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Final

Midterm Review Report

UNDP-supported, GEF-financed Full-size Project:
Energy Efficiency through the Development of Low-carbon RAC Technologies in Trinidad and Tobago

(GEF Project ID: 9789, UNDP PIMS ID: 5957)

GEF Focal Area: Climate Change

MTR Timeframe: (October 2022 – February 2023)

MTR Team: William Kwan (International Consultant)

Final: 22 May 2023

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ACKNOWLEDGEMENTS

The Midterm Review (MTR) International Consultant wishes to extend his special thanks to all individuals and organizations who made themselves available for discussions and interviews (both in-person, fact to fact and also virtually) during the course of the MTR duration, in particular during the MTR mission that took place 12 - 20 December 2022, and values their continuous cooperation and assistance during subsequent contacts for clarifications and/or additional information. The Reviewer is particularly grateful for the many open and frank discussions, and their willingness and readiness to provide comments and suggestions to see the success of the project.

The International Consultant also likes to extend his special appreciation to members of the Project Management Unit (PMU) for their special efforts in collecting and providing all the relevant documents for the documents review phase, prior to the MTR mission. This has facilitated tremendously towards understanding the project under review, and be familiar with the project objectives, coordination facilitated and progress made on implementing the project activities up to the commencement of the Midterm Review. The Reviewer is grateful to the Ministry of Planning and Development (MPD), the PMU Team, the United Nations Development Programme (UNDP) Trinidad and Tobago Country Office and the UNDP Nature, Climate and Energy Panama Regional Hub Team for their cooperation in finalizing and arranging a well-organized schedule for the MTR mission, covering a full spectrum and well represented key stakeholders, project partners and project beneficiaries for discussions and interviews, all these actions are instrumental in facilitating an efficient and thorough evaluation mission.

Midterm Review
William Kwan (International Consultant)

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ACRONYMS AND ABBREVIATIONS

APR	Annual Project Report
AWP	Annual Work Plan
CEO	(GEF) Chief Executive Office
CO	Country Office
DCS	District Cooling Services
FSP	Full-size Project
GEF	Global Environment Facility
GHG	Green House Gas
GOTT	Government of Trinidad and Tobago
HCFCs	Hydrochlorofluorocarbons
HFC	Hydrofluorocarbons
IA	Implementing Agencies
IR	Inception Report
IW	Inception Workshop
M&E	Monitoring & Evaluation
MPD	Ministry of Planning and Development
MT	Metric ton
MTR	Midterm Review
NIDCO	National Infrastructural Development Company
NIM	National Implementation Modality
NIP	National Implementation Plan
NOU	National Ozone Unit
ODS	Ozone Depleting Substances
PIMS	UNDP GEF Project Information Management System
PIR	Project Implementation Review
PMU	Project Management Unit
PPG	Project Preparation Grant
ProDoc	Project Document
PSC	Project Steering Committee
RAC	Refrigeration and Air-conditioning
RTA	UNDP Regional Technical Advisor
S&L	Standards and Labelling
TPR	Tripartite Review
TTBS	Trinidad and Tobago Bureau of Standards
TTCO	(UNDP) Trinidad and Tobago Country Office
TTR	Terminal Tripartite Review
UNDP	United Nations Development Programme
UNDP NCS	United Nations Development Programme Natural, Climate and Energy
USD	United States dollars
UTT	University of Trinidad and Tobago

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1. EXECUTIVE SUMMARY

1.1 Basic Project t Information Table

Project Title:	Energy Efficiency through the Development of Low-carbon RAC Technologies in Trinidad and Tobago			
GEF Project ID	9789		*At endorsement (Million US$)*	*At Midterm Review (Million US$)*
UNDP PIMS ID	5957	GEF financing:	**5.15**	**5,15**
Atlas Output ID (formerly UNDP Project ID)	00114399			
Country	Trinidad and Tobago	Government:	2.26	0.82
Region		Private Sector:	16.75	6.84
GEF Focal Area	Climate Change	UNDP	0.10	0.06
FA Objectives (OP/SP)		In-kind (Government, Private Sector, NGO and Farmers):	2.02	0.53
Executing Agency	Ministry of Planning and Development (MPD)	Total Project Cost:	**26.28**	**13.40**
Other Partners Involved		Project Document Signature (Date Project Began)	1 September 2020	
		(Operational) Closing Date:	1 September 2024	

