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IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninety-third Meeting
Montreal, 15-19 December 2023
Items 9(c) and 9(d) of the provisional agenda[1]

PROJECT PROPOSALS: GRENADA

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

Energy efficiency

- Additional activities to maintain energy efficiency for the servicing sector under decision 89/6(b) — UNIDO

Phase-down

- Kigali HFC implementation plan (stage I, first tranche) — UNEP and UNDP

[1] UNDP/OzL.Pro/ExCom/93/1

ADDITIONAL ACTIVITIES TO MAINTAIN ENERGY EFFICIENCY FOR THE SERVICING SECTOR UNDER DECISION 89/6(b)

PROJECT DESCRIPTION

Background

1. Stage II of the HCFC phase-out management plan (HPMP) for Grenada was approved at the 90th meeting[2] to completely phase out HCFC consumption by 2030, at a total cost of US $377,500, plus agency support costs. The second tranche will be submitted in 2025.

2. On behalf of the Government of Grenada, UNIDO, as the designated implementing agency, has submitted a request for funding for additional activities to introduce alternatives to HCFCs with zero or low global warming potential (GWP) and to maintain energy efficiency in the refrigeration and air-conditioning (RAC) servicing sector in line with decisions 89/6 and 92/22, at the amount of US $100,000, plus agency support costs of US $7,000.[3] The submission includes a description of specific activities, targets, and performance indicators and an implementation plan for 2024 to 2025.

Report on HCFC consumption

3. The Government of Grenada reported a consumption of 0.12 ODP tonnes of HCFC-22 in 2022, which is 85 per cent below the HCFC baseline for compliance. The 2018–2022 HCFC consumption is shown in table 1.

Table 1. HCFC consumption in Grenada (2018-2022 Article 7 data)

HCFC-22	2018	2019	2020	2021	2022	Baseline
Metric tonnes	3.76	3.25	3.33	2.28	2.21	15.09
ODP tonnes	0.21	0.18	0.18	0.13	0.12	0.83

4. The country's decreasing HCFC consumption since 2018 is attributed to the enforcement of the licensing system and activities conducted under the HPMP, particularly the promotion of HCFC alternatives and the recovery and reuse of refrigerants. The HCFC consumption in 2022 is well below the control targets under the Montreal Protocol and the maximum allowed limits in the Agreement between the Government and the Executive Committee, which ensures its compliance with the Montreal Protocol.

Country programme implementation report

5. The Government of Grenada reported HCFC sector consumption data under the 2022 country programme implementation report that is consistent with the data reported under Article 7 of the Montreal Protocol.

Energy efficiency project

Legal framework

6. Grenada is implementing stage II of the HPMP and has been making efforts to introduce low-GWP alternatives and enhance the energy efficiency of the replacement technologies. The Government of Grenada has established the minimum energy performance standards (MEPS) and energy efficiency

[2] Decision 90/38

[3] As per the letter to UNIDO from the National Ozone Officer as the focal point of Grenada for the Montreal Protocol.

labelling for RAC appliances, and has adopted the energy efficiency building codes and building performance standards issued by the Organisation of Eastern Caribbean States.

7. The Government is finalizing the Montreal Protocol Controlled Substance Act (the ODS Act) which includes a ban on the import of HCFC-based equipment; a ban on the import of HFC-based domestic refrigerators with refrigerants that have a GWP greater than 150; and a ban on the import of unitary air-conditioning (AC) units (capacity up to 24,000 British Thermal Unit (BTU)) with refrigerants that have a GWP greater than 750. The ODS Act is expected to come into effect on 1 January 2024.

Additional activities for maintaining energy efficiency in the refrigeration and air-conditioning servicing sector

8. The project is designed to strengthen and increase collaboration among various stakeholders to implement the MEPS and promote the adoption of zero-ODP and low-GWP refrigerants. The project proposes to replace domestic refrigerators and stand-alone commercial refrigeration equipment in hospitals and schools operating with HCFCs and HFCs that are approaching decommissioning, with newer, more energy-efficient appliances operating on R-600a or R-290 refrigerants. Subsidies will be provided for the beneficiaries with the expectation of further replacement to be undertaken by the beneficiaries with their own funding. The aim is to replace a total of 8,000 to 12,000 units of HCFC- or HFC-based equipment with the incentive provided by the project. The programme also includes activities for refrigerant recovery, recycling and the sound disposal of the replaced equipment.

9. Energy efficiency improvement and the resulted emission reduction will be analyzed as part of the project and the results will be disseminated for further escalation of the replacement.

10. The following activities are proposed:

(a) Hiring one consultant to conduct a market survey to obtain a comprehensive inventory of the RAC sector in Grenada, including the type of equipment being used, energy consumption and rating, and the cost of the equipment; and conducting data analysis (US $8,000);

(b) Procurement of domestic refrigerators and commercial refrigeration equipment for replacement (US $70,000);

(c) Collection and transportation of the replaced appliances; and dismantling, refrigerant recovery from the equipment before disposal, recycling of recovered refrigerants, and coordination with stakeholders (US $10,000);

(d) Awareness-raising activities for the public on HCFC phase-out, the introduction of low-GWP alternatives, national policies in favour of low-GWP technologies (tax concessions, or subsidies and rebates to be adopted); and public consultation and identification of beneficiaries (US $9,000); and

(e) Coordination with other multilateral environmental agreements on matters related to energy efficiency; and reporting on progress of implementation (US $3,000).

11. The project will be implemented within 18 months of the date of approval.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

12. The Secretariat reviewed the project proposal in the light of decision 89/6.

13. The Secretariat noted that part of the replacement programme proposes to use R-600a to replace HFC-134a domestic refrigerators, which is the dominant technology in the domestic refrigeration sector in Grenada based on the survey undertaken during preparation of the KIP. Noting that decision 89/6 requires the project to be implemented as part of the HPMP in the context of HCFC phase-out, not for HFC phase-down, the Secretariat is not clear whether replacement of HFC-134a-based domestic refrigerators with units that use R-600a is an eligible activity under decision 89/6.

