

The Government of Iran proposes to use low GWP HC based technologies in foam sector wherever feasible. The Government, after careful and thorough consultations with the industry, recognizes the importance of safety while adopting flammable alternatives in different applications and in their strategy, would adopt measures to ensure that the alternatives are adopted in a safe manner. Under the proposed plan, the Government would phase-out HCFCs in different applications in the following manner.

**Table 2: Proposed Phase-out Plan for HPMP Stage II**

| Sectors | Technology options | Phase-out in manufacturing | Remarks |
|---|---|---|---|
| Unitary Air-conditioning | R-290, and other low GWP options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Commercial and industrial air conditioning | Cascade systems like NH3/HCs/low GWP-CO2, water, brine | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Refrigeration | HC and other low GWP technology options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Foam | HC, Water blown and other low GWP technology options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |

Note: In air-conditioning and refrigeration sector given the large number of SMEs, technical assistance support would be provided for conversion to HCFC free technologies. Limited project assistance is proposed to be provided for conversion projects.

The table number 3 provide the HCFC Phase-out of each agency and each sector by 2023:

**Table 3: Total ODP Tonnes Phase-out Plan for HPMP Stage II by all Agencies**

| Activity | Agency | Eligible consumption and funds requested | | | | Additional HCFC reductions | |
|---|---|---|---|---|---|---|---|
| | | mt | ODP | US $ | CE US $/kg | mt | ODP |
| PU foam integral skin, TA | Germany | 39.00 | 4.29 | 763,444 | | | |
| PU foam commercial refregeration, TA | UNDP | 315.70 | 34.73 | 1,896,401 | | | |
| PU foam other rigid | UNIDO | 444.70 | 48.92 | 2,770,412 | | | |
| **Sub-total PU foam** | | **799.40** | **87.93** | **5,430,257** | **6.79** | ***28.82** | **3.17** |
| RAC manufacturing TA | Germany | 397.70 | 21.87 | 1,908,960 | | **2.30 | 0.13 |
| RAC manufacturing kits | UNDP | 397.70 | 21.87 | 1,908,960 | | **2.30 | 0.13 |
| AC manufacturing | | | | | | ***200.00 | 11.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sub-total RAC manufacturing** | | **795.40** | **43.75** | **3,817,920** | **4.80** | **204.6** | **11.26** |
| Refrig. distribution system | UNDP | 100.00 | 5.50 | 480,000 | | | |
| Servicing non-investment | UNEP | 145.83 | 8.02 | 700,000 | | | |
| Servicing investment | UNIDO | 50.00 | 2.75 | 240,000 | | | |
| **Sub-total servicing** | | **295.83** | **16.27** | **1,420,000** | **4.80** | | |
| PMU | UNDP | | | 620,000 | | | |
| **Grand total** | | **1890.63** | **147.95** | **11,288,177** | **5.97** | **233.42** | **14.42** |
| Total Germany | | | | | | 2,672,404 | |
| Total UNDP | | | | | | 4,905,361 | |
| Total UNIDO | | | | | | 3,010,412 | |
| Total UNEP | | | | | | | 700,000 |

*Remaining consumption of HCFC-141b eligible for funding, which will be deducted from the starting point although the phase-out of HCFC-141b non-eligible for funding is larger (68.26 ODP tonnes).

**Consumption corresponds to one RAC manufacturing enterprise found non-eligible and will be deducted from the starting point.

***Consumption in the AC manufacturing sector will be phased out through regulations and will be deducted from the starting point.

Overall UNDP has to phase-out 62.23 ODP tonnes under investment component and rest through policy and regulations.

Based on the above considerations, the following phase-out actions will be implemented:

(a) ***Foam and commercial refrigeration sector:*** In foam sector, the remaining eligible consumption amounts to 91.1 ODP tonnes (828.2MT). The total quantity of HCFC-141b that will be phased-out under Stage II is 87.9 ODP tonnes (799.4 MT) – includes both PU foam and commercial refrigeration sub-sectors as well as SMEs. The innovative character of the Stage II is that pure foam companies as well as commercial refrigeration companies who are foaming are going to be joined in the technology and assistance programs, for a comprehensive sector phase out.

(b) ***Air Conditioning Sector***: The estimated consumption of HCFC-22 in air-conditioning applications including domestic and commercial air-conditioning is 11 ODP tonnes (200 MT). During the field survey, HCFC-22 consumption in 5 eligible companies amounted to 3.53 ODP tonnes (64.24 MT). These companies are engaged in manufacturing commercial / industrial air-conditioning equipment. Project funding is proposed to be included for these eligible companies for conversion to R-290, or other low GWP as a refrigerant. Technical assistance through information outreach on new technologies, targeted workshops/meetings for providing information on HCFC-22 free technologies and other schemes for encouraging SMEs to adopt HCFC free technologies are proposed to be used.

(c) ***Refrigeration Sector:*** The consumption quantities of ODS for refrigeration in the refrigeration sector are low. The consumption of HFC-134a is high. HCFC-141b is used by some of the companies for insulation foam blowing purposes. Field survey data during HPMP Stage-II shows that there are 51 companies consuming 400 MT and 315.7 MT of HCFC-22 and HCFC-141b, respectively in the year 2015. Of these 51 companies, 44 companies consume less than 10 MT of HCFC-141b. These companies produce commercial and industrial refrigeration equipment as well as chillers for commercial and industrial air conditioning.

Commercial refrigeration and air conditioning sector technology programme: Considering the large amount of small companies and manufacturing support required, several technology samples including cascade systems for low GPW solutions will be produced. These technologies will be build up at several companies for different applications and shared across the whole sector. The technologies will then be shared with the educational institutes TVTO and Enghelāb-e Eslāmi Technical College a branchof the Technical and Vocational University for capacity building in the design, manufacturing and servicing. A product stewardship will be

setup to introduce EPR (Extended Product Responsibility). In combination with the introduction of non-disposable refrigerant cylinders to improve the traceability and monitoring.

The project funding for 51 enterprises is to be provided for HCFC phase-out in refrigeration manufacturing. Training, and Technical assistance through information outreach on new technologies, targeted workshops/meetings for providing information on HCFC-22 free technologies, training and educational support for manufacturers service and design engineers, packages of equipment for conversion and other schemes for encouraging SMEs to adopt HCFC free technologies are proposed to be used. This in combination with the foam phase-out mentioned above.

(d) ***Air-conditioning and Refrigeration Servicing Sector:*** Refrigeration servicing sector is proposed to be addressed in this stage to ensure that the service sector enterprises have technical knowledge and equipment support to manage good servicing practices of the equipment. Further, to ensure sustainable phase-out in service sector, support is proposed to be provided for identified technical institutions for training service technicians.

In the current approach, the remaining consumption in industrial refrigeration and air-conditioning sector is proposed to be addressed through technical assistance provided to refrigeration and air-conditioning sector and service sector technical support. The consumption in these applications is primarily relating to installation and servicing. Further low GWP options that are cost-effective in terms of capital and operating costs are still under development (e.g., R-290 based equipment, $CO_2$ based equipment etc.). Given the above, such an approach is considered for a cost-effective phase-out strategy.

The Iran UNDAF Results Matrix for 2017 – 2021, Outcome 1.2: Low carbon economy and climate change, specifically identifies that UNDP will “Promote policies and programmes aimed at reducing the use of ozone depleting substances” amongst other activities addressed in this Outcome.

As can be noted from above, new technologies being introduced into the country will be shared with the educational institutes TVTO and Enghelāb-e Eslāmi Technical College - for capacity building in the design, manufacturing and servicing, thereby building a sustainable resource. In addition, fast-track outreach of training activities will also be done by providing training equipment and educational aids to some of the Training Centres and strengthening the curriculum.

The project has several links to the Sustainable Development Goals (SDG) to be achieved by 2030.

- This project is aligned with the objective of SDG12: "Ensure sustainable consumption and production patterns", in particular with the goal: " By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.”
- SDG 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and promote innovation" and will contribute in particular to the following goal of this ODS: "by 2030, improving infrastructure and readjust the industries to make them sustainable, using resources more effectively and promoting the adoption of technologies and industrial processes cleaner and environmentally sound ", and getting all countries to take measures in accordance with their respective capabilities".
- SDG 13: "Adopt urgent measures to combat climate change and its effects", specifically contributing to the goal "Incorporate measures relating to climate change in policies, strategies and national plans".

## III. RESULTS AND PARTNERSHIPS

### *Expected Results and Resources Required to Achieve the Expected Results*

**Expected Results**

The results expected from the HPMP Stage-II would be to comply with the accelerated HCFC phase out targets as per the agreement between the Executive Committee of the Multilateral Fund and the Department of Environment, Government of Islamic Republic of Iran. The implementation framework and strategy will be to meet the HCFC phase out targets and milestones as per this agreement.

**Resources Required to Achieve the Expected Results**

The Multilateral Fund for implementation of the Montreal Protocol provides incremental capital and operating costs to facilitate conversion to non-HCFC technology, which the Government of Islamic Republic of Iran, Department of Environment, provides to the HCFC consuming enterprises, following proper due diligence and the implementation framework for the project.

**Partnerships**

UNDP, as the lead agency for HPMP in Iran, will work closely with Department of Environment. UN Environment, UNIDO, GIZ and Government of Italy are the cooperating agencies. The various line ministries and industry stakeholders are also associated in the implementation of HPMP Stage-II.

The National Ozone Unit (NOU), with the full support of DoE (as the national focal point to the Vienna convention and its Montreal Protocol) and other government organizations and the refrigeration industry association, plays a pivotal role in managing the Montreal Protocol Programs. In addition to meeting the country's ODS phase-out targets, NOU plays a critical role in establishing and amending ODS regulations, conducting extensive public awareness campaigns and take initiatives to strengthen the enforcement of the regulations. The NOU is responsible for overall management of MP programs, i.e. supervision of investment operations at the national level, which is done with the support of technical and administrative staff of NOU.

The Customs Department plays a very important role in enforcement of ODS regulations and facilitating data collection process on ODSs. The Customs Departments, in addition to ensuring that imports of ODS are in accordance with licenses and assigned quotas, are also responsible for examining and inspecting any suspicious shipments and forwarding quarterly reports including a list of importers and other information on ODS imports to DoE and NOU.

The Ministry of Foreign Affairs has authority over policy issues expressed internationally relating to MEAs. It is the official contact point in Iran for matters relating to the MP.

The Ministry of Industry, Mines and Trade (MoIMT) is the licensing authority for industry and issues permission for the start-up of any new workshops. Hence, it has a significant role in policy decisions making and enforcement of regulations related to ODS phase-out.

MoIMT maintains data and information on businesses, issues trademarks and helps with setting industrial standards. Companies wishing to import ODS or ODS consuming equipment must have a valid commercial license and register with the Trade Promotion Organization (TPO), who in turn provides the information to NOU.

The Refrigeration Industry Association has been working actively with NOU to control illicit distribution of refrigerant cylinders and has been assisting with training of technicians in servicing sector. This Association has also been working with the ISIRI to prepare national refrigerant standards. In addition, there also are Association of Manufacturers of Home Appliances, who are mostly in manufacturing business; Association of Refrigeration Industries, who are mainly in repair and maintenance of refrigeration; Association of the Automobile Spare Part & Part Manufacturers, who cover all auto part manufacturers including foam and refrigeration systems for both light and heavy vehicles; Association of Furniture Manufacturers and Tehran Association of Mattress and Car Seats producers.

As part of establishment of the regulatory instrument, training through collaborative programs between Technical Vocational Training Organizations, RAC association, and NOU was performed during Stage I of HPMP and will continue in Stage II. The RAC servicing sector, as the largest distributor and consumer of HCFCs, are the main target of the training programs of HPMP. In fact, one of the major strategies over the RAC sector is institutional training to enhance technical knowledge of the servicing division. The main concept behind RAC training program is improving the quality of the work provided by the servicing sector to accelerate accomplishment of the phase out target.

***Risks and Assumptions***

Annex 4 specifies the main risks associated with the implementation of the project and planned actions to mitigate them. The risks identified are:

- *Environmental:* Successful implementation of the HPMP (Stage-II) in Iran will result in a phase-out of 131.9 ODP tonnes of HCFCs. The conversion of the remaining PU foam manufacturing enterprises in the Islamic Republic of Iran would avoid the emission into the atmosphere of some 570 thousand tonnes of $CO_2$ equivalent per year, while conversions in the RAC sector with a consumption of 800 mt will result in an additional avoidance of some 14,480 tonnes of $CO_2$ equivalent per year. However, in the absence of proper control, obsolete HCFCs may cause environmental pollution. The risk could be eliminated by proper containment and destruction of the obsolete material.
- *Financial*: No risk is envisaged since the funding towards incremental capital and incremental operating costs of conversion to non-HCFC technologies by the enterprises is provided by the MLF.
- *Operational:* Islamic Republic of Iran has successfully phased out the consumption of other Ozone depleting substances (ODS) such as Chlorofluorocarbons (CFCs,) Carbon tetrachloride (CTC) and halons including 10% of the consumption of HCFCs as on 1.1.2015 in line with the Montreal Protocol schedule. The lessons learnt from ODS phase out in the past would help in addressing the operational bottlenecks, if any. Insecurity associated with use of flammable technologies (Pentane, Hydrocarbons) by the companies in the foam and refrigeration sectors may pose a risk which is duly addressed if the predefined security measures are taken appropriately. The time available to implement actions for achieving the objectives of Stage-II is limited and keeping in view the large number of enterprises, particularly the Small and Medium enterprises in the foam and RAC manufacturing sector, there are likely to be challenges in implementation. However, sound implementation framework supported by a result-oriented and integrated approach will ensure timely and successful implementation. Hence no strategic risks are envisaged.

- *Organizational:* Insufficient cooperation by the institutions involved in consumption and import of HCFCs to implement control of the project activities could be a risk. To curb the risk, regular meetings of the National Ozone Committee is recommended.
- *Political:* The Implementation of the Montreal Protocol and ODS phase out activities in Iran has the full support of the political system of the country, including the policy, regulatory and implementation framework. Hence no risk is envisaged.
- *Regulatory:* To ensure compliance with MP control measures and provisions a “comprehensive programme of policies and regulations concerning the protection of ozone layer has been put in place under the framework of existing laws of the country including the Constitution, The Law of Importation and Exportation of Commodity, the Environment Conservation and Rehabilitation Act, Laws of Five-year Development Plans, Plant Protection Act, and Air Pollution Prevention Act. The Licensing System on ODS Import and Export comprises a set of incentives and disincentives, standards, training programmes, awareness raising, labelling, and ODS Importation control measures, importation quota regime, Ban on installing new enterprises with old technologies, ban on equipment containing ODS, Custom tax exemptions, and so on. While the regulatory framework is considered as sufficient and conducive to ensure compliance, there may be risks associated with actual enforcement.
- Hence no risk is involved from the regulatory angle.

- *Strategic:* No major strategic risks are foreseen to be associated with the implementation of the project.

***Stakeholder Engagement***

The main actors to be involved in successful implementation of stage II of the HPMP are:

- Identified domestic and commercial refrigeration manufacturers; Discontinuous sandwich panel manufacturers; and spray foam applicators for their insulation foam technology replacement.
- Refrigeration and air-conditioning equipment manufacturers.
- Identified system house manufacturing premixed polyols for conversion to non HCFC technology.
- Refrigeration and air-conditioning service sector.
- Other potentially affected groups: the general population, primarily consumers of products and equipment containing ODS.
- Government Counterparts as represented by the National Ozone Committee coordinated by the Department of Environment of Iran.

***South-South and Triangular Cooperation (SSC/TrC)***

Although the project does not cover South-South cooperation schemes in its design, will seek to identify opportunities for cooperation of this kind within the framework of the participation of the NOU in the South Asia Ozone Officers network.

***Knowledge***

In the foam, refrigeration and air-conditioning sectors, for SMEs, technical assistance on-site and through information outreach on new technologies, targeted workshops/meetings for providing information on HCFC-141b free technologies and other schemes for encouraging SMEs to adopt HCFC free technologies are proposed to be used.

For the RAC technicians, stage II will continue implementing training programs to ensure high quality work in servicing sector. The training program provides opportunity to introduce environmentally friendly alternatives to ozone depleting refrigerants and their replacement guidance.

Promotion of alternative emerging technologies through industry roundtables and O2C Technology Roadshows, green procurement initiatives and awareness raising workshops in collaboration with the Iran Chamber of Commerce, Mines and Agriculture and the ECO Chamber of Commerce and other identified organizations.

Campaign on HCFCs phase-out and HCFCs alternatives including production and distribution of printed materials (e.g. translation of technical material, newspaper ads, and articles in journals) and though mass media (e.g. short films for technicians) in Persian language. Message on alternatives with low global warming potential (GWP).

Awareness-raising on the risk associated with storage of HC particularly to the RAC technicians, commercial and industrial importers and educate them on the safety issues related to handling such gases.

Consumer Campaign on refrigerants in R/AC and R/AC servicing workshops and technicians' certification scheme.

***Sustainability and Scaling Up***

The participating enterprises, especially large SMEs involved in the project implementation will be exposed and trained to non-HCFC technologies, through specially structured training and awareness workshops. This would, besides enhancing their competencies, also provide the requisite support in conversion to non HCFC technologies and sustaining the phase out of HCFCs under the project.

The awareness campaigns will also promote sustained stakeholder participation.

## IV. PROJECT MANAGEMENT

### *Cost Efficiency and Effectiveness*

The Multilateral Fund of the Montreal Protocol has developed Policies and Guidelines which include how funding is to be utilised for specific activities that have been approved, and agreement signed with the country. Stage I HPMP is being successfully implemented by UNDP Iran and the execution modality should continue.

### *Project Management*

At the national level, the overall work related to ozone layer protection is overseen by the National Ozone Committee, a multi-stakeholder set-up of relevant national institutions and organisations. At the project level, the decision-making body of the project will be the Project Board consisting of representatives from DOE, MFA, and NOU as well as a representative from National Ozone Committee. The Project Board will be chaired by the NPD and meet at least every six months, reviewing and adopting project annual work plans and progress updates while also making required coordination to further enhance project implementation.

UNDP is the lead implementing agency and UNIDO, UN Environment, Government of Italy and the Government of Germany (represented by GIZ Proklima) are the cooperating agencies. These agencies are providing the necessary technical support for Iran to meet its commitments, with funding from the Multilateral Fund.

The project will be implemented by the National Ozone Unit (NOU) within the Department of Environment (DoE). The NOU is responsible for overall management of MP programs, i.e. supervision of investment operations at the national level, which is done with the support of technical and administrative staff of NOU.

A PMU has been established under the National Ozone Unit to implement project activities under the HPMP Stage I. PMU will continue to act as the project implementation arm of the National Ozone Unit. It reports to the National Project Manager (as director of Ozone Layer Protection Unit) who is overall responsible for project management and supervision. The PMU will also be responsible for monitoring project implementation in coordination with various agencies associated with implementation of project.

## V. RESULTS FRAMEWORK

**Table 4: Results Framework**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Intended Outcome as stated in the UNDAF/Country [or Global/Regional] Programme Results and Resource Framework: UNDAF 1.2: Low carbon economy and climate change -** Responsible GOI agencies formulate, implement and monitor low carbon economy and climate change policies and programmes more effectively. | | | | | | | | | | | | | |
| **Outcome indicators as stated in the Country Programme [or Global/Regional] Results and Resources Framework, including baseline and targets:** ODP tonnes of HCFCs imported/consumed annually. Baseline: 380.50 ODP Tonnes. 31st December 2022 Target: 95.13 ODP Tonnes | | | | | | | | | | | | | |
| **Applicable Output(s) from the UNDP Strategic Plan:** 1.3 - The Islamic Republic of Iran's institutional capacities to meet HCFC and POP phase out commitments are enhanced. | | | | | | | | | | | | | |
| **Project title and Atlas Project Number:** | | | | | | | | | | | | | |
| **EXPECTED OUTPUTS** | **OUTPUT INDICATORS** | **DATA SOURCE** | **BASELINE** | | **TARGETS (by frequency of data collection)** | | | | | | | | **DATA COLLECTION METHODS & RISKS** |
| | | | **Value** | **Year** | **Year 1 2017** | **Year 2 2018** | **Year 3 2019** | **Year 4 2020** | **Year 5 2021** | **Year 6 2022** | **Year 7 2023** | **FINAL** | |
| **Output 1** Procurement of foaming equipment for conversion of three commercial refrigeration equipment manufacturers to Pentane. | ***1.1*** Number of converted companies | *GIZ/NOU* | 0 | 2016 | | 3 | | | | | | *3* | *Data collection from NOU and GIZ* *Risk Free* |
| **Output 2** Procurement of foam kits using water blown technology for 40 commercial refrigeration manufacturers | ***2.1*** Number of converted companies | *GIZ/NOU* | 0 | 2016 | 15 | | | 25 | | | | *40* | *Data collection from NOU and GIZ* *Risk Free* |
| **Output 3** Procurement of refrigeration conversion kits for 40 refrigeration equipment manufacturers | ***3.1*** Number of converted companies | *GIZ/NOU* | 0 | 2016 | 12 | 14 | 0 | 9 | 3 | 2 | | *40* | *Data collection from NOU and GIZ* *Risk Free* |
| **Output 4** One System House establishment converted to manufacture HCFC free polyol systems | ***4.1*** Number of converted companies | *GIZ/NOU* | 0 | 2016 | 1 | | | | | | | *1* | *Data collection from NOU and GIZ* *Risk Free* |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Output 5:** Introduction of reusable refrigerant cylinders and cylinder cleaning and charging stations | ***5.1*** Number of cylinders procured and charging stations established | *GIZ/NOU* | 0 | 2016 | | 1 | | | 1 | | | *2* | *Data collection from NOU and GIZ*<br>*Risk Free* |
| **Output 6:** Project Management and Monitoring | ***6.1*** Number of Annual Progress Reports | *UNIDO/ ITALY /UNDP/ GIZ/NOU* | 0 | 2016 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | *7* | *Data collection from UNIDO, Italy, UNDP, GIZ and NOU*<br>*Risk Free* |
| | ***6.2*** Number of Annual implementation report of the HCFC phase-out Plan for the Multilateral Fund Executive Committee | *UNIDO/ ITALY /UNDP/ GIZ/NOU* | 0 | 2016 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | *7* | *Data collection from UNIDO, Italy, UNDP, GIZ and NOU*<br>*Risk Free* |
| | ***6.3*** Number of Verification reports | *NOU* | 0 | 2016 | | 1 | | 1 | 1 | 1 | | *4* | *Data collection from NOU*<br>*Risk Free* |

## VI. MONITORING AND EVALUATION

In accordance with UNDP's programming policies and procedures, the project will be monitored through the following monitoring and evaluation plans: *[Note: monitoring and evaluation plans should be adapted to project context, as needed]*

**Table 5: Monitoring Plan**

| Monitoring Activity | Purpose | Frequency | Expected Action | Partners (if joint) | Cost (if any) |
|---|---|---|---|---|---|
| **Track results progress** | Progress data against the results indicators in the RRF will be collected and analysed to assess the progress of the project in achieving the agreed outputs. Progress against the CPD and SP of UNDP should be recorded. | Quarterly, or in the frequency required for each indicator. | Slower than expected progress will be addressed by project management. | NoU | n/a |
| **Monitor and Manage Risk** | Identify specific risks that may threaten achievement of intended results. Identify and monitor risk management actions using a risk log. This includes monitoring measures and plans that may have been required as per UNDP's Social and Environmental Standards. Audits will be conducted in accordance with UNDP's audit policy to manage financial risk. | Quarterly | Risks are identified by project management and actions are taken to manage risk. The risk log is actively maintained to keep track of identified risks and actions taken. | NOU | n/a |
| **Learn** | Knowledge, good practices and lessons will be captured regularly, as well as actively sourced from other projects and partners and integrated back into the project. | At least annually | Relevant lessons are captured by the project team and used to inform management decisions. | National Ozone Committee, NOU | n/a |
| **Annual Project Quality Assurance** | The quality of the project will be assessed against UNDP's quality standards to identify project strengths and weaknesses and to inform management decision making to improve the project. QA tools for design, implementation and closure phases to be used as relevant. | Annually | Areas of strength and weakness will be reviewed by project management and used to inform decisions to improve project performance. | NOU | |

| | | | | | |
|---|---|---|---|---|---|
| **Review and Make Course Corrections** | Internal review of data and evidence from all monitoring actions to inform decision making. Make course corrections on project mid-year reports if needed. | At least annually | Performance data, risks, lessons and quality will be discussed by the project board and used to make course corrections. | National Committee, NOU | |
| **Project Report** | A progress report will be presented to the Project Board and key stakeholders, consisting of progress data showing the results achieved against pre-defined annual targets at the output level, the annual project quality rating summary, an updated risk long with mitigation measures, and any evaluation or review reports prepared over the period. UNDP APPR tool should be used. | Semi-annually and Annually, and at the end of the project (final report) | | NOU | |
| **Project Review (Project Board/National Ozone Committee)** | The project's governance mechanism (i.e., project board which is mentioned in the first paragraph of project management on page 12) will hold regular project reviews to assess the performance of the project and review the Multi-Year Work Plan to ensure realistic budgeting over the life of the project. In the project's final year, the Project Board shall hold an end-of project review to capture lessons learned and discuss opportunities for scaling up and to socialize project results and lessons learned with relevant audiences. | At least twice a year | Any quality concerns or slower than expected progress should be discussed by the project board and management actions agreed to address the issues identified. | NOU | |

**Table 6: Evaluation Plan**

| Evaluation Title | Partners (if joint) | Related Strategic Plan Output | UNDAF/CPD Outcome | Planned Completion Date | Key Evaluation Stakeholders | Cost and Source of Funding |
|---|---|---|---|---|---|---|
| Performance verification | Ozone Cell, DoE and UNDP | The HCFC consumption is within prescribed limit as mentioned in Appendix 2-A row 1.2 and country is within compliance | Sustainable and resilient development | In accordance with the HPMP agreement between the Executive Committee of the Multilateral Fund and Government of Iran, performance verification will need to be carried out for each year for which national level consumption targets are stipulated and a tranche release is requested. This would apply to the national consumption level of 2018, 2020, 2021 and 2022 | Executive Committee of the Multilateral Fund / Independent consultant | n/a |

## VII. MULTI-YEAR WORK PLAN [23]

**Table 7: Multi-Year Work Plan***

| EXPECTED OUTPUTS | PLANNED ACTIVITIES | Planned Budget by Year | | | | | RESPONSIBLE PARTY | PLANNED BUDGET | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Y1 2017 | Y2 2018 | Y3 2020 | Y4 2021 | Y5 2022 | | Funding Source | Budget Description (Atlas Account Code) | Amount |
| **Output 1** Procurement of foaming equipment for conversion of three commercial refrigeration equipment manufacturers to Pentane. | 1.1 Procurement and delivery of equipment to beneficiaries. | | 541,771 | | | | NOU/UNDP | MLF | 72100 | 541,771 |
| | **Sub-Total for Output 1** | | | | | | | | | |
| **Output 2** Procurement of foam kits using water blown technology for 40 commercial refrigeration manufacturers | 2.1 Procurement and delivery of equipment to beneficiaries. | 375,000 | 48,424 | 705,706 | | | NOU/UNDP | MLF | 72100 | 1,129,130 |
| | **Sub-Total for Output 2** | | | | | | | | | |
| **Output 3** Procurement of refrigeration conversion kits for 40 refrigeration equipment manufacturers | 3.1 Procurement and delivery of equipment to beneficiaries. | 566,550 | 666,320 | 437,470 | 119,310 | 119,310 | NOU/UNDP | MLF | 72100.. | 1,908,960 |
| | **Sub-Total for Output 3** | | | | | | | | | |
| **Output 4** Conversion of one System House to manufacture HCFC free polyol systems | 4.1 Procurement and delivery of equipment to beneficiary and technical assistance. | 185,500 | 40,000 | | | | NOU/UNDP | MLF | 72100 | 225,500 |
| | **Sub-Total for Output 4** | | | | | | | | | |
| **Output 5** Introduction of reusable refrigerant cylinders and cylinder cleaning and charging stations | 5.1 Procurement of cylinders and establishment of charging stations | | 240,000 | | 240,000 | | NOU/UNDP | MLF | 72100 | 480,000 |

[2] Cost definitions and classifications for programme and development effectiveness costs to be charged to the project are defined in the Executive Board decision DP/2010/32

[3] Changes to a project budget affecting the scope (outputs), completion date, or total estimated project costs require a formal budget revision that must be signed by the project board. In other cases, the UNDP programme manager alone may sign the revision provided the other signatories have no objection. This procedure may be applied for example when the purpose of the revision is only to re-phase activities among years.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **Sub-Total for Output 5** | | | | | | | | |
| **Output 6**<br>Project Management | 6.1. Project Management and Reporting<br>a) Training and awareness workshops on low GWP alternatives in foam manufacturing sector for SMEs<br>b) Project Monitoring and evaluation | 12,000 | 216,585 | 164,804 | 104,921 | 121,690 | NOU/UNDP | MLF | 75700<br>71600<br>71300<br>74500 | 620,000 |
| **TOTAL** | | | | | | | | | | 4,905,361 |

*To be reviewed and revised as required at the time of inception of project implementation.

**Table 8 shows the breakdown of activities by funding tranche over the entire period of the project.**

| Table 8: Work Plan 2016-2022 (FOAM and RAC) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **No. of Enterprises** | **ICC** | **IOC** | **Total cost** | **Total Project Cost** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** |
| **Tranche >** | | | | | | **1st** | | **2nd** | | **3rd** | **4th** | **5th** |
| **FOAM (ODP tonnes reduction targets 34.73)** | | | | | **1,896,401** | **648,924** | | **541,771** | | **705,706** | **0** | **0** |
| **Enterprise conversions (ODP tonnes reduction targets 22+5.5=27.5)** | | | | | **2,388,960** | **596,550** | | **876,320** | | **437,470** | **359,310** | **119,310** |
| **PMU** | | | | | **620,000** | **52,696** | | **175,889** | | **164,804** | **104,921** | **121,690** |
| **TOTAL** | | | | | **4,905,361** | **1,298,170** | | **1,593,980** | | **1,307,980** | **464,231** | **241,000** |
| Commercial refrigeration (foam panel) | 3 | 600,600 | (58,829) | 541,771 | | 0 | 0 | 0 | 541,771 | | | |
| Commercial refrigeration | 40 | 960,000 | 169,130 | 1,129,130 | | 0 | 375,000 | 48,424 | | 705,706 | 0 | 0 |
| Technical assistance to Systems house | 1 | | | 225,500 | | 0 | 185,500 | 40,000 | 0 | 0 | 0 | 0 |
| Conversion package Commercial refrigeration companies (Ref. manufacturing kits) | 40 | | | 1,908,960 | | 0 | 566,550 | 30,000 | 636,320 | 437,470 | 119,310 | 119,310 |
| Setup of refrigerant distribution system | | | | 480,000 | | 0 | 0 | 0 | 240,000 | | 240,000 | |
| PMU operations | | | | | | 0 | 12,000 | 40,696 | 175,889 | 164,804 | 104,921 | 121,690 |
| **TOTAL UNDP** | | | | | | **0** | **1,139,050** | **159,120** | **1,593,980** | **1,307,980** | **464,231** | **241,000** |
| | | | | | | 0 | **1,298,170** | | 1,593,980 | 1,307,980 | 464,231 | 241000 |

## Table 8: Annual Work Plan 2017-2018

| | | |
|---|---|---|
| **MLF Ref.** | | IRA/PHA/77/INV/226 |
| **Award ID** | | 000XXXXX |
| **Project ID** | | 000XXXXX |
| **Project Title** | | HPMP Stage-II of Iran (2016-2022) |
| **Responsible Party** | | Department of Environment |

| **ATLAS Activity** | **Responsible Party** | **Source of Funds** | **ATLAS Code** | **ATLAS Budget Description..** | **Budget (US$)** | | |
|---|---|---|---|---|---|---|---|
| | | | | | **2017** | **2018** | **Total** |
| **Output 2**<br>Procurement of foam kits using water blown technology for 15 commercial refrigeration manufacturers | DoE | 63030 | 72100 | Contractual services – Companies | 375,000 | 48,424 | 423,424 |
| **Output 3**<br>Procurement of refrigeration conversion kits for 12 refrigeration equipment manufacturers | DoE | 63030 | 72100 | Contractual services – Companies | 566,550 | 30,000 | 596,550 |
| **Output 4**<br>Conversion of one System House to manufacture HCFC free polyol systems | DoE | 63030 | 72100 | Contractual services – Companies | 185,500 | 40,000 | 225,500 |
| **Output 6**<br>Project Management | DoE | 63030 | 71300 | Contractual services - Individual | 2000 | 8000 | 10,000 |
| | DoE | 63030 | 75700 | Training, workshops and meeting | 3500 | 11696 | 15,196 |
| | DoE | 63030 | 74500 | Miscellaneous expenses | 4500 | 11000 | 15,500 |
| | DoE | 63030 | 71600 | Travel | 2000 | 10000 | 12,000 |
| **Total Project Cost** | | | | | | | **1,298,170** |

## VIII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

**Management Arrangement**

The project will be implemented under the National Implementation (NIM) modality. The HCFC Phase out management project (Stage II) would be operationalized in Tehran and implemented across the country under the overall guidance of the National Ozone Committee and direct supervision of the National Project Director in the National Department of Environment (DoE). The project will be implemented in close coordination with the participating enterprises in foam and RAC manufacturing sectors. Upon the prior consent and official request of DoE supported by required documentations including but not limited to TORs, Specifications, UNDP will sign Memorandum of Agreements (MoAs)/contracts with each of the respective participating enterprises selected by the DoE. Periodic monitoring will be done jointly by the DoE and the UNDP. Verification of accomplishment of milestones will be done by an external agency appointed by UNDP, which along with the National Ozone Unit (NoU) will monitor the verification. The NoU and UNDP will review the verification reports and on satisfactory accomplishment of the milestones, payments will be released by UNDP after accomplishment of the milestones as per the MOA by the enterprises and endorsement of the same by the DoE. Other activities relating to project implementation and monitoring will be jointly carried out by the project team in the NoU and the programmme division in the UNDP. UNDP, as lead implementing agency, will also carry out verification to ensure phase out of HCFC consumption at national level, in accordance with the agreement between the DoE and the Ex-Com.

The National Ozone Committee composed of authorized representatives of relevant ministries and organization has the overall decision making and inter-sectoral coordination role at the National level over the country's activities in relation to the Montreal Protocol.

A Project Board chaired by NPD and comprising representatives from DOE, MFA, and NOU as well as a representative from National Ozone Committee, will be established to provide overall guidance to the implementation of the project, review and endorse annual work plans, monitor implementation progress and so on. The Project Board will meet at least every six months.

**Implementing Partner (IP)**: The project will be implemented by NOU, DoE in close cooperation with UNDP. DoE and UNDP will be responsible for the effective use of resources and the achievement of the project outcomes and outputs as set forth in the document. The DoE will designate a senior manager as National Project Director (NPD), who will be focal point at DoE will be responsible for implementation of the projects (UNDP component) as articulated in the HPMP stage II final proposal document approved by the Executive Committee of the Multilateral Fund for the implementation of the Montreal Protocol as well as all financial management, quality assurance and monitoring of the project implementation by the IP. UNDP would also be offering procurement and recruitment services if official request containing required details such as TOR, Specification etc. are provided by NOU. UNDP recruitment and procurement rules will apply.

UNDP will prepare a budgeted Annual Work Plan annually as per UNDP rules and regulations, in consultation with PMU, DoE.

The institutional arrangements for implementation of the Montreal Protocol in Iran are depicted in the figure below:



Figure 1: Management Arrangement of HPMP II Project

The roles and responsibilities of DoE and UNDP vis-à-vis project implementation are agreed upon as follows:

**NOU/DoE**

- Coordination of overall project implementation and monitoring;
- Convening inter-agency coordination meetings for annual planning and progress review;
- Ensuring timely project implementation including signature of enterprise level agreements project implementation consultations/reviews, progress monitoring, etc.;
- Coordinating with, and keeping informed, the national stakeholders including Government organization/ministries, private sector beneficiaries, etc., on project related mattes
- Coordinating review of policy/regulatory framework among related Government agencies and national stakeholders, and ensuring awareness/consensus on the same for implementation;
- Securing endorsement of project work plans, reports, publications/deliverables as required;
- Securing endorsement of Verification Reports as per the MLF ExCom requirements;

- Developing and submitting HCFC consumption reports under Article 7 of Montreal Protocol, CP Reports and HPMP Implementation Reports to Ozone Secretariat and MLF Secretariat.

**UNDP**

- Ensuring timely services including signing contracts, enterprise level agreement based on official request by the IP supported with required documentation
- Ensuring the timely release of payments to be made in accordance with the respective agreements;
- Providing policy and technical inputs to UNDP project component as required;
- Ensuring Performance Verification in accordance with the terms of the Agreement between ExCom and Government to achieve Stage II targets;
- Assisting Government in preparation of Implementation Reports and Implementation Plan as required under the Agreement between Government and ExCom on Stage-II targets;
- Quality assurance, Progress review, Conducting verification visits as required to ensure Iran's compliance with the abovementioned Agreement on Stage-II targets;
- Financial monitoring of project activities and providing financial progress report to NOU/DoE on a half-yearly basis (ad hoc reports may be requested as and when required)

## IX. LEGAL CONTEXT AND RISK MANAGEMENT

### STANDARD ANNEX TO PROJECT DOCUMENT FOR USE IN COUNTRIES WHICH ARE NOT PARTIES TO THE STANDARD BASIC ASSISTANT AGREEMENT (SBAA)

### STANDARD TEXT: SUPPLEMENTAL PROVISIONS TO THE PROJECT DOCUMENT:

### THE LEGAL CONTEXT

### GENERAL RESPONSIBILITIES OF THE GOVERNMENT, UNDP AND THE IMPLEMENTING PARTNER

1. The Government, assuming its overall responsibility**,** shall designate the Government Co-operating Agency named in the cover page of this document (hereinafter referred to as the "Co-operating Agency") which shall be directly responsible for the implementation of the Government contribution to the project.

2. The Project Document, and the term as used in this Annex, includes the Country Programme Action Plan (CPAP) signed by the Government of Iran (The Government) on (signing date of the current CPAP), and the Annual Work plan (AWPs), together with this Annex attached to the AWPs.

3. UNDP project activities shall be carried out in accordance with the relevant and applicable resolutions and decisions to the competent UNDP organs, and subject to the availability of the necessary funds to UNDP. In particular, decision 2005/1 of 28 January 2005 of UNDP's Executive Board approved the new Financial Regulations and Rules and, along with them, the new definitions of 'Executing Entity'[4] and 'Implementing Partner'[5] enabling UNDP to fully implement the new Common Country Programming Procedures resulting from the UNDP simplification and harmonization initiative.

4. All phases and aspects of the project shall be governed by and carried out in accordance with the relevant and applicable resolutions and decisions of the competent United Nations organs and the principles embedded in UNDP's Financial Regulations and Rules, and in accordance with UNDP's policies and procedures for such projects, and subject to the requirements of the UNDP Monitoring, Evaluation and Reporting System.

[4] Executing Entity shall mean, for UNDP programme activities carried out under the harmonized operational modalities established in response to General Assembly resolution 56/201, the entity that assumes the overall ownership over and responsibility for UNDP programme activities and the acceptance of accountability for results, and shall normally be the programme country Government.

[5] Implementing Partner shall mean, for UNDP programme activities carried out under the harmonized operational modalities established in response to General Assembly resolution 56/201, the entity to which the Administrator has entrusted the implementation of UNDP assistance specified in a signed document along with the assumption of full responsibility and accountability for the effective use of UNDP resources and the delivery of outputs, as set forth in such document.

5. The Co-operating agency shall remain responsible for its part in UNDP-assisted development projects and the realization of their objectives as described in the Project Document.

6. Assistance under the Project Document is provided for the benefit of the Government and the people of the Islamic Republic of Iran. The Co-operating Agency shall bear all imputable risks of operations in respect of this project.

7. The Co-operating Agency, in accordance with the Project Document, shall provide to the project the national counterpart personnel, training facilities, land, buildings, equipment and other required services and facilities.

8. The UNDP undertakes to complement and supplement the Co-operating Agency participation and will provide through the Implementing Partner the required expert services, training, equipment and other services within the funds available to the project.

9. Upon commencement of the project the Implementing Partner shall assume primary responsibility for project implementation and shall have the status of an independent contractor for this purpose. However, that primary responsibility shall be exercised in consultation with UNDP and in agreement with the Co-operating Agency. Arrangements to this effect shall be stipulated in the Project Document as well as for the transfer of this responsibility to the Co-operating Agency or to an entity designated by the Co-operating Agency during the implementation of the project.

10. Part of the Co-operating Agency's participation may take the form of cash contribution to UNDP. In such cases, the Implementing Partner will provide the related services and facilities and will account annually to the UNDP and to the Co-operating Agency for the expenditure incurred.

***(a) Participation of the Government***

1. *The Co-operating Agency shall provide to the project the services, equipment and facilities in the quantities and at the time specified in the Project Document Budgetary provision, either in kind or in cash, for the Co-operating Agency's participation so specified shall be set forth in the Project Budgets.*

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2. *The Co-operating Agency shall, as appropriate and in consultation with the Implementing Partner, assign a director for the project on a full-time basis. He shall carry out such responsibilities in the project as are assigned to him by the Co-operating Agency.*

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3. *The estimated cost of items included in the Co-operating Agency contribution, as detailed in the project budget, shall be based on the best information available at the time of drafting the project proposal. It is understood that price fluctuations during the period of execution of the project may necessitate an adjustment of said contribution in monetary terms; the latter shall at all times be determined by the value of the services, equipment and facilities required for the proper implementation of the project.*

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4. *Within the given number of work-months of personnel services described in the Project Document, minor adjustments of individual assignments of project personnel provided by the co-operating Agency may be made by the co-operating Agency in consultation with the Implementing Partner, if this is found to be in the best interest of the project. UNDP shall be so informed in all instances where such minor adjustments involve financial implications.*

5. *The Co-operating Agency shall continue to pay the local salaries and appropriate allowances of national counterpart personnel during the period of their absence from the project while on UNDP fellowships.*

6. *The Government shall defray any customs duties and other charges related to the clearance of project equipment, its transportation, handling, storage and related expenses within the country. It shall be responsible for its installation and maintenance, insurance, and replacement, if necessary after deliver to the project site.*

7. *The Co-operating Agency shall make available to the project – subject to existing security provisions and national laws and regulations – any published and unpublished reports, maps, records and other data, which are considered necessary to the implementation of the project. Such reports, maps, records and other data shall be exclusively used for the implementation of the project. In cases when the Co-operating Agency, due to security provisions or national laws and regulations, does not make available reports, maps, records and other data considered necessary to the implementation of the project, UNDP and the Government may decide to modify or redesign the project or components thereof.*

8. *Unless otherwise agreed by the Parties in each case, patent rights, copyright and other similar rights to any discoveries or work resulting from UNDP assistance in respect of this project shall belong to the UNDP. Unless otherwise agreed by the Parties in each case, however, the Government shall have the right to use any such discoveries to work within the country free of royalty and any charge of similar nature.*

9. *The Co-operating Agency undertakes to assist all project personnel in finding suitable housing accommodation at reasonable rents.*

10. *The services and facilities specified in the Project Document which are to be provided to the project by the Co-operating Agency by means of a contribution in cash shall be set forth in the Project Budget. Payment shall be made in accordance with the Schedule of Payments in the Project Document.*

11. *Payment of the above-mentioned contribution on or before the dates specified in the Schedule of Payments is a prerequisite to commencement or continuation of project operations.*

***(b) Participation of the UNDP and the Implementing Partners***

1. The UNDP shall provide to the project through the Implementing Partner the services, equipment and facilities described in the Project Document Budgetary provision for the UNDP contribution as specified shall be set forth in the Project Budgets.

2. The Implementing Partner shall consult with the Co-operating Agency and UNDP on the candidature of the Project Manager[6] who, under the direction of the Implementing Partner, will be responsible in the country for the Implementing Partner's participation in the project.

3. The Project Manager shall supervise the experts and other entity personnel assigned to the project, and the on-the-job training of national counterpart personnel. The Project Manager shall

be responsible for the management and efficient utilization of all UNDP-financed inputs, including equipment provided to the project.

4. The Implementing Partner, in consultation with the Co-operating Agency and UNDP, shall assign international staff and other personnel to the project as specified in the Project Document, select candidates for fellowships and determine standards for the training of national counterpart personnel.

5. Fellowships shall be administered in accordance with the fellowships regulations of the Implementing Partner.

6. The Implementing Partner may, in agreement with the Co-operating Agency and UNDP, implement part or the entire project by subcontract. The selection of subcontractors shall be made, after consultation with the Co-operating Agency and UNDP, taking into account the Implementing Partner's procedures.

7. All material, equipment and supplies which are purchased from UNDP resources will be used exclusively for the implementation of the project, and will remain the property of the UNDP in whose name it will be held by the Implementing Partner. Equipment supplied by the UNDP shall be marked with the insignia of the UNDP and of the Implementing Partner.

8. Arrangements may be made, if necessary, for a temporary transfer of custody of equipment to local authorities during the life of the project, without prejudice to the final transfer.

9. Prior to completion of UNDP assistance to the project, the Co-operating Agency, the UNDP and the Implementing Partner shall consult as to the disposition of all project equipment provided by the UNDP. Title to such equipment shall normally be transferred to the Co-operating Agency, or to an entity nominated by the Co-operating Agency, when it is required for continued operation of the project or for activities following directly there from. UNDP may, however, retain title to part or all of such equipment in accordance with UNDP regulations and rules.

10. At an agreed time after the completion of UNDP assistance to the project, the Co-operating Agency and the UNDP, and if necessary the Implementing Partner, shall review the activities continuing from or consequent upon the project with a view to evaluating its results.

11. UNDP may release information relating to any investment oriented project to potential investors, unless and until the Co-operating Agency has requested the UNDP in writing to restrict the release of information relating to such project.

**(c ) Rights, Facilities, Privileges and Immunities**

1. In accordance with the Convention on the Privileges and Immunities of the United Nations of 1946, given effect to by the Act of 4 March 1973 of the Iranian National Assembly, and the Agreement between the United Nations Special Fund and the Government of Iran Concerning Assistance from the Special Fund, signed by the Minister of Foreign Affairs 6 October 1959, the officials of UNDP and other United Nations organizations associated with the project shall be accorded rights, facilities, privileges and immunities specified in said Convention and Agreement.

2. (a) Should the Parties agree to involve “Persons Performing Services” in this project in accordance with Article 8(3) of the Agreement between the United Nations Special Fund and the Government of Iran Concerning Assistance from the Special Fund, signed on 6 October 1959, the expression “persons performing services” as used in this Article of this Annex includes UN Volunteers, operational experts, Implementing Partners, their employees and contractors, implementing or assisting in the implementation of UNDP assistance to a project, other than Government nationals employed locally. Any agreement between the parties to involve persons performing services has to be approved in accordance with the Iranian national procedures.

   (b) The expression “persons performing services” does not extend to cover nationals and the residents in the territory of Iran.