1.2 Project Description

The project entitled "*Energy Efficiency through the Development of Low carbon RAC Technologies in Trinidad and Tobago*" is funded by the Global Environment Facility (GEF), helping the economies transition to a more sustainable future. The project aims to provide a sustained market change for adopting low carbon technologies for the Refrigeration and Air Conditioning (RAC) end use to reduce GHG emissions in the residential and commercial sectors in Trinidad and Tobago. Specifically, the project is designed to increase the availability of low carbon technologies and introduce district cooling systems to improve efficiency levels in energy consumption.

It is expected that the project will provide global environmental benefits in terms of direct emissions savings of at least 450,289 tCO_2e in the 4-year duration of the project, as well as direct post project savings of at least 765,351 tCO_2e and indirect savings in the 20 years of at least 284,693 tCO_2e after project completion. The total lifetime direct and indirect GHG emissions avoided would be 1,500,333 tCO_2e

At CEO Endorsement, the total approved project cost is $26,278,644 with GEF grant of $5,152,392 and co-financing of $21,126,252. The project is implemented under a National Implementation Modality (NIM) with UNDP support. The Ministry of Planning and Development is the Implementing Partner (IP), with support services for payment, procurement, recruitment, and HR administration to be provided by UNDP Trinidad and Tobago Country Office (TTCO).

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The project has three (3) main components: ***Component I:*** Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies; ***Component II.*** Accelerate RAC market transformation towards less energy intensive and low-GWP technologies; and ***Component III.*** Information outreach and Monitoring & Evaluation (M&E) implemented. GEF Chief Executive Officer (CEO) Endorsement for the full-size project was approved on March 3, 2020, however the UNDP Project Document (ProDoc) was not signed until September 2020, delay caused mainly by the impacts on restriction movements imposed by the COVID-19 pandemic situation. Thus the project started implementation only in September 2020, and with project duration of four years, the planned operation completion date of the project will be September 2024.

The expected Outcome from the interventions under the three project components were formulated as follow:

Component I **Outcome 1.1** The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened.

Component II **Outcome 2.1** Investment path along the RAC market chain enhanced;

Outcome 2.2 Investment portfolio on replacement of energy intensive technologies implement

Component III **Outcome 3.1** An information strategy to share knowledge gained, lessons-learned and best practices developed

Outcome 3.2 A Monitoring and Evaluation plan and adaptive management applied in response to needs as per UNDP/GEF Predoc procedures and of its environmental progress and impact indicators, has been designed and implemented

To achieve each Outcome, planned activities were defined in extensive details. The MTR reviewed and evaluated the progress made against these planned activities.

1.3 Project Progress Summary

Commencement of project implementation was delayed until the UNDP Project Document was signed by all parties on 1 September 2020 while CEO Endorsement was approved on 3 March 2020. The delay can be attributed to the COVID-19 pandemic as movements and contacts were restricted during that period. Despite the delay in Project Document signature and subsequent limited movement until February 2022, the Project Team was able to undertake adaptive management to initiated and continue project implementation and has made good progress with significant efforts of the Project Team. Progress made up to MTR can be summarized as follows:

For **Component 1 – Enhance national policy, regulatory and institutional framework for sustainable end-use RAC technologies**, significant results achieved include: legislation review undertaken where energy-efficient design were incorporated into the current building governance framework.; energy-efficient design and passive cooling techniques have been included into the building regulatory framework; Inputs was provided into the National Climate Change Policy to promote market transition towards energy-efficient RAC technologies and the use of low GWP and non-ODS hydrocarbon refrigerants; MEPS was developed and approved at Board level of the Trinidad and Tobago Bureau of Standards (TTBS), supported by EE Labelling for use as voluntary standards with intention to move to compulsory standard; gender amendments to National Cooling Strategy was drafted and circulated to stakeholders and Technical Steering Committee for review; Initial suggestions for fiscal incentives has been drafted; and capacity development within the sector have been achieved through development of the Energy Efficiency on RAC training curriculum focusing initially on Training of Trainers and then targeted training sessions for the technical sector will follow; and public awareness activities were conducted. (Outcome 1.1).

