


# **MALAYSIA HCFC PHASE-OUT MANAGEMENT PLAN (HPMP STAGE-2) (2017-2022)**

**Prepared by  
Department of Environment Malaysia  
and  
United Nations Development Programme**



# MALAYSIA HCFC PHASE-OUT MANAGEMENT PLAN (HPMP) STAGE-II FOR COMPLIANCE WITH POST 2015 CONTROL TARGETS FOR ANNEX-C, GROUP-I SUBSTANCES



Prepared Jointly by :

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## EXECUTIVE SUMMARY

Malaysia acceded to the Vienna Convention and ratified the Montreal Protocol on Substances that deplete the Ozone Layer in August 1989. As of October 2001, Malaysia has ratified all the amendments to the Montreal Protocol. Malaysia was classified as a party operating under Paragraph-1, Article-5 of the Montreal Protocol and thus qualified for technical and financial assistance, including transfer of technology, through the financial mechanism of the Montreal Protocol.

Malaysia's Country Programme incorporating the National Strategy and Action Plan for controlling the use of Ozone Depleting substances was approved 1992. Since then, Malaysia has taken proactive measures such as phase-out project activities including technology transfer investments, technical assistance, training and capacity-building, information dissemination and awareness-raising and regulations. Malaysia has established a comprehensive regulatory framework for controlling ODS. As a result, Malaysia has consistently been in compliance with the provisions of the Montreal Protocol.

Hydrochlorofluorocarbons (HCFCs) are classified as controlled substances under Annex-C Group-I of the Montreal Protocol and are subject to the adjusted control schedule for Article-5 countries. As of date, Malaysia has largely completed implementation of HPMP Stage-I project activities that contributed to a consumption reduction of 111.85 ODP tons.

HCFCs are used in Malaysia in various industry sectors, such as Air Conditioning, Refrigeration, Foams, Firefighting and Solvents. The predominant HCFC used is HCFC-22 mainly in the Refrigeration and Air Conditioning Sectors. HCFC consumption in Malaysia decreased from 7,700 MT in 2009 to 6,571.22 MT in 2015. While the consumption has grown during the period 2011 – 2012, due to HPMP control measures and other market factors relating to technology choices by industry, growth in consumption of HCFCs decreased during the period 2013 to 2015. Through implementation of HPMP Stage-I projects in foam sector, systems houses and service sector, the Government of Malaysia has achieved their 2013 and 2015 targets.

In order to achieve post 2015 targets, the Government of Malaysia needs to take steps in achieving phase-out of remaining consumption in manufacturing of HCFC based products and servicing HCFC based RAC equipment. The key international trends relating to HCFC-141b supply reduction and HCFC free alternative technologies need to be taken into consideration while defining plans for achieving post 2015 targets. It must also be noted that in residential air-conditioning applications, the consumption of HCFCs are driven mainly by enterprises owned by non-A5 countries. Their phase-out plans also needs to form an integral part of HPMP project activities.

The main constraints for transitioning from HCFCs to alternative environment-friendly substitutes that are cost-effective particularly for SMEs. A careful assessment of long term availability and sustainability of the substitutes needs to be made for providing industry policy and technical guidance.

As in case of Stage-I, adequate technical and financial assistance would be one of the inputs needed to minimize the burden of transition on consumers and industry. Also, adequate institutional support will be needed to ensure that awareness of the targets among consumers.





# UNITED NATIONS DEVELOPMENT PROGRAMME PROJECT DOCUMENT MALAYSIA



Empowered lives,  
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<b>Project Title :</b> HCFC Phase-out Management Plan (HPMP) Stage-II for compliance with post 2015 control targets for Annex-C, Group-I substances		
<b>Country :</b> Malaysia	<b>Implementing Partner :</b> Department of Environment, Ministry of Natural Resources and Environment (MNRE)	<b>Management Arrangements :</b> National Implementation Modality (NIM)
<p><b>UNDAF/Country Programme Outcome :</b></p> <p>As Malaysia does not have a United Nations Development Assistance Framework, UNDP's framework is based on activities that directly supports the achievement of national priorities as laid out in the 11<sup>th</sup> Malaysia Plan and in line with the <i>national transformation policy, government transformation programme, economic transformation programme, rural transformation programme, and political transformation programme</i>.</p> <p>Expected Country Programme outcome- Priority 2 on Sustainable and Resilient Development: Implementation of a national development agenda that enables green growth through climate-resilient measures, sustainable management of energy and natural resources, and improved risk governance.</p>		
<p><b>UNDP Strategic Plan Output :</b></p> <p><b>Output 1.4</b> Scaled up action on climate change adaptation and mitigation across sectors which is funded and implemented.</p>		
<b>UNDP Social and Environmental Screening Category :</b> Low		<b>UNDP Gender Marker :</b> 1
<b>Atlas Project ID/Award ID number :</b> 00098730		<b>Atlas Output ID/Project ID number :</b> 00101950
<b>Planned start date :</b> 31 July 2017		<b>Planned end date :</b> 31 December 2021
<b>LPAC date :</b> 6 June 2017		
<p><b>Brief project description :</b></p> <p>Malaysia's HCFC Phase-out Management Plan (HPMP Stage-II) comprises of a combination of interventions such as technology transfer investments, policies and regulations, technical assistance, training, awareness and communications and management, coordination and monitoring in various HCFC consuming sectors, to be implemented from 2017 to 2021. This plan builds on activities completed in HPMP Stage-I.</p> <p>Expected Outcome: Upon successful completion, the plan will result in net sustainable reductions of minimum 146.24 ODP tonnes (2,049.54 MT) in the national HCFC consumption by 1 January 2022, contributing to Malaysia's compliance with the post 2015 control targets for HCFCs.</p>		
<b>FINANCING PLAN</b>		
Montreal Protocol		USD 6,138,063
Cost-Sharing (Cash)		N/A
Government (In-kind)		USD 300,000
<b>TOTAL RESOURCES</b>		<b>USD 6,438,063</b>

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## ACRONYMS AND ABBREVIATION

APR	Annual Progress Report
AWP	Annual Work Plan
AP systems	Approved Permit System
AC	Air-Conditioning
ATC	Authorised Training Centres
CTC	Carbon Tetrachloride
CE	Cost Effectiveness
CDR	Combined Delivery Report
CFC	Chlorofluorocarbon
CPAP	Country Programme Action Plan
DOE	Department of Environment
EPU	Economic Planning Unit
GWP	Global warming potential
HCFC	Hydrochlorofluorocarbon
HPMP	HCFC Phase-out Management Plan
IOCs	Incremental Operating Costs
ICCs	Incremental Capital Costs
iPIC	Informal Prior Informed Consent
MNRE	Ministry of Natural Resources and Environment
MITI	Ministry of International Trade and Industry
MLF	Multilateral Fund for the Implementation of the Montreal Protocol
MP	Montreal Protocol
MOP	Meeting of the Parties
NOU	National Ozone Unit
NSE	National Steering Committee
NIM	National Implementation Modality
NFP	National Focal Point
NPD	National Project Director
ODS	Ozone Depleting Substances
ODP	Ozone Depleting Potential
OPU	Ozone Protection Unit
OAI	Office of Audit and Investigations
PU	Polyurethane
PSE	Project Steering Committee
PMU	Project Management Unit
RAC	Refrigeration and Air-Conditioning
SMEs	Small and Medium Enterprises
TA	Technical Assistance
TWG	Technical Working Group
UNDP	United Nations Development Program



# SITUATION ANALYSIS





# I. SITUATION ANALYSIS

## 1. BACKGROUND

Malaysia is an upper-middle income country with a population of approximately 31.7 million (2016) and an area of approximately 330,803 km<sup>2</sup>.