   (c) The privileges and immunities are accorded to the officials of UNDP and other relevant UN organizations associated with the projects in the interest of the United Nations and not for the personal benefit of the individuals themselves. The Secretary-General shall have the right and duty to waive the immunity of any official in any case where, in his opinion, the immunity would impede the course of justice and can be waived without prejudice to the interest of the United Nations. The United Nations shall cooperate at all times with the appropriate authorities of the Islamic Republic of Iran to facilitate the proper administration of justice, secure the observance of police regulations and prevent the occurrence of any abuse in connection with the privileges, facilities and immunities referred to above.

3. (a) For purposes of the instruments on privileges and immunities referred to in the preceding parts of this Article:

   i. All papers and documents relating to a project in the possession or under the control of the persons referred to in sub-paragraph 2(a), above, shall be deemed to be documents belonging to UNDP, the United Nations or the Specialized Agency concerned, as the case may be; and

   ii. Equipment, materials and supplies brought into or purchased or leased by those persons within the country for purposes of a project shall be deemed to be property of UNDP, the United Nations or the Specialized Agency concerned, as the case may be.

4. The Cooperating Agency shall ensure:

   (a) Prompt clearance of experts and other persons performing services in respect of this project; and

   (b) The prompt release from customs of:

      i. Equipment, materials and supplies required in connection with this project; and

      ii. Property belonging to and intended for the personal use or consumption of the personnel of the UNDP, its Implementing Partners, or other persons performing services on their behalf in respect of this project, except for locally recruited personnel.

5. Nothing in the Project Document shall be construed to limit the rights, facilities, privileges or immunities conferred in any other instrument upon any person, natural or juridical, referred to hereunder.

6. The Co-operating Agency shall facilitate the project implementation under the provisions of the Project Document.

**(d) Suspension or termination of activities**

1. Following mutual consultation with the Co-operating Agency, UNDP may by written notice to the Co-operating Agency and to the Implementing Partner concerned suspend any project activities, if in the judgment of UNDP, any circumstances arise which interferes or threatens to interfere with the successful completion of the project of the accomplishment of its purposes.

2. The procedure for suspension and termination of a project are as follows:

   a. Suspension: During the period of suspension, the Parties may consult and try to resolve the problems by corrective measures. If the problems are resolved, the project activities may be resumed. The UNDP Resident Representative confirms to the Parties the date for resuming such activities. However, UNDP may terminate a project, in cases of force majeure.

   b. Termination: A project may be terminated only after a period of suspension. If neither party has been able to reach a resolution of the problem within a reasonable period of time, either party may recommend the project's termination. Unspent TRAC1 or TRAC2 funds from a terminated project may be reprogrammed, taking into account the outstanding obligations of the terminated project. The Implementing Partner proceeds with the steps required for financial completion.

3. The UNDP Resident Representative takes the necessary steps regarding suspension or termination of a project and confirms it in writing to the parties concerned, in consultation with the national coordinating authority and the Implementing Partner.

# X. ANNEXES

1. **Simple Theory of Change Diagram**

2. **Project Quality Assurance Report**

3. **Social and Environmental Screening Template**

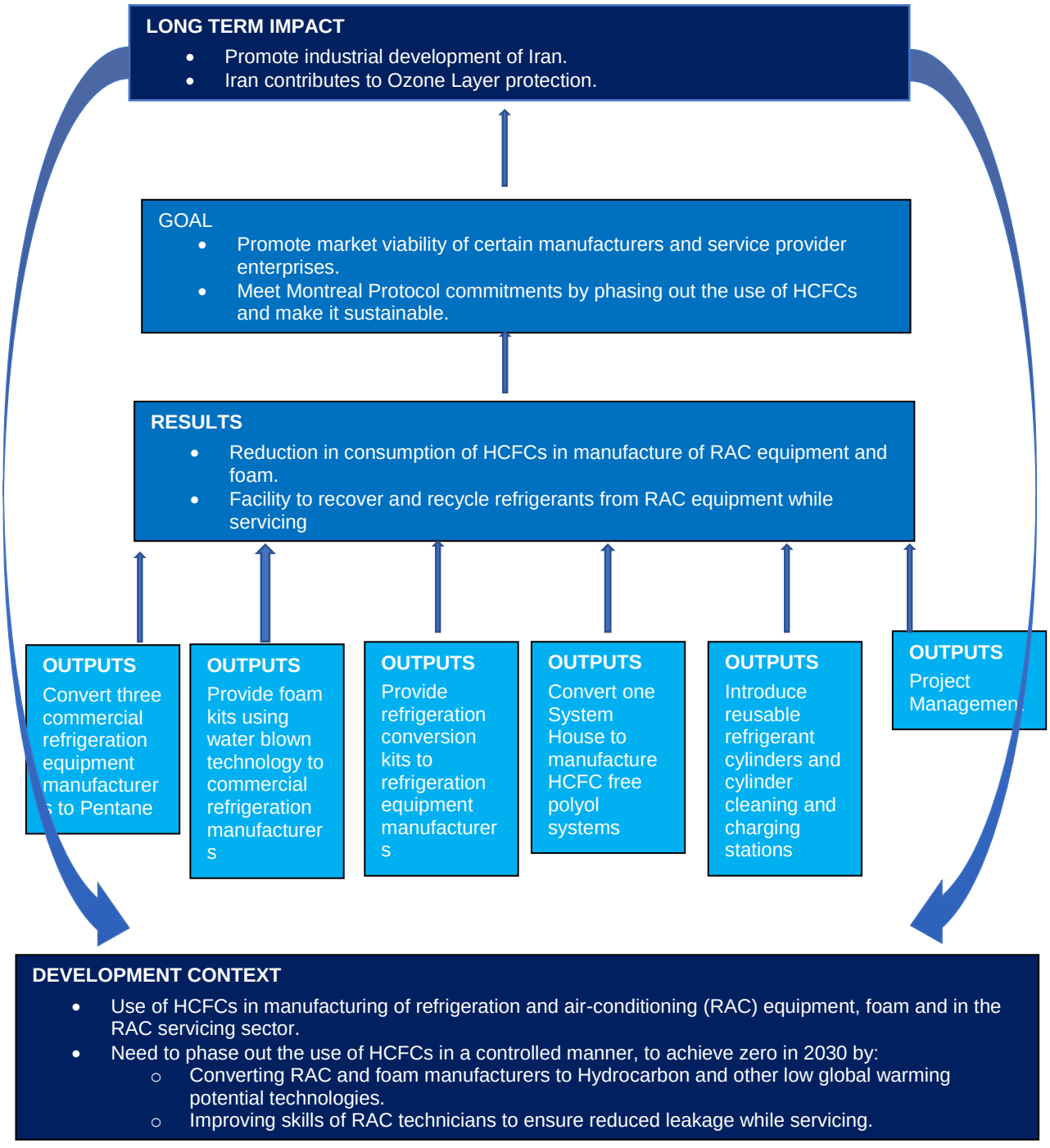
4. **Risk Analysis**

5. **Agreement between Government of the Islamic Republic of Iran and the MLF Executive Committee**

6. **Project document approved by MLF**

**ANNEX 1**

## Theory of Change Diagram*




* Smart indicators will be formulated in line with the RBM concept at the time of project inception.

**ANNEX 2: Project Quality Assurance Report**

# PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

## OVERALL PROJECT

| EXEMPLARY (5) ◉◉◉◉◉ | HIGHLY SATISFACTORY (4) ◉◉◉◉○ | SATISFACTORY (3) ◉◉◉○○ | NEEDS IMPROVEMENT (2) ◉◉○○○ | INADEQUATE (1) ◉○○○○ |
|---|---|---|---|---|
| At least four criteria are rated Exemplary, and all criteria are rated High or Exemplary. | All criteria are rated Satisfactory or higher, and at least four criteria are rated High or Exemplary. | At least six criteria are rated Satisfactory or higher, and only one may be rated Needs Improvement. The SES criterion must be rated Satisfactory or above. | At least three criteria are rated Satisfactory or higher, and only four criteria may be rated Needs Improvement. | One or more criteria are rated Inadequate, or five or more criteria are rated Needs Improvement. |

**DECISION**

- **APPROVE** – the project is of sufficient quality to continue as planned**.** Any management actions must be addressed in a timely manner.
- **APPROVE WITH QUALIFICATIONS** – the project has issues that must be addressed before the project document can be approved. Any management actions must be addressed in a timely manner.
- **DISAPPROVE** – the project has significant issues that should prevent the project from being approved as drafted.

## RATING CRITERIA

## STRATEGIC

| | | |
|---|---|---|
| **1. Does the project's Theory of Change specify how it will contribute to higher level change? (Select the option from 1-3 that best reflects the project):**<br>• **3:** The project has a theory of change with explicit assumptions and clear change pathway describing how the project will contribute to outcome level change as specified in the programme/CPD, backed by credible evidence of what works effectively in this context. The project document clearly describes why the project's strategy is the best approach at this point in time.<br>• **2:** The project has a theory of change. It has an explicit change pathway that explains how the project intends to contribute to outcome-level change and why the project strategy is the best approach at this point in time, but is backed by limited evidence.<br>• **1:** The project does not have a theory of change, but the project document may describe in generic terms how the project will contribute to development results, without specifying the key assumptions. It does not make an explicit link to the programme/CPD's theory of change.<br>*Note: Management Action or strong management justification must be given for a score of 1 | 3 / 2<br>1<br>**3**<br>**Evidence**<br>Project document (sections I, II, III, V, Annex 1) | |
| **2. Is the project aligned with the thematic focus of the UNDP Strategic Plan? (select the option from 1-3 that best reflects the project):** | 3 / 2<br>1<br>**1**<br>**Evidence**<br>The project will contribute to SP Outcome 5 as mentioned in project document Section V. | |

| | |
|---|---|
| • **3:** The project responds to one of the three areas of development work[7] as specified in the Strategic Plan; it addresses at least one of the proposed new and emerging areas[8]; an issues-based analysis has been incorporated into the project design; and the project's RRF includes all the relevant SP output indicators. *(all must be true to select this option)*<br>• **2:** The project responds to one of the three areas of development work[1] as specified in the Strategic Plan. The project's RRF includes at least one SP output indicator, if relevant. *(both must be true to select this option)*<br>• **1:** While the project may respond to one of the three areas of development work[1] as specified in the Strategic Plan, it is based on a sectoral approach without addressing the complexity of the development issue. None of the relevant SP indicators are included in the RRF. This answer is also selected if the project does not respond to any of the three areas of development work in the Strategic Plan. | The project is linked to the SP Area 1 and the New Emerging Area 1: Sustainable Production Technologies |
| **RELEVANT** | |
| **3. Does the project have strategies to effectively identify, engage and ensure the meaningful participation of targeted groups/geographic areas with a priority focus on the excluded and marginalized? (select the option from 1-3 that best reflects this project):**<br>• **3:** The target groups/geographic areas are appropriately specified, prioritising the excluded and/or marginalised. Beneficiaries will be identified through a rigorous process based on evidence (if applicable.)The project has an explicit strategy to identify, engage and ensure the meaningful participation of specified target groups/geographic areas throughout the project, including through monitoring and decision-making (such as representation on the project board) *(all must be true to select this option)*<br>• **2:** The target groups/geographic areas are appropriately specified, prioritising the excluded and/or marginalised. The project document states how beneficiaries will be identified, engaged and how meaningful participation will be ensured throughout the project. *(both must be true to select this option)*<br>• **1:** The target groups/geographic areas are not specified, or do not prioritize excluded and/or marginalised populations. The project does not have a written strategy to identify or engage or ensure the meaningful participation of the target groups/geographic areas throughout the project.<br>*Note: Management Action must be taken for a score of 1, or select not applicable. | 3 \| 2<br>1<br>**3**<br>**Evidence**<br>The target groups are properly identified through a thorough assessment carried out in collaboration with national and international partners.<br>The project has a stated focus on small and medium enterprises |
| **4. Have knowledge, good practices, and past lessons learned of UNDP and others informed the project design? (select the option from 1-3 that best reflects this project):**<br>• **3:** Knowledge and lessons learned (gained e.g. through peer assist sessions) backed by credible evidence from evaluation, corporate policies/strategies, and monitoring have been explicitly used, with appropriate referencing, to develop the project's theory of change and justify the approach used by the project over alternatives.<br>• **2:** The project design mentions knowledge and lessons learned backed by evidence/sources, which inform the project's theory of change but have not been used/are not sufficient to justify the approach selected over alternatives.<br>• **1:** There is only scant or no mention of knowledge and lessons learned informing the project design. Any references that are made are not backed by evidence.<br>*Note: Management Action or strong management justification must be given for a score of 1 | 3 \| 2<br>1<br>**3**<br>**Evidence**<br>The Project builds on and learns from a predecesor project successfully implemented.<br>Project document (Section I, II) |
| **5. Does the project use gender analysis in the project design and does the project respond to this gender analysis with concrete measures to address gender inequities and empower women? (select the option from 1-3 that best reflects this project):**<br>• **3:** A participatory gender analysis on the project has been conducted. This analysis reflects on the different needs, roles and access to/control over resources of women and men, and it is fully integrated into the project document. The project establishes concrete priorities to address gender | 3 \| 2<br>1<br>**1**<br>**Evidence** |

[7] 1. Sustainable development pathways; 2. Inclusive and effective democratic governance; 3. Resilience building

[8] sustainable production technologies, access to modern energy services and energy efficiency, natural resources management, extractive industries, urbanization, citizen security, social protection, and risk management for resilience

| | |
|---|---|
| inequalities in its strategy. The results framework includes outputs and activities that specifically respond to this gender analysis, with indicators that measure and monitor results contributing to gender equality. *(all must be true to select this option)*<br>• **2:** A gender analysis on the project has been conducted. This analysis reflects on the different needs, roles and access to/control over resources of women and men. Gender concerns are integrated in the development challenge and strategy sections of the project document. The results framework includes outputs and activities that specifically respond to this gender analysis, with indicators that measure and monitor results contributing to gender equality. *(all must be true to select this option)*<br>• **1:** The project design may or may not mention information and/or data on the differential impact of the project's development situation on gender relations, women and men, but the constraints have not been clearly identified and interventions have not been considered.<br>*Note: Management Action or strong management justification must be given for a score of 1 | Management Action: During the start of the project identification of possible actions to incorporate the women empowerment issues in the project will be done**.** |
| **6. Does UNDP have a clear advantage to engage in the role envisioned by the project vis-à-vis national partners, other development partners, and other actors? (select from options 1-3 that best reflects this project):**<br>• **3:** An analysis has been conducted on the role of other partners in the area where the project intends to work, and credible evidence supports the proposed engagement of UNDP and partners through the project. It is clear how results achieved by relevant partners will contribute to outcome level change complementing the project's intended results. If relevant, options for south-south and triangular cooperation have been considered, as appropriate. *(all must be true to select this option)*<br>• **2:** Some analysis has been conducted on the role of other partners where the project intends to work, and relatively limited evidence supports the proposed engagement of and division of labour between UNDP and partners through the project. Options for south-south and triangular cooperation may not have not been fully developed during project design, even if relevant opportunities have been identified.<br>• **1:** No clear analysis has been conducted on the role of other partners in the area that the project intends to work, and relatively limited evidence supports the proposed engagement of UNDP and partners through the project. There is risk that the project overlaps and/or does not coordinate with partners' interventions in this area. Options for south-south and triangular cooperation have not been considered, despite its potential relevance.<br>*Note: Management Action or strong management justification must be given for a score of 1 | 3 \| 2<br>1<br>**3**<br>**Evidence**<br>Project document (sections III and VIIII) |
| **SOCIAL & ENVIRONMENTAL STANDARDS** | |
| **7. Does the project seek to further the realization of human rights using a human rights based approach? (select from options 1-3 that best reflects this project):**<br>• **3:** Credible evidence that the project aims to further the realization of human rights, upholding the relevant international and national laws and standards in the area of the project. Any potential adverse impacts on enjoyment of human rights were rigorously identified and assessed as relevant, with appropriate mitigation and management measures incorporated into project design and budget. *(all must be true to select this option)*<br>• **2:** Some evidence that the project aims to further the realization of human rights. Potential adverse impacts on enjoyment of human rights were identified and assessed as relevant, and appropriate mitigation and management measures incorporated into the project design and budget.<br>• **1:** No evidence that the project aims to further the realization of human rights. Limited or no evidence that potential adverse impacts on enjoyment of human rights were considered.<br>*Note: Management action or strong management justification must be given for a score of 1 | 3 \| 2<br>1<br>**3**<br>**Evidence**<br>The project contributes to the global efforts to safeguard the environment and protect humans (particularly the poor) from the impacts of climate change<br>Project document (annex 2 SESP) |
| | 3 \| 2<br>1 |

| | | |
|---|---|---|
| **8. Did the project consider potential environmental opportunities and adverse impacts, applying a precautionary approach? (select from options 1-3 that best reflects this project):**<br>• **3:** Credible evidence that opportunities to enhance environmental sustainability and integrate poverty-environment linkages were fully considered as relevant, and integrated in project strategy and design. Credible evidence that potential adverse environmental impacts have been identified and rigorously assessed with appropriate management and mitigation measures incorporated into project design and budget. *(all must be true to select this option)*.<br>• **2:** No evidence that opportunities to strengthen environmental sustainability and poverty-environment linkages were considered. Credible evidence that potential adverse environmental impacts have been identified and assessed, if relevant, and appropriate management and mitigation measures incorporated into project design and budget.<br>• **1:** No evidence that opportunities to strengthen environmental sustainability and poverty-environment linkages were considered. Limited or no evidence that potential adverse environmental impacts were adequately considered.<br>*Note: Management action or strong management justification must be given for a score of 1 | **2**<br>**Evidence**<br>Project document (sections II, III and annex 2) | |
| **9. Has the Social and Environmental Screening Procedure (SESP) been conducted to identify potential social and environmental impacts and risks?** The SESP is not required for projects in which UNDP is Administrative Agent only and/or projects comprised solely of reports, coordination of events, trainings, workshops, meetings, conferences and/or communication materials and information dissemination. [if yes, upload the completed checklist. If SESP is not required, provide the reason for the exemption in the evidence section.] | Yes | No |
| | Yes, SESP is attached as Annex 2 of Project Document | |
| **MANAGEMENT & MONITORING** | | |
| **10. Does the project have a strong results framework? (select from options 1-3 that best reflects this project):**<br>• **3:** The project's selection of outputs and activities are at an appropriate level and relate in a clear way to the project's theory of change. Outputs are accompanied by SMART, results-oriented indicators that measure all of the key expected changes identified in the theory of change, each with credible data sources, and populated baselines and targets, including gender sensitive, sex-disaggregated indicators where appropriate. *(all must be true to select this option)*<br>• **2:** The project's selection of outputs and activities are at an appropriate level, but may not cover all aspects of the project's theory of change. Outputs are accompanied by SMART, results-oriented indicators, but baselines, targets and data sources may not yet be fully specified. Some use of gender sensitive, sex-disaggregated indicators, as appropriate. *(all must be true to select this option)*<br>• **1:** The results framework does not meet all of the conditions specified in selection "2" above. This includes: the project's selection of outputs and activities are not at an appropriate level and do not relate in a clear way to the project's theory of change; outputs are not accompanied by SMART, results-oriented indicators that measure the expected change, and have not been populated with baselines and targets; data sources are not specified, and/or no gender sensitive, sex-disaggregation of indicators.<br>*Note: Management Action or strong management justification must be given for a score of 1 | 3 | 2 |
| | 1 | |
| | **3**<br>**Evidence**<br>Project document (section V and RRRF) | |
| **11. Is there a comprehensive and costed M&E plan in place with specified data collection sources and methods to support evidence-based management, monitoring and evaluation of the project? Evidence:** Project document Section VI | **Yes (3)** | No (1) |
| **12. Is the project's governance mechanism clearly defined in the project document, including planned composition of the project board? (select from options 1-3 that best reflects this project):**<br>• **3:** The project's governance mechanism is fully defined in the project composition. Individuals have been specified for each position in the governance mechanism (especially all members of the project board.) Project Board members have agreed on their roles and responsibilities as specified in the terms of reference. The ToR of the project board has been attached to the project document. *(all must be true to select this option)*. | 3 | 2 |
| | 1 | |
| | **2**<br>**Evidence** | |

| | | |
|---|---|---|
| • **2:** The project's governance mechanism is defined in the project document; specific institutions are noted as holding key governance roles, but individuals may not have been specified yet. The prodoc lists the most important responsibilities of the project board, project director/manager and quality assurance roles. *(all must be true to select this option)*<br>• **1:** The project's governance mechanism is loosely defined in the project document, only mentioning key roles that will need to be filled at a later date. No information on the responsibilities of key positions in the governance mechanism is provided.<br>*Note: Management Action or strong management justification must be given for a score of 1 | Project document (sections VI and VIII**)** | |
| **13. Have the project risks been identified with clear plans stated to manage and mitigate each risks? (select from options 1-3 that best reflects this project):**<br>• **3:** Project risks related to the achievement of results are fully described in the project risk log, based on comprehensive analysis drawing on the theory of change, Social and Environmental Standards and screening, situation analysis, capacity assessments and other analysis. Clear and complete plan in place to manage and mitigate each risk. *(both must be true to select this option)*<br>• **2:** Project risks related to the achievement of results identified in the initial project risk log with mitigation measures identified for each risk.<br>• **1:** Some risks may be identified in the initial project risk log, but no evidence of analysis and no clear risk mitigation measures identified. This option is also selected if risks are not clearly identified and no initial risk log is included with the project document.<br>*Note: Management Action must be taken for a score of 1 | 3 / 1<br>**2**<br>**Evidence**<br>Project document (section III and annex 4) | 2 |
| **EFFICIENT** | | |
| **14. Have specific measures for ensuring cost-efficient use of resources been explicitly mentioned as part of the project design? This can include: i) using the theory of change analysis to explore different options of achieving the maximum results with the resources available; ii) using a portfolio management approach to improve cost effectiveness through synergies with other interventions; iii) through joint operations (e.g., monitoring or procurement) with other partners. Evidence:** Project document section IV | **Yes (3)** | No (1) |
| **15. Are explicit plans in place to ensure the project links up with other relevant on-going projects and initiatives, whether led by UNDP, national or other partners, to achieve more efficient results (including, for example, through sharing resources or coordinating delivery?) Evidence:** Project document section IV | **Yes (3)** | No (1) |
| **16. Is the budget justified and supported with valid estimates?**<br>• **3:** The project's budget is at the activity level with funding sources, and is specified for the duration of the project period in a multi-year budget. Costs are supported with valid estimates using benchmarks from similar projects or activities. Cost implications from inflation and foreign exchange exposure have been estimated and incorporated in the budget.<br>• **2:** The project's budget is at the activity level with funding sources, when possible, and is specified for the duration of the project in a multi-year budget. Costs are supported with valid estimates based on prevailing rates.<br>• **1:** The project's budget is not specified at the activity level, and/or may not be captured in a multi-year budget. | 3 / 1<br>**2**<br>**Evidence**<br>Project proposal approved by Multilateral Fund (annex 9) | 2 |
| **17. Is the Country Office fully recovering the costs involved with project implementation?**<br>• **3:** The budget fully covers all project costs that are attributable to the project, including programme management and development effectiveness services related to strategic country programme planning, quality assurance, pipeline development, policy advocacy services, finance, procurement, human resources, administration, issuance of contracts, security, travel, assets, general services, information and communications based on full costing in accordance with prevailing UNDP policies (i.e., UPL, LPL.)<br>• **2:** The budget covers significant project costs that are attributable to the project based on prevailing UNDP policies (i.e., UPL, LPL) as relevant. | 3 / 3<br>**Evidence**<br>Project workplan and budget table indicating the support cost allocated to UNDP. | 2 |

| | |
|---|---|
| • **1:** The budget does not adequately cover project costs that are attributable to the project, and UNDP is cross-subsidizing the project.<br>*Note: Management Action must be given for a score of 1. The budget must be revised to fully reflect the costs of implementation before the project commences. | The on-going IS project of Iran |
| **EFFECTIVE** | |
| **18. Is the chosen implementation modality most appropriate? (select from options 1-3 that best reflects this project):**<br>• **3:** The required implementing partner assessments (capacity assessment, HACT micro assessment) have been conducted, and there is evidence that options for implementation modalities have been thoroughly considered. There is a strong justification for choosing the selected modality, based on the development context. *(both must be true to select this option)*<br>• **2:** The required implementing partner assessments (capacity assessment, HACT micro assessment) have been conducted and the implementation modality chosen is consistent with the results of the assessments.<br>• **1:** The required assessments have not been conducted, but there may be evidence that options for implementation modalities have been considered.<br>*Note: Management Action or strong management justification must be given for a score of 1 | 3 / 2<br>3<br>**Evidence**<br>The partnership arrangement is a continuation of Stage I project which was implemented successfully towards the attainment of the intended results/milestones. |
| **19. Have targeted groups, prioritizing marginalized and excluded populations that will be affected by the project, been engaged in the design of the project in a way that addresses any underlying causes of exclusion and discrimination?**<br>• 3: Credible evidence that all targeted groups, prioritising marginalized and excluded populations that will be involved in or affected by the project, have been actively engaged in the design of the project. Their views, rights and any constraints have been analysed and incorporated into the root cause analysis of the theory of change which seeks to address any underlying causes of exclusion and discrimination and the selection of project interventions.<br>• 2: Some evidence that key targeted groups, prioritising marginalized and excluded populations that will be involved in the project, have been engaged in the design of the project. Some evidence that their views, rights and any constraints have been analysed and incorporated into the root cause analysis of the theory of change and the selection of project interventions.<br>• 1: No evidence of engagement with marginalized and excluded populations that will be involved in the project during project design. No evidence that the views, rights and constraints of populations have been incorporated into the project. | 3 / 2<br>1<br>**2**<br>**Evidence**<br>Project document Section I |
| **20. Does the project conduct regular monitoring activities, have explicit plans for evaluation, and include other lesson learning (e.g. through After Action Reviews or Lessons Learned Workshops), timed to inform course corrections if needed during project implementation? Evidence:** Project document Section VI | **Yes (3)** |
| **21. The gender marker for all project outputs are scored at GEN2 or GEN3, indicating that gender has been fully mainstreamed into all project outputs at a minimum.**<br>*Note: Management Action or strong management justification must be given for a score of "no"<br>**Actions to take:** During the start of the project identification of possible actions to incorporate the gender issues in the project will be done**.** | **No (1)**<br>**1**<br>**Evidence** |
| **22. Is there a realistic multi-year work plan and budget to ensure outputs are delivered on time and within allotted resources? (select from options 1-3 that best reflects this project):**<br>• **3:** The project has a realistic work plan & budget covering the duration of the project *at the activity* level to ensure outputs are delivered on time and within the allotted resources.<br>• **2:** The project has a work plan & budget covering the duration of the project at the output level.<br>• **1:** The project does not yet have a work plan & budget covering the duration of the project. | 3 / 2<br>1<br>**3**<br>**Evidence**<br>Project document approved by |

| | | |
|---|---|---|
| | Multilateral Fund (annex 9) | |
| **SUSTAINABILITY & NATIONAL OWNERSHIP** | | |
| **23. Have national partners led, or proactively engaged in, the design of the project? (select from options 1-3 that best reflects this project):**<br>• **3:** National partners have full ownership of the project and led the process of the development of the project jointly with UNDP.<br>• **2:** The project has been developed by UNDP in close consultation with national partners.<br>• **1:** The project has been developed by UNDP with limited or no engagement with national partners. | 3 \| 2<br>3<br>Evidence<br>The National Ozone Unit has been fully involved in the design of the project document | |
| **24. Are key institutions and systems identified, and is there a strategy for strengthening specific/ comprehensive capacities based on capacity assessments conducted? (select from options 0-4 that best reflects this project):**<br>• **3:** The project has a comprehensive strategy for strengthening specific capacities of national institutions based on a systematic and detailed capacity assessment that has been completed. This strategy includes an approach to regularly monitor national capacities using clear indicators and rigorous methods of data collection, and adjust the strategy to strengthen national capacities accordingly.<br>• **2.5:** A capacity assessment has been completed. The project document has identified activities that will be undertaken to strengthen capacity of national institutions, but these activities are not part of a comprehensive strategy to monitor and strengthen national capacities.<br>• **2:** A capacity assessment is planned after the start of the project. There are plans to develop a strategy to strengthen specific capacities of national institutions based on the results of the capacity assessment.<br>• **1.5:** There is mention in the project document of capacities of national institutions to be strengthened through the project, but no capacity assessments or specific strategy development are planned.<br>• **1:** Capacity assessments have not been carried out and are not foreseen. There is no strategy for strengthening specific capacities of national institutions. | 3 \| 2.5<br>2 \| 1.5<br>1<br>**3**<br>Evidence<br>Project activities and results will be under surveillance of the National Ozone Committee, a multisector body overseeing the activities under the Montreal Protocol | |
| **25. Is there is a clear strategy embedded in the project specifying how the project will use national systems (i.e., procurement, monitoring, evaluations, etc.,) to the extent possible? Evidence:** Project document Section IV | **Yes (3)** | |
| **26. Is there a clear transition arrangement/ phase-out plan developed with key stakeholders in order to sustain or scale up results (including resource mobilisation strategy)?** | Yes (3) | |

## ANNEX 3: Social and Environmental Screening Template

### Project Information

| *Project Information* | |
|---|---|
| 1. Project Title | HCFC Phase-out Management Plan (HPMP) Stage-II of Islamic Republic of Iran |
| 2. Project Number | TBD |
| 3. Location (Global/Region/Country) | Islamic Republic of Iran |

### Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

| **QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?** |
|---|
| ***Briefly describe in the space below how the Project mainstreams the human-rights based approach*** |
| This project's ultimate goal is to implement structural changes in sectors of foams and refrigeration services and contribute to the quality of people's lives, through the protection of the ozone layer. The project also seeks to empower all State agencies and private companies that are linked to the acquisition and use of ODS to promote the use of technologies that do not deplete the ozone layer. |
| ***Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment*** |
| While the project does not have a specific gender related dimension, it will implement a wide range of activities for capacity-building relating to the protection of the environment, the Elimination of HCFCs and the promotion of the use of alternate technologies, aimed at the central public institutions and sectors of foams and refrigeration services. Project activities have an indirect impact on the level of knowledge of women users of home appliances that will be made ozone friendly under the project. |
| ***Briefly describe in the space below how the Project mainstreams environmental sustainability*** |
| The implementation of the activities of the second phase of the HPMP aiming to reduce the use of HCFCS is a key component of the country's environmental policy. The project contributes to the global efforts to safeguard the environment and mitigate the climate change while helping restore the stratospheric ozone layer. It also contributes to the national efforts towards attaining the SDGs. |

## Part B. Identifying and Managing Social and Environmental Risks

| **QUESTION 2: What are the Potential Social and Environmental Risks?**<br>*Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any "Yes" responses). If no risks have been identified in Attachment 1 then note "No Risks Identified" and skip to Question 4 and Select "Low Risk". Questions 5 and 6 not required for Low Risk Projects.* | **QUESTION 3: What is the level of significance of the potential social and environmental risks?**<br>*Note: Respond to Questions 4 and 5 below before proceeding to Question 6* | | | **QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?** |
|---|---|---|---|---|
| ***Risk Description*** | ***Impact and Probability (1-5)*** | ***Significance (Low, Moderate, High)*** | ***Comments*** | ***Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.*** |
| Risk 1: improper handling of flammable alternatives to HCFCs (e.g. hydrocarbons) used in the foam and refrigeration and air-conditioning sector | I = 2<br>P = 1 | **Low** | **Standard measures will be taken to avoid the risk** | To consider this risk, UNDP would liaise with UN Environment, one of the implementing partners, will update policies, regulations and safety standards on the alternative refrigerants including flammable refrigerants and develop Standard Operating Procedures for the servicing workshops for handing flammable gases and its storage. |

| **QUESTION 4: What is the overall Project risk categorization?** | | |
|---|---|---|
| **Select one (see SESP for guidance)** | | **Comments** |
| ***Low Risk*** | **X** | |
| ***Moderate Risk*** | ☐ | |
| ***High Risk*** | ☐ | |

| **QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?** | | |
|---|---|---|
| Check all that apply | | **Comments** |
| ***Principle 1: Human Rights*** | ☐ | |

| | | | |
|---|---|---|---|
| | ***Principle 2: Gender Equality and Women's Empowerment*** | ☐ | |
| | ***1. Biodiversity Conservation and Natural Resource Management*** | ☐ | |
| | ***2. Climate Change Mitigation and Adaptation*** | ☐ | |
| | ***3. Community Health, Safety and Working Conditions*** | x | |
| | ***4. Cultural Heritage*** | ☐ | |
| | ***5. Displacement and Resettlement*** | ☐ | |
| | ***6. Indigenous Peoples*** | ☐ | |
| | ***7. Pollution Prevention and Resource Efficiency*** | x | |

## Final Sign Off

| ***Signature*** | ***Date*** | ***Description*** |
|---|---|---|
| QA Assessor | | Ali Nazaridoust |
| QA Approver | | Anne Marie Sloth Carlsen |
| PAC Chair | | Ann Marie Sloth Carlsen |

## SESP Attachment 1. Social and Environmental Risk Screening Checklist

| **Checklist Potential Social and Environmental Risks** | | |
|---|---|---|
| **Principles 1: Human Rights** | | **Answer (Yes/No)** |
| 1. | Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups? | No |
| 2. | Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? [9] | No |
| 3. | Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups? | No |
| 4. | Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them? | No |
| 5. | Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project? | No |
| 6. | Is there a risk that rights-holders do not have the capacity to claim their rights? | No |
| 7. | Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process? | Yes |
| 8. | Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals? | No |
| **Principle 2: Gender Equality and Women's Empowerment** | | |
| 1. | Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls? | No |
| 2. | Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits? | No |
| 3. | Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment? | No |
| 4. | Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services?<br>*For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being* | No |
| **Principle 3: Environmental Sustainability:** Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below | | |
| | | |
| **Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management** | | |
| 1.1 | Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services?<br>*For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes* | No |
| 1.2 | Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities? | No |

[9] Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

| | | |
|---|---|---|
| 1.3 | Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5) | No |
| 1.4 | Would Project activities pose risks to endangered species? | No |
| 1.5 | Would the Project pose a risk of introducing invasive alien species? | No |
| 1.6 | Does the Project involve harvesting of natural forests, plantation development, or reforestation? | No |
| 1.7 | Does the Project involve the production and/or harvesting of fish populations or other aquatic species? | No |
| 1.8 | Does the Project involve significant extraction, diversion or containment of surface or ground water?<br>*For example, construction of dams, reservoirs, river basin developments, groundwater extraction* | No |
| 1.9 | Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development) | No |
| 1.10 | Would the Project generate potential adverse transboundary or global environmental concerns? | No |
| 1.11 | Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area?<br>*For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.* | No |
| **Standard 2: Climate Change Mitigation and Adaptation** | | |
| 2.1 | Will the proposed Project result in significant[10] greenhouse gas emissions or may exacerbate climate change? | No |
| 2.2 | Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change? | No |
| 2.3 | Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)?<br>*For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding* | No |
| **Standard 3: Community Health, Safety and Working Conditions** | | |
| 3.1 | Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities? | No |
| 3.2 | Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)? | No |
| 3.3 | Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)? | No |
| 3.4 | Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure) | No |
| 3.5 | Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions? | No |
| 3.6 | Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)? | No |
| 3.7 | Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning? | Yes |

[10] In regards to $CO_2$, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

| | | |
|---|---|---|
| 3.8 | Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)? | No |
| 3.9 | Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)? | No |
| **Standard 4: Cultural Heritage** | | |
| 4.1 | Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts) | No |
| 4.2 | Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes? | No |
| **Standard 5: Displacement and Resettlement** | | |
| 5.1 | Would the Project potentially involve temporary or permanent and full or partial physical displacement? | No |
| 5.2 | Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)? | No |
| 5.3 | Is there a risk that the Project would lead to forced evictions?[11] | No |
| 5.4 | Would the proposed Project possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources? | No |
| **Standard 6: Indigenous Peoples** | | |
| 6.1 | Are indigenous peoples present in the Project area (including Project area of influence)? | No |
| 6.2 | Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples? | No |
| 6.3 | Would the proposed Project potentially affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples (regardless of whether indigenous peoples possess the legal titles to such areas, whether the Project is located within or outside of the lands and territories inhabited by the affected peoples, or whether the indigenous peoples are recognized as indigenous peoples by the country in question)?<br>*If the answer to the screening question 6.3 is "yes" the potential risk impacts are considered potentially severe and/or critical and the Project would be categorized as either Moderate or High Risk.* | No |
| 6.4 | Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned? | No |
| 6.5 | Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples? | No |
| 6.6 | Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources? | No |
| 6.7 | Would the Project adversely affect the development priorities of indigenous peoples as defined by them? | No |
| 6.8 | Would the Project potentially affect the physical and cultural survival of indigenous peoples? | No |

[11] Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

| | | |
|---|---|---|
| 6.9 | Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices? | No |
| **Standard 7: Pollution Prevention and Resource Efficiency** | | |
| 7.1 | Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts? | Yes |
| 7.2 | Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)? | Yes |
| 7.3 | Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs?<br>*For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol* | No |
| 7.4 | Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health? | No |
| 7.5 | Does the Project include activities that require significant consumption of raw materials, energy, and/or water? | No |

## ANNEX 4: Risk Analysis

### OFFLINE RISK LOG

| **Project Title:** HCFC Phase Out Management Plan (HPMP) Stage-II of Islamic Republic of Iran | **Award ID:** | **Date:** |
|---|---|---|

| # | Description | Date Identified | Type | Impact & Probability | Countermeasures / Mngt response | Owner | Submitted, updated by | Last Update | Status |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Possible Insufficient co-ordination between the NOU and the institutions involved in consumption and import of HCFCs to implement control of the project activities. | 07/2017 | Organizational/ Strategic | Delays in project implementation.<br>P = 1<br>I = 2 | Optimize the respective coordination from the beginning. | NOU, UNDP | UNDP | | |
| 2 | Lack of sufficient capacity to carry out the project activities. | 07/2017 | Operational/ Organizational | Delays in project implementation.<br>P = 1<br>I = 1 | Analysis and monitoring of activities / results of the activities. | NOU | UNDP | | |
| 3 | Delay in endorsement of action plans by government. | 07/2017 | Operational | Delays in project implementation.<br>P = 1<br>I = 1 | Maintain follow up with NOU. | NOU | UNDP | | |
| 4 | Delay in completion of project deliverables | 07/2017 | Operational | Delays in project implementation.<br>P = 1<br>I = 1 | Maintain follow up with NOU and cooperating agencies | NOU | UNDP | | |
| 5 | Delay in availability of cost effective and commercially available HCFC free options. | From Stage I | Operational | Delays in project implementation.<br>P = 1<br>I = 2 | Start working on identifying technologies and alternatives at the earliest. | UNDP, cooperating agencies and NOU | UNDP | | |
| 6 | Insecurity associated with use of flammable technologies (Pentane, Hydrocarbons) by the companies in the foam and refrigeration sectors. | From Stage I | Operational | Delays in project implementation.<br>P = 2<br>I = 2 | Update policies, regulations and safety standards on the alternative refrigerants including flammable refrigerants and develop Standard Operating Procedures for the servicing workshops for handing flammable gases and its storage. | UNEP and GIZ | UNDP | | |

**ANNEX 5**

**Letter from Multilateral Fund Secretariat and**
**AGREEMENT BETWEEN THE GOVERNMENT OF THE ISLAMIC REPUBLIC OF IRAN AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN**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MULTILATERAL FUND
FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

*Secretariat*

15 December 2016

Dear Mr. Hajizadeh,

I refer to the Seventy-seventh meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol held in Montreal, Canada, from 28 November to 2 December 2016.

I am pleased to inform you that the Executive Committee approved funding for the eleventh phase of the institutional strengthening (IS) project requested by your Government at a cost of US $222,094. In this regard, the Executive Committee expressed the following observations :

> *The Executive Committee reviewed the report presented with the request for the IS project for the Islamic Republic of Iran (phase XI) and noted with appreciation the effective quota and licensing system that had allowed the country to achieve compliance with the 2015 control measure of the Montreal Protocol. The Executive Committee further noted the release of all four funding tranches of stage I of the HCFC phase-out management plan (HPMP), as well as the submission of the relevant progress and verification reports, and expressed appreciation for the efforts of the Islamic Republic of Iran for achieving the final stage of its conversion projects. The Committee expressed the expectation that the Islamic Republic of Iran will sustain its enforcement of the established regulatory measures to control HCFC import and distribution to enable effective implementation of stage II of the HPMP.*

I would also like inform you that the Executive Committee approved, in principle, stage II of the HPMP for the Islamic Republic of Iran for the period 2016 to 2023 to reduce HCFC consumption by 75 per cent of the baseline, at a total funding level of US $11,288,177 to be implemented by UNDP (US $4,905,361), UNEP (US $700,000), UNIDO (US $2,103,205), the Government of Germany (US $2,672,404), and the Government of Italy (US $907,207), in accordance with the attached Agreement between your Government and the Executive Committee. In approving stage II of the HPMP the Executive Committee :

> *decided that the approach taken for the refrigeration and air-conditioning manufacturing sector was agreed on an exceptional basis owing to the special circumstances in the country;*

Mr. Ebrahim Hajizadeh
Director of Ozone Layer Protection Unit
Department of Environment
Tehran
Islamic Republic of Iran

*noted the commitment of your Government to :*

*reduce HCFC consumption by 75 per cent of the baseline by 2023;*

*issue a ban on the import and use of HCFC-141b pure or contained in pre-blended polyols upon the completion of the conversion of all the eligible enterprises and no later than 1 July 2023;*

*issue a ban on new manufacturing capacity using HCFC-22 by 1 January 2020; and*

*issue a ban on the use of HCFC-22 in the manufacturing of refrigeration and air-conditioning equipment upon completion of the conversion of all the eligible enterprises and no later than 1 January 2023;*

*deducted 162.37 ODP tonnes of HCFCs from the remaining HCFC consumption eligible for funding; and*

*requested UNDP to include in the submission of the request for the second funding tranche a report on the results of the conversion of the first 15 enterprises in the refrigeration and air conditioning manufacturing sector to low-global-warming-potential alternatives, highlighting the lessons learned and challenges faced.*

Furthermore, the Executive Committee approved the first tranche of stage II of the HPMP for the Islamic Republic of Iran and the corresponding tranche implementation plans, at a total cost of US $3,020,440, to be implemented by UNDP (US $1,298,170), UNEP (US $200,000), UNIDO (US $473,567), the Government of Germany (US $645,500), and the Government of Italy (US $403,203).

Sincerely yours,

Eduardo Ganem
Chief Officer

Enclosure

c.c.: Mr. Jacques Van Engel – UNDP
Ms. Shamila Nair-Bedouelle – UNEP
Mr. Ole Nielsen – UNIDO
Ms. Ulrike Haupt – Germany
Ms. Valeria Rizzo – Italy

**AGREEMENT BETWEEN THE GOVERNMENT OF THE ISLAMIC REPUBLIC OF IRAN AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN**

**Purpose**

1. This Agreement represents the understanding of the Government of the Islamic Republic of Iran (the "Country") and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A ("The Substances") to a sustained level of 95.13 ODP tonnes by 1 January 2023 in compliance with Montreal Protocol schedule.

2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A ("The Targets, and Funding") in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances that exceeds the level defined in row 1.2 of Appendix 2-A as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances that exceeds the level defined in rows 4.1.3 and 4.2.3 (remaining consumption eligible for funding).

3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees, in principle, to provide the funding set out in row 3.1 of Appendix 2-A to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A ("Funding Approval Schedule").

4. The Country agrees to implement this Agreement in accordance with the stage II of the HCFC phase-out management plan (HPMP) approved ("the Plan"). In accordance with sub-paragraph 5(b) of this Agreement, the Country will accept independent verification of the achievement of the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A of this Agreement. The aforementioned verification will be commissioned by the relevant bilateral or implementing agency.

**Conditions for funding release**

5. The Executive Committee will only provide the Funding in accordance with the Funding Approval Schedule when the Country satisfies the following conditions at least eight weeks in advance of the applicable Executive Committee meeting set out in the Funding Approval Schedule:

(a) That the Country has met the Targets set out in row 1.2 of Appendix 2-A for all relevant years. Relevant years are all years since the year in which this Agreement was approved. Years for which there are no due country programme implementation reports at the date of the Executive Committee meeting at which the funding request is being presented are exempted;

(b) That the meeting of these Targets has been independently verified for all relevant years, unless the Executive Committee decided that such verification would not be required;

(c) That the Country had submitted a Tranche Implementation Report in the form of Appendix 4-A ("Format of Tranche Implementation Reports and Plans") covering each

previous calendar year; that it had achieved a significant level of implementation of activities initiated with previously approved tranches; and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent; and

(d) That the Country has submitted a Tranche Implementation Plan in the form of Appendix 4-A covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen.

**Monitoring**

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A ("Monitoring Institutions and Roles") will monitor and report on implementation of the activities in the previous Tranche Implementation Plans in accordance with their roles and responsibilities set out in the same appendix.

**Flexibility in the reallocation of funds**

7. The Executive Committee agrees that the Country may have the flexibility to reallocate part or all of the approved funds, according to the evolving circumstances to achieve the smoothest reduction of consumption and phase-out of the Substances specified in Appendix 1-A:

(a) Reallocations categorized as major changes must be documented in advance either in a Tranche Implementation Plan as foreseen in sub-paragraph 5(d) above, or as a revision to an existing Tranche Implementation Plan to be submitted eight weeks prior to any meeting of the Executive Committee, for its approval. Major changes would relate to:

(i) Issues potentially concerning the rules and policies of the Multilateral Fund;

(ii) Changes which would modify any clause of this Agreement;

(iii) Changes in the annual levels of funding allocated to individual bilateral or implementing agencies for the different tranches;

(iv) Provision of funding for activities not included in the current endorsed Tranche Implementation Plan, or removal of an activity in the Tranche Implementation Plan, with a cost greater than 30 per cent of the total cost of the last approved tranche; and

(v) Changes in alternative technologies, on the understanding that any submission for such a request would identify the associated incremental costs, the potential impact to the climate, and any differences in ODP tonnes to be phased out if applicable, as well as confirm that the Country agrees that potential savings related to the change of technology would decrease the overall funding level under this Agreement accordingly;

(b) Reallocations not categorized as major changes may be incorporated in the approved Tranche Implementation Plan, under implementation at the time, and reported to the Executive Committee in the subsequent Tranche Implementation Report;

(c) Any enterprise to be converted to non-HCFC technology included in the Plan and that would be found to be ineligible under the policies of the Multilateral Fund (i.e., due to foreign ownership or establishment post the 21 September 2007 cut-off date), would not receive financial assistance. This information would be reported as part of the Tranche Implementation Plan;

(d) The Country commits to examining the possibility of using pre-blended systems with low-global warming potential blowing agents instead of blending them in-house, for those foam enterprises covered under the Plan, should this be technically viable, economically feasible and acceptable to the enterprises;

(e) The Country agrees, in cases where HFC technologies have been chosen as an alternative to HCFCs, and taking into account national circumstances related to health and safety: to monitor the availability of substitutes and alternatives that further minimize impacts on the climate; to consider, in the review of regulations standards and incentives adequate provisions that encourage introduction of such alternatives; and to consider the potential for adoption of cost-effective alternatives that minimize the climate impact in the implementation of the HPMP, as appropriate, and inform the Executive Committee on the progress accordingly in tranche implementation reports; and

(f) Any remaining funds held by the bilateral or implementing agencies or the Country under the Plan will be returned to the Multilateral Fund upon completion of the last tranche foreseen under this Agreement.

