



Iranian roadmap on ODS bank management

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On behalf of:



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of the Federal Republic of Germany

In cooperation with:



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دائرة محیط زیست

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Registered offices:

Bonn and Eschborn, Germany

Dag-Hammarskjöld-Weg 1-5

65760 Eschborn, Germany

T +49 619679-1022

F +49 619679-80 1022

E proklima@giz.de

I www.giz.de/proklima

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Responsible:

Bernhard Siegele, Franziska Frölich (GIZ GmbH, Eschborn)

Authors:

Irene Papst, Igor Croiset (HEAT GmbH, Königstein)

Review:

Marcel Nitschmann, Alireza Saadatfar (GIZ GmbH, Eschborn)

Layout:

Eva Hofmann, Katrin Straßburger, W4 Büro für Gestaltung, Frankfurt

Photo:

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On behalf of:

The German Federal Ministry for the Environment, Nature Conservation

and Nuclear Safety

Division Kl II 7 International Climate Finance, International Climate Initiative

11055 Berlin, Germany

T +49 30 18305-0

F +49 30 18305-4375

E K1117@bmu.bund.de

I www.bmu.bund.de

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Abbreviations

| | |
|--------|---|
| BHRC | Road, Housing & Urban Development Research Center (BHRC) |
| BMU | German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety |
| CFC | Chlorofluorocarbon |
| COP | Conference of the Parties |
| EEE | Electrical and Electronic Equipment |
| EPR | Extended Producer Responsibility |
| GEF | Global Environment Facility |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH |
| GWP | Global warming potential |
| HCFC | Hydrochlorofluorocarbon |
| HCl | Hydrogen chloride |
| HF | Hydrogen fluoride |
| HFC | Hydrofluorocarbon |
| HPMP | HCFC Phase-out Management Plan |
| HVAC | Heating, ventilation, air conditioning |
| HW | Hazardous waste |
| IKI | International Climate Initiative of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety |
| IPCC | International Panel on Climate Change |
| LEDS | Low emission development strategy |
| MLF | Multilateral Fund for the Implementation of the Montreal Protocol |
| MRV | Monitoring, reporting and verification |
| ODP | Ozone depleting potential |
| ODS | Ozone depleting substances |
| RAC | Refrigeration and air conditioning |
| RAC&F | Refrigeration, air conditioning and foam |
| RRR | Recovery, Recycling and Reclaiming |
| SATBA | Renewable Energy and Energy Efficiency Organization |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VAT | Value added tax |
| WEEE | Waste Electrical and Electronic Equipment |

Management and Destruction of Existing Ozone Depleting Substances Banks

The Montreal Protocol on substances that deplete the ozone layer (ODS) has been effectively regulating the production and consumption of ODS since 1989. However, large banks of ODS have accumulated globally due to the excessive historical use of these substances. ODS are continuously being released to the atmosphere from these banks – damaging the ozone layer and contributing to global warming. It is important to note that these banks are not regulated under the Montreal Protocol. Adequate collection, recovery and destruction of ODS banks represent a challenge for developing countries.

Various programmes and projects that were promoted and financed by the Montreal Protocol aiming at the reduction and elimination of ODS resulted in the voluntary conversion to technologies free of these substances by large companies. However, the management and destruction of ODS in decommissioned systems have been overlooked for a long time.

The global project “Management and Destruction of ODS Banks” supports the integrated waste management of ODS and equipment containing ODS. This project is commissioned by the Federal Ministry of Environment, Nature Conservation and Nuclear Safety (BMU) as part of its International Climate Initiative (IKI) and being implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. This Iranian roadmap on ODS bank management was developed as part of the ODS Banks project in close cooperation with the National Ozone Unit (NOU) of the Department of Environment (DoE) Iran. The aim was providing a strategic action plan for ODS bank management and to reduce emissions from the most important sectors.

1 Introduction

1.1 Background

Iran has been a Party to the Montreal Protocol since the 3rd of October 1990. Since then, the consumption and production of ozone depleting substances (ODS) has been effectively reduced in the country. Still, the historical and current use of ODS has led to the accumulation of large amounts of ODS, e.g. in old refrigerators, insulation foam or cylinders, so-called ODS banks¹. The emissions from these ODS banks contribute not only to ozone layer depletion but also to climate change.

As neither the Montreal Protocol nor any other international environmental convention regulates the management and destruction of existing ODS banks², it is each country's own responsibility to establish a successful ODS bank management to handle this important source of emissions.

Within the project "Management and destruction of ozone depleting substances", the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU) has conducted several stakeholder workshops in Iran with the National Ozone Unit and representatives from other ministries. The first workshop conducted in February 2016 was followed by consultation meetings with the Renewable Energy and Energy Efficiency Organization (SATBA), the Road, Housing & Urban Development Research Center (BHRC), Ministry of Energy, National Climate Change Office, Water and Soil Bureau, National Ozone Unit, the Iranian Heating, Venting and air conditioning (HVAC) Association, the Technical and Vocational Training Organization (TVTO), the Teheran Waste Man-

agement Organization (TWMO), and NGO stakeholders among other refrigerant suppliers and waste recycling companies. A second workshop was held in July 2017 to discuss the preliminary results and collect further feedback. The findings from these workshops substantially contributed to the development of this Iranian roadmap on ODS bank management.

Regarding the international climate negotiations with the key objective to limit the temperature increase well below 2°C and pursue efforts to limit it even further to 1.5°C, Iran as a party to the UN Framework Convention on Climate Change (UNFCCC) agreed at the 21st Conference of the Parties in Paris in December 2015 (COP 21) to fight climate change by reducing their greenhouse gas (GHG) emissions. Within this scope, Iran defined climate targets laid down in the "Intended Nationally Determined Contribution" (INDC)³, published in November 2015.

This 'Iranian roadmap on ODS bank management' introduces four key processes to establish good practices in ODS bank management:

- introducing a suitable set of laws and regulations;
- a sustainable financing mechanism;
- a functioning recycling and destruction infrastructure;
- an effective collection mechanism.

For each of the key processes the status quo is shortly described in Iran, followed by specific recommendations and guidance to policy-makers, e.g. national ozone officers and policy-makers from the waste sector. This roadmap focusses on

1 Banks are defined as the "total amount of substances contained in existing equipment, chemical stockpiles, foams and other products not yet released to the atmosphere" (IPCC/TEAP 2005).

2 Apart from technical requirements once the countries have decided to destroy ODS.

3 <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Iran/1/INDC%20Iran%20Final%20Text.pdf> (last accessed 09.01.2018)

chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC) which have been used in the refrigeration, air conditioning and foam (RAC&F) sectors and accumulated to substantial banks.

1.2 The ODS bank in Iran

A recently finished ODS bank inventory shows that the highest amounts of ODS (metric tonnes) – have accumulated in the air conditioning sectors and chillers, dominated by HCFC. According to the gathered data and applied inventory model, no significant amount of CFC is left in the refrigeration and AC sectors.

From an environmental perspective, it is more important to consider the ozone depleting potential (ODP)-weighted tonnes, which is 1168 ODP tonnes. From Figure 1, it becomes evident that highest priority should be given to the air conditioning sectors and the chiller sector. The HCFC dominated sectors are the focus for the recovery of R-22 for recycling and reclaim. It is further assumed that domestic refrigeration might be under represented due to lack of data. Due to long lifetimes of domestic refrigerators and known conversion dates from CFC to HFC or hydrocarbons, it is expected that a considerable amount of disposed refrigerators still contain CFCs.

Consequently, this roadmap particularly focuses on these three sectors, suggesting activities in the core processes that are introduced in Chapter 2.