On **Component II - Accelerate RAC market transformation towards less energy intensive and low GWP technologies**, market analysis for RAC replacement initiatives and impacts at national level was initiated; training curriculum outline was completed and approved by sector training entities; the Project has received and initiated distribution of eight (8) hydrocarbon training units to training providers with Training of Trainers; a consultant has finalized the training materials for lending agencies and project developers with the first round of training completed (Outcome 2.1).

However, slight delay was encountered on the two District Cooling pilot project due to COVID-19 pandemic and changes in participants and locations. The two pilot sites were eventually finalized in second half of 2022. Two

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entities, Edan K. Properties Limited will implement the pilot at its Industrial Business Park at Couva, Point Lisas, and TOSL Engineering Limited will implement the pilot at its building and warehouse complex at Marabella. The University of Trinidad and Tobago will establish itself as the Center of excellency for District Cooling training and will provide training in a short course format as well as a module and elective in District Cooling at its Diploma level and BSc Level programs. The District Cooling technical support consultant entity, DEVCCO, completed the Technical Reports and Business Management Reports for the two enterprises on the technical feasibility and financial viability for the pilot project, with Social and Environmental Screening Procedures (SESP) completed for these two pilot sites. DEVCCO concluded that both pilot projects are technically feasible. Memorandum of Agreements (MOAs) were signed in September 2022 with GEF grant of $1.25 million for Edan K. Properties Limited for its Couva site, against DEVCCO's estimated Capital Expenditure (CAPEX) of $2,134,342 and an Annual Operational Expenditure (OPEX) of $18,816, and GEF grant of $075 million to TOSL Engineering Limited against CAPEX of $1,666,000 and OPEX of $77,827. The two participants have now initiated their procurement process for equipment and construction works. Completion dates of installation are estimated at February and May 2024 for TOSL Engineering Limited and Edan K. Properties Limited respectively, depending on how long it will take for the equipment to be manufactured and the shipment from overseas, the project completion date may be slightly delayed (Outcome 2.2).

Furthermore, there are five (5) demonstration sites in the private sector for the early retirement of low-efficiency, light units (split/window) systems, 2 in Tobago and 3 in Trinidad. The Project has received the hydrocarbon RAC equipment, the equipment is being distributed and installation are being arranged (Outcome 2.2, Output2.2.4).

For **Component III, Information Outreach and Monitoring and Evaluation Implemented**, the Project developed a Communication Plan and started its implementation with a series of targeted webinars first hosted since June 2021; the Project Officer of GEF and Montreal Protocol discussed with the developers of the MRV system on upgrades that could be incorporated; a Gender Consultant was engaged and an initial capacity building activity was held in June 2022 with members of PMU and National Ozone Unit attending. However, the Gender Consultant served her contract end of June 2022 only a few months after recruitment. Nonetheless, a second gender workshop was organized in July 2022 with the help of another stakeholder. A monitoring and evaluation plan was developed and implementation of the plan has started., and the project continue to be monitored at the component level. All UNDP and GEF reporting requirements were prepared and delivered on time. Due to the late start and the impact of COVID-19, the first PIR for the period of June 2021 to July 2022 was prepared and submitted in September 2022. Monthly reports on project activities were prepared. All reports and meeting records, including the Project Steering Committee minutes, were prepared on time, and were well organized and archived.

Significant amount of knowledge products, including printed, audio/visual, social media, articles, publications etc. were shared with target groups and the general public to raise awareness and to promote market transformation to EE RAC technologies.

1.4 MTR Ratings & Achievement Summary Table

The summary of the evaluation ratings used in the Midterm Review is provided in Table 1 below. A complete discussion of the ratings is provided in Section 4.

