

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT



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Resilient nations.*

Technical Support to the Kigali Baseline Assessment Consultancy

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Date submitted: 06/08/2019

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Acknowledgement Page

The consultant would like to express his gratitude and appreciation to Mr. Vivian K. Blake National Ozone Officer, National Environment and Planning Agency and Ms. Sharona Napier, Programme Associate, United Nations Development Programme. Their contributions were most appreciated, and information and opinions they shared played a critical part in the preparation of this report.

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Abbreviations

BSJ	Bureau of Standards Jamaica
CARICOM	The Caribbean Community
CFC	Chlorofluorocarbon
CO ₂	Carbon dioxide
GOJ	Government of Jamaica
GWP	Global Warming Potential
HC	Hydrocarbon
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
HFE	Hydrofluoroether
HFO	Hydrofluroolefin
HPMP	HCFC Phase-out Management Plan
MAC	Mobile air-conditioning
JARVA	Jamaica Air, Refrigeration & Ventilation Association
JCA	Jamaica Customs Agency
MLF	Multi-Lateral Fund
MOHW	Ministry of Health and Wellness
MOP	Meeting of Parties
NCRA	National Compliance & Regulatory Authority
NEPA	National Environment and Planning Agency
NOU	National Ozone Unit
ODP	Ozone Depleting Potential
ODS	Ozone Depleting Substance
PF foam	Phenolic insulation foam
PU foam	Polyurethane insulation foam
RAC	Refrigeration & Air Conditioning
TEAP	Technology and Economic Assessment Panel
UNDP	United Nations Development Program
XPS foam	Extruded polystyrene insulation foam

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Executive Summary

The Kigali Amendment to the Montreal Protocol entered into force on 1 January 2019. Under the Amendment, all countries will gradually phase-down Hydrofluorocarbons (HFCs) by more than 80 per cent over the next 30 years and replace them with more environmentally-friendly alternatives. Phasing down HFCs under the Protocol is expected to avoid up to 0.5°C of global warming by the end of the century while continuing to protect the ozone layer.

The Government of Jamaica, in collaboration with the United Nations Development Programme (UNDP), is currently implementing “Enabling activities for the ratification of the Kigali Amendment”. The main objective of these enabling activities is to prepare Jamaica for the ratification and early implementation of the Kigali Amendment to the Montreal Protocol.

One of these enabling activities is a baseline assessment of HFC importation in Jamaica. The objective of the HFC baseline study is to help the country establish a consumption baseline to identify usage trends and develop recommendations to facilitate future HFC consumption studies.

This report presents the findings of the HFC baseline study conducted from April to June 2019. The ‘*Guide for preparation of the surveys of ODS alternatives*¹’ developed by the Multi-Lateral Fund (MLF) Secretariat of the Montreal Protocol is used as a reference in the preparation and finalization of the HFC survey. The report also uses the proposed format in this guide for the final report and describes how the results of the study are analyzed and presented.

Data for the research were collected from the Jamaica Customs Agency (JCA), leading importers, and large users of HFCs in the market. Follow-up meetings with key stakeholders were conducted from 14 to 17 May 2019. A workshop to validate main findings with key stakeholders was conducted on 3 July 2019.

- **HFC consumption in Jamaica**

“Consumption” means production plus imports minus exports of controlled substances (the Montreal Protocol, Article 1). **Table 1** presents the consumption of HFCs during the years 2012-18 by substance calculated as imports. There is no HFC production or export in Jamaica.

Table 1. Estimated use of HFCs in Jamaica (Metric Tonnes)²

Substances	2012	2013	2014	2015	2016	2017	2018
HFC-134a	16.2	80.6	46	47.1	89.5	99.1	95.6
R-32	0	0	0	0	0	0	0.14
R-404A	14.7	22.5	16.2	29.3	20.5	36.6	30.3
R-407C	0	0.6	0.8	2.8	0.02	1.6	2.0
R-407F	0	0.22	0	0	0	0	0
R-410A	7.8	14.2	14.3	13.2	34.1	33.0	37.6
Total	38.7	118.1	77.3	92.4	144.2	170.3	165.6

¹ MLF/IACM.2016/2/21

² Consumption data from the year 2012 till 2015 are obtained from the ODS Alternatives Survey study report 2017

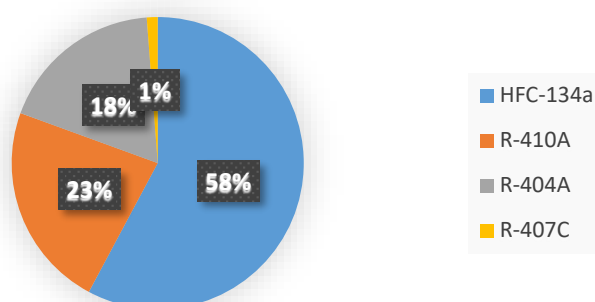
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Information source: Customs data, import data provided by key importers, and ODS Alternative survey 2017

China, Mexico, and the United States are the primary sources of HFCs imported by Jamaica. In 2018 more than 67% of the total, HFC imports into the country were from these two countries.

HFC Consumption in Jamaica has increased by nearly 7.4% per annum since the year 2016. In 2018, almost the entire HFC quantity imported in the island was consumed in the Refrigeration and Air Conditioning (RAC) servicing sector. The main HFCs used in the RAC sector are HFC-134a (57.7%), R-410A (22.7%), R-404A (18.2%), and R-407C (1.2%).

Main HFCs used in Jamaica



- **Import of products containing HFCs**

One of the objectives of the HFC baseline study is to report on the importation of products containing HFCs such as Refrigerators and Air conditioners (RAC), pre-blended polyols for foam manufacturing, and automobiles.

RAC sector:

For the RAC sector, approximately eighty-two thousand (82,000) domestic and commercial refrigerators and forty-six thousand (46,000) air conditioners were imported in the year 2018. As per the information provided by the major importers and industry experts, most of the imported equipment now use HFCs as refrigerants (domestic refrigerators- HFC-134A; commercial refrigerators- R404A; air conditioners- R410A).

The Bureau of Standards Jamaica (BSJ) has set energy efficiency standards for RAC equipment in the country. The process of energy labelling has also commenced, and it is expected that significant categories of RAC equipment will have energy labels starting in the latter part of the year 2019.

Automobiles:

According to the Trade Board Limited, approximately forty thousand (40,000) vehicles are imported into the country each year. Majority of the cars imported are used vehicles

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(approximately 36,000). Automobile servicing firms interviewed during the baseline study have informed that most of the cars currently use HFC-134a as a refrigerant for mobile air conditioning.

Pre-blended polyols:

There is one company which has reported using imported HFC pre-blended polyol in Jamaica. The table below outlines the HFCs consumption by this company.

Table 2. Estimated use of HFCs in pre-blended polyols for foam manufacturing

Application	HFCs (Metric Tonnes)	2012	2013	2014	2015	2016	2017	2018
Spray Foam	HFC-245fa	3.5	2.5	2	6.5	8	12	6
	HFC-227ea/HFC-365mfc	8.5	6.5	9.5	6	-	-	-

Information source: Company data

- **Projection of HFC consumption for the years 2013-2030**

The RAC servicing sector is the primary consumer for HFCs in Jamaica. Past ODS alternatives survey points to the limited use of HFC alternatives such as HFOs, hydrocarbons etc. in the country. It is expected that the requirement for new refrigerant due to reduced consumption of HCFC will be mostly met by HFCs in a business-as-usual (BAU) scenario.