14. After discussion, UNIDO reported that the project had been revised to piloting R-290 technology in the domestic AC sector and in light commercial refrigeration equipment. Co-financing will be sought to the extent possible. To ensure sustainability, a training component was added to the project to train technicians to install the R-290-based equipment and monitor energy efficiency. Awareness-raising will also cover the dissemination of the project results to promote further adoption of R-290 technology in the two subsectors.

15. The revised activities and costs are presented as follows:

(a) Hiring one consultant to conduct a market survey to obtain a comprehensive inventory of the RAC sector in Grenada, including the type and cost of equipment used in the domestic AC and light commercial refrigeration subsectors and their energy consumption and rating; and conducting data analysis (US $10,000);

(b) Procurement of 30 units of R-290-based AC or light commercial refrigeration equipment (10 units each of 12,000 BTU, 18,000 BTU and 24,000 BTU) to be installed in households, commercial buildings and public buildings to showcase R-290 technology (US $51,000);

(c) Purchasing two sets of the same R-290 units for each model for training purposes; training 30 technicians and two business owners on how to safely install R-290-based units, maintain the energy-efficient operation of the equipment, and monitor the energy efficiency performance of the installed units (US $19,000);

(d) Collection and transportation of the replaced appliances; and recovery of refrigerants from the dismantled units and recycling of the recovered refrigerants (US $10,000);

(e) Purchasing 50 sets of energy-tracking systems, measuring the energy performance of the installed R-290-based RAC units, and reporting the results of the pilot projects (US $3,000);

(f) Awareness-raising activities for the public on HCFC phase-out and HFC phase-down, the introduction of low-GWP alternatives, and national policies in favour of low-GWP technologies (tax concessions, or subsidies and rebates to be adopted); and dissemination of the results of the pilot projects (US $4,000); and

(g) Project implementation, coordination, monitoring and reporting (US $3,000).

Updated Agreement

16. In view of the inclusion of funding for additional activities to maintain energy efficiency in the refrigeration servicing sector, the Agreement between the Government of Grenada and the Executive Committee has been updated. Specifically, Appendix 2-A has been revised and paragraph 17 has been added to indicate that the updated Agreement supersedes that reached at the 90th meeting, as contained in annex I to the present document. The full updated Agreement will be appended to the final report of the 93rd meeting.

Conclusion

17. The Government of Grenada has established the MEPS and energy efficiency labelling standards for RAC appliances and is implementing stage II of the HPMP to phase out HCFCs. The project was submitted in line with decisions 89/6 and 92/22 and address the barriers for adoption of low-GWP technology while maintaining the energy efficiency in the servicing sector. The demonstration of R-290 technology in residential AC and light commercial refrigeration sector will provide an opportunity for the industry, technicians and end-users to get familiar with the technology and understand the safety risk, support the capacity building of servicing technicians in handling flammable refrigerants. The information collected on energy efficiency of the demonstrated units will help raise awareness on the benefit of using high energy efficiency appliances. The awareness and training activities planned in the project will further support the country's transition to low-GWP alternatives when phasing out HCFCs.

RECOMMENDATION

18. The Fund Secretariat recommends blanket approval of the funding request for additional activities for the introduction of alternatives to HCFCs with low- or zero-global-warming-potential and for maintaining energy efficiency in the refrigeration and air-conditioning servicing sector for Grenada, and the corresponding 2024–2025 implementation plan, at the funding level shown in the table below, on the understanding that the Fund Secretariat has updated the Agreement between the Government of Grenada and the Executive Committee, as contained in annex I to the present document, specifically: Appendix 2-A, based on the inclusion of funding for additional activities to maintain energy efficiency in the refrigeration servicing sector referred to in paragraph 18 above; and paragraph 17 that has been added to indicate that the updated Agreement supersedes that reached at the 90th meeting.

	Project title	Project funding (US $)	Support costs (US $)	Implementing agency
(a)	Additional activities for the introduction of alternatives to HCFCs with low or zero global-warming potential and for maintaining energy efficiency in the refrigeration servicing sector	100,000	6,358	UNIDO

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Grenada

(I) PROJECT TITLE	AGENCY
Kigali HFC implementation plan (stage I)	UNEP (lead), UNDP

(II) LATEST ARTICLE 7 DATA (Annex F)	Year: 2022	13.15 mt	29,700 CO_2-eq tonnes

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (CO_2-eq tonnes)									Year: 2022
Chemical	Aerosol	Foam	Firefighting	AC and refrigeration			Solvent	Other	Total sector consumption
				Manufacturing		Servicing			
				AC	Other				
HFC-32						101			101
HFC-134a						5,591			5,591
HFC-245fa						10			10
R-404A						10,667			10,667
R-407C						603			603
R-410A						12,045			12,045
R-422D						682			682

(IV) AVERAGE 2020-2022 HFC CONSUMPTION IN SERVICING	15.76 mt	35,056 CO_2-eq tonnes

(V) CONSUMPTION DATA (CO_2-eq tonnes)			
Baseline: average 2020-2022 HFC consumption plus 65% of HCFC baseline	52,815	Starting point for sustained aggregate reductions	[n/a]*
CONSUMPTION ELIGIBLE FOR FUNDING			
Already approved	0	Remaining	[n/a]*

* For countries with average 2020-2022 HFC consumption in servicing only and below 360 mt.