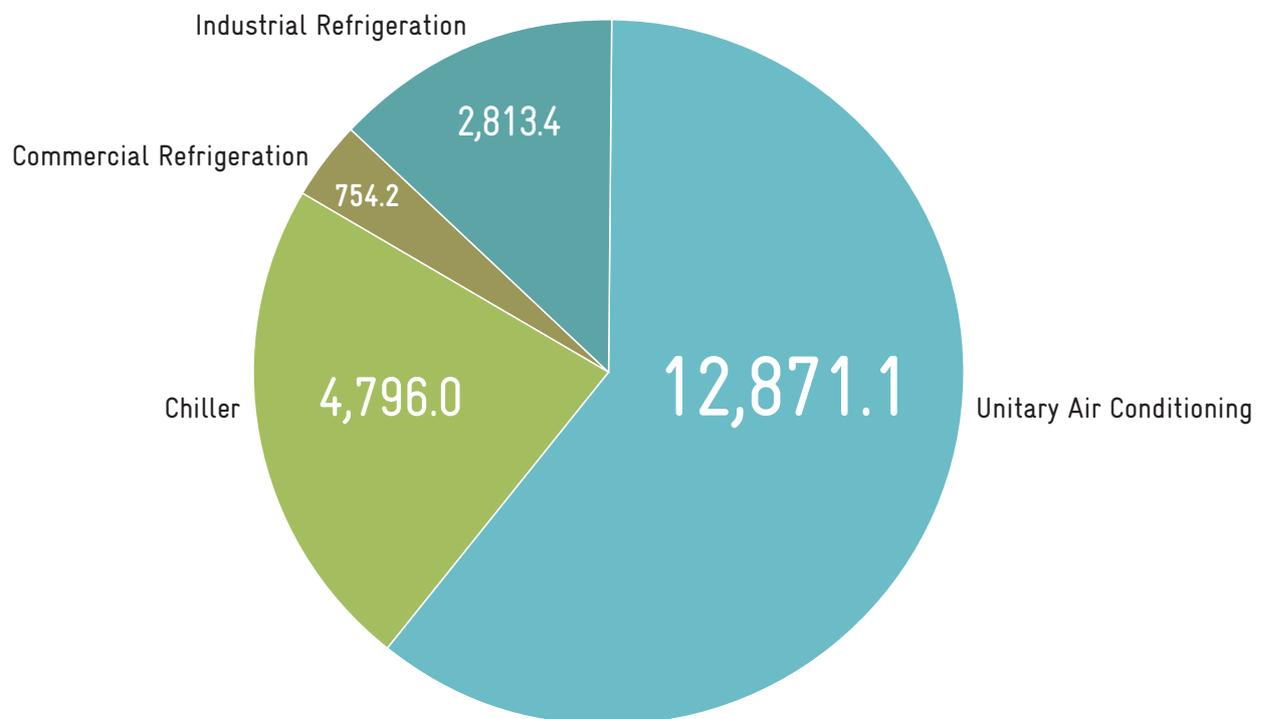


Figure 1: ODS bank of the refrigeration and air conditioning sectors in metric tonnes

Vision for the roadmap

Based on the ODS bank inventory in Iran (GIZ 2018), the ODS amounts that are potentially and realistically available for ODS bank management have been quantified. While the first perspective considers all RAC equipment which is decommissioned due to end of life and thus potentially enter the waste stream (assuming a 100% collection rate). The second perspective is a more realistic scenario: Here, we assume a 5% collection rate and recovery rate, respectively which can easily be achieved when

implementing the short-term key measures that are suggested in this roadmap.

Around 1800 tonnes of R-22 are potentially available per year, assuming a 100% recovery of the substance. Manageable amounts of R-22 will increase until the year 2022 and decrease afterwards.

When assuming more realistic collection and recovery rate of 5%, around 100 tonnes of R-22 are available for management (Figure 2).

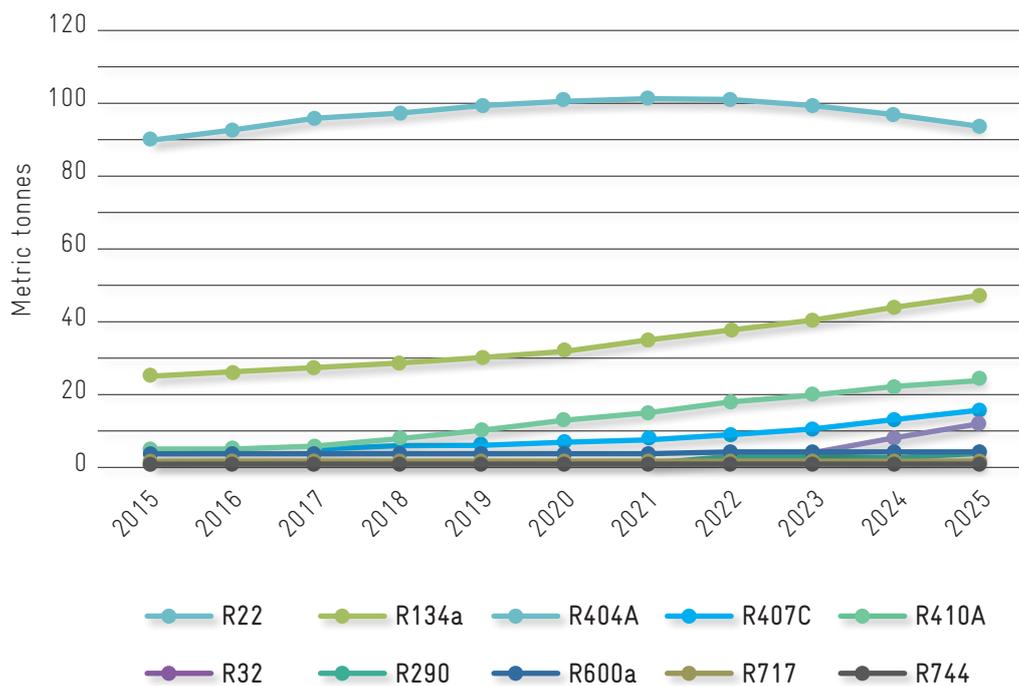


Figure 2: Amount of ODS and HFC in the RAC sectors realistically available for management when implementing key measures of this roadmap (GIZ 2018).

1.3 General priorities for ODS bank management

General priorities within ODS bank management are closely related to the technical feasibility. Technical feasibility is defined as the possibility to recover ODS at a reasonable level of effort and cost (ICF 2010). TEAP (2009) assigned three categories of effort levels (low, medium, high) to the reachable bank in the RAC&F subsectors. Short-term actions (until 2020) should focus on large refrigeration and air conditioning (RAC) systems, mid-term actions (until 2025) on the appliance sector and long-term actions on the ODS contained in construction foam (until 2030–2050 or longer)⁴. The effort required to extract ODS is generally lower in urban areas, so these should be considered first.

The recovery of blowing agents from construction foam is a complex and expensive issue, simultaneously not urgent because of the slow release from the foam matrix. The short-term actions, i.e. the recovery of ODS from large RAC systems are already addressed by the Iranian HCFC Phase out management plan (HPMP) to a large extent, financially supported by the Multilateral Fund for the Implementation of the Montreal Protocol (MLF). Since ODS bank management is closely related to the activities of the HPMP, for example training and certification of refrigeration and air conditioning technicians or developing laws to reduce ODS emissions from equipment, the roadmap also points to overlapping issues.

4 The time horizon is not given by TEAP.

2 The core processes of ODS bank management

For a successful ODS bank management, the core processes (Figure 3, light red colouring) are to establish:

- a suitable set of policy measures (i.e. laws and regulations, but also fiscal and other non-regulatory measures);
- a sustainable financing mechanism;
- an effective collection mechanism;
- a functioning recycling and destruction infrastructure.

Generally, these processes are embedded in a larger framework or steering process such as Iran's Five Years National Development Plan, which is

renewed every 5 years – or other national climate and energy plans. Important accompanying processes (support processes) are:

- the compilation of an ODS bank inventory;
- the establishment of a monitoring, reporting and verification (MRV) system;
- and capacity building (e.g. technician training to properly recover ODS from equipment).

For each core process, the roadmap describes the situation in Iran, and formulates specific recommendations based on a gap analysis (Annex II)⁵. Barriers identified during several stakeholder workshops are also considered.

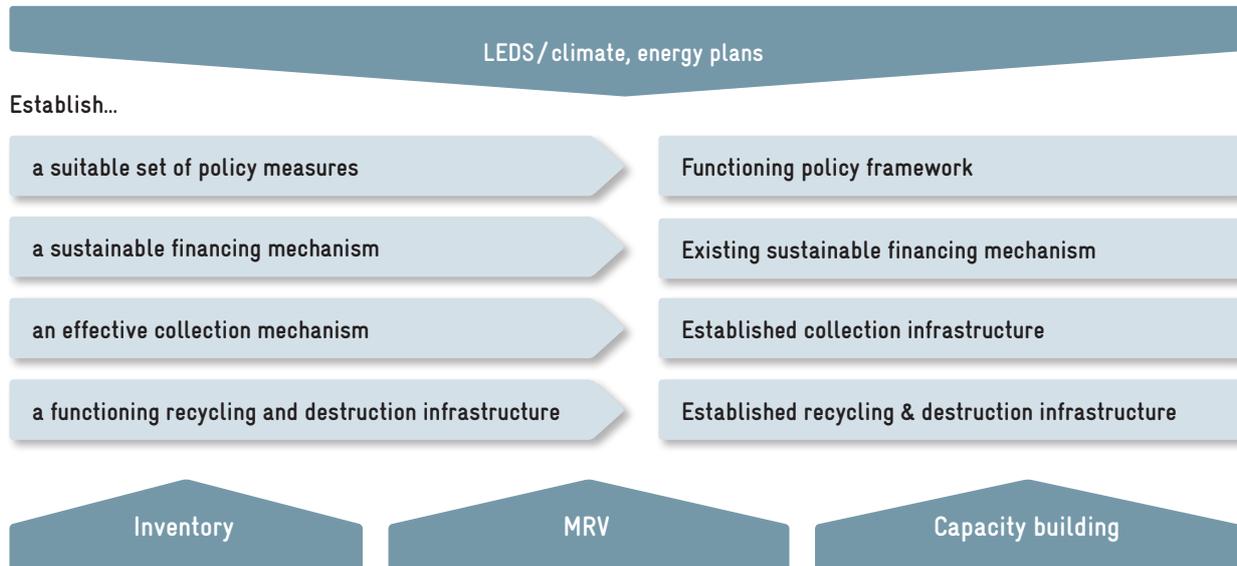


Figure 3: Core processes for successful ODS bank management (light grey), as well as steering processes (dark grey, top) and support processes (dark grey, bottom).