Table 3 below shows the estimated HFC consumption for the years 2020-2030 in a business-as-usual (BAU) scenario. The following HFC consumption is projected without considering the Kigali Amendment control limits.

Table 3. Estimated HFCs consumption for 2020 to 2030 (mt), Business-as-usual scenario

Substance	Average growth rate in the importation of RAC equipment	Average growth rate since 2016	2020	2021	2022	2023	2024	2025	2030
HFC-134a	3%	7.4%	102.7	105.7	108.9	112.2	115.5	119.1	136.9
R-404A			32.5	33.4	34.4	35.5	36.5	37.7	43.3
R-410A			40.4	41.6	42.8	44.1	45.4	46.8	53.8
R-407C			2.1	2.1	2.2	2.2	2.3	2.4	2.8
Total			177.7	183.0	188.5	194.1	200.0	206	236.9

- **Recommendations**

The following recommendations are developed to support the Government of Jamaica for future HFC baseline studies.

- Capacity building and awareness programs on the Kigali Amendment, data collection methodologies should be conducted for various stakeholders to facilitate future data collection;

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- A voluntary reporting mechanism should be set by the NOU to collect data before the start of the compliance regime;
- Refrigerant identifiers available with the custom's lab to check refrigerants at the time of imports should be assessed for their use for HFC identification, and necessary modifications should be conducted;
- Inter-agency cooperation mechanism should be strengthened to develop a shared understanding of the compliance requirements and roles to be played by different agencies.

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Introduction

Background

The Kigali Amendment is an amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. It was adopted by the 28th Meeting of Parties to the Montreal Protocol (MOP28) on 15 October 2016 in Kigali, Rwanda. The Amendment adds hydrofluorocarbons (HFCs) which are potent greenhouse gases to the list of controlled substances to be phased down.

Given their zero impact on the depletion of the ozone layer, HFCs, which are potent greenhouse gases (GHG) are currently used as replacements of hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs). These substances are generally used as refrigerants in refrigerators and air conditioners, blowing agents in the foam manufacturing process and as process chemicals for fire protection and solvent sectors. Use of HFCs is increasing rapidly as substitutes for ozone-depleting substances (ODS) such as HCFCs.

Under the Amendment, Montreal Protocol parties are required to gradually reduce the use of HFCs by 80-85 per cent by the late 2040s (Table 4). First reductions by most developed countries are expected in 2019. Most developing countries will follow suit by a freeze of HFCs consumption levels in 2024, and in 2028 for some of them. The HFC phase-down is expected to avoid up to 0.5 degree Celsius of global temperature rise by the year 2100.

Table 4: HFC Phase-down schedule

	A5 parties (developing countries)- Group 1	A5 parties (developing countries)- Group 2	Non-A5 parties (developed countries)
Baseline formula	Average HFC consumption for 2020-2022+65% HCFC baseline	Average HFC consumption for 2024-2026+65% HCFC baseline	Average HFC consumption for 2011-13+15% HCFC baseline
Freeze	2024	2028	-
1st step	2029-10%	2032-10%	2019-10%
2nd step	2035-30%	2037-20%	2024-40%
3rd step	2040-50%	2042-30%	2029-70%
4th step	-	-	2034-80%
Plateau	2045-80%	2047-85%	2036-85%

Information source: Kigali Amendment- operational plan, MLF document: UNEP/OzL.Pro.WG.1/39/INF/1

Notes:

1. Group 1: Article 5 parties not part of Group 2
2. Group 2: Bahrain, India, the Islamic Republic of Iran, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia and the United Arab Emirates
3. Non-A5 parties- For Belarus, Russian Federation, Kazakhstan, Tajikistan, Uzbekistan, 25% HCFC component of baseline and different two steps (1) 5% reduction in 2020 and (2) 35% reduction in 2025

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Legal Framework

The Government of Jamaica (GOJ) has ratified all the earlier amendments of the Montreal Protocol and is currently in the process of ratifying the Kigali Amendment of the Montreal Protocol. The country has already phased out CFCs. HCFCs are now phased-out as per Jamaica's HCFC Phase-out Management Plan (HPMP) project funded by the Montreal Protocol. The project, which was initiated in the year 2012³, aims to reduce HCFC consumption by 35 per cent of the baseline by the end of 2020.

Table 5: HCFC Phase-out schedule

2009-2010 Baseline: 268.24 metric tonnes (16.3 Ozone Depleting Potential (ODP) tonnes)		
Year	2015	2020
Montreal Protocol Consumption Limits (ODP tonnes)	14.7	10.6

Information source: Jamaica HCFC Phase-out Management Plan

The Environmental and Risk Management Branch of the Ministry of Economic Growth and Job Creation (MEGJC) is the Focal Point for the Montreal Protocol. The National Ozone Unit (NOU), housed in the National Environmental and Planning Agency (NEPA) manages the HPMP project. The NOU is responsible for the day to day implementation of all project activities, collecting and organizing information generated by the project; facilitating all legal and policy procedures required for the successful implementation. A Country Working Group co-chaired by NEPA and UNDP with membership from relevant stakeholders is charged with oversight of the Project.

The country has a comprehensive licensing system introduced in 1998 to monitor and control trade in ODS.

- The Trade (Prohibition of Importation) (Equipment Containing Chlorofluorocarbons) Order, 1998 [Prohibition Order] bans with effect from March 1, 1998, the importation of equipment and appliances which use or contain CFCs. It also prohibits the importation of certain aerosols, foams, solvents and fire-fighting equipment.
- The Trade (Restriction on Importation) (CFCs) Order, 1999, to comply with its Montreal Protocol obligations to freeze and subsequently phase-out the import of CFCs. This legislation provides a schedule for phasing out the importation of CFCs through the administration of quotas for importers covering the period July 1999 to December 2005.
- The Trade (Prohibition of Importation) (Halon) Order, 2002 banned the importation of virgin Halons effective July 2002. It supported the Halon Bank Management Plan for the Caribbean Region.

All the above Orders were repealed and replaced by the Trade (Montreal Protocol) (Trade in Ozone Depleting Controlled Substances) Order, 2014. The Trade Order 2014 seeks to regulate

³ HPMP was approved during the 63rd Executive Committee Meeting; April 2011

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the importation of ODS, ensuring that HCFC import in Jamaica does not exceed the control limits set in the HPMP.

It includes among other things, prohibition on import of controlled substances (ODS) except under license, a quota and permit system for HCFCs import, and a ban on the importation of equipment containing or using the chlorofluorocarbons. Currently, the country is in the process of evaluating legal requirements to control trade in HFCs. Many of the provisions of the existing Order may be adapted to meet the requirements of the HFC phase-down requirements of the Kigali Amendment.

As per the current regulatory regime, Importers of HCFCs are given a quota for which they are allowed to import HCFCs (annexure-A7, List of HCFC importers and allowed import quota till 2040). They are required to obtain an import permit from the Ministry of Health and Wellness (MOHW) for each import instance.

MOHW maintains records of issued permits for HCFC imports along with necessary documents including purchase invoices. However, details on actual imports are not maintained by the Ministry.