**Considerations for the refrigeration servicing sector**

8. Specific attention will be paid to the execution of the activities in the refrigeration servicing sector included in the Plan, in particular:

(a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation; and

(b) The Country and relevant bilateral and/or implementing agencies would take into consideration relevant decisions on the refrigeration servicing sector during the implementation of the Plan.

**Bilateral and implementing agencies**

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. UNDP has agreed to be the lead implementing agency (the "Lead IA") and UNEP, UNIDO, the Government of Germany and the Government of Italy have agreed to be the cooperating implementing agencies (the "Cooperating IAs") under the lead of the Lead IA in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of the Lead IA and/or Cooperating IAs taking part in this Agreement.

10. The Lead IA will be responsible for ensuring co-ordinated planning, implementation and reporting of all activities under this Agreement, including but not limited to independent verification as per sub-paragraph 5(b). The Cooperating IAs will support the Lead IA by implementing the Plan under the overall co-ordination of the Lead IA. The roles of the Lead IA and Cooperating IAs are contained in Appendix 6-A and Appendix 6-B, respectively. The Executive Committee agrees, in principle, to provide the Lead IA and the Cooperating IAs with the fees set out in rows 2.2, 2.4, 2.6, 2.8 and 2.10 of Appendix 2-A.

**Non-compliance with the Agreement**

11. Should the Country, for any reason, not meet the Targets for the elimination of the Substances set out in row 1.2 of Appendix 2-A or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding in accordance with the Funding Approval Schedule. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amount set out in Appendix 7-A ("Reductions in Funding for Failure to Comply") in respect of each ODP kg of reductions in consumption not achieved in any one year. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once decisions are taken, the specific case of non-compliance with this Agreement will not be an impediment for the provision of funding for future tranches as per paragraph 5 above.

12. The Funding of this Agreement will not be modified on the basis of any future Executive Committee decisions that may affect the funding of any other consumption sector projects or any other related activities in the Country.

13. The Country will comply with any reasonable request of the Executive Committee, the Lead IA and the Cooperating IAs to facilitate implementation of this Agreement. In particular, it will provide the Lead IA and the Cooperating IAs with access to the information necessary to verify compliance with this Agreement.

**Date of completion**

14. The completion of the Plan and the associated Agreement will take place at the end of the year following the last year for which a maximum allowable total consumption level has been specified in Appendix 2-A. Should at that time there still be activities that are outstanding, and which were foreseen in the last Tranche Implementation Plan and its subsequent revisions as per sub-paragraph 5(d) and paragraph 7, the completion of the Plan will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per sub-paragraphs 1(a), 1(b), 1(d), and 1(e) of Appendix 4-A will continue until the time of the completion of the Plan unless otherwise specified by the Executive Committee.

**Validity**

15. All of the conditions set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

16. This Agreement may be modified or terminated only by mutual written agreement of the Country and the Executive Committee of the Multilateral Fund.

## APPENDICES

## APPENDIX 1-A: THE SUBSTANCES

| Substance | Annex | Group | Starting point for aggregate reductions in consumption (ODP tonnes) |
|---|---|---|---|
| HCFC-22 | C | I | 163.6 |
| HCFC-141b | C | I | 216.9 |
| Total | | | 380.5 |

### APPENDIX 2-A: THE TARGETS, AND FUNDING

| Row | Particular | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.1 | Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes) | 342.45 | 342.45 | 342.45 | 342.45 | 247.33 | 247.33 | 247.33 | 247.33 | n/a |
| 1.2 | Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes) | 342.45 | 342.45 | 266.35 | 266.35 | 247.33 | 247.33 | 247.33 | 95.13 | n/a |
| 2.1 | Lead IA (UNDP) (US $) | 1,298,170 | 0 | 1,593,980 | 0 | 1,307,980 | 464,231 | 241,000 | 0 | 4,905,361 |
| 2.2 | Support costs for Lead IA (US $) | 90,872 | 0 | 111,579 | 0 | 91,559 | 32,496 | 16,870 | | 343,375 |
| 2.3 | Cooperating IA (UNIDO) (US $) | 473,567 | 0 | 584,000 | 0 | 524,000 | 447,638 | 74,000 | 0 | 2,103,205 |
| 2.4 | Support costs for Cooperating IA (US $) | 33,150 | 0 | 40,880 | 0 | 36,680 | 31,335 | 5,180 | 0 | 147,224 |
| 2.5 | Cooperating IA (UNEP) (US $) | 200,000 | 0 | 190,000 | 0 | 170,000 | 0 | 140,000 | 0 | 700,000 |
| 2.6 | Support costs for Cooperating IA (US $) | 24,857 | 0 | 23,614 | 0 | 21,129 | 0 | 17,400 | 0 | 87,000 |
| 2.7 | Cooperating IA (Germany) (US $) | 645,500 | 0 | 1,047,035 | 0 | 285,009 | 598,000 | 96,860 | 0 | 2,672,404 |
| 2.8 | Support costs for Cooperating IA (US $) | 73,420 | 0 | 119,092 | 0 | 32,417 | 68,018 | 11,017 | 0 | 303,964 |
| 2.9 | Cooperating IA (Italy) (US $) | 403,203 | 0 | 504,004 | 0 | 0 | 0 | 0 | 0 | 907,207 |
| 2.10 | Support costs for Cooperating IA (US $) | 48,797 | 0 | 60,996 | 0 | 0 | 0 | 0 | 0 | 109,793 |
| 3.1 | Total agreed funding (US $) | 3,020,440 | 0 | 3,919,019 | 0 | 2,286,989 | 1,509,869 | 551,860 | 0 | 11,288,177 |
| 3.2 | Total support costs (US $) | 271,096 | 0 | 356,161 | 0 | 181,785 | 131,848 | 50,467 | 0 | 991,357 |
| 3.3 | Total agreed costs (US $) | 3,291,536 | 0 | 4,275,180 | 0 | 2,468,774 | 1,641,717 | 602,327 | 0 | 12,279,534 |
| 4.1.1 | Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes) | | | | | | | | | 71.27 |
| 4.1.2 | Phase-out of HCFC-22 to be achieved in the previous stage (ODP tonnes) | | | | | | | | | 38.6 |
| 4.1.3 | Remaining eligible consumption for HCFC-22 (ODP tonnes) | | | | | | | | | 53.73 |
| 4.2.1 | Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes) | | | | | | | | | 91.1 |
| 4.2.2 | Phase-out of HCFC-141b to be achieved in the previous stage (ODP tonnes) | | | | | | | | | 125.8 |
| 4.2.3 | Remaining eligible consumption for HCFC-141b (ODP tonnes) | | | | | | | | | 0 |

## APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval at the second meeting of the year specified in Appendix 2-A.

## APPENDIX 4-A: FORMAT OF TRANCHE IMPLEMENTATION REPORTS AND PLANS

1. The submission of the Tranche Implementation Report and Plans for each tranche request will consist of five parts:

(a) A narrative report, with data provided by tranche, describing the progress achieved since the previous report, reflecting the situation of the Country in regard to phase out of the Substances, how the different activities contribute to it, and how they relate to each other. The report should include the amount of ODS phased out as a direct result from the implementation of activities, by substance, and the alternative technology used and the related phase-in of alternatives, to allow the Secretariat to provide to the Executive Committee information about the resulting change in climate relevant emissions. The report should further highlight successes, experiences, and challenges related to the different activities included in the Plan, reflecting any changes in the circumstances in the Country, and providing other relevant information. The report should also include information on and justification for any changes vis-à-vis the previously submitted Tranche Implementation Plan(s), such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes;

(b) An independent verification report of the Plan results and the consumption of the Substances, as per sub-paragraph 5(b) of the Agreement. If not decided otherwise by the Executive Committee, such a verification has to be provided together with each tranche request and will have to provide verification of the consumption for all relevant years as specified in sub-paragraph 5(a) of the Agreement for which a verification report has not yet been acknowledged by the Committee;

(c) A written description of the activities to be undertaken during the period covered by the requested tranche, highlighting implementation milestones, the time of completion and the interdependence of the activities, and taking into account experiences made and progress achieved in the implementation of earlier tranches; the data in the plan will be provided by calendar year. The description should also include a reference to the overall Plan and progress achieved, as well as any possible changes to the overall Plan that are foreseen. The description should also specify and explain in detail such changes to the overall plan. This description of future activities can be submitted as a part of the same document as the narrative report under sub-paragraph (b) above;

(d) A set of quantitative information for all Tranche Implementation Reports and Plans, submitted through an online database; and

(e) An Executive Summary of about five paragraphs, summarizing the information of the above sub-paragraphs 1(a) to 1(d).

2. In the event that in a particular year two stages of the HPMP are being implemented in parallel, the following considerations should be taken in preparing the Tranche Implementation Reports and Plans:

(a) The Tranche Implementation Reports and Plans referred to as part of this Agreement, will exclusively refer to activities and funds covered by this Agreement; and

(b) If the stages under implementation have different HCFC consumption targets under Appendix 2-A of each Agreement in a particular year, the lower HCFC consumption target will be used as reference for compliance with these Agreements and will be the basis for the independent verification.

## APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES

1. The monitoring process will be managed by the Department of Environment (DOE) through the National Ozone Unit (NOU) with the assistance of the Lead IA.

2. The consumption will be monitored and determined based on official import and export data for the Substances recorded by relevant Government departments. The NOU shall compile and report on an annual basis on or before the relevant due dates on consumption of the Substances to be submitted to the Ozone Secretariat and on progress of implementation of HPMP to be submitted to the Executive Committee.

3. The NOU and the Lead IA will engage an independent and qualified entity to carry out a qualitative and quantitative performance evaluation of the HPMP implementation.

4. The evaluating entity shall have full access to relevant technical and financial information related to implementation of the HPMP; it shall prepare and submit to the NOU and the Lead IA, a consolidated draft report at the end of each Tranche Implementation Plan, comprising of the findings of the evaluation and recommendations for improvements or adjustments, if any. The draft report shall include the status of the Country's compliance with the provisions of this Agreement upon incorporating the comments and explanations as may be applicable, from NOU, Lead IA and the Cooperating IAs, the evaluating entity shall finalize the report and submit to the NOU and Lead IA.

5. The NOU shall endorse the final report and the Lead IA shall submit the same to the relevant meeting of the Executive Committee along with the Tranche Implementation plan and reports.

## APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY

1. The Lead IA will be responsible for a range of activities, including at least the following:

(a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's HPMP;

(b) Assisting the Country in preparation of the Tranche Implementation Reports and Plans as per Appendix 4-A;

(c) Providing independent verification to the Executive Committee that the Targets have been met and associated tranche activities have been completed as indicated in the Tranche Implementation Plan consistent with Appendix 4-A;

(d) Ensuring that the experiences and progress is reflected in updates of the overall plan and in future Tranche Implementation Plans consistent with sub-paragraphs 1(c) and 1(d) of Appendix 4-A;

(e) Fulfilling the reporting requirements for the Tranche Implementation Reports and Plans and the overall plan as specified in Appendix 4-A for submission to the Executive Committee, and should include the activities implemented by the Cooperating IAs;

(f) In the event that the last funding tranche is requested one or more years prior to the last year for which a consumption target had been established, annual tranche implementation reports and, where applicable, verification reports on the current stage of the Plan should be submitted until all activities foreseen had been completed and HCFC consumption targets had been met;

(g) Ensuring that appropriate independent technical experts carry out the technical reviews;

(h) Carrying out required supervision missions;

(i) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;

(j) Co-ordinating the activities of the Cooperating IAs, and ensuring appropriate sequence of activities;

(k) In case of reductions in funding for failure to comply in accordance with paragraph 11 of the Agreement, to determine, in consultation with the Country and the Cooperating IAs, the allocation of the reductions to the different budget items and to the funding of the Lead IA and each Cooperating IA;

(l) Ensuring that disbursements made to the Country are based on the use of the indicators;

(m) Providing assistance with policy, management and technical support when required;

(n) Reaching consensus with the Cooperating IAs on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan; and

(o) Timely releasing funds to the Country/participating enterprises for completing the activities related to the project.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent entity to carry out the verification of the HPMP results and the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement and sub-paragraph 1(b) of Appendix 4-A.

## APPENDIX 6-B: ROLE OF THE COOPERATING IMPLEMENTING AGENCIES

1. The Cooperating IAs will be responsible for a range of activities. These activities are specified in the Plan, including at least the following:

(a) Providing assistance for policy development when required;

(b) Assisting the Country in the implementation and assessment of the activities funded by the Cooperating IAs, and refer to the Lead IA to ensure a co-ordinated sequence in the activities;

(c) Providing reports to the Lead IA on these activities, for inclusion in the consolidated reports as per Appendix 4-A; and

(d) Reaching consensus with the Lead IA on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan.

## APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY

1. In accordance with paragraph 11 of the Agreement, the amount of funding provided may be reduced by US $139 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target specified in row 1.2 of Appendix 2-A has not been met, on the understanding that the maximum funding reduction would not exceed the funding level of the tranche being requested. Additional measures might be considered in cases where non-compliance extends for two consecutive years.

2. In the event that the penalty needs to be applied for a year in which there are two Agreements in force (two stages of the HPMP being implemented in parallel) with different penalty levels, the application of the penalty will be determined on a case-by-case basis taking into consideration the specific sectors that lead to the non-compliance. If it is not possible to determine a sector, or both stages are addressing the same sector, the penalty level to be applied would be the largest.

## APPENDIX 8-A: SECTOR SPECIFIC ARRANGEMENTS

1. This section outlines a specific condition required to be met before the portion of funding shown in rows 2.1 to 2.10 and 3.1 to 3.3 of Appendix 2-A could be released:

   (a) That the Lead IA, the Cooperating IAs and the Country have included in the submission of the request for the second tranche a report on the results of the conversion of the first 15 enterprises in the refrigeration and air-conditioning manufacturing sector to low-GWP alternatives highlighting lessons learned and challenges faced.

## ANNEX 6: Project document approved by MLF

Iran-Project
Proposal HPMP Stag

# Islamic Republic of Iran

# HCFC Phase-out Management Plan Stage-II

Prepared by

Government of Iran

With the assistance of

National Stakeholders
United Nations Development Programme (Lead Agency)
United Nations Environment Programme (Cooperating Agency)
United Nations Industrial Development Organization (Cooperating Agency)
GERMANY implemented by GIZ Proklima (Cooperating Agency)

22 August 2016 (revised July 2017)

| PROJECT COVER SHEET | |
|---|---|
| **COUNTRY NAME** | **Government of the Islamic Republic of Iran** |
| **LEAD IMPLEMENTING AGENCY** | **UNDP** |
| **CO-OPERATING IMPLEMENTING AGENCY(IES)** | **UNEP** |
| | **UNIDO** |
| | **Germany (Implemented by GIZ Proklima)** |

| **SUBMISSION OF COMPLETE DOCUMENTATION** | | |
|---|---|---|
| **Document** | **Yes/No** | **Comments** |
| **Letter of transmittal** | Yes | |
| **MYA tables (on-line)** | Yes | |
| **Executive summary** | Yes | |
| **Remarks from annual progress and financial reports and status report as relevant** | | |
| **Stage II of HPMP proposal** | Yes | |
| **Independent technical review for investment projects** | No | |
| **Draft agreement** | Yes | |

| **HCFC REGULATIONS IN PLACE** | | |
|---|---|---|
| **Regulation** | **Date** | **Comments** |
| **HCFC regulation adapted to XIX/6** | | |
| **HCFC licensing system (operational)** | 01/01/2011 | |
| **HCFC quota system (operational)** | 01/01/2011 | |

| **SUBMISSION OF ODS DATA REPORTS** | | | |
|---|---|---|---|
| **Report** | **Date** | **Year reported data** | **Comments** |
| **Country programme** | | 2015 | |
| **Article 7 data** | | 2015 | |

| | |
|---|---|
| **Calculated HCFC baseline (ODP tonnes)** | 380.5 |
| **Starting point for aggregate reductions in HCFC consumption (ODP tonnes)** | 380.5 |
| **HCFC reductions from stage I as per Appendix 2-A of the Agreement** | 164.4 |
| **HCFC reductions from stage II as per Appendix 2-A of the draft Agreement** | After finalization |
| **Explain any data discrepancies:** | |

| **HPMP DOCUMENT** | | | | | |
|---|---|---|---|---|---|
| **Servicing only** | | **Manufacturing only** | | **Servicing and manufacturing** | Yes |
| **Phase out commitment (%)** | | | **Year of commitment** | | |

| **Main components included** | **Yes/No** |
|---|---|
| **Status of implementation of the overarching strategy** | Yes |
| **Strategy and action plan for stage II** | Yes |
| **Co-financing** | N/A |
| **Impact on the environment** | |
| **Implementation work programme and timeframe** | Yes |
| **Implementation modalities (project monitoring unit) (disbursement by country to final enterprise beneficiaries) (other—please define)** | Yes |

| **FUNDING** | |
|---|---|
| **Funding consistent with guidelines (servicing sector, cut-off date, second stage, HCFC-141b imported in polyols, cost effectiveness, technology upgrade, foreign ownership, export to non-Article 5 countries)** | Yes |
| **Funding of last tranche requested at the last year of implementation** | Yes |
| **Priority given to manufacturing over servicing sector (if applicable)** | Yes |
| **Justification for not addressing first HCFC-141b (if applicable)** | N/A |
| **Justification provided on how the proposed funding levels would enable the fulfilment of the 20 per cent disbursement threshold by the time of the request of the next tranche in the light of new IPSAS disbursement definitions and historical time needed to obtain required agreements.** | |
| **Indication on how policies on individual projects have been taken into account in funding levels, i.e. transnational corporations, foreign ownership, un-intentional technology upgrade, technologies in the public domain, incremental operating savings (alternative or energy savings, for example)** | As per MLF Guidelines |

## Executive Summary

Islamic Republic of Iran, with a total population of approximately 82 million inhabitants has ratified all the amendments to the Montreal Protocol.

**ODS policy and regulatory framework**

The Government of Iran introduced regulatory system to comply with MP objectives. The objective of the regulatory framework is to provide control over consumption and import of HCFCs to obtain phase-out targets. The main elements of the regulatory framework for HCFC phase-out involve: licensing system, quota system, certification scheme, codification system, provision of fiscal incentive and disincentives, labeling requirements.

**Licensing and quota system:** Imports of HCFCs are already subject to import quota system. The Import Registration and Licensing System, which was set up through issuance of CLP on ODS Phase-out and its enforcement in March 2007, brought the Islamic Republic of Iran in compliance with MLF licensing system requirements. While the country has only imports of HCFCs, this licensing system includes licensing of HCFC imports and exports.

**Quota system**: NOU has established the quota system, which is operational from the year 2012. The quota system includes all HCFCs indicated in the Annex C Group I of the Montreal Protocol. The National Ozone Committee or its subcommittees decide the quota for each year. The specified amount for quota is communicated to the Ministry of Industry, Mine and Trade (MIMT) and Customs department for action. Before MIMT issues the import license to the registered importer, they inform NOU who approves the importer and quantity. Quotas are given to importers on a first come first serve basis with a cap of 45 MT per import valid for 3 months. After proving that import has taken place, additional import permission is given after checking the balance left.

Licensing and quota system are introduced on the basis of the new policy and regulatory framework to provide official control on the import registry system. The regulatory framework is to accelerate obtaining the HCFC phase-out targets by reducing the import and consumption of ODS.

**Status of implementation of Stage I activities**

UNDP has completed the conversion of one domestic air-conditioning project with Mehr Asl Manufacturing Corporation. Germany (implemented by GIZ Proklima) has completed or nearly completed the conversion of 6 Continuous Sandwich Panel projects and 2 other rigid foam projects. UNIDO has completed or nearly completed 4 Discontinuous Panel projects and 7 Domestic Refrigeration Insulation Foam projects. In total 19 projects are complete or near completion and 29.3 ODP tonnes of HCFC-22 and 118.4 ODP tonnes of HCFC-141b have been phased out in Stage I.

1 project with a system house and 8 foam projects have been cancelled or postponed to Stage II, with no changes to the tranche reports of Stage I.

The progress on non-investment components by Implementing Agency is given in the narrative below.

***Stakeholder consultation and project management on foam***

Consultation with the stakeholders on project implementation is on-going. The companies solved the issue of local pentane supply with the support of the NOU and opening of local supply chains.

***GIZ Progress on activities in the refrigeration servicing sector:***

(a) Technology demonstration for supermarkets: A 2-day practical training workshop was held in October 2014, consisting of one-day theory and one-day practical training. Technical assistance and technology support are on-going for supporting the continuation of the measures demonstrated.

(b) Financial incentives for technology demonstration: Further supermarkets refrigeration systems have been converted to leakage free. Activities have been finalized although the exercise of facilitating the supply chain continued. Consultations with international suppliers are on-going and several international companies are re-establishing offices to improve the supply chain of refrigeration parts. This will facilitate enormously the Stage-II with regard to availability and technology of equipment and parts.

(c) Development of tools and guidelines for electronic download: Book published June 2015 and 3,000 hardcopies printed in Iranian language. It contains i) Basic refrigeration and leakage tight conversion of refrigeration systems including experience gained in Iran through monitoring and visits to the supermarkets; ii) Servicing refrigeration systems; iii) Sealed system design; iv) Leak control; and v) Rules and regulations for refrigerated food in Iran

(d) Certification and standards development: The book mentioned above contains the standards and guidelines. There is interest to harmonize the marking and labelling.

***UNEP progress on non-investment activities:***

As part of establishment of the regulatory instrument, training through collaborative programs between RAC association, NOU and TVTO was performed during Stage I of HPMP. The RAC servicing sector, as the largest distributor and consumer of HCFCs, have been the main target of the training programs during Stage I of HPMP. In fact, one of the major strategies over the RAC sector was institutional training to enhance technical knowledge of the servicing division. The main concept behind RAC training program was improving the quality of the work provided by the servicing sector to accelerate accomplishment of the phase out target.

A summary of training courses conducted by UNEP is provided in the table below.

**Table 1: Summary of Training Courses conducted by UNEP**

| Title / Province | Number of Participants |
|---|---|
| Training of Trainers Workshop on Good Servicing Practice /Karaj Instructor Training Centre & Technical and Vocational Researches, Karaj | 34 |
| Training Workshop on Good Servicing Practice (Group 1)/Mashhad | 30 |
| Training Workshop on Good Servicing Practice (Group 2)/Mashhad | 30 |
| Montreal Protocol Enforcement Training (Training of Trainers)/Tehran | 60 |
| Customs Officers Training Workshop (Training of Trainers)/Tehran | 64 |
| Awareness and Training Workshop for Customs Officers of North West region/Urumia | 71 |
| Training workshops on good practice in refrigeration and air conditioning Group 1 (technicians from residential refrigeration system) | 45 |

| | |
|---|---|
| Training workshops on good practice in refrigeration and air conditioning Group 2 (beneficiaries from Air Conditioning Industry) | 45 |
| Training Workshop on Good Practices (Domestic section) at Bandar Abbas | 36 |
| Training Workshop on Good Practices (Industrial section) at Bandar Abbas | 25 |
| Training Workshop on Good Practices (Domestic section) at Esfahan | 42 |
| Training Workshop on Good Practices (Industrial section) at Esfahan | 39 |
| Awareness Workshop on Energy Efficiency and HCFCs Phase-out in Refrigeration and Air-conditioning Sectors | 79 |

More details can be found in the attached project description of UNEP.

For the years 2013 – 2015, the progress reports and verification reports for HPMP Stage-I were submitted. Iran complied with their national consumption targets for the respective years.

**Table 2: Statement of Expenditure as of End of July 2016 for HPMP Stage-I of Iran**

| Implementing Agency | Total up to 30 June 2015 (USD) | |
|---|---|---|
| | Approved | Disbursed |
| UNDP | 4,340,246 | 4,097,234 |
| UNIDO | 2,506,277 | 2,483,751 |
| Government of Germany | 2,885,815 | 2,885,815 |
| UNEP | 262,000 | 222,965 |
| **Total** | **9,994,338** | **9,689,765** |

** Per Decision 73/21, UNEP would returnUS$60,000 from this amount to the MLF towards the same amount that had not been accounted for in the national CFC phase-out plan (IRA/PHA/63/TAS/200), on the understanding that the corresponding activities of the HPMP would be implemented using the Government's own resources.*

*# Subject to update after the final financial report is prepared.*

**HCFC consumption and production**

HCFCs are not produced in the Islamic Republic of Iran and are imported. Consumption of HCFCs for the year 2013 - 2015 is given below.

**Table 3: Consumption of HCFCs in Iran**

| Substance | 2013 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|
| | MT | ODP tonne | MT | ODP tonne | MT | ODP tonne |
| HCFC-22 | 2,886.94 | 158.78 | 2,666.78 | 146.67 | 2,783.22 | 153.08 |
| HCFC-141b | 1,805.97 | 198.66 | 1,777.00 | 195.47 | 1,420.00 | 156.20 |
| **Total** | **4,692.91** | **357.44** | **4,443.78** | **342.14** | **4,203.22** | **309.28** |

*Note: Article 7 data reports and verification reports*

Imports of pre-blended polyol containing HCFC-141b as foam blowing agent is not licensed in the Islamic Republic of Iran. Also, import of polyol pre-blended with HCFC-141b is almost nil. The manufacturers of foam products procure HCFC-141b from existing importers and undertake blending at their premises or procure pre-blended from local system houses. HCFC-141b based pre-blended polyols are not exported from the Islamic Republic of Iran.

The break-down of distribution of HCFC-22 and HCFC-141b consumption in different sub-sectors/uses for the year 2015 is given below.

**Table 4: Break-down of HCFC Use by Sub-sectors for 2015 (MT)**

| | RAC – Manufacturing | RAC – Servicing | Foam | Total |
|---|---|---|---|---|
| HCFC-22 | 1,310.99 | 1,448.52 | 24.49 | **2,784.00** |
| HCFC-141b | 638.72 | - | 781.28 | **1,420.00** |
| **Total** | **1,949.71** | **1,448.52** | **805.77** | **4,204.00** |

## HCFC PHASE-OUT STRATEGY AND ACTION PLAN FOR STAGE-II TARGETS

### Principles

The overarching strategy underlying the HCFC Phase-out Management Plan (HPMP, Stage-II) for Iran is based on the following:

- Reflect national context and priorities, national policies and the current political and economic country context;
- Prioritize sectors based on ExCom policies and achievement of country targets;
- Develop technology adoption mechanisms which is practical and to the extent feasible, based on self-reliant options;
- Develop and demonstrate a strengthened partnership between government and industry;
- Be dynamic and evolving, and to be open for revisions and adaptation as necessary in response to evolving situations
- Innovative through combined effort of the IAs and GIZ in the phase out in the RAC and foam sectors at individual companies instead of standalone activities

### Approach for Compliance

Iran will implement a staged approach for complying with the adjusted control schedule for Annex-C Group-I substances (HCFCs) under the Montreal Protocol.

### Stage-I (2011 to 2018)

HPMP Stage-I activities relating to industry phase-out are at advanced stages of completion as of date. In Stage-I, taking into consideration revisions up to the 74th ExCom meeting, the country's estimated phase-out target is 164.4 ODP tonnes. This constitutes reduction of 43.2 % from the starting point for Iran. It must also be noted that the targets in the original agreement of Iran agreed in the 63rd ExCom meeting were revised in the 74th ExCom meeting and the maximum allowable total consumption of Annex C, Group 1 substances in 2018 is 266.35 ODP tonnes (70 % of baseline).

### Stage-II (2016 to 2023)

In the HPMP Stage-II period from 2016 to 2023, the focal areas for action were identified as follows:

- HCFC phase-out in foam sector resulting in complete phase-out of HCFCs in foam application. This will include phase-out of HCFCs from formal sector as well as informal sector.
- Addressing HCFC consumption in refrigeration and air-conditioning sector (manufacturing) on priority basis given the high consumption levels as well as consumption growth coupled with availability of low GWP energy efficient technologies. It must be noted that technical assistance support would be made available to a large number of SMEs to facilitate the process of their adoption of low GWP and commercially viable alternatives.
- Technical assistance to small SMEs combined with technology and equipment.
- Full conversion of companies in the commercial refrigeration sector.
- Addressing service sector to build capacity of service agencies for reducing HCFC use in servicing.
- Adopting a sectoral/sub-sectoral approach in the phase-out strategy to offer a level playing field to all market players.
- Providing project-monitoring support to ensure that HCFC phase-out activities are implemented in a systematic and phased-manner.

The Government of Iran proposes to use low GWP HC based technologies in foam sector wherever feasible. The Government after careful and thorough consultations with the industry recognizes the importance of safety while adopting flammable alternatives in different applications and in their strategy, would adopt measures to ensure that the alternatives are adopted in a safe manner. Under the proposed plan, the Government would phase-out HCFCs in different applications in the following manner.

**Table 5: Proposed Phase-out Plan for HPMP Stage II**

| Sectors | Technology options | Phase-out in manufacturing | Remarks |
|---|---|---|---|
| Unitary Air-conditioning | R-290, and other low GWP options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Commercial and industrial air conditioning | Cascade systems like NH3/HCs/low GWP-CO2, water, brine | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Refrigeration | HC and other low GWP technology options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Foam | HC, Water blown and other low GWP technology options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |

Note: In air-conditioning and refrigeration sector given the large number of SMEs, technical assistance support would be provided for conversion to HCFC free technologies. Limited project assistance is proposed to be provided for conversion projects.

Based on the above considerations, the following phase-out actions will be implemented:

(a) ***Foam and commercial refrigeration sector:*** In foam sector, the remaining eligible consumption amounts to 91.1 ODP tonnes (828.2MT). The total quantity of HCFC-141b that will be phased-out under Stage II is 87.9 ODP tonnes (799.4 MT) – includes both PU foam and commercial refrigeration sub-sectors as well as SMEs. Impact based on 2015 consumption would be 1,420 MT (156.2 ODP

tonnes). The innovative character of the Stage II is that pure foam companies as well as commercial refrigeration companies who are foaming are going to be joined in the technology and assistance programs, for a comprehensive sector phase out.

(b) ***Air Conditioning Sector***: The estimated consumption of HCFC-22 in air-conditioning applications including domestic and commercial air-conditioning is 11 ODP tonnes (200 MT). During the field survey, HCFC-22 consumption in 5 eligible companies amounted to 3.53 ODP tonnes (64.24 MT). These companies are engaged in manufacturing commercial / industrial air-conditioning equipment. Project funding is proposed to be included for these eligible companies for conversion to R-290, or other low GWP as a refrigerant. Technical assistance through information outreach on new technologies, targeted workshops/meetings for providing information on HCFC-22 free technologies and other schemes for encouraging SMEs to adopt HCFC free technologies are proposed to be used.

(c) ***Refrigeration Sector:*** The consumption quantities of ODS for refrigeration in the refrigeration sector are low. The consumption of HFC-134a is high. HCFC-141b is used by some of the companies for insulation foam blowing purposes. Field survey data during HPMP Stage-II shows that there are 51 companies consuming 400 MT and 315.7 MT of HCFC-22 and HCFC-141b, respectively in the year 2015. Of these 51 companies, 44 companies consume less than 10 MT of HCFC-141b. These companies produce commercial and industrial refrigeration equipment as well as chillers for commercial and industrial air conditioning.

Commercial refrigeration and air conditioning sector technology programme: considering the large amount of small companies and manufacturing support required. Several technologies sample including cascade systems for low GPW solutions will be produced. These technologies will be build up at several companies for different applications and technology shared through the whole sector. The technologies will then be shared with the educational institutes VTOC and University of Enghelab for capacity building in the design, manufacturing and servicing. A product stewardship will be setup to introduce EPR (Extended Product Responsibility). In combination with the introduction of non-disposable refrigerant cylinders to improve the traceability and monitoring.

The project funding for 51 enterprises is proposed to be provided for HCFC phase-out in refrigeration manufacturing. Training, and Technical assistance through information outreach on new technologies, targeted workshops/meetings for providing information on HCFC-22 free technologies, training and educational support for manufacturers service and design engineers, packages of equipment for conversion and other schemes for encouraging SMEs to adopt HCFC free technologies are proposed to be used. This in combination with the foam phase-out mentioned above.

(d) ***Air-conditioning and Refrigeration Servicing Sector:*** Refrigeration servicing sector is proposed to be addressed in this stage to ensure that the service sector enterprises have technical knowledge and equipment support to manage good servicing practices of the equipment. Further, to ensure sustainable phase-out in service sector, support is proposed to be provided for identified technical institutions for training service technicians.

In the current approach, the consumption of remaining consumption in industrial refrigeration and air-conditioning sector is proposed to be addressed through technical assistance provided to refrigeration and air-conditioning sector and service sector technical support. The consumption in these applications is primarily relating to installation and servicing. Further low GWP options that are cost-effective in terms of capital and operating costs are still under development (e.g., R-290 based equipment, $CO_2$ based equipment etc.). Given the above, such an approach is considered for a cost-effective phase-out strategy.

**Implementation Supervision, Management, Coordination and Monitoring**

The implementation of the HPMP (Stage-II) will be carried out using the national execution modality. The framework that was successfully used during the Stage-1 will be primarily used for supervision, monitoring and management of implementation, with changes as needed to respond to evolving situations. The National Ozone Unit will have the overall coordination role and will undertake the day-to-day implementation supervision and project management. The NOU will be supported by the Department of the Environment as well as national and international technical experts as needed. UNDP is designated as the implementing agency for the HPMP and will be responsible for project and financial management, as well as for providing technical and policy backstopping. UNDP will work closely with UNEP, UNIDO and Government of Germany on their respective components of HPMP Stage II.

**Total cost of HPMP Stage II is :**

**Table 7: IRAN HPMP STAGE II SUMMARY BUDGET BY TRANCHES (as originally submitted)**

| Agency | Sector | Total | 2016 | 2018 | 2020 | 2022 |
|---|---|---|---|---|---|---|
| UNIDO | PU Foam | $3,588,102 | $1,049,752 | $1,638,350 | $900,000 | |
| | RAC Servicing Sector (for UNEP) | $245,800 | $245,800 | | | |
| **TOTAL UNIDO** | | **$3,833,102** | **$1,295,552** | **$1,638,350** | **$900,000** | **$0** |
| | | | | | | |
| GIZ | PU Foam | $894,300 | $225,000 | $357,300 | $312,000 | |
| | Refrigeration Training | $2,365,000 | $475,000 | $625,000 | $850,000 | $415,000 |
| **TOTAL GIZ** | | **$3,259,300** | **$700,000** | **$982,300** | **$1,162,000** | **$415,000** |
| | | | | | | |
| UNDP | Foam | $2,939,170 | $607,390 | $1,371,780 | $960,000 | |
| | Refrigeration | $3,600,000 | | $2,400,000 | $1,200,000 | |
| **TOTAL UNDP** | | **$6,539,170** | **$607,390** | **$3,771,780** | **$2,160,000** | **$0** |
| | | | | | | |
| UNEP | Foam | $50,000 | $50,000 | | | |
| | Policy and Enforcement Capacity-building | $110,000 | $40,000 | $45,000 | $25,000 | |
| | Training and certification of RAC Service Technicians | $339,000 | $86,000 | $135,000 | $118,000 | |
| | Promotion of alternative technologies | $220,000 | $75,000 | $80,000 | $65,000 | |
| | Development of standards for products and services | $20,000 | $10,000 | $10,000 | | |
| | Monitoring, Coordination and Management | $150,000 | $50,000 | $50,000 | $50,000 | |
| **TOTAL UNEP** | | **$889,000** | **$311,000** | **$320,000** | **$258,000** | **$0** |
| | | | | | | |
| **UNDP** | PMU (NOU) | $628,000 | $151,500 | $166,000 | $154,000 | $156,500 |
| | | | | | | |
| **AGENCY** | | **TOTAL** | **2,016** | **2,018** | **2,020** | **2,022** |
| **TOTAL UNIDO** | | **$3,833,102** | **$1,295,552** | **$1,638,350** | **$900,000** | **$0** |
| **TOTAL Germany (GIZ Proklima)** | | **$3,259,300** | **$700,000** | **$982,300** | **$1,162,000** | **$415,000** |
| **TOTAL UNDP** | | **$7,167,170** | **$758,890** | **$3,937,780** | **$2,314,000** | **$156,500** |
| **TOTAL UNEP** | | **$889,000** | **$311,000** | **$320,000** | **$258,000** | **$0** |
| **GRAND TOTAL** | | **$15,149,372** | **$3,065,442** | **$6,878,430** | **$4,634,000** | **$571,500** |

**UNDP submitted table 7 above for approval of funds but the 77th ExCom approved the funds tranche wise as per the below table:**

| IRAN HPMP STAGE II SUMMARY BUDGET BY TRANCHES | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Agency** | **Sector** | **Total** | **2016** | **2018** | **2020** | **2021** | **2022** |
| UNIDO | PU Foam | $1,863,205 | $389,567 | $540,000 | $480,000 | $403,638 | $50,000 |
| | RAC Servicing Sector (for UNEP) | $240,000 | $84,000 | $44,000 | $44,000 | $44,000 | $24,000 |
| **TOTAL UNIDO** | | **$2,103,205** | **$473,567** | **$584,000** | **$524,000** | **$447,638** | **$74,000** |
| | | | | | | | |
| ITALY | PU Foam | $907,207 | $403,203 | $504,004 | $0 | $0 | $0 |
| **TOTAL ITALY** | | **$907,207** | **$403,203** | **$504,004** | **$0** | **$0** | **$0** |
| | | | | | | | |
| GIZ | PU Foam | $763,444 | $215,680 | $312,510 | $139,754 | $95,500 | $0 |
| | Refrigeration TA | $1,908,960 | $429,820 | $734,525 | $145,255 | $502,500 | $96,860 |
| **TOTAL GIZ** | | **$2,672,404** | **$645,500** | **$1,047,035** | **$285,009** | **$598,000** | **$96,860** |
| | | | | | | | |
| UNDP | Foam | $1,896,401 | $649,924 | $541,771 | $705,706 | $0 | $0 |
| | Refrigeration | $2,388,960 | $596,550 | $876,320 | $437,470 | $359,310 | $119,310 |
| UNDP | PMU (NOU) | $620,000 | $52,696 | $175,889 | $164,804 | $104,921 | $121,690 |
| **TOTAL UNDP** | | **$4,905,361** | **$1,298,170** | **$1,593,980** | **$1,307,980** | **$464,231** | **$241,000** |
| | | | | | | | |
| UNEP | Policy and Enforcement Capacity-building | $90,000 | $22,500 | $32,500 | $17,500 | $0 | $17,500 |
| | Training and certification of RAC Service Technicians | $320,000 | $88,350 | $77,350 | $79,450 | $0 | $74,850 |
| | Promotion of alternative technologies | $195,000 | $64,550 | $53,550 | $46,450 | $0 | $19,050 |
| | Development of standards for products and services | $20,000 | $3,000 | $5,000 | $5,000 | $0 | $7,000 |
| | Monitoring, Coordination and Management | $75,000 | $21,600 | $21,600 | $21,600 | $0 | $21,600 |
| **TOTAL UNEP** | | **$700,000** | **$200,000** | **$190,000** | **$170,000** | **$0** | **$140,000** |
| | | | | | | | |

| TOTAL PROJECT COST (Without IA support costs) | | | | | | |
|---|---|---|---|---|---|---|
| **TOTAL UNIDO** | **$2,103,205** | **$473,567** | **$584,000** | **$524,000** | **$447,638** | **$74,000** |
| **TOTAL ITALY** | **$907,207** | **$403,203** | **$504,004** | **$0** | **$0** | **$0** |
| **TOTAL Germany (GIZ Proklima)** | **$2,672,404** | **$645,500** | **$1,047,035** | **$285,009** | **$598,000** | **$96,860** |
| **TOTAL UNDP** | **$4,905,361** | **$1,298,170** | **$1,593,980** | **$1,307,980** | **$464,231** | **$241,000** |
| **TOTAL UNEP** | **$700,000** | **$200,000** | **$190,000** | **$170,000** | **$0** | **$140,000** |
| **GRAND TOTAL** | **$11,288,177** | **$3,020,440** | **$3,919,019** | **$2,286,989** | **$1,509,869** | **$551,860** |

# 1. OVERVIEW OF MONTREAL PROTOCOL IMPLEMENTATION IN IRAN

## 1.1 BACKGROUND

The Islamic Republic of Iran ("Iran") is an important country in the Middle East Region, with a population of about 82 million being the most populous country in the region and ranked 16th in the world. The economy ranks among the top three in the region and Iran is the second largest OPEC oil producer with the world's second largest gas reserves. Despite a long period of international isolation and economic embargo that has limited its access to long-term financing opportunities and technological improvements for its development needs, it has made progress albeit facing challenges similar to most large developing countries. As an ancient civilization, and an internationally important culture pole, Iran exerts a great deal of influence in the region and the world. The country's health and education indicators are high by regional standards. The literacy rate is more than 80 percent. Iran has a large social protection system with some 28 different social insurance and assistance programs benefiting large segment of the population. Notwithstanding some improvements in social indicators, the economy continues to confront major challenges. Labor market pressures continue to increase because of demographic dynamics, including growth in the labor supply and increased participation of women in labor force. Iran's economy is not generating enough jobs and furthermore, high inflation rates and price subsidies hinder efficiency, and structural impediments prevent private sector development.

Iran lies in western Asia. The climate distribution in Iran is 35.5% hyper-arid, 29.2% arid, 20.1% semi-arid, 5% Mediterranean, and 10% wet (of the cold mountainous type). Thus, more than 82% of Iran's territory is located in the arid and semi-arid zone of the world. The average yearly rainfall in Iran is about 250 mm, which is less than 1/3 of the average rainfall in the world (860 mm). In addition, this sparse precipitation is also unfavorable with respect to time and location. Another important climatic element is extreme temperature changes that sometimes range from –20ºC to +50ºC. Severe drought has also been recognized as a feature of I.R. of Iran's climate. In the last few years, the country has suffered severe desiccation and this lack of rainfall has resulted in extensive losses.

Environment has been one of the highest priorities of Iran. Environmental affairs are handled at a Vice Presidential level. The Environmental High Council reporting to the President includes two Vice Presidents, ten Cabinet Ministries, and the Attorney General. Given Iran's rapidly growing population and declining infrastructure quality, it faces major environmental challenges. Air pollution is a major urban environmental concern especially that caused by motor vehicles, which is the cause of serious health problems for its citizens. In an effort to overcome these challenges, the Government has taken a number of actions, including the installation of an air quality-monitoring network with stations in a number of provinces (Mashad, Esfahan, and Arak) and has initiated the revision of water and soil standards. In addition, the Government has allocated a budget to conduct economic valuations of the Iranian Ecosystem.

## 1.2 MONTREAL PROTOCOL (MP) IMPLEMENTATION IN IRAN

Iran committed to ODS phase-out in the early 1990s and it made the Montreal Protocol (Montreal Protocol) part of its constitutional laws (Official Gazette No. 13063 of 28/9/1368 AH (8 Dec. 1989) even before ratifying the protocol. Iran ratified the Vienna Convention for the Protection of the Ozone Layer and the MP on Substances that Deplete Ozone Layer in 1990. Subsequently, it ratified the 1990 London Amendment, the 1992 Copenhagen and the 1997 Montreal Amendment of the MP. Iran is classified as a country operating under Article-5 of the MP.

**Table 1: Ratification of the Montreal Protocol and its Amendments**

| Agreement/Amendment | Date of Ratification | In Force Since |
|---|---|---|
| Vienna Convention | 3 October 1990 | December 1990 |
| Montreal Protocol | 10 October 1990 | December 1990 |
| London Amendment | 4 August 1997 | November 1997 |
| Copenhagen Amendment | 4 August 1997 | November 1997 |
| Montreal Amendment | 17 October 2001 | November 1999 |
| Beijing Amendment | 14 February 2013 | February 2002 |

Source: Ozone Secretariat.

In addition to MP, Iran is a party to Biodiversity, Climate Change, Climate Change-Kyoto Protocol, and other international agreements relating to Desertification, Endangered Species, Hazardous Wastes, Marine Dumping, Ship Pollution and Wetlands. IR of Iran has signed, but not ratified the Environmental Modification, Law of the Sea and Marine Life Conservation.

## 1.3 HCFC PHASE-OUT MANAGEMENT PLAN STAGE-I

Iran prepared its HCFC phase-out plan in the form of HPMP Stage-I in the year 2010. This document was finally approved by the Executive Committee at its 73rd Meeting at a total funding level of USD 10.393 million. The total phase-out proposed to be achieved initially was 107.1 ODP tonnes that includes 41.4 ODP tonnes of HCFC-22 and 65.7 ODP tonnes of HCFC-141b. UNDP was the lead implementing agency, UNEP, UNIDO and Government of Germany (represented by GIZ Proklima) were cooperating agencies for this project. The project went through adjustments of project components that resulted in lower level of funding and higher quantities of phase-out – which essentially resulted in higher cost effectiveness for phase-out.

The final agreement translates to a funding level of USD 9.994 million and phase-out of 164.4 ODP tonnes, consists of 38.6 ODP tonnes of HCFC-22 and 125.8 ODP tonnes of HCFC-141b. HPMP Stage-I is currently under implementation and is almost complete in terms of implementation of project components. All funding approved under HPMP Stage-I have been received and at this stage, the country is reporting progress of activities and achievement of targets through independent verification. The latest progress report and verification report for HPMP Stage-I was submitted to the 76th Meeting of the Executive Committee held in Montreal in May 2016.

## 1.4 STATUS OF IMPLEMENTATION OF STAGE I ACTIVITIES

The status of implantation of the investment projects by the various agencies is provided in the tables below.