Table 1: MTR Rating and Achievement Summary

Measure	MTR Rating	Achievement Description
Project Strategy	N/A	The project was designed to create a significant and sustained market change towards the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-use in order to reduce GHG emissions in the residential and commercial sectors in Trinidad and Tobago. The project design follows a conventional barriers removal strategy, with detailed background, and an in-depth and logical baseline analysis that facilitates the development of appropriate p project Objectives, Components, Outcomes and Outputs with well defined, detailed and well-

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		throughout planned activities to achieve the desired Outputs/Outcomes. The indicators, and the targets set at Midterm and End-of-project in the Project Results Framework are clear and comply with the requirements for SMART indicators.
Progress Towards Results	Objective Achievement Rating: **5 - Satisfactory**	The project has undertaken extensive activities to strengthen policy, regulatory and institutional frameworks to prepare for the market transformation to be facilitated with introduction of District Cooling scheme and early retirement of energy-intensive, low-efficiency RAC equipment to promote EE technologies and push forward low-GWP, non-ODS R290 hydrocarbon technology. Significant GHG emission reduction has been achieved, and energy saving has also been recorded even though the accurate amount was not feasible due to quality of data gathering and reporting. Of the four indicators in the Results Framework, three has been achieved, while the fourth cannot be determined due to the above data issue. It is likely that the target on energy saved has been met or even exceeded if accurate data is available.
	Outcome 1.1 Achievement Rating: **5 – Satisfactory (S)**	Major achievements generated from the many activities implemented to strengthen policy, regulatory, institutional frameworks with fiscal incentive study completed; MEPS developed and approved; EE Labelling Standards completed but enforcement on voluntary basis; refrigerant code in final stage of approval, technician capacity strengthened. Both indicators in the Results Framework met the midterm targets with Indicator 6 (Standards & Labelling) exceeded target.
	Outcome 2.1 Achievement Rating: **5 – Satisfactory (S)**	Project activities implemented to facilitate technology promotion. A series of Webinars conducted; low-GWP, non-ODS R290 hydrocarbon training units distributed and training conducted; Training materials for lending agencies and project developers conducted, Indicators 7 and 8 of the Results Framework met and slightly exceeded midterm targets
	Outcome 2.2 Achievement Rating: **4 – Moderately Satisfactory (MS)**	District Cooling pilot projects delayed due to change of participants and location, and impacts of COVID-19 pandemic. Location finally agreed and MOAs signed with pilot projects launched but with completion estimated February and May 2024. Hydrocarbon pilot equipment for early retirement distributed pending installation arrangements. Amount of $6.84 million private sector investment mobilized.
	Outcome 3.1 Achievement Rating: **5 – Satisfactory (S)**	Communication and Media Plan developed and implementation started; a series of Webinars conducted; knowledge products produced , distributed and shared with key stakeholders and general public. Two gender training conducted.

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	Outcome 3.2 Achievement Rating **4 – Moderately Satisfactory (MS)**	MRV system has been designed and implemented by NDC Support Programme project, upgrading was discussed with the MRV developer. M&E Plan developed and implementation started with project being continuously monitor on project component basis. All GEF and UNDP required reporting duly prepared and submitted on a timely manner with good inputs and recommended actions. MS rate recorded as Indicator 11 of the Results Framework of 50% project expenditure delivery not met due to delay in the investment pilot projects. However, delivery will catch up starting 2023 when pilot activities being fast-tracked.
Project Implementation & Adaptive Management	**5 – Satisfactory (S)**	Despite restriction of COVID-19, significant activities were being initiated, implemented and making good progress as a result of extra efforts by Project Team. It is highly likely that results generated so far will contribute to achievement of project objectives at project completion.
Sustainability	**Moderately Likely**	Despite issue on high upfront capital expenditure, average life span of equipment after payback period and saving on energy costs are attractive for potential replication, main issue will be to secure financial mechanism to meet upfront investment Extra efforts will be needed to change end-users behaviour, and to move the EE Labelling standards to compulsory to restrict import of non-EE equipment and to facilitate enforcement, so as to complement good on-the-ground promotion efforts.