The JCA through its online system (The UNCTAD Automated System for Customs Data-ASYCUDA) maintains records of permits and actual imports including, the type of substance, importer details, date of shipment etc.

The NOU maintains records of quotas and obtains actual HCFC import data from JCA for its periodic reporting requirements including annual Article 7 data submission to the MLF.

Though there is no restriction on the importation of HFCs in the country, importers are required to obtain an import permit from MOHW after submission of required documents. As there is no quota restriction, required import permits are issued upon submission of necessary documents.

The current online system (ASYCUDA) used by the JCA has all the required features to collect import data on various controlled substances, including HFCs. To accurately capture data of HFCs, the JCA has recently developed harmonized tariff codes for HFCs. New HS codes have been implemented since the start of the year 2019.

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HCFC consumption in Jamaica

Based on the consumption data (Table 6) reported by NOU in Jamaica, the country is experiencing a reduced demand of HCFCs, which is increasingly being replaced in the local market by HFCs and other alternatives such as CO₂, Ammonia, HFOs, Methyl Formate etc. As per the HPMP Stage-1, in the baseline scenario, 67% of HCFC-22 was used for servicing of air conditions and remaining for servicing of refrigerators. HCFC 141b was used by only one enterprise for foam manufacturing. Under the HPMP-1, this enterprise has been provided with the necessary support to shift to non-HCFC alternatives for blowing of foams.

Table 6: HCFC Consumption Data

2009-2010 Baseline: 268.24 metric tonnes (16.3 Ozone Depleting Potential (ODP) tonnes)			
Year	2015	2016	2017
Montreal Protocol Consumption Limits (ODP tonnes)	14.7	14.7	14.7
Actual HCFC consumption (ODP tonnes)	2.92	3.55	3.97

Information source: Jamaica HCFC Phase-out Management Plan and Article 7 Data

A market shift towards HFC based RAC equipment in recent past is considered as the prime reason behind reduction in HCFC consumption in the country.

The objective of the study

Although the Government of Jamaica has a well establish Legal and Institutional Framework to implement the Montreal Protocol commitments ratified so far, the new Kigali Amendment will bring additional challenges to determine the national requirements and needs for the ratification of this Amendment and establish a sound foundation to undertake future work towards its the implementation.

The funding request for the implementation of enabling activities for the early ratification of the Kigali Amendment for Jamaica was made by UNDP during the 80th ExCom meeting.

One of these enabling activities is the baseline assessment of HFC importation in Jamaica. The objective of the HFC baseline study is to help the country establish a consumption baseline, identify usage trends, identify the sectoral distribution of consumption. The study will provide the country with a comprehensive overview of its national market where HFCs are used and will be phased down, while taking into consideration other existing technologies.

The scope of the HFC baseline study included the following:

- The main products being imported in the country that contain HFCs;
- Labelling standards for imported products containing HFCs;

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- Identifying gaps in documentation by the Jamaica Customs Agency of HFCs at ports of entry;
- Quantification of annual importation of HFCs and associated growth pattern;
- Importers of products containing HFCs and the intended sectors where these products are used;
- Recommendations regarding
 - The specifications of HFC detectors and/or analytical devices for the testing of equipment containing HFC by the JCA, BSJ, and the NOU’.
 - Highlighting international best practices to collect, report, analyze and monitor HFC data;
 - Strengthening of inter-agency network governing the importation of HFCs.

Mr Ashutosh Pandey, an International consultant, was engaged by the Implementing Agency (IA), United Nations Development Programme (UNDP) to conduct this study. The study was carried out from April to June 2019.

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Approach and Methodology

The assignment approach is based on ‘*Guide for preparation of the survey of ODS alternatives-MLF/IACM.2016/2/21*’. Its key components include data collection, data analysis, and assessment, as described below.

Data Collection:

Data was collected from various sources to estimate the current use of HFCs by substance and sector. As the first step, data were gathered through a desk review using the information available from institutions including, NOU and the JCA. Information on national regulations and standards related to the import and use of ODS alternatives were also collected and reviewed.

Based on the desk review, the methodology for data collection was designed to focus only on the specific HFCs commonly used in Jamaica and the key sectors/subsectors where they are used including domestic, commercial or industrial refrigeration (servicing); stationary and mobile air conditioning- (servicing); and foam.

The following activities were undertaken to facilitate data collection:

- A. A detailed questionnaire⁴ was developed for distribution to identified key stakeholders including, inter alia:
 - a. Importers of products containing HFCs;
 - b. Importers of refrigeration and/or air-conditioning equipment;
 - c. Refrigeration and (mobile and stationary) air-conditioning service companies.
- B. HFC and RAC Import data from the JCA were obtained. JCA had provided import data in excel sheets including information on importers, substances, import quantity, date of import, country of export etc.;
- C. Site visits with key stakeholders including importers, the JCA officials, BSJ, major RAC servicing companies, the Trade Board Limited, and consultants. Semi-structured interviews were conducted with key stakeholders during the site⁵ visits. The main discussion points included-
 - a. Estimating the use of HFCs by sector and subsector, taking into account increased demand, particularly in the refrigeration and air-conditioning sector;
 - b. The current regulatory framework, import procedures, energy efficiency and other relevant standards.

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Data analysis and assessment

Based on the data gathered through the questionnaires and field surveys, the following analysis was undertaken:

- A. Computation of current consumption level of HFCs, importation of products containing HFCs including RAC, cars and pre-blended polyols for foam;
- B. Growth patterns in consumption of HFCs:
 - c. A methodology was developed for forecasting growth of HFCs used in each sector/subsector;
 - d. Reviewed the historical data for the use of HFCs and forecasted their growth;
 - e. Estimated growth patterns of sector and subsector where HFCs are used (up to 2030).

Data validation procedure

The validation process included cross-checks of the data for quality control, which provided insight to any data gap and inaccurate data in the completed questionnaire.

- A. Import data from 2016 to 2018 obtained from JCA was manually verified. In the manual verification process; customs data collected from JCA in excel sheet and company data were cross-checked with documents such as invoices, bill of lading etc. submitted by importers in the online system of JCA (detailed declarations section of import entries);
- B. The data collected during the survey were validated by conducting site visits for selected enterprises and stakeholders including importers, appliance/equipment importers, and service providers to verify the data;
- C. In case of any data gap for a company or a specific period, JCA data was used;
- D. A validation workshop was conducted on 3rd July 2019 to seek inputs from stakeholders on critical findings. The workshop had helped in identify erroneous data, data gaps, and methods to fill these gaps.

⁴ Annexure- A4

⁵ Annexure- A3: Mission Itinerary

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Data between the years 2012 to 2015

Import data obtained from JCA for the period 2012 till 2015 had several discrepancies including wrong statistical units, incorrect categorisation etc. Given that supporting documents, including invoices for the past import data, are also not available online and have been archived, it was challenging to verify past data manually. Most of the surveyed companies were also unable to provide HFC data before the year 2016. With these constraints, the HFC baseline report uses the information for the period 2012 till 2015 from the ODS Alternatives Survey report 2017.

The current report and ODS Alternatives Survey report use different methodologies for HFC consumption estimation. The current report uses consumption as import plus production minus exports, and wherein earlier report used sales data from key players as consumption.