(VI) ENDORSED BUSINESS PLAN		2023	2024	2025	Total
UNEP	HFC phase-down (CO_2-eq tonnes)	0	0	0	0
	Funding (US $)	27,883	0	0	27,883
UNDP	HFC phase-down (CO_2-eq tonnes)	0	0	0	0
	Funding (US $)	140,580	0	0	140,580

(VII) PROJECT DATA			2023	2024-2026	2027	2028	2029	2030	Total
Consumption (CO_2-eq tonnes)	Montreal Protocol limits		n/a	52,815	52,815	52,815	47,534	47,534	n/a
	Maximum allowable		n/a	52,815	52,815	52,815	47,534	47,534	n/a
Amounts requested in principle (US $)	UNEP	Project costs	42,830	0	28,670	0	0	16,342	87,842
		Support costs	5,568	0	3,727	0	0	2,124	11,419
	UNDP	Project costs	29,670	0	27,488	0	0	0	57,158
		Support costs	2,670	0	2,474	0	0	0	5,144
Amounts recommended in principle (US $)	Total project costs		72,500	0	56,158	0	0	16,342	145,000
	Total support costs		8,238	0	6,201	0	0	2,124	16,563
	Total funds		80,738	0	62,359	0	0	18,466	161,563

(VIII) Request for approval of funding for the first tranche (2023)		
Implementing agency	**Funds recommended (US $)**	**Support costs (US $)**
UNEP	42,830	5,568
UNDP	29,670	2,670
Total	72,500	8,238

Secretariat's recommendation:	Individual consideration – all technical and cost issues resolved

PROJECT DESCRIPTION

19. On behalf of the Government of Grenada, UNEP as the lead implementing agency has submitted a request for stage I of the Kigali HFC implementation plan (KIP), at a total cost of US $161,563, consisting of US $87,842, plus agency support costs of US $11,419 for UNEP and US $57,158, plus agency support costs of US $5,144 for UNDP, as originally submitted.[4]

20. The implementation of stage I of the KIP will assist Grenada in meeting the target of 10 per cent reduction from its HFC baseline consumption by 1 January 2029.

21. The first tranche of stage I of the KIP being requested at this meeting amounts to US $68,900, consisting of US $42,000, plus agency support costs of US $5,460 for UNEP, and US $19,670, plus agency support costs of US $1,770 for UNDP, as originally submitted, for the period from January 2024 to December 2026.

Background

22. Grenada has ratified all the amendments to the Montreal Protocol, including the Kigali Amendment on 29 May 2018. Grenada has an HCFC consumption baseline of 0.83 ODP tonnes or 15.09 metric tonnes (mt) and is set to completely phase out consumption of HCFCs by 1 January 2030.[5]

Status of implementation of the HCFC phase-out management plan

23. Stage I of the HCFC phase-out management plan (HPMP) for Grenada was originally approved at the 62nd meeting[6] and revised at the 77th meeting[7] to meet the 54 per cent reduction from the baseline and 35 per cent reduction from the starting point for aggregate reduction in consumption by 2020, resulting in the phase-out of 0.20 ODP tonnes of HCFCs, at a total cost of US $210,000 plus agency support costs.

24. Stage II of the HPMP for Grenada was approved at the 90th meeting[8] to reduce HCFC consumption by 77 per cent of the baseline by 2025 and 100 per cent from the baseline by 2030, at a total cost of US $377,500 plus agency support costs. Stage II of the HPMP will be completed by December 2031, as stipulated in the Agreement between the Government of Grenada and the Executive Committee.

Status of implementation of HFC-related activities

25. At its 75th meeting, the Executive Committee approved US $40,000 for Grenada to conduct a survey on ODS alternatives. The project was completed in September 2017. The survey indicated that four HFCs (HFC-134a, R-410A, R-404A and R-407C) had been identified as refrigerants to replace HCFCs in the refrigeration and air-conditioning (RAC) sector (including mobile air-conditioning (MAC)) and that the consumption of HFC-134a and R-410A was growing rapidly. Natural refrigerants (R-600a and R-717) have been introduced into the country as alternatives to HCFCs with limited use.

26. At the 81st meeting, Grenada received funding to implement the enabling activities for HFC phase-down (US $50,000), which was completed in July 2020. These activities assisted the country *inter alia* in ratifying the Kigali Amendment in 2018; establishing the operational licensing and quota system for HFCs (including blends); reporting the import and export of HFCs under Article 7 of the

[4] As per the letter of 11 August 2023 from the Ministry of Climate Resilience, the Environment and Renewable Energy of Grenada to the Secretariat.
[5] Except for those HCFCs allowed for a servicing tail between 2030 and 2040, where required, consistent with the provisions of the Montreal Protocol.
[6] Decision 62/43
[7] Annex XXV of UNDP/OzL.Pro/ExCom/77/76
[8] Decision 90/38

Montreal Protocol; facilitating coordination among stakeholders; creating awareness among and building the capacity of the national ozone unit (NOU), stakeholders, the servicing sector and end-users; identifying the barriers and opportunities for introducing low-GWP alternatives and improving energy efficiency; and reviewing regulations and preparing a national strategy for implementation of the Kigali Amendment.

Stage I of the Kigali HFC implementation plan

Policy, regulatory and institutional frameworks

27. The Ministry of Climate Resilience, the Environment and Renewable Energy is the national body responsible for the implementation of the Montreal Protocol and its Amendments in Grenada. It also manages energy-efficiency-related matters and is driving the process for the adoption of the minimum energy performance standards (MEPS). The NOU, established under the Ministry, is responsible for implementing all projects and activities related to the Montreal Protocol.

28. The Government is developing the Montreal Protocol Controlled Substance Act (the ODS Act) to further strengthen the regulatory framework for the phase-out/phase-down of substances controlled under the Montreal Protocol. The ODS Act covers the storage, transport, processing, disposal, resale, recovery, recycling, and reuse of all controlled substances, including HFCs, and features a ban on the import of HCFC-based equipment; a ban on the import of HFC-based domestic refrigerators with refrigerants that have a global warming potential (GWP) greater than 150; and a ban on the import of unitary air-conditioning (AC) units (capacity up to 24,000 British Thermal Unit (BTU)) with refrigerants that have a GWP greater than 750. The Government is considering a differentiated tax scheme to promote energy-efficient RAC equipment and low-GWP alternatives to HCFCs. The Act is expected to be finalized by the end of 2023. The Government of Grenada has established an operational licensing and quota system under the Supplies Control Regulation that controls the import and export of controlled substances under the Montreal Protocol, including HFCs.

29. The following standards have been adopted: labelling of refrigerant containers (GDS 135:2016); a code of practice for the safe use, handling, storage and transportation of refrigerants, including flammable refrigerants (GDS139:2018); MEPS for RAC appliances; and energy efficiency building codes and building performance standards issued by the Organisation of Eastern Caribbean States.