As a country that is subjected to monsoon seasons, it is vulnerable to the changes in rainfall variability and intensity and in weather patterns. In recent years, Malaysia has been especially prone to increased climate hazards such as urban flooding and droughts. Malaysia has also been experiencing the adverse effects of climate change which include impacts on water resources, agriculture, forest resources, coastal and marine areas, energy and public health.

Malaysia has been an active player in the International Environmental Agreement and acceded to the Vienna Convention and ratified the Montreal Protocol on Substances that Deplete the Ozone Layer in August 1989. Table 1-1 shows the dates of ratification by Malaysia of the Protocol and its amendments:

**Table 1-1: Dates of Ratification of Montreal Protocol and its Amendments**

AGREEMENT	RATIFICATION
Vienna Convention	29 August 1989
Montreal Protocol	29 August 1989
London Amendment	16 June 1993
Copenhagen Amendment	05 August 1993
Montreal Amendment	26 October 2001
Beijing Amendment	26 October 2001

Source : Ozone Secretariat

Malaysia is classified as a party operating under Paragraph-1, Article-5 of the Montreal Protocol and thus qualified for technical and financial assistance, including technology transfer, through the financial mechanism of the Montreal Protocol.

Malaysia's Country Programme incorporating the National Strategy and Action Plan for controlling the use of Ozone Depleting Substances was approved in 1992. Since then, Malaysia has taken proactive measures such as phase-out activities including technology transfer investments, technical assistance, training and capacity-building, information dissemination and awareness-raising and development and implementation of regulations. Malaysia has established a comprehensive regulatory framework for controlling ozone depleting substances (ODS). As a result, Malaysia has consistently been in compliance with the provisions of the Montreal Protocol. Hydrochlorofluorocarbons (HCFCs) are classified as controlled substances under Annex-C Group-I of the Montreal Protocol and are subject to the adjusted control schedule for Article-5 countries.

### 1.1 HPMP Stage-I of Malaysia

Malaysia implemented HPMP Stage-I during 2012-2016 and has largely completed HPMP Stage-I activities that contributed to a consumption reduction of 111.85 ODP tonnes of HCFCs. These activities helped the country achieve their HCFC consumption reduction target in year 2015. The main achievements of HPMP Stage-I of Malaysia are :

#### ***Legal Framework :***

- The licensing and quota system for HCFC import was established by the Department of Environment (DOE) and was enhanced in 2014 by adding the licensing of HCFC re-exports.
- Three hundred thirty-one (331) customs officers were trained with 60 to 80 continue to receive training annually and 15 refrigerant identifiers were purchased and distributed.

#### ***Foam Manufacturing Sector :***

- Thirteen (13) Poly Urethane (PU) foam manufacturers included in HPMP stage I had completed their conversions to cyclopentane, resulting in the phase-out of 860 MT (94.6 ODP tonnes) of HCFC-141b. Through the technical assistance (TA) programme four local systems houses had customized at least one low-GWP formulation and shared their experiences with downstream clients.

#### ***Refrigeration Servicing Sector :***

- A total of 8,430 technicians have been trained to date. In addition, 82 trainers were certified as Master Trainers; a training manual for technicians in the refrigeration and air-conditioning (RAC) sector was developed and distributed; the technicians' certification programme was updated and a mandatory online certification programme for technicians using controlled refrigerants launched during the Ozone Day celebration on 29 September 2016; 30 recovery units and service tools were procured and distributed to 30 selected Authorised Training Centres (ATC); and six mini-reclaim units for reclaim centres are in the process of being procured with delivery expected by the end of 2017.
- The pilot project to replace 82 small-size HCFC-22 based air-conditioning (AC) units by HFC-32 based units has been completed at two demonstration sites (University Kuala Lumpur and the Environmental Institute of Malaysia).

#### ***Project Implementation and Monitoring Unit***

- The management, co-ordination and monitoring of the activities planned under the HPMP is undertaken with the overall supervision of the National Ozone Unit (NOU).

As part of the implementation plan for the fourth tranche of the HPMP Stage-I, the following activities will be implemented :

- Finalisation of refrigerant management regulations by the Attorney General's office;
- A training session for approximately 40 customs officers on the use of refrigerant



identifiers, agreements with HCFC exporting countries and informal prior informed consent (iPIC) system, labelling standards and practices, HC codes, harmonization of databases of refrigerants and blends, nomenclature of refrigerants and categories of refrigeration and air-conditioning equipment;

- Training workshops on good refrigeration practices for approximately 400 technicians; 10 refrigerant identifier units will be procured and provided to DOE training centres and selected ATCs; the signing of a Memorandum of Understanding between the 6 reclaim centres and DOE, and delivery of mini-reclaim units to the centres;
- Activities in refrigeration management, including the completion of the ongoing pilot incentive programme to introduce CO<sub>2</sub>-based systems in the industrial and commercial refrigeration sector;
- Completion of the CO<sub>2</sub> demonstration project; and
- Co-ordination and management of the HPMP.

## 1.2 HCFC Survey in Malaysia for HPMP Stage-II

Taken into account the complexities associated with technology choices of conversion in RAC and foam sectors and the need for addressing Small and Medium Enterprises (SMEs) under the HPMP Stage-II, detailed stakeholder consultations were held during 2014 and 2015 with the relevant ministries and industries. Through a national consultant team, field survey on HCFC consumption was undertaken in 2015 and early 2016. The data collected was analysed, and an overall approach for post 2015 targets was developed. This was discussed with various stakeholders for their inputs and suggestions in May 2016.

## 2. HCFC SUPPLY SCENARIO

### 2.1 Production, Import, Export and Distribution

There is no production of HCFCs in Malaysia. The entire domestic demand is met through imports mainly from China, India, Republic of Korea, Singapore and USA. Small amount of HCFCs are also re-exported by the country. Import and export of HCFCs are regulated in Malaysia through a licensing and permit system. HCFC-141b, HCFC-22 and HCFC-123 are the main HCFCs imported. HCFC-22 and HCFC-123 are consumed in manufacturing and servicing of RAC equipment, whereas HCFC-141b is used primarily as blowing agent in foam sector.

HCFCs are sold by the importers to manufacturers or users directly or indirectly through secondary distributors or retailers. HCFCs are also supplied through service establishments and contractors. Larger manufacturers also import HCFCs directly through the licensing and permit system.

### 2.2 Historical HCFC Consumption (2011-2015)

The HCFC consumption in Malaysia in 2009 was 7,700 MT. As of 2015, the consumption of HCFCs was 6,571 MT.