Limitations to the study

Several constraints were encountered throughout this study:

- Narrow time-frame was available to analyse information. Though key project documents were readily made available by the project team, much time was spent to gather information from external sources before being able to conduct the analysis;
- HFC specific HS codes were implemented during early 2019, and hence, there is a lack of reliable data available from Customs for the past years. Many data discrepancies were identified in terms of data received from companies and the JCA;
- The volume of data and short time-frame for the study limited manual verification of old import records;
- A total of 16 people were interviewed within a week time frame in which the site visits were conducted, making it challenging to have follow-up conversations with key stakeholders.

However, within the context of available resources and the planned approach, the consultant was able to conduct a detailed assessment of the HFC consumption and on this basis to identify lessons learned and recommendations.

Table 7. Survey respondents

Appliance Trader Ltd	Carlisa Enterprises	CAC 2000 Ltd	Sealspray
AREL Ltd	Comfort Systems Ltd	Geddes Refrigeration	Tropical
BJ Henna and Sons Ltd	Donald Witter Ltd	Quality Distributors	

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HFC Baseline Assessment: Key Findings

HFC consumption

Jamaica does not produce HFCs it imports primarily from China, Mexico and the United States. According to data received from the JCA, in 2018 China, and the United States accounted for sixty seven percent (67%) of the total HFC imports. No export quantity was reported by any major company involved in HFC imports and trading. Earlier surveys have also not reported on any export quantity.

The following table presents the country's consumption of HFCs during the years 2012-2018 by substance calculated as imports minus exports.

Table 8. Estimated use of HFCs in Jamaica (Metric Tonnes)

Substances	2012	2013	2014	2015	2016	2017	2018
HFC-134a	16.2	80.6	46	47.1	89.5	99.1	95.6
R-32	0	0	0	0	0	0	0.14
R-404A	14.7	22.5	16.2	29.3	20.5	36.6	30.3
R-407C	0	0.6	0.8	2.8	0.02	1.6	2.0
R-407F	0	0.22	0	0	0	0	0
R-410A	7.8	14.2	14.3	13.2	34.1	33.0	37.6
Total	38.7	118.1	77.3	92.4	144.2	170.3	165.6

Information source: Customs data, import data provided by leading importers, and ODS Alternative survey 2017

In 2018, almost the entire HFC quantity imported in the island was consumed in the Refrigeration and Air Conditioning (RAC) servicing sector. The main products used in the RAC sector are HFC-134a (57.7%), R-410A (22.7 %), R-404A (18.2 %), and R-407C (1.2%).

Total HFC Consumption in Jamaica has increased by nearly 7.4% per annum since the year 2016. HCFCs consumption reduction under the HPMP and a market shift to HFC based RAC equipment have been the main reasons attributed to the increase of HFC consumption in Jamaica.

HFC prices

The following table presents prevailing prices of main HFCs sold in Jamaica based on information provided by companies involved in HFCs trading.

Table 9. Prices of HFCs in Jamaica (Jamaican Dollars)

Substances	Year 2019
HFC-134a	15,000-20,000
R-404A	14,000-18,000
R-407C	14,000-18,000
R-410A	17,000-20,000

Information source: company data, 2019

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Importers

Currently, there are fifteen companies which are allowed to import HCFCs through quota and permit system as per the Trade Order 2014. However, there is no such restriction on import of HFCs in Jamaica. As per JCA records, a total of twenty-five (25) companies imported HFCs in 2018 and 2019, out of these only ten are approved HCFC importers. The market is highly concentrated: the largest four companies account for sixty point seven percent (60.7%) of total imports.

Table 10. HFC importers in Jamaica (the year 2018-2019)

Organisation	Address
Geddes Refrigeration	226 Spanish Town Road, Kingston
Carlisa Enterprises	14 ¼ retirement Road, Kingston
Donald Witter	14 Ruthven Road, Kingston
B J Hannah & Sons	7 Retirement Crescent, Kingston
Tropical	56A Studio 1 Blvd, Kingston
ATL	5 Collings Green Avenue, Kingston
CAC 2000 Limited	231 Marcus Garvey Drive, Kingston
Quality Distributors & Manufacturing	2 Westminster Road), Kingston
Arel Ltd	2 Piccadilly Road, Kingston
ACON Supplies	Shop 6, 4 Kerr Crescent, Montego Bay, St. James
Caribbean Coolers Ltd.	53a Molyneux Road, Kingston
IGL Ltd.	593-595 Spanish Town Road, Kingston
Jamaica Public Service	6 Knutsford Boulevard, Kingston
Modern Refrigeration	4 Hart Street, Montego Bay-391, St. James
Maritime & Transport Services	Newport West 40, Second ST., ST. ANDREW, Kingston
Rayton Electric	16 Red Hills Road, Kingston
UNICOMER (Jamaica)	79-81A Sliper Road, Kingston
SANDALS NEGRIL	Norman Manly BLVD. Negril
Domestic and Commercial Appliances	16 Regal Plaza, Kingston
CHAD - AD Distributors	Newport est 87-91 FIRST ST., , Kingston
Port Marly	Bloody Bay, Westmoreland, Negril
Club Riu Hotel	Mahoe Bay, ST. JAMES, Montego Bay
Montego Bay Technologies	33 Montego Bay trade Centre, Montego Bay
GORDON'S Refrigeration	9 WAKEFIELD CRES. Kingston
FORBES-MELLIS	IRWINLOT 6 Tucker, St. James, Montego Bay

Information source: JCA data

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Sectoral Distribution

While HFCs are primarily consumed in the RAC servicing segment, there is no direct HFC consumption observed in the aerosol, solvent, or foam industry.

Table 11. Summary of use in all sectors between 2012 to 2018 (mt)

Substance	Refrigeration and air-conditioning		PU foam	XPS foam	Aerosol	Fire fighting	Solvent	Others
	Manufacturing	Servicing						
HFC								
HFC-134a	-	yes	-	-	-	-	-	-
HFC blends								
R-404A	-	yes	-	-	-	-	-	-
R-407C	-	yes	-	-	-	-	-	-
R-410A	-	yes	-	-	-	-	-	-

Information source: Sectoral distribution is based on information collected from key suppliers and users of HFCs

The main products used in the RAC sector are HFC-134a (57.7%), R-410A (22.7 %), R-404A (18.2 %), and R-407C (1.2%) during the year 2018. Approximately forty percent (40%) of HFC-134a is consumed in the Mobile AC (MAC) sector, while the remaining sixty percent (60%) HFC-134a is used for refrigerators and commercial chillers. R-404A is mostly used for commercial refrigerators, R-410A for domestic ACs, and R-407C for commercial ACs.

Table 12. Sectoral usage of HFCs, 2018 (mt)

Substance	RAC Servicing				
	Refrigerators and commercial chillers	Commercial refrigerators	Domestic ACs	MAC sector	Commercial ACs
HFC-134a	57.4	-	-	38.2	-
R-404A	-	30.3	-	-	-
R-407C	-	-	-	-	2.0
R-410A	-	-	37.6	-	-

Information source: Sectoral distribution is based on information collected from key suppliers and users of HFCs

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

- Refrigeration

This sector includes refrigeration systems for domestic, commercial, and industrial applications (e.g., household refrigerators and freezers, food display systems and beverage dispensing units in supermarkets, food storage rooms, industrial manufacturing processes, refrigerated trucks/vessels and refer containers). The most commonly used alternative refrigerants are R-404A and HFC-134a and, to a lesser extent, R-407A.