HFC consumption

30. Grenada only imports HFCs for use in the servicing sector. In 2022, Grenada consumed R-410A (40.6 per cent of total HFC consumption in CO_2-equivalent tonnes), R-404A (36.0 per cent), HFC-134a (18.8 per cent), and other HFCs (4.6 per cent). Table 2 presents the country's HFC consumption as reported under Article 7 to the Ozone Secretariat.

Table 2. HFC consumption in Grenada (2019–2022 Article 7 data)

HFC	GWP	2019	2020	2021	2022	Share of HFC consumption in 2022 (%)
mt						
HFC-32	675	0.30	0.00	0.55	0.15	1.1
HFC-134a	1,430	4.32	5.94	6.68	3.91	29.8
HFC-245fa	1,030	0.00	0.00	0.00	0.01	0.1
R-404A	3,922	2.39	2.81	4.49	2.72	20.7
R-407C	1,774	0.11	0.17	0.28	0.34	2.5
R-410A	2,088	6.31	5.84	7.26	5.77	44.0
R-422B	2,526	0.00	0.00	0.11	0.00	0.0
R-422D	2,729	0.06	0.00	0.00	0.25	1.9
Total (mt)		**13.49**	**14.76**	**19.37**	**13.15**	**100.0**

HFC	GWP	2019	2020	2021	2022	Share of HFC consumption in 2022 (%)
CO_2-eq tonnes						
HFC-32	675	203	0	371	101	0.3
HFC-134a	1,430	6,178	8,494	9,552	5,591	18.8
HFC-245fa	1,030	0	0	0	10	0.0
R-404A	3,922	9,373	11,020	17,608	10,667	36.0
R-407C	1,774	195	302	497	603	2.0
R-410A	2,088	13,172	12,191	15,155	12,045	40.6
R-422B	2,526	0	0	278	0	0.0
R-422D	2,729	156	0	0	682	2.3
Total (CO_2-eq tonnes)		**29,276**	**32,006**	**43,461**	**29,700**	**100.0**

31. HFC consumption has been steadily increasing along with the HCFC phase-out. The decrease of HFC consumption in 2022 was explained by the effects of the global COVID-19 pandemic and reduced economic activity, and also attributed partially to the use of stock from 2021 imports. The HFCs imported in 2023 so far indicate that HFC imports in 2023 will surpass the numbers for 2021 and 2022. It is expected that HFC consumption will continue to increase under the business-as-usual scenario owing to the continued HCFC phase-out and economic growth.

Country programme implementation report

32. The Government of Grenada originally reported HFC sector consumption data in the 2022 country programme (CP) implementation report that was slightly (0.03 mt, or 57 CO_2-eq tonnes) lower than the data reported under Article 7 of the Montreal Protocol due to the calculations related to HFC-134a. The CP data has been revised.

HFC distribution by sector

33. HFCs are mainly consumed for servicing in residential AC (32 per cent in mt and 29 per cent in CO_2-eq tonnes) and in industrial and transport refrigeration (17 per cent in mt and 26 per cent in CO_2-eq tonnes), followed by commercial AC (17 per cent in mt and 16 per cent in CO_2-eq tonnes), commercial refrigeration (8 per cent in mt and 13 per cent in CO_2-eq tonnes) and the MAC subsector (15 per cent in mt and 9 per cent in CO_2-eq tonnes), as shown in table 3.

Table 3. HFC consumption in the RAC servicing subsectors (2022)

Subsector	HFC-134a	R-410A	R-404A	R-407C	HFC-32	R-422D	Total	Share of total (%)
mt								
Refrigeration subsectors								
Domestic	1.28	0.00	0.00	0.00	0.00	0.00	1.28	10
Commercial	0.00	0.00	0.95	0.14	0.00	0.00	1.09	8
Industrial and transport	0.52	0.00	1.77	0.00	0.00	0.00	2.29	17
Air-conditioning subsectors								
Domestic	0.00	3.64	0.00	0.20	0.15	0.25	4.24	32
Commercial (centralized system)	0.15	2.13	0.00	0.00	0.00	0.00	2.28	17
Mobile	1.96	0.00	0.00	0.00	0.00	0.00	1.96	15
Total (mt)	**3.91**	**5.77**	**2.72**	**0.34**	**0.15**	**0.25**	**13.14**	**100**
CO_2-eq tonnes								
Refrigeration subsectors								
Domestic	1,830	0	0	0	0	0	1,830	6
Commercial	0	0	3,726	248	0	0	3,974	13
Industrial and transport	744	0	6,941	0	0	0	7,685	26
Air-conditioning subsectors								
Domestic	0	7,599	0	355	101	682	8,737	29

Subsector	HFC-134a	R-410A	R-404A	R-407C	HFC-32	R-422D	Total	Share of total (%)
Commercial (centralized system)	215	4,446	0	0	0	0	4,661	16
Mobile	2,803	0	0	0	0	0	2,803	9
Total (CO_2-eq tonnes)	**5,591**	**12,045**	**10,667**	**603**	**101**	**682**	**29,690**	**100**

Refrigeration and air-conditioning servicing sector

34. There are approximately 200 technicians (including 10 women) and 80 workshops (20 formal and 60 informal) consuming HFCs in the country. Under stage I of the HPMP, a total of 160 technicians have been trained in good servicing practices and the safe handling of flammable refrigerants in general; refresher training for 150 technicians has been planned under stage II.

35. There are two technical and vocational education and training (TVET) institutes in Grenada with an average of 25 RAC students graduating each year. Some equipment has been provided to the training institutions under the HPMP. There are also 16 refrigerant recovery and recycling centres and one reclamation centre which have been supported under the HPMP.

Domestic, commercial, industrial and transport refrigeration servicing

36. Domestic refrigeration applications predominantly use HFC-134a, with a growing number of units based on R-600a. There are approximately 41,000 domestic units currently installed, with anticipated growth to approximately 48,000 installed units. In the commercial refrigeration subsector, there are approximately 214 installed units, with R-404a being the dominant technology. Transport refrigeration mainly relies on HFC-134a.