Over the period up to 2015, consumption of HCFCs has largely decreased except for a small growth in HCFC-123. It must be noted that this growth in HCFC-123 has minimum impact on national HCFC consumption targets in the country. The consumption of HCFC-22 and HCFC-141b has seen a declining trend. The main reasons for this decline are :

- National regulations and consumption control measures implemented by the National Ozone Unit (NOU) for HCFCs to achieve compliance with HCFC consumption targets;
- Phase-out projects that have been implemented in foam sector for phasing-out HCFC-141b consumption; and
- Inflow of imported HCFC free RAC equipment that contributed to reduced dependence on HCFC-based equipment in the country.

It must also be noted that HFC consumption levels would have increased in the last 3-4 years in Malaysia. This is mainly because of increase in manufacturing and demand of HFC using equipment in RAC sector. Table 1-3 shows the consumption of HCFCs in Malaysia over the last 5 years.

**Table I 2: HCFC Consumption in Malaysia (2011-2015 Article 7 Data)**

HCFC	2011	2012	2013	2014	2015	BASELINE
METRIC TONNES (MT)						
HCFC-22	6,167.26	7,635.02	5,355.20	5,913.75	5,425.18	6,355.19
HCFC-21	0.00	0.00	0.00	0.00	0.00	18.60
HCFC-121	0.17	0.00	0.00	0.00	0.00	0.00
HCFC-123	33.70	64.29	14.95	72.93	65.48	56.65
HCFC-141	80.0	0.00	0.00	0.00	0.00	13.38
HCFC-141b	1,242.06	2,869.16	1,321.08	1,239.97	1,079.04	1,477.61
HCFC-142b	1.80	0.00	86.74	4.47	0.00	12.10
HCFC-225	1.08	1.18	0.58	0.00	1.52	1.11
<b>Total (MT)</b>	<b>7,526.07</b>	<b>10,569.65</b>	<b>6,778.55</b>	<b>7,231.12</b>	<b>6,571.22</b>	<b>7,934.74</b>
<b>ODP tonnes</b>						
HCFC-22	339.20	419.93	294.54	325.26	298.38	349.54
HCFC-21	0.00	0.00	0.00	0.00	0.00	0.74
HCFC-121	0.01	0.00	0.00	0.00	0.00	0.00
HCFC-123	0.67	1.29	0.30	1.46	1.31	1.13
HCFC-141	5.60	0.00	0.00	0.00	0.00	0.94
HCFC-141b	136.63	315.61	145.32	136.40	118.69	162.54
HCFC-142b	0.12	0.00	5.64	0.29	0.00	0.79
HCFC-225	0.08	0.08	0.04	0.00	0.11	0.08
<b>Total (ODP tonnes)</b>	<b>482.30</b>	<b>736.90</b>	<b>445.83</b>	<b>463.40</b>	<b>418.50</b>	<b>515.76</b>

Source: A7 data report



### 3. SECTORS USING HCFCs

Historically, Malaysia has had a robust industrial and manufacturing base in various sectors from petrochemicals to consumer goods. The main HCFC consuming sectors also are largely consistent with this trend and have a diverse manufacturing base in Malaysia. The consumption of HCFCs in Malaysia has been seen in the following sectors/sub-sectors and application areas :

- Air-conditioning sector (both manufacturing and servicing)
- Refrigeration sector (both manufacturing and servicing)
- Foam sector
- Fire-fighting sector
- Solvents sector

#### 3.1 Air Conditioning Sector

##### 3.1.1 Manufacturing

Among the enterprises active under the AC sector only two companies are wholly Malaysian owned. All the enterprises engage in the sector have their operations in the State of Selangor and only one located in the State of Negri Sembilan. There are no manufacturers in both the States of Sabah and Sarawak.

Various types of air-conditioners are produced in Malaysia and these include units for residential, commercial and industrial applications. Products include air-cooled split units, air and water-cooled packaged units, DX and flooded chillers and heat pumps.

Based on the survey response, and estimates of HCFC consumption for 2015, the estimated total annual production by the 12 manufacturers was about 1.2 million units. The total production in the country not only caters the demand of domestic market, but also serves the overseas which include USA and Australia. The residential air-conditioners accounts for about 90 per cent of total production.

HCFC-22 and HCFC-123 are the two types of HCFCs used in the AC sector of Malaysia. Of all manufacturers, only one company is using HCFC-123 for large capacity installations. Consumption of HCFCs for the last two years is shown in the table below.

**Table I-3: Dates of Ratification of Montreal Protocol and its Amendments**

HCFC TYPE	CONSUMPTION (MT)			CONSUMPTION IN ODP TONNE (2015)
	2013	2013	2013	
HCFC-22	1,399.9	1,200.60	1,056.30	58.10
HCFC-123	39.0	53.00	34.60	0.69

### 3.1.2 Imports

The imports of air conditioning equipment in Malaysia is mainly of air-cooled split and packaged units, of which split room air-conditioners up to 2.5 HP rating constitute the bulk of the imports. There are about twenty importers, of which about ten are large-sized. In 2015, about 358,000 units were estimated to be imported to Malaysia, mainly from China, Japan and US, predominantly HCFC-22 based. The imported air-conditioners are fully or partially charged with refrigerants. During installation of these split air-conditioners, additional top-up charge is needed and this is estimated to be 229 MT in the year 2015.

### 3.1.3 Exports

Malaysia is a significant export hub for air conditioning equipment in the region, particularly for air-cooled split and packaged air-conditioners. Between 60-70 per cent of the production is exported. Estimated total exports in 2015 are between 717,000-836,000 units and these primarily include air-cooled split and packaged units.

### 3.1.4 Servicing

The estimated population of HCFC-based equipment in the air conditioning sector in 2015 was about 8 million units and HCFC-22 and HCFC-123 were the main substances used for servicing in this sector. The estimated HCFC consumption in servicing in this sector in 2015 was about 4,000 metric tonnes. Due to the steady economic development, market penetration of air conditioning equipment would continue to grow in Malaysia and thus consumption in AC sector is expected to grow in the next two to three years.

## 3.2 Refrigeration Sector

The application of HCFCs in the refrigeration sector has been observed in commercial and industrial applications. The refrigeration sector performs a critical function of serving the cold chain in Malaysia. Due to expanding market for food service equipment, the quality and sophistication of the manufacturing technology has gradually improved over the years. The sector also experiences competition from imported products and equipment, testifying to the significant market potential.

### 3.2.1 Manufacturing

The commercial refrigeration sub-sector comprises of vending machines, bottle coolers, water-coolers, chest freezers, etc. used in restaurants and other food service establishments. The Cold Chain refrigeration sub-sector comprises of supermarket refrigeration equipment (such as display cabinets, island freezers, walk-in coolers and freezers), cold storages and warehouses. R-404A and R-507 are mainly used in low-temperature applications. Ammonia is used in some applications and HCFC-22 is used in medium temperature applications.