Jamaica does not manufacture refrigerator's, According to data received from the JCA, the country imported 83,765 (eighty-three thousand seven hundred and sixty-five) units in the year 2018. Most of the new domestic refrigerators use⁶ HFC-134a and commercial equipment use HFC-134a and R-404A. The capacity of domestic refrigerators range between 320-600 litres, and these are typically charged with 300-400 grams of R-134a refrigerant. Commercial refrigerators use R-404A for larger systems and HFC-134a for smaller systems.

During the stakeholder consultation, the leading importers confirmed that for the last four years, majority of domestic and commercial refrigerators are using HFC based refrigerants. In recent times there is an increase in the importation of isobutane based display coolers and freezers available at leading retailers. A few multinational companies like Coca Cola are also using CO₂ based refrigerators. However, the isobutane and CO₂ based refrigerator market share is expected to be below five per cent.

HFCs are primarily imported in the country from The United States of America, China, and Mexico. The leading brands available in the market include LG, Whirlpool, Samsung, Mabe, Mastertech, and Frigidaire. As per import data, there are more than 100 importers for refrigerators. Unicomer, Active Traders, Appliance Traders, Rosh Marketing, Singer Jamaica, Classic Jewellers are a few of the leading importers of refrigerators in Jamaica.

Though BSJ has set standards for minimum energy efficiency levels and energy labels, these are currently being enforced (refer to the next section on energy efficiency in RAC equipment). Most of the local brands currently do not use any label to show the energy efficiency of the equipment. Some of the international brands have energy labels, but as Jamaica's climatic condition and power supply differ from many exporting countries, the information on the current energy efficiency might not be relevant to the Jamaican market.

In Jamaica, HFC consumption is considered as importation, production or exportation of products containing the substance, as such, HFCs contained in equipment are not accounted for as consumption for the country⁷. However, servicing of such equipment during their lifetime will require HFCs import and will impact HFCs consumption in the country.

⁶ Based on the information provided by leading suppliers and users in the market

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Table 13. Refrigerator imports in Jamaica (units)

Application	2016	2017	2018
Refrigeration (domestic and commercial)	77,199	80,056	82,378

Information source: JCA and company data

- Air-conditioning

This sector refers to air conditioning systems that cool and/or heat enclosed spaces ranging from single rooms to large commercial buildings, and vehicles. These include small self-contained -airconditioning, split -airconditioning, ducted and packaged rooftops, water chillers, heat pumps for heating and mobile -airconditioning- systems. The cooling capacity for domestic ACs ranges from 1.0-2.5 TR. Commercial and Industrial ACs may range from two kilowatts (kW) to 10,000 kW, and refrigerant charge ranges from 0.2 kg to 13,000 kg.

Jamaica does not manufacture air conditioning units. In the year 2018, the country imported a total of 46,357 units (JCA data). The most commonly used HFCs in the air-conditioning sector are R-410A and R-407C. Some large chillers also use HFC-134A. A recent study ‘*World Air Conditioner Demand by Region- April 2018*’⁸ by The Japan Refrigeration and Air Conditioning Industry Association predicts Jamaican AC market size of 53,000 units per year (43,000 domestic and 10,000 packaged units).

There are both international and local brands available in the market. The leading brands sold include Panasonic, Prizm, Windy, Mastertech, Frigidaire, Gree, and LG. As per Customs records, Appliance Traders, Carlisa, Unicomer, and Geddes are a few of the leading importers of ACs in Jamaica.

According to data received from leading importers, majority of ACs imported in the country use R-410A as a refrigerant. It is estimated that HCFC-22 based ACs market share is below five per cent (5%). An interesting trend observed in the past few years is the increased use of inverter ACs in the market. Based on information collected during interviews with key importers and traders, more than 75% of new ACs are energy efficient inverter ACs.

Similar to refrigerators, the mandatory requirement for minimum energy consumption standards or energy efficiency labels for ACs is currently in the process of being enforced. As such, many of the local brands do not currently carry any such labels, international brands may have energy consumption labels, but these are not localised.

⁷ Consumption= Import +Production-Exports

⁸ https://www.jraia.or.jp/english/World_AC_Demand.pdf

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Table 14. AC imports in Jamaica (Units)

Application	2016	2017	2018
Small self-contained, split, packaged systems	43,025	44,574	46,357

Information source: Customs and company data

- Mobile air-conditioning sector (MAC)

This sector refers to the mobile air-conditioner (MAC) systems used to cool land transport systems including, cars, trucks, buses. The most commonly used refrigerants for cars is HFC-134a.

Jamaica does not have any local manufacturing facilities of cars, vans or any other large vehicle segments. The country imports approximately thirty-six thousand (36,000) used cars every year, along with 3,000-4,000 new cars. Japan is the leading exporting nation for used cars to Jamaica. As per the Motor Vehicle Import Policy in Jamaica, the maximum allowed age of sedans and station wagons at importation is six years (increased from the earlier limit of five years in June 2019).

A large percentage (approximately 40% of total HFC-134a imported in the country) of HFC-134a is used for servicing of MAC in Jamaica. In recent times, there has also been an uptake of alternatives like HFO-1234yf, though minimal use currently.

Table 15. Cars import in Jamaica (Units)

Application	2018
Cars (refrigerants charge 0.4-0.8 kg)	Approximately 40,000

Information source: The Trade Board Limited data

- Foam Sector

Seal Sprayed Solutions Limited (SEAL) is the only foam manufacturing company using HFCs (as part of pre-blended polyols). As per stakeholder interviews, other foam companies do not utilize HCFCs or HFCs in their manufacturing process. Before HPMP Stage-1, the company was using HCFC-141b with methyl formate for the production of sprayed foam in roofing systems, insulation, waterproofing and sealing. An MLF funded investment project to replace HCFC-141b with methyl formate was implemented in the plant. The project was operationally completed in December 2015.

There was no direct import of HFC-245fa, HFC-227ea or HFC-365mfc during 2012-18 as per the import data from JCA. The company currently imports HFC based pre-blended polyols for some of its products. The following table provides information on HFC consumption in pre-blended polyols imported in Jamaica.

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Table 16. HFCs in pre-blended polyol used in the foam sector

Application	HFCs (Metric Tonnes)	2012	2013	2014	2015	2016	2017	2018
Spray Foam	HFC-245fa	3.5	2.5	2	6.5	8	12	6
	HFC-227ea/HFC-365mfc	8.5	6.5	9.5	6			

Information source: Company data

- Aerosol Sector

This sector typically includes a large number of applications such as insecticides, cosmetics, paints, cleaners, pharmaceutical and veterinarian products, glues and lubricant oils. The most commonly used HFCs for industrial and cleaning applications with flammability and safety considerations include HFC-245fa, HFC-152a, and HFC-227ea.

According to data received from the JCA, there were no imports of HFC-245fa, HFC-152a or HFC-227ea between 2012 to 2018. Import documents from the HPMP project, previous ODS alternative surveys as well as HFC importers and industry experts have also confirmed this observation.