⁵ More general information is found in the "Global roadmap on ODS bank management" (GIZ 2017) and the guidelines which are referred to in the document.

Within the GIZ project, the following key activities have been identified together with the Iranian partners to support successful ODS bank management. They are currently being implemented. The total project duration is 3 years.

- **Compilation of ODS bank inventory**
 - review of existing data and information
 - compiling equipment data for conducting a detailed Tier 2 inventory approach
- **Training for the e-waste management sector**
 - training workshops for waste managers, regional and local authorities on dismantling of equipment containing ODS (refrigerators and air conditioners)
 - supply of a "Guideline on the Manual Dismantling of Refrigerators and Air Conditioners" (2017)
- **Technical support for designing a dismantling plant in supporting a domestic refrigeration manufacturer for collection and dismantling of domestic refrigerators. A cooperation with other Iranian manufacturing companies is pursued to set up the infrastructure for a closer cooperation between the manufacturers.**

2.1 Core process 1: Establish a suitable set of policy measures

The responsible ministries have different policy options for guiding ODS bank management to reach the required goal of reducing emissions, including regulatory, fiscal and non-regulatory measures. Policies can aim at different RAC sectors, e.g. domestic refrigerators, or refrigerant collection overall. For comprehensive ODS bank management, both waste electrical and electronic equipment (WEEE) containing ODS and the ODS themselves need to be considered.

To establish a suitable set of policy measures, generally the following steps are recommended:

2.1.1 Status quo

Iran already has some regulations dealing with ODS, and WEEE. Regarding ODS, the focus lies on certification and training. Each workshop has to employ at least one certified technician. The aim is to reduce emissions by ensuring proper handling and recovery of refrigerants. Recovery units were distributed during the CFC phase-out, but recycling centres to collect the recovered refrigerant are lacking. No monitoring of collected amounts or incentives for technicians to return used ODS does exist. Also, there is no formal venting ban on ODS or HFC.



On WEEE, the “Rules, regulation and executive methods for Electric and electronic waste”, prepared by Health, Safety and Environment office, Ministry of industry, Mine and Trade included in Chapter 5 “Good environmental waste management on Refrigeration system”. It is defined that refrigerant gases should be recovered from the domestic and commercial refrigerators and should be handed over to recycling centres (Article 24) and that polyurethane foam should be separated and recycled (Article 25). However, it is also stated that if it is not possible to recycle materials in correct way, the material should be send to the landfill sites that are under supervision of municipality.

Highest priority for reducing the ODS bank and avoiding corresponding emissions should be given to the air conditioning sector, the chiller sector and domestic refrigerators.

There is window of opportunity to address ODS bank management within the HPMP. Suggestions on important regulations to be added are included in this roadmap.

2.1.2 Key actions for future ODS bank management

The table below shows key actions for future ODS bank management, regarding suitable policy measures, indicating the importance for the three most relevant RAC subsectors and indicating the urgency of implementation (short-, medium- and long-term action). Short-term actions should be implemented within the next years (until 2025), mid-term actions until 2030 and long-term actions afterwards. However, the planning and design of all actions must be initiated now.

| KEY ACTIONS | TIME FRAME Short-term Medium-term Long-term | RELEVANCE IN KEY SECTORS | | | ADDITIONAL INFORMATION |
|---|--|--------------------------|--------------------------|-------------------|---|
| | | Unitary Air Conditioning | Commercial Refrigeration | Dom Refrigeration | |
| Mandatory recovery and ideally explicit venting ban of ODS together with reporting obligations on the quantity of recycled, reclaimed or destroyed ODS. The legislation must include the requirement that recovered substances are either subject to reclaim, recycling or destruction. | Short-term | ✓ | ✓ | ✓ | The environmental impact will be particularly high for large appliances (e.g. large building chiller systems) and are key to reduce emission from the AC and the commercial sectors. Defined acceptable leakage rates are no prerequisite for implementing this measure. |

| KEY ACTIONS | TIME FRAME Short-term  Medium-term  Long-term  | RELEVANCE IN KEY SECTORS | | | ADDITIONAL INFORMATION |
|---|---|--------------------------|--------------------------|-------------------|--|
| | | Unitary Air Conditioning | Commercial Refrigeration | Dom Refrigeration | |
| Establish a regulation demanding periodic leak checking of RAC equipment above a critical refrigerant charge and appropriate monitoring. |  | ✓ | ✓ | | <p>The leak checks need to be done by certified RAC technicians.</p> <p>A detailed pre-assessment of the policy measure is required, similar to a stringent outlined enforcement strategy (see step 4 of the core process).</p> <p>The monitoring refers to the quantity and type of refrigerants added and the quantity recovered during maintenance, servicing and final disposal of the equipment or system. Therefore log books are useful to keep these records, and this information must be made available upon request. (a similar system is set up under Eu F-Gas Regulation)</p> |
| Adjust existing legislation addressing end-user of RAC equipment, penalizing inappropriate disposal of ODS containing equipment and release of ODS refrigerants/blowing agents. |  | ✓ | ✓ | ✓ | Part of RAC appliances are already covered by WEEE legislation but not large RAC systems, such as chillers or centralised systems |
| Discuss voluntary industry agreements with companies involved in the RAC sectors (other than domestic refrigeration). |  | ✓ | ✓ | | For example, with companies producing or assembling split commercial AC or stand-alone refrigeration units. The agreements can include the avoidance of using certain toxic components or high GWP refrigerants. Voluntary agreements are most promising if there is only a small number of actors. |
| Establish a rebate system ⁶ to increase the return of refrigerants and implement incentives schemes for end-users to use natural refrigerants |  | ✓ | ✓ | ✓ | <p>Also combinations of tax (measure below) and rebate schemes are possible.</p> <p>Implementation could start with voluntary schemes and pilot projects, before being introduced nationwide</p> |
| Establish fiscal measures such as GWP-weighted taxes on refrigerants ⁷ |  | ✓ | ✓ | ✓ | |
| Develop an overall ODS and F-gas regulation containing all relevant aspects, from mandatory recovery for reclaim, recycling or destruction but also a robust monitoring scheme |  | ✓ | ✓ | ✓ | |

6 Part of the tax (or fee) on refrigerants is recovered when refrigerants are returned for recycling, reclaiming, or destruction. This generates a strong incentive for refrigerant consumers and the servicing sector to return the recovered refrigerant

7 A tax on refrigerants based on their GWP raises the price of harmful substances. Companies can choose whether to pay higher prices for refrigerants or to convert to more environmentally friendly solutions

2.2 Core process 2: Establish a sustainable financing mechanism

ODS bank management needs to be based on a sustainable financing mechanism.

Financing is not only necessary for the destruction of ODS but also for other activities such as the infrastructure and operation of a collection scheme, including transport of ODS and equipment containing ODS. The appliance market (e.g. refrigerators and small ACs) and the non-appliances market – where refrigerants will be recovered on site (e.g. air conditioning chillers and centralised systems in supermarkets) – must be considered separately.

Possible financing mechanisms may involve a combination of:

- Extended Producer Responsibility (EPR) scheme: EPR requires manufacturers to bear the financial and organisational responsibility for their products throughout their life and is particularly suitable for the appliances market (including historical production of systems containing ODS).
- Import tax or levy: suitable for import countries who do not have manufacturing capacities
- Advanced disposal fee: Fees are imposed for purchases of appliances containing ODS (and HFC) to fund the cost of ODS bank management
- Operators of large RAC appliances (owners) are responsible for their equipment at decommissioning including the containing hazardous waste. They have to pay for the proper management of the recovered substances
- Use of carbon dioxide allowance auction revenues
- Voluntary carbon market
- Support through industrialised country's contributions to climate financing and ozone layer protection
- Transitional multi-lateral or bilateral grant and concessionary loan funding to initiate the incremental development of programs

2.2.1 Status quo

In Iran, RAC equipment is classified as special waste and as such, the producers are responsible for proper treatment. This could be interpreted as the bases for an EPR scheme, however there is no initiative to implement this clause. There is a need to establish further specifications in particular regarding the responsibilities of the involved players to put accurate environmental waste management into practice.