**Table 2: HPMP STAGE I Completed//Near Completed Investment Projects**

| Name | Sector | IA | HCFC -141b (ODP) | HCFC-22 (ODP) | Status | Completion Date |
|---|---|---|---|---|---|---|
| Mehr Asl Manufacturing Corporation | Air-conditioning | UNDP | 0 | 29.3 | Completed | |
| Arghavan Kabir Co.(Kabir Panel) | Continuous Sandwich Panel | GIZ | 8.8 | | Completed | |
| Asre Sard Co. | Continuous Sandwich Panel | GIZ | 5 | | Completed | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Electrosteel Co. | Continuous Sandwich Panel | GIZ | 2 | | Commissioning of the equipment | Sep-16 |
| Kian Panel Co. | Continuous Sandwich Panel | GIZ | 2.42 | | Completed/ signature pending | Aug-16 |
| Nama Sazan Emrooz Co. | Continuous Sandwich Panel | GIZ | 3.9 | | Completed | |
| Parlo Co. | Continuous Sandwich Panel | GIZ | 2.42 | | Commissioning of the equipment | Sep-16 |
| Ammut Panel | Discontinuous Sandwich Panel | UNIDO | 1.1 | | Completed | |
| Paya Telecommunication Industries Co. | Discontinuous Sandwich Panel | UNIDO | 1.4 | | Completed | |
| Poushesh Fomdare Gharb Co. | Discontinuous Sandwich Panel | UNIDO | 2 | | Completed | |
| Himalia | Domestic refrigerator insulation foam | UNIDO | 13.2 | | Completed | |
| Emersun | Domestic refrigerator insulation foam | UNIDO | 34.1 | | Commissioning of the equipment | 31/12/2016 |
| Parsin Gostar Jonoub Co. | Discontinuous Sandwich Panel | UNIDO | 3.9 | | Completed | |
| Niksun | Domestic refrigerator insulation foam | UNIDO | 25.3 | | Completed | |
| Pakran | Other Rigid foam | GIZ | 2.9 | | | |
| Behdor Rangin Co. | Other Rigid foam | GIZ | 2.9 | | | |
| Azar Soozan Tabriz (Silwan) | Domestic refrigerator insulation foam | UNIDO | 2 | | Completed | |
| Gol Asay Sarma | Domestic refrigerator insulation foam | UNIDO | 2.6 | | Completed | |
| Golbin | Domestic refrigerator insulation foam | UNIDO | 1.2 | | Completed | |
| Soren Neishaboor houseware | Domestic refrigerator insulation foam | UNIDO | 1.3 | | Completed | |
| **Total ODP tonnes Phase Out Stage I** | | | **118.4** | **29.3** | | |

**HPMP Stage I Investment Projects Cancelled/Postponed**

| | | | | | |
|---|---|---|---|---|---|
| Urethane Systems Company | Systems House | UNDP | 0 | | Company did not want to continue with the project |
| Homa Sa'nat Co. | Discontinuous Sandwich Panel | UNIDO | 0.77 | | Removed - consumption too low. Funds reallocated to other eligible projects |
| Nobugh Sarmayesh Co. | Discontinuous Sandwich Panel | UNIDO | 3.8 | | Removed as not eligible. Funds reallocated to other eligible projects |
| Yakhchavan Co. | Discontinuous Sandwich Panel | UNIDO | 4.6 | | Removed as not eligible. Funds returned to MLF |
| USC | Other Rigid foam | GIZ | 3.3 | | Company did not want to continue with the project |
| Erish Khodro | Integral Skin foam | UNIDO | 2.42 | | Postponed to Stage II. Funds reallocated to other projects. |
| Sanat Foam Iran | Integral Skin foam | UNIDO | 2 | | |
| Royan Polymer Co. | Integral Skin foam | UNIDO | 1.38 | | |
| Zivar Khodro Co. | Integral Skin foam | UNIDO | 2 | | |
| **Total ODP tonnes** | | | **20.27** | | |

The progress on non-investment components by Implementing Agency is given in the narrative below.

***Stakeholder consultation and project management on foam***

Consultation with the stakeholders on project implementation is on-going. The companies solved the issue of local pentane supply with the support of the NOU and opening of local supply chains.

During HPMP Stage II this will be facilitated through implementation of distribution of pentane drums from system houses. Kaboodan Chemie is committed to provide this service for SMEs when support and technology is provided in Stage II. Further consultation with Kaboodan Chemie confirmed their commitment.

***GIZ Progress on activities in the refrigeration servicing sector:***

(a) Technology demonstration for supermarkets: A 2-day practical training workshop was held in October 2014, consisting of one-day theory and one-day practical training. Approximately 60 supermarket managers, who run up to 6 supermarkets were invited from 20 provinces in Iran. The theory consisted of basic refrigeration training so that the managers can improve the decision making regarding the use, repair and procurement of refrigeration systems, as well as decision making on the selection of qualified servicing companies. A refrigeration system was converted to leakage free and a complete condensing unit procured for the purpose to show the state-of-the-art industrial manufacture instead of on-site assembled units. Technical assistance and technology support are on-going for supporting the continuation of the measures demonstrated.

During the HVAC conference in Tehran, May 2016, technologies were presented and discussed to be applied in the 2nd phase. Large interest was found in the use of Natural refrigerants and solutions to phase out HFC's. The HVAC conference is the yearly event of the refrigeration sector in Iran.

This with the supermarkets servicing and for newly to be established supermarkets.

We continue to distribute the refrigeration servicing handbook for supermarkets on a regular basis for which a large interest exists. Considering the success of this handbook in Iranian language during the 2nd phase the same methodology will be used.

(b) Financial incentives for technology demonstration: Further supermarkets refrigeration systems have been converted to leakage free. For demonstration purposes, two complete new condensing units and equipment were bought, of which one was installed at Azadi and one at Theranpars. The purpose was to show that a factory made unit is qualitatively better than on-site built units. Equipment and parts were bought and servicing provided for the supermarkets. The equipment is performing well and leakage has been reduced to practically zero. Activities have been finalized although the exercise of facilitating the supply chain continued. Consultations with international suppliers are on-going and several international companies are re-establishing offices to improve the supply chain of refrigeration parts. This will facilitate enormously the Stage II with regard to availability and technology of equipment and parts.

(c) Development of tools and guidelines for electronic download: Book published June 2015 and 3000 hardcopies printed in Iranian language. The book has received acceptance by as well as professionals, supermarkets management and training institutes. It contains i) Basic refrigeration and leakage tight conversion of refrigeration systems including experience gained in Iran through monitoring and visits to the supermarkets; ii) Servicing refrigeration systems; iii) Sealed system design; iv) Leak control; and v) Rules and regulations for refrigerated food in Iran. The book is being continuously distributed to stakeholders and information collected by refrigeration experts for improving the book for a future second edition.

(d) Certification and standards development: The book mentioned above contains the standards and guidelines. There is interest to harmonize the marking and labelling. A meeting was held at the NOU with the major importers of refrigerants for unification of the refrigerant bottles marking and labelling. This activity will continue to see how a practical implementation can be achieved, considering that refrigerants are imported and therefore regulations need to be put in place. Further to our consultations with refrigerant suppliers initiatives are taking off for the introduction of re-usable refrigeration bottles. A refrigerant supplier is advancing with the setup in their factory and could be one of the firsts to be supported in the activity for Stage II.

Support is provided and consultations on-going with respect to IEC standards and their implementation.

(e) Technical management assistance: Project management is ongoing in close consultation with the NOU.

(f) Monitoring and documentation system, surveys, logbooks: Logbooks and specific documentation for each condensing unit were prepared and provided to the supermarkets.

More details can be found in the attached Annex of GIZ project description.

***UNEP progress on non-investment activities:***

As part of establishment of the regulatory instrument, training through collaborative programs between RAC association, NOU and TVTO was performed during Stage I of HPMP. The RAC servicing sector, as the largest distributor and consumer of HCFCs, have been the main target of the training programs

during Stage I of HPMP. In fact, one of the major strategies over the RAC sector was institutional training to enhance technical knowledge of the servicing division. The main concept behind RAC training program was improving the quality of the work provided by the servicing sector to accelerate accomplishment of the phase out target.

Also, as part of training program, UNEP arranged courses for the trainers, to promote the knowledge of the servicing technicians. This course was held with the presence of 35 RAC industry trainers. The training programs included procedures for good practice services and standards for operational performance of equipment in RAC servicing sector.

For training the RAC servicing technicians, a three-day training workshop on Good Practices in RAC servicing sector was conducted by UNEP in close consultation and cooperation with the NOU and GIZ on 18 - 20 February 2013 at Karaj Instructor Training Centre & Technical and Vocational Researches. Trainers of provincial vocational training centers (34 trainers from 20 provinces) participated in this training. During this program, 5 trainers were selected by NOU to serve as trainers for training programs at the provincial vocational training centers. In September 2014, two groups of repair technicians in Mashhad received one-day training each on Good Practices in Refrigeration and Air Conditioning.

Also, two workshops on good practice in refrigeration and air conditioning were conducted in Sari city in Mazandaran Province on 24-25 February 2015. These workshops were organized with cooperation of Provincial DoE of Mazandaran Province as well as the Mazandaran TVTO. During the period 24-26 September 2013, the Montreal Protocol Enforcement Training (Training of Trainers) was held in Tehran. The second Training of Trainers, "Customs Officers Training Workshop", was held on 3-5 March 2014 with resource people from national enforcement authorities, UNDP, UNIDO, GIZ and UNEP. The NOU, with help of national resource people, commenced the provincial level customs trainings in August 2014.

A summary of training courses conducted by UNEP is provided in the table below.

**Table 3: Summary of Training Courses conducted by UNEP**

| Title/ Province | Number of Participants |
|---|---|
| Training of Trainers Workshop on Good Servicing Practice /Karaj Instructor Training Centre & Technical and Vocational Researches, Karaj | 34 |
| Training Workshop on Good Servicing Practice (Group 1)/Mashhad | 30 |
| Training Workshop on Good Servicing Practice (Group 2)/Mashhad | 30 |
| Montreal Protocol Enforcement Training (Training of Trainers)/Tehran | 60 |
| Customs Officers Training Workshop (Training of Trainers)/Tehran | 64 |
| Awareness and Training Workshop for Customs Officers of North West region/Urumia | 71 |
| Training workshops on good practice in refrigeration and air conditioning Group 1 (technicians from residential refrigeration system) | 45 |
| Training workshops on good practice in refrigeration and air conditioning Group 2 (beneficiaries from Air conditioning Industry) | 45 |
| Training Workshop on Good Practices (Domestic section) at Bandar Abbas | 36 |

| | |
|---|---|
| Training Workshop on Good Practices (Industrial section) at Bandar Abbas | 25 |
| Training Workshop on Good Practices (Domestic section) at Esfahan | 42 |
| Training Workshop on Good Practices (Industrial section) at Esfahan | 39 |
| Awareness Workshop On Energy Efficiency and HCFCs Phase-out in Refrigeration and Air-conditioning Sectors | 79 |

More details can be found in the attached Annex of project description of UNEP.

For the years 2013 – 2015, the progress reports and verification reports for HPMP Stage-I were submitted. Iran complied with their national consumption targets for the respective years.

**Financial report**

The following table presents the details of total funds approved up to the fourth tranche along with disbursement and commitments. From the table below, it can be seen that, to date, the disbursement is more than 86 % of the approvals on a cumulative basis up to the fourth tranche.

**Table 4 Statement of Expenditure as of end of July 2016 for Stage I of HPMP of Iran**

| Implementing Agency | Total up to fourth tranche (USD) | |
|---|---|---|
| | **Approved** | **Disbursed** |
| UNDP | 4,340,246 | 4,097,234 |
| UNIDO | 2,506,277 | $2,483,751 |
| Government of Germany | 2,885,815 | 2,885,815 |
| UNEP | 262,000 | 222,965 |
| **Total** | **9,994,338** | **9,689,765** |

** Per Decision 73/21, UNEP would returnUS$60,000 from this amount to the MLF towards the same amount that had not been accounted for in the national CFC phase-out plan (IRA/PHA/63/TAS/200), on the understanding that the corresponding activities of the HPMP would be implemented using the Government's own resources.*

*# Subject to update after the final financial report is prepared.*

## 1.5 POLICY AND REGULATORY FRAMEWORK

The Government of Iran introduced regulatory system to comply with MP objectives. The objective of the regulatory framework is to provide control over consumption and import of HCFCs to obtain phase-out targets. The main elements of the regulatory framework for HCFC phase-out involve: licensing system, quota system, certification scheme, codification system, provision of fiscal incentive and disincentives, labeling requirements.

- **Licensing and quota system:** Imports of HCFCs are already subject to import quota system. The Import Registration and Licensing System, which was set up through issuance of CLP on ODS Phase-out and its enforcement in March 2007, brought the Islamic Republic of Iran in compliance with MLF licensing system requirements. While the country has only imports of HCFCs, this licensing system includes licensing of HCFC imports and exports.

  The NOU closely consults and interacts with the Ministry of Industry, Mine and Trade and Customs Department to ensure completion and regular submission to NOU of the "Ozone Office Statistics Form" at the time of application. For the year 2015, NOU has collected information on

consumption of ODSs from Custom Department and Ministry of Industry, Mine and Trade and this data are reported after cross checking to the Ozone Secretariat under Article 7 data reporting requirements. The NOU continues follow-up for data collection and analysis by importers for registration for the import of HCFCs into the country.

- **Quota system**: NOU has established the quota system, which is operational from the year 2012. The quota system includes all HCFCs indicated in the Annex C Group I of the Montreal Protocol. The National Ozone Committee or its subcommittees decide the quota for each year. These subcommittee consists of representatives from different relevant bodies including Ministry of Industry, Mine and Trade, Custom Department and relevant unions of importers/users. The quota for the year for each substance is determined based on total consumption with view to achieve HCFC phase-out targets for coming years and the protocol schedules applicable to Islamic Republic of Iran. The specified amount is communicated to the relevant organization and ministries prior to the beginning of subsequent year.

  Importers need to fill out the Statistics Form for Ozone Layer Protection Unit for Import in the Ministry of Industry, Mine and Trade and the Custom Dept. These forms are periodically submitted through the Ministry of Industry, Mine and Trade and Custom Department to NOU to make sure that the country is in compliance with the allocated quota. The strict control is in place through coordinated actions by NOU and the above-mentioned organizations.

  The specified amount for quota is communicated to the Ministry of Industry, Mine and Trade (MIMT) and Customs department for action. Before MIMT issues the import license to the registered importer, they inform NOU who approves the importer and quantity. Quotas are given to importers on a first come first serve basis with a cap of 45 MT per import valid for 3 months. After proving that import has taken place, additional import permission is given after checking the balance left.

  Licensing and quota system are introduced on the basis of the new policy and regulatory framework to provide official control on the import registry system. The regulatory framework is to accelerate obtaining the HCFC phase-out targets by reducing the import and consumption of ODS. Therefore, the main elements of the licensing and quota system include:

  - **HCFC supply control:** The HCFC supply is regulated through quota system. The objective of the quota system is to limit the quantity of HCFC, which is to be imported. The quantity of HCFC import throughout the year is defined based on the accelerated phase-out schedule as well as according to the HPMP targets. In fact, quota provides control over the HCFC supply system. In line with decision 63/17, the Government of Islamic Republic of Iran confirms that an enforceable system of licensing and quotas for HCFC imports and exports is in place and the system is capable of ensuring the country's compliance with the HCFC phase-out schedule.

  - **HCFC demand control:** The demand of industries and consumers for HCFCs is provided through importing the substances. The import companies are required to register their requirements of HCFC to get the necessary authorization from the licensing authority prior to placing their HCFC order. The licensing procedure helps NOU keep track of the importers and the market demand for HCFCs.

- **Certification Scheme**: The certification scheme is introduced with the objective to improve the technical knowledge of the ODS related sectors. The activities incorporate the certification program are:

- **Issuance of mandatory training certification**: RAC association is involved in issuance of regulations to motivate technicians in participation of training courses. Labors need to successfully pass a technical exam, which is held by RAC association, prior to official startup of their work.

- **Development of standards for adoption of efficient equipment**: RAC association in collaboration with TVTO has established standards for efficient performance and operation of equipment.

- **Development of standards for certification of technicians**: RAC association in collaboration with TVTO has published standards that technicians require to have knowledge about in their field of expertise.

- **Development of national standards for HCFC-free construction**: Ministry of Housing and Urban Development (MHUD), as the main building construction authority, has cooperated with municipalities and TVTO in development of national technical standards for HCFC-free design and construction of buildings.

- **Provision of fiscal incentive and disincentives**: The financial incentives are mainly import tax exemption or reduction of the import duties to encourage environmental-friendly usage of technology. Therefore, industries that convert to non-ODS technologies would be exempted from import tax. Also import duties of non-ODS appliances i.e. compressor, chiller, refrigerators, etc. was reduced. On the other hand, import of ODS-containing appliances are banned and taxes on imported ODS has increased.

- **Codification (HS Codes)**: To improve the control over import and export of the related substances, codification of all ODS through a national system was performed. The HS codes are included in the Import and Export Book of Regulation and the codes are used for assigning import license for individual HCFCs to importers

- **Labeling Requirements**: As part of CLP, labeling of the appliances containing ODS with indication of the scientific and commercial name of the substance is required. Also, industries with converted technology and replaced ODS with non-ODS need to visibly indicate "Ozone-Friendly" on their products. Labeling of the products eases controlling of the ODS consumption in industries.

- **Others**: Other regulations relating to prohibition of imports and manufacturing of ODS based products are under active consideration by the NOU. These are periodically discussed during consultative meetings with implementing agencies involved in HPMP implementation. Priority areas under consideration are prohibition of manufacturing HCFC based air-conditioning equipment and prohibition of usage of HCFC-141b in manufacturing foam products including usage of pre-blended polyol using HCFC-141b as blowing agent. These regulations will be aligned to date of cessation/prohibition of manufacturing of the said products.

  Currently HCFC alternatives (e.g., HFCs and HFC-based mixtures, hydrocarbons and others) are not subject to licensing and quota.

## 1.6 HCFC CONSUMPTION AND PRODUCTION

HCFCs are not produced in the Islamic Republic of Iran and are imported. Consumption of HCFCs for the year 2013 - 2015 is given below.

**Table 5: Consumption of HCFCs in Iran**

| Substance | 2013 | | 2014 | | 2015 | |
|---|---|---|---|---|---|---|
| | MT | ODP tonne | MT | ODP tonne | MT | ODP tonne |
| HCFC-22 | 2,886.94 | 158.78 | 2,666.78 | 146.67 | 2,783.22 | 153.08 |
| HCFC-141b | 1,805.97 | 198.66 | 1,777.00 | 195.47 | 1,420.00 | 156.20 |
| **Total** | **4,692.91** | **357.44** | **4,443.78** | **342.14** | **4,203.22** | **309.28** |

*Note: Article 7 data reports and verification reports*

As mentioned in the HPMP document, import of HCFC blends is negligible. The imports of HCFC blends are controlled under HCFC licensing and quota system.

Imports of pre-blended polyol containing HCFC-141b as foam blowing agent is not licensed in the Islamic Republic of Iran. Also, import of polyol pre-blended with HCFC-141b is almost nil. The manufacturers of foam products procure HCFC-141b from existing importers and undertake blending at their premises or procure pre-blended from local system houses. HCFC-141b based pre-blended polyols are not exported from the Islamic Republic of Iran.

The break-down of distribution of HCFC-22 and HCFC-141b consumption in different sub-sectors/uses for the year 2015 is given below.

**Table 6: Break-down of HCFC Use by Sub-sectors for 2015 (MT)**

| | RAC – Manufacturing | RAC – Servicing | Foam | Total |
|---|---|---|---|---|
| HCFC-22 | 1,310.99 | 1,448.52 | 24.49 | **2,784.00** |
| HCFC-141b | 638.72 | - | 781.28 | **1,420.00** |
| **Total** | **1,949.71** | **1,448.52** | **805.77** | **4,204.00** |

As the country plans to diversify its economy and considering that the implementation of Iran's Five-Years Social–Economic Plan targeted at 2015, an industry growth is expected during 2013-2015 and the average growth rate of Gross National Product (GNP) has been projected to be 8% at the end of 2015. The access of the domestic industry to raw material and new developed technologies and goods is expected to be facilitated in a short time span due to removal of the sanctions and recently emerged openings. Due to the new situation, the improvement in the business infrastructures including global insurance of goods, shipping and accessing to the global banking system contribute to the projected 8% economic growth. The distribution of the 2015 use for HCFC-141b and HCFC-22 are about 33.8% (1,420 MT) and 66.2% (2,784 MT) respectively. One can see decrease in consumption of HCFC-22 and HCFC-141b consumption levels mainly due to (a) implementation of phase-out projects in foam and RAC sector and (b) stricter controls/restrictions on imports of HCFCs.

Consumption trends of HCFC-22 and HCFC-141b are given below:

- HCFC-22 – the consumption of HCFC-22 is decreasing over the period 2013-2015 due to implementation of HCFC-22 phase-out project and controls/restrictions on HCFC imports. The equipment using HCFC free technologies in the market mainly use R-410A and R-407C as refrigerants.

- HCFC-141b – the consumption of HCFC-141b is also decreasing as a result of applying quota system. Implementation of conversion projects in foam section is contributing to the reduction of consumption. The equipment using HCFC free technologies in the market mainly use HCs.

At present, all imports of raw materials are delayed due to payment requirements and export license award. All payments have to be done in advance by TT and this means higher costs for the companies. Furthermore, all exports to Iran are subject to award of an export license which takes considerable time. This constrains the consumption situation of HCFCs in the country.

The price of HCFC-22 and HCFC-141b in the market collected through field survey is given below. The price trends are primarily governed by demand supply situation and international price trends of these substances, besides commercial practices adopted by the industry.

**Table 7: Price of HCFCs in 2015**

| Refrigerant | 2015 |
|---|---|
| HCFC-141b | 2.60 USD/kg |
| HCFC-22 | 3.31 USD/kg* |

Costs for HCFC result from investigation beneficiaries during survey of companies 2015.

The price of HCFCs fluctuate depending upon market factors such as availability, demand-supply in the global market etc.

HCFCs are imported and sold in the domestic market either directly to the end-user (e.g., manufacturer of HCFC based equipment, agencies installing HCFC based equipment) or through a distribution network of retailers / chemical products selling companies. In Iran, HCFCs are sold through the distribution network of retailers and chemical products selling companies.

GIZ has purchased during the activities with the supermarkets HCFC-22 on the local market for $3.31/Kg.

## 1.7 HCFC USE IN IRAN

As mentioned earlier, HCFCs are mainly used in manufacturing and servicing refrigeration and air-conditioning, foam for refrigeration and air-conditioning appliances and foam products. During the survey, no HCFC use was reported in solvents, aerosol and fire-fighting applications. The following paragraphs provide detailed estimates of HCFCs used in different applications in Iran.

### 1.7.1 Overview Refrigeration and Air-Conditioning Sector

The following sections presents details of HCFC-22 used in Refrigeration and Air-conditioning applications in Iran. As mentioned earlier, consumption of HCFCs other than HCFC-22 in Iran is negligible. Therefore, the section presents details of HCFC-22 usage in Iran.

It must also be noted that while data of registered enterprises engaged in RAC equipment manufacturing shows more than 500 enterprises in this business, during field survey, it was noted that many of these enterprises are not active in manufacturing activities. During the field survey, all attempts were made to cover all active enterprises engaged in RAC equipment manufacturing / assembly. The data presented below is based on field survey data collected and industry expert inputs obtained during data collection process.

**Air-conditioning**

Unitary air-conditioning

The estimated sales of residential air-conditioners in Iran is more than 800,000 to 1 million per annum. One company, namely Mehr Asl, Manufacturing Corporation was provided funding support for HCFC-22 phase-out in residential air-conditioner phase-out in Iran. The company converted to R-410A. There are an estimated number of more than 30 enterprises importing and assembling HCFC based unitary air-conditioning equipment in the country.

The products are mainly sold in the local markets. Some quantities are exported to Article 5 countries in Asian, Middle Eastern and African regions. With the recent economic development, the situation could change and more imports/exports of air-conditioners can be expected from Iran.

Unitary air-conditioning applications form a very significant proportion of national consumption of HCFCs- both as initial charge and recharge. It is also known that currently, in very limited quantities, HCFC free alternatives (e.g., R-410A, R-407C) are being used in the markets – mainly imported from countries in the region. Given the long life of this equipment, they are expected to consume HCFCs over long duration of time (say more than 15 years) for servicing, if not addressed for HCFC phase-out.

Price of power is an important factor that is expected to affect demand of HCFCs in the country. Any policy changes in the Government that results in increase in power price would affect the HCFC based RAC equipment demand in Iran. It must also be noted that as a substitute to air-conditioners, water-based air-cooled units are widely used in Iran, wherever possible.

**Commercial and industrial air-conditioning (including chillers)**

Commercial air-conditioning equipment are largely used in commercial establishments including business centers, business establishments, supermarkets, restaurants etc. These equipment have capacities larger than domestic air-conditioning equipment. These products are manufactured both locally and imported. The estimated consumption of HCFC-22 is low compared to domestic air-conditioning as production volumes are low compared to domestic air-conditioning.

Industrial air-conditioning equipment produced in Iran essentially includes central air-conditioning requirement and chillers used in commercial and industrial enterprises in Iran. Like industrial refrigeration equipment, these equipment use HCFC-22 and other non-HCFC based refrigerants.

The split between commercial and industrial refrigeration manufacturing companies is difficult to make. The reason being that in both sectors, chillers are being used and differences are mainly in size of the units. During the second phase the producers of chillers of the commercial sector are included in the HPMP.

Compressors for commercial and industrial air-conditioning equipment are imported into Iran. There is no local manufacturer of compressors in the country. Components for installation are locally procured from different suppliers and installed at the customer's premises.

There are more than 100 enterprises, which are installing HCFC-22 based industrial air-conditioning equipment in the country.

The total use of HCFC-22 from the survey in the manufacturing sector has been determined at 400 MT HCFC-22.

**Refrigeration**

The commercial refrigeration sector in contrary to the domestic refrigeration or domestic air conditioners is mainly supplying equipment not charged with refrigerant. The conversion of this sector to low GWP will have an additional beneficial aspect that the overall consumption reduction will conservatively be double the actual consumption of the beneficiaries. The reason being that large equipment's are charged by associate installation companies before the servicing sector is entering into the merit. Therefore, that the estimate consumption reduction is conservatively estimated double the actual consumption and Iran commits to this.

In Iran, mainly HCFC-22 is consumed as refrigerant only in commercial, industrial and transport refrigeration and air-conditioning applications.

**Domestic refrigeration**

Producers of domestic refrigeration applications do not consume HCFC-22 as a refrigerant.

**Commercial refrigeration**

Commercial refrigeration equipment are used in different parts of Iran primarily for refrigeration of food items and beverages. The enterprises in this sector primarily manufacture equipment using HFC-134a and HCFC-22. During the survey, there were about 51 enterprises identified in this sub-sector consuming HCFC-22 as the refrigerant.

Total consumption of HCFC-22 in commercial refrigeration applications is estimated to be 400 MT in 2015.

**Industrial refrigeration**

Industrial refrigeration equipment produced in Iran essentially includes cold storages and refrigeration equipment used in facilities needing low temperature applications (e.g., food products, dairy products, seafood industry, ice machines etc.). These equipment operate using different types of refrigerants e.g., ammonia, HFCs, HCFCs, etc. In Iran, there are some very specific applications that use Ammonia, Carbon dioxide applications have not been found. For the ammonia applications there are few engineering companies who assemble these units on a project basis.

As mentioned before the commercial sector manufacturers of refrigeration equipment are also providing equipment for the industrial sector. Therefore, that the consumption of 400 MT is allocated to both the sectors and we do not differentiate between them.

There is no local manufacturer of compressors in the country. Compressors for industrial refrigeration equipment are imported into Iran. Components for installation are locally procured from different suppliers and installed at the customer's premises.

While HCFC-22 is used in different applications, in the recent past, there is increasing use of equipment based on HCFC free alternatives such as Ammonia in installations. Particularly, in large installations used in industrial areas outside main cities or towns, ammonia based installations are increasingly being installed. It must be noted that these refrigeration and air-conditioning equipment have high levels of

charge of refrigerants. This refrigerant is charged on-site and mostly done by companies who are not the manufacturers.

**Transport refrigeration**

There are different large manufacturers, namely Mehran-Sard, Pakran, Sorena besides non-eligible companies producing transport air-conditioning applications using HCFC-22. One other company, namely Sard Sir, was producing transport air-conditioning applications earlier but they have reported discontinuation of manufacturing. Besides the above, there are some organizations who handle installation and servicing HCFC-22 based transport air-conditioning applications.

During the survey, most companies imported the refrigeration units from China and Korea. The distributor of Thermoking and also Carrier in the past is the company Mammut. During the last years the servicing of Thermoking units has continued. The companies have indicated that they would be interested in switching from HCFC-22 to low GWP in transport refrigeration applications. This is primarily due to non-availability of low GWP technologies that can be adopted in these applications.

**Servicing sector**

The servicing and maintenance of RAC appliances is using more than 50% of the Iranian annual HCFC-22 consumption. This consumption is primarily driven by population of HCFC using equipment mainly in unitary air-conditioners and other RAC applications using HCFC-22. With the phase-out of HCFC-22 consumption in manufacturing operations, this percentage is expected to slow down further. Specifically when the large chiller units used in central air-conditioning and commercial/ industrial are converted the servicing amounts will drastically reduce.

The main areas related to the HCFC consumption in the servicing sector are:

a. Air conditioning –Window and split air-conditioning units in Iranian households, working offices, commercial establishments and hotels.
b. Commercial sector - Small and medium sized equipment which present high rates of refrigerant leakage evidenced during the activities of the GIZ with supermarkets. The high leakage is also expressed in through high energy consumption with chillers used for AC systems in hotels and supermarkets.
c. Industrial sector - Large cold rooms and refrigeration systems, mainly in industries engaged in food processing and some other manufacturing operations, process cooling and AC in industrial sector (in hotels and in large public buildings).

All 31 provinces in Iran have local refrigeration unions which register and certify refrigeration technicians and servicing companies to operate servicing and maintenance in the domestic and commercial refrigeration sectors.

The range of servicing, maintenance and installation operations among HCFC end-users includes a wide range of enterprises from different major industries:

- Food, beverage (refrigeration),
- Chemical factories, oil by products industry (AC and chillers),
- Textiles, clothing and leather manufacturers (AC),
- Paper producers, press articles (chillers),

- Big public and private buildings (banks, hotels, government buildings, offices) are also significant end users where maintenance and servicing is regularly required.

There are about 4,000 registered workshops in Iran but the estimated number of operating servicing workshops is more than 10,000 in the country. These workshops have RAC service technicians working in the country using HCFC-22 for servicing equipment.

At present, there is no direct source for measuring HCFC-22 consumption data for servicing in RAC applications. During the survey information on use of HCFC-22 in manufacturing equipment was collected through field survey and this is expected to account for most of the consumption of HCFC-22 in manufacturing. Allowing for a margin of error of 10% for small enterprises which were not completely covered during the survey, the estimated consumption of HCFC-22 in manufacturing is about 1,310.99 MT in 2015. The estimated consumption of HCFC-22 in servicing is about 1,448.52 MT in 2015.

Ministry of Labor in the country coordinates existing refrigeration training programs and infrastructure.

A brief overview of the same is given below.

- There are 31 Vocational Training centers in each Iranian province – also called provincial TVTOs – which are under supervision of TVTO HQ in Tehran.

- 400 Vocational Training institutes located in different cities in Iran give required training to technicians in different subjects. These smaller training institutes fall under Government control and are under supervision of TVTOs in the province centers. Both institutions are under authority of Ministry of Labor in Iran. It should be noted that only 50 of these 400 local vocational training centers are competent to give the technical refrigeration trainings and have skilled trainers in order to provide professional refrigeration training. There are still many training centers which do not have the required competencies to provide requisite training support to the technicians.

- Vocational Training centers have trainers who are responsible to give technical training to the technicians in different fields such as Refrigeration. Before opening a servicing workshop (in any field), the owner or technician needs to have a certificate in refrigeration by the local TVTOs. Having received the certificate, the owner has to get the working permission from the relevant unions to open the servicing workshop. In some cases, like in Tehran, the Refrigeration Union and the Union Training Board have the authority to train the new technicians in the Union to certify technicians.

- Local trainers in 400 cities come every year to Tehran to attend at least 120 hours training on different matters.

- The Central TVTO in Tehran which is responsible to train other TVTO trainers is ready to include all Montreal Protocol related training issues including HCFCs phase-out in their training standards. Training and awareness materials will be sent to them to be distributed to their local trainers to be used in their training courses.

- As these TVTOs have very good potential and existing infrastructures. it should be considered to include the center in the capacity building, awareness and training programs for HCFCs phase-out plans.

In addition to TVTOs, there are other training centers providing training to refrigeration technicians in Iran. An overview of the training infrastructure is presented below.

- ITC is the largest and the most equipped training center in Iran.

- Universities: Iranian University of Science and Technology, Arak campus (The University provides a HVAC course under the supervision of Ministry of Science, Research and Technology. The main purpose of the course is to train and educate with O&M orientation of HVAC & R systems), ShahidRajai Teacher Training University (The university is under the supervision of two ministries: Ministry of Science, Research and Technology and Ministry of Education and Training. The main purpose of the university is to train teachers. but semi-professional academic activities have been started in recent years. There is a refrigeration laboratory in mechanical engineering department but without state of art equipment.).

- Private Training Institutes: Private Training Institutes in Tehran providing HVAC & R courses: Adiban Institute, which organizes IRCEO courses (www.adiban.net), Kaashaaneh institute (www.kaashaaneh.ir), HVAC House, a newly established institute that belongs to Mr. Dehghan owner of 3 HVAC magazines.

There are two Refrigeration and Heating, Ventilation and Air-Conditioning (HVAC & R) related institutions in Iran. A brief overview of these institutions is presented below.

- Iranian Syndicate of Heating, Refrigeration and Air-Conditioning Industries (www.ishrai.ir): mostly dealing with daily issues of HVAC&R manufacturers. It has 115 members. However, it is estimated that over 300 manufacturers are working in this field.

- Iranian Scientific-Engineering Society on Heating and Refrigeration (ISESHR) (www.iseshr.org): founded about 2 years ago by a team of 7 universities and government members. It is working under the supervision of Ministry of Science.

Their active involvement through a network with the training institutions will help in fast-track outreach of training activities that would be undertaken while phasing out HCFCs in Iran.

A summary of usage of HCFC-22 in RAC applications in manufacturing and servicing for the year 2015 is provided in the table below.

**Table 8: Summary of HCFC-22 Consumption in Iran in RAC Applications in 2015**

| Sectors/subsectors | 2015 Consumption (MT) |
|---|---|
| Air-conditioning | |
| Residential Air-conditioners | 200 (a) |
| Commercial Air-conditioning | # |
| Industrial Air-conditioning (Chillers) | |
| Refrigeration | |
| Domestic Refrigeration Equipment | 0 |
| Commercial Refrigeration Equipment | 400# |
| Industrial Refrigeration Equipment | # |
| Transport Refrigeration Equipment | 15.7 |
| Servicing | 1,662.73 |
| Total | **2,272.73** |

Note: (a) Manufacturing use is based on survey data collected from manufacturers of RAC equipment. Service use is based on best estimates of HCFC-22 for servicing equipment in these applications. (b) In addition to the above, HCFC-22 is used in manufacturing XPS as explained below. This HCFC-22 is however not refrigerant grade therefore difficult to identify.

#This consumption as explained earlier would include commercial refrigeration and air-conditioning and industrial refrigeration equipment.

### 1.7.2 Overview Foam Sector

The survey for the HPMP Stage II in Iran began in June 2014. An interagency committee, including implementing agencies and the NOU, assigned specific sectors for each agency. UNIDO covered the domestic refrigerators, discontinuous sandwich panels, integral skin foam, spray foam and other small foam applications. GIZ concentrated on the commercial refrigeration sector which included also companies providing commercial and industrial air-conditioning systems.

The commercial refrigeration sector survey was conducted thoroughly as in the Phase I we had no projects in this sector. Interactions occurred during the servicing projects with the supermarkets as the companies supply equipment and refrigeration systems. Furthermore, some of the companies were known due to the servicing component of phase I.

For the foam sector we have companies working only with foams and companies using foams in refrigeration equipment. The companies in the commercial sector have primarily the objective of providing products for refrigeration purposes. In this sector UNDP and GIZ will work closely together. The survey began with a list of 420 companies, resulting from the compilation of various data base available at the NOU, the Ministry of Industry and other sources. A first screening reduced the number to 226 companies likely to use HCFC-141b.

Through onsite visits we come to the conclusion that only 166 companies are using HCFC-141b, as follows:

1. Domestic refrigerator 43 companies
2. Commercial Refrigeration 43 companies
3. Discontinuous sandwich panels 26 companies
4. Integral skin foam 15 companies
5. Other applications 39 companies

Of these, 72 companies are not eligible because HCFC-141b based equipment were installed after 21.09.2007. Therefore, 94 companies (166-72) using HCFC-141b are eligible for funding, these in the: domestic refrigeration, commercial refrigeration, discontinues panels, integral skin and other applications (spray, water boilers, solar heaters, etc.).

Specifically, for the Commercial Refrigeration sector (CRF), we have identified 51 companies, of those 43 are consuming HCFC-141b, and are eligible, the remaining 8 companies are not using foam however, these 8 companies are eligible for the servicing sector; conversion from HCFC-22 to low GWP.

The distribution of the foam companies is shown in Table 9.

**Table 9: Foam Company's Consumption and Size**

| Sector | No. of Companies | HCFC-141b (MT) | No of companies < = 10 MT | No of companies < 20 MT |
|---|---|---|---|---|
| Rigid | 3 | 11.2 | 3 | 0 |
| Domestic refrigeration | 32 | 334.4 | 23 | 9 |
| Discontinuous panel | 8 | 76.4 | 6 | 2 |
| Integral foam | 6 | 57.7 | 3 | 3 |
| Spray foam | 2 | 4.0 | 2 | - |
| **Total** | **51** | **483.7** | **37** | **14** |

We note that a large amount of companies has a consumption of less than 10 MT. The distribution of companies according to the consumption is shown in the table hereunder.

**Table 10: Foam Companies Distribution according to Consumption.**

| Consumption | No of Companies | HCFC-141b (MT) | ODP Tonne |
|---|---|---|---|
| Companies <= 10 MT consumption | 37 | 194.6 | 21.4 |
| Companies <= 20 MT consumption | 9 | 123.8 | 13.6 |
| Companies > 20 MT consumption | 5 | 165.3 | 18.2 |
| **Total** | **51** | **483.7** | **53.2** |

The commercial refrigeration sector where foams are used shows a similar distribution although only one company has a consumption of >20 MT.

**Table 11: Distribution according to Consumption in the Commercial Refrigeration Sector.**

| | No. of Companies | HCFC-22 (MT) | HCFC-141b (MT) | HCFC-141b (ODP tonne) |
|---|---|---|---|---|
| Companies with no foam consumption | 8 | 48.5 | - | 0 |
| Companies consume <=10MT HCFC-141b | 36 | 266.0 | 196.4 | 21.6 |
| Companies consume <=20MT HCFC-141b | 6 | 69.3 | 96.9 | 10.7 |
| Companies consume >20MT HCFC-141b | 1 | 16.2 | 22.3 | 2.5 |
| **Total:** | **51*** | **400.0** | **315.7** | **34.7** |

*43 companies using HCFC-141b; 8 companies not using HCFC-141b; total 51 companies

For clarity reasons the overview of companies using foams, PU and CRF is shown in the Table 11 hereunder.

The foam conversion of the commercial refrigeration companies will be dealt with in this foam sector plan as many training, awareness and workshops are the same.

The refrigeration system conversions are dealt with in the commercial refrigeration sector plan.

**Table 12: Total Eligible Consumption for HCFC-141b and Refrigerant, All Sectors.**

| | No. of Eligible Companies | HCFC-22 (MT) | HCFC-141b (MT) |
|---|---|---|---|
| Total eligible companies 2015 | 102 | 400.0 | 799.4 |
| Total ODP tonnes eligible 2015 | | 22.0 | 87.9 |

**Summary total companies and total consumption**

In conclusion, during the survey we have assessed 420 companies; of these, 166 companies are using HCFC-141b (total consumption 1,777 MT), of these, 72 companies are not eligible (977.6 MT); and 94 are eligible (799.4 MT).

In addition, we have 8 commercial refrigeration companies using HCFC-22. There are therefore a total of 102 companies to address during HPMP Stage II.

Table 13 below shows the total HCFC-141b consumption, eligible and not eligible.

**Table 13: Companies with HCFC-141b Consumption (2014, MT)**

| Sector | HCFC-141b Consumption |
|---|---|
| Domestic Refrigeration | 745 |
| Commercial refrigeration | 316 |
| Disc. Sandwich Panels | 452 |
| Integral Skin | 110 |
| Rigid Foam | 77 |
| Flexible Foam | 60 |
| Spray Foam | 10 |
| Solar Water Heater | 7 |
| **Total** | **1,777** |

The survey further highlighted that:

- The eligible companies technically and financially sound;
- Technology and R&D is often lacking;
- Clear guidance and support is required;
- Companies were looking for solutions and technical support to improve their products, especially for the commercial refrigeration companies.
- A relatively large number of companies, 72, with a total consumption of 977 MT of HCFC-141b, were established or expanded after September 2007 using HCFC-141b based equipment therefore, are not eligible for funding.

Technologies have been discussed with the companies and they have been informed about the different stages of the Ozone protection activities in the IR of Iran.

Spray foam companies were also part of the survey and two companies found eligible, for these companies water-blown technology is going to be proposed as a starting point.

Technology support will be in any case part of the non-investment measures

## 1.8 OTHERS

There is no reported consumption of HCFCs in aerosol, fire-fighting and solvent applications in Iran.

## 1.9 HCFC CONSUMPTION SUMMARY

Summary of HCFC consumption for the years 2015 is given in the table below.

**Table 14: Summary of HCFC Use in 2015 in Iran (MT)**

| Sectors / Sub-sectors | HCFC-22 | HCFC-141b |
|---|---|---|
| **Foam** | | |
| Rigid PU Foam (sandwich panel) | | 76.4 |
| Rigid PU Foam (others) | | 11.2 |
| Rigid PU Foam (spray) | | 4.0 |
| Integral Skin | | 57.7 |
| XPS | | |
| **Air-conditioning** | | |
| Residential Air-conditioners | 200.0* | |
| Commercial Air-conditioning | | |
| Industrial Air-conditioning (Chillers) | | |
| **Refrigeration** | | |
| Domestic Refrigeration Equipment* | | 334.4 |
| Commercial Refrigeration Equipment | 800.0 | 315.7 |
| Industrial Refrigeration Equipment | | |
| Transport Refrigeration Equipment | | |
| Servicing | 1,448.52 | |
| Ineligible Companies | | 977.6 |
| **Total** | **2,759.51** | **1,777.0** |

*Includes chillers also.

From the above table, one can observe the following:

- HCFC 22 manufacturing includes use of HCFC-22 in manufacturing air-conditioning equipment and refrigeration equipment. The commercial manufacturing sector produces as well as equipment for refrigeration and commercial and industrial air conditioning RAC. During the survey a clear split in sectors has not been possible and also not aimed at as the manufacturers need to be addressed over the complete range of products. Use in refrigeration equipment is limited to commercial and industrial refrigeration and transport refrigeration. Given that HCFC-22 was not fully addressed in HPMP Stage-I, there is a need to address HCFCs consumption.

- HCFC 22 used for servicing constitutes about 60 % of the total HCFC-22 consumption. This demand will continue to grow with ageing and growing population of HCFC-22 based equipment. Further, as a percentage of total consumption, service sector will continue to grow significantly, until manufacturing sector phase-out is completed. A phase-out in the commercial refrigeration sector which comprises also other sectors as mentioned would also reduce for the same amount the servicing sector consumption due to the installation of equipment. Combined with extensive servicing training, bans on pre-charged imported equipment substantial improvements of the course of time can be achieved with replacement of old equipment.

## 1.10 REMAINING ELIGIBLE CONSUMPTION FOR HCFCS

Table 15 below presents the remaining eligible consumption in Iran. This includes both manufacturing and servicing.

**Table 15: Remaining Eligible Consumption (ODP tonnes)**

| Particulars in ODP tonne | Starting Point | Phase-out in HPMP Stage-I | Remaining Consumption after HPMP Stage-I |
|---|---|---|---|
| HCFC-22 | 163.6 | 38.6 | 125.0* |
| HCFC-141b | 216.9 | 125.8 | 91.1* |
| **Total** | **380.5** | **164.4** | **216.1** |
| % of Starting Point | | 43.2% | |

*In metric tons, the above amount to 2,272.78 MT of HCFC-22 and 828.2 MT of HCFC-141b, respectively.

The above factors need to be taken into consideration while designing the phase-out strategy and cost effectiveness for HPMP Stage-II.

# 2. HCFC PHASE-OUT STRATEGY AND ACTION PLAN FOR STAGE-II TARGETS

## 2.1 PRINCIPLES

The overarching strategy underlying the HCFC Phase-out Management Plan (HPMP, Stage-II) for Iran is based on the following:

- Reflect national context and priorities, national policies and the current political and economic country context;
- Prioritize sectors based on ExCom policies and achievement of country targets;
- Develop technology adoption mechanisms which is practical and to the extent feasible, based on self-reliant options;
- Develop and demonstrate a strengthened partnership between government and industry;
- Be dynamic and evolving, and to be open for revisions and adaptation as necessary in response to evolving situations
- Innovative through combined effort of the IAs and GIZ in the phase out in the RAC and foam sectors at individual companies instead of standalone activities

## 2.2 APPROACH FOR COMPLIANCE

Iran will implement a staged approach for complying with the adjusted control schedule for Annex-C Group-I substances (HCFCs) under the Montreal Protocol.

**Stage-I (2011 to 2018)**

HPMP Stage-I activities relating to industry phase-out are at advanced stages of completion as of date. In Stage-I, taking into consideration revisions up to the 74th ExCom meeting, the country's estimated phase-out target is 164.4 ODP tonnes. This constitutes reduction of 43.2 % from the starting point for Iran. It must also be noted that the targets in the original agreement of Iran agreed in the 63rd ExCom meeting were revised in the 74th ExCom meeting and the maximum allowable total consumption of Annex C, Group 1 substances in 2018 is 266.35 ODP tonnes (70 % of baseline).

**Stage-II (2016 to 2023)**

In the HPMP Stage-II period from 2016 to 2023, the focal areas for action are identified:

- HCFC phase-out in foam sector resulting in complete phase-out of HCFCs in foam application. This will include phase-out of HCFCs from formal sector as well as informal sector.
- Addressing HCFC consumption in refrigeration and air-conditioning sector (manufacturing) on priority basis given the high consumption levels as well as consumption growth coupled with availability of low GWP energy efficient technologies. It must be noted that technical assistance support would be made available to a large number of SMEs to facilitate the process of their adoption of low GWP and commercially viable alternatives.
- Technical assistance to small SMEs combined with technology and equipment.
- Full conversion of companies in the commercial refrigeration sector.
- Addressing service sector to build capacity of service agencies for reducing HCFC use in servicing.
- Adopting a sectoral/sub-sectoral approach in the phase-out strategy to offer a level playing field to all market players.
- Providing project-monitoring support to ensure that HCFC phase-out activities are implemented in a systematic and phased-manner.

The Government of Iran proposes to use low GWP HC based technologies in foam sector wherever feasible. The Government after careful and thorough consultations with the industry recognizes the importance of safety while adopting flammable alternatives in different applications and in their strategy, would adopt measures to ensure that the alternatives are adopted in a safe manner. Under the proposed plan, the Government would phase-out HCFCs in different applications in the following manner.

**Table 16: Proposed Phase-out Plan for HPMP Stage II**

| Sectors | Technology options | Phase-out in manufacturing | Remarks |
|---|---|---|---|
| Unitary Air-conditioning | R-290, and other low GWP options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Commercial and industrial air conditioning | Cascade systems like NH3/HCs/low GWP-CO2, water, brine | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Refrigeration | HC and other low GWP technology options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |
| Foam | HC, Water blown and other low GWP technology options | 31 December 2022 | Manufacturing projects to be supported with project funding and for SMEs, technical assistance for conversion as well as manufacturing servicing training |

Note: In air-conditioning and refrigeration sector given the large number of SMEs, technical assistance support would be provided for conversion to HCFC free technologies. Limited project assistance is proposed to be provided for conversion projects.