In the refrigeration sector, there are 16 enterprises engaged in manufacturing of commercial refrigeration equipment. Of the 16 enterprises in the sector, 9 use HCFC-22 as refrigerant (with an average 2013-2015 consumption of 5.4 MT) and HCFC-141b as a foam blowing agent (with an average 2013-2015 consumption of 45.37 MT).

It must be noted here that HFC based technologies are popular in Malaysia in refrigeration sector (e.g., HFC-134a, R-404A). These enterprises consume both HCFCs and HFCs depending upon the customer needs.

### 3.2.2 Imports and Exports

Import-export of HCFC based refrigeration equipment from Malaysia is negligible.

### 3.2.3 Servicing

While in the past, the servicing demand for HCFC-22 was growing due the rapidly increasing population of commercial refrigeration equipment, the growth is expected to decrease in future. This is mainly because of the increase in HFC consumption in commercial refrigeration equipment and possibly, other lower GWP refrigerant based equipment. The estimated HCFC consumption in servicing is about 50 MT.

## 3.3 Foam Sector

### 3.3.1 Polyurethane Foam

Polyurethane foams for various applications are manufactured in Malaysia. The sector has experienced steady growth in recent years primarily driven by the economic development and increase in purchasing power of the population, and growth in the construction and cold chain industry.

HCFC-141b is still the predominant blowing agent used in foam applications. It is used either as pure HCFC-141b or pre-blended in polyols supplied by the polyurethane chemical suppliers. There is no local production of HCFC-141b and therefore the entire requirement is met through imports by registered chemical suppliers or systems houses. HCFC-141b as a part of pre-blended polyols are also exported to neighbouring countries such as Vietnam. Of total import of 1,079.04 MT (118.69 ODP tonnes) of HCFC-141b in 2015, 712.47 MT (78.37 ODP tonnes) was consumed in the PU foam sector and 8.5 MT (0.94 ODP tonnes) in the solvent sector. The rest 358 MT (39.4 ODP tonnes) contained in pre-blended polyol was exported to Vietnam.

There are seven systems houses in the country, namely, BASF, Colorex, Cosmo, Dow, Maskimi, PPT and Oriken, which have facilities for blending and customization of HCFC-141b polyols in Malaysia.



Polyurethane foam processing equipment is not manufactured locally. There are four main polyurethane foam processing equipment suppliers in Malaysia and these are- Cannon, OMS, RIM Polymers and SAIP. Other global suppliers are represented through their respective corporate representations. Consumption of the HCFC-141b over the period 2013 to 2015 for different foam applications is shown in Table 1-5.

**Table I-4: HCFC-141b Consumption by Applications (2013-2015)**

FOAM GROUP (no. of enterprises)	CHEMICAL CONSUMPTION (Blowing Agent: HCFC-141B) (MT)			PERCENTAGE CHANGE (2013 – 2015)
	2013	2014	20135	
Roofing (11)	189.27	235.70	261.55	38.2
Panel & Insulated Pipe (42)	265.48	300.19	323.68	21.9
Commercial Freezer & Chiller (16)	39.92	43.68	51.68	29.5
Ice Box (and others) (8)	61.15	65.60	75.56	23.6
<b>Total Consumption (77)</b>	<b>555.82</b>	<b>645.17</b>	<b>712.47</b>	<b>28.2</b>

As evident from the table above, there is an increase in consumption of HCFC-141b for all applications between 2013 and 2015. Overall, consumption for the sector has gone up by about 28.2 per cent with the largest share by the roofing group (38.2 per cent). The distribution of HCFC-141b use among PU foam enterprises is presented in Table 1-6.

**Table I-5: Distribution of HCFC-141b Use Among PU Foam Enterprises (2015)**

SIZE OF ENTERPRISE (MT/year)	SIZE OF ENTERPRISE (MT/year)	SIZE OF ENTERPRISE (MT/year)	SIZE OF ENTERPRISE (MT/year)
Below 1	12	4.43	0.487
1 - < 5	29	80.88	8.896
5 - < 20	25	230.21	25.323
=>20	11	396.96	43.666
<b>Total</b>	<b>77</b>	<b>712.47</b>	<b>78.37</b>

Large enterprises (capacity 20 MT or more per year) consumed about 56 per cent of the total HCFC-141b usage by the industry (equivalent to about 44 ODP tonnes). Small enterprises (capacity < 5 MT per year) consumed less than 10 ODP tonnes.

Various methods are applied for foam dispensing. Manual methods are still used not only by small and medium scale enterprises but also by larger ones. Both high-pressure (58 per cent) and low pressure machines (42 per cent) are used.

### 3.4 XPS Foam

There is no consumption of HCFCs in XPS foam sector as there is no company in operation in this sector.

### 3.5 Fire-Fighting Sector

In HPMP Stage-I, it was observed that HCFC-123 was used in portable fire extinguishers and total flooding systems. It was also noted that there was only one manufacturer of HCFC-123 based fire extinguishing systems and the manufacturer consumed about 13 MT of HCFC-123 in 2009.

Survey and consultations held with industry players in fire-fighting sector during the preparation of the HPMP Stage-II noted that use of HCFC by the industry is limited or very minimal as all or almost all of the industry players have transitioned to use of HFCs and powder forms of fire suppressants.

### 3.6 Solvents Sector

HCFC-based solvents are used in general and precision cleaning, drying and defluxing applications and in electronics cleaning such as audio and video-heads, reflector glasses for laser printers and lenses, which require optimal surface cleanliness. During Stage-I, it was observed that about 0.67 metric tons of HCFC-225 has been reported in the Solvents Sector in 2009.

Based on information provided by one enterprise, it has been established that HCFC-141b is used as a cleaning agent mainly for the electronic, aeronautical, automotive and glass making sectors. For the single enterprise, consumption of HCFC-141b for 2015 was about 8.5 MT (0.94 ODP tonnes). In addition, 1.52 MT (0.11 ODP tonnes) of HCFC-225 were consumed as a cleaning solvent in 2015.

## 4. HCFC CONSUMPTION BY SECTOR AND SUBSTANCE (2015)

Table 1-7 below shows the 2015 HCFC consumption in Malaysia by substance and sector:

**Table I-6: Distribution of HCFCs by sector and substance in Malaysia (2015)**

DESCRIPTION	HCFC TYPE	SECTOR	MT	MT (PER CENT)	ODP TONNES	ODP TONNES (PER CENT)
Manufacturing	HCFC-22	RAC	1,072.73	16.3	59.00	14.1
	HCFC-141b	PU foam	1,070.54	16.3	117.76	28.1
	HCFC-141b	Solvents	8.50	0.1	0.94	0.2
	HCFC-225	Solvents	1.52	0.0	0.11	0.0
	HCFC-123	RAC	30.78	0.5	0.62	0.1
Servicing	HCFC-22	RAC	4,352.55	66.2	239.39	57.2
	HCFC-123		34.60	0.5	0.69	0.2
Total			6,571.22	100	418.50	100

HCFC-22 and HCFC-141b are the main HCFCs used in the country. HCFC-141b is consumed mainly in the PU foam manufacturing, while HCFC-22 is consumed in the RAC manufacturing and

servicing sectors. A small quantity of HFC-123 is consumed to manufacture and service chillers. Approximately 10 MT (HCFC-141b [8.50 MT] and HCFC-225 [1.52 MT]) are consumed in the solvent sector.