2.2.2 Key actions for future ODS bank management

The table below shows key actions for future ODS bank management to establish a sustainable financing mechanism.

| KEY ACTIONS | TIME FRAME Short-term Medium-term Long-term | RELEVANCE IN KEY SECTORS | | | ADDITIONAL INFORMATION |
|--|---|--------------------------|--------------------------|-------------------|--|
| | | Unitary Air Conditioning | Commercial Refrigeration | Dom Refrigeration | |
| Adjust the existing hazardous waste regulation to explicitly oblige end-users (owners) of large RAC equipment to bear the financial responsibility for the recovered ODS. The owner has to pay for the recovery and the dismantling. |  | ✓ | ✓ | | In contrast to appliances, large RAC systems are assembled on-site. Here, the owner of the RAC system must be financially responsible for the proper servicing and waste management including ODS treatment after decommissioning and the treatment of other (hazardous) components. |
| Introduce direct incentives <ul style="list-style-type: none"> • A pilot project with the direct incentive for returned refrigerants could demonstrate the mechanism • Incentives for RAC service technicians for the purchase of recovery equipment with oil-separation and rechargeable cylinders • Introduce a rebate scheme: Every supplier adds a fee on the sales price, which is refunded (depending on the quality) when recovered refrigerants are returned |  | ✓ | ✓ | ✓ | Once the reclaimed refrigerants are well accepted, a rebate scheme can be implemented, whereby a fee is added to the sales prices. This fee is refunded when the refrigerants are returned. The fee might be fully refunded for substances that can enter the reclaim process and only partly refunded for impure refrigerants which are subject to destruction. |
| Introduce indirect incentives <ul style="list-style-type: none"> • Options should be discussed of introducing a tax abatement when further recovery, recycling or reclaim systems are imported as a financial alleviation for RAC technicians and e-waste managers |  | ✓ | ✓ | ✓ | |

2.3 Core process 3: Establish an effective collection mechanism

The steps to establish an effective collection mechanism range from the analysis of an e-waste policy framework over capacity building to the endorsement of the sector plan. More general information about this process is found in the “Global roadmap on ODS bank management” (GIZ 2017).



2.3.1 Status quo

In Iran, some activity was undertaken during the CFC phase-out. However, there is no concerted initiative to establish an effective collection mechanism so far. On initiative of this project, a local manufacturer is supported to establish a collection and dismantling scheme for domestic refrigerators.

2.3.2 Key actions for future ODS bank management

To improve ODS bank management regarding the collection of refrigerant and of equipment containing ODS, the following activities are recommended.

| KEY ACTIONS | TIME FRAME Short-term  Medium-term  Long-term  | RELEVANCE IN KEY SECTORS | | | ADDITIONAL INFORMATION |
|--|---|--------------------------|--------------------------|-------------------|---|
| | | Unitary Air Conditioning | Commercial Refrigeration | Dom Refrigeration | |
| Awareness raising for e-waste managers <ul style="list-style-type: none"> • state-of-the art recovery tools and equipment • Proper recovery of hazardous substances • Proper storage and transport • Valorisation of equipment of recovered components • marketing opportunities |  | ✓ | | ✓ | "Safe" landfilling of recovered substances must be avoided. |
| Establishment of a collection system for refrigerants <ul style="list-style-type: none"> • Introduction of refillable refrigerant cylinders • Enforcement of the collection mechanism |  | ✓ | ✓ | | Support and complementing the activities that were undertaken under the HPMP is needed to ensure a collection system that is effective in the long run. |
| Establishment of a collection system for appliances Initiate the cooperation between local manufacturers to set up a joint system |  | | | ✓ | Establish the working mechanism to involve the retail sector as suppliers and collection point of refrigerators. Cooperate with the major manufacturers located in different cities to act as logistics hubs. Put in place a financial mechanism to incentivize the return of used refrigerators as an overall business case. |
| Intensification of exchange and knowledge transfer between central, regional and local authorities. |  | ✓ | ✓ | ✓ | It is important that regional and local authorities fulfil their duty in controlling small and medium enterprises dealing with refrigerants. Local authorities must be enabled to inform end-users on possibilities to return WEEE including equipment containing ODS. |
| Increase the capacity in Iran to process recovered components from RAC appliances |  | ✓ | ✓ | ✓ | |

| KEY ACTIONS | TIME FRAME | RELEVANCE IN KEY SECTORS | | | ADDITIONAL INFORMATION |
|---|---|--------------------------|--------------------------|-------------------|--|
| | Short-term  Medium-term  Long-term  | Unitary Air Conditioning | Commercial Refrigeration | Dom Refrigeration | |
| Informal sector Consider training and education programmes to involve the informal sector, at least in certain dismantling steps of RAC appliances. |  | ✓ | ✓ | ✓ | The informal sector should be involved in the collection scheme, particularly in remote areas. The informal sector is very effective in collecting appliances, however the appliances are mostly processed regardless of any environmental, social and health standards. As an alternative, hand-over points could be established, where scrap collector are paid for the return of appliances. The price must be slightly above the appliances' net material value. People from the informal sector should be educated by the formal waste management companies. Beyond, alternative employment opportunities and social frameworks should be discussed. |

2.4 Core process 4: Establish a functioning recycling and destruction infrastructure

An ODS bank inventory enables a robust estimate of the available ODS amounts and therefore helps to establish a functioning recycling and destruction infrastructure. A suitable recycling and reclaim infrastructure should be in place: In ODS bank

management, re-use of ODS should be a priority, reducing the need and accumulation of new virgin refrigerants. Refrigerants can be re-used many times without deterioration of their quality as long as different refrigerants are not mixed or contaminated otherwise. Afterwards a detailed cost assessment based on the available ODS supports the decision for either the local destruction of ODS or the export of ODS for destruction.



2.4.1 Status quo

Since there is no functioning collection system, critical amounts of ODS to be recycled or destroyed have not been recorded. Hand in hand with ODS collection, procedures and infrastructure to deal with the collected amounts have to be defined and established. For example, there are several cement kilns in operation in Iran, where the suitability for the destruction of unwanted ODS could be investigated. Issues to be considered are to avoid corrosion by limiting the feeding of chlorine and fluorine, as well as a suitable feeding duct.

2.4.2 Key actions for future ODS bank management

To improve ODS bank management, regarding recycling and destruction infrastructure, the following activities are recommended.

| KEY ACTIONS | TIME FRAME | RELEVANCE IN KEY SECTORS | | | ADDITIONAL INFORMATION |
|---|---|--------------------------|--------------------------|-------------------|------------------------|
| | Short-term  Medium-term  Long-term  | Unitary Air Conditioning | Commercial Refrigeration | Dom Refrigeration | |
| Capacity building and awareness raising for RAC technicians <ul style="list-style-type: none"> • Focus on recovery of refrigerants from large AC equipment and chiller • Inform technicians on what they can do with recovered gas, also in case there are doubts about the quality or in case refrigerant blends have been extracted • Intensification of training on natural refrigerants • Increase awareness that the reclaimed material is of good quality and tested according to current standards AHRI 700 and 740 |  | ✓ | ✓ | ✓ | |

| KEY ACTIONS | TIME FRAME Short-term  Medium-term  Long-term  | RELEVANCE IN KEY SECTORS | | | ADDITIONAL INFORMATION |
|--|---|--------------------------|--------------------------|-------------------|---|
| | | Unitary Air Conditioning | Commercial Refrigeration | Dom Refrigeration | |
| <p>Improve the existing RRR network</p> <ul style="list-style-type: none"> • Improve the existing RRR network: • Providing state-of-the-art re-usable refrigerant cylinders (DOT or ADR P200 dual port rechargeable refrigerant recovery cylinder) • Increase the possibilities to return refrigerants (without additional costs), for example at the places where new refrigerants are put on the market • Set up a decent coverage of an RRR network • Establish reclaim centres with sufficient storage capacities • Cylinder cleaning facilities are recommended for reclaim centres, as well as analytical tools to assess the type and quality of the returned refrigerants (gas chromatography laboratory should be applicable also for HFC) |  | ✓ | ✓ | ✓ | There is currently a lack of these cylinders and service companies often cannot afford them. However, they are more cost-effective and have a positive environmental impact compared to discarded cylinders which still contain remaining refrigerants. |
| Establish local recycling and reclaim capacities |  | ✓ | ✓ | ✓ | Technology support for the design and manufacture of the plant and trade-off with the different manufacturers on sizing of the plant. |
| Strengthen the capacity of e-waste management companies to more effectively process refrigerators including the recovery of the refrigerant (stage I) but also to work towards a stage II system for domestic refrigerators, i.e. using full encapsulated system to capture the blowing agents during the dismantling process |  | ✓ | | ✓ | Please see the "Guideline on the Manual Dismantling of Refrigerators and Air Conditioners" (2017) |

3 References

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GIZ, 2017

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Technology and Economic Assessment Panel. Task force decision XX/7 – Interim Report “Environmentally sound management of banks of ozone-depleting substances”. Coordination: TEAP and its XX/7 Task force. UNON Nairobi.