Based on the above considerations, the following phase-out actions will be implemented:

(a) ***Foam and commercial refrigeration sector:*** In foam sector, the remaining eligible consumption among to 91.1 ODP tonnes (828.2MT). From the survey, eligible consumption was found to be 87.9 ODP tonnes (799.4 MT). The subsectors that consume HCFC-141b include integral skin foam, discontinuous sandwich panel, commercial refrigeration and domestic refrigeration companies. This includes 81 small and tiny enterprises (i.e., enterprises consuming less than 10 MT of HCFC-141b per annum). The total quantity of HCFC-141b that will be phased-out is 87.9 ODP tonnes (799.4 MT) – includes both PU foam and commercial refrigeration sub-sectors. Under this strategy, project costs have been estimated for the large companies and are presented in Annex A for foam sector. For SMEs, technical assistance on-site and through information outreach on new technologies, targeted workshops/meetings for providing information on HCFC-141b free technologies and other schemes for encouraging SMEs to adopt HCFC free technologies are proposed to be used. Together, the above activities would achieve a full phase-out of 799.4 MT (87.9 ODP tonnes) from the starting point and impact based on 2015 consumption would be 1,420 MT (156.2 ODP tonnes). The innovative character of the Stage II is that pure foam companies as well as commercial refrigeration companies who are foaming are going to be joined in the technology and assistance programs. For a comprehensive sector phase out.

(b) ***Air Conditioning Sector***: The estimated consumption of HCFC-22 in air-conditioning applications including domestic and commercial air-conditioning is 11 ODP tonnes (200 MT). HCFC-22 is consumed by a number of SMEs assembling air-conditioning equipment and the consumption of these enterprises are largely in the range of 5-7 MT of HCFC-22 per annum.

Details of accurate number of enterprises that are engaged in assembling air-conditioning equipment is not available.

During the field survey, HCFC-22 consumption in 5 eligible companies amounted to 3.53 ODP tonnes (64.24 MT). These companies are engaged in manufacturing commercial / industrial air-conditioning equipment. Project funding is proposed to be included for these eligible companies for conversion to R-290, or other low GWP as a refrigerant. Technical assistance through information outreach on new technologies, targeted workshops/meetings for providing information on HCFC-22 free technologies and other schemes for encouraging SMEs to adopt HCFC free technologies are proposed to be used.

(c) ***Refrigeration Sector:*** As mentioned earlier in the refrigeration sector, the consumption quantities are low. As mentioned in the earlier sections, the consumption of HFC-134a in refrigeration sector is high. HCFC-141b is used by some of the companies for insulation foam blowing purposes. Field survey data during HPMP Stage-II shows that there are 51 companies consuming 400 MT and 315.7 MT of HCFC-22 and HCFC-141b, respectively in the year 2015. Of these 51 companies, 44 companies consume less than 10 MT of HCFC-141b. These companies produce commercial and industrial refrigeration equipment as well as chillers for commercial and industrial air conditioning.

Commercial refrigeration and air conditioning sector technology program: considering the large amount of small companies and manufacturing support required. Several technologies sample including cascade systems for low GPW solutions will be produced. These technologies will be build up at several companies for different applications and technology shared through the whole sector. The technologies will then be shared with the educational institutes VTOC and University of Enghelab for capacity building in the design, manufacturing and servicing. A product stewardship will be setup to introduce EPR (Extended Product Responsibility). In combination with the introduction of non-disposable refrigerant cylinders to improve the traceability and monitoring.

The project funding for 51 enterprises is proposed to be provided for HCFC phase-out in refrigeration manufacturing. Training, and Technical assistance through information outreach on new technologies, targeted workshops/meetings for providing information on HCFC-22 free technologies, training and educational support for manufacturers service and design engineers, packages of equipment for conversion and other schemes for encouraging SMEs to adopt HCFC free technologies are proposed to be used. This in combination with the foam phase-out mentioned above.

(d) ***Air-conditioning and Refrigeration Servicing Sector:*** Refrigeration servicing sector is proposed to be addressed in this stage to ensure that the service sector enterprises have technical knowledge and equipment support to manage good servicing practices of the equipment. Further, to ensure sustainable phase-out in service sector, support is proposed to be provided for identified technical institutions for training service technicians.

In the current approach, the consumption of remaining consumption in industrial refrigeration and air-conditioning sector is proposed to be addressed through technical assistance provided to refrigeration and air-conditioning sector and service sector technical support. The consumption in these applications is primarily relating to installation and servicing. Further low GWP options that are cost-effective in terms of capital and operating costs are still under development (e.g., R-290 based equipment, $CO_2$ based equipment etc.). Given the above, such an approach is considered for a cost-effective phase-out strategy.

The following points may be noted.

- The Government will work systematically with industry and technical experts to make available cost-effective solutions for users of HCFC-141b in foam manufacturing. The systems houses will also be provided technical inputs and would be consulted for developing low GWP polyol systems particularly to SMEs. During HPMP Stage-I, constraints were faced by the systems house on availability of cost-effective technologies and as a result, the project was withdrawn from HPMP Stage-I implementation. Due to the recent changes in the market environment for Iran, it is anticipated that the systems house would be able to access low GWP HCFC free technologies in the next 2-3 years and convert to alternatives.

- Refrigeration and air-conditioning equipment manufacturing sector includes a large number of SMEs geographically distributed. As indicated earlier, the strategy will involve adopting a project based approach for HCFC assembly enterprises and technical assistance support for SMEs. As such, for the SMEs, while the enterprises will be encouraged to adopt low GWP technologies, it is likely that there would be HFC based products (both domestic production and imports) available in the market.

**Table 17: Overall Timeline for Project Implementation**

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Air-conditioning | | | | | | | |
| Refrigeration | | | | | | | |
| Foam sector | | | | | | | |
| Service sector | | | | | | | |
| PMU | | | | | | | |

The overall fund flow and targets for HCFC consumption for the period 2016-2023 under HPMP Stage-II are given below. As mentioned earlier, the policies and regulations will be aligned to phase-out targets in individual sectors/sub-sectors and will eventually result in zero consumption of HCFCs in manufacturing and reduction of HCFCs in servicing by 2026.

## 2.3 IMPLEMENTATION SUPERVISION, MANAGEMENT, COORDINATION AND MONITORING

The earliest date by which actual field activities can commence, is by the second quarter of 2017, subject to approval of the HPMP Stage-II in December 2016 at the 77th ExCom meeting. This is to allow time for putting in place the necessary project initiation procedures, agreements, etc. This means that stringent timelines are likely to be encountered for implementing actions for Stage-II compliance. This will make the task of management and coordination of activities very challenging. Adequate resources would need to be allocated, to support the additional costs of management, coordination and monitoring.

It is considered extremely important to engage and enlist the support of all stakeholders in the implementation of the HPMP (Stage-II). To accomplish this, targeted awareness and capacity-building activities will need to be carried out. These activities need to be synchronized with those implemented under HPMP Stage-I. Accordingly, resources would need to be allocated to cover the costs of awareness and capacity-building actions.

**Management Arrangements**

The implementation of the HPMP (Stage-II) will need to be closely coordinated with the various policy, regulatory, fiscal, awareness and capacity-building actions the Government of Iran is taking and will need to take in future, ensuring consistency with national priorities.

The implementation of the HPMP (Stage-II) will be carried out using the national execution modality. The framework that was successfully used during the Stage-I will be primarily used for supervision, monitoring and management of implementation, with changes as needed to respond to evolving situations. The National Ozone Unit will have the overall coordination role and will undertake the day-to-day implementation supervision and project management. The NOU will be supported by the Department of the Environment as well as national and international technical experts as needed. UNDP is designated as the implementing agency for the HPMP and will be responsible for project and financial management, as well as for providing technical and policy backstopping. UNDP will work closely with UNEP, UNIDO and Government of Germany on their respective components of HPMP.

A PMU was established under Iran National Ozone Unit to implement project activities under the HPMP Stage I which can continue to operate to take on the additional works of the Stage II activities. PMU would act as the project implementation arm of the National Ozone Unit and would focus on the following:

- Planning of activities under each sub-component for the HPMP in line with the approved overall project plan. The PMU will incorporate respective sector plans that are implemented by the respective agencies for HPMP.
- Developing and maintaining database of HCFC suppliers and users by individual sector / sub-sector – particularly service agencies and organizations implementing project activities.
- Periodically consulting enterprises which will be implementing HPMP activities on project activity progress and implementation support, if any.
- Implementing activities associated with individual sub-components in close coordination with industry, technical institutions, NGOs, other Government departments and NOU.
- Coordinating closely with technical schools and industry associations, as required, on project implementation matters – particularly training, recovery & reuse and retrofit initiatives.
- Reporting periodically on project implementation status to NOU and implementing activities based on guidance given by NOU.
- Participating in inter-agency coordination meetings and other meetings with Government and national stakeholders on HPMP matters.
- Identifying specific regulatory and other interventions needed for achieving HCFC phase-out target.

***Project budget***

**PMU cost of $620,000 was approved at the 77th ExCom Meeting, planned PMU activities and proposed budget for the duration of 2017 to 2022 is indicated below:**

**Table 18: PMU Activities and Costs (as submitted to 77th ExCom)**

| Particulars | Cost in USD |
|---|---|
| **Project implementation and coordination** | |
| Staff costs (4 staff members equivalent) | 420,000.00 |
| National stakeholder meetings | 30,000.00 |
| Computers and office electronic equipment | 10,000.00 |
| Furniture and equipment | 2,000.00 |
| Stationery and printing | 10,000.00 |
| Communication costs | 6,000.00 |
| Operational costs and overheads | 22,000.00 |
| **Project monitoring** | |
| Site visits | 50,000.00 |
| Performance verification | 30,000.00 |
| **Policies and regulations implementation** | |
| Stakeholder meetings | 30,000.00 |
| **Capacity building** | |
| Government stakeholder training workshops | 10.000.00 |
| **Total** | **620,000.00** |

Management arrangements for the Foam Sector, Commercial Refrigeration and Enabling Activates to be implemented individually or jointly by UNDP, UNEP, UNIDO and GIZ are described in the respective sector plans contained in the Annexes.

**Subsequent Stage (post 2022)**

The focus of actions for subsequent stages will be on gradually reducing supply of HCFCs and adopting alternatives to HCFCs for achieving complete phase-out of HCFCs by end of the year 2030. This will be achieved through support to service sector, promotion of low GWP retrofit/replacement options for operating existing HCFC based refrigeration and air-conditioning equipment as well as regulatory interventions to reduce and eliminate HCFC use.

## 2.4 ENVIRONMENTAL IMPACT

### Ozone Layer Protection

Successful implementation of the HPMP (Stage-II) in Iran will result in a phase-out of 131.9 ODP tonnes of HCFCs (based on 2015 eligible consumption levels) and will help the country reduce their consumption on a sustainable basis to 162.37 ODP tonnes by the year 2022.

### Global Warming

### Direct GHG emissions

Due to the relatively high global warming potential of HCFCs, their phase-out will result in reduced greenhouse effect due to adoption of low GWP technologies in foam and air-conditioning manufacturing applications. The net impact would be the difference in the greenhouse effect between HCFCs and their alternatives.

### Indirect GHG emissions

Refrigeration and Air Conditioning equipment typically has a long useful economic life up to 15 years or more. The theoretical efficiency of equipment can be potentially optimized and improved, with suitable design changes while using alternative refrigerants. This would result in reduction of electricity consumption through the equipment useful life and reduce indirect $CO_2$ emissions. Energy efficiency improvements are not the primary objective of this plan. Indirect GHG emissions due to energy consumption of equipment contribute typically 60-90% of the overall emissions from each equipment. The estimates of actual impact on conversion of equipment in air-conditioning to alternatives is expected to result in at least about 10% increase in energy efficiency, while noting that older equipment replacement with these new energy efficient equipment can result in higher energy efficiency impact. Since detailed assessment of the impact are difficult to make on account of market factors and price of electricity, the impact of indirect GHG emissions cannot be accurately estimated at this time.

Further, it must be noted that the markets in refrigeration and air-conditioning applications will use alternatives which are both HFC based and other low GWP options based. At this stage, it is known that a significant quantity of HFC based RAC equipment are in use in the markets. Based on specific Government policies and evolution of markets, the adoption of low GWP technologies in the market would vary and this would alter the net GHG impact of HPMP.

### Health and Safety

The HPMP Stage-II will be implemented taking into account all considerations for safeguarding health and safety in line with local and international regulations and guidelines.

## 3. CONSOLIDATED BUDGET

The consolidated budget for HPMP Stage II is as mentioned in the next page:

| IRAN HPMP STAGE II SUMMARY BUDGET BY TRANCHES | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Agency** | **Sector** | **Total** | **2016** | **2018** | **2020** | **2021** | **2022** |
| UNIDO | PU Foam | $1,863,205 | $389,567 | $540,000 | $480,000 | $403,638 | $50,000 |
| | RAC Servicing Sector (for UNEP) | $240,000 | $84,000 | $44,000 | $44,000 | $44,000 | $24,000 |
| **TOTAL UNIDO** | | **$2,103,205** | **$473,567** | **$584,000** | **$524,000** | **$447,638** | **$74,000** |
| | | | | | | | |
| ITALY | PU Foam | $907,207 | $403,203 | $504,004 | $0 | $0 | $0 |
| **TOTAL ITALY** | | **$907,207** | **$403,203** | **$504,004** | **$0** | **$0** | **$0** |
| | | | | | | | |
| GIZ | PU Foam | $763,444 | $215,680 | $312,510 | $139,754 | $95,500 | $0 |
| | Refrigeration TA | $1,908,960 | $429,820 | $734,525 | $145,255 | $502,500 | $96,860 |
| **TOTAL GIZ** | | **$2,672,404** | **$645,500** | **$1,047,035** | **$285,009** | **$598,000** | **$96,860** |
| | | | | | | | |
| UNDP | Foam | $1,896,401 | $649,924 | $541,771 | $705,706 | $0 | $0 |
| | Refrigeration | $2,388,960 | $596,550 | $876,320 | $437,470 | $359,310 | $119,310 |
| UNDP | PMU (NOU) | $620,000 | $52,696 | $175,889 | $164,804 | $104,921 | $121,690 |
| **TOTAL UNDP** | | **$4,905,361** | **$1,298,170** | **$1,593,980** | **$1,307,980** | **$464,231** | **$241,000** |
| | | | | | | | |
| UNEP | Policy & Enforcement Capacity-building | $90,000 | $22,500 | $32,500 | $17,500 | $0 | $17,500 |
| | Training and certification of RAC Service Technicians | $320,000 | $88,350 | $77,350 | $79,450 | $0 | $74,850 |
| | Promotion of alternative technologies | $195,000 | $64,550 | $53,550 | $46,450 | $0 | $19,050 |
| | Development of standards for products and services | $20,000 | $3,000 | $5,000 | $5,000 | $0 | $7,000 |
| | Monitoring, Coordination and Management | $75,000 | $21,600 | $21,600 | $21,600 | $0 | $21,600 |
| **TOTAL UNEP** | | **$700,000** | **$200,000** | **$190,000** | **$170,000** | **$0** | **$140,000** |
| | | | | | | | |
| **TOTAL PROJECT COST (Without IA support costs)** | | | | | | | |
| **TOTAL UNIDO** | | **$2,103,205** | **$473,567** | **$584,000** | **$524,000** | **$447,638** | **$74,000** |
| **TOTAL ITALY** | | **$907,207** | **$403,203** | **$504,004** | **$0** | **$0** | **$0** |
| **TOTAL Germany (GIZ Proklima)** | | **$2,672,404** | **$645,500** | **$1,047,035** | **$285,009** | **$598,000** | **$96,860** |
| **TOTAL UNDP** | | **$4,905,361** | **$1,298,170** | **$1,593,980** | **$1,307,980** | **$464,231** | **$241,000** |
| **TOTAL UNEP** | | **$700,000** | **$200,000** | **$190,000** | **$170,000** | **$0** | **$140,000** |
| **GRAND TOTAL** | | **$11,288,177** | **$3,020,440** | **$3,919,019** | **$2,286,989** | **$1,509,869** | **$551,860** |

**ANNEX A**

**ISLAMIC REPUBLIC OF IRAN**

# HCFC PHASE OUT MANAGEMENT PLAN FOR THE FOAM SECTOR

National Ozone Unit, Islamic Republic of Iran

(Developed with the assistance of UNDP, UNEP, UNIDO, and GERMANY)

**Abbreviations**

| | |
|---|---|
| BAU | Business as usual |
| CFC | Chlorofluorocarbons |
| DoE | Department of Environment |
| ExCom | Executive Committee of the Multilateral Fund |
| GDP | Gross Domestic Product |
| GIZ | Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation and Development) |
| HC | Hydrocarbons |
| HCFC | Hydro chlorofluorocarbons |
| HFC | Hydro fluorocarbons |
| HP | Horse Power |
| HPMP | HCFC Phase out Management Plan |
| ISIRI | Institute of Standards & Industrial Research of Iran |
| I.R. of Iran | Islamic Republic of Iran |
| Kg | Kilogram |
| LVC | Low Volume Country |
| MP | Montreal Protocol |
| MT | Metric ton |
| NOU | National Ozone Unit |
| NPP | National CFC Phase out Plan |
| ODP | Ozone Depleting Potential |
| ODS | Ozone Depleting Substance |
| RAC | Refrigeration Air Conditioning |
| TR | Ton Refrigeration |
| UNDP | United Nations Development Program |
| UNEP | United Nations Environmental Program |
| UNIDO | United Nations Industrial Development Organization |
| CRF | Commercial refrigeration |
| PU | Polyurethane |
| DRF | Domestic refrigeration |
| DSW | Discontinuous sandwich panel |
| INT | Integral foam |

## Project Cover Sheet

| Targets and Funding requested | Total costs (US$) | 2016 (US$) | 2018 (US$) | 2020 (US$) |
|---|---|---|---|---|
| Project costs Germany represented by GIZ | 894'300.00 | 225'000.00 | 357'300.00 | 312'000.00 |
| Project costs UNIDO | 3'588'102.00 | 1'049'752.43 | 1'638'349.57 | 900'000.00 |
| Project costs UNDP | 2'939'170.00 | 607'390.00 | 1'371'780.00 | 960'000.00 |
| Project costs UNEP | 50'000.00 | 50'000.00 | - | - |
| **Total Project Cost** | **7'471'572.00** | **1'932'142.43** | **3'367'429.57** | **2'172'000.00** |

| Target and Funding approved by ExCom 77th | | | | | | |
|---|---|---|---|---|---|---|
| **Targets and Funding** | **Total Cost (US$)** | **2016 (US$)** | **2018 (US$)** | **2020 (US$)** | **2021 (US$)** | **2022 (US$)** |
| Project Cost Germany represented by GIZ | $763,444 | $215,680 | $312,510 | $139,754 | $95,500 | $0 |
| | | | | | | |
| Project Costs UNIDO | $1,863,205 | $389,567 | $540,000 | $480,000 | $403,638 | $50,000 |
| | | | | | | |
| Project Costs Italy | $907,207 | $403,203 | $504,004 | $0 | $0 | $0 |
| | | | | | | |
| Project costs UNDP | $1,896,401 | $648,924 | $541,771 | $705,706 | $0 | $0 |
| | | | | | | |
| **Total Project Cost** | **$5,430,257** | **$1,657,374** | **$1,898,285** | **$1,325,460** | **$ 499,138** | **$ 50,000** |

**Executive Summary**

There are 15 companies, table 5.1-1, which will be converted and supported with replacement of existing equipment and conversion to Pentane. Considering the experiences gained in the first phase technical assistance will be required at an early stage. The GIZ as lead will organize together with the NOU a workshop with the beneficiaries and provide all the necessary information regarding available technologies, raw materials and counterpart responsibility issues to the companies. Further, visit the companies and asses the production for determining the procurement technical specifications, provide technical assistance for foam product related issues and schedule of implementation. In the first phase, we followed a similar approach whereby GIZ and UNIDO determined an overall specification. In this phase we are working together also with UNDP to have an overall scheme and avoid disparity between the beneficiaries. The actual procurement of the equipment will then be executed by UNIDO and UNDP.

The companies mentioned in table 5.2-1 will have a high content of technical assistance for introduction of the new technologies. The GIZ as lead will hold several workshops for introducing the specific technologies according to the foam products of the beneficiaries. Introduce the water blown technology and determine together with the beneficiaries through individual visits the necessary equipment support required. The procurement of the individual conversion kits will then be executed by UNDP and UNIDO. The technical assistance will then continue during the commissioning of the conversion kits and during the introduction of the water blown system.

## 1. Introduction

The foam sector in the Islamic Republic of Iran is next to the refrigeration sector the main HCFCs user. With a starting point for the HPMP Stage-II of 91.1 ODP tonnes it covers app. 42% of the aggregated consumption in Iran.

The implementation of HPMP Stage I was hampered by the particular situation of Iran on the world markets with regard to availability of suppliers and import restrictions. Nevertheless, all the companies have received the machinery and project completion is nearly achieved. We incurred in the problematic of sourcing Pentane from the local market in the appropriate quantities. During Stage I the solution was chosen to have a supply of premixed polyol with pentane to reduce investment costs for the beneficiaries. However, the chosen system house did not proceed with the project because of own marketing issues and therefore the beneficiaries had to find other sourcing solutions. Although this brought to delays, the positive spin off is that now another system house has shown interest and an alternative solution is available. Pentane has been chosen by all the companies and is still considered the driving technology in rigid foam.

We noted during the surveys and activities in the foam sector that capacity is being build up due to market expansion. Especially in the construction sector the expectations are that the sandwich panel industry will increase capacity. We saw that the domestic refrigeration industry stepped up production due to foreign import constraints. Integral foams used in the automotive sector follow the trend of the car manufacturers and will step up production also.

The HPMP Stage-II foam sector plan is designed for a complete phase out of HCFC-141b by 2023. During Stage-I the industry was monitored closely and the largest companies were converted. The remaining companies are fairly small and in the strategy the largest will be converted first. The largest consumers in the foam sector with the highest capacity potential are the continuous sandwich panel producers which were converted in Stage-I. The not eligible companies will need to convert with the tightening of the available quota. The second group are the domestic refrigerator companies and also here the largest enterprises have been converted. In any case we expect more imports to take place and capacity increase will be contained. Also for the discontinuous panel producers we have converted the largest and only one company with a consumption >20 MT is left.

The technology selection is the same as for HPMP Stage-I, water blown and hydrocarbon (Pentane), because of the availability in Iran and standardization of the industry.

The HPMP Stage II in the PU foam sector includes the typical companies of purely foamers but also the companies active in the commercial refrigeration sector who also foam.

The commercial refrigeration sector is strongly related to the foam sector due to the foam. Many activities will flow into the foam sector specifically with regard to the foam conversion technologies, the interaction of pure foam companies e.g. as supplier of panels for cold rooms. The technologies will have design impacts on the panel and foam properties as well as on the refrigeration systems.

## 2. Overview of Foam sector in Iran

### 2.1 Overview foam sector

The survey for the HPMP Stage II in Iran began in June 2014. An interagency committee, including implementing agencies and the NOU, assigned specific sectors for each agency. UNIDO covered the domestic refrigerators, discontinuous sandwich panels, integral skin foam, spray foam and other small foam applications. GIZ concentrated on the commercial refrigeration sector which included also companies providing commercial and industrial air-conditioning systems.

The commercial refrigeration sector survey was conducted thoroughly as in HPMP Stage-I. We had no projects in this sector. Interactions occurred during the servicing projects with the supermarkets as the companies supply equipment and refrigeration systems. Furthermore, some of the companies were known due to the servicing component of Stage-I.

For the foam sector we have companies working only with foams and companies using foams in refrigeration equipment. The companies in the commercial sector have primarily the objective of providing products for refrigeration purposes. In this sector UNDP and GIZ will work closely together.

The survey covered all the foam producers and the IR of Iran counts app. 237 foam companies in the rigid and integral and spray foam. All these companies are collected inside a database for easy communication purposes. Not all the companies are still active or eligible but they are kept in the database.

The survey covered 175 companies of which many were already surveyed during HPMP Stage-I. All the companies were contacted and only 27 were found to be not active at the moment. 72 companies are considered not eligible for reasons of starting point or machinery installed / renovated after 21.09.2007.

In the PU sector 51 companies are considered eligible and need funding support and in the Commercial Refrigeration sector (CRF), 4 out of the 51 companies were not using foam. The 8 are eligible for the servicing and conversion from HCFC-22 to low GWP.

Total eligible companies using foam for the PU and CRF sector amount to: 97.

The distribution of the foam companies is shown in Table 2.1

**Table 2.1: Foam company's consumption and size**

| Sector | No of Companies | HCFC-141b (MT) | No. of Companies < = 10 MT | No. of Companies < 20 MT |
|---|---|---|---|---|
| Rigid | 3 | 11.2 | 3 | 0 |
| Domestic refrigeration | 32 | 334.4 | 23 | 9 |
| Discontinuous panel | 8 | 76.4 | 6 | 2 |
| Integral foam | 6 | 57.7 | 3 | 3 |
| Spray foam | 2 | 4.0 | 2 | - |
| **Total** | **51** | **483.7** | **37** | **14** |

We noticed that a large amount of companies has a consumption of less than 10 MT. The distribution of companies according to the consumption is shown in the table hereunder.

**Table 2.2: Foam company's distribution according to consumption.**

| | No. of Companies | HCfC-141b (MT) | ODP tonnes |
|---|---|---|---|
| Companies <= 10 MT consumption | 37 | 194.6 | 21.4 |
| Companies <= 20 MT consumption | 9 | 123.8 | 13.6 |
| Companies > 20 MT consumption | 5 | 165.3 | 18.2 |
| **Total:** | **51** | **483.7** | **53.2** |

The commercial refrigeration sector where foams are used shows a similar distribution although only 1 company has a consumption of >20 MT.

**Table 2.3: Distribution according to consumption of the CRF sector.**

| | No. of Companies | HCFC-22 (MT) | HCFC-141b (MT) | HCFC-141b (ODP tonne) |
|---|---|---|---|---|
| Companies with no foam consumption | 8 | 48.5 | - | 0 |
| Companies <= 10 MT consumption of HCFC-141b | 36 | 266.0 | 196.4 | 21.6 |
| Companies <= 20 MT consumption of HCFC-141b | 6 | 69.3 | 96.9 | 10.7 |
| Companies > 20 MT consumption of HCFC-141b | 1 | 16.2 | 22.3 | 2.5 |
| | | | | |
| Total: | 51 | 400.0 | 315.7 | 34.7 |

For clarity reasons the overview of companies using foams, PU and CRF is shown in the table hereunder.

The foam conversion of the commercial refrigeration companies will be dealt with in this foam sector plan as many training, awareness and workshops are the same.

The refrigeration system conversions are dealt with in the commercial sector plan.

**Table 2.4: Survey consumption accounted for of the PU and CRF sectors.**

| | No. of Eligible Companies | HCFC-22 (MT) | HCFC-141b (MT) |
|---|---|---|---|
| Total survey 2015: | 102 | 400.0 | 799.4 |
| Total ODP tonnes survey 2015 | | 22.0 | 87.9 |
| Starting point for HPMP Stage-II (MT) | | 2,272.7 | 828.2 |
| Starting point for HPMP Stage (ODP tonnes) | | 125.0 | 91.1 |

## 2.2 Companies status

During the survey 799.4 MT of HCFC-141b has been accounted for of the eligible companies slightly less than the starting point for the II stage. 102 companies are eligible for funding in the PU and CRF sector.

The survey further evidenced that:

- The eligible companies were in good state;
- Technology and R&D is in many cases lacking;
- Clear guidance and support is required;
- Most of the companies with a consumption of less than 20T would not be suitable for conversion to Pentane due to their low production and infrastructure.
- Companies where no replacements are planned would be more helped with technology and product specific support.
- Companies were looking for solutions and technical support to improve the products, especially for the commercial refrigeration companies

Technologies have been discussed with the companies and they have been informed about the different stages of the Ozone protection activities in the IR of Iran.

Spray foam companies were also part of the survey and two companies found eligible, for these companies water blown technology is going to be proposed as a starting point.

Technology support will be in any case part of the non-investment measures

## 2.3 Blowing agents import

All the blowing agents are imported into Iran. We have to mention that due to the political situation of Iran, the majority of blowing agents which could be considered are not available. Among these are HFC's which have not been found:

- HFC 245fa

- HFC 365mfc

It is important that the II stage start asap to avoid that HFC's are going to enter into the market. Considering that Iran will develop fast in the coming years, typical growth rate around 8%.

### 2.4 Blowing agents production

The only blowing agent produced in Iran are pentanes by the petrochemical industry in the city of Tabriz.

### 2.5 Raw material suppliers and importers

Raw materials, Polyols and Isocyanates are imported in bulk (drums or IBC containers) from major supplier. All these imported materials are not pre-blended, at least we did not find any company using imported pre-blends.

The imported raw materials are blended together with HCFC-141b or Pentane at the beneficiaries' workshops. What has been noted is that the lack of technical knowledge often leads to additional losses and increase of consumption due to:

- Improper mixing of the components
- Chemical spillage
- Losses due to extreme hot climate and evaporation.

Major companies exporting to Iran are system houses located in Dubai and large raw material suppliers:

- Baalbaki (Syria)
- Korean Polyurethane Company
- Kumho (South Korea)
- Asia Polyurethane (system house, Singapore)
- Resina
- IPC (Netherlands)
- Covestro (ex. Bayer Material Science) (Germany)
- Huntsman (USA)
- Coim (Italy)
- Synthesia (Spain).

### 2.6 Local raw material suppliers

In Iran there is a small TDI production but this raw material is used for flexible slabstock foam and therefore of no interest.

Local raw material suppliers are mainly system houses:

- Kaboodan Chemie (system house)
- Iran Polyurethane (system house, mainly used for themselves)
- BASF Elastogran (system house)
- Urethane System Company (USC)(system house).

These system house were already available during the first phase and in addition new companies were established:

- Arian Polyurethane
- Jazbe setareh
- Mokarrar

All the systems houses provide pre-blended polyols with HCFC-141b into the market.

### 2.7 Training and research institutions

There are some institutions for technical training in Iran which are accredited from The Institute of Standards & Industrial Research of Iran (ISIRI).

The basis is however mainly theoretical and practical process engineering is not available. Therefore the support will be limited. A training course in polyurethane processing is in this respect advisable with the introduction of new technologies.

### 2.8 Standards and literature

Until now there are a few Persian basic PU books published, but no technical and really practical book exists. Furthermore, the students and studies are mainly attracted to chemical literature and not practical application.

### 2.9 National quality standard:

There is not only no obligation for standardization of PU products, but also no significant and sufficient standard has been accredited. Fortunately useful and reliable infrastructure is available like "The Institute of Standards & Industrial Research of Iran", "Building & Housing Research Centre", "Firefighting & Safety Services Organization" which are governmental and official institutes.

### 2.10 Automotive standards

The automotive industry has their own standards imposed by the mother factories like Peugeot, Benz and Renault as these automobiles are made in Iran under license. This includes also integral skin foam parts like steering wheels etc. This is not common in construction industries.

For the successful introduction of new technologies a standardization process is required in order to avoid also new companies to produce with technologies which are being phased out.

## 3. Alternative technologies Foam sector

The options for the IR of Iran are established, HC's (pentane) and water blown, nevertheless during the phase-out period running until 2025 new developments will be considered. All the projects done in Stage-I were with HC's and this is also the standard in the refrigeration and sandwich panel industry. The introduction of methyl formate was not successful as the system house saw a negative market potential and therefore did not consider this option.

The technology options selection is according to the following criteria:

- Costs for the beneficiary, the transition from CFC-11 to HCFC-141b encountered difficulties due to higher costs for the blowing agent and modification of the inliner. With the conversion of HCFC-141b to HC's or waterblown this barrier is not anymore the case.
- An option must provide the consensus of the company to convert and a clear understanding of the impact,
- Availability of the blowing agent in the beneficiaries' country, this barrier is already removed with HC's and for waterblown systems developed locally,
- The local availability is of major importance considering the large amount of small companies who often lack knowledge about raw materials as well as commercial insight for options, technical support together with the availability of options is required,
- Cost of the blowing agent, small workshops are difficult to monitor and often have a lack of understanding the need of a conversion when this is commercially not sustainable.

The above considerations were evidenced during the workshop held in November 2009 with beneficiaries, suppliers, GIZ, implementing agencies and NOU as well as following workshops held. Visits of the beneficiaries and consultations between UNIDO, GIZ, UNDP and the NOU.

Based on the above the options are strongly reduced and will be concentrated on:

- Hydrocarbons conversions (Pentane)
- Waterbased systems
- Eventual new low GWP developments

Hydrocarbon conversion:

These conversions are from technical point of view mature technologies nevertheless require companies who have the appropriate organization, space and qualified personnel. Also the consideration of using pre-blended polyol with hydrocarbons can be discarded when the following is not met:

- A pre-blended polyol reduces the need of blending but the other equipment needs to satisfy the safety requirements as any other hydrocarbon plant.
- Special storage areas are required as well as sufficient factory space for proper storage and foaming under controlled temperature conditions.
- The company has to instruct and provide qualified personnel for using hydrocarbons.
- The company must have a sufficient high production rate in order to amortize the costs for the additional safety measures.
- The additional foaming equipment, like mould carriers, presses, fixtures etc. in which the foam is injected must be sufficient developed for conversion.

Therefore, the selection of the companies was done on the basis of the above and with the introduction of pre-blended we are able to reduce costs. As well reduce investment costs for those companies who are not eligible but due to the quota system will need to convert by their own means.

Water based:

Water based systems are two component systems and can be used with existing equipment. The draw-back of this system is:

- Lower insulation properties therefore the application has to be selected where the insulation has not a dominant importance, e. g. commercial refrigeration where the mechanical properties are dominant.
- Already tested in Iran during the NPP at Freidoni with excellent results presented at the MOP in Bali 2011.
- Higher density of the foam which has an impact on the IOC. The HCFC system which is used by the companies has to be evaluated against water based system during technology development training.
- System houses availability of the raw materials at BASF Iran, major producers like BASF, DOW and Covestro (former Bayermaterial science) have developed appropriate systems.
- Together with the conversion technology a transfer for proper design of the products to be manufactured is required. In order to compensate the often inefficient designs against the higher raw material costs.

It must be noted that in Integral skin applications in Europe and USA the systems are water based due to regulations with regard to volatile organic components (VOC).

For the commercial refrigeration industry, the issue of thermal insulation is secondary, primarily the static strength of cabinets is important. When we consider display counters, open top refrigerators and freezers due to their design the loss of energy is through the openings. The back of a multideck display counter is insulated but the heat loss will occur through the opening.

The commercial refrigeration application due to its variety of design needs support on the construction of the cabinets and a “simple” foaming system. Their craftsmanship includes foaming, sheet bending, painting, assembly and refrigeration. The potential of energy consumption reduction consists on the combination of all these craftsmanship’s and by introduction of e.g. doors and lids energy consumption reduction potential is higher than with foam only. We cannot compare most of these beneficiaries with high end, high output and standardized products manufacturers.

*HFC’s*

HFC 245fa or 365mfc: these have both high GWP options, costs are higher than HCFC-141b and are not imported to Iran. Considering the high GWP this option is not considered.

*HFO's - Unsaturated HFC*

The development is not yet finished and availability is still an issue. Costs for these blowing agents will be prohibitive (several times higher than e.g. pentane). The gain in thermal insulation with respect to Pentane and waterblown is there but the cost efficiency seems only viable for high end domestic refrigerators (class A+++). However, vacuum panels are used to achieve these classes without losing too much volume. Vacuum panels achieve twice the insulation performance with respect to high end polyurethane formulations.

Tests performed with HFO (FEA-1100) showed good results in domestic appliance1. Several mixtures of HFO and HC's were tested and best cost efficiency versus energy saving was achieved by mixing HFO with HC's. The balance in the mixture, besides costs, must also be found with respect to mechanical aspects like compressive strength. The conversion would anyway need to consider also the capital costs of HC's equipment.

*Other options:*

Methylformate did not receive the acceptance in the market so we are not considering this option, besides the safety requirements will only slightly be less than with HC's. Costs of foaming machines higher due to the corrosive character of the solvent methylformate (metering pumps, mixing head, to some extent piping, gaskets, flowmeters all need to specially coated).

## 4. HPMP Phase-out Strategy Foam sector

### 4.1 Strategy

The conversions done under Stage-I showed that key element is the technical support. We are facing now 88 companies out of 102 whose consumption is too low or the facilities do not allow for conversion to HC's. These 88 companies include also the not foamers of the commercial refrigeration sector who acquire foam. As well 14 companies who will be converted with capital investments. Furthermore, also not eligible companies who need guidance.

The important aspect of market belief that specific products have a better performance with HCFC-141b is embedded. This is also valid for applications like supermarket cabinets whereby the design of the foam elements and refrigeration system play a more important role than the individual foam property alone. This has been demonstrated with bottle coolers which were foamed with HCFC-141b and waterblown providing the same insulation properties.

The companies will need to be assisted with a combination of:

- Design support for the foam elements
- Calculation of product performance
- Modification of moulds and production methods
- Training of personnel
- Awareness

All with the scope to provide to the small company's competitive products allowing and facilitating the phase out of HCFC-141b.

[1] 2013 Polyurethanes Technical Conference – Formacel®1100 (FEA-1100), a Zero ODP and Low GWP Foam Expansion Agent for the Appliance Industry.

We have splitted the refrigeration and foam activities but in reality the activities at a beneficiary will practically go in parallel. The goal thereby is to have a phase-out in foam and refrigeration.

The end users will be trained in the use of commercial refrigeration equipment for capacity building purposes and acceptance of the new products. Herewith, removing barriers with regard to the use of waterblown and alternative low GWP refrigerants. Note that the technologies are commonly used in Europe and other countries.

The plan in Stage I was to facilitate the distribution of premixed polyol with pentane. This to reduce the technical conversion costs, storage and easier handling. We weren't able to introduce this component because of market issues of the system house. We have spoken with another 100% locally owned system house Kaboodan Chemie and they are willing to introduce the premixed systems. This attempt was in the first phase also approached with USC who for marketing reasons couldn't proceed with the project.

Therefore, a package of equipment and know-how will be provided to Kaboodan for setting up tankstorage and premixing system.

At the same time we will develop with Kaboodan Chemie waterblown systems for local sourcing. These systems are planned for the integral and rigid foam beneficiaries. This to remove the barrier of availability and sourcing issues and provide alternatives to the international suppliers.

The phase out plan therefore consists of:

Conversion to Pentane:

- Selected eligible companies who have the appropriate size and capacity
- Foaming equipment
- Technical assistance

Conversion to waterblown

- Selected eligible companies with small consumption
- Mainly companies where insulation plays a lesser role
- Technical assistance to support the beneficiaries
- Package of equipment

Technical assistance for Premixed pentane

- Equipment
- Technical know-how mixtures and application
- Basic conditions for equipment on-site for not eligible companies
- Capacity building

Technical assistance for local produced waterblown foam

- Equipment
- Technology transfer
- Capacity building

Technical assistance foaming technology and applications

- Technical know-how chemistry and application
- Trials
- Components for optimizing foaming equipment
- Workshops
- Standards
- Capacity building

Supporting equipment for conversion to waterblown will be tailored according to the beneficiaries needs and consumption and will include:

- Raw materials for trials and testing
- Modification to the foaming equipment, mixing head adaptations or replacement, cooling and heating foaming equipment, moulds retrofitting
- Storage adaptations of raw materials

Reporting and monitoring structure

- A database will be setup at the NOU for progress reporting of the activities
- Access of training materials for the beneficiaries
- Scheduling of workshops and training activities

### 4.2 Phase out plan

The sequence of activities planned depends on the support of the beneficiaries to absorb the technology change and make the necessary preparation.

We thereby need to distinguish between the traditional conversions by means of foaming equipment, services and installation and those with a higher content of technology transfer. The number of enterprises involved are for the foam sector 51 and for the commercial refrigeration foaming part are 43 out of 51 companies. In Annex I are the foam companies and annex II the commercial refrigeration companies for reference.

Of these companies 11 of the foam sector and 3 of the commercial sector are going to be converted to pentane by means of foaming equipment, services and installation. We have therefore still 80 companies who will be supported with technical assistance and supporting equipment. We need also to consider that the commercial refrigeration companies also need to receive the support for conversion from HCFC-22 to HCFC/HFC free refrigerant which is part of the Commercial refrigeration HPMP.

The companies considered for traditional conversion are the following:

Foaming equipment supply for conversion to Pentane of foam sector companies (UNIDO)

**Table: 4.2-1 Foam sector companies domestic refrigeration and discontinuous sandwich panel for conversion**

| Sector | Name of Company | Eligible refrigeration | Eligible foam | HCFC-22 consumption (MT) | HCFC 141b Consumption (MT) |
|---|---|---|---|---|---|
| DRF | HANZAD | 0 | Y | | 15.0 |
| DRF | JAVAHERAN Tehran | 0 | Y | | 19.0 |
| DRF | PARTO SHIVA SANAT | 0 | Y | | 19.0 |
| DRF | AYSAN SANAT | 0 | Y | | 22.0 |
| DRF | TARA SANAT BARFIN (SEPAND AFROUZ) | 0 | Y | | 24.0 |
| DRF | NOVIN BOROODAT ENJEMAD | 0 | Y | | 35.0 |
| DRF | FOROUZAN | 0 | Y | | 39.0 |
| DSW | JAVAD HASANI (Mamut Delijan) | 0 | Y | | 16.0 |
| DSW | Shiller (Fanavari Novin Shiller) | 0 | Y | | 24.3 |

The companies are in the domestic refrigeration (DRF), discontinuous sandwich panel (DSW) active.

Foaming equipment supply for conversion to water-blown for integral foam application of foam sector companies (GIZ)

**Table: 4.2-2 Foam sector companies integral foam (INT) conversion**

| Sector | Name of Company | Eligible refrigeration | Eligible foam | HCFC-22 consumption (MT) | HCFC 141b Consumption (MT) |
|---|---|---|---|---|---|
| INT | ZIVAR KHODRO (II Phase) | 0 | Y | | 18.0 |
| INT | ERISH KHODRO | 0 | Y | | 21.0 |

These companies are working in the automotive sector and produce integral foam and will be converted to waterblown.

Foaming equipment supply for conversion to pentane of commercial refrigeration companies (UNDP)

**Table: 4.2-3 Commercial refrigeration companies with foam conversion**

| Sector | Name of Company | Eligible refrigeration | Eligible foam | HCFC-22 consumption (MT) | HCFC 141b Consumption (MT) |
|---|---|---|---|---|---|
| CRF | Esfahan Yakhchal Isfahan | Y | Y | 18.0 | 18.0 |
| CRF/AC | Sanaye Boroudati Maleki (Sarma cell) | Y | Y | 16.2 | 22.3 |
| CRF | Sard Sazan Kavir Kerman | Y | Y | 5.5 | 15.2 |

The conversion of the foam sector DRF and DSW can start from the K.O date. Technical assistance will be required but conversion experience was gained during stage I. Considering the size of the companies an early start is advisable.

***Activity plan***

**Table 4.2-4 Activity plan**

| Item | Activity | Starting date | Time |
|---|---|---|---|
| 1) | Conversion foam companies - domestic refrigeration and cont. Sandwich panel | K.O | 2016-2018 |
| 2) | Conversion foam companies - integral | K.O+12 months | 2016-2020 |
| 3) | conversion commercial refrigeration companies | K.O+6 months | 2016-2022 |
| 4) | Setup premixed pentane technology | K.O | 2016-2018 |
| 5) | Setup waterblown technology rigid foam | K.O | 2016-2018 |
| 6) | Setup waterblown technology integral foam | K.O | 2016-2020 |
| 7) | Supporting equipment for waterblown conversion | K.O+6 months | 2016-2022 |
| 8) | Technical assistance | | 2016-2022 |

For the companies in the integral and commercial refrigeration the water blown raw materials must be first developed. As backup solution the import of these raw materials for the short term can be considered. In any case the start from kick-off (K.O) stage II is delayed with 6 months.

The starting delay is also for the companies who will receive technical support and equipment but who will convert to water blown, 80 companies. The fruits of this technical assistance will also be available and disseminated to all the companies involved in foaming and refrigeration (>200).

The setup for the premixed pentane technology will run in parallel and first step will the procurement of premixing technology for trials and secondly bulk storage of pentane. This to be able to provide the companies which are converted to pentane with premixed material.

The technical assistance will comprise of typical foaming technology issues as well as the activities mentioned hereafter.

The overall phase out plan of HCFC-141b and HCFC-22 is shown in the table hereafter.

**Table 4.2.5 Overall Phase-out Plan**

| Overall phase out plan | MT | ODP tonnes |
|---|---|---|
| HCFC-141b | 799.3 | 87.9 |
| HCFC-22 manufacturing | 400.0 | 22.0 |
| HCFC-22 manufacturing-installation | 400.0 | 22.0 |
| **Total:** | **1,599.3** | **131.9** |

The detailed planning is shown in the table hereafter, including phase out quantities.