1.5 Summary of Conclusions

The project is formulated to bring about a significant sustainable market transformation to the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-user in order to reduce GHG emission in the residential and commercial sectors in Trinidad and Tobago.

The Midterm Review (MTR) was conducted from October 2022 to February 2023. Based on the desk review of documents, and the in person and focused group discussions, interviews and interactions with the key stakeholders, and project partners in an open and participatory approach, the MTR concludes that the project design and strategy were well formulated, and the planned activities were well organized, well defined and carefully throughout that have been used as useful guidance for project implementation to achieve the desired Outputs, Outcomes and the Project Objectives. The MTR recognizes that good progress has been made at midpoint of project implementation, meeting, or exceeding in some cases, the midterm targets and leading towards achieving the project's proposed targets at project completion. This conclusion is supported by evidence gathered throughout the Midterm Review process, either through document review, in-person or virtual discussions or interview conducted. The results generated towards achieving the project's objectives can be summarized as follows:

Under Component I Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies, Project activities have been initiated and generated significant results towards achieving the Outcome 1.1 in strengthening the national policy, regulatory and institutional frameworks to facilitate the country's promotion to push towards Energy Efficient (EE) RAC technologies to adopt low-carbon, non-ODS R290 hydrocarbon refrigerants. Some significant progress include: energy-efficient design incorporated into the current building

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governance framework; changes to the National Climate Change Policy; energy-efficient design and passive cooling techniques included into the building regulatory framework; inputs provided into the National Climate Change Policy to promote market transition towards energy-efficient RAC technologies and the use of low-GWP and non-ODS hydrocarbon refrigerants; MEPS developed and approved at Board level of TTBS; gender amendments to National Cooling Strategy was drafted and circulated to stakeholders and Technical Steering Committee for review; initial suggestions for fiscal incentives has been drafted; and capacity development within the sector have been achieved through development of the Energy Efficiency on RAC training curriculum etc. (Outcome 1.1).

On Component II Accelerate RAC market transformation towards less energy intensive and low GWP technologies, progress and achievements include: market analysis for RAC replacement initiatives and impacts at national level was initiated; training curriculum outline was completed and approved by sector training entities; the project has received and initiated distribution of 8 hydrocarbon training units to training providers with Training of Trainers; a consultant finalized the training materials for lending agencies and project developers with the first round of training. (Outcome 2.1).

However, slight delay was encountered on the two District Cooling pilot project due to COVID-19 pandemic and changes in participants and locations. The two pilot sites were eventually finalized, one pilot will be implemented at an Industrial Business Park at Couva, the other pilot at a building and warehouse complex at Marabella. Technical Reports and Business Management Reports completed by the technology provider, DEVCCO, concluded that both pilot projects are technically feasible. MOAs were signed in September 2022 with GEF grant of $1.25 million against calculated Capital Expenditure (CAPEX) of $2,134,342 (Annual Operational Expenditure – OPEX of $18,816) for the industrial park site at Couva, and $075 million GEF grant against CAPEX of $1,666,000 (Annual OPEX of $77,827) for the Marabella site. The two participants have now initiated their procurement process for equipment and construction works. Completion date of installation are estimated at February and May 2024 for TOSL Engineering Limited and Edan K. Properties Limited respectively, depending on how long it takes for the equipment to be manufactured and the shipment from overseas, the project completion date may be slightly delayed. (Outcome 2.2).

There are five (5) demonstration sites in the private sector for the early retirement of energy-intensive, low-efficiency RAC units, 2 in Tobago and 3 in Trinidad. The project received the hydrocarbon equipment which were being distributed and installation being arranged. (Outcome 2.2, Output2.2.4).