- Solvent and Fire Protection Sectors

Solvents are widely used as process agents in a variety of industrial manufacturing processes, although they are not contained in the final products to consumers. Their main applications include metal cleaning, electronics cleaning, and precision cleaning. The most commonly used HFCs for the solvent sector is HFC-365mfc and the most widely used HFCs in fire protection sector include HFC-23, HFC-125, HFC-227ea.

Based on data received from the Jamaica Customs Limited between 2012 and 2018, there was no importation of the following substances- HFC-365mfc, HFC-23, HFC-125, and HFC-227ea. Leading HFC importers and industry experts have also confirmed this observation during the stakeholder consultation process.

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Projection of HFC consumption for the years 2020-2030

Past ODS alternatives survey points to the limited use of HFC alternatives such as HFOs, hydrocarbons etc. in the country. It is expected that HFCs will be dominant refrigerant for new equipment in a business-as-usual (BAU) scenario.

The following HFC consumption is projected (without considering the Kigali Amendment control limits). **Table 17** shows the estimated HFC consumption for the years 2020-2030 in a business-as-usual (BAU) scenario.

This projection was calculated assuming the following items:

- A. The annual GDP growth rate of 1% in Jamaica, yearly population growth rate of 0.3%⁹. RAC sector has witnessed an average growth rate of approximately 3% annually during the past three years, the same growth rate is expected. Total HFC Consumption in Jamaica has increased by nearly 7.4% per annum since the year 2016;
- B. The HCFC-22 consumption will follow the chronogram defined by the Montreal Protocol in Decision XIX/6 for the HCFC phase-out in the Article 5 Parties. The current import of HCFC is primarily to meet the servicing demand of older systems in the RAC sector;
- C. The market has already made a shift towards HFC based equipment in recent past and hence any further reduction in HCFC might not result in a significant increase in HFC consumption;
- D. In the longer run, the growth in the HFC consumption will be in line with the import of RAC equipment in the country. Hence, for the period till 2020, past growth rate as witnessed during the past three years is taken. For a period from 2020 to 2030, a growth rate of 3% (annual growth rate of RAC equipment) is chosen.

Table 17. Estimated HFCs consumption for 2020 to 2030 (mt), Business-as-usual scenario

Substance	Average growth rate in the importation of RAC equipment	Average growth rate since 2016	2020	2021	2022	2023	2024	2025	2030
HFC-134a	3%	7.4%	102.7	105.7	108.9	112.2	115.5	119.1	136.9
R-404A			32.5	33.4	34.4	35.5	36.5	37.7	43.3
R-410A			40.4	41.6	42.8	44.1	45.4	46.8	53.8
R-407C			2.1	2.1	2.2	2.2	2.3	2.4	2.8
Total			177.7	183.0	188.5	194.1	200.0	206	236.9

⁹ The World Bank data for the past five years

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Energy Efficiency Standards for RAC

Over 80 per cent of the global warming impact of RAC systems is associated with indirect emissions generated during the production of the electricity used to operate the equipment. The Kigali Amendment provides an opportunity to reduce both direct and indirect emissions from the cooling sector.

Setting minimum energy performance standards, enforcing mandatory energy labelling for equipment are some of the ways in which countries are trying to improve the energy efficiency of appliances. Choice of refrigerant also plays a vital role in the energy consumption of RAC equipment. The following section provides an overview of standards for RAC equipment in Jamaica.

The Bureau of Standards Jamaica (BSJ) is an agency under the Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF) and enforces three (3) Acts namely: The Processed Foods Act of 1959, the Standards Act of 1968 and the Weights and Measures Act of 1976. BSJ is responsible for setting standards. The National Compliance and Regulatory Authority (NCRA) is the regulatory agency responsible for compliance of approved standards.

Standards are developed by technical committees comprised of experts in specific fields/sectors as well as representation from government, consumer interests and sector support agencies. Committees operate on the principle of consensus, and the public is allowed to examine and comment on all drafts before they are published as National Standards.

The Energy Efficiency Testing and Labelling Programme of the BSJ requires importers, distributors and retailers of refrigerators, freezers, and ACs to submit these items for energy efficiency tests by the BSJ laboratories or other accredited laboratories. As per the NCRA website, the Energy Efficiency Testing and Labelling Program is mandatory. Manufacturers, importers, and retailers are required to have each model unit registered and tested under the programme in Jamaica, before the sale on the local market. Only those appliances which meet the Minimum Energy Efficiency Ratio (MEER) will be allowed to be sold locally.

An integral part of this initiative will be a program to label (Ener\$ave Jamaica)¹⁰ appliances available for sale in Jamaica with information about their energy efficiency and cost of operation. The main objective of the Program is to promote energy efficient appliances, thus influencing consumers' purchase decisions for household appliances.

As per information provided by BSJ, the process of equipment energy efficiency testing and labelling program has commenced recently and it is expected that significant categories of RAC equipment will have energy labels starting in the latter part of the year 2019.

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The following are the main Jamaican Standards as part of the Energy Efficiency Program, which are relevant for the RAC appliances:

- JS178: Jamaican Standard Specification for Testing of the energy performance of household refrigerators and freezers;
- JS179: Jamaican Standard Specification for Room Air Conditioners;
- JS1 Part 21, Energy labelling of appliances and products: Defines terms and conditions under which major household appliances shall be labelled. Identifies information consumers must receive on the energy operating cost and energy consumption of major appliances.

Other relevant standards include:

- JS1 Part 29: Labelling of Products and Equipment containing or manufactured using ODS and/or their substitutes. This standard requires refrigerant information of products and equipment;
- JS339:2017, Jamaican Standard Specification for transportation, handling, and storage of refrigerants.

During the HFC baseline study, it was observed that many RAC appliance brands do not currently use any energy label or information on the refrigerants used in it. While some of the international brands have energy labels, as Jamaica's climatic condition and power supply differ from many exporting countries, the information on the current energy efficiency might not be relevant to the Jamaican market.

BSJ is also currently working with the Caribbean Community (CARICOM) Regional Organisation for Standards and Quality (CROSQ) for regional harmonisation of energy labels for RAC appliances (CRS 57 - Energy Labelling for Refrigerated Appliances). Once harmonised standards are adopted, local standards may need to be revised to meet new requirements.

¹⁰ Annex- Ener\$save Jamaica label design

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Other Findings

- *Inter-agency coordination:* There is a Country Working Group under the Kigali project and a Project Steering Committee under the HCFC phase-out project and while the stakeholders are similar, there seems to be a lack of clarity regarding the roles played by various stakeholders. For example, various stakeholders have a different understanding regarding the role played by multiple agencies for issuance of permits and licenses for import of HCFCs.
- *Data compilation issues:* Data received from the JCA on the importation of HFCs and equipment in Jamaica were found to have several discrepancies for example, the classification, statistical units, aggregation of various gases in one import entry etc were incorrectly reported/documented???. This required an exhaustive manual verification of documents available in the detailed deceleration of each import entry for data verification. As HFCs are not controlled substances, data are not compiled by any agency. JCA has recently developed and implemented harmonised tariff codes for HFCs, and this is expected to reduce data problems witnessed during the study.
- *Market trends:* There is an uptake of inverter-based room ACs in Jamaica during the past four years. These ACs have higher energy efficiency compared to standard non-inverter ACs. However, the main driver behind this uptake is not the increased awareness about energy efficiency in the local market, but since most of the exporting firms have started making inverters for the world market. This is a clear signal that trends in the local market are affected by changes made by exporting countries.
- *Stakeholder awareness on the Kigali Amendment:* Though leading importers have general awareness about the Kigali Amendment, there is a need for capacity building of various stakeholders for a successful market transition.