37. Industrial refrigeration is used primarily in fish processing and bulk storage. This includes ice machines, blast freezers and cold storage equipment. The use and growth of equipment in this sector is expected to remain relatively stable with the replacement of equipment when reaching equipment lifetime. R-404A is the dominant technology in the subsector.

Residential and commercial air-conditioning servicing

38. The main refrigerants used in the sector include R-410A, HFC-32, R-290, R-407C and HFC-134a. Based on the survey conducted during KIP preparation, for the period from 2018 to 2021, 75 per cent of the AC equipment imported into the country are based on R-410A, 16 per cent on HFC-32 and 9 per cent on R-290. AC units using R-290 and HFC-32 are small split units with a capacity ranging from 12,000 to 36,000 BTU, while R-410A is used in a variety of products including the ducted and packaged AC units. HFC-134a and R-407C are used in chillers installed in large commercial and public buildings, such as hospitals, resorts, malls and universities.

Mobile air-conditioning servicing

39. The MAC sector mainly uses HFC-134a, with limited use of R-1234yf. The survey conducted during preparation of the KIP indicated that three local suppliers are supplying R-1234yf refrigerant, and a total of 106 R-1234yf-based cars have been imported. The sector is expected to grow at a rate of 5 per cent per year with HFC-134a continuing to dominate the market with HFOs being present.

Phase-down strategy for stage I of the Kigali HFC implementation plan

Overarching strategy

40. Grenada is proposing four stages for implementation of the KIP following the Montreal Protocol schedule for HFC phase-down. Stage I is proposed to be implemented simultaneously with the HPMP until 2030. Stage II is expected to cover a period of six years (from 2030 to 2035), stage III six years from 2035 to 2040, and stage IV six years from 2040 to 2045.

Established HFC baseline and proposed reductions

41. The Government of Grenada reported its Article 7 data for 2020–2022. By adding 65 per cent of the HCFC baseline (in CO_2-eq tonnes) to the average 2020–2022 HFC consumption, the established HFC baseline is 52,815 CO_2-eq tonnes, as shown in table 4.

Table 4. HFC baseline for Grenada (CO_2-eq tonnes)

Baseline calculation	2020	2021	2022
HFC annual consumption	32,006	43,461	29,700
HFC average consumption 2020-2022			35,056
HCFC baseline (65%)			17,759
HFC baseline			**52,815**

42. Under the unconstrained scenario, the Government of Grenada and UNEP projected HFC consumption based on an annual average economic growth of 6 per cent. The estimated consumption in 2023 is based on average HFC consumption in 2020-2022. In addition, the phase-out of 2.34 mt of HCFC-22 will result in the phase-in of 4,240 CO_2-eq tonnes of HFCs by 2030. Assuming equal distribution in CO_2-eq tonnes each year from 2024-2030, the annual increase in HFC consumption from HCFC phase-out would be 606 CO_2-eq tonnes. Table 5 shows the calculated overall increase in HFC consumption under the business-as-usual scenario.

Table 5. Unconstrained scenario of HFC consumption forecast and the required reductions (CO_2-eq tonnes)

	2022*	2023**	2024	2025	2026	2027	2028	2029	2030
HFC consumption growing at an annual rate of 6 per cent	29,700	43,461	46,069	48,833	51,763	54,869	58,161	61,650	52,711
HFC phased in from HCFC phase-out	0	0	606	606	606	606	606	606	606
Total HFC estimated consumption	29,700	43,461	46,674	49,439	52,368	55,474	58,766	62,256	65,955
Montreal Protocol consumption limits	n/a	n/a	52,815	52,815	52,815	52,815	52,815	47,534	47,534
Required HFC reductions	n/a	n/a	0	0	0	2,659	5,951	14,722	18,422

* Article 7 data.
** Estimated based on the 2023 imports to date.

43. Table 5 shows that in the business-as-usual scenario, Grenada is expected to be in compliance from 2024 to 2026. However, without any action, HFC consumption with the import of HFC-based equipment, mainly in the residential AC and commercial, industrial and transport refrigeration subsectors, would continue to grow, and exceed the Montreal Protocol control target in 2027. In light of this, stage I of the KIP is being proposed to control the growth of HFCs, and ensure that HFC consumption remains lower than the Montreal Protocol limits throughout stage I and lay a foundation for sustained HFC reduction in

future stages. The Government proposes to follow the Montreal Protocol control target to phase down HFCs in stage I of the KIP.

Proposed activities

44. The overall HFC phase-down strategy for stage I of the KIP is built upon the activities of the HPMP. It focuses on policy and legislation to control the import of HFCs; promoting market uptake of low-GWP technologies and energy-efficient RAC equipment through import controls; capacity-building in handling flammable refrigerants; and refrigerant recovery, recycling and leakage reduction to reduce refrigerant demand. The following activities are proposed:

(a) Policy and legislation to control import and export of HFCs: Reviewing and updating policy and regulations, safety standards, and codes for handling flammable refrigerants; and implementing the licensing and quota system for HFCs including mandatory reporting by HFC importers (UNEP) (US $10,000);

(b) Customs capacity-building: Reviewing and updating customs training modules to include HFCs; adoption of 2022 Harmonized Systems (HS) codes; training 30 customs officers and 15 customs brokers in identifying controlled substances using the correct HS codes including HFCs, preventing illegal trade, and data recording; and training 15 importers in the safe handling, transportation, storage and disposal of flammable refrigerants (UNEP) (US $16,000);

(c) Capacity-building for RAC technicians: Providing training to 45 technicians on the use of low-GWP alternatives and on maintaining and enhancing the energy efficiency of RAC equipment; training 16 technicians under the pilot project of AHRI[9] and UNEP to obtain the "refrigerant driver's licence" based on competency in the safe handling of refrigerants; implementing a mandatory national technician certification scheme; and certifying 24 technicians (UNEP) (US $28,000);

(d) Refrigerant recovery and recycling and procurement of equipment: Procurement of equipment and tools for two training institutions,[10] technicians, students of TVET and for refrigerant recovery, recycling and reclamation[11] (UNDP) (US $57,158);

(e) Strengthening the RAC Association: Employing a consultant to review its constitution and functions, and supporting its restructuring in order to transform it into an active supporting partner for implementation of the KIP (UNEP) (US $7,000);

(f) Public awareness: Outreach activities through print media, seminars, radio and TV interviews, and visits to schools and interest groups on HFC phase-down, the adoption of low-GWP technologies, and using energy-efficient appliances (UNEP) (US $15,842); and

(g) Gender mainstreaming: Conducting a training workshop on good servicing practices and on handling low-GWP alternative technologies specifically for 13 female technicians, collecting data on gender mainstreaming activities, and promoting female technicians as role models (UNEP) (US $7,000).