**Table 4.2-6 Detailed phase out plan in the foam sector**

| | UNIDO | | | | | | FUNDING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **Name of Company** | **Eligible refrigeration** | **Eligible Foam** | **HCFC-22 consumption (MT)** | **HCFC 141b Consumption (MT)** | **Unit Phase out Costs (US$)** | **2016** | **(MT)** | **2018** | **(MT)** |
| DRF | HANZAD | 0 | Y | | 15 | 211'402.86 | - | 0 | 211'402.86 | 15 |
| DRF | JAVAHERAN Tehran | 0 | Y | | 19 | 211'402.86 | - | 0 | 211'402.86 | 19 |
| DRF | PARTO SHIVA SANAT | 0 | Y | | 19 | 211'402.86 | - | 0 | 211'402.86 | 19 |
| DRF | AYSAN SANAT | 0 | Y | | 22 | 211'402.86 | 211'402.86 | 22 | | 0 |
| DRF | TARA SANAT BARFIN (SEPAND AFROUZ) | 0 | Y | | 24 | 211'402.86 | 211'402.86 | 24 | | 0 |
| DRF | NOVIN BOROODAT ENJEMAD | 0 | Y | | 35 | 211'402.86 | 211'402.86 | 35 | | 0 |
| DRF | FOROUZAN | 0 | Y | | 39 | 211'402.86 | 211'402.86 | 39 | | 0 |
| | | | | total | 173 | | 845'611.43 | 120 | 634'208.57 | 53 |

| | UNIDO | | | | | | FUNDING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **Name of Company** | **Eligible refrigeration** | **Eligible Foam** | **R22 consumption (MT)** | **HCFC 141b Consumption (MT)** | **UNIT Phase out Costs (US$)** | **2016** | **(MT)** | **2018** | **(MT)** |
| DSW | JAVAD HASANI (Mamut Delijan) | 0 | Y | | 16 | 204'141.00 | - | 0 | 204'141.00 | 16 |
| DSW | Shiller (Fanavari Novin Shiller) | 0 | Y | | 24.3 | 204'141.00 | 204'141.00 | 24 | | 0 |
| | | | | total | 386.3 | | 204141 | 24 | 204141 | 16 |

| | UNDP | | | | | | FUNDING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **Name of Company** | **Eligible refrigeration** | **Eligible Foam** | **HCFC-22 consumption (MT)** | **HCFC 141b Consumption (MT)** | **Unit Phase out Costs (US$)** | **2016** | **(MT)** | **2018** | **(MT)** |
| CRF | Sard Sazan Kavir Kerman | Y | Y | 5.5 | 15.2 | 205'890.00 | 205'890.00 | 15 | | 0 |
| CRF | Esfahan Yakhchal Isfahan | Y | Y | 18 | 18 | 205'890.00 | | 0 | 205'890.00 | 18 |
| CRF/AC | Sanaye Boroudati Maleki (Sarma cell) | Y | Y | 16.2 | 22.3 | 205'890.00 | - | 0 | 205'890.00 | 22.3 |
| | | | | | | | 205890 | 15 | 411780 | 40.3 |

| | GIZ | | | | | | FUNDING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **Name of Company** | **Eligible refrigeration** | **Eligible Foam** | **R22 consumption (MT)** | **HCFC 141b Consumption (MT)** | **Unit Phase out Costs (US$)** | **2016** | **(MT)** | **2018** | **(MT)** |
| INT | ZIVAR KHODRO (II Phase) | 0 | Y | | 18 | 103'650.00 | - | 0 | 103'650.00 | 18 |
| INT | ERISH KHODRO | 0 | Y | | 21 | 103'650.00 | - | 0 | 103'650.00 | 21 |
| | | | | | | | - | 0 | 207300 | 39 |

Total funding approved by the 77th ExCom is shown below and this will be utilized for complete HCFC-141b phase-out. **Table 4.2-6 Detailed phase out plan in the foam sector (Approved in 77th ExCom)**

| | UNIDO | | | | | | FUNDING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **Name of Company** | **Eligible refrigeration** | **Eligible Foam** | **HCFC-22 consumption MT** | **HCFC 141b Consumption MT** | **Unit Phase out Costs (US$)** | **2016** | **(MT)** | **2018** | **(MT)** |
| DRF | HANZAD | 0 | Y | | 15 | 174,002.86 | - | 0 | 174,002.86 | 15 |
| DRF | JAVAHERAN Tehran | 0 | Y | | 19 | 174,002.86 | - | 0 | 174,002.86 | 19 |
| DRF | PARTO SHIVA SANAT | 0 | Y | | 19 | 174,002.86 | - | 0 | 174,002.86 | 19 |
| DRF | AYSAN SANAT | 0 | Y | | 22 | 174,002.86 | 150,692.86 | 22 | 23311.00 | 0 |
| DRF | TARA SANAT BARFIN (SEPAND AFROUZ) | 0 | Y | | 24 | 174,002.86 | 150,692.86 | 24 | 23311.00 | 0 |
| DRF | NOVIN BOROODAT ENJEMAD | 0 | Y | | 35 | 174,002.86 | 150,692.86 | 35 | 23310.00 | 0 |
| DRF | FOROUZAN | 0 | Y | | 39 | 174,002.86 | 150,691.86 | 39 | 23310.00 | 0 |
| | | | | Total | 173 | | 602,770 | 120 | 615,250 | 53 |

| | UNIDO | | | | | | FUNDING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **Name of Company** | **Eligible refrigeration** | **Eligible Foam** | **R22 consumption (MT)** | **HCFC 141b Consumption (MT)** | **UNIT Phase out Costs (US$)** | **2016** | **(MT)** | **2018** | **(MT)** |
| DSW | JAVAD HASANI (Mamut Delijan) | 0 | Y | | 16 | 196,991 | - | 0 | 196,991 | 16 |
| DSW | Shiller (Fanavari Novin Shiller) | 0 | Y | | 24.3 | 196,991 | 190,000 | 16.3 | 6,991 | 8 |
| | | | | Total | 386.3 | | 190,000 | 16.3 | 203,982 | 24 |

| | UNDP | | | | | | FUNDING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **Name of Company** | **Eligible refrigeration** | **Eligible Foam** | **HCFC-22 consumption (MT)** | **HCFC 141b Consumption (MT)** | **Unit Phase out Costs (US$)** | **2016** | **(MT)** | **2018** | **(MT)** |
| CRF | Sard Sazan Kavir Kerman | Y | Y | 5.5 | 15.2 | 180,591 | | 0 | 180,591 | 15.2 |
| CRF | Esfahan Yakhchal Isfahan | Y | Y | 18 | 18 | 180,590 | | 0 | 180,590 | 18 |
| CRF/AC | Sanaye Boroudati Maleki (Sarma cell) | Y | Y | 16.2 | 22.3 | 180,590 | - | 0 | 180,590 | 22.3 |
| | | | | Total | | 541,771 | | 0 | 541,771 | 55.5 |

| | GIZ | | | | | | FUNDING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **Name of Company** | **Eligible refrigeration** | **Eligible Foam** | **R22 consumption (MT)** | **HCFC 141b Consumption (MT)** | **Unit Phase out Costs (US$)** | **2016** | **(MT)** | **2018** | **(MT)** |
| INT | ZIVAR KHODRO (II Phase) | 0 | Y | | 18 | 84,175 | - | 0 | 84,175 | 18 |
| INT | ERISH KHODRO | 0 | Y | | 21 | 84,175 | - | 0 | 84,175 | 21 |
| | | | | Total | 39 | | - | 0 | 168,350 | 39 |

| Target and Funding approved by 77th ExCom | | | | | | |
|---|---|---|---|---|---|---|
| **Targets and Funding** | **Total costs (US$)** | **2016 (US$)** | **2018 (US$)** | **2020 (US$)** | **2021 (US$)** | **2022 (US$)** |
| Project costs Germany represented by GIZ | $763,444 | $215,680 | $312,510 | $139,754 | $95,500 | $0 |
| Project costs UNIDO | $ 1,863,205 | $ 389,567 | $ 540,000 | $ 480,000 | $ 403,638 | $50,000 |
| Project costs ITALY | $907,207 | $403,203 | $504,004 | $0 | $0 | $0 |
| Project costs UNDP | $1,896,401 | $648,924 | $541,771 | $ 705,706 | $0 | $0 |
| **Total Project Cost** | **$5,430,257** | **$1,382,620** | **$1,906,514** | **$1,169,754** | **$821,369** | **$150,000** |

### 4.3 Technical assistance and training

The technical assistance and training will be focused on acceptance of the technologies and support for the conversion. We noted that during Stage-I many barriers had to be removed which the companies themselves weren't able to solve:

- Raw materials selection
- Blowing agent sourcing
- Foam product standards of the new materials
- Production quality standards and workshop workers regulations

Considering the number of companies and in order to avoid delays in installation of equipment the companies need guidance. Furthermore, the development of premixed pentane will require safety rules to be followed and guidance documentation needs to be discussed with the individual companies. This also for future blowing agents which could come into the market.

We have seen also that the foam training provided by the machinery suppliers is poor, due to time restraints, different applications to be dealt with and basic knowledge of the beneficiaries. This training is especially for the commercial refrigeration sector an important aspect in order to maintain and improve the energy class of the products made. There is in the commercial sector misunderstanding where and how to properly use foam.

This training to the companies will be a one-to-one for the specific needs and group trainings.

We have 48 and 40 companies in the commercial refrigeration and foam sector respectively whose consumption does not justify a conversion to pentane. Therefore waterblown has been selected and eventually depending on developments other low GWP solutions. For these companies several ICC related activities are required and during the technical assistance these will be discussed and determined including trials and testing.

## 5. Phase-out costs in the Foam Sector

### 5.1 Beneficiaries conversion

During the company's evaluation through visit of experts the equipment in place has been reviewed. For all the companies suitable for conversion, tables 4.2-1/3, replacement of the equipment has been advised. The ICC and IOC for the different applications are collected in Annex III. Whereby the same costing and structure as during the Phase-I has been applied.

**Table 5.1-1 ICC and IOC conversion costs of beneficiaries.**

| Application | N° | Phase-out HCFC-141b (MT) | ICC (US$) | IOC (US$) | Total Cost (US$) | CE (US$/kg) | Agency | Implementation period 2016 (US$) | (MT) | 2018 (US$) | (MT) | 2020 (US$) | (MT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Discontinuous sandwich panel | 2 | 40.3 | 451'000.00 | -42'718.00 | 408'282.00 | 10.13 | UNIDO | 204'141.00 | 24.30 | 204'141.00 | 16.00 | - | - |
| Integral skin | 2 | 39 | 211'200.00 | -3'900.00 | 207'300.00 | 5.32 | GIZ | - | - | 207'300.00 | 39.00 | - | - |
| Domestic refrigeration | 7 | 173 | 1'663'200.00 | -183'380.00 | 1'479'820.00 | 8.55 | UNIDO | 845'611.43 | 120.00 | 634'208.57 | 53.00 | - | - |
| System House | 1 | | 401'500.00 | 0 | 401'500.00 | N/A | UNDP | 401'500.00 | | | | | |
| Commercial refrigeration - Foam | 3 | 55.5 | 676'500.00 | -58'830.00 | 617'670.00 | 11.13 | UNDP | 205890 | 15.2 | 411780 | 40.3 | 0 | 0 |
| Totals: | | 307.8 | | | 3'114'572.00 | | | 1'657'142.43 | 159.50 | 1'457'429.57 | 148.30 | - | - |

**The revised table as per approval of 77th ExCom is as below:**

**Table 5.1-1 ICC and IOC conversion costs of beneficiaries**

| Application | No | Phase-out HCFC-141b (MT) | ICC (US$) | IOC (US$) | Total Cost (US$) | CE (US$/ Kg) | Agency | 2016 | 2018 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Discontinuous Sandwich Panel | 2 | 40.3 | 436,700 | (42,718) | 393,982 | 9.78 | UNIDO & ITALY | $792,770 | $819,232 | $0 | $0 | $0 |
| Domestic Refrigeration | 7 | 173 | 1,401,400 | (183,380) | 1,218,020 | 7.04 | UNIDO & ITALY | | | | | |
| Integral Skin | 2 | 39 | 143,000 | 25,350 | 168,350 | 4.32 | GIZ | $0 | $168,350 | $0 | $0 | $0 |
| | | | | | 0 | | | $0 | $541,771 | $0 | $0 | $0 |
| Commercial refrigeration Foam | 3 | 55.5 | 600,600 | (58,829) | 541,771 | 9.76 | UNDP | | | | | |
| **Total** | **15** | **307.8** | **2,581,700** | **(259,577)** | **$ 2,322,123** | **7.54** | | **$ 792,770** | **$ 1,529,353** | | | |

## 5.2 Beneficiaries technical assistance and supporting tools and materials

The technical assistance and conversion kits to water blown involves 40 companies in the foam sector and 48 of the commercial refrigeration sector who also foam. Overall the technical assistance will involve all the 102 companies directly and indirectly the complete foam sector of Iran (>200 companies).

| | | | | | | | | Implementation period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Application** | **N°** | **Phase-out HCFC-141b (MT)** | **ICC (US$)** | **IOC (US$)** | **Total Cost (US$)** | **CE (US$/kg)** | **Agency** | **2016 (US$)** | **(MT)** | **2018 (US$)** | **(MT)** | **2021 (US$)** | **(MT)** |
| Commercial refrigeration - waterblown conversion kits | 48 | 260.2 | 40'000.00 | - | 1'920'000.00 | 7.38 | UNDP | | | 960'000.00 | 130.10 | 960'000.00 | 130.10 |
| Foam sector - waterblown conversion kits | 40 | 227.4 | 40'000.00 | | 1'600'000.00 | 7.04 | UNIDO | | | 800'000.00 | 113.70 | 800'000.00 | 113.70 |
| Technical assistance conversions | 102 | 0 | 6'000.00 | | 612'000.00 | | GIZ | 150'000.00 | | 150'000.00 | | 312'000.00 | |
| Technical assistance development waterblown systems | 1 | | 75'000.00 | | 75'000.00 | | GIZ | 75'000.00 | | | | | |
| Spray foam equipment | 2 | 4 | 50'000.00 | | 100'000.00 | 25.00 | UNIDO | | | | 4.00 | 100'000.00 | |
| Reporting and monitoring structure | | 0 | 50'000.00 | - | 50'000.00 | | UNEP | 50'000.00 | | | | | |
| **Totals:** | | **491.6** | | | **4'357'000.00** | | | **275'000.00** | **-** | **1'910'000.00** | **247.80** | **2'172'000.00** | **243.80** |

**Table 5.2.1 – Technical assistance and foam kit conversions foam sector**

| Table 5.2-1 Technical assistance and foam kit conversions foam sector | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Application** | **No** | **Phase-out HCFC-141b (MT)** | **ICC (US$)** | **IOC (US$)** | **Total Cost (US$)** | **CE (US$/ Kg)** | **Agency** | **2016** | **2018** | **2020** | **2021** | **2022** |
| Commercial refrigeration - water blown conversion kits | 40 | 260.2 | 960,000 | 169,130 | 1,129,130 | 4.34 | UNDP | $423,424 | $0 | $705,706 | $0 | S0 |
| Foam sector – water blown conversion kits | 40 | 227.4 | 960,000 | 147,810 | 1,107,810 | 4.87 | UNIDO & ITALY | $0 | $224,772 | $454,700 | $378,338 | $50,000 |
| Technical assistance conversions | 102 | 0 | - | - | 545,094 | | GIZ | $165,680 | $144,160 | $139,754 | $95,500 | $0 |
| Technical Assistance development of Water Blown System | 1 | 0 | - | - | 50,000 | | GIZ | $50,000 | $0 | $0 | $0 | $0 |
| Technical assistance System House | 1 | 0 | 225,000 | - | 225,500 | | UNDP | $225,500 | $0 | $0 | $0 | $0 |
| Spray foam equipment | 2 | 4 | 48,000 | 2,600 | 50,600 | 12.65 | UNIDO | $0 | $0 | $25,300 | $25,300 | $0 |
| **Total** | | | | | **$ 3,108,134** | | | **$ 864,604** | **$ 368,932** | **$ 1,325,460** | **$ 499,138** | **$ 50,000** |

The costing of the conversion kits cannot be determined 100% for each company and in principle consists of:

**Table 5.23 – Conversion kits to water blown for each beneficiary**

| Conversion kits to waterblown | |
|---|---|
| Mixing head adaptation | 3'000.00 |
| Cooling heating system foaming equipment | 2'000.00 |
| Heating system for moulds | 15'000.00 |
| Raw material storage heating/cooling | 3'000.00 |
| Raw material for testing 2 T | 8'000.00 |
| Installation and modification | 2'000.00 |
| Trials and testing | 7'000.00 |
| | 40'000.00 |

The technical assistance is including visits of international and local experts for identification of the required modifications. Design modifications of the products and organization of workshops, training materials.

## 6. Summary and cost effectiveness

The phase-out plan II stage for the Islamic Republic of Iran involves 102 companies active in the foaming sector of pure foamers and commercial refrigeration sector.

The overall costs and cost efficiency are shown in the table hereunder:

**Table 6.1 – Overall project costs and cost efficiency.**

| | Total costs (US$) | 2016 (US$) | 2018 (US$) | 2020 (US$) |
|---|---|---|---|---|
| Project costs Germany represented by GIZ | 894'300.00 | 225'000.00 | 357'300.00 | 312'000.00 |
| Project costs UNIDO | 3'588'102.00 | 1'049'752.43 | 1'638'349.57 | 900'000.00 |
| Project costs UNDP | 2'939'170.00 | 607'390.00 | 1'371'780.00 | 960'000.00 |
| Project costs UNEP | 50'000.00 | 50'000.00 | - | - |
| **Total Project Cost** | **7'471'572.00** | **1'932'142.43** | **3'367'429.57** | **2'172'000.00** |

MT Phase out – 799.4 MT, Sector CE – 9.3 US$/kg

**The overall project cost and cost efficiency approved by 77th ExCom is as under:**

| Agency | Total Amount | 2016 | 2018 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| UNIDO | $1,863,205 | 389,567 | 540,000 | 480,000 | 403,638 | 50,000 |
| ITALY | $907,207 | $403,203 | $504,004 | $0 | $0 | $0 |
| GIZ | $763,444 | 215,680 | 312,510 | 139,754 | $95,500 | $0 |
| UNDP | $1,896,401 | $648,924 | $541,771 | $705,706 | $0 | $0 |
| TOTAL | $5,430,257.00 | $1,657,374.00 | $1,898,285.00 | $1,325,460.00 | $499,138.00 | $50,000.00 |

MT Phase out – 799.4 MT, Sector CE – 6.79 US$/Kg

The distribution of the costs over the different triennia has taken into account the in-front technical assistance and acceptance activities of the beneficiaries for the different applications. Notably the conversion kits as part of the technical assistance and supporting tools and materials for the phase-out of HCFC – 141b as described in table 5.2-1 are K.O after the technical assistance. Providing sufficient preparatory time and acceptance of the beneficiaries of the technologies. On the other hand the system house activities are started immediately from K.O.

**7. Implementation arrangements**

7.1 Agencies distribution of activities

Table 5.1-1 & 2 show the allocated responsibilities of the Implementing agencies and Germany.

7.2 Methodology of implementation

There are 15 companies, table 5.1-1, which will be converted and supported with replacement of existing equipment and conversion to Pentane. Considering the experiences gained in the first phase technical assistance will be required at an early stage. The GIZ as lead will organize together with the NOU a workshop with the beneficiaries and provide all the necessary information regarding available technologies, raw materials and counterpart responsibility issues to the companies. Further, visit the companies and asses the production for determining the procurement technical specifications, provide technical assistance for foam product related issues and schedule of implementation. In the first phase we followed a similar approach whereby GIZ and UNIDO determined an overall specification. In this phase we are working together also with UNDP to have an overall scheme and avoid disparity between the beneficiaries. The actual procurement of the equipment will then be executed by UNIDO and UNDP.

The companies mentioned in table 5.2-1 will have a high content of technical assistance for introduction of the new technologies. The GIZ as lead will hold several workshops for introducing the specific technologies according to the foam products of the beneficiaries. Introduce the water blown technology and determine together with the beneficiaries through individual visits the necessary equipment support required. The procurement of the individual conversion kits will then be executed by UNDP and UNIDO. The technical assistance will then continue during the commissioning of the conversion kits and during the introduction of the water blown system.

## Annex A-I

Foaming companies in HPMP Stage II

| Sector | Name of Company | Eligible refrigeration | Eligible foam | HCFC-22 consumption (MT) | HCFC 141b Consumption (MT) | Received support under |
|---|---|---|---|---|---|---|
| DRF | Sarma Sooz Zayanderood | 0 | y | - | 1.0 | |
| DRF | Setare Sard (Kooler Star) | 0 | y | - | 2.0 | |
| DRF | Zonooz Sanaat | 0 | Y | - | 2.0 | |
| DRF | Jaleh Negin Group | 0 | Y | - | 3.0 | |
| DRF | SANAYE SHAGHAYEGH BOROUDAT | 0 | Y | - | 3.0 | |
| DRF | Farsan Sanat Pasargad Co. (Moradi) | 0 | Y | - | 3.7 | NPP |
| DRF | Taghargh Sanaat | 0 | y | - | 4.0 | |
| DRF | BARD (SELEN) Sanaye | 0 | Y | - | 4.0 | |
| DRF | Ariz Poyayeh Sanaat (Ariz co.) | 0 | Y | - | 4.8 | |
| DRF | Charmahali | 0 | Y | - | 5.0 | |
| DRF | YOOSH ELECTRIC | 0 | y | - | 5.1 | |
| DRF | Takran Mobared (East Cool) | 0 | Y | - | 5.8 | NPP |
| DRF | Isun Co. | 0 | Y | - | 5.9 | |
| DRF | Peiman Sanat Moghadam | 0 | Y | - | 6.0 | |
| DRF | Shaghayegh Boroudat | 0 | y | - | 7.8 | |
| DRF | Yakhchalsazi anzabi | 0 | y | - | 7.8 | |
| DRF | Yakhnoosh | 0 | y | - | 8.4 | |
| DRF | Faravardeh Negin | 0 | Y | - | 9.0 | |
| DRF | Kolon Nik | 0 | Y | - | 9.0 | |
| DRF | Sarshar boroudat (Sonya) | 0 | y | - | 9.4 | |
| DRF | Rezvan | 0 | Y | - | 9.9 | |
| DRF | General industrial factories | 0 | Y | - | 10.0 | |
| DRF | NEGIN QOM (POLAR) | 0 | Y | - | 10.0 | |
| DRF | ASAYESH NEISHABOOR | 0 | Y | - | 11.0 | |
| DRF | Roshan Industrial Co. | 0 | Y | - | 13.8 | NPP |
| DRF | HANZAD | 0 | Y | - | 15.0 | |
| DRF | JAVAHERAN Tehran | 0 | Y | - | 19.0 | |
| DRF | PARTO SHIVA SANAT | 0 | Y | - | 19.0 | |
| DRF | AYSAN SANAT | 0 | Y | - | 22.0 | |
| DRF | TARA SANAT BARFIN (SEPAND AFROUZ) | 0 | Y | - | 24.0 | |
| DRF | NOVIN BOROODAT ENJEMAD | 0 | Y | - | 35.0 | |
| DRF | FOROUZAN | 0 | Y | - | 39.0 | |
| DSW | ALBORZ DAMAKARAN | 0 | Y | - | 1.0 | |
| DSW | MEHRAB | 0 | Y | - | 2.4 | |
| DSW | LIROK | 0 | Y | - | 6.0 | |
| DSW | Homa Sa'nat Co.* (II Phase UNIDO) | 0 | Y | - | 6.7 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| DSW | EVANS INDUSTRIAL Manufacturing | 0 | Y | - | 10.0 | |
| DSW | SANAYE BOROUDATI NASR | 0 | Y | - | 10.0 | |
| DSW | JAVAD HASANI (Mamut Delijan) | 0 | Y | - | 16.0 | |
| DSW | Shiller (Fanavari Novin Shiller) | 0 | Y | - | 24.3 | NPP |
| INT | ISFAHAN DASHBOARD | 0 | Y | - | 2.0 | |
| INT | PISHGAM FOAM | 0 | Y | - | 2.0 | |
| INT | ABR AVARAN | 0 | Y | - | 2.7 | |
| INT | Royan Polymer Co. (II Phase) | 0 | y | - | 12.0 | |
| INT | ZIVAR KHODRO (II Phase) | 0 | Y | - | 18.0 | |
| INT | ERISH KHODRO | 0 | Y | - | 21.0 | |
| RIG | Technodar Co. | 0 | y | - | 0.5 | |
| RIG | Iran Koolakfar | 0 | Y | - | 3.6 | |
| RIG | Khouzestan technique | 0 | Y | - | 7.1 | |
| Spray | Akia Duetch | 0 | Y | - | 2.0 | |
| Spray | Tejarat Aftab | 0 | Y | - | 2.0 | |
| | | | | | | |
| | | | Total HCFC-141b (MT): | | 483.7 | |

Legend:

DRF - Domestic refrigeration
DSW - Discontinuous Sandwich panel
INT - Integral
RIG - Rigid foam other applications
Spray - Spray foam

**Annex** A-II

Commercial refrigeration companies foam part Stage II

| Sector | Name of Company | Eligible refrigeration | Eligible foam | HCFC-22 consumption (MT) | HCFC 141b Consumption (MT) | Received support under |
|---|---|---|---|---|---|---|
| AC | Isfahan Dama | Y | Y | 5.5 | - | |
| AC | MEHAFROUZ GHARIN | Y | Y | - | 10.0 | |
| CRF | Sardsazi Tehran Co. | Y | y | 26.2 | 0.6 | |
| CRF | Yakhchalsazi Yeganeh | Y | Y | 4.5 | 2.0 | NPP |
| CRF | Yazd Monjamed | Y | Y | 4.3 | 2.0 | |
| CRF | Bahareh Lorestan | Y | Y | 2.5 | 2.5 | |
| CRF | Sanaye Boroutati Shams | Y | Y | 6.5 | 2.5 | |
| CRF | Sayn Electric | Y | Y | 6.0 | 2.5 | NPP |
| CRF | Sanaye Boroodati Pazhang (Garma Sarma Sazan Payame Isfahan) | Y | Y | 4.5 | 2.9 | NPP |
| CRF | Farmad Sarma | Y | Y | 5.5 | 4.2 | NPP |
| CRF | Milad Boroudat Kerman | Y | Y | 3.5 | 4.5 | NPP |
| CRF | Pardis Yazd | Y | Y | 5.0 | 4.5 | NPP |
| CRF | Tajhizate Ashpazkhaneh DATA | Y | Y | 4.3 | 4.9 | NPP |
| CRF | Arg Yazd | Y | Y | 7.5 | 5.0 | NPP |
| CRF | Rad Sarma | Y | Y | 22.7 | 5.0 | NPP |
| CRF | Faraz Chain Supermarket | Y | N | 2.3 | - | NPP |
| CRF | Arvand Refrigerator | Y | Y | 2.5 | 6.0 | NPP |
| CRF | Farshid Electric (Iran Sever - Goodarzi) | Y | N | 17.5 | - | NPP |
| CRF | Milad Khoram | Y | Y | 3.5 | 6.0 | NPP |
| CRF | Part Fereidouni | Y | Y | 4.0 | 6.3 | NPP |
| CRF | Gassoo Group | Y | Y | 2.8 | 6.4 | NPP |
| CRF | Mashhad Sarma | Y | Y | 5.5 | 6.4 | NPP |
| CRF | Mehr | Y | Y | 5.5 | - | NPP |
| CRF | buran sarma | Y | Y | 1.7 | 6.7 | |
| CRF | Sanaye Felezi&Boroodati Sardintoos (Kalantari) - Tajhizat Forooshgahi Bahman | Y | Y | 4.7 | 6.7 | NPP |
| CRF | Sorena | Y | Y | 7.0 | 6.8 | NPP |
| CRF | Oujbouran (Jalalzadeh) | Y | Y | 10.3 | 6.8 | NPP |
| CRF | Parsin Gostar Jonoub (Forough Manesh) | Y | N | 7.5 | - | NPP |
| CRF | Electro Sard Azna | Y | Y | 7.5 | 7.0 | NPP |
| CRF | Sarma Gostar Shiraz | Y | Y | 4.5 | 7.0 | NPP |
| CRF | Seyed Saleki (Yakhchalsazi Baradaran) | Y | Y | 5.5 | 7.2 | NPP |
| CRF | Sanaye Boroudati Jamali | Y | Y | 1.7 | - | NPP |
| CRF | Aysan Shargh Co. | Y | Y | - | 7.5 | NPP |
| CRF | Electro Toos Industrial Refrigeration (Tavana Industrial Group) | Y | Y | 5.5 | 7.5 | NPP |

| | | | | | | |
|---|---|---|---|---|---|---|
| CRF | Arminco | Y | Y | 15.3 | 7.8 | NPP |
| CRF | Fereidooni Co. | Y | Y | 7.7 | 7.9 | NPP |
| CRF | Sanaye Sard Sobouh Isfahan (Sobouhi) | Y | N | 5.0 | - | NPP |
| CRF | MEHRAN SARD (SALEHABAD) | Y | Y | 8.7 | 8.0 | |
| CRF | Abbaspour Refrigeration (Mahdis Co.) | Y | Y | 4.2 | 10.0 | NPP |
| CRF | Sarma Saz Taban | Y | Y | 3.5 | - | |
| CRF | Enjemad System Gharb Tehran | Y | Y | 7.8 | 11.8 | |
| CRF | Abdolrezazadeh (Enjemad Sanat) | Y | Y | 14.0 | 12.0 | |
| CRF | Behsarma Co. | Y | Y | 11.8 | 12.0 | NPP |
| CRF | Yazd Sardin | Y | Y | 5.3 | 13.9 | NPP |
| CRF | Yakhnooshan Kasa Co. | Y | Y | 6.8 | 14.0 | |
| CRF | Sard Sazan Kavir Kerman | Y | Y | 5.5 | 15.2 | NPP |
| CRF | Esfahan Yakhchal Isfahan | Y | Y | 18.0 | 18.0 | NPP |
| CRF/AC | Hvasa Saz Co. | Y | Y | 22.0 | 2.0 | NPP |
| CRF/AC | Boroudati Hararati Nik Co. | Y | Y | 14.0 | 6.5 | NPP |
| CRF/AC | Sanaye Boroudati Vahid (Sabcool) | Y | Y | 26.2 | 6.9 | NPP |
| CRF/AC | Sanaye Boroudati Maleki (Sarma cell) | Y | Y | 16.2 | 22.3 | NPP |
| | | | | | | |
| | | Total HCFC-22 (MT): | | 400.0 | | |
| | | Total HCFC-141b (MT): | | | 315.7 | |

Legend:
AC - Air conditioning systems manufacturers commercial and industrial
CRF - Commercial refrigeration
CRF/AC - Producers of commercial refrigeration and air conditioning commercial and industrial

## Annex A-III

Incremental and operating costs

| ICC Discontinuous panel: | | |
|---|---|---|
| **Item** | **Amount Requested/ Submitted** | **Amount approved in 77th ExCom** |
| **Production** | | |
| Retrofit High pressure dispenser | 70'000.00 | 70'000.00 |
| Premix pumping unit | 30'000.00 | 25,000 |
| Buffer tank for polyol | 15'000.00 | 15,000 |
| Nitrogen gas cylinder supply system | 10'000.00 | 10,000 |
| Modification of press | 15'000.00 | 15,000 |
| **Plant safety** | | |
| Ventilation and exhaust system (fans, piping, ductworks, grounding, electrical boards/connections) | 15'000.00 | 58,500 |
| Electrical Heating modification (similar to domestic refrigeration) | 10'000.00 | |
| Gas sensors, alarm, monitoring system for entire plant | 15'000.00 | |
| Fire protection/control system for the plant | 5'000.00 | |
| Lightning protection and grounding | 5'000.00 | |
| Antistatic floor | 2'500.00 | |
| Safety audit/safety inspection & certification | 5'000.00 | |
| Standby electric generator | | |
| General Works | | |
| Civil work/plant modifications | 2'500.00 | |
| Technology transfer/training | | |
| Trials and commissioning | 5'000.00 | 5,000 |
| Sub-total (USD): | 205'000.00 | 198,500 |
| Contingency | 20'500.00 | 19,850 |
| Sub-total (USD): | 225'500.00 | 218,350 |
| Phase out HCFC (MT) | 40.30 | 40.30 |
| Phase out HCFC (ODP Ton) | 4.43 | 4.43 |
| Number of companies: | 2.00 | 2 |
| Total Capital costs (USD): | 451'000.00 | 436,700 |
| Incremental Operating Cost (USD): | -42‘718.00 | -42,718 |
| Total Project Cost (USD): | 408‘282.00 | 393,982 |
| Local ownership (%): | 1.00 | 1 |
| Export component (%): | - | - |
| Requested grant (USD): | 408‘282.00 | 393,982 |
| Cost-effectiveness (Metric): | 10.13 | 9.78 |
| 60th ExCom CE ICC, USD/kg | 6.23 | |
| 60th ExCom CE IOC, USD/kg | 1.60 | |
| total incl. 25% for low GWP | 9.79 | |

| IOC excom/55/47 | | | Continuous Sandwich panel | | |
|---|---|---|---|---|---|
| | blowing agent | Cost US$ | Consumption (MT) | | Conversion factor |
| before | HCFC-141b | 1.85 | | 40.30 | 0.70 |
| after conversion | Pentane | 2.00 | | 28.21 | |
| | | | | | |
| | IOC: | -17'973.80 | | USD | |
| | | | | | |

| IOC excom/55/47 | Commercial refrigeration - Foam | | | |
|---|---|---|---|---|
| | Blowing agent | Cost US$ | Consumption (MT) | Conversion factor |
| before | HCFC-141b | 2.60 | 55.50 | 0.70 |
| after conversion | Pentane | 2.20 | 38.85 | |
| IOC: | | -58'830.00 | USD | |

## ICC Domestic refrigeration:

| Item | Amount Proposed | Amount Approved in 77th ExCom |
|---|---|---|
| **Production** | | |
| Retrofit High pressure dispenser | 65'000.00 | 60,000 |
| Replacement pre-mixing unit | 10'000.00 | 10,000 |
| Premix pumping unit | 7'500.00 | 7,500 |
| Buffer tank for polyol | - | - |
| Nitrogen gas cylinder supply system | 10'000.00 | 9,500 |
| Modification of fixtures | 50'000.00 | 30,000 |
| **Plant safety** | | |
| Ventilation and exhaust system (fans, piping, ductworks, grounding, electrical boards/connections) | 15'000.00 | 60,000 |
| Electrical Heating modification (similar to domestic refrigeration) | 10'000.00 | |
| Gas sensors, alarm, monitoring system for entire plant | 20'000.00 | |
| Fire protection/control system for the plant | 6'000.00 | |
| Lightning protection and grounding | 5'000.00 | |
| Antistatic floor | 2'500.00 | |
| Safety audit/safety inspection & certification | 5'000.00 | |
| Standby electric generator | | |
| **General Works** | | |
| Civil work/plant modifications | 5'000.00 | |
| Technology transfer/training | | |
| Trials and commissioning | 5'000.00 | 5,000 |
| Sub-total (USD): | 216'000.00 | 182,000 |
| Contingency | 21'600.00 | 18,200 |
| Sub-total (USD): | 237'600.00 | 200,200 |
| Phase out HCFC (MT) | 173.00 | 174 |
| Phase out HCFC (ODP Ton) | 19.03 | 19.14 |
| Number of companies: | 7.00 | 7 |
| Total Capital costs (USD): | 1'663'200.00 | 1,401,400 |
| Incremental Operating Cost (USD): | -183'380.00 | -183,380 |

| | | |
|---|---|---|
| Total Project Cost (USD): | 1'479'820.00 | 1,218,020 |
| Local ownership (%): | 1.00 | 1 |
| Export component (%): | - | - |
| Requested grant (USD): | 1'479'820.00 | 1,218,020 |
| Cost-effectiveness (Metric): | 8.55 | 7 |

| | | |
|---|---|---|
| 60th ExCom CE ICC, USD/kg | 6.23 | |
| 60th ExCom CE IOC, USD/kg | 1.60 | |
| total incl. 25% for low GWP | 9.79 | |

IOC ExCom/55/47 Domestic refrigeration

| | blowing agent | Cost US$ | Consumption MT | Conversion factor |
|---|---|---|---|---|
| before | 141b | 2.60 | 173.00 | 0.70 |
| after conversion | Pentane | 2.20 | 121.10 | |

IOC: -183'380.00 USD

| ICC Integral foam: | | |
|---|---|---|
| | **Amount proposed** | **Amount Approved in 77th ExCom** |
| **Production** | | |
| Retrofit High pressure dispenser | 20'000.00 | 30,000 |
| Replacement pre-mixing unit | | |
| Heating elements with electronic control (30 pieces) | 30'000.00 | |
| Nozzles mixing head | 1'500.00 | |
| Nitrogen charging polyol | 2'000.00 | |
| Modification of fixtures | 10'000.00 | 10,000 |
| **Plant safety** | | |
| Ventilation and exhaust system (fans, piping, ductworks, grounding, electrical boards/connections) | | 0 |
| Electrical Heating modification (similar to domestic refrigeration) | | |
| Gas sensors, alarm, monitoring system for entire plant | | |
| Fire protection/control system for the plant | | |
| Lightning protection and grounding | | |
| Antistatic floor | | |
| Safety audit/safety inspection & certification | | |
| In mould coating | 7'500.00 | |
| **General Works** | | |
| Civil work/plant modifications | 5'000.00 | 5,000 |
| Technology transfer/training | | |
| Trials and commissioning | 20'000.00 | 20,000 |
| Sub-total (USD): | 96'000.00 | 65,000 |
| Contingency | 9'600.00 | 6,500 |
| Sub-total (USD): | 105'600.00 | 71,500 |
| Phase out HCFC (MT) | 39.00 | 39 |
| Phase out HCFC (ODP Ton) | 4.29 | 4.29 |
| Number of companies: | 2.00 | 2 |
| Total Capital costs (USD): | 211'200.00 | 143,000 |
| Incremental Operating Cost (USD): | 25'506.00 | 25,350 |
| Total Project Cost (USD): | 236'706.00 | 168,350 |
| Local ownership (%): | 1.00 | 1 |

| | | |
|---|---|---|
| Export component (%): | - | - |
| Requested grant (USD): | 236'706.00 | 168,350 |
| Cost-effectiveness (Metric): | 6.07 | 4.32 |

| | | |
|---|---|---|
| 60th ExCom CE ICC, USD/kg | 15.26 | |
| 60th ExCom CE IOC, USD/kg | 1.60 | |
| total incl. 25% for low GWP | 21.08 | |

IOC excom/55/47 Integral

| | blowing agent | Cost US$ | Consumption (MT) | Cost USD factor |
|---|---|---|---|---|
| before | HCFC-141b | 1.85 | 39.00 | 71'994.00 |
| after conversion | Higher density +5%, in-mould coating | 5.00 | 19.50 | 97'500.00 |
| | IOC: | 25'506.00 | USD | |

**ICC System House:**

| Item | Amount proposed | Amount approved in 77th ExCom |
|---|---|---|
| **Production** | | |
| Reactor | 90'000.00 | |
| Pentane tank | 120'000.00 | |
| Premix pumping unit | 65'000.00 | |
| Buffer tank for polyol | 20'000.00 | |
| **Plant safety** | | |
| Ventilation and exhaust system (fans, piping, ductworks, grounding, electrical boards/connections) | 20'000.00 | |
| Electrical Heating modification | - | |
| Gas sensors, alarm, monitoring system for entire plant | 15'000.00 | |
| Fire protection/control system for the plant | 5'000.00 | |
| Lightning protection and grounding | 5'000.00 | |
| Antistatic floor | - | |
| Safety audit/safety inspection & certification | 5'000.00 | 225,500 |
| General Works | | |
| Civil work/plant modifications | 5'000.00 | |
| Technology transfer/training | | |
| Trials and commissioning | 15'000.00 | |
| Sub-total (USD): | 365'000.00 | |
| Contingency | 36'500.00 | |
| Sub-total (USD): | 401'500.00 | |
| Phase out HCFC (MT) | N/A | |
| Phase out HCFC (ODP Ton) | | |
| Number of companies: | 1.00 | |
| Total Capital costs (USD): | 401'500.00 | |
| Incremental Operating Cost (USD): | N/A | |
| Total Project Cost (USD): | 401'500.00 | 225,500 |
| Local ownership (%): | 1.00 | 1 |
| Export component (%): | - | - |
| Requested grant (USD): | 401'500.00 | 225,500 |
| Cost-effectiveness (Metric): | N/A | |

| | | |
|---|---|---|
| 60th ExCom CE ICC, USD/kg | 6.23 | |
| 60th ExCom CE IOC, USD/kg | 1.60 | |
| total incl. 25% for low GWP | 9.79 | |

**ANNEX B**

**ISLAMIC REPUBLIC OF IRAN**

# HCFC PHASE OUT MANAGEMENT PLAN FOR THE COMMERCIAL AND AIR CONDITIONING REFRIGERATION SECTOR

National Ozone Unit Islamic Republic of Iran

(Developed with the assistance of UNDP and GERMANY)

Abbreviations

| | |
|---|---|
| BAU | Business as usual |
| CFC | Chlorofluorocarbons |
| DoE | Department of Environment |
| ExCom | Executive Committee to the Montreal Protocol |
| GDP | Gross Domestic Product |
| GIZ | Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation and Development) |
| HC | Hydrocarbons |
| HCFC | Hydro chlorofluorocarbons |
| HFC | Hydro fluorocarbons |
| HP | Horse Power |
| HPMP | HCFC Phase out Management Plan |
| ISIRI | Institute of Standards & Industrial Research of Iran |
| I.R. of Iran | Islamic Republic of Iran |
| Kg | Kilogram |
| LVC | Low Volume Country |
| MP | Montreal Protocol |
| Mt | Metric ton |
| NOU | National Ozone Unit |
| NPP | National CFC Phase out Plan |
| ODP | Ozone Depleting Potential |
| ODS | Ozone Depleting Substance |
| RAC | Refrigeration Air Conditioning |
| TR | Ton Refrigeration |
| UNDP | United Nations Development Program |
| UNEP | United Nations Environmental Program |
| UNIDO | United Nations Industrial Development Organization |
| CRF | Commercial refrigeration |
| PU | Polyurethane |
| DRF | Domestic refrigeration |
| DSW | Discontinuous sandwich panel |
| INT | Integral foam |

Targets and funding

| | Total costs (US$) | MT | 2016 (US$) | 2018 (US$) | 2020 (US$) | 2022 (US$) |
|---|---|---|---|---|---|---|
| Project costs Germany represented by GIZ | 2'365'000.00 | 400.00 | 475'000.00 | 625'000.00 | 850'000.00 | 415'000.00 |
| Project costs UNDP | 3'600'000.00 | 400.00 | - | 2'400'000.00 | 1'200'000.00 | - |
| **Total Project Cost** | **5'965'000.00** | **800.00** | **475'000.00** | **3'025'000.00** | **2'050'000.00** | **415'000.00** |
| | CE (USD/kg) | 8.29 | | | | |

Targets and funding approved by 77th ExCom for Commercial and air-conditioning Refrigeration sector:

| Agency | Total Cost (US$) | MT | 2016 (US$) | 2018 (US$) | 2020 (US$) | 2021 (US$) | 2022 (US$) |
|---|---|---|---|---|---|---|---|
| GIZ | $1,908,960 | 400 | $429,820 | $734,525 | $145,255 | $502,500 | $96,860 |
| UNDP | $1,908,960 | 400 | $ 596,550 | $636,320 | $ 437,470 | $119,310 | $119,310 |
| **TOTAL** | **$3,817,920.00** | **800** | **$1,026,370.00** | **$1,370,845.00** | **$582,725.00** | **$621,810.00** | **$216,170.00** |

**Executive summary**

The companies mentioned in table 5.1-1 will have a high content of technical assistance for introduction of the new technologies. The GIZ as lead will hold several workshops for introducing the specific technologies according to the refrigeration technology used by the beneficiaries. Including the servicing and educational institutes and determine together with the beneficiaries through individual visits the necessary equipment support required. The procurement of the individual conversion kits will then be executed by UNDP. Technology support for using the conversion kits and introduction of the new technologies will be done by GIZ.

## 1. INTRODUCTION

The commercial refrigeration sector in Iran has many aspects as companies produce equipment for a series of applications. We have supermarkets cooling equipment in the range of combined systems, standalone units and cold rooms. At the same time manufacturers produce chillers either for commercial refrigeration or air conditioning applications. A typical feature is that manufacturers like Sabcool, Behsharma or Hvasa Saz produce equipment test and then ship without refrigerant. The first charging of the equipment on-site is done by themselves or external installation companies. We specifically mention installation companies as their task cannot be compared with the traditional servicing.

There are many shops who provide semi assembled equipment which is then on-site assembled for completion. Examples are the supply of condensing units in a variety of assembly state with evaporators and condenser acquired from other companies.

During the activities with the Supermarkets by GIZ a variety of these solutions have been found and supermarkets owners expressed their negative view on these practices. The training held in 2015 in combination of the book published by GIZ has had a positive resonance. Supermarkets managers are taking over the principle of leakage free and clear responsibility of the supply.

There is a change going on from HCFC-22 to HFC refrigerants because of tendencies in the market without substantial technical background. New systems are being developed like the compound systems with the same issues as the old systems.

On the other hand, during the leakage free activities on the refrigeration systems complete replacement also was experienced. According to specific technical requirements a condensing unit system was ordered from a local manufacturer. This was quite an eye opener for the supermarket owners as the quality was superior, maintenance over a year time practically zero. This option of purchasing factory made refrigeration systems was new for them and for future supermarkets this solution will be chosen.

We therefore, although no activities were done in this sector during the I phase, have experience in working with refrigeration equipment manufacturers. Understand the issues support is required for and methods.

The Commercial refrigeration sector plan is designed for a complete phase out by 2022. This period is needed due to the large number of companies, products and related refrigeration applications.

The commercial refrigeration sector is strongly related to the foam sector due to the foam. Many activities will flow into the foam sector specifically with regard to the foam conversion technologies, the interaction of pure foam companies in e.g. as supplier of panels for cold rooms.

The commercial refrigeration sector in contrary to the domestic refrigeration or domestic air conditioners is mainly supplying equipment not charged with refrigerant. The conversion of this sector to low GWP will have an additional beneficial aspect that the overall consumption reduction will conservatively be double the actual consumption of the beneficiaries.

The reason being that large equipment's are charged by associate installation companies before the servicing sector is entering into merit. Therefore that the estimate consumption reduction is conservatively

estimated double the actual consumption and Iran commits to this. From discussions we had with manufacturers the sector requires extensive training in design and manufacturing of low GWP solutions. Further to support from educational centres to build up capacity in training manufacturers and their engineers. This is substantially different than the servicing sector. The servicing sector will receive specific product related training documents and documentation of the products for proper servicing practices. This documentation is also a weak point of the manufacturing sector and key element for proper servicing.

## 2. HPMP sector survey and consumption status commercial refrigeration sector

### 2.1 Overview commercial sector

In the commercial sector we found only a couple of companies manufacturing AC equipment, in any case these were all large systems and refrigerant was added during installation on-site.

Most companies produce typical commercial refrigeration like water coolers, chillers, air handling systems, refrigeration cabinets for supermarkets or small shops. Combined systems or standalone units like small ice cream cabinets and bottle coolers.

The particularity of this sector is the fact that as well as PU foaming as refrigeration knowledge is required. Most companies are small and technology level medium.

Extensive training and technology transfer is required and ICC support for:

- Refrigeration tools
- Refrigeration components
- Technology

Some of the companies are worthwhile to undergo also a conversion to Pentane for the foam component:

**Table 2.1-1 Conversion of foaming equipment to pentane in the commercial refrigeration sector**

| | | | | | | |
|---|---|---|---|---|---|---|
| CRF | Sard Sazan Kavir Kerman | Y | Y | 5.5 | 15.2 | GIZ 2015 |
| CRF | Esfahan Yakhchal Isfahan | Y | Y | 18.0 | 18.0 | GIZ 2015 |
| CRF/AC | Sanaye Boroudati Maleki (Sarma cell) | Y | Y | 16.2 | 22.3 | GIZ 2015 |

The consumption justifies the conversion and the projects are integrated in the foam sector HPMP.

The size distribution of this sector according to HCFC-141b consumption:

**Table 2.1-2 Size distribution of commercial refrigeration companies according to HCFC-141b consumption**

| | No. of Companies | HCFC-22 (MT) | HCFC-141b (MT) |
|---|---|---|---|
| Companies with no foam consumption | 8 | 48.5 | |
| Companies <=10 T consumption of HCFC-141b | 36 | 266.0 | 196.4 |
| Companies <=20 T consumption of HCFC-141b | 6 | 69.3 | 96.9 |
| Companies > 20 T consumption of HCFC-141b | 1 | 16.2 | 22.3 |
| Total | 51 | 400.0 | 315.7 |

Note: nearly all the companies use foam but most are small <10 T

The size distribution is as follows according to HCFC-22 consumption:

**Table 2.1-3 Size distribution of commercial refrigeration companies according to HCFC-22 consumption**

| | No. of Companies | HCFC-22 (MT) | HCFC-141b (MT) |
|---|---|---|---|
| Companies with no HCFC-22 consumption | 2 | | 17.5 |
| Companies <= 10 T consumption of HCFC-22 | 37 | 185.9 | 198.2 |
| Companies <= 20 T consumption of HCFC-22 | 8 | 117.2 | 85.5 |
| Companies > 20 T consumption of HCFC-22 | 4 | 97.0 | 14.5 |
| **Total** | **51** | **400.0** | **315.7** |

One of the companies without HCFC-22 consumption is the AC company Mehafrouz Gharin. The reason being that the produced units are filled on-site during installation. All the AC companies where not producing domestic air conditioning. In any case domestic air conditioning is so much more developed in Asian countries that units are more likely to be imported.

- Bans on the use of HCFC in imported units will be essential here.

All the companies of the commercial refrigeration sector have been surveyed and a total of 51 companies found eligible.