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4 Annex I: ODS bank fact sheet

1. Country overview

| GENERAL OVERVIEW | |
|--|---|
| Area (km²) | 1 648 195 km ² |
| Population | 79.93 million in 2016 (Census 2016 ⁸) |
| Population density | 49.8/km ² ⁹ |
| GDP (US\$/capita) | 439.5 billion US\$ ¹⁰ , 6946.9 per capita ¹¹ |
| Geographical position and particularities | North of Persian Gulf and the Gulf of Oman |
| Average annual temperature including summer and winter temperature (°C) | From arid or semiarid, to subtropical along the Caspian coast and the northern forests, subtropical aridity in the Arabian desert areas and subtropical humidity in the Persian Gulf and Eastern Mediterranean area. January is the coldest month, with temperatures from 5°C to 10°C, and August is the hottest month at 20°C to 50°C. (more details in Chapter 9, Annex) |
| Urbanisation rate (%) | 74.0% (based on census 2016) |
| Metropolitan areas | There are 31 provinces in Iran each of them has a capital and local government. The capital of Iran is Tehran and the 5 largest cities of Iran are: Tehran, Isfahan, Mashhad, Ahwaz and Tabriz. These cities all have more than 1 million inhabitants with Tehran being by far the largest with 13.23 million. (Census 2016). |
| Road Network | There are more than 190 thousand kilometers of roads in the country (2009) ¹² , of which 141 thousand kilometers are paved and in good condition. 26.7% of the road network is not paved and in a bad condition (2006) ¹³ . |
| Main industries | Petroleum, petrochemicals, gas, fertilizers, caustic soda, textiles, cement and other construction materials, food processing (particularly sugar refining and vegetable oil production), ferrous and nonferrous metal fabrication, armaments, steel industry, cement industry, chemical, medication, copper and profile industry, mineral products, transportation, home appliances. ¹⁴ |
| Important harbours for international goods traffic | There are 14 large active harbors in Iran. The 5 most important are: Rajae, Imam Khomeini, Anzali, Chabahar and Asalouyeh |

8 https://www.amar.org.ir/Portals/1/census/2016/Census_2016_Selected_Findings.pdf

9 <https://data.worldbank.org/indicator/EN.POP.DNST?locations=IR>

10 <https://tradingeconomics.com/iran/gdp>

11 <https://tradingeconomics.com/iran/gdp-per-capita>

12 <https://tradingeconomics.com/iran/roads-total-network-km-wb-data.html>

13 <https://tradingeconomics.com/iran/roads-paved-percent-of-total-roads-wb-data.html>

14 <https://www.isna.ir>

2. International conventions

| BASEL CONVENTION | |
|--|--|
| Party to the Basel convention | Yes |
| Definition of hazardous waste | <p>Definition by the Iran Department of Environment: Solid or liquid waste that due to quantity, concentration or quality (physical, chemical or biological) can increase mortality or very serious diseases or constitutes a risk to the environment.</p> <p>Hazardous waste has usually one of the following characteristics: explosive, combustible, corrosive, reactive, toxic or radioactive.</p> <p>ODS is a hazardous waste according to the DOE definition.</p> |
| Bilateral or regional agreements under the Basel convention | A regional office of the Basel convention is located in Tehran of which 6 countries are members: Iraq, Afghanistan, Pakistan, Nepal, Bangladesh and Maldives. Its main mission is training and transferring new technology for all members. |
| Import bans reported to the Basel Secretariat | None |
| Focal point/Competent Authority | Department of Environment (DOE)/Deputy of Human Environment Affair/Water and Soil Office |
| Regular transboundary movement (TBM) of other hazardous waste according to Basel? | Yes |
| STOCKHOLM CONVENTION | |
| Party to the Stockholm Convention? | Yes |
| National Focal Point/Official Contact Point | Department of Environment (DOE)/Deputy of Human Environment Affair/Water and Soil Office |
| Activities under Stockholm | None |
| UNFCCC | |
| Ratification of the Kyoto Protocol | Yes |
| Does the country have specific climate goals? | <p>Yes</p> <p>Short term target called "low carbon economy" until 2020</p> <p>Third national communication to UNFCCC specifies a mitigation scenario, leading to 12% reduction by 2030.</p> |

3. ODS and HFC specific information

| ODS AMOUNTS | |
|--|--|
| Existing data about ODS banks | Inventory was undertaken by this project. |
| Existing ODS consumption/production (e.g. HPMP, other) | <p>During the national phase out program (NPP), CFC consumption data was reported in ODP tonnes for the applicable subsectors. This reporting ceased in 2010, when the phase-out was completed. (Data table provided in the annex)</p> <p>HCFC consumption is reported under the HPMP. There is no local production of HCFC, hence the required amounts are imported. The main imported HCFCs are HCFC-22 and HCFC-141b, while blends are negligible. Pre-blended polyol for foam blowing is also not imported but mixed locally. (Data table for 2013-2015 provided in the annex)</p> |
| Existing HFC consumption/emission inventories | <p>HFC consumption/emission data was gathered from the HPMP survey among >50 companies in 2016</p> <p>Data table provided in the annex.</p> |
| Prognosis of future ODS amounts and past substance replacements | <p>During the CFC phase-out, between 1999 and 2002, R12 was replaced by R134a, while R11 using foam blowing was converted to pentane and R141b.</p> <p>During the HCFC phase-out, foam blowing is converted to pentane and water-blown systems, while refrigeration equipment manufacture is partly converted to HFC. First steps to convert to also use R600a are taken.</p> <p>Due to the ongoing activities under the HPMP, HCFC consumption is decreasing. However, there is still a large bank.</p> |
| NATIONAL LEGAL MANDATE | |
| Venting of ODS/HFC | The refrigeration Unions set the training curricula and are the voice versus the Ministry of trade, mines and industry. There are no bans on venting HFC. |
| Import and export of ODS/HFC (see also Basel) | <p>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, and codification system, provision of fiscal incentive and disincentives, labelling requirements. That means that importers require a licence with an allocated quota to be able to import HCFC. That total amount is subject to the phase-out target and decreasing accordingly. Equipment containing HCFCs is planned to be included into the quota system.</p> <p>There are no regulations applying to HFCs so far. With the Kigali Amendment the integration of HFC's in the MLF will need to be implemented.</p> |
| ODS/HFC management during the lifetime of equipment | The technicians' certification is done by the technicians' Unions (especially the Refrigeration Union) who together with the ministry of trade, mines and industry and chamber of commerce certify the workshops. In each workshop there must be a certified technician who then acts as supervisor to the employees. The TVTO's, Vocational training centres, provide the training and also certification to individual technicians. |
| ODS/HFC treatment at EOL of equipment | <p>During the NPP project, a total number of 400 recovery units for mobile AC (car mechanics) and 517 units under the refrigeration management plan (service technicians) were distributed between the workshops (between 2004-2009). Efficient use of the tools was hampered by the lack of adequate training and complicated English instruction manuals. Due to lack of recycling centers, all the collected refrigerants remained in workshops and there was a huge number of correspondences to the National Ozone Unit (NOU) finding out what to do with these recovered refrigerants.</p> <p>This project is still opened because there isn't any specific center for destructing and recycling these refrigerants.</p> |