[9] Air-Conditioning, Heating, and Refrigeration Institute.

[10] R-290 training units, R-600a domestic refrigerator inverter training system, R-290 commercial refrigeration training unit, R-290 monoblock cold room training unit, leak detector.

[11] E.g., reclamation unit, refrigerant recovery system with ball valve hoses, recycling system, recovery cylinders, vacuum pumps, scales, leak detector.

Project implementation, coordination, and monitoring

45. Project monitoring, coordination and reporting will be conducted at a total cost of US $4,000 for establishing a monitoring mechanism (US $2,000) and for preparing reports (US $2,000).

Gender policy implementation

46. The Government of Grenada has been recognizing the importance of gender equality and women's empowerment and has developed a 2014–2024 Gender Equality Policy and Action Plan that aims at promoting equality between women and men and understanding differentiated needs. In line with decisions 84/92(d), 90/48(c), and 92/40(b), stage I of the KIP will incorporate a gender mainstreaming element into all activities. Activities will include continuous monitoring of gender-mainstreaming improvements by collecting sex-disaggregated data, providing incentives for women to participate in the RAC sector by granting scholarships to female students, holding a capacity-building workshop for women only and implementing public awareness campaigns targeted at female technicians. In addition, female technicians will share their experiences as role models during visits and in the media under the public outreach activities of the KIP. The NOU plans to collaborate with the Department of Gender Affairs in creating a partnership to promote women in science, technology, engineering and mathematics.

Total cost of stage I of the Kigali HFC implementation plan

47. The budget for implementing stage I of the KIP has been established at US $145,000 in line with decision 92/37. The proposed activities and cost breakdown are summarized in paragraphs 44 to 45.

Coordination of activities in the servicing sector under the HCFC phase-out and HFC phase-down plans

48. Stage I of the KIP will be implemented in three tranches. The funding schedule and commitments of HFC phase-down and HCFC phase-out, and the activities and associated cost of stage I of the KIP and stage II of the HPMP, are presented in annexes II and III to the present document.

Implementation plan for the first tranche of stage I of the Kigali HFC implementation plan

49. The first funding tranche of stage I of the KIP, in the total amount of US $61,670, will be implemented between January 2024 and December 2026 and will include the following activities:

(a) Policy and legislation to control imports of HFCs: Reviewing and updating customs training modules to include HFCs; and training of 14 customs officers, seven customs brokers, and 15 importers (UNEP) (US $9,000);

(b) Capacity-building for RAC technicians: Providing training to 15 technicians on the use of low-GWP alternatives and on maintaining and enhancing the energy efficiency of RAC equipment; training eight technicians to obtain the "refrigerant driver's licence" based on competency in the safe handling of refrigerants; establishing a national certification scheme; and certifying 12 technicians (UNEP) (US $15,500);

(c) Refrigerant recovery and recycling and procurement of equipment: Procurement of equipment and tools for two training institutions (R-290 AC training units, R-600a domestic refrigerator inverter training system, R-290 commercial refrigeration training unit, R-290 monoblock cold room training unit, leak detector); and provision of tools to students of TVET (UNDP) (US $19,670);

(d) Strengthening the RAC Association: Employing a consultant to review its constitution and functions, initial consultation for RAC Association restructuring (UNEP) (US $5,000);

(e) Public awareness: Outreach activities (print media, seminars, radio and TV interviews, and visits to schools and interest groups) to raise awareness for HFC phase-down, and the development of multimedia material (documentaries, jingles) (UNEP) (US $7,000);

(f) Gender mainstreaming: Conducting a training workshop on good servicing practices and on handling low-GWP alternative technologies specifically for 13 female technicians; and a public-awareness activity to promote female technicians as role models (UNEP) (US $3,000); and

(g) Project monitoring, coordination and reporting at a total cost of US $2,500 for monitoring activities under the KIP (US $2,000) and for preparing reports (US $500).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

50. The Secretariat reviewed stage I of the KIP for Grenada in light of the existing policies and guidelines of the Multilateral Fund, including decision 92/37,[12] stage II of the HPMP, and the 2023–2025 business plan of the Multilateral Fund.

HFC consumption and the control targets in stage I

51. The Secretariat noted that, although the particularly low consumption in 2022 may not be representative, the estimated consumption in 2023 is still 18 per cent lower than the baseline, and therefore enquired about whether lower targets than the Montreal Protocol phase-down schedule could be committed for the period of 2024 to 2029. UNEP explained that the Government would like to take a very precautionary approach for setting the targets for stage I of the KIP for the following reasons: the low-GWP alternative technology needed for HFC phase-down is not available or accessible for all RAC applications at the moment; the country has already experienced increased consumption in 2023 as compared to the baseline years and this trend may continue in the coming years, which would put additional pressure on the country to meet the baseline and Montreal Protocol control target in 2029; and there is insufficient funding for undertaking more ambitious intermediate reduction steps. However, the Government would make the best effort to control HFCs and review this situation in the next year or two, and then decide on any alternative actions to the implementation of the Kigali Amendment.