## 5. INSTITUTIONAL ARRANGEMENT

Malaysia established the Ozone Protection Unit (OPU) within the Department of Environment (DOE) to respond to the mandates of the Montreal Protocol. The Ozone Protection Unit within the Air Division of the Department of Environment, plays a lead role in the Government's sustained efforts to phase-out ODS in the country and act as National Ozone Unit (NOU).

A Project Steering Committee (PSC) is convened by the DOE, and serves as the project's coordination and decision-making body. The NOU acts as the Secretariat to the PSC.

The NOU is also the Secretariat to the National Steering Committee (NSC) for the Protection of Ozone Layer that serves as an advisory body to the Government to provide strategic and policy guidance for implementation of the Montreal Protocol. The Chair of the NSC is the Secretary General of the Ministry of Natural Resources and Environment (MNRE). There are various working groups for the implementation of Montreal Protocol in Malaysia and the OPU acts as their coordinating body.

The OPU is partially supported through the Institutional Strengthening Project with financial assistance from the Multilateral Fund and implemented by UNDP.

A Project Management Unit (PMU) was established under HPMP Stage-I. This unit supports the NOU in operationally managing HPMP project activities and reports to the OPU. PMU has only operational project management responsibilities and does not have regulatory powers which remain with the Government.

### 5.1 Existing Policies and Regulations

Malaysia has taken a proactive approach in phasing out controlled substances under the Montreal Protocol. It has formulated policies and legislations to restrict and limit the use of these controlled substances. These policies and strategies have provisions for the monitoring of the importation and consumption of controlled substances as well as for promoting the use of non-ODS substitutes and alternatives in existing industries and new investments.

Malaysia's environmental policy regime can be traced to as early as 1974 with introduction of the Environmental Quality Act, 1974. Amendments to the Act had been made to include provisions on the prohibition of the use of CFCs in the refrigeration, foam and fire-fighting sectors. The guidelines for the control measures for the protection of the ozone layer to facilitate the implementation of the phase-out programme were issued by the Department of Environment in 1994.



To provide regulatory and policy support for enabling the industry to eliminate ODS in line with the country's obligations under the Montreal Protocol, the Government of Malaysia has taken and continues to take the following key initiatives and actions:

- Environmental Quality (Prohibition on the Use of CFCs and Other Gases as Propellants and Blowing Agents) Order, 1993;
- Environmental Quality (Refrigerant Management) Regulations, 1999;
- Environmental Quality (Halon Management) Regulations, 1999;
- Environmental Quality (Delegation of Powers) (Halon Management) Order, 2000;
- Hydrogen Cyanide (Fumigation) Act (1953), (revised 1981);
- Occupational Safety and Health Act (1974); and
- Plant Quarantine Act (1976).

The above regulations provide for powers to control the import, installation, use and/or disposal of CFCs and other ODSs which are prohibited under the Montreal Protocol.

One of the primary systems of controls on ODS is the Approved Permit System (AP System), which was initially administered by the Ministry of International Trade and Industry (MITI). However, since 2013, the AP System has been administered by the Department of Environment.

Since its introduction in 1994 under the Prohibition of Import (Amendment No. 4) Order, 1994 of the Customs Act, 1967, all importers of the listed ODS, namely CFC-11, CFC-12, CFC-13, CFC-113, CFC-114, CFC-115, carbon tetrachloride (CTC) and 1,1,1-trichloroethane (TCA) must obtain an import permit issued by MITI. The total quantity of any of these substances that can be imported by the licensed importers in any year is set by a committee. The amount is reduced each year in line with the Montreal Protocol obligations.

Besides the above, the Government has also undertaken various educational and public awareness programmes on the need to protect the ozone layer. Various guidelines and documents have also been produced for industry and public information and include:

- Guidelines for prequalifying and selection criteria for acceptable alternatives of ODS (1995);
- Training Manual for mobile air conditioning and recycling/service workshop operators (2003);
- Operation Manual and Safety Guide for RSS Technicians (2007);
- Guidebook on non-ODS technology (1997);
- Training Manual for Technicians in Refrigeration and Air-conditioning sector (2014).

Other initiatives implemented by the Government included the provision of incentives to

investment in ozone friendly technologies by approving several fiscal measures such as duty exemptions on imports on non-ODS technology, duty exemption on imports of HFC-134a and also include:

- Promoting the decentralization of implementation and enforcement of policies and regulations by interacting with and strengthening local environment focal points.
- Supporting public awareness initiatives and campaigns for promoting ozone layer protection at the consumer level.
- Regular interaction with other ministries and departments, industry representatives and implementing agencies for information dissemination related to impact of policy measures.
- Actively participating in international meetings to represent Malaysia's interests.
- Promoting research and use of ozone-friendly technologies.
- Providing incentives and rewards for development and use of ozone-friendly technologies.

Over the last 4 years, the Government has implemented policies and regulations to control and monitor HPMPs. The Department of Environment established AP system which enabled the Government to control and monitor importation and consumption of HCFCs, this was further enhanced in 2014 with the licensing of re-export of HCFC.

The monitoring system of ODS imports and exports is functioning well. Malaysia has achieved their compliance targets for consumption for 2013 and 2014. The Government would continue to strengthen the regulations for phasing-out HCFCs based on the overall strategy and HCFC phase-out approach.

The Government has recently launched an e-based system of identification of technicians who have been trained and have received a certificate. This system will help in customers knowing whether the technicians servicing their equipment are qualified and would promote adoption of good service practices.

## 6. DEVELOPMENT CHALLENGES

### **Availability of Suitable Alternatives and Technologies:**

Under the HPMP stage-II, the focus is more on long term environmental and occupational sustainability while selecting alternative substances and technologies. Thus, the selection of alternative substance whether used as a refrigerant, blowing agent or fire suppressant, are governed by the factors such as-favourable physical and chemical properties for the concerned application, being inert and stable, compatible with existing materials, preferably not flammable and toxic, with zero ODP and low GWP and easily available.

In addition, the technology selection is governed by the factors such as-proven and reasonably mature technology, end-product properties and performance should be maintained, cost-

effective conversion with minimal disruption of current manufacturing operations, compliance with established local and international standards for health safety and environment, low overall direct and indirect CO<sub>2</sub>-equivalent emissions and implementable in a relatively short time frame. Currently, alternative substances and technologies that fully meet the above requirements are not available, except for one or two applications. Due to the environmental and occupational impact of technologies in the ODS consuming sectors, the past two decades have been marked by constant uncertainties and changes as well as several technological innovations and investments to overcome them.

As more scientific and technical information on alternative technologies and their environmental impacts, as well as information on research on new alternatives becomes available, the eventual choice of alternative technology will need to carefully consider environmental impacts and focus more on long-term environmental and occupational sustainability. This will need resources to be directed towards innovative products and processes that minimize ozone and climate impacts, while remaining efficient and affordable.