The consumption in the refrigeration sector, only HCFC found was HCFC-22, was on the low side according to our estimates and overall HCFC-22 consumption and starting point of 2.272,7 MT.

The reason for this consumption of only 400 MT is:

- Large producers of chillers do not charge the equipment when this is shipped to the location.
- Installation companies are engaged for starting up all not pre-charged equipment and the consumption therefore is allocated to these companies.

Considering that the only domestic company producing domestic split unit air conditioners has been converted by UNDP during phase I. The part of the consumption which is related to startup of the larger not pre-charged equipment for installation purposes is much higher than the indicated 400 MT.

The companies producing commercial refrigeration mainly produced:

- Chillers larger than 5 KW
- Refrigerated furniture for supermarkets like Island case, display cabinets, multideck, bottle coolers
- Cooling equipment like condensing units

All this refrigeration equipment is charged on-site and the refrigerant used for testing in the factories is not recovered!

With all the activities in the foam sector large part of the commercial refrigeration sector companies foam contribution will be converted to waterblown. Therefore, that with the activities of training and awareness in the foam sector these companies merge together with the mere foam companies. The sourcing of raw materials and everything what has to do with foam is the same. The purpose is also that these companies' conversions is for both HCFC-141b and HCFC-22.

## 2.2 Commercial refrigeration sector consumption

We mentioned in the paragraph above the issue that equipment is in most cases not supplied pre-charged.

The condensing units for example of sabcool are supplied to companies manufacturing cold rooms and refrigeration for supermarkets but they are not involved with the charging.

The refrigerant used is for testing purposes and after sales servicing activities in the cases the companies are at the same time doing the servicing and purely for installation purposes.

Therefore, that the allocation of consumption related to this sector conservatively is double the consumption of 400 MT of HCFC-22!

A company like Gassoo who is one of the largest producers has an extremely low consumption of 2.8 MT. The company Behsharma on the other hand does the installation by themselves and their consumption is 11.8 MT, but they work only on project basis. Hvasa Saz is producing large chillers of up to 500 KW but the charging is done by installation companies.

These chillers of Hvasa Saz are also used for industrial application in refrigeration and air conditioning. A clear cut between commercial, industrial and air conditioning applications can therefore not be given. Another example is the company Behsharma who is providing complete supermarkets but also equipment for airports and large centralized AC systems.

The company Mehafrouz Gharin has no consumption because the installation is completely outsourced, nevertheless, this companies requires assistance for support in conversion of their products as it is a large manufacturer.

It is important to understand this mechanism as is helps to understand better the installation and servicing sector. Therefore, that the expected phase-out will be conservatively 800 MT of HCFC-22 for this sector.

### 2.3 Companies status

During the survey 400 MT of HCFC-22 has been accounted for of the eligible companies. 51 companies are eligible for funding in the CRF sector.

The survey further evidenced that:

- The eligible companies were in good state;
- Technology and R&D is in many cases lacking;
- Clear guidance and support is required;
- The consumption of HCFC-22 is significant and only the production consumption accounted for. The installation of equipment startup consumption is estimated to be twice.
- Companies where no replacements are planned would be more helped with technology and product specific support.
- Companies were looking for solutions and technical support to improve the products, especially for the commercial refrigeration companies
- Design and ready to implement refrigeration cycles are essential for the companies for a fast conversion.

Technologies have been discussed with the companies and they have been informed about the different stages of the Ozone protection activities in the IR of Iran.

### 2.4 Refrigeration import

All the refrigerant is imported to Iran. The phase out of HCFC-22 has been recognized by the stakeholders and alternatives coming onto the market in the refrigeration manufacturing sector are HFCs.

It is important that the Stage-II start as soon as possible to avoid that HFC's are going to enter into the market. Considering that Iran will develop fast in the coming years, typical growth rate around 8%.

### 2.5 Refrigerant production

There is no refrigerant production but there is interest by the petrochemical industry for CO2 and R600A production. Iran being also an exporter of LPG.

## 3. Alternative technologies commercial refrigeration and air conditioning sector

In Iran, like in other countries, the refrigeration industry currently uses HCFC-22 as refrigerant for a large number and variety of residential air-conditioning, commercial air-conditioning systems, commercial refrigeration systems, fisheries, cold rooms, refrigerated transport.

In addition to HCFCs, the refrigeration servicing sector uses in growing amounts HFCs, like HFC-134a for the complete domestic refrigeration manufacturers and HFC-404A, 410A in commercial applications, and HFC-410A in the air-conditioning sector. The share of HCFC-22 is still dominant, however import and domestic production of air-conditioning systems are gradually moving away from HCFC-22-based systems to systems using HFC-404A, HFC-410A. Likewise, in industrial, commercial and transport refrigeration, instead of HCFC technologies HFCs are gradually taking over the lead. Hydrocarbons and CO2 are being used in some applications (e.g. production of bottle coolers for Coca Cola) but in very limited amounts. While these refrigerants are cheap, the cost of components and materials is high, which confines their use to small capacity appliances.

During the supermarkets leakage free solutions we noticed however that the components prices weren't that more costly but availability more an issue. Further, to the knowledge of which components to be used.

HC-290 based air-conditioners are commercially not yet available in Iran moreover because importers are not aware of the technology.

HFO-based equipment has not yet reached the Iranian market.

Ammonia is currently available but its use is limited, since traditionally it is only used in large, industrial installations because availability of components does not allow downscaling. Furthermore, design, operation and maintenance of such systems require well-trained technicians due to their complexity and the toxicity of ammonia.

It was also discovered that working with several servicing companies and visiting on-going installation work that the service technicians although trained were lacking implementation of the learned skills. This due to the lack of knowledge and requirements to be placed on the servicing and installation companies by the owners.

For any technology introduced a proper product stewardship or EPR (extended product responsibility) needs to be set in place. This as guidance of all the stakeholders from the service providers, manufacturers and owners.

Not considering HFC or high GWP refrigerant solutions and the benchmark nowadays with the available options are solutions with a GWP <150. We have following options:

- HCs
    - R290 Propane
    - R1270 (Propylene)
    - R600a (mainly bottle coolers)
    - R744 $CO_2$
    - R717Ammonia

- Unsaturated HFC's (HFO)
    - 1234yf MAC automotive
    - Others under development

These refrigerants are also used in combinations through cascade systems and the most known ones are:

- NH3
    - With CO2
    - Brine or glycol

- R290
    - With CO2
    - Brine or glycol

Most cascade systems have good applications in the centralized supermarkets refrigeration with different stages for cooling at +8 or -18°C and centralized air conditioning systems where glycol is used combined with air handling units.

We must consider in the choice the temperature conditions in Iran whereby we have hot summers (>35°C) and humid conditions in the south of Iran. In Tehran we noticed that the working conditions of the refrigeration equipment were quite different during winter and summer. Summer conditions are hot and excessive discharge temperatures of the refrigerant will pose problems for running during winter and summer. The practice used is to discharge during winter time part of the refrigerant in order to increase the condenser discharge temperatures. Technical solutions have been applied to prevent this practice but with excessive discharge temperature, considering winter period of nearly 0°C and summer >35°C this will be difficult to achieve.

Test performed during the Praha exercise already showed this problem with HFO's in combination with R32. Developments will show future options and the plan is to prepare the industry and research institutes to properly asses the pro and cons.

## 4. HPMP Phase-out Strategy Commercial refrigeration and air conditioning sector HCFC-22

### 4.1 Strategy

The strategy involves all the stakeholders to achieve a harmonized approach. This involves that from training perspective the leading institutes provide the general training curricula and manufacturers provide product related training material. This will then be harmonized according to the educational practices of Iran.

The manufacturers for converting their products are in need of technical know-how, manufacturing tools, samples of products on which to build their own products. As well as components for producing refrigeration products of different types. Samples of the products will then be used for training purposes at the training institutes and for training of the servicing sector.

### 4.2 Technology conversion kit

For the conversion of the commercial sector the companies need packages of ready know how which they can apply directly. Most of the companies are not capable of any R&D and capacities to do this are lacking. These packages are for introducing new technologies with low GWP refrigerants and are not retrofits or drop inn solutions! The new refrigeration units will be based of low GWP refrigerants excluding the use of HFC's.

There are many companies which do not have a high consumption and therefore training alone will not be sufficient. The proposal is to introduce conversion kits tailored to their products.

These kits would consist of:

- Compressors
- Electrical parts e.g. thermostats
- Filter dryers
- Evaporator
- Condenser
- Expansion valve or capillary tube
- Etc.

At least 30 to 50 kits for each beneficiary tailored to the needs. This would allow the transition and motivation to discard HCFC-22 technology. Furthermore, specific equipment for use of HC's would be required like refrigerant charging and safety equipment:

- Vacuum pump ATEX suitable for HC's and HFO's
- Temperature and pressure gauges
- Manifolds
- Handheld gas sensor
- Weighing balance
- Oil separation filters
- Etc.

This sector doesn't need to have specific charging equipment like domestic refrigeration or air conditioners manufacturers who have a limited range of charging mass and central charging points.

These components would be tailored according to the products manufactured.

### 4.3 Technology samples

The company have not the means to do extensive R&D and we know from experience that a conversion is than difficult.

The scope of the technology samples is to provide for different products ready-made samples. Which than can be taken over by the companies in their own manufacture. These samples will then also be used for the training institutes to provide support to the companies and train servicing technicians.

For the demo samples which will be developed at selected companies and then placed at the disposal of the training institutes are:

- Bottle coolers

The majority of the companies are producing these and technologies proposed are R290 and R600a. HFO's are at this stage not yet commercially available. Bottle coolers are already produced with R600a in Iran and this is the easiest technology conversion.

Dissemination of this technology is required and at three manufacturers samples will be made under supervision of GIZ experts and cooperation with the training institutes. The samples will then be handed over to the training institutes, workshops organized for dissemination of the technology and design, servicing training.

- Chillers

Chillers are used for various applications, refrigeration in the food industry and also air conditioning of large buildings.

The principle of producing a chiller with R290 must be understood and a sample size will be demonstrated. At this stage the size we are looking at is between 10-20 KW which can then be extended to other size once the technology is acquired.

The chillers will be setup as a cascade with in the beginning two models, R290/glycol-brine for +8 applications in supermarkets and R290/ CO2 for low temperature applications. These are the best known solutions and once this technology is apprehended the step to future technologies is open.

Chillers are used in centralized refrigeration systems of e.g. supermarkets. Spin-off for the companies producing the industrial chillers is of course the industrial AC sector.

We will make these samples at two companies under supervision of GIZ experts and cooperation with the training institutes. The samples will then be handed over to the training institutes, workshops organized for dissemination of the technology and design, servicing training.

- Compact cooling unit for cold rooms

Cold store modern systems are units in one block. These can be used for nearly all cold stores with exception of course of large units of e.g. logistic companies. Therefore that we need the development of cascade systems, specific request also from companies supplying supermarkets and large refrigeration systems. As well as a compact sized unit which can be hung up directly on the cold room. Avoiding the need of lengthy piping and condensing units with compressors placed on the floor.

Together with the development of the compact refrigeration unit the cold room design will be dealt with. For determining the correct cooling requirements, at this stage there is no guidance on this issue.

We are looking at units with R600a and R290 depending on the cooling capacity.

We will make these samples at three companies under supervision of GIZ experts and cooperation with the training institutes. The samples will then be handed over to the training institutes, workshops organized for dissemination of the technology and design, servicing training.

- Standalone furniture

The majority of the supermarkets does not justify the use of condensing units as cooling equipment. The supermarkets mainly use

- 2-4 island case for -20°C
- 2-4 island case for +8°C
- 20-60 m Display cabinets (mulitdeck +8°C)

For this furniture in pairs condensing units are used which are badly maintained, conversion costs are high (complete replacement required), leakage extremely high up to 400% and long piping.

Alternatives are standalone units which build in refrigeration systems which can be changed quickly in case of the need of repair. The supermarket owners are looking forward to this kind of solution and the technology should take into account the removal of heat produced by the units.

Therefore, the technology will be made available to produce standalone units. For the multideck the option is also there to make use of chillers units with brine as secondary cycle or using a cascade R290/glycol. The chiller sample made with the manufactures will then be tested in a supermarket in combination with the refrigeration furniture.

Complete kits will be provided and samples produced with three manufacturers under supervision of GIZ experts and cooperation with the training institutes. The samples will then be handed over to the training institutes, workshops organized for dissemination of the technology and design, servicing training.

- Ice-cream chest freezer

The same is valid for chest freezers which are produced by the companies in different sizes and temperature ranges.

- NH3 systems

During the HVAC conference in April 2016 many companies were interested for this application but NH3 systems are quite particular. There are companies already producing, importing them but are moreover designer, developers instead of manufacturers. We would consider the design and training aspects but not introduction of samples.

Other low-GWP solutions are of course welcome and once R&D is understood for sure the companies will develop.

### 4.4 Refrigeration technology transfer, trials and testing.

None of the companies visited had a suitable testing laboratory for energy measurement. This is a shortcoming that prevents the benchmarking of produced refrigeration units. Standards need to be setup for the measurement methods and laboratories introduced. We have different types and sizes of refrigeration systems so a flexible method for measurements is required. Most of the refrigeration units produced do not fit in the traditional testing chambers used for domestic refrigerators and air conditioners. Therefore, mobile testing equipment is needed with temperature, humidity, pressure measuring equipment. A whole set of benchmarks will need to be performed together with the institute of standards to setup the testing method and measurement equipment. Under the project measurement equipment will be provided for the educational centres, institute of standards and manufacturers. The manufacturers can then share this equipment on a loan basis.

### 4.5 Training component research institutes and VTC

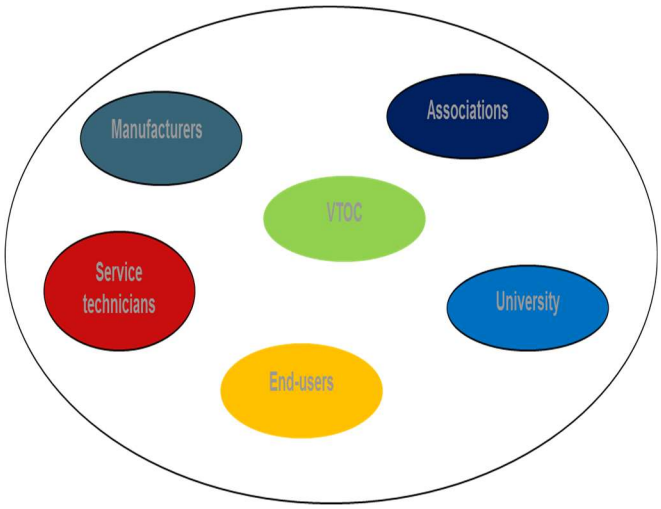
We have to distinguish between typical servicing technicians training and technicians working in the production facilities. The scope of this training is to familiarize and educate the technicians in the use of low GWP refrigerants:

- design of equipment
- education on standards
- troubleshooting and support of external service technicians
- Product stewardship

The roll out of new low GWP technologies needs to be accompanied with capacity building of an infrastructure. One of the main items is that producers perform specific product training of trained service technicians. Furthermore, provide a certification for their products to servicing technicians.

The roll out essentially requires an extended responsibility of the producers which can be achieved through product stewardship.

The approach is to have a harmonized concept involving all the stakeholders




From manufacturers to vocational training centers, associations, research universities, servicing technicians to end-users.

### 4.5.1 Vocational training centers

There are in Iran abt. 150 vocational training centers in the different provinces. In Tehran the most famous and reputable is Enghelab University under the Ministry of Science. This institute provides training for servicing up to Master degree in refrigeration.

The connection between the producers, technologies and servicing technicians needs to be reinforced. The training materials of the university are not up to date and knowledge of low GWP refrigerants is limited.

The samples which are rolled out at industrial level need to be transferred to University level for setting the curricula of the future servicing technicians, designer and engineers.

Initiating the training and support measures of the Enghelab University the other vocational training centers curricula will start.

### 4.5.2 Capacity of institutes training measures

Enghelab vocational school

This school has abt. 5000 students and falls, under the Ministry of Science

- Every year 80 students graduate in refrigeration sector
- At the moment there are 240 students studying refrigeration

Enghelab also has contracts for training students of different universities in the cities of Ahwaz, Kerman, Mashad, Esfahan

- 170 branches all over the country are under their supervision
- 20 branches, have practical servicing training, i.e. Heating and Air-conditioning in their program and have workshops for practical work

The potential of students that would be trained is in the range of 1600/ year. Further to modular courses on specific topics. We have then to add the manufacturing companies and their directly related servicing engineers or companies who work with them. Conservatively the training would access in each company 3 to 6 engineers. Moreover, the introduction of improved documentation which is totally lacking at the moment will facilitate the work of many more servicing engineers.

TVTO Karaj, is another institute which is more aimed at practical training of trainers. The institute is well equipped and provides training on the major aspects of refrigeration. However, the training equipment and tools for low GWP refrigerants is lacking as well as the technological knowhow.

Their courses are aimed at training the trainers with theoretical and above all practical training. The institute falls under the ministry of labour and is represented all over the country. The plan is that already trained trainers follow specific courses on the different aspects and technologies. This would allow to disseminate the technology in a proper way through the country.

For both institutes training equipment needs to be developed in accordance with the roll out of the new technologies. As well as training curricula.

### 4.5.3 Training curricula

The new technologies will be accompanied by documentation on design, training, use and servicing training. This documentation will then be produced together with the producers – training centers – refrigeration associations to have a common understanding on servicing. The link between producers and end user for a proper product stewardship will be set here. There are at the moment no curricula for HC's or HFO's and to a limited extent HFC. The training curricula will be developed for the most common refrigeration applications, commercial and air conditioning. In order to provide theoretical and practical training material for the servicing sector.

### 4.5.4 Foam technology

With the use of waterblown we need to modify production practices and modify equipment. Additional design work will be required for the introduction of the refrigeration technologies. There is a labelling standard according to EU 1060/2010 but lack of accredited laboratories. Enforcement of testing will need to be assessed.

### 4.6 Training manufacturers

A program of training, tools and curricula needs to be prepared for manufacturers to have a synergy with TVTO, VECT and University. The link with the training institutes is not available at the moment.

Several workshops will be held for training of the beneficiaries in the new technologies. The training will involve:

- Sealed system design
- Leakage detection
- Manufacturing practices
- Good practices
- Recovery, recycling and reclaim
- Refrigeration training, basics of refrigeration and modules regarding specific refrigerant aspects and advanced courses in the design of refrigeration circuits.
- Requirements and contents of documentation
- Servicing training and courses for their technicians and servicing companies working with the beneficiaries. (this activity will then flow into the servicing training activities)

Practical training

- Training on-site in the production of refrigeration products
    - Design and use of foam
    - Insulation and the relation with refrigeration systems
    - Calculation of cooling needs
    - Assemble of refrigeration units and refrigeration circuits
    - Quality control and certification of the units
- The onsite trainings will be depending on the beneficiaries product range about two weeks each

### 4.7 Development curricula

The University of Enghelab and their training centers and associated VETC curricula will need to be extended to the new technologies and refrigerants. As well as the train the trainers centers like the VTOC Karaj. In close cooperation between the educational centers and experts new curricula Certification and classification requirements will be setup.

Several workshops and trainings at manufacturers will be organized as well as coordination meetings with the educational centres. Information from manufacturers will then flow into the curricula and vice versa.

Guide will be the European Area refrigeration craftsmanship guidelines adapted to the Iranian reality.

Abroad work visits will be organized for exchange of educational content.

### 4.8 Manufacturing and testing standards

Iran has adopted international refrigeration standards and guidelines but the knowledge is limited between the manufacturers. These standards are required for good design and application of good practices as well as uniform construction methods. A review of the standards and explanation of these in manufacturing is going to be implemented.

Iran has adopted an energy labelling scheme for domestic refrigeration equipment. For commercial refrigeration energy schemes are not available but moreover the testing conditions and methods have to be established for energy conservation aspects and technology choices. The schemes will be setup according

to international standards adapted to the Iranian climate conditions which are medium to hot climate conditions.

These testing standards will be implemented in close cooperation with the accredited testing institutes in the major cities of Iran.

### 4.9 Introduction of reusable refrigerant cylinders

For control and monitoring of consumption one of the issues is the uncontrolled distribution of one time use of refrigerant cylinders. The ODPT released by these cylinders are impossible to determine with certainty but considering the content of 11,5 kg and overall consumption the numbers are huge. Typically a cylinder is difficult to empty completely and once opened the leak tightness is not assured.

The introduction of reusable refrigerant cylinders as practiced in developing countries allows the introduction of monitoring and more accurate quota control. Further to reduction of ODP consumption. The GIZ held a meeting with the major importers and these agreed to the introduction of reusable cylinders which provide also a better control on fake refrigerants. The company Roshan gas has just introduced cylinder charging equipment for refrigerant imported with Iso cylinders. The project would involve to introduce these cylinders in other cities of Iran include the possibility of registered importers to make use of charging stations. Further to the introduction of these cylinders to the manufacturers, shops and training institutes. This will be accompanied by support in setting up legislation for banning one-use cylinders, standards.

Planned are 400 reusable cylinders as sample and capacity building for local industry to fabricate these according to drawings approved by the local pressure certification institute and 4 gas bottles charging stations in the major cities. The gas bottle charging stations include:

- Refrigerant capture system of exhaust
- Bottle vacuuming station
- Pumping station
- Filling station
- Conveyors
- Bottle cleaning and recovery of remaining refrigerant
- Safety system

### 4.10 Regulatory supporting measures

The Islamic Republic of Iran is adopting the European standards which are translated into Iranian language. An example is the labelling standard for appliance. For acceptance of HC's and other flammable refrigerants the standard EN 378 which regulates the safety and charge amounts needs to be adopted. The NOU has committed to adopt this standard and place it into force. This standard will be one of the topics during the workshops of the stakeholders and is part of the training and curricula development for the manufacturing and servicing sectors.

## 5. Phase-out costs in the refrigeration Sector

The costs are shown in the table hereunder according to the activities.

## 6. Summary and cost effectiveness

The approach chosen is to start with the manufacturing companies and close the loop with all other stakeholders. This supported by capacity building of the educational institutes, EPR and a refrigerant bottle return scheme. For promoting low GWP refrigerants and setup the industry for future challenges.

Overall cost effectiveness and agency distribution is shown in the table hereunder.

**Table 5.1-1 Commercial and AC refrigeration detailed project cost**

| Activity | N° | Phase-out HCFC-22 (MT) | ICC (US$) | IOC (US$) | Total Cost | CE (US$/kg) | Agency | Implementation period 2016 (US$) | (MT) | 2018 (US$) | (MT) | 2020 (US$) | (MT) | 2022 (US$) | (MT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Training curricula | 1 | | 100'000.00 | | 100'000.00 | | GIZ | 25'000.00 | | 50'000.00 | | 25'000.00 | | | |
| TVTO/VETC/University training | 1 | | 400'000.00 | | 400'000.00 | | GIZ | 75'000.00 | | 75'000.00 | | 150'000.00 | | 100'000.00 | |
| Refrigeration technology transfer/trials and testing | 1 | | 200'000.00 | | 200'000.00 | | GIZ | 50'000.00 | | 50'000.00 | | 50'000.00 | | 50'000.00 | |
| Qualification and certification | 1 | | 200'000.00 | | 200'000.00 | | GIZ | 50'000.00 | | 50'000.00 | | 50'000.00 | | 50'000.00 | |
| Standards | 1 | | 75'000.00 | | 75'000.00 | | GIZ | 25'000.00 | | 25'000.00 | | 25'000.00 | | | |
| Training companies | 48 | | 5'000.00 | | 240'000.00 | | GIZ | 50'000.00 | | 50'000.00 | | 75'000.00 | | 65'000.00 | |
| Introduction of reusable cylinders | 1 | | 350'000.00 | | 350'000.00 | | GIZ | 50'000.00 | | 75'000.00 | | 225'000.00 | | | |
| Lead agency Coordination and management | 1 | | 200'000.00 | | 200'000.00 | | GIZ | 50'000.00 | | 50'000.00 | | 50'000.00 | | 50'000.00 | |
| Training tools/ Demos | 1 | | 600'000.00 | | 600'000.00 | | GIZ | 100'000.00 | | 200'000.00 | | 200'000.00 | | 100'000.00 | |
| Sub-total | 400 | | | | 2'365'000.00 | 5.9125 | | 475'000.00 | | 625'000.00 | | 850'000.00 | | 415'000.00 | |

| Activity | N° | Phase-out HCFC-22 (MT) | ICC (US$) | IOC (US$) | Total Cost | CE (US$/kg) | Agency | Implementation period 2016 (US$) | (MT) | 2018 (US$) | (MT) | 2020 (US$) | (MT) | 2022 (US$) | (MT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conversion package Commercial refrigeration companies | 48 | 400 | 50'000.00 | | 2'400'000.00 | | UNDP | | | 600'000.00 | 100.00 | 600'000.00 | 100.00 | 1'200'000.00 | 200.00 |
| Setup of refrigerant distribution system | 4 | | 300'000.00 | | 1'200'000.00 | | UNDP | | | 1'200'000.00 | | | | | |
| Sub-total | | 400 | | | 3'600'000.00 | 9 | | - | - | 1'800'000.00 | 100.00 | 600'000.00 | 100.00 | 1'200'000.00 | 200.00 |
| **Total** | | **800** | | | **5'965'000.00** | **7.45625** | | **475'000.00** | **-** | **2'425'000.00** | **100.00** | **1'450'000.00** | **100.00** | **1'615'000.00** | **200.00** |

**Table 5.1-1 Commercial and AC refrigeration detailed project cost**

**Commercial and AC refrigeration detailed project cost agreed and approved cost by the 77th ExCom for Germany is as below:**

| **Commercial Refrigeration and Servicing Sector Component - GIZ** | | | | | | |
|---|---|---|---|---|---|---|
| | **Total costs** | **2016** | **2018** | **2020** | **2021** | **2022** |
| | **(US$)** | **(US$)** | **(US$)** | **(US$)** | **(US$)** | **(US$)** |
| Project costs Germany represented by GIZ | 1,908,960.00 | $429,820 | $734,525 | $145,255 | $502,500 | $96,860 |
| **Commercial Refrigeration Component - UNDP** | | | | | | |
| | **Total costs** | **2016** | **2018** | **2020** | **2021** | **2022** |
| | **(US$)** | **(US$)** | **(US$)** | **(US$)** | **(US$)** | **(US$)** |
| Conversion package Commercial refrigeration companies | 1,908,960 | $596,550 | $636,320 | $437,470 | $119,310 | $119,310 |
| Setup of refrigerant distribution systems (2) | 480,000 | $0 | 240,000 | 0 | $240,000 | 0 |
| | | | | | | |

## 7. Implementation arrangements

### 7.1 Agencies distribution of activities

Table 5.1-1shows the allocated responsibilities of the Implementing agencies and Germany.

### 7.2 Methodology of implementation

The companies mentioned in table 5.1-1 will have a high content of technical assistance for introduction of the new technologies. The GIZ as lead will hold several workshops for introducing the specific technologies according to the refrigeration technology used by the beneficiaries. Including the servicing and educational institutes and determine together with the beneficiaries through individual visits the necessary equipment support required. The procurement of the individual conversion kits will then be executed by UNDP. Technology support for using the conversion kits and introduction of the new technologies will be done by GIZ.

## Annex I

Commercial and AC refrigeration companies HCFC 22 part stage II

| Sector | Name of Company | Eligible refrigeration | Eligible foam | HCFC-22 consumption (MT) | HCFC 141b Consumption (MT) | Received support under |
|---|---|---|---|---|---|---|
| AC | Isfahan Dama | Y | Y | 5.5 | - | |
| AC | MEHAFROUZ GHARIN | Y | Y | - | 10.0 | |
| CRF | Sardsazi Tehran Co. | Y | y | 26.2 | 0.6 | |
| CRF | Yakhchalsazi Yeganeh | Y | Y | 4.5 | 2.0 | NPP |
| CRF | Yazd Monjamed | Y | Y | 4.3 | 2.0 | |
| CRF | Bahareh Lorestan | Y | Y | 2.5 | 2.5 | |
| CRF | Sanaye Boroutati Shams | Y | Y | 6.5 | 2.5 | |
| CRF | Sayn Electric | Y | Y | 6.0 | 2.5 | NPP |
| CRF | Sanaye Boroodati Pazhang (Garma Sarma Sazan Payame Isfahan) | Y | Y | 4.5 | 2.9 | NPP |
| CRF | Farmad Sarma | Y | Y | 5.5 | 4.2 | NPP |
| CRF | Milad Boroudat Kerman | Y | Y | 3.5 | 4.5 | NPP |
| CRF | Pardis Yazd | Y | Y | 5.0 | 4.5 | NPP |
| CRF | Tajhizate Ashpazkhaneh DATA | Y | Y | 4.3 | 4.9 | NPP |
| CRF | Arg Yazd | Y | Y | 7.5 | 5.0 | NPP |
| CRF | Rad Sarma | Y | Y | 22.7 | 5.0 | NPP |
| CRF | Faraz Chain Supermarket | Y | N | 2.3 | - | NPP |
| CRF | Arvand Refrigerator | Y | Y | 2.5 | 6.0 | NPP |
| CRF | Farshid Electric (Iran Sever - Goodarzi) | Y | N | 17.5 | - | NPP |
| CRF | Milad Khoram | Y | Y | 3.5 | 6.0 | NPP |
| CRF | Part Fereidouni | Y | Y | 4.0 | 6.3 | NPP |
| CRF | Gassoo Group | Y | Y | 2.8 | 6.4 | NPP |
| CRF | Mashhad Sarma | Y | Y | 5.5 | 6.4 | NPP |
| CRF | Mehr | Y | Y | 5.5 | - | NPP |
| CRF | buran sarma | Y | Y | 1.7 | 6.7 | |
| CRF | Sanaye Felezi&Boroodati Sardintoos (Kalantari) - Tajhizat Forooshgahi Bahman | Y | Y | 4.7 | 6.7 | NPP |
| CRF | Sorena | Y | Y | 7.0 | 6.8 | NPP |
| CRF | Oujbouran (Jalalzadeh) | Y | Y | 10.3 | 6.8 | NPP |
| CRF | Parsin Gostar Jonoub (Forough Manesh) | Y | N | 7.5 | - | NPP |
| CRF | Electro Sard Azna | Y | Y | 7.5 | 7.0 | NPP |
| CRF | Sarma Gostar Shiraz | Y | Y | 4.5 | 7.0 | NPP |
| CRF | Seyed Saleki (Yakhchalsazi Baradaran) | Y | Y | 5.5 | 7.2 | NPP |
| CRF | Sanaye Boroudati Jamali | Y | Y | 1.7 | - | NPP |
| CRF | Aysan Shargh Co. | Y | Y | - | 7.5 | NPP |
| CRF | Electro Toos Industrial Refrigeration (Tavana Industrial Group) | Y | Y | 5.5 | 7.5 | NPP |
| CRF | Arminco | Y | Y | 15.3 | 7.8 | NPP |

| | | | | | | |
|---|---|---|---|---|---|---|
| CRF | Fereidooni Co. | Y | Y | 7.7 | 7.9 | NPP |
| CRF | Sanaye Sard Sobouh Isfahan (Sobouhi) | Y | N | 5.0 | - | NPP |
| CRF | MEHRAN SARD (SALEHABAD) | Y | Y | 8.7 | 8.0 | |
| CRF | Abbaspour Refrigeration (Mahdis Co.) | Y | Y | 4.2 | 10.0 | NPP |
| CRF | Sarma Saz Taban | Y | Y | 3.5 | - | |
| CRF | Enjemad System Gharb Tehran | Y | Y | 7.8 | 11.8 | |
| CRF | Abdolrezazadeh (Enjemad Sanat) | Y | Y | 14.0 | 12.0 | |
| CRF | Behsarma Co. | Y | Y | 11.8 | 12.0 | NPP |
| CRF | Yazd Sardin | Y | Y | 5.3 | 13.9 | NPP |
| CRF | Yakhnooshan Kasa Co. | Y | Y | 6.8 | 14.0 | |
| CRF | Sard Sazan Kavir Kerman | Y | Y | 5.5 | 15.2 | NPP |
| CRF | Esfahan Yakhchal Isfahan | Y | Y | 18.0 | 18.0 | NPP |
| CRF/AC | Hvasa Saz Co. | Y | Y | 22.0 | 2.0 | NPP |
| CRF/AC | Boroudati Hararati Nik Co. | Y | Y | 14.0 | 6.5 | NPP |
| CRF/AC | Sanaye Boroudati Vahid (Sabcool) | Y | Y | 26.2 | 6.9 | NPP |
| CRF/AC | Sanaye Boroudati Maleki (Sarma cell) | Y | Y | 16.2 | 22.3 | NPP |
| | | | | | | |
| | | Total HCFC-22 (MT): | | 400.0 | | |
| | | Total HCFC-141b (MT): | | | 315.7 | |

Legend:

AC - Air conditioning systems manufacturers commercial and industrial
CRF - Commercial refrigeration
CRF/AC - Producers of commercial refrigeration and air conditioning commercial and industrial

**ANNEX C**

**PHASE-OUT PLAN FOR HCFC PHASE-OUT IN SERVICING SECTOR: NON-INVESTMENT IN IRAN IN STAGE-II**

## 1. INTRODUCTION

The HPMP is implemented through a stage-wise approach. Each stage of the HPMP involves investment and non-investment activities. The non-investment components have been implemented throughout HPMP to enable achieving and sustaining the HCFC phase-out targets in Iran. These components include training programs, policy and regulatory measures through licensing and quota system, awareness raising and enforcement for controlling and monitoring of the regulatory framework. As part of the non-investment activities and Iran contribution to HPMP-stage II, new policies and regulatory instruments in relevant sectors will be introduced. These regulations are to reduce the demand and supply of HCFCs as well as to introduce monitoring strategy over the enforcement process. The policies cover HCFC-based sectors, which are mainly the Refrigeration and Air Conditioning (RAC) sector and foam industries.

## 2. PHASE-OUT STRATEGY

Obtaining the phase-out target relies on three main elements. These elements are adoption of policies and regulations for phasing out HCFCs, enforcement strategy of the policy framework and regular capacity building of key stakeholders like enforcement agencies and technicians and monitoring of the enforcement procedure and awareness raising in industries and domestic users as well as the assistance for converting ODS using industries. Based on the lessons learnt and impact of non-investment components in stage I of the HPMP, the following suggestions in connection with each element are proposed:

### TRAINING

Training plays a vital role in effective phase-out of HCFCs from refrigeration, air-conditioning and related industries. Obtaining complete phase out of HCFCs requires involvement of different sections, i.e. industries, technicians and regulatory agencies. Therefore, the training program needs to cover all the associated aspects in the relevant sections. The main training features include:

- **Training programs for trainers of RAC technicians:** TVTO in collaboration with NOU and RAC association have published training courses for trainers for the technicians in RAC servicing sector and industries.
- **Training programs for RAC servicing technicians:** TVTO in collaboration with RAC association have arranged training courses for the servicing sector technicians.
- **Training programs for ISIRI laboratories:** The Institute of Standard and Industrial Research (ISIRI), as the official authority for quality control of the equipment, is required to be updated on the objectives and necessities of HCFC phase out plan. ISIRI received training to establish controlling standards for the imported equipment in compliance with the HPMP.
- **Training programs of enforcement and regulatory agency:** Enforcement and regulatory agency is the core of the supervisory system on the imported goods. Custom

as the main division for issuance of import authorization can observe and control the imported equipment and goods to fulfil the HPMP condition and requirements. In this regard, training programs for the enforcement agency on the technical knowledge of the HCFC-based refrigerants and the relevant regulations plays a vital role in successful obtaining of the phase out targets. NOU has supported training programs for the customs officers, which arranged by RAC association in collaboration with TVTO. The training material includes technical part and regulatory frameworks. The policy and regulation part of the training program is well established and fully clarified in the first stage of HPMP. However, less attention on the technical part has been paid.

## IMPACT OF TRAINING

Based on the comprehensive law of the country, National Ozone Unit (NOU) in collaboration with some governmental organization such as Institute of Standard and Industrial Research of Iran (ISIRI), Technical Vocational Training Organizations (TVTO) and Refrigeration and Air Conditioners (RAC) industry association introduced and implemented regulatory scheme to promote knowledge and service quality in RAC servicing sector. Based on the latest update received from RAC association, regarding the training and certification scheme, an agreement has made between RAC association and TVTO through which TVTO certifies the licensing diploma issued by RAC association.

As one key organization, TVTO plays an active role in the training programs. TVTOs are distributed over the province's centers in Iran, which are under supervision of the TVTO headquarter in Tehran. In 1965, association of producers and electrical equipment repairers was established with the objective of implementing the rules and regulations in corporations with activities related to producing and maintenance of electrical equipment. The three main societies of this association include electronic equipment society, electro-motors equipment society, and refrigeration and heating equipment society. In 2002 the society of refrigeration and heating was authorized by the Ministry of Commerce (MoC) to actively and independently work as the Refrigeration and Air Conditioner Association.

Also, ISIRI is an important organization in developing training materials. The main objective of the ISIRI is to establish and develop standard systems to promote quality of goods, services and production process. ISIRI is also responsible for supervision of compulsory standards and the quality control of imported and exported goods.

As part of establishment of the regulatory instrument, training through collaborative programs between RAC association, NOU and TVTO is performed during stage I of the HPMP. The RAC servicing sector, as the largest distributor and consumer of HCFCs, have been the main target of the training programs during stage I of HCFC phase out plan. In fact, one of the major strategies over the RAC sector was institutional training to enhance technical knowledge of the servicing division. The main concept behind RAC training program was improving the quality of the work provided by the servicing sector to accelerate accomplishment of the phase out target.

Also, as part of training program, UNEP arranged courses for the trainers, which was "named train the trainers", to promote the knowledge of the servicing technicians. This course was held with the presence of 35 RAC industry trainers. The training programs included procedures for good practice services and standards for operational performance of equipment in RAC servicing sector. Some of the training courses involve:

- Good practice training in refrigeration industries
- Introduction to vapor compression refrigeration cycle and categorization of refrigerant

types

- Alternatives to HCFCs and combined HFCs
- Maintenance of equipment using HCFCs
- Refrigerant recovery and treatment
- Comprehensive guide and methods to equipment maintenance of RAC systems
- Simulation of maintenance for appliances using HCFCs and HFCs
- Good practice guide for pipe bending and welding
- Instruction for installation, start up and maintenance of air conditioner systems
- Instruments for equipment maintenance
- Economical aspects of refrigerant treatment
- Maintenance practice for equipment detecting contaminated refrigerants

For training the RAC servicing technicians, a three-day training workshop on Good Practices in RAC servicing sector was conducted by UNEP in close consultation and cooperation with the NOU and GIZ on 18 - 20 February 2013 at Karaj Instructor Training Centre & Technical and Vocational Researches. Trainers of provincial vocational training centers (34 trainers from 20 provinces) participated in this training. During this program, 5 trainers have been selected by NOU to serve as trainers for training programs at the provincial vocational training centers. In September 2014, two groups of repair technicians in Mashhad received one-day training each on Good Practices in Refrigeration and Air Conditioning.

Also, two workshops on good practice in refrigeration and air conditioning were conducted in Sari city in Mazandaran Province on 24-25 February 2015. These workshops were organized with cooperation of Provincial DoE of Mazandaran Province as well as the Mazandaran TVTO. During the period 24-26 September 2013, the Montreal Protocol Enforcement Training (Training of Trainers) was held in Tehran. The second Training of Trainers, “Customs Officers Training Workshop”, was held on 3-5 March 2014 with resource people from national enforcement authorities, UNDP, UNIDO, GIZ and UNEP. The NOU, with help of national resource people, commenced the provincial level customs trainings in August 2014. Table 7 shows a summary of training programs, which held during the years 2013-2015. These training programs involve training the trainers, the servicing technicians and enforcement officers.

To obtain a good understanding of the impact of training program in RAC servicing sector, a questionnaire is prepared. This questionnaire involves three sections, which are the basic information, questions on type of refrigeration and their supply source and questions on servicing equipment. The aim of the prepared questionnaire is to examine the overall consumption of HCFC-based refrigerants by domestic service shops. It is also to provide data to investigate if service technicians participated in training programs.

**Table 1. Training Courses during 2013-2016**

| Date | Title/ Province | Number of Participants |
|---|---|---|
| 18-20 February 2013 | Training of Trainers Workshop on Good Servicing Practice /Karaj Instructor Training Centre & Technical and Vocational Researches, Karaj | 34 |
| 5thSeptember 2013 | Training Workshop on Good Servicing Practice (Group 1)/Mashhad | 30 |
| 6thSeptember 2013 | Training Workshop on Good Servicing Practice (Group 2)/Mashhad | 30 |
| 24-26 September 2013 | Montreal Protocol Enforcement Training (Training of Trainers)/Tehran | 60 |
| 3-5 March 2014 | Customs Officers Training Workshop (Training of Trainers)/Tehran | 64 |
| 20thAugust 2014 | Awareness and Training Workshop for Customs Officers of North West region/Urumia | 71 |
| 24thFeb 2015 | Training workshops on good practice in refrigeration and air conditioning Group 1 (technicians from residential refrigeration system) | 45 |
| 25thFeb 2015 | Training workshops on good practice in refrigeration and air conditioning Group 2 (beneficiaries from Air conditioning Industry) | 45 |
| 14th March 2015 | Training Workshop on Good Practices (Domestic section) at Bandar Abbas | 36 |
| 15th March 2015 | Training Workshop on Good Practices (Industrial section) at Bandar Abbas | 25 |
| 12th May 2015 | Training Workshop on Good Practices (Domestic section) at Esfahan | 42 |
| 13th May 2015 | Training Workshop on Good Practices (Industrial section) at Esfahan | 39 |
| 20th Sept. 2015 | Awareness Workshop On Energy Efficiency and HCFCs Phase-out in Refrigeration and Air-conditioning Sectors | 79 |

## POLICY AND REGULATORY FRAMEWORK

The government of Iran introduced regulatory system to comply with MP objectives. The objective of the regulatory framework is to provide control over consumption and import of HCFCs to obtain phase-out targets. The main elements of the regulatory framework for HCFC phase-out involve: licensing system, quota system, certification scheme, codification system, provision of fiscal incentive and disincentives, labelling requirements.

- **Licensing and quota system:** Imports of HCFCs are already subject to import quota system. The Import Registration and Licensing System, which was set up through issuance of CLP on ODS Phase-out and its enforcement in March 2007, brought the Islamic Republic of Iran in compliance with MLF licensing system requirements. While the country has only imports of HCFCs, this licensing system includes licensing of HCFC

imports and exports.

The NOU closely consults and interacts with the Ministry of Industry, Mine and Trade and Customs Department to ensure completion and regular submission to NOU of the "Ozone Office Statistics Form" at the time of application For the year 2015, NOU has collected information on consumption of ODSs from Custom Department and Ministry of Industry, Mine and Trade and this data are reported after cross checking to the Ozone Secretariat under Article 7 data reporting requirements. The NOU continues follow-up for data collection and analysis by importers for registration for the import of HCFCs into the country.

- **Quota system:** NOU has established the quota system, which is operational from the year 2012. The quota system includes all HCFCs indicated in the Annex C Group I of the Montreal Protocol. The National Ozone Committee or its subcommittees decide the quota for each year. These subcommittee consists of representatives from different relevant bodies including Ministry of Industry, Mine and Trade, Custom Department and relevant unions of importers/users. The quota for the year for each substance is determined based on total consumption with view to achieve HCFC phase-out targets for coming years and the protocol schedules applicable to Islamic Republic of Iran. The specified amount is communicated to the relevant organization and ministries prior to the beginning of subsequent year.

  Importers need to fill out the Statistics Form for Ozone Layer Protection Unit for Import in the Ministry of Industry, Mine and Trade and the Custom Dept. These forms are periodically submitted through the Ministry of Industry, Mine and Trade and Custom Department to NOU to make sure that the country is in compliance with the allocated quota. The strict control is in place through coordinated actions by NOU and the above-mentioned organizations.

  The specified amount for quota is communicated to the Ministry of Industry, Mine and Trade (MIMT) and Customs department for action. Before MIMT issues the import license to the registered importer, they inform NOU who approves the importer and quantity. Quotas are given to importers on a first come first serve basis with a cap of 45 MT per import valid for 3 months. After proving that import has taken place, additional import permission is given after checking the balance left.

  Licensing and quota system are introduced on the basis of the new policy and regulatory framework to provide official control on the import registry system. The regulatory framework is to accelerate obtaining the HCFC phase-out targets by reducing the import and consumption of ODS. Therefore, the main elements of the licensing and quota system include:

  - **HCFC supply control:** The HCFC supply is regulated through quota system. The objective of the quota system is to limit the quantity of HCFC, which is to be imported. The quantity of HCFC import throughout the year is defined based on the accelerated phase-out schedule as well as according to the HPMP targets. In fact, quota provides control over the HCFC supply system. In line with decision 63/17, the Government of Islamic Republic of Iran confirms that an enforceable system of licensing and quotas for HCFC imports and exports is in place and the system is capable of ensuring the country's compliance with the HCFC phase-out schedule.

  - **HCFC demand control:** The demand of industries and consumers for HCFCs is

provided through importing the substances. The import companies are required to register their requirements of HCFC to get the necessary authorization from the licensing authority prior to placing their HCFC order. The licensing procedure helps NOU keep track of the importers and the market demand for HCFCs.

- **Certification Scheme**: The certification scheme is introduced with the objective to improve the technical knowledge of the ODS related sectors. The activities incorporate the certification program are:

  - **Issuance of mandatory training certification:** RAC association is involved in issuance of regulations to motivate technicians in participation of training courses. Labors need to successfully pass a technical exam, which is held by RAC association, prior to official startup of their work.

  - **Development of standards for adoption of efficient equipment:** RAC association in collaboration with TVTO has established standards for efficient performance and operation of equipment.

  - **Development of standards for certification of technicians:** RAC association in collaboration with TVTO has published standards that technicians require to have knowledge about in their field of expertise.

  - **Development of national standards for HCFC-free construction:** Ministry of Housing and Urban Development (MHUD), as the main building construction authority, has cooperated with municipalities and TVTO in development of national technical standards for HCFC-free design and construction of buildings.

- **Provision of fiscal incentive and disincentives:** The financial incentives are mainly import tax exemption or reduction of the import duties to encourage environmental-friendly usage of technology. Therefore, industries that convert to non-ODS technologies would be exempted from import tax. Also import duties of non-ODS appliances i.e. compressor, chiller, refrigerators, etc. was reduced. On the other hand, import of ODS-containing appliances are banned and taxes on imported ODS has increased.

- **Codification (HS Codes):** To improve the control over import and export of the related substances, codification of all ODS through a national system was performed. The HS codes are included in the Import and Export Book of Regulation and the codes are used for assigning import license for individual HCFCs to importers

- **Labeling Requirements:** As part of CLP, labeling of the appliances containing ODS with indication of the scientific and commercial name of the substance is required. Also, industries with converted technology and replaced ODS with non-ODS need to visibly indicate "Ozone-Friendly" on their products. Labeling of the products eases controlling of the ODS consumption in industries.