Policy, regulatory and institutional frameworks

HFC licensing and quota system

52. Decision 87/50(g) requests the bilateral and implementing agencies, when submitting stage I of the KIPs, to include confirmation that the country has an established and enforceable national system of licensing and quotas for monitoring HFC imports/exports in place, consistent with decision 63/17. Accordingly, the Government of Grenada has established a licensing system for HFCs and blends. The national quota for 2024 will be set in accordance with the Montreal Protocol.

Technical and cost-related issues

53. The Secretariat noted that additional equipment is planned for refrigerant recovery, recycling and reclamation and enquired about the progress in establishing a refrigerant reclamation centre approved under the HPMP. UNDP reported that the centre has been established; but some equipment is to be provided and the training of operators will still need to be conducted. The remaining equipment is currently under

[12] Level and modalities of funding for HFC phase-down in the refrigeration servicing sector.

procurement by UNIDO and the training of operators has been planned for later this year. The centre is expected to be in full operation after completion of these activities. It was further clarified that the additional equipment planned under the KIP is for training institutions and tools for technicians to support capacity development in refrigerant recovery and recycling.

54. With regard to the training on good servicing practices and handling low-GWP alternative technologies specifically for female technicians, UNEP clarified that the course design is planned to be more tailored to women and will create an enabling learning environment to ensure an effective transfer of skills to female technicians. A female HVAC instructor will conduct the training.

Tranche distribution

55. The funding tranches under the KIP were originally planned in 2023, 2026 and 2029, while the funding tranches in stage II of the HPMP are planned in 2022, 2025, 2027 and 2030. In order to synchronize the tranches under the two multi-year agreements to reduce the administrative cost and workload associated with tranche submissions, the funding tranches under the KIP were adjusted to 2023, 2027 and 2030. The first tranche was increased to 72,500 (50 per cent) considering the four years of implementation, and includes US $20,000 for purchasing equipment. After this adjustment, the total number of tranches to be requested for stage I of the KIP and stage II of the HPMP will be reduced from six to four tranches.

Impact on the climate

56. The activities planned by Grenada, including its efforts to promote low-GWP alternatives, training of technicians in good servicing practices, and the recovery and reuse of refrigerants, indicate that the implementation of stage I of the KIP will reduce the emission of HFCs into the atmosphere, resulting in climate benefits. A calculation of the impact on the climate of the activities in the KIP indicates that Grenada will achieve an annual emission reduction of 5,282 CO_2-eq tonnes of HFCs when the final target in stage I of the KIP is achieved, calculated based on the difference between the HFC baseline and the final target set in stage I.

Sustainability of the HFC phase-down and assessment of risks

57. The NOU has established important partnerships with various institutions that will ensure continuation of the project. The Montreal Protocol-related issues have been included in the curriculum for training customs officers and will continue to be an integral part of customs capacity development. The NOU has built a strong partnership with the national training institutions and has helped update their curriculum. Local training institutes have also received support from the NOU to update their curriculum. The NOU collaborated with Marryshow Community College in capacity development, and upgraded its facilities (HVAC laboratory and classroom for technician training) to support a sustainable approach to developing the capacity of local technicians.

58. The lack of adequate training and tools for handling natural refrigerants that are flammable, toxic, and under high pressure could form a potential risk for the smooth transition to low-GWP technologies. To address this, activities including training, mandatory certification of technicians, support to training institutions, and the provision of tools and equipment have been planned in stage I of the KIP.

Co-financing

59. Co-financing will be provided through the Government's in-kind contributions to implementation, including office space, utilities, communication, and administrative support. The Government and implementing agencies will continue to explore other opportunities for co-financing during the implementation of the KIP.

2023–2025 business plan of the Multilateral Fund

60. UNEP and UNDP are requesting US $145,000, plus agency support costs, for the implementation of stage I of the KIP for Grenada. The total value of US $80,738, including agency support costs, requested for the period 2023–2025, is US $87,725 below the amount in the business plan.

Draft Agreement

61. A draft Agreement between the Government of Grenada and the Executive Committee for stage I of the KIP has not been prepared as the Agreement template is still under consideration by the Executive Committee.

62. If the Executive Committee so wishes, the funds for stage I of the KIP for Grenada could be approved in principle, and funds for the first tranche could be approved on the understanding that the Agreement would be prepared and presented at a future meeting, before the submission of the second tranche, and once the Agreement template has been approved.

RECOMMENDATION

63. The Executive Committee may wish to consider:

(a) Approving, in principle, stage I of the Kigali HFC implementation plan (KIP) for Grenada for the period 2023–2030 to reduce HFC consumption by 10 per cent of the country's baseline in 2029, in the amount of US $161,563, consisting of US $87,842, plus agency support costs of US $11,419 for UNEP, and US $57,158, plus agency support costs of US $5,144 for UNDP, as reflected in the schedule contained in annex II to the present document;

(b) Approving the first tranche of stage I of the KIP for Grenada, and the corresponding tranche implementation plan, in the amount of US $80,738, consisting of US $42,830, plus agency support costs of US $5,568 for UNEP, and US $29,670, plus agency support costs of US $2,670 for UNDP; and

(c) Requesting the Government of Grenada, UNEP, UNDP and the Secretariat to finalize the draft Agreement between the Government of Grenada and the Executive Committee for the reduction in consumption of HFCs, including the information contained in the annex referred to in subparagraph (a) above, and to submit it to a future meeting once the KIP Agreement template has been approved by the Executive Committee.