| | |
|---|--|
| Recycling/ Destruction of ODS/HFC containing products | <p>The treatment of ODS/HFC containing products is regulated in the "Instruction for environmental management of electronic waste". This instruction is approved by Ministry of Industry, Mine and Trade with the reference No. of 60/123725-18 in 2015 and it was notified to all stakeholders. Page 5 of this instruction describes "Accurate environmental waste management waste in refrigeration systems". In this part it is clearly mentioned that:¹⁵</p> <ul style="list-style-type: none"> • Refrigerant from the compressor and heat exchanger should be separated and collected by the device and transferred to authorized recycling centers. • Insulating Polyurethane foam of refrigerators should be separated and recycled. Note: In case of inappropriate recycling these materials for elimination should be transferred to landfills which are under the supervision of municipality. • Switches and other components containing HG compounds should be separated and HG recycling should be done as well. • The remaining components like the body of the device, compressors and evacuated exchangers should be torn apart and recycled. • All the plastic, glass and metallic components should be sliced and after separating should be transferred to the land field which are under the supervision of municipality. • All the sliced metals should be separated and transferred to the recycling unit. <p>Due to a lack of appropriate recycling centers, refrigerators are usually landfilled.</p> |
| Technical/ industry standards regarding recycling/ destruction of ODS/ ODS containing products (also HFC)? | <p>None</p> |
| ODS BANK MANAGEMENT ACTIVITIES | |
| Existing activities regarding the collection of ODS/HFC containing equipment | <p>There isn't any kind of collection system for the refrigerators and refrigeration systems in Iran. Waste collection is done in recycling centres which are managed by the municipality. Waste that is not recycled is landfilled. When a refrigerator comes to these centres, only the plastics, electrical parts, metals and wires will be recycled, and the rest will be landfilled. However, this disposal is completely unprofessional, non-specialized and non-Ozone friendly.</p> |
| Existing activities regarding the recycling of ODS/HFC containing equipment | <p>It seems that the rules and regulations is complete and cover all aspects. However, the infrastructure and the implementation is lacking. First steps undertaken by producers to analyse the possibilities of collecting and recycling of domestic refrigerators are underway.</p> |
| Existing activities regarding the destruction of ODS/HFC containing equipment | <p>None</p> |
| Barriers regarding past/new/future ODS bank management activities | <ul style="list-style-type: none"> • There isn't any kind of financial mechanism for recycling in Iran. As before mentioned the responsibility of recycling for special waste is on its producers under the rules and regulations of Iran. Since there is no financial incentive for the recycling process, the manufacturers don't care about this matter as well. • Opening a recycling center is a cornerstone for successful collection. |

4. Solid waste and e-waste

| WASTE GENERAL | |
|---|---|
| Competent authorities | Department of Environment (DOE)/Deputy of Human Environment Affair/Water and Soil Office |
| Informal sector involvement | None |
| Legislation/Regulation/Standards – in force | The Waste Management Law from 2004 contains the definition of waste, waste categories and responsibilities for destruction, Waste is classified in 5 groups: Normal waste, Medical waste, Special waste, Agriculture waste and industrial waste. |
| Legislation/Regulation/Standards – planned | None |
| State of enforcement (responsibilities, control) | The Soil and Water Pollution Office (within the DOE) is the monitoring and supervisory body with municipalities being responsible for the executive management of normal domestic waste. For industrial and special waste, the waste managing responsibility is with the producers. Refrigeration and AC equipment (including domestic refrigerators) is classified as industrial and special waste. |
| Financing of waste management | There is no financial mechanism for recycling in Iran. As mentioned above, it is the producer's responsibility to ensure the recycling of special waste. However, this law is not enforced. |
| Installed waste management infrastructure | Apart from landfills, there are about 4 incineration facilities in Iran. Destruction of chemical and industrial waste is done undertaken by municipalities following terms and regulations assigned by Department of Environment. |
| Existing cement kilns | There are more than 60 cement kilns in the country. Actual cement production is limited do to the embargo. Suitability for ODS destruction needs to be investigated |
| Associations regarding waste | A company, named "Rojan Sanaat-e Alborz", works in the recycling field professionally and at the moment they work in the waste management of persistent organic pollutants (POPs): Dechlorination, dehalogenation, disposal of polluted oil, polychlorinated biphenyl (PCB) and DDT pesticide are some examples of their activities. Polluted oil is first collected from the related centers and exported to the France for destruction (Meeting with Rojan Sanaate Alborz, Mirdamad St, 8-February-16) |
| Existing regulation/legislation dealing with e-waste | "Rules, regulation and executive methods for Electric and electronic waste", prepared by Health, Safety and Environment office, Ministry of industry, Mine and Trade: <ul style="list-style-type: none"> • Chapter 5 "Good environmental waste management on Refrigeration system" • Article 24: Refrigerant gases should be recovered from the domestic and commercial refrigerators and should be handed over to recycling centres. • Article 25: Polyurethane foam should be separated and recycled. <p>NOTE: If it is not possible to recycle materials in correct way, the material should be send to the landfill sites that are under supervision of municipality.</p> |
| Planned regulation/legislation dealing with e-waste | None |
| Activities under EPR schemes | None |
| Association dealing with e-waste | None |

5. Existing projects

| SUBJECT | PROJECTS | RESPONSIBLE ORGANISATION | CONTACT PERSON (NAME, ADDRESS) |
|---------------------------------|---|--|--|
| EPR | | | |
| (E-) waste | | | |
| ODS substitution | ODS Alternative project | UNDP | Karamadan Co. |
| ODS collection/recycling | TA (Technical assistance) refilling of re-usable refrigerant cylinders | Waste is classified in 5 groups: Normal waste, Medical waste, Special waste, Agriculture waste and industrial waste. | |
| ODS substitution | TA at commercial refrigeration companies substituting HCFC R22 with HC R290 | GIZ/UNDP | Initially 15 and additional 35 up to 2026. |
| ODS destruction | | | |
| Other | ODS Banks | GIZ | GIZ office, NOU, DOE |
| | C4 – Cool contributions fighting climate change | GIZ | GIZ office, NOU, DOE |
| | HPMP | GIZ, UNIDO, UNDP, UNEP | NOU, DOE |

6. Stakeholder and relevant actors

| CATEGORY | CONTACT DETAILS (CONTACT PERSON, ADDRESS, EMAIL, PHONE NUMBER) | FUNCTION AND RESPONSIBILITY |
|---|--|---|
| Government/Policy making | Department of Environment (DOE) | Monitoring and supervision of government body on protecting environment. |
| Enforcement of laws | Soil and Water Pollution office, Mrs. Jabbari (Deputy of Soil and Water office), DOE | Focal point and responsible for supervision on implementation of the Basel, Stockholm and Rotterdam conventions in Iran. |
| | Tehran Waste Management Organization (TWMO), Mr. Heidari (Composting unit director), Mr. Azimian (Deputy of TWMO) | Responsible organization for waste land filled in Tehran |
| Focal points/National contact points etc. | National ozone unit, Dr. Hajizadeh, DOE | Responsible for implementing Montreal protocol, HPMP project and ozone layer protection projects |
| | Basel regional office, Dr. Monavari, DOE | This office works with 14 countries members. It is a center that responsible for training, technology transfer and capacity building on Basel convention. |
| | Iran Renewable Energy and Energy Efficiency Organization (SATBA), Mr. Ghalami (Energy efficiency manager), Mr. Tavakoli (Executive manager of optimization projects) | They are doing research and also have some project for reducing energy consumption in country and promote energy efficient electrical appliances. |
| | Iran Climate change office, Dr. Nasser, Mr. Ahadi, Mrs. Maghsoudi | They are responsible for preparing national reports to UNFCCC. This office is financed by UNDP under the GEF project. |
| Associations and Networks for (e-) waste | | |
| Refrigeration, air conditioning and foam association | Tehran Refrigeration Association, Mr. Jamali | |
| | HVAC Manufacturer Association, Mr. Amini | |
| | Tehran HVAC Appliances Retailer Union, Mr. Moetamed | |

| | | |
|--|-----------------------------------|--|
| Industry | Rojan Sanaat-e Alborz co. | Recycling company working with POPs and other hazardous waste |
| | Emersun | Local manufacturer of domestic refrigerators, which signaled interest in a refrigerator destruction facility. Proposal has been submitted to SATBA, but financial support could not be secured until now. The company has been visited by GIZ in December 2017. Domestic refrigerator recycling is an interesting subject for refrigerator producers. As big producers have their own distribution network all around the country, they can easily manage the gathering of the old refrigerators and destruct them in a proper way. It is also interesting for them in financial aspects, as they can sell their new products instead of the old ones to the costumers. |
| | Foam Industry | Technology conversion from HCFC 141b to Pentane and waterblown with total ban entering into force July 2026 |
| | Commercial refrigeration industry | Technology conversion from HCFC R22 to HC R290 in supermarket cabinets |
| International implementing agencies | UNDP | Active in the country regarding HPMP and environmental projects |
| | UNIDO | Active in the country regarding HPMP and environmental projects |
| | UNEP | Active in the country regarding HPMP and environmental projects |
| Informal sector | | |
| Non-governmental organisations NGOs | | |

7. Annex: Reported consumption and emission data

Nation Phase-out Plan (NPP): CFC consumption in ODP tonnes

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | TOTAL |
|-------------------------------|--------------|--------------|--------------|--------------|--------------|-------------|----------|---------------|
| Domestic/Commercial Servicing | 130.0 | 125.0 | 125.0 | 5.0 | 25.0 | 5.0 | - | 475.0 |
| Refrigeration Assembly/Mfg. | 89.8 | 120.8 | 56.1 | - | - | - | - | 266.8 |
| Foam Sector Plan | 120.8 | 118.7 | 140.9 | 127.0 | 68.4 | - | - | 575.8 |
| MAC Sector | 79.0 | 86.0 | 90.0 | 40.0 | 21.0 | 10.0 | - | 326.0 |
| Solvent Sector Plan | 64.8 | - | - | - | - | - | - | 64.8 |
| Total | 484.4 | 450.5 | 412.0 | 172.0 | 114.4 | 15.0 | 0 | 1708.4 |