HPMP Stage-I implementation provides a lot of insight into technology options and timing associated with the technology choices. Given that HPMP Stage-II will involve phasing-out HCFCs in a large number of SMEs in foam, refrigeration and air-conditioning applications, the technology choices should be cost-effectiveness, easily available and in addition, the implementation capability of the enterprises along with time required for implementation need to be taken into account.

Thus, cost effectiveness, and availability of technologies are the factors that are currently unfavourable to wider adoption of substitute technologies. This constitutes a major challenge for reducing demands for HCFCs and thereby compliance with the HPMP Stage II targets.

### **Stringent Timeline For Implementation:**

The earliest date by which actual field activities of HPMP stage-II can commence, is by May 2017. 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. In addition, the number of foam manufacturers eligible for funding will be doubled compared to that in Stage-I. This will make the management and coordination of activities very challenging. Adequate resources will 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 be carried out. Accordingly, resources will be allocated to cover the costs of awareness and capacity-building actions.





# STRATEGY



## II. STRATEGY

### 7. GUIDING PRINCIPLES

The overarching strategy underlying the HCFC Phase-out Management Plan (HPMP) for Malaysia is based on the following guiding principles:

- Reflect national context and priorities;
- Develop and demonstrate a strengthened and proactive partnership between government and industry;
- Draw upon the lessons learnt from the functioning of institutional arrangements and operational mechanisms, integrate and build upon existing infrastructures and introduce new mechanisms as needed; and
- Be dynamic and evolving, and to be open for revisions and adaptation as necessary in response to evolving situations.

### 8. OBJECTIVES

The objectives of the overarching strategy of Malaysia's HCFC Phase-out Management Plan Stage-II are as below:

- To facilitate Malaysia's compliance with the control targets for HCFC consumption with minimal impacts on the national economy, on environment and occupational health; and
- To implement a combination of interventions such as technology transfer investments, policies and regulations, technical assistance, training and capacity-building, awareness and education and monitoring and management in the selected HCFC consuming sectors, contributing to achieve sustainable reductions and phase-out of HCFC consumption.

The activities relating to HPMP Stage-II will build on activities that have been and are under implementation in HPMP Stage-I.

### 9. ELEMENTS OF STRATEGY

The main elements of the strategy for Stage-II are:

- Achieve compliance with 2020 targets with priority to HCFC-141b phase-out in foam applications;
- Early phase-out of RAC manufacturing to avoid population of HCFC based equipment - link to the existing amended regulations on refrigerant management relating to prohibition of manufacture, import and assembly of 2.5HP and below of air-conditioning units for use In Malaysia;
- Promote and adopt low-GWP substances, as much as possible keeping in view industry acceptability, safety to industry and consumers and long term sustainability;
- Prohibit manufacture, assembly and import of all products and equipment using HCFCs except essential use to the extent feasible at the earliest instance possible; and
- Provide support to service sector primarily to equip infrastructure for training institutions.

## 10. STARTING POINT AND PHASE-OUT ACHIEVED

Table 2-1 below presents Malaysia's achievement under HPMP Stage-I and the remaining eligible consumption for phase-out project activities post Stage-I.

**Table II-1: Remaining Eligible Consumption After HPMP Stage-I (ODP Tonnes)**

SUBSTANCE	ANNEX	GROUP	STARTING POINT	STAGE I TARGETS	REMAINING CONSUMPTION
HCFC-123	C	I	1.13	0.0	1.13
HCFC-141	C	I	0.94	0.0	0.94
HCFC-141b	C	I	162.54	94.6	67.94
HCFC-142b	C	I	0.79	0.0	0.79
HCFC-21	C	I	0.74	0.0	0.74
HCFC-22	C	I	349.54	17.25	332.29
HCFC-225	C	I	0.08	0.0	0.08
<b>Total</b>			<b>515.76</b>	<b>111.85</b>	<b>403.91</b>

Source: HPMP Stage-I updated Agreement approved at 75th ExCom Meeting

The HPMP Stage-I prioritized the foam sector and the project activities under investment component were successfully completed in the sector. Only some activities relating to service sector and promotion of projects for adoption of low GWP technologies in the country are still under implementation.

As evident from the table above, about 22 per cent reduction from starting point was proposed to be achieved through the measures adopted in HPMP Stage-I. It is observed that HPMP Stage-I translates to achievement of about 15 per cent reduction compared to starting point by 2015.

## 11. PLAN OF ACTION UNDER HPMP STAGE-II

The components to be implemented during HPMP Stage-II include-regulatory actions; conversion of the remaining PU foam manufacturing enterprises; Technical assistance (TA) to RAC manufacturing enterprises to completely phase-out the use of HCFC-22; a workshop to provide TA to enterprises in the solvent sector; activities in the servicing sectors; and implementation and monitoring (Table 2-2).

**Table II-2: Components of HPMP Stage-II of Malaysia**

SECTOR	SECTOR	TARGETED SUBSTANCE	IMPACT IN ODP TONNES	
			ELIGIBLE	ACTUAL
Polyurethane foam sector	Conversion of PU foam manufacturing sector: Enterprises with consumption above 5 MT per year will be addressed first during period 2017-2018 and those with lesser than 5 MT per year would be addressed from 2019 to 2021. <u>Technology options:</u> Pre-blended hydrocarbons (HC), HC and HFO.	HCFC-141b	66.94	78.37



SECTOR	SECTOR	TARGETED SUBSTANCE	IMPACT IN ODP TONNES	
			ELIGIBLE	ACTUAL
Solvent sector	Stage II does not include the phase out of HCFCs in the solvent sector since there are limited alternatives that are cost-effective, safe and low-GWP. Instead, only TA to the sector for a workshop on ODS-free alternatives will be provided. Technology options: HFE, PCE and other HC based solvents.	HCFC-141b	NA	NA
Refrigeration and air-conditioning sector	Refrigeration manufacturing sector: TA for enterprises in manufacturing of refrigeration equipment on conversion of HCFC-22 to low GWP based alternative technology. Technology options: Low GWP options (e.g. R-600a, carbon dioxide, ammonia, and low-GWP blends, should those become available and feasible in a safe manner)	HCFC-22	0.29	0.29
	Air-conditioning manufacturing sector: TA for enterprises in manufacturing of air-conditioning equipment on conversion of HCFC-22 to low GWP based alternative technology. Technology options: Low GWP options promoted (e.g. HFC-32, HC-290 and low-GWP blends, should those become available and feasible in a safe manner)	HCFC-22	58.79	58.79
	RAC servicing sector: Capacity building and training focusing on minimizing HCFC-22 consumption through good practices and efficient/safe servicing of equipment using low GWP flammable alternatives.	HCFC-22	17.75	17.75
	Project Management and Coordination		NA	NA
	<b>Total</b>			

The above action plan would result in phase-out of 66.94 ODP tonnes of HCFC-141b and 76.83 ODP tonnes of HCFC-22 for a total of 143.77 ODP tonnes.