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Recommendations

HFC consumption data collection process:

Capacity Building to improve data collection process: HFC specific HS codes have been implemented since early 2019. However, data collected from JCA for the year 2019 show that information included in the online system from importers and custom brokers might have accuracy issues regarding statistical quantities, categorization of different substances etc. Following capacity building needs have been identified to improve the data collection process.

Table 18. Capacity building of key stakeholders to improve the data collection process

Stakeholders	Topics/Potential Training Needs
<p>Customs officials and Customs Lab Technicians:</p> <p>Training and capacity building of enforcement authorities on HFCs and mechanisms of monitoring and reporting consumption is essential for accurate data monitoring and reporting</p>	<ul style="list-style-type: none"> • Compliance requirements of the Kigali Amendment; • HFC data collection methodology and the importance of custom data in baseline assessment and consumption verification; • HFCs and HFC blends, nomenclature and commercial names; • The techniques for the identification of refrigerants and the control of HFCs imports.
<p>Customs Agents/Brokers/Importers:</p> <p>There is a need for training to ensure data reported are accurate.</p>	<ul style="list-style-type: none"> • Compliance requirements of the Kigali Amendment; • Training on how to fill various fields in the custom database/forms to provide accurate information on HFC importation; • HFC data collection methodology and the importance of custom data in baseline assessment and consumption verification.

Initiate voluntary reporting by importers: The NOU should encourage voluntary reporting from users on an annual basis (i.e., importers and large users) of HFCs to simplify the process of future mandatory reporting, and the establishment of a robust HFC permit and licensing system. Disaggregated information on uses (e.g., HFC used in servicing refrigerators, MACs, small commercial refrigeration equipment, etc.) should also be included in voluntary reporting. A sample template is included as annexure A.8 that could be used for collecting information from HFC importers.

Data collection during permit issuance: The Standards and Regulations Branch of the MOHW is the nodal agency to issue permits for the importation of refrigerants. Currently, importers provide an estimated quantity of HFCs to be imported. These estimations very often do not match with actual import data which leads to data discrepancies. Similar to HCFC import

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process, MOHW could seek exact HFC quantities to be imported for a given permit. MOHW should also maintain electronic records of permits issued for HFCs imports.

Provision of refrigerant identifiers to the Jamaica Customs Agency to facilitate detection of illegal trade: During the HPMP phase-1, refrigerant detectors were supplied. Generally same detectors could be used for other substances with little modifications, availability of calibration methodologies and pure test substances. An assessment should be done on the sufficiency of already available identifiers, modification requirements to use them for HFCs, and need for additional identifiers.

Other recommendations:

Strengthen the inter-agency coordination mechanism: The inter-agency cooperation mechanism should be strengthened to develop a shared understanding of the compliance requirements and roles to be played by different agencies. The role of each agency should be documented and made available online.

Enhance stakeholder engagement process: As HFC consumption is showing significant growth, early action to promote awareness and outreach on HFCs and HFC blends is necessary to address consumption and control of these substances strategically. NOU should conduct key stakeholders meeting including importers, service companies, technology providers etc. once every six months.

Training needs identification: Energy efficiency and safety standards are critical components of the Kigali Amendment. The NOU should conduct focus group sessions to determine critical training needs to sensitise various stakeholders on these issues. This should also include an assessment of the needs of the RAC servicing sector to determine the training, capacity-building, standards and regulatory support required for technicians, to identify the options to include the technologies based on HFCs and its alternatives.

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Appendices

A1. Documents reviewed

- HPMP Project Document Stage-1
- HPMP Tranche requests to MLF, Tranche 1, 2, and 3
- ODS Alternatives Survey report 2017
- Article 7 Data on HCFC Consumption
- The Trade (Montreal Protocol) (Trade in Ozone Depleting Controlled Substances) Order, 2014

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A2. Key Stakeholders

Organisation	Person
National Ozone Unit (a part of the National Environment and Planning Agency)	Mr. Vivian Blake
United Nations Development Programme	Ms. Sharona Napier
Jamaica Customs Agency	Ms. Francine Dunbar, Ms. Marsha Wilson, Ms. Michelle Chambers
Caribbean Maritime University	Professor Noel Brown
Bureau of Standards Jamaica	Ms. Shane Slater
The Trade Board Limited	Mr. Douglas Webster
MEGJC	Ms. Joanne Felix
Ministry of Health and Wellness	Kerry-Ann, Blagrove-Hamilton
Geddes Refrigeration	Mr. Richard Salmon
Carlisa	Mr. Cari Gordon
Donald Witter	Mr. Donal Witter
B J Hannah & Sons	Carey Cameron
Tropical	Ms. Violet McNaughton
ATL	Mr. Bryan Stephens
CAC 2000 Limited	Mr. Colin Roberts
Quality Distributors & Manufacturing	Mr. Jason Duncan
Arel Ltd	Mr. Kevin Henry
SEAL Sprayed Solutions	Ms. Tanya Silvera*
Others	Mr. Kirkland Rowe, National Consultant who conducted ODS alternative survey in the year 2017

*email interview

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

A3. Agenda: Mission for stakeholder consultation and validation workshop



Empowered lives.
Resilient nations.

Project Title: *Implementing Enabling Activities for the Ratification of the Kigali Amendment*

13-17 May 2019

DAY	DATE	TIME	MEETINGS	Discussion Topics
Tuesday	14 May	9:00 – 12:00	Meeting with UNDP Programme Team	Objectives of the assignment
		1:30	Meeting with Noel Brown	Market trends, import processing, trainings
		3:00 pm	Geddes Refrigeration (Richard Salmon)	Data collection, market trends
		4:15 pm	Carlisa (Cari Gordon)	Data collection, market trends
Wednesday	15 May	10:45	Donald Witter	Data collection, market trends
		12:00	B J Hannah & Sons (Carey Cameron)	Data collection, market trends
		1:00	Jamaica Customs MEGJC (Joanne Felix will also join the meeting)	Custom processes for monitoring and reporting of HFC and RAC imports
		3:30	Tropical (Violet McNaughton)	Data collection, market trends
Thursday	16 May	9:00	Kirkland Rowe	ODS alternatives survey 2017
		10:00	ATL (Bryan Stephens)	Data collection, market trends
		11:00	Modern Refrigeration (Harnel Taylor)	Skype call
		1:00	Ministry of Health	Process for issuance of permits to import refrigerants
		3:00	Bureau of Standards (Shane Slater)	Standards for energy efficiency, Ener\$ave Jamaica program

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

DAY	DATE	TIME	MEETINGS	Discussion Topics
Friday 17 May		9:00	Colin Roberts CAC 2000 Limited	Data collection, market trends
		10:20	Trade Board Limited (Douglas Webster)	Import process, automobile imports
		11:00	Quality Distributors & Manufacturing (Jason Duncan)	Data collection, market trends
		1:00	Arel Ltd (Kevin Henry)	Data collection, market trends