HPMP: HCFC consumption

| SUBSTANCE | 2004 | | 2006 | | 2008 | |
|--------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|
| | MT | ODP tonnes | MT | ODP tonnes | MT | ODP tonnes |
| 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 |

HPMP: sectors split for HCFC consumption in 2015 in metric tonnes

| | 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 |

HFC data, collected via the HPMP survey (All data in metric tonnes)

| | 2010 R134a | 2011 R134a | 2012 R134a | 2013 R134a | 2014 R134a | 2015 forecast R134a | 2010 R404 | 2011 R404 | 2012 R404 | 2013 R404 | 2014 R404 | 2015 forecast R404 |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------------------|
| Com. Ref. | 188.9 | 184.3 | 200.7 5 | 243.2 5 | 289.7 | 385.9 | 76 | 82.9 | 82.85 | 103.8 5 | 115.3 | 148.5 |
| Com. Ref. (part) | 71 | 71.5 | 92.5 | 114.5 | 146 | 191 | | | | | | |
| | 2010 R407 | 2011 R407 | 2012 R407 | 2013 R407 | 2014 R407 | 2015 forecast R407 | 2010 R410 | 2011 R410 | 2012 R410 | 2013 R410 | 2014 R410 | 2015 forecast R410 |
| Com. Ref. | 9 | 9.5 | 11.2 | 13.5 | 14 | 21 | 1 | 1 | 1 | 1 | 1 | 2 |
| | 2010 R507 | 2011 R507 | 2012 R507 | 2013 R507 | 2014 R507 | 2015 forecast R507 | 2010 R502 | 2011 R502 | 2012 R502 | 2013 R502 | 2014 R502 | 2015 forecast R502 |
| Com. Ref. | 0 | 0.5 | 0.5 | 1 | 1 | 0 | 6.5 | 7.5 | 8 | 8.5 | 9.5 | 11.5 |
| | 2010 R22 | 2011 R22 | 2012 R22 | 2013 R22 | 2014 R22 | 2015 forecast R22 | 2010 R141b | 2011 R141b | 2012 R141b | 2013 R141b | 2014 R141b | 2015 forecast R141b |
| All sectors** | 361 | 357 | 373.2 | 404.3 | 434.2 | 515.3 | 526 | 525 | 535.5 | 592.5 | 630 | 750.5 |
| Dom. Ref. (part) | 5 | 4.5 | 5 | 5.5 | 6 | 8 | 40.5 | 42 | 45 | 59.5 | 75 | 104 |
| DSW*** | 6.5 | 6.5 | 7 | 7.5 | 8 | 10 | 115 | 117 | 124 | 128 | 132 | 160 |

** refers to refrigeration, domestic and commercial sectors *** Discontinuous sandwich panels

8. Annex: ODS legislation/regulations

The Islamic Republic of Iran initiated policy measures for ODS phase-out as part of the original Country Programme (CP) in 1992 with the establishment of the NOU. Since then, comprehensive policy and regulatory frameworks covering institutional, regulatory, fiscal, and legislative actions have been established. Ratification of the Conventions, Protocols and their amendments in the 1990s created a comprehensive framework to encompass future laws related to Montreal Protocol decisions. Subsequently, new ODS rules and regulations were introduced on the basis of the existing laws in Islamic Republic of Iran, namely: (i) Article 50 of the constitutional Law on Protection of Environment; (ii) Import and Export Regulation Act, 1993; (iii) Environmental Protection and Enhancement Act, 1974; (iv) Plant Protection Act, 1967; (v) Air Pollution Act, 1994; and (vi) Economic, Social and Cultural Development Plan, by issuance of directives. In this regard, directives have been issued since 2004 on ODS controls and monitoring requirement.

Comprehensive Legislation Plan (CLP): Establishment of the CLP in 2004 was a major milestone for ODS phase-out, as it facilitated issuance of additional regulations and directives. The NOU is responsible for implementation of CLP, monitors the progress of the activities against schedules, and ensures that enforcement of approved legislations is in accordance with National Acts and Laws that define enforcement.

The following rules were issued under CLP to limit import and consumption of ODS (including HCFCs): Licensing 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, the 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 2013, NOU has collected information on consumption of ODSs from Custom Department and Ministry of Industry, Mine and Trade for the year and this data has been reported to the Ozone Secretariat under Article 7 data reporting requirements. The NOU continues follow-up for data collection and analysis in 2014 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 total HCFC imports quotas for the year 2014 were subject to a maximum of 4451 Tons. Against this, the actual quantities of HCFCs imported were 4443 MT. The total import quota for the year 2015 was 4204 Tons. The actual quantity of imports against this was about 4203 Tons. This was verified through an independent agency as per the HPMP Agreement requirement and the verification report is submitted with this report.

Iran follows the quota implementation cycle running from January to December each year. The quota for each year is decided by the National Ozone Committee or its subcommittee which consists of representatives from different relevant bodies including the 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 the coming years and the

protocol schedules applicable to the Islamic Republic of Iran. During the month of December of the year, consultations to determine individual quota allocation are held. The specified amount is communicated to relevant organizations and ministries prior to the beginning of subsequent year. Around July/August, the NOU and the National Ozone Committee assess the quota issued against the actual import already taken place to see if any reassessment of the quota is necessary.

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 Department. These forms are periodically submitted through the Ministry of Industry, Mine and Trade and Custom Department to the NOU to ensure that the country's compliance with the allocated quota. The strict control is in place through coordinated actions by the NOU and the above mentioned organizations. Further activities will be discussed during the next coordination meeting especially with regard to imports of equipment containing or designed for the use of HCFC.

HS Codes: The HS codes are included in the Import and Export Book of Regulation (Annex 2) and the codes are used for assigning import license for individual HCFCs to importers. The codes are used by HCFCs importers when submitting their application for import to the Ministry of Industry, Mine and Trade.

Screening of import applications: Since 2014, the NOU has intensified their effort to screen import permit applications pre-shipment through the platform of informal Prior Informed Consent (iPIC). A number of bilateral queries took place between the Iran NOU and exporting country's authority such as China ODS Import and Export Management Office to verify soundness of imports to curb risk of unauthorized import.

In line with decision 63/17, the Government of the 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.

Prohibition of expansion of HCFC based equipment manufacturing capacity/ new capacity establishment: 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.

Fiscal Incentives and Disincentives: The following fiscal measures were established for HCFC phase-out. Some of the measures are extensions of the existing ODS phase-out measures adopted in the Islamic Republic of Iran.

Enterprises that convert to non-ODS technology are exempt from import duties for import of capital equipment.

The commercial benefits tax on import of non-ODS compressors was decreased to promote its usage.

Labelling Requirements: The following labelling requirements are under implementation in the country. Manufacturers of products that contain ODS are required to affix labels on their products clearly indicating the scientific and commercial name of the substances and the text "Ozone Depleting Substances". Furthermore all manufacturers that have converted their technology to non-ODS.

All manufacturers that have converted their technology to non-ODS must put a label on their products to clearly show the scientific and commercial name of the substances and the text “Ozone Friendly Product”.

For all RAC and ICR products, a strict labelling was introduced in 2016 to include the type and quantity of refrigerant according to national and/or international standards. Foams using HCFC require labelling indicating the type of blowing agent used in order to facilitate the monitoring of the converted and non-converted companies.

Others

The 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.

9. Annex Climate regions Iran

| Climate zone | Average maximum temperature in summer in °C | Average relative humidity in summer % | Average minimum temperature in winter in °C | Average relative humidity in winter % | Sample city / Province |
|--|---|---------------------------------------|---|---------------------------------------|--------------------------|
| Very cold | 25-30 | 45-55 | -5 to -10 | 65-75 | Sarab / East Azerbaijan |
| Cold | 35-40 | 25-40 | -5 to -10 | 65-75 | Tabriz / East Azerbaijan |
| Rainy mild (Moderate and rainy) | 25-30 | More than 60 | 0-5 | More than 60 | Rahst / Gilan |
| Semi-humid (Semi-Moderate) | 30-35 | More than 50 | 0-5 | More than 60 | Moghan / Ardebil |
| Semi-arid | 35-40 | 20-45 | 0-5 | 40-60 | Tehran / Tehran |
| Hot and dry | 35-45 | 15-20 | 0-5 | 35-50 | Zahedan / Zahedan |
| Very hot and dry | 45-50 | 20-30 | 5-10 | 60-70 | Ahvaz / Khuzestan |
| Very hot and humid | 35-40 | More than 60 | 10-20 | More than 60 | Bandar Abbas / Hormozgan |

5 Annex II: Gap analysis

The colour shading indicates progress and implementation status in the country (traffic light scheme).