### Regulatory Actions:

To implement the above measures, the following key policy and regulatory interventions will be implemented:

- A ban on export of HCFC-141b contained in pre-blended polyols by 31 December 2018 and a ban on the import and use of HCFC-141b contained in pre-blended polyols by 1 January 2022;
- Phase-out all uses of HCFC-141b except in the solvent sector by 1 January 2022;
- Limit consumption of HCFC-141b to 1 ODP tonne or less for use in the solvent sector by 1 January 2022;
- A ban on import of refrigeration and air-conditioning (RAC) equipment operated with HCFCs and a ban on manufacturing and new installations of RAC equipment operating with HCFCs by 1 January 2020; and

- No longer issue licenses for the import of HCFC-141, HCFC-142b, and HCFC 21. (Malaysia has not seen import of HCFC-141, HCFC-142b and HCFC-21 in recent past and hence it is decided not to issue licenses for these substances). This intervention will result in the additional phase-out of 0.94 ODP tonnes of HCFC-141, 0.79 ODP tonnes of HCFC-141b and 0.74 ODP tonnes of HCFC-21 from Malaysia's total consumption)

Thus, HPMP Stage II will result in total phase-out of 146.24 ODP tonnes of HCFCs.

## 12. STRATEGY COMPONENTS AND THEIR COST BREAK-UP

Polyurethane foam sector plan.

The HCFC phase-out strategy in the polyurethane foam sector will comprise of the following components:

- Seventy-seven enterprises will be converted to low-GWP alternatives, including pre-blended hydrocarbons (HC), HC and HFO, with a total phase-out of 78.37 ODP tonnes of HCFC-141b. Of the 77 enterprises, 67 are eligible (with a consumption of 70.99 ODP tonnes), one is non-Article 5-owned (0.18 ODP tonnes), and nine were established after the 21 September 2007 cut-off date (7.2 ODP tonnes).

Considering that 1 ODP tonne of HCFC-141b will be phased out in the solvent sector in later stages of the HPMP, and that the remaining eligible funding of HCFC-141b after Stage I of HPMP is 67.94 ODP tonnes, funding is requested for only 66.94 ODP tonnes. The remaining 4.05 ODP tonnes of HCFC-141b consumption eligible for funding and the 7.38 ODP tonnes of consumption ineligible for funding would be phased out without funding from the Multilateral Fund. Therefore, off the 67.94 ODP tonnes remaining eligible for funding after Stage I of HPMP, 66.94 ODP tonnes would not be deducted from Malaysia's remaining consumption, leaving 1 ODP tonnes of remaining HCFC-141b tonnage eligible for funding to cover the solvent sector in future stage of HPMP.

A staged approach will be used with enterprises with consumption above 5 MT converted during 2017-2018, and the remaining smaller enterprises from 2019 to 2021, in anticipation of the further optimization and introduction of low-cost, low-GWP alternatives developed during Stage I.

- Technical support to the sector for information dissemination on emerging low-GWP alternatives.

## 13. SOLVENT SECTOR PLAN

Stage II does not include the phase out of HCFCs in the solvent sector since there are limited alternatives that are cost-effective, safe and low-GWP. Instead, only TA to the sector for a workshop

on ODS-free alternatives will be provided, on the understanding that a proposal to phase out consumption in the solvent sector will be submitted in stage III of the HPMP.

#### 14. REFRIGERATION AND AIR-CONDITIONING SECTOR PLAN

The refrigeration and air-conditioning sector plan includes both manufacturing and servicing sector plan. The phase-out strategy for manufacturing sector will comprise of following component:

- Technical assistance (TA) for enterprises in manufacturing of refrigeration and air-conditioning equipment on conversion of HCFC-22 to low-GWP based alternative technology.

TA will be provided through workshops, one per year for five years to support the conversion of enterprises to low-GWP alternatives (e.g., R-600a, carbon dioxide, ammonia, and low-GWP blends, should those become available) in the refrigeration sector and HFC-32, HC-290 and low-GWP blends, should those become available, in the AC sector. While non Article 5 owned AC manufacturers are expected to phase-out their consumption without funding from the Multilateral Fund and following their strategy, TA activities would include participation of all enterprises in the RAC sector to inform them on alternative technologies and to facilitate the achievement of phase-out.

The phase-out strategy for servicing sector will comprise of following component:

- Service sector infrastructure capacity building through equipment support to technical training institution;
- Centers of excellence for training technicians on handling flammable refrigerants;
- Training of trainers for adoption of good service practices and servicing equipment using alternatives; and
- Technical support to the sector for information dissemination on emerging low-GWP alternatives.

This strategy considered for both manufacturing and servicing sector takes into account (a) need for the country to achieve their compliance targets, (b) market factors that affect the choice of technology by enterprises particularly the A2 owned enterprises<sup>1</sup> and SMEs, (c) equipping service infrastructure to gear up adoption of good service practices and using low GWP flammable technologies.

In addition to these activities, the Government would implement policies and regulatory measures to prohibit use of HCFCs in manufacturing, assembly and installation of HCFC based equipment progressively keeping in mind compliance requirement and phase-out trends in the market.

<sup>1</sup> A2 owned air-conditioner manufacturers are expected to phase-out HCFC based air-conditioners on their own following their corporate technology strategy.

## 15. PROJECT MANAGEMENT ACTIVITIES:

The main activities under the project management component are.

- Prepare annual work plan for implementation of HPMP Stage-II;
- Manage operations of the staff of the project management unit;
- Identify beneficiaries and facilitate/follow-up signature of performance based payment contracts with the beneficiaries;
- Project monitoring and verification with the industry;
- Ensure timely completion of verification activities as required under the Agreement and/or based on specific Executive Committee decision;
- Design and implement regulations for controlling and monitoring of HCFCs; and
- Knowledge management and documentation on technology and policy issues that would be helpful for HPMP implementation

## 16. PHASE-OUT TARGETS FOR HPMP STAGE-II

The net impact of HPMP Stage-II is presented in Table 2-7 with remaining eligible consumption after implementation of HPMP Stage-II.

**Table II 3: Remaining Eligible Consumption After Implementation of HPMP Stage-II  
(in ODP tonnes)**

SUBSTANCE	ANNEX	GROUP	STARTING POINT	STAGE-I TARGETS	REMAINING CONSUMPTION AFTER STAGE-I	STAGE-II TARGETS	REMAINING CONSUMPTION AFTER STAG-II
HCFC-123	C	I	1.13		1.13	0.00	1.13
HCFC-141	C	I	0.94		0.94	0.94	0.00
HCFC-141b	C	I	162.54	94.6	67.94	66.94	1.00
HCFC-142b	C	I	0.79		0.79	0.79	0.00
HCFC-21	C	I	0.74		0.74	0.74	0.00
HCFC-22	C	I	349.54	17.25	332.29	76.83	255.46
HCFC-225	C	I	0.08		0.08	0.00	0.08
<b>Total</b>			<b>515.76</b>	<b>111.85</b>	<b>403.91</b>	<b>146.24</b>	<b>257.67</b>

Thus, the HPMP Stage-II of Malaysia for the period 2016 to 2021 will result in reduction of HCFC consumption by 49.94 per cent of the baseline.