For Component III, Information Outreach and Monitoring and Evaluation Implemented, The project developed a Communication and Media Plan and started its implementation with a series of targeted webinars were hosted since June 2021; the MRV system was established and the project discussed with the developers on upgrades that can be incorporated; a Gender Consultant was engaged and an initial capacity building activity held in June 2022 with members of PMU and National Ozone Unit attending. A second gender workshop was organized in July 2022 with the help of another stakeholder as the Gender Consultant terminated her contract. The Monitoring and Evaluation Plan was developed and implementation started, and the project continues to be monitored at the project component level. All UNDP and GEF reporting requirements were prepared and delivered on time. Due to the late start and the impact of COVID-19, the first PIR for the period of June 2021 to July 2022 was prepared and submitted in September 2022. Monthly reports on project activities were prepared. All reports and meeting records, including the Project Steering Committee minutes, were well organized and archived.

Significant amount of knowledge products have been produced, including printed, audio/visual, social media, articles, publications etc. are shared with target groups and the general public to raise awareness and promote market transformation to EE RAC technologies.

While the project shows a low financial delivery but it is expected that significant disbursements from the investment pilot projects starting 2023 will catch up on delivery rate. The low delivery rate should not be considered as slow implementation as payment usually lags behind activities implemented in most cases. Nonetheless, It is encouraged that close monitoring and follow-up actions should be carried out the Project Team, MPD and UNDP on financial delivery.

The MTR recognizes that this project reflects a unique complementary efforts of moving towards low GWP, non-ODS refrigerants technology as funded by the Multilateral Fund, and at the same time, the emphasis on efforts to

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create a significant market transformation towards low GWP, low-carbon, energy efficiency RAC technology funded by the GEF, have generated significant complementary efforts and results at the same time.

It is also noted that, in hind sight, the project duration of four years may be a tight timeframe to complete the many planned project activities if there are any unforeseen incidents. While this project may not encounter delay in project completion despite the delayed start and the restrictions imposed by COVID-19 pandemic, a 5 year duration may be a more appropriate timeframe to implement all the activities. This is supported by the fact that most UNDP submitted to the GEF these days have already applied the 5 year project duration.

Thus, the MTR concludes that the project is progressing well, has met and exceeded in some cases, the targets of the indicators stipulated in the Results Framework, and is on track to produce the relevant contributions towards achieving the Outputs, Outcomes and Objectives of the Project at project completion. The MTR acknowledges the extraordinary efforts of the Project Team, the MPD, key stakeholders, UNDP TTCO and UNDP NEC Regional Technical Advisors in making significant implementation progress despite the almost one and half years movement restrictions caused by the COVID-19 pandemic. It is however, suggested that the PMU, together with MPD and UNDP, undertake close and regular monitoring on the progress of the two District Cooling pilot projects, including frequent interactions with the two enterprises, to be appraised on the updates of the equipment delivery, installation, trial and final commissioning of the system, in order to make an practical judgement on a reliable estimate of the completion time of the pilot projects, to determine whether a project extension will be needed closer to the planned project completion date.

The sustainability off the project outcome was determined by the MTR as Moderately Likely, despite the expressed concerns on financial sustainability in view of the high upfront investment costs for replication of the District Cooling pilot, especially without the financial support of the GEF grant. In discussion with DEVCCO, it was learned that the payback period of such investment is usually between 7 – 10 years, while the life span of the system, with a low annual Operational Expenditures, can last 15-20 years and in many case the lifespan has up to 30-40 years with good maintenance. That means the owner of the system will not only enjoy low annual expenditures, but can continue to enjoy an extended period of significant savings in operating expenditures and energy costs after the payback period. Therefore, the only obstacle is to secure financing for the upfront capital expenditure. DEVCCO also indicated that the system can be easily incorporated with new construction design for an industrial park or a new residential or commercial building, while the adoption in a crowded close community will be more challenging, but as long as space can be spared to accommodate the footprint of the (sizeable) equipment, such replication is feasible.

In discussing with TOSL Engineering Limited, it was learned that TOSL is a trading company doing business all over the Caribbean. The MTR believes that, during and after the completing of the installation and successful operation of the District Cooling pilot, TOSL can become an advocate and promoter of the District Cooling system to the region, an added benefit to the project, and a significant contribution to the wider replication and market transformation to EE technologies, an excellent contribution to Global Environmental Benefits (GEB).

1.6 Recommendation Summary Table

Table 2 below summarizes the recommendation by the MTR.