Green means "fairly progressed", yellow is "intermediate", red indicates deficiencies/action needed.

5.1 Functioning policy framework

| MILESTONE | CURRENT STATE | FURTHER ACTIVITIES NEEDED |
|---|--|--|
| ODS/HFC venting prohibited | There is no venting ban on ODS/HFC | Establish venting ban |
| Regulation about ODS/HFC management during the lifetime of equipment (proper servicing without leakage) | Training is carried out by Unions. Each workshop must employ one certified technician. | Overall the regulation and training concept needs to be revised as there isn't a guarantee that the operators in the field are trained. |
| ODS/HFC treatment at decommissioning of equipment (proper servicing at decommissioning without leakage) | No formal policy requirements for the treatment of used ODS or HFC. Recovery units were distributed during NPP (2004–2009), but there are no recycling centres to collect recovered amounts. Recovered amounts unknown. | There is only policy on the recycling of domestic refrigerators. A policy is needed for all refrigerants as well recycling policy to promote private recycling companies. |
| Mandatory certification of technicians | Each workshop has to employ one certified technician otherwise the licence is not provided. | |
| Development of technical standards: <ul style="list-style-type: none"> • Best servicing, operation and installation practices • Introduction of sealed system design characteristics • Containment/reduction of ODS emissions from existing equipment and decommissioned equipment | <p>"Rules, regulation and executive methods for Electric and electronic waste", prepared by Health, Safety and Environment office, Ministry of industry, Mine and Trade:</p> <ul style="list-style-type: none"> • Chapter 5 "Good environmental waste management on Refrigeration system". • Article 24: Refrigerant gases should be recovered from the domestic and commercial refrigerators and should be handed over to recycling centres. • Article 25: Polyurethane foam should be separated and recycled. <p>Note: If it is not possible to recycle materials in correct way, the material should be send to the landfill sites that are under supervision of municipality.</p> | <p>Establish a functional infrastructure to enable proper collection and recycling. Next steps include:</p> <ul style="list-style-type: none"> • Establishment of guidelines later to be converted into standards and regulations for ban of one-way gas cylinders • Ban of one-way cylinders, <p>A scheme with domestic refrigerator producers should be setup for collection and destruction of decommissioned refrigerators. Involvement of local producers and country wide collection scheme including the retail sector.</p> |
| Monitoring scheme of recovered ODS <ul style="list-style-type: none"> • Consumer (commercial and industrial end-user) • Technicians (servicing, decommissioning) • Recycling, reclaim, destruction | Not existing | Possibly involve regional DOEs to monitor new, reused and collected amounts of refrigerants |

| MILESTONE | CURRENT STATE | FURTHER ACTIVITIES NEEDED |
|---|---|---|
| WEEE regulation with take-back obligations of ODS/HFC containing equipment | RAC equipment is classified as special waste and as such, the producers are responsible for proper treatment. However, there is no enforcement. | Establish functional Extended Producer Responsibility (EPR) Scheme to organize (and pay for) the collection of residential fridges and ACs. |
| Assess implementation of further policy measures <ul style="list-style-type: none"> Information campaign GWP-weighted taxes on refrigerants Rebate system refrigerants Incentives for end-users Voluntary industry agreement | HPMP contains provisions for re-useable HCFC refrigerant cylinders. | Extend this activity to HFC's and in general to all refrigerants existing and future. Include recycling and/or destruction of the collected refrigerants. |
| Enforcement of existing regulation | Lack of enforcement | |

5.2 Existing sustainable financing mechanism

| MILESTONE | CURRENT STATE | FURTHER ACTIVITIES NEEDED |
|--|--|---|
| Sustainable financing mechanisms are established for the RAC sectors: <ul style="list-style-type: none"> EPR scheme is established for the appliance sector/end-user of large systems are obliged to pay for the recovery and management of ODS Import tax/levy are introduced Advanced disposal fee in place Carbon dioxide allowance auction revenues are used for financing | No financing mechanisms established. | To develop concept for an EPR: <ul style="list-style-type: none"> Identify stakeholders Set up financing scheme Technical support in design of decommissioning plant for recycling of domestic refrigerators |
| International/multilateral or national climate financing programmes are used for ODS bank management <ul style="list-style-type: none"> MLF National climate programmes such as ICI GCF GEF World Bank | | |
| Elimination of electricity incentives for end-user | Energy cost is heavily subsidized from the production side as oil is purchased at reduced costs as well as from the end-user side, who are supported in accordance with the actual consumption. The funds to maintain the system could be used better in supporting more energy efficient home appliance and improve housing insulation. | Redesign of incentive program to truly promote the use of energy-efficient appliances. |
| Voluntary carbon market | | |

5.3 Established collection infrastructure

| MILESTONE | CURRENT STATE | FURTHER ACTIVITIES NEEDED |
|--|---|---|
| A sufficient infrastructure for the collection of recovered ODS is in place with sufficient financial support from the MLF | Recovery units distributed during NPP (2004–2009), but no recycling centres to collect recovered amounts. Recovered amounts unknown. | Revamp and integrate the past activities with proper recycling collection scheme. |
| Appropriate policy framework is in place, requiring collection and financing mechanisms of WEEE containing ODS → for more details see also “Functioning policy framework” | There is a provision that the producer is responsible for recycling, but no implementation or enforcement because of not having financial incentives (yet). | |
| An appropriate steering structure is in place (for WEEE appliance sector) including a leading government entity, a technical advisory group together with a well-defined stakeholder process | Was established for other GIZ-Activities in Iran, it is foreseen to extend it with additional stakeholder for ODS Banks as well. | |
| Existing sector study and sector plan, considering for example: <ul style="list-style-type: none"> • Available waste stream (inventory) • Infrastructure and technology for ODS management • Economic feasibility • Responsibilities of reverse logistic systems • Co-benefits (for WEEE appliance sector) | Inventory completed | |
| Development of steering structure for ODS bank management in general | Set up in progress | |
| Installing collection points for recovered ODS (part of sector plan) (non-appliance sector) | No collection points | |
| Monitoring of ODS/HFC substances flow (appliance and non-appliance sector) | No monitoring | |
| Capacity building and awareness raising for technicians and end-users dealing with RAC equipment containing ODS, but also for ministerial departments/third parties being responsible for monitoring the flow of WEEE: <ul style="list-style-type: none"> • Seminar/training/workshop • Helpdesk • Seminars • News/radio/TV • Brochures/flyers etc. | Training was/is undertaken | |

| MILESTONE | CURRENT STATE | FURTHER ACTIVITIES NEEDED |
|---|---------------|---------------------------|
| Initiatives for the transition from informal to formal waste management (e.g. WEEE manager/scrap collectors), including RAC technicians | None | |
| Indirect or direct incentives are in place to increase the recovery of ODS/collection rates of WEEE containing ODS | None | |
| In case a sector plan is established, endorsement and monitoring are taking place | None | |

5.4 Established recycling and destruction infrastructure

| MILESTONE | CURRENT STATE | FURTHER ACTIVITIES NEEDED |
|--|--|---|
| Assessment of amount available for management (inventory) | No plans for such an assessment | Inventory is carried out under this project |
| Assess available facilities in the country <ul style="list-style-type: none"> • Reclaim • Dedicated destruction facility • Rotary kiln • Cement kiln • Municipal waste incineration • Cracking | <p>Assessment was undertaken during research under this project.</p> <p>There is currently no reclaim facility or any other recycling or destruction facility.</p> <p>As part of the HPMP, the company Rohan Gas is likely to receive a facility for refilling refrigerant cylinders and reclaim the received refrigerant.</p> <p>There are 60 cement kilns in the country, which could potentially serve as destruction facilities.</p> | |
| Assess local policy regarding export <ul style="list-style-type: none"> • Member of Basel Convention? • Contact local focal point of Basel Convention Check local definition of hazardous waste | Member of Basel Convention | |
| Costs assessment <ul style="list-style-type: none"> • Organisation/management • Equipment • Recycling/local destruction/export | No plans for such an assessment | |
| Assess financing options for most cost effective and sustainable solution → see sustainable financing mechanism | No plans for such an assessment | |
| Implement facility or initiate export | No plans | |



Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn

Friedrich-Ebert-Allee 36 + 40
53113 Bonn, Germany
T +49 228 44 60-0
F +49 228 44 60-17 66

Dag-Hammarskjöld-Weg 1 - 5
65760 Eschborn, Germany
T +49 61 96 79-0
F +49 61 96 79-11 15

E info@giz.de
I www.giz.de