Keeping in view the above phase-out to be achieved in HPMP Stage-II, the Government of Malaysia proposes to adopt the following targets for HCFC consumption levels up to 2021 (table 2-8). Along with the phase-out targets funding tranches for 2016, 2019 and 2021 are provided in Table 2-8.



Table II 4: HPMP Stage-II Phase-Out Targets and Tranche Flow

PARTICULARS	2017	2018	2019	2020	2021	2022	TOTAL
Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	464.18	464.18	464.18	464.18	335.24	335.24	n/a
Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	438.40	438.40	438.40	400.00	335.24	309.46	n/a

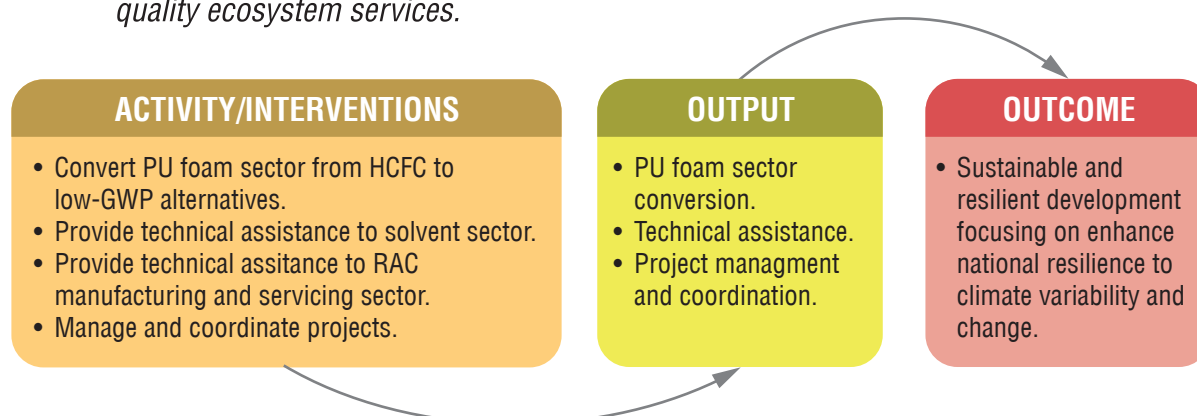
## 17. PROJECT OBJECTIVES, OUTCOMES AND OUTPUTS/ACTIVITIES

The activities/interventions envisaged under the HPMP Stage-II will result in the following outputs:

- *Output 1: Conversion of PU foam sector.*
- *Output 2: Technical Assistance for foam, solvents and RAC manufacturing and servicing sector.*
- *Output 3: Project management and co-ordination.*

These outputs are expected to contribute to achieving the following Country Programme Outcome as defined in Country Programme Action Plan (CPAP) (2016-2020):

- *Priority 2. Sustainable and resilient development*
- *Priority 2a: Enhancing national resiliency to climate variability and change. Innovative mitigation actions promoting use of clean technology, sustainable production and consumption and eco-efficiency.*
- *Priority 2b: Value natural capital, reduce environmental impacts and improve access to quality ecosystem services.*



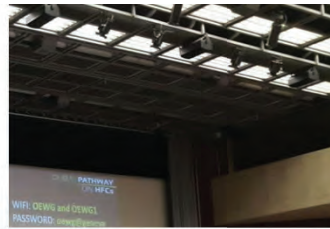
The projects envisaged under the HPMP Stage-II will promote inter sectoral coordination and capacity development to ensure effectiveness and efficiency across the various agencies involved in management of Ozone Depleting Substances. Malaysia has taken a proactive approach in phasing out controlled substances under the Montreal Protocol. It has formulated policies and legislations to restrict and limit the use of these controlled substances. These policies and strategies have provisions for the monitoring of the importation and consumption of controlled substances as well as for promoting the use of non-ODS substitutes and alternatives in existing industries and new investments.

This is evident where joint monitoring and enforcement activities are required, involving the Customs Department, Department of Environment, MITI, MNRE, UNDP and targeted beneficiaries. The National Ozone Unit will be responsible for the capacity building of the Customs Department, other agencies and targeted beneficiaries from the private sector involved in the management of Ozone Depleting Substances. Regular training, capacity building, awareness programme will be held to update their knowledge on new technology, regulations and policies, which will result in active participation from the stakeholders under the HPMP Stage-II. The partnership will be beneficial to all agencies concerned as information and knowledge will be shared for effective and efficient monitoring and enforcement activities.

### **Mainstreaming Gender and Vulnerable Communities Issues**

Gender and community issues will be considered throughout the project planning and implementation stages. During the survey stage, elements of gender were incorporated in the survey questionnaire. It was noted that even though women were not discriminated in participating at managerial level or as general worker, the nature of business, is not attractive to women in general. Nevertheless, there are still women who has partnerships in a company or at decision making level, but their numbers are few. Where ever possible, the project will ensure participation of women and the vulnerable groups during training, workshops, seminar and public awareness programme. With their participation in these activities, it will provide them with access to knowledge and skills they require to be active participants in other initiatives which address climate change. Where possible, their engagement throughout the project will be reported to monitor that their perspectives have been included to achieve the outcomes of the project.

# STRATEGY







# MANAGEMENT ARRANGEMENTS





## IV. MANAGEMENT ARRANGEMENTS

The project will be implemented following UNDP's National Implementation Modality (NIM), per the Standard Basic Assistance Agreement between UNDP and the Government of Malaysia and the Country Programme.

Project management and coordination is an integral part of HPMP Stage-II. This component essentially helps in management of project activities under HPMP to ensure timely and systematic implementation of HPMP Stage-II. The main activities that would be undertaken under the project management component are listed in Section 2.

HPMP Stage II will be implemented under the National Implementation Modality (NIM). The framework that was successfully used during the Stage-I will be primarily used for supervision and management of implementation, with changes as necessary to respond to evolving needs. The Department of Environment (DOE) will coordinate the implementation, through the National Ozone Unit (NOU). The NOU 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 Ministry of Natural Resources and 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.

### **National Steering Committee (NSC)**

A National Steering Committee (NSC) will provide guidance and direction to the project implementation process per the established detailed work plan monitoring tool. The Committee will be composed of representatives from EPU, MNRE, UNDP Malaysia, and other relevant stakeholders to be identified. The Chair of the NSC is the Secretary General of the Ministry of Natural Resources and Environment (MNRE).

### **Project Steering Committee (PSC)**

A Project Steering Committee (NPSC) will be convened by the Department of Environment (DOE), and will serve as the Project's coordination and decision-making body. It will provide guidance and direction to the project implementation process per the established detailed work plan monitoring tool. The PSC will assist the NSC in handling all technical and operational matters of the project. The members of the PSC will consist of representatives from the DOE, EPU, Customs Department, MITI, MNRE, UNDP and other relevant stakeholders to be determined by the National Steering Committee. The chair of the PSC is Deputy Director General (Operation) DOE.

### **Technical Working Group (TWG)**

A Technical Working Group may be formed on the advice of the PSC. The technical working group will comprise of NOU (secretariat), UNDP, MITI, DOSH, experts in the area of foam and refrigerant to be identified by the secretariat. The PSC may also recommend any other agencies or experts to be part of the TWG.