## IMPACT OF REGULATORY FRAMEWORK

Since the agreement of Decision XIX/6 and introduction of the HFCF targets in regard to the baseline, the government has established new regulatory framework including the licensing system and quota system to meet the determined targets based on the accelerated schedule. Based on the comprehensive law of the country, the government has adopted

development plans with special consideration to aspects of environmental protection. Since the establishment of Montreal Protocol and Iran agreement to HPMP contribution, new policies and regulatory instruments in relevant sectors are introduced. These policies include regulations to reduce the consumption of HCFCs as well as monitoring over the enforcement process.

Under the current regulatory framework associated with RAC sector in Iran[2], only service shop owners need to be officially authorized from RAC industry association in their field of profession prior to start-up of their occupation. The authorization is provided upon obtaining the related working license through successful pass of exam at RAC association. The exam includes both theoretical and practical parts. The working license is certified by TVTO and will be delivered to the RAC industry association office. RAC in collaboration with TVTO organizes training courses for the servicing labors and applicants of the working license. The training courses are prepared under the supervision of ISIRI to ensure standard instruction and practice materials delivered to the servicing technicians.

In regards to the training scheme, the training programs are arranged by TVTOs and RAC association with support from NOU for certifying the technicians at various sectors. In general each training course includes 120 hours of education in special expertise.

The government of Iran with support of UNEP and the government of Japan has initiated establishment of a Comprehensive Legislation Plan (CLP) to be implemented for ODS phase-out in Iran. In regard to CLP, the current import and export rules were updated and new systematic structures including new licensing systems and ODS quota systems were introduced. The import registration and licensing system, which established through the issuance of CLP, has officially become effective since 2008 in compliance with Multilateral Fund (MLF) licensing system. The quota system, which has become operational since 2012, includes all HCFCs that were indicated in the Annex C Group I of the MP. The quota for each year is decided by National Ozone Committee and NOU and assessed based on the HFCF phase-out targets with regard to base-line consumption of HCFC in Iran. So far, the import quota system and licensing systems through import registration forms, have been able to facilitate the monitoring process over HCFCs import at custom and were partly successful in preventing illegal trade of ODS. The current quota system is based on first-come, first-served. Therefore, the HCFC importing company, which comes for order registration, will be allocated quota for HCFC import. There is still more scope to promote the quota and licensing systems to provide more systematic control on reducing HCFCs import and consumption.

## AWARENESS RAISING

Awareness raising provides opportunity to increase public knowledge of the HCFC damage on health and environment as well as educating all concerned stakeholders about the ODS related policies and regulations and HPMP targets. Awareness raising can get obtained via media, social networking and by implementing targeted programs for HCFC user industries, stakeholders and custom;

- **Stakeholder consultations:** Regular consultation programs for industries and stakeholders can update their knowledge on the recent developments of HCFC-free technologies and the necessities to their participation in HPMP.

[2]Regulation 13 of the guild system is established in four articles and one note for enforcement of the note on within the RAC industry association and approved by the ministry of Commerce in 21st August 2004.

- **Custom:** Custom, as the main import and export channel of the country, needs to be updated on the objectives and requirements of the HCFC phase-out plan. Moreover, custom officers need to increase more detailed knowledge on different types of HCFC-based refrigerants and their detection procedures to be able to recognize the related substances.

- **HCFC user industries:** Industries, as the largest consumers of HCFC-based refrigerants, are required to improve their knowledge on the latest phase-out policies as well as provisions to convert to HCFC-free technologies. This is necessary for managing their further activities and future plans.

## IMPACT OF AWARENESS RAISING

Awareness raising is implemented through stage I of HPMP. The main pubic knowledge improvement is done through advertising posters at airport, custom and consultations programs for stakeholders. The awareness programs were provided information relative to the damage of HCFCs on health and environment. As part of the awareness raising programs, seminars and meetings with HCFC related industries and stakeholders are held. The more recent seminar was held on the National Ozone Day in September 2015.These seminars and meetings provided opportunity to discuss different aspects of the HCFC phase-out. The main aspects include the effect of HCFCs on ozone layer and ecosystem, techniques to protect human from the destructive impact of the ultraviolet radiations and methods to reduce consumption of HCFCs in domestic and industrial sectors. In general the impacts of current activities on awareness raising can be categorized into short-term and long-term impacts. Concerning the short-term impact, the presented aspects through seminars introduced the real threat of using HCFC-based refrigeration systems in current situation, which delivered extra attention to public for their current consumption of HCFCs. As part of the long-term impact, awareness raising through seminars and meetings increases public level of knowledge, which helps in decision making for choosing environmentally-friendly refrigeration unit.

## ENFORCEMENT AND CONTROLLING SYSTEM

The objective of the enforcement and controlling system is to provide successful implementation of the policies and regulatory framework related to HCFC phase-out plan. Therefore, the controlling system needs to monitor and investigate the implementation progress of every regulation adopted to control supply and demand of HCFCs and observe the enforcement strategies in practice. The policy to introduce the enforcement system is creation of enabling environment for HCFC related sector to participate in phase-out plan. In reference to this policy, fiscal incentives are introduced.

- **HCFC supply control:** The HCFCs are not produced in the country and the only supply channel is through import. Therefore, the HCFC supply is to be controlled by monitoring the enforcement of the regulations related to the import of HCFCs. Import of HCFCs is subject to quota system. In connection to the quota system, supply control is achieved by policies, which limit the import quantity of HCFCs and strengthen the licensing system by identifying the authorized HCFC imports.

- **HCFC demand control:** Refrigeration, air-conditioning and foam sectors as the main HCFC consumers in Iran. Control of the HCFC from demand side is through enforcement of policies to reduce consumption of HCFCs. The ban policies related to HCFC users, which are already effective, include:

- ✓ Build new capacity or expansion of capacity of enterprises producing HCFC based equipment and products. DoE has prohibited establishment of new HCFC-consuming industrial units and/or expansion of capacity of existing HCFC consuming industrial enterprises from July 2010. This is continuously monitored by the National Ozone Unit. The latest status of applications for the new HCFC based installations and developments was updated through the provincial departments of environment to understand effectiveness of enforcement of the ban on new installation and developments based on HCFCs in July 2010.
- ✓ Import of HCFC blends in RAC and foam applications

- **Financial incentives:** As part of assisting industries to enroll in HCFC phase-out plan, Iran established fiscal incentives. These financial incentives are mainly provided for reducing HCFC consumption and promoting to HCFC-free technologies in relevant industries. Financial assistance includes reduction/exemption of import custom tax. Also, financial penalties as the undesirable side are considered as a motive for participation in the move to HCFC-free technologies.

## IMPACT OF ENFORCEMENT AND CONTROLING SYSTEM

Management of HCFC phase-out was carried out through enforcement and controlling measures. The controlling measures involve monitoring of the HCFC consumption in industrial units, import and export of HCFC-containing appliances along with provision of financial incentives and taxing scheme. Accurate monitoring of the HCFC import/export maintains better collection of the related data and facilitates obtaining the phase-out targets. Also, the data collected through the monitoring process helps NOU to analyze the country demand and supply of HCFCs. This can help NOU in obtaining an improved management plan for ODS phase-out which complies with MP guidelines in Iran.

To improve the controlling strategy over the import and export of the ozone depleting substances, codification of all HCFCs through a national system was performed. Moreover, as part of the Comprehensive Legislation Plan, labelling of the appliances containing ODS with indication of the scientific and commercial name of the substance is required. Also, industries with converted technology and replaced HCFC-based refrigerants with non-HCFC substances need to visibly indicate “Ozone-Friendly” on their products. Labelling of the products facilitates controlling of the ODS consumption in industries.

The financial incentives are mainly import tax exemption or reduction of the import duties to encourage environmentally friendly usage of technology. Therefore, industries that convert to non-ODS technologies would be exempted from import tax. Also import duties of non-ODS appliances i.e. compressor, chiller, refrigerators, etc. was reduced. The exempt enterprises, which adopt non-HCFC, based technologies from import duty, excise duty and sales tax for capital equipment, which is under operation since 1st January 2011).On the other hand, import of HCFC-containing appliances are controlled under quota system and taxes on imported ODS has increased.

## OVERALL STRATEGY FOR HPMP STAGE-II OF IRAN

The non-investment components have been implemented through HPMP to assist the HCFC phase-out plan in Iran. Table 2 presents an overview of the non-investment components and their impact on HCFC phase-out through first stage of HPMP. Based on the outcomes of implementing non-investment components during stage I, suggestions related to each component are recommended to enhance the progress of HCFC phase-out in country (Table 8).

**Table 2 Non-investment Components of HPMP**

| Non-Investment Component | | Description | Impact of implementation on HPMP Phase I | Action Plan |
|---|---|---|---|---|
| 1 | Training | 1. Train the trainers for good practices in servicing | Successfully implemented. | Regular courses for updating on recent technology development are suggested. |
| | | 2. Train servicing technicians<br>a. Compile information on service stations<br>b. Supplying the necessary service tools to improve the quality of service sector | 1. Training is partly done, not all the servicing technicians are included in the training program. | Continue Training servicing technicians:<br>To include technicians of service shops.<br>Include training on non-HCFC based technologies. |
| | | 3. Train ISIRI laboratories | Training the ISIRI is not fully considered in HPMP-stage I. | More attention needs to be paid to ISIRI employees in stage II. To deal with long term alternatives related aspects |
| | | 4. Train enforcement agencies employees:<br>a. Custom officers on HCFC Import and regulations on HCFC trade | Training of current officers is done. The impact was not a complete success. | Enforcement resources:<br>a. To continue training and include both new and currents custom officers as well as other enforcement officers.<br>b. To train the resources with HCFC identifier equipment. As well as on ODS regulations and kind of HCFC gases. |
| 2 | Policy and Regulatory Framework | 1. To issue regulations of mandatory training for RAC technicians | 1. Potential for good practice services in RAC servicing sector.<br>2. Not fully implemented on all RAC technicians. | Mandatory training:<br>c. To continue training and improve training material to include training on new technologies<br>d. To define monitoring and controlling system.<br>e. To observe RAC technicians training.<br>f. To improve certification scheme |

| Non-Investment Component | | Description | Impact of implementation on HPMP Phase I | Action Plan |
|---|---|---|---|---|
| | | 2. Developments of standards for adoption of efficient RAC equipment | TVTO and RAC association have defined standards. | To implement the developed standards for efficient RAC equipment:<br>a. New equipment supply needs to be based on the standards.<br>b. Performance of current equipment needs to be improved to meet the standards.<br>c. Standards for HCFC alternatives specially ISO 5149 and ISO 817 |
| | | 3. Developments of vocational standards for certification of technicians | Standards are employed for certification of technicians. | To continue the program and improve implementation in stage II. |
| | | 4. Providing assistance for development of national standards for HCFC-free construction | National standards are successfully set and implemented. | Observing system for final approval of the HCFC free construction based on standards. |
| | | 5. HCFC supply control:<br>a. Introduce quota system<br>b. Import licensing for authorized importers | Quota system is introduced to control the HCFCs import.<br>NOU is responsible for the issuance of import authorization. | In regard to HCFC supply:<br>Improve and update of Quota system to provide more control on the import license.<br>NOU to increase the resources to control the issuance of import certification based on the new quota system. |
| | | 6. HCFC demand control<br>a. Registration of HCFC users | NOU records the HCFC user registration | In regard to HCFC users:<br>a. The accuracy of the HCFC demands of the users to be controlled by NOU.<br>b. Regular control of HCFC users. |
| 3 | Awareness Raising | 1. Stakeholders consultation on technology evolution for HPMP | Stakeholders are notified on the HPMP | Arrangements for briefing the related stakeholders on HPMP impact and ODS regulations and policies in collaboration with the Iran Chamber of Commerce, Mines and Agriculture |

| Non-Investment Component | | Description | Impact of implementation on HPMP Phase I | Action Plan |
|---|---|---|---|---|
| | | 2. Custom | Custom is notified on development of HPMP phase I. | To target enforcement agencies such as custom officers through TV ads, newspapers, public billboards, magazines, etc.<br>Public awareness on<br>a. HCFC impact on ozone layer<br>b. Advantages of alternative options |
| | | 3. HCFC user industries<br>a. E-based awareness programs<br>b. Encourage industry support in awareness of HCFC phase-out | Programs are developed to observe UV rays during day in different provinces over the country | Industries to act more effective in awareness raising<br>Regular consultation to industries on efficient and cost-effective conversion to alternative technologies. Organize O2C Industry Roundtables and Technology Exhibitions |
| 4 | Enforcement and Control System | 1. HCFC supply control<br>a. Ban on import of R-141b | The regulation is set and officially implemented. Partly successful in practice. | To control law enforcement at custom<br>To improve codification and labelling system<br>Introduction of training for detection of imported substances and provision of identifiers for detection of the imported HCFCs |
| | | 2. HCFC demand control<br>a. Registration of HCFC users<br>b. Ban on new capacity or expansion of capacity<br>c. Ban on import of HCFC blends (enforced since January 2015)<br>d. Ban on HCFC based appliances with Cap≥10TR<br>e. Ban on using spray using R-141<br>f. Exempt enterprises adopted to non HCFCs from import duty, excise duty and sale tax | The regulation is set and officially implemented. Partly successful in practice. | . Improve enforcement system to provide more control on HCFC importing companies<br>. To increase control the market for illegal trade.<br>. To promote building design that avoids mechanical refrigeration as alternative to HCFC free options and encourage green procurement in collaboration with Iran Chamber of Commerce, Mines and Agriculture |

| Non-Investment Component | | Description | Impact of implementation on HPMP Phase I | Action Plan |
|---|---|---|---|---|
| | | 3. Financial incentives<br>a. For demonstration of alternative technologies | Demonstration of alternative technologies is not fully considered. | To provide financial motivations to assist technicians and service labours broaden their technical knowledge.<br>Financial incentives for converting to non-HCFCs and alternative technologies<br>Financial incentives to fund academic-industrial projects on introduction of alternative technologies<br>Fines for disobeying the regulatory system |

## ACTION PLAN AND TARGETS FOR HPMP STAGE-II

Obtaining the phase-out target relies on three main elements. These elements are adoption of policies and regulations for phasing out HCFCs, enforcement strategy of the policy framework and regular monitoring of the enforcement procedure in industries and domestic users as well as the assistance for converting ODS using industries. Based on the impact of non-investment components in stage I of the HPMP, the following suggestions in connection with each element are proposed:

UNEP will carry out the following activities in collaboration with the NOU and other related stakeholders:

**Policy and Enforcement Capacity Building:**

UNEP will provide assistance to NOU in carrying out the activities under Policy and regulatory framework during the Stage II. These are some controlling policies, which will be introduced with the objective to assist total phase out plan in near future. Some of these policies will be:

- Installation of HCFC based AC systems with capacity greater than 10 ton of refrigeration, which has been introduced from 1st January 2016;
- Strengthen the HCFC supply control, import of HCFC-141b is going to be banned from 1 January 2023;
- Use of spray foaming using HCFC-141b or pre-blended polyol containing HCFC-141b from 1 January 2023;
- Use of HCFC-141b or pre-blended polyol containing HCFC-141b in producing foam products or manufacturing insulation foam in refrigeration equipment from 1 January 2023.

- Development and implementation of a revised HCFCs quota management system and licensing system based on lessons learned
- Development and implementation of registry of importers and users of alternatives to HCFCs including natural refrigerants.
- Evaluation and development of policies and regulations and safety standards on the alternative refrigerants including flammable refrigerants specifically in regard to ISO

5149 and ISO 817

- Policy Outreach and Training targeting local government enforcement officers.
- Study possible financial instruments to accelerate HCFCs phase out and introduction of alternatives including natural refrigerants.
- To ensure successful enforcement of the policy and regulatory framework, it is suggested to introduce an observatory team from the enforcement system for regular control on the progress of policy enforcement at custom.
- Under the existing policies in RAC division, there is no official procedure available to control illegal consumption of HCFCs in servicing sector. Therefore, it is suggested to introduce regulatory instruments, which will enable NOU to actively control and track any illegal consumption and distribution of the refrigerant over the service shops
- Codification and labelling system require improvement to clearly identify the components of HCFCs in container.
- One of the difficulties at custom is the fraud labelling of the imported ODS-based refrigerants. This is mainly due to the lack of knowledge on the imported compounds. It is suggested to promote the enforcement system to detect fraud labelling. This can be obtained through proper training of the custom officers.
- One of the main problems at custom is that the imported gases have impurities, which makes the detection process difficult. Therefore, it is suggested to provide advanced identifiers. While this equipment will be part of UNEP component, it will be procured by UNIDO on behalf of UNEP and the funding will be counted for as part of UNIDO funding. The total costs of 10 identifiers including shipping and transportation is estimated at USD 70,000.
- To improve enforcement system to provide control over HCFC importing companies.
- As an alternative solution to a sustainable ODS free design, it is suggested to promote building design that avoids mechanical refrigeration as HCFC alternative. An observatory system is required for official control on HCFC-free construction;
- Introduction of penalties for fraud measures in import, consumption and trade of HCFCs.

**Implementation of a Training and Certification program for the RAC technicians**:

It is suggested that stage II to continue implementing training programs to ensure high quality work in servicing sector. The training program provides opportunity to introduce environmentally friendly alternatives to ozone depleting refrigerants and their replacement guidance.

- A refresher course for master trainers will be arranged to update the trainers on the new emerging technologies and alternatives. It will aim to train altogether 20 more national trainers from the whole country. They will be trained by already trained master trainers including experts from UNEP will visit the country to update on the new alternatives and its usage in different servicing sectors.

  Around 50 training courses will be planned by TVTO in cooperation with the NOU. These trained national trainers will provide training to 1,000 technicians; each course comprises 3 days and trains about 20 to 25 technicians.

- Provision of training equipment and educational aids to TVTO to a total of 6 centres. The costs of the equipment for the training centers are estimated as below (Table 3). While this equipment will be part of UNEP component, it will be procured by UNIDO on behalf of UNEP and the funding will be included in the UNIDO component:

**Table 3. Cost of the equipment for the Training Centers**

| Description | Unit | Qty | Unit Cost (US $) | Total Cost |
|---|---|---|---|---|
| **Equipment for six (6) training centre** | | | | |
| Teaching aids | Each | 24 | 500 | 12,000 |
| Training rigs | Each | 12 | 2,000 | 24,000 |
| Recovery machine | Each | 12 | 600 | 7,200 |
| Recycling machine to be used for training | Each | 12 | 7,000 | 84,000 |
| Recovery Cylinders, 13kg | Each | 60 | 30 | 1,800 |
| Vacuum pumps | Each | 12 | 400 | 4,800 |
| Refrigerant identifier | Each | 6 | 7,000 | 42,000 |
| **Total:** | | | | **175,800** |

- Strengthening the curriculum for training of technicians in the syllabus of TVTOs;
- Development and implementation of a certification scheme on RAC Servicing sector.
- Collaboration of RAC association and TVTO with ISIRI to develop standards for HCFCs and alternative refrigerants.

Promotion of alternative technologies and a**wareness Raising**

- Promotion of alternative emerging technologies through industry roundtables and O2C Technology Roadshows, green procurement initiatives and awareness raising workshops in collaboration with the Iran Chamber of Commerce, Mines and Agriculture and the ECO Chamber of Commerce and other identified organizations.
- Establishment of Technology Promotion Center to raise capacity of manufacturers and servicing sector on technical and regulatory aspects of advanced new technologies for refrigeration and air-conditioning. UNEP in collaboration with GIZ will support NOU to coordinate with TVTO to establish the center. Experts from different sectors can be hired to provide knowledge on the latest technologies and new emerging refrigerants for different sub-sectors in servicing such as Commercial RAC sector, Transport refrigeration, domestic air conditioning, and refrigeration etc. The centre will provide guidelines to manufacturers, OEMs, small and medium enterprises and large service workshops to develop at pace with upcoming market trend ozone and climate friendly technologies. The flammability issues can be addressed at large during these technology promotion workshops.
- Compilation and dissemination of information on the latest development and new emerging technologies with special focus on R/AC manufacturing and servicing in collaboration with Iran Chamber of Commerce, Mines and Agriculture and RAC associations.
- Campaign on HCFCs phase-out and HCFCs alternatives including production and

distribution of printed materials (e.g. translation of technical material, newspaper ads, articles in journals) and though mass media (e.g. short films for technicians) in Persian language. Message on alternatives with low global warming potential (GWP).

- Forums with Iran Chamber of Commerce, Mines and Agriculture, Trade Associations, RAC Associations and SMEs to discuss market trends and the HCFCs phase-out strategy of Iran and raise awareness on green procurement.
- Awareness-raising on the risk associated with storage of HC particularly to the RAC technicians, commercial and industrial importers and educate them on the safety issues related to handling such gases
- Consumer Campaign on refrigerants in R/AC and R/AC servicing workshops and technicians certification scheme.

**Development of standards for products and services**

- Update the national standards for RAC sector including the development of Standard Operating Procedures for the servicing workshops for handling flammable gases and its storage. These activities to be conducted jointly with GIZ as the lead agency on this aspect.

## INSTITUTIONAL MECHANISMS FOR IMPLEMENTATION

Government of Islamic Republic of Iran proposes to continue to implement policies and projects for phasing-out HCFCs for achieving stage II targets specified in the HPMP agreement. GIZ is the Lead Agency for the servicing sector and UNEP as the Cooperating Agency will work closely with GIZ and other Implementing Agencies for the implementation of Stage 2. As an implementation modality, based on Stage 1 experiences, UNEP is proposing to strengthen the PMU for HPMP by providing a national policy expert to assist the Ozone Officer and his team and the Implementing Agencies in coordinating, providing technical expertise and liaising with the national level stakeholders in implementing the non-investment activities. The expert will be housed in the PMU and will synergise UNEP component with the investment components. A provision for the costs has been included in the budget.

Summary of action plan as foreseen for the non-investment activities under stage-II is provided in the table below (Table 4):

**Table 4. Summary of Action Plan for 2017-2022**

| Activity area | Planned Activities | Expected results |
|---|---|---|
| **1. Policy and Enforcement Capacity-building** | | |
| 1.1 Strengthening of HCFCs license and quota systems and monitoring on an annual basis | - review of existing policy framework and developing recommendations for revision of e.g. licensing and quote system, registration system, fiscal incentives and introduction of bans on HCFC<br>- conduct national stakeholder workshops to review recommendations and policy revisions | -policy review document and recommendations<br>-enhanced policy framework for ODS control and phase-out |

| Activity area | Planned Activities | Expected results |
|---|---|---|
| | - implement the recommendations and review from time to time for further improvement | |
| 1.2 Training of Customs officers on Montreal Protocol and HCFCs control | - conduct training of customer officers at Customs training institutes, including ODS risk profiling and especially targeting the newly recruited ones<br>- incorporate MP related trainings into Custom Department programmes<br>- distribute identifiers to key customs point[3] | - enhanced knowledge and skills of custom officers<br>- records of Custom Department annual work programmes including MP related trainings for custom officers<br>- improved monitoring of ODS related imports and trade |
| 1.3 Training workshop for enforcement officers in local governments | - identify the relevant stakeholders engaged in HCFC policy enforcement<br>- conduct awareness workshop | |
| **2. Training and certification of RAC Service Technicians** | | |
| 2.1 Updating the national curriculum to reflect the recent developments in technologies and alternatives | - Update the national curriculum to introduce new long-term alternatives to HCFCs, including natural refrigerants and its safe handling.<br>- translate the courses for R/AC servicing sector into local languages | - updated national curriculum<br>- number of courses translated into local language |
| 2.2 Provision of training equipment and educational aids to Technical Vocational Training Organization (TVTO) | - Provide 6 training centres of TVTO with 6 sets of training equipment and educational aids to enhance the capacity of training centre to deliver the planned training and certification scheme[4] | - 6 training centres with relevant training equipment |
| 2.3 Continuous capacity development of R/AC servicing sector on good practices | -Deliver refresher Training of trainers of RAC Trainers using the updated material as above | - pool of master trainers created |
| | - Conduct training programmes on RAC good servicing practices in collaboration with technical and vocational training institutions such as TVTO (ensure representation of female technicians) | -at least 1,000 technicians trained<br>- improved available skills to handle safely ODS alternatives and related technologies |
| 2.4 Enhancing the pilot technician | - Update existing certification programme | - certification programme updated and tested and running |

[3] Identifiers will be procured by UNIDO on behalf of UNEP with the funding included in the UNIDO component

[4] The equipment will be procured by UNIDO on behalf of UNEP with the funding included in the UNIDO component

| Activity area | Planned Activities | Expected results |
|---|---|---|
| certification programme | - conduct national consultation workshops on the proposed certification<br>- conduct trainings for technicians against the certification programme<br>-piloting the certification programme | |
| 2.5 Strengthening R/AC associations and networking | - support the R/AC associations' activities for recruitment of technicians, delivery of trainings, networking, policy outreach, raising awareness including among consumers to use certified technicians as well as promoting alternative technologies.<br>-Activities will include any relevant ones to develop the association capacity to provide training and sustain certification programme. | - database of technicians<br>- enhanced capacity of R/AC associations to be effective support for compliance with the Montreal Protocol |
| **3. Promotion of alternative technologies** | | |
| 3.1 Establishment of a dedicated entity for technology promotion | - identify and establish a Technology Promotion Centre<br>- compile and disseminate information on the latest developments and new emerging technologies with special focus on R/AC manufacturing and servicing in collaboration with RAC associations<br>- conduct activities that ensure the sustainability of the centre beyond the HPMP implementation | - Technology Promotion Centre with readily available information on latest technology and other MP related issues |
| 3.2 Campaign on HCFCs phase-out and alternatives and other MP related issues | - produce printed materials (including translation of technical material, newspaper ads, articles in journals) addressing the new alternatives with low global warming potential (GWP).<br>- distribute through the Technology Promotion Centre and other channels such as mass media (e.g. short films for servicing technicians) in Farsi language | - printed materials produced, translated and distributed through various channels<br>- short films in Farsi about alternative technologies including low GWP options |
| | - Organize Ozone2Climate Technology Roadshows and Industry roundtable | - companies exhibited at the technology roadshows and participated in industry roundtables;<br>-industries and other relevant stakeholders well informed of technological developments |
| | - conduct workshops on green procurement and green buildings to highlight the HCFC issues in collaboration with Iran Chamber of Commerce, | - stakeholders from procurement and building sector updated on |

| Activity area | Planned Activities | Expected results |
|---|---|---|
| | Mines and Agriculture, ECO Chamber of Commerce, R/AC Association, above mentioned Technology Promotion Centre | mainstreaming HCFC opportunities in their work |
| **4. Development of standards for products and services** | | |
| 4.1 Update the national standards of R/AC sector | - identify suitable activities to support the standards and implementation in collaboration with GIZ which is leading this activity | - Updated and widely disseminated national standards for R/AC sector |
| 4.2 Development of Standard Operating Procedures (SOPs) for the servicing workshops for handing flammable gases and its storage | | |
| **5. Monitoring, Coordination and Management** | | |
| 5.1 Regular monitoring | -Monitor the consumption quotas to users and control the quotas and supplies according to the licensing and quota enforced<br>- Monitor and control the consumption of HCFCs in R/AC sector according to the National strategy devised for the management of HCFCs.<br>- engage in regular coordination with UNEP and other lead and cooperating agencies | -full compliance with MP |
| 5.2 Regular coordination and management of HPMP project | - ensure proper coordination and management of the HPMP project and timely completion of all activities including progress and financial reporting to UNEP | - timely and quality driven implementation of SSFA activities<br>- timely and quality reporting and coordination with UNEP<br>- regular use of iPIC |

The implementation mechanism for the non-investment activities of the HPMP during stage II is presented in the Table 5. The numbers presented in Table 5 is corresponding to each item in Table 4.

**Table 5. Plan of Action for the Year 2017-2021**

| Act. | 2017 | | | | 2018 | | | | 2019 | | | | 2020 | | | | 2021 | | | | 2022 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1.1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4.1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4.2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5.1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5.2 | | | | | | | | | | | | | | | | | | | | | | | | |

## 3. PHASE-OUT COSTS

(Please provide costs relating to investment costs for phase-out, TA component and other costs if any. Please provide investment costs for each sub-sector in the table with a final grand total.)

**Non-investment Component Costs (2017-2022)**

The non-investment activities cover legislation, customs' training, public awareness through media campaign, conferences, workshops, dedicated websites, /stakeholder's consultation, publications, information dissemination, training and certification of technicians, providing technical assistance and monitoring of the proceedings. The itemized cost of each activity for the non-investment component for the period 2017-2022 is estimated in Table 6. Table 6 has been revised as per approved budget of $700,000.

## Table 6. Non-investment Component Costs for Stage II (2017-2022)

| Sr.# | Activities of Project Component | Unit | Qty | Unit Cost | Total Cost | Tranche I | Tranche II | Tranche III | Tranche IV |
|---|---|---|---|---|---|---|---|---|---|
| | | | | (US $) | (US $) | 2016 | 2018 | 2020 | 2022 |
| **1** | **Policy and Enforcement Capacity-building** | | | | | | | | |
| i) | Resource persons to assist in the development of related policies based on the national priorities and needs (Travel, per diem and fees) | Visits | 4 | 2,500 | 10,000 | 2,500 | 2,500 | 2,500 | 2,500 |
| ii) | Strengthening of HCFCs license and quota systems and monitoring on an annual basis. | No. | 1 | 20,000 | 20,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| iii) | Training of 100 Customs officers on Montreal Protocol and HCFCs control including risk profiling 100% of newly recruited officers trained by 2022. | Nos. | 5 | 10,000 | 50,000 | 10,000 | 20,000 | 10,000 | 10,000 |
| iv) | Training workshop for enforcement officers in local governments | Nos. | 2 | 5,000 | 10,000 | 5,000 | 5,000 | - | - |
| | **Sub-total** | | | | **90,000** | 22,500 | 32,500 | 17,500 | **17,500** |
| **2** | **Training and certification of RAC Service Technicians** | | | | | | | | |
| i) | Resource persons (Travel, per diem and fees) | Nos. | 2 | | 14,000 | 7,000 | 7,000 | - | - |
| ii) | Update of Training Curriculum to consider the introduction of newly long term alternatives and related safety and technical aspects including natural refrigerants and its safe handling. | Nos. | 1 | 6,000 | 6,000 | 6,000 | - | - | - |
| iii) | Delivery of refresher Training of RAC Trainers for 20 persons; including venue, logistics, consumables, etc) | Nos. | 2 | 10,000 | 20,000 | 10,000 | 10,000 | - | - |
| iv) | Continue implementation of the training program on R/AC Good Servicing Practices for 1000 technicians, in collaboration with technical and vocational training institutions (TVTO). (average 20 persons/ workshops; including venue, logistics, advertisement, consumables, etc) | Nos. | 50 | 4,400 | 220,000 | 44,000 | 44,000 | 66,000 | 66,000 |
| v) | Implementation of a pilot technician certification programme for 200 technicians/ 20 persons per workshop (including first group of assessors). The program will be implemented in conjunction with the training program for RAC technicians. The cost includes certification fees estimated at 250 US$/person | Nos. | 10 | 5,000 | 50,000 | 20,000 | 15,000 | 10,000 | 5,000 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| vi) | Strengthen R/AC associations and networking for raising awareness among technicians and support the training and certification program | Nos. | 5 | 10,000 | 10,000 | 1,350 | 1,350 | 3,450 | 3,850 |
| | **Sub-total:** | | | | **320,000** | 88,350 | 77,350 | 79,450 | 74,850 |
| **3** | **Promotion of alternative technologies** | | | | | | | | |
| i) | Establishment of Technology Promotion Center: Dissemination of information on the latest development and new emerging technologies with special focus on R/AC manufacturing and servicing in collaboration with RAC associations. | Set | 1 | 45,000 | 43,000 | 15,000 | 11,000 | 10,000 | 7,000 |
| ii) | Campaign on HCFCs phaseout and HCFCs alternatives including | | | | 0 | | | | |
| | *o organizing 3 O2C Technology Roadshows and Industry Roundtables in collaboration with Iran Chamber of Commerce, Mines and Agriculture* | Nos. | 3 | 15,000 | 47,000 | 17,000 | 15,000 | 15,000 | - |
| | *o awareness workshops on green procurement and green buildings to highlight the HCFC issues in collaboration with Iran Chamber of Commerce, Mines and Agriculture and ECO Chamber of Commerce* | Nos. | 3 | 8,333 | 25,000 | 8,400 | 8,300 | 8,300 | |
| | *o production and distribution of printed materials (e.g. translation of technical material, newspaper ads, articles in journals) and though mass media (e.g. short films for servicing technicians* | Job | 6 | 10,000 | 48,600 | 17,150 | 15,150 | 7,150 | 9,150 |
| iii) | Outreach with Air Conditioning Refrigeration Association | Nos. | 3 | 10,000 | 20,000 | 7,000 | 4,100 | 6,000 | 2,900 |
| | **Sub-total** | | | | **183,600** | 64,550 | 53,550 | 46,450 | 19,050 |
| **4** | **Development of standards for products and services** | | | | | | | | |
| i) | Update the national standards of RAC and foam products in accordance with the international standards. | Nos. | 1 | 10,000 | 10,000 | 1,500 | 2,500 | 2,500 | 3,500 |
| ii) | Development of Standard Operating Procedures (SOPs) for the industry and servicing workshops for handling flammable and hazardous refrigerants | Nos. | 1 | 10,000 | 10,000 | 1,500 | 2,500 | 2,500 | 3,500 |
| | **Sub-total** | | | | **20,000** | 3,000 | 5,000 | 5,000 | 7,000 |
| **5** | **Monitoring, Coordination and Management** | | | | | | | | |
| i) | Monitoring, Coordination and Management costs for 6 years | Nos. | 8 | 9,375 | **86,400** | 21,600 | 21,600 | 21,600 | 21,600 |
| | **Total*** | | | | **700,000** | **200,000** | **190,000** | **170,000** | **140,000** |
| ***This budget does not include USD 175,800 for technician training equipment and USD 70,000 for identifier purchase that will be procured by UNIDO on behalf of UNEP.** | | | | | | | | | |

The below financial proposal was submitted to 77th ExCom, after discussions instead of three tranches the allocation was approved for four tranches and reduced budget:

| Item | Tranche-I2016 | Tranche-II2018 | Tranche- III 2020 |
|---|---|---|---|
| 1. Policy and Enforcement Capacity-building | 40,000 | 45,000 | 25,000 |
| 2. Training and certification of RAC Service Technicians | 86,000 | 135,000 | 118,000 |
| 3. Promotion of alternative technologies | 75,000 | 80,000 | 65,000 |
| 4. Development of standards for products and services | 10,000 | 10,000 | 0.00 |
| 5. Monitoring, Coordination and Management | 50,000 | 50,000 | 50,000 |
| **Total Tranche Wise** | **261,000** | **320,000** | **258,000** |

**The following has been agreed at 77th ExCom for implementation of Non-investment activities by UNEP:**

**Tranche Distribution**

| Table 6: IRAN HPMP STAGE II SUMMARY BUDGET BY TRANCHES | | | | | | |
|---|---|---|---|---|---|---|
| **Agency** | **Sector** | **Total** | **2016** | **2018** | **2020** | **2022** |
| UNEP | Policy and Enforcement Capacity-building | $90,000 | $22,500 | $32,500 | $17,500 | $17,500 |
| | Training and certification of RAC Service Technicians | $320,000 | $88,350 | $77,350 | $79,450 | 74,850 |
| | Promotion of alternative technologies | $183,600 | $64,550 | $53,550 | $46,450 | 19,050 |
| | Development of standards for products and services | $20,000 | $3,000 | $5,000 | 5,000 | 7,000 |
| | Monitoring, Coordination and Management | $86,400 | $21,600 | $21,600 | $21,600 | 21,600 |
| **TOTAL UNEP** | | **$700,000** | **$200,000** | **$190,000** | **$170,000** | **$140,000** |
| | | | | | | |

ANNEX 1

LPAC Meeting Presentation

Final HPMP LPAC
Meeting-22 Nov 2017.

UNDP COUNTRY OFFICE IN I.R. IRAN

LOCAL PROJECT ADVISORY COMMITTEE (LPAC) MEETING NOTES

22 November 2017

Empowered lives.
Resilient nations.

Project Information:

| | |
|---|---|
| Award Title and number | HCFC Phase Out Management Plan Stage-II (HPMP-II) |
| Source of fund and budget | Multilateral Fund for the Implementation of Montreal Protocol: USD 4,905,361 |
| Implementing Partner | Islamic Republic of Iran (represented by Department of Environment) |
| Start date | 2017 |
| Planned duration | 6 years |
| UNDP Officer | Ali Nazaridoust |

Participants:

| Name | Organization and Position | Signature |
|---|---|---|
| Ms. Anne Marie Sloth Carlsen | UNDP Iran Deputy Resident Representative | |
| Mr. Ebrahim Hajizadeh | National Ozone Officer and National Project Manager | |
| Mr. Abbas Golriz | Senior Expert, Ministry of Foreign Affairs | |
| Mr. Ali Nazaridoust | Head of Programme Unit, UNDP | |
| Ms. Negar Arefi | Operations Manager, UNDP | |
| Mr. Mohammadreza Khosravi | Programme Support Unit, UNDP | |
| Mr. Mehdi Bakhshizadeh | Technical Expert, National Ozone Unit | |
| Ms. Hedieh Khaneghahpanah | UNDP Project Manager | |
| Mr. Morteza Amlashi | UNDP Project Manager | |
| Ms. Sara Koochaki | UNDP Programme Associate | |
| Ms. Zahra Allahdad | National Consultant | |
| Mr. Saeid Ferdowsi | National Consultant | |

## Background and Purpose of LPAC Meeting:

Stratospheric ozone depletion and climate change are known to be two major mutually reinforcing phenomena that threaten the global environment. The Montreal Protocol (MP) on substances that deplete the ozone layer is the internationally agreed instrument laid down by the global community to safeguard the ozone layer against human induced impacts that threaten the natural resource base and affects the health and wellbeing of peoples across the globe. Iran is a signatory to the Montreal Protocol on substances that deplete the ozone layer and its amendments; hence eligible to receive assistance from the MP's Multilateral Fund (MLF) to phase out MP controlled substances as per the phase-out schedules set forth under the MP including hydrochloroflurocarbons (HCFCs).

At the 63rd Meeting of the Executive Committee of MLF in April 2011, HCFC Phase out Management Plan (HPMP) Stage I of Iran was approved with UNDP. Through the HPMP, Iran Government committed itself to HCFC freeze in 2013 and 10% reduction in 2015 (Stage I targets). The Stage I is nearly complete.

At the 77th Meeting of the Executive Committee, in November-December 2016, HPMP Stage II of Iran was approved, UNDP as the lead implementing agency and UNIDO, UNEP, Italy and Germany (GIZ) as the cooperating agencies. The objectives of this project is (i) to assist the Islamic Republic of Iran in successfully mobilising and effectively using MLF resources for the country's beneficiary production sub-sectors to switch to new ozone friendly and climate smart technologies as a prerequisite for developing markets and generating employment; (ii) for the Government of Iran to meet its international environmental obligations as a member to Multilateral Environmental Agreements (MEAs); and (iii) for Iran to contribute to the global partnership concerning the conservation and sustainability of atmosphere. Implementation of the project will assist Government of the Islamic Republic of Iran in reducing HCFC consumption to 266.35 ODP tonnes in 2018, to 247.33 ODP tonnes in 2020 and to 95.13 ODP tonnes in 2023 in refrigeration & air-conditioning (RAC) and foam sectors.

Following the approval of the MLF grant, the project document of the above-mentioned project was developed and shared with all key partners. Through a round of iterative exchanges, feedbacks were received from the National Ozone Unit (NOU) of the Department of Environment and the Ministry of Foreign Affairs and incorporated into the project document.

Furthermore, an internal Pre-PAC meeting on was held within UNDP with the participation of the Programme Unit staff, Deputy Resident Representative and Programme Support Unit to review the document.

The final round of comments were shared with the regional office and the Regional Technical Advisor at the UNDP Regional Office in Bangkok for review. The final draft of the Project Document was shared with relevant parties along with invitation to the present Local Project Advisory Committee (LPAC) which was convened on 22 November to review and finalize the Project Document for approval by authorities.

## Opening of the Meeting

The meeting was opened by UNDP Deputy Resident Representative (DRR), Ms. Anne Marie Sloth Carlsen who welcomed the participants and thanked them for their cooperation. She said in her remarks that the draft project document was prepared based on the original country proposal on HPMP stage II which was a multi-agency initiative approved by ExCom. She noted that the UNDP Project Document was to elaborate on that particular component of the MLF approval that was to be implemented by UNDP. She thanked NOU for its collaboration in developing the Document and commented the Ministry of Foreign Affairs for the thorough review of the document and the valid comments provided.

Noting that the global ozone layer has passed the peak of its depletion, she praised the Montreal Protocol as one of the most successful MEAs.

Dr. Ebrahim Hajizadeh, National Ozone Unit Manager, thanked UNDP for its cooperation and support and stated that the project team has learned many lessons from the first stage of HPMP. The experiences and lessons from the previous stage would be used in the implementation of the second stage of the project. He pointed to the multi-stakeholder nature of the project and the challenges associated with mobilizing the engagement of target companies to adopt the new ozone friendly technologies. Successful implementation of the project requires joint efforts of all partners, first and foremost the Ministry of Foreign Affairs, UNDP and the National Ozone Committee. He referred to the draft project document as the result of a participatory process that provided for the incorporation of the views and comments of all parties concerned.

The meeting went on with a comprehensive overview of the project document presented by Dr. Ali Nazaridoust. In his presentation (attached hereto as Annex I), Mr. Nazaridoust emphasized that the project document, as presented to LPAC, was the results of an interactive process of receiving and incorporating the comments thankfully provided by LPAC members.

The meeting continued with a presentation by Mr. Reza Khosravi who elaborated on the sections related to M&E, Social and Environmental Safeguards and Quality Assurances envisaged in the document. Referring to the review made at the Pre-PAC meeting held by UNDP prior to the present LPAC meeting, he highlighted a number of changes proposed to be made in the annexes of the project document:

- In the monitoring plan (page 15 of the project document) the following changes were proposed:
    - Under “track results progress”, the progress against UNDP-CPD and UNDP Strategic Plan should also be tracked;
    - Under “project quality assurance”, all three stages of QA (i.e. design, implementation and closing) should be addressed;
    - Under “review and make course corrections”, project mid-year reports have to be addressed;
    - Under “project report”, Annual Project Progress Reports (APPRs) have to be included;
    - The link between Project Board and National Ozone Committee and the way of Committee meetings would be considered as Project Board meeting have to be clearly elaborated.

- In the evaluation plan (table 6 on page 17), as the final evaluation is not mandatory for MP projects, it should be deleted from the plan.

Note: Since the project will not disburse its 2017 budget as reflected in table 7 (project multi-year WP), a budget revision will be required at the onset of the project implementation.

- In Project QA Report (Annex 2), following changes are proposed:
    - The score for “question 2” should be decreased;
    - The score for question 6 should be increased to3;
    - The score for question 8 should be revised down to 2.

- In Social and Environmental Risk Screening Checklist, the answer of question 7.1 under standard no. 7 should be turned to “YES”.

The meeting took note of Mr. Khosarvi’s points. On his point related to the start date of the project, UNDP will discuss the case with its Regional Office and insert the result in the project document.

Roundtable Discussions

Mr. Abbas Golriz, representing the Ministry of Foreign Affairs, noted that the draft project document incorporated the comments he had previously communicated to UNDP. He however asked for clarification on the following issues:

- The share of the Government of Italy: Dr. Hajizadeh responded that the share of Italy in the project was about USD 1,000,000 and incorporated in UNIDO's component of the overall HPMP approval for Iran. He presented a table generated by EXCOM in which the share of Italy is clearly mentioned. The meeting took note of the same and agreed that the aforesaid table be annexed to the project document.

- The budget allocated to the Service Sector in the project document is less than the other sectors: Mr. Hajizadeh explained that the Service Sector is mostly covered by GIZ, UNEP and UNIDO and not UNDP, hence the smaller share of UNDP in the former sector. It was also noted that the service sector engagements are more related to capacity building and "soft" types of activities which do not require large investments.

- It was also noted that the "Enghelab University" mentioned in the last paragraph of page 7 and fifth paragraph of page 8 in the project document is a technical and vocational faculty; hence the need to correctly mention the name of the collaborating university in the project document.

Mr. Mehdi Bakhshizadeh noted that the results framework of the project does not clearly indicate the desired outcome. This may create difficulties in reporting in conformity with the requirements of the Results Based Management reporting. Mr. Nazaridoust explained that deviation from MLF targets as mentioned in the HPMP approval document was not possible. He however proposed that some smart indicators be added to the logical framework of the project for monitoring at the onset of project implementation. This also applies to Project Management output.

Dr. Hajizadeh asked about when the project budget will be received. Dr. Nazaridoust explained that UNDP had received the required Delegation of Authority for the first tranche of the project budget. Upon the signature of the project document a budget revision would be carried out and the required Authorized Spending Level (ASL) would be raised.

Dr. Hajizadeh further said that given the approval of the MLF funding several months ago, the project component regarding the conversion of one "foaming system house" should start implementation as soon as possible in 2017, However, full implementation will extend into 2018.

At the end of the meeting, Mr. Hajizadeh asked for making a deletion in paragraph 1 on page 22 of the project document where it says "the project will be implemented in close coordination with the participating enterprises in foam and RAC manufacturing sectors. Upon the prior consent and official request of DoE supported by required documentation including but not limited to TORs, Specifications, UNDP will sign Memorandum of Agreements (MoAs)/contracts on behalf of the DoE with each of the respective participating enterprises selected by the DoE." He suggested removing the word "on behalf" from the text.

This suggestion was discussed in the meeting and operational and legal dimensions were discussed. It was finally agreed that UNDP would remove the phrase "On behalf."

LPAC Recommendations:

In concluding the meeting, Ms. Carlsen summarized the recommendations of the LPAC as follows:

- Add the project organogram in to the Management Arrangement title on page 22 of the project document;
- Make reference in the Project Document to the pertinent annex in the MLF approval where the share of cooperating countries is clearly mentioned.
- Follow up with UNDP Regional Office to make sure that the "final project evaluation" is not needed.
- Observations and comments of the Pre-PAC meeting should be considered and required changes have to be applied in the Project Document.
- The discrepancy regarding the sums of substances to be phased out through the UNDP component of the MLF approval (62.23 versus 62.1ODP tonnes) to be Phase-out as reflected in table 3 of page 6 and in page 7, Paragraph 1 of the project document shall be looked at and resolved in consultation with the project Regional Technical Advisor and based on the original proposal submitted to and adopted by MLF;
- Reference to "University of Enghlab" should be corrected in the project document by replacing it with the official title of the University ( Islamic Enghelab Technical and Vocational Faculty under supervision of the Ministry of Science, Research and Technology);
- Necessary revision be made in the project indicators in line with the RBM approach at the commencement of project implementation,'
- The word "On behalf" should be removed from page 22 (in Governance and Management Arrangements section.

Certification:

| | |
|---|---|
| The undersigned certify that LPAC recommendations are fully incorporated in the document as appears in the attachment hereto. | |

| | |
|---|---|
| | |

Endorsement:

| | |
|---|---|
| I endorse the recommendations made by the LPAC as reflected in these minutes and in the document attached hereto. | UNDP Resident Representative:<br>Name:<br>Signature: |

Follow-up Action:

1. Incorporate the LPAC comments in the project document as necessary.
2. Upon incorporation of the recommended changes, the project document could be recommended for signature.
3. Once the document is signed, UNDP to carry out the Atlas related tasks required to make funds available for project implementation.