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

STAKEHOLDER VALIDATION WORKSHOP
for the
Implementing Enabling Activities for the Ratification of the Kigali Amendment project
3 July 2019
9:30 am – 12 noon
Ministry of Economic Growth & Job Creation, Conference Room
16A Half Way Tree Road
Kingston

MEETING AGENDA

Objective:

- To verify data collected on the importation of HFCs into the country

Chair: Ms. Gillian Guthrie, Senior Director, Environment & Risk Management Division, MEGJC

TIME	TOPIC	LEAD
9:00	Registration	
9:15	Welcome & Opening Remarks	Chair
9:30	Greetings	Mr. Richard Kelly, Programme Specialist, UNDP
9:45	Project Overview	Ms. Sharona Napier, Programme Associate, UNDP
10:00	Overview of the Baseline Report	Mr. Ashutosh Pandey, Consultant
11:00	Questions and Answers	
11:30	Wrap up and close	

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

A4. Data Collection Survey Forms

HFC Importers:

Date:	
Name of the organisation:	
Person Name:	
Products (Refrigerators, airconditioners, Car ACs etc.)	

Imports		2012	2013	2014	2015	2016	2017	2018
HFC-134a	Metric Tonnes							
HFC-32	Metric Tonnes							
HFC-152a	Metric Tonnes							
HFC-161	Metric Tonnes							
HFC-245fa	Metric Tonnes							
HFC-227ea/HFC-365mfc	Metric Tonnes							
R-404A	Metric Tonnes							
R-407C	Metric Tonnes							
R-408C	Metric Tonnes							
R-409C	Metric Tonnes							
R-507A	Metric Tonnes							
R-410A	Metric Tonnes							
Others (specify)	Metric Tonnes							

RAC Importers:

Date:	
Name of the organisation:	
Person Name:	
Products (Refrigerators, airconditioners, Car ACs etc.)	

Number of units imported

		Refrigerant	2012	2013	2014	2015	2016	2017	2018
Domestic refrigerators and freezers	HFC-134a								
	Butane								
	any HCFC based equipment								
	Others specify								
Commercial refrigeration systems (stand alone, condensing units and small/medium sized systems)	R-404A								
	HFC-134a								
	R-407A								
	any HCFC based equipment								
	Others specify								
Room air-conditioning (including windows, small split or medium air-conditioning)	R-410A								
	R-407A								
	HFC-161								
	R-32								
	Others specify								

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

Foam Sector:

Date:	
Name of the organisation:	<input type="text"/>
Person Name:	
Source of HFCs, import or domestic purchase?	
Products (Rigid PU, Spray, Integral Skin, XPS etc.)	

		2012	2013	2014	2015	2016	2017	2018
Rigid PU Foam								
HFC-245fa	Metric Tonnes							
HFC-227ea/HFC-365mfc	Metric Tonnes							
Others (specify)	Metric Tonnes							

		2012	2013	2014	2015	2016	2017	2018
Spray Foam								
HFC-245fa	Metric Tonnes							
HFC-227ea/HFC-365mfc	Metric Tonnes							
Others (specify)	Metric Tonnes							

		2012	2013	2014	2015	2016	2017	2018
Integral Skin and flexible moulded foam								
HFC-134a	Metric Tonnes							
HFC-245fa	Metric Tonnes							
HFC-227ea/HFC-365mfc	Metric Tonnes							
Others (specify)	Metric Tonnes							

		2012	2013	2014	2015	2016	2017	2018
XPS Foam								
HFC-134a	Metric Tonnes							
HFC-152a	Metric Tonnes							
Others (specify)	Metric Tonnes							

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

A5. Commonly used HFCs

Chemical*	Chemical name, Blend	GWP ¹¹	Sectors				
			RAC	Foam	Aerosols	Solvent	Fire suppression
HFC-23	Trifluoromethane	14,800	•				•
HFC-32	Difluoromethane	675	•				
HFC-125	Pentafluoroethane	3,500	•				•
HFC-134a	1,1,1,2-tetrafluoroethane	1,430	•	•	•		•
HFC-143a	1,1,1-trifluoroethane	4,470	•				
HFC-152a	1,1-difluoroethane	124	•	•	•		
HFC-227ea	Heptafluoropropane	3,220	•	•	•		•
HFC-245fa	1,1,1,3,3-pentafluoropropane	1,030		•	•		
HFC-365mfc	1,1,1,3,3-pentafluorobutane	794		•	•	•	
R-407C	HFC-32 / HFC-125 / HFC-134a (23.0 / 25.0 / 52.0)	1,774	•				
R-410A	HFC-32 / HFC-125 (50.0 / 50.0)	2,088	•				
R-404A	HFC-125 / HFC-143a / HFC-134a (44.0 / 52.0 / 4.0)	3,922	•				
R-507A	HFC-125 / HFC-143a (50.0 / 50.0)	2,465					

¹¹ Global warming potential (GWP) values used are based on the 4th Assessment of the Intergovernmental Panel on Climate Change.

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

A6. The proposed Energy Efficiency Label for RAC equipment

THE ENERGY EFFICIENCY LABEL



IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

A7. Quota allocation of HCFCs to specified companies (in Metric Tonnes)

SN	Name of Importer	Year ending December 31, 2014	January 1, 2015 to December 31, 2019	January 1, 2020 to December 31, 2024	January 1, 2025 to December 31, 2029	January 1, 2030 to December 31, 2039
1	Acon Supplies	1	0.9	0.65	0.325	0.025
2	Appliance Traders Limited	18.6	16.74	12.09	6.04	0.465
3	Arel Limited	18.74	16.866	12.181	6.09	0.468
4	B.J. Hanna and Sons Limited	2.0	1.8	1.3	0.65	0.05
5	CAC2000 Limited	14.2	12.78	9.23	4.615	0.355
6	Troy Traders Limited	47.62	42.858	30.953	15.476	1.19
7	Carlisa Enterprises	4.5	4.05	2.92	1.462	0.112
8	Comfort System Limited	17	15.3	11.05	5.525	0.425
9	Donald Witter	42	37.8	27.3	13.65	1.05
10	Geddes Refrigeration	6.5	5.8	4.22	2.11	0.162
11	IGL Limited	21.35	19.215	13.877	6.93	0.533
12	Jamaica Public Service Limited	2	1.8	1.3	0.65	0.05
13	Modern Refrigeration Limited	26.52	23.868	17.238	8.619	0.663
14	Quality Distributors Manufacturing Company Limited	17.69	15.921	11.498	5.749	0.442
15	Tropical Air-conditioning and Refrigeration Company Limited	15	13.5	9.75	4.875	0.375

Information source: The Trade Order 2014, Pages 11 and 12

IMPLEMENTING ENABLING ACTIVITIES FOR THE RATIFICATION OF THE KIGALI AMENDMENT PROJECT

A8. Templates for Voluntary Reporting

HFC Importers

Name of the Organisation				
Address				
Year of data collection				Jan- Dec 2019
Date of filling datasheet				dd.mm.year
Name of the person filling datasheet				
Contact details				
Substance	Number of cylinders/cans	Weight per cylinder/can (KGs)	Date of Import	
HFC-134a				
R-404A				
R-407C				
R-410A				
Any other (please add rows as required)				