Annex I

TEXT TO BE INCLUDED IN THE UPDATED AGREEMENT BETWEEN THE GOVERNMENT OF GRENADA AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN

(Relevant changes are in bold font for ease of reference)

17. **This updated Agreement supersedes the Agreement reached between the Government of Grenada and the Executive Committee at the 90th Executive Committee meeting.**

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2022	2023-2024	2025	2026	2027	2028-2029	2030	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	0.54	0.54	0.27	0.27	0.27	0.27	0	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	0.38	0.38	0.19	0.19	0.19	0.19	0	n/a
2.1	Lead IA (UNEP) agreed funding (US $)	111,000	0	39,700	0	51,400	0	24,400	226,500
2.2	Support costs for Lead IA (US $)	14,430	0	5,161	0	6,682	0	3,172	29,445
2.3	Cooperating IA (UNIDO) agreed funding (US $)	61,000	**100,000**	12,300	0	60,500	0	17,200	**251,000**
2.4	Support costs for Cooperating IA (US $)	5,490	**6,358**	**782**	0	**3,847**	0	**1,093**	**17,570**
3.1	Total agreed funding (US $)	172,000	**100,000**	52,000	0	111,900	0	41,600	**477,500**
3.2	Total support costs (US $)	19,920	**6,358**	**5,943**	0	**10,529**	0	**4,265**	**47,015**
3.3	Total agreed costs (US $)	191,920	**106,358**	**57,943**	0	**122,429**	0	**45,865**	**524,515**
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this agreement (ODP tonnes)								0.38
4.1.2	Phase-out of HCFC-22 to be achieved in the previous stage (ODP tonnes)								0.2
4.1.3	Remaining eligible consumption for HCFC-22								0

Annex II

SCHEDULE OF HFC PHASE-DOWN AND HCFC PHASE-OUT COMMITMENTS AND FUNDING TRANCHES UNDER THE KIGALI HFC IMPLEMENTATION PLAN AND THE HCFC PHASE-OUT MANAGEMENT PLAN FOR GRENADA

Kigali HFC implementation plan (stage I)

Row	Particulars	2023	2024	2025	2026	2027	2028	2029	2030	Total
1.1	Montreal Protocol reduction schedule of Annex F substances (CO_2-eq tonnes)	n/a	52,815	52,815	52,815	52,815	52,815	47,534	47,534	n/a
1.2	Maximum allowable total consumption of Annex F substances (CO_2-eq tonnes)	n/a	52,815	52,815	52,815	52,815	52,815	47,534	47,534	n/a
2.1	Lead IA (UNEP) agreed funding (US $)	42,830	0	0	0	28,670	0	0	16,342	87,842
2.2	Support costs for Lead IA (US $)	5,568	0	0	0	3,727	0	0	2,124	11,419
2.3	Cooperating IA (UNDP) agreed funding (US $)	29,670	0	0	0	27,488	0	0	0	57,158
2.4	Support costs for Cooperating IA (US $)	2,670	0	0	0	2,474	0	0	0	5,144
3.1	Total agreed funding (US $)	72,500	0	0	0	56,158	0	0	16,342	145,000
3.2	Total support costs (US $)	8,238	0	0	0	6,201	0	0	2,124	16,563
3.3	Total agreed costs (US $)	80,738	0	0	0	62,359	0	0	18,466	161,563

HCFC phase-out management plan (stage II)

Row	Particulars	2022	2023-2024	2025	2026	2027	2028-2029	2030	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	0.54	0.54	0.27	0.27	0.27	0.27	0.00	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	0.38	0.38	0.19	0.19	0.19	0.19	0.00	n/a
2.1	Lead IA (UNEP) agreed funding (US $)	111,000	0	39,700	0	51,400	0	24,400	226,500
2.2	Support costs for Lead IA (US $)	14,430	0	5,161	0	6,682	0	3,172	29,445
2.3	Cooperating IA (UNIDO) agreed funding (US $)	61,000	0	12,300	0	60,500	0	17,200	151,000
2.4	Support costs for Cooperating IA (US $)	5,490	0	1,107	0	5,445	0	1,548	13,590
3.1	Total agreed funding (US $)	172,000	0	52,000	0	111,900	0	41,600	377,500
3.2	Total support costs (US $)	19,920	0	6,268	0	12,127	0	4,720	43,035
3.3	Total agreed costs (US $)	191,920	0	58,268	0	124,027	0	46,320	420,535

Annex III

IMPLEMENTATION OF BOTH THE HCFC PHASE-OUT MANAGEMENT PLAN AND THE KIGALI HFC IMPLEMENTATION PLAN IN GRENADA

Category of activity	HCFC phase-out management plan (HPMP) – stage II			Kigali HFC implementation plan (KIP) – stage I		Combined HPMP+KIP (US $)
	Activity	Cost (US $)		Activity	Cost (US $)	
Supporting associations				RAC association re-organization and review of RAC association constitution	7,000	7,000
Training of RAC technicians	Training and re-training 200 technicians in good servicing practices and in servicing RAC equipment with alternative refrigerants; scholarships for two female students at tertiary institutions	28,900		Training 45 technicians in low-GWP alternatives and issues related to energy efficiency; training 16 technicians to obtain the "refrigerant driver's licence"	21,000	49,900
Training on HVAC design	Training 15 technicians, architects, and engineers in the design of HVAC systems at large facilities	12,000				12,000
Support to centres of excellence	Providing tools and equipment to training institutions and establishing a refrigerant recovery and reclamation centre	151,000		Provision of tools to support recovery activities, equipment to training institutions and technicians and support to students of TVET	57,158	208,158
Support to tertiary institutions	Review of HVAC curriculum	10,000				10,000
Certification of technicians	Initiation of national certification system for RAC technicians	10,000		Full establishment of the national certification scheme (mandatory)	7,000	17,000
Training of customs officers	Training of 100 customs officers and 12 brokers, annual training of 10 importers on HCFC import control	41,800		Training of 30 customs officers, 15 brokers and 15 importers in the safe handling of flammable refrigerants; updating training curricula and modules	16,000	57,800
Standards and other policy measures	Development of policy and standards	18,000		Review and update of policy and regulations, including licensing and quota system, standards and codes	10,000	28,000
Awareness	Awareness-raising and information dissemination activities on HCFC phase-out	74,000		Awareness-raising activities on HFC phase-down, energy efficiency issues and the adoption of low-GWP technologies	15,842	89,842
Project coordination	Project coordination, monitoring and reporting	31,800		Strengthening of the monitoring mechanism and preparation of reports	4,000	35,800

Gender mainstreaming				Capacity-building workshops for female technicians and public-awareness campaign	7,000	**7,000**
Total		**377,500**			**145,000**	**522,500**
Percentage of total		**72**			**28**	**100**