Table 2 Summary of Recommendations

No.	Recommendation	Parties Responsible	Timeframe
	Outcome 1.1		
1	Project Team and Government Authorities to follow-up and push forward moving the two EE Labelling Standards for Air-conditioners and Refrigeration Appliances from voluntary to compulsory Standards	MPD, PMU, UNDP, TTBS, MTI	2023, 2024
	Outcome 2.2		

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2	Close monitoring and follow-up on the progress of the two District Cooling pilot projects to prevent any slippage in project completion beyond the planned operation completion of project	PMU, MPD, UNDP	2023, 2024
3	Identify inventory of potential enterprises and locations to participate in replication of District Cooling scheme	PMU, MPD, UNDP	Early 2024
4	Establish mechanism to address accumulation of replaced RAC equipment and to address waste generated as a result of early retirement of energy-intensive, low-efficiency equipment	PMU, MPD, UNDP	2023, 2024
5	Enlist TOSL Engineering Limited as advocate and promoter to promote District Cooling scheme in CARICOM Region	PMU, MPD, UNDP	2023, 2024
	Outcome 3.1		
6	Leverage implementation experience to be model for other project including projects in the CARICOM Region	PMU, MPD, UNDP	2024
	Outcome 3.2		
7	Close cooperation, interaction, and frequent and clear communication channel be recognized and formalized amongst Project Team and key stakeholders to strengthen efforts in project implementation for the remaining 19 months	PMU, MPD, UNDP	2023-2024

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2. INTRODUCTION

2.1 The Midterm Review (MTR) Report

This Midterm Review (MTR) Report presents the process and the findings and recommendations of the Midterm Review of the United Nations Development Programme (UNDP)-supported, Global Environment Facility (GEF)-financed project entitled "*Energy Efficiency through the Development of Low-carbon RAC Technologies in Trinidad and Tobago*" carried out during the period of October 2022 to February 2023, in particular during a MTR mission that took place 12-20 December 2022 in Port of Spain, Trinidad and Tobago where the International Consultant had the opportunity to conduct, both in-person and virtually, discussions and interviews with key stakeholders and project beneficiaries. The time frame of review under the MTR includes the period starting from GEF Chief Executive Officer (CEO) Endorsement in March 2020 to December 2022, approximately a few months beyond the mid-point of the four-year project implementation which started 1 September 2020. The project has a total budget of USD 26,278,644, of which USD 5, 152,392 is GEF grant and an Implementing Agency fee of $489,478. In addition, USD 21,126,252 is co-financing supported by government authorities, private sector and UNDP through in-kind, cash or grant contributions.

The Ministry of Planning and Development (MPD) is the National Executing Agency (Implementing Partner), and the United Nations Development Programme (UNDP) is the International Implementing Agency of this project. According to the CEO Endorsement Request and the UNDP Project Document, the project has a duration of four years. The CEO Endorsement approval was dated March 3, 2020, however due to the impacts of the COVID-19 pandemic, the Project Document was signed by all parties only in September 2020, thus the implementation period of this four-year full-size project was adjusted to start on 1 September 2020 and the planned project completion date is therefore 1 September 2024. The MTR was commissioned by UNDP Trinidad and Tobago Country Office (TTCO) for the duration of October 2022 to February 2023, a few month beyond the mid-point of project implementation. The MTR was conducted by William Kwan as Independent International Consultant under an Individual Contract with the UNDP Trinidad and Tobago Country Office. This MTR report was submitted to UNDP, MPD and project partners for review and comment. Comments and suggestions made by these key stakeholders will be taken into account in the finalization of the Midterm Review Report during February 2023.

2.2 The Purpose, Objective, and Scope of the Midterm Review

As the UNDP-support, GEF-financed project is a full-size project, a mandatory Midterm Review (MTR) is required at mid-point of project implementation. The MTR will assess the progress of the project towards the achievement of the project objectives, outcomes and outputs as specified in the Project Document, and assess early signs of project success or failure with the goal of identifying the necessary adjustments (Adaptive Management) to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project's strategy, its risks to sustainability and make recommendations on how to improve the project over the remainder of its lifetime.

The MTR is expected to serve as a means of validating or filling the gaps in the initial assessment of relevance, effectiveness, efficiency, and sustainability obtained from monitoring. Specifically, the MTR is intended to provide the Project Team with a basis for identifying appropriate actions to:

a. Address particular issues or problems in project design, identify potential project design issues or problems;
b. Address particular issues or problems regarding project implementation;
c.. Address particular issues or problems regarding the project management;
d. Assess progress towards the achievement of objectives and targets;
e. Identify and document initial lessons learnt from experience (including lessons that might improve design and implementation experience)
f. Identify additional risks (which are not part of the current risk log, if any) and countermeasures;
g. Make recommendations and aid decision-making regarding specific actions that might be taken to improve the project and reinforce initiatives that demonstrate the potential for success;
h. Find out the impact of the COVID-19 on the project and propose necessary changes in the project document because of COVID-19.

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2.3 The Midterm Review Approach and Methodology

The MTR provides evidence based information that is credible, reliable and useful. The MTR was conducted following a collaborative and participatory approach ensuring close engagement and interaction with the Project Team, government counterparts, the Implementing Partners and Responsible Parties, the UNDP Country Office(s), the UNDP-Nature, Climate and Energy (NCE) Panama Regional Technical Advisers, direct beneficiaries and other key stakeholders etc.

The MTR was conducted focused on:

(a) Assessment of progress towards results, how and to what extent the project realized its planned results;

(b) Monitoring of implementation and adaptive management to improve outcomes;

(c) Early identification of risks to sustainability, and

(d) Recommend adjustments (adaptive management) to improve project implementation to achieve project outputs, outcomes and objectives.

Evaluation Principles and Criteria

This GEF evaluation adheres to the five major evaluation criteria and reflects how the criteria have been employed in each case:

Relevance: The extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time.

Effectiveness: The extent to which an objective has been achieved or how likely it is to be achieved.

Efficiency: The extent to which results have been delivered with the least costly resources possible. Also called cost-effectiveness or efficacy.

Results: The positive and negative, and foreseen and unforeseen, changes to and effects produced by a development intervention. In GEF terms, results include direct project outputs, short- to medium term outcomes, and longer-term impact including global environmental benefits, replication effects and other, local effects.

Sustainability: The likely ability of an intervention to continue to deliver benefits for an extended period of time after completion. Projects need to be environmentally as well as financially and socially sustainable.

In carrying out this review exercise, qualitative and quantitative data collection tools were applied for analyzing information from the principles of results-based review (including relevance, ownership, efficiency and effectiveness, sustainability). The review was carried out according to the UNDP/GEF Monitoring and Evaluation Policy.

The following tools and methods were deployed to gather assessment information:

(a) ***Initial Briefings/Assessment Meetings*** were held in several sessions in group or individually with the representatives of the Project Management Unit (PMU), UNDP Trinidad and Tobago Country Office and the UNDP NCE Panama Regional Technical Advisors to clarify key objectives and points that were relevant to the MTR, to have an overview so as to be familiar with the project, to obtain preliminary updates on the progress of project implementation, and to gather key achievements and specific obstacles/setbacks on project implementation, to understand interactions/interventions conducted with key stakeholders and partnership arrangements.

(b) ***Document review and analysis***: In-depth review and analysis of all relevant sources of information including documents prepared during the project preparation phase, assembled and made available by the PMU, was conducted. The documentation analysis examined during this phase of MTR included, but not limited to, the following documents of the project:

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- PIF
- UNDP Initiation Plan
- UNDP Project Document
- UNDP Social and Environmental Screening Procedures (SESP)
- Project Inception Workshop Report and Project Implementation Reports (APR/PIR's)
- Quarterly progress report and work plans of the various implementation task teams
- Finalized GEF Focal Area Core Indicators at CEO endorsement and midterm
- Minutes of meetings of the Project Steering Committee
- Minutes of Tripartite Meeting
- Minutes of Project Team meetings
- Oversight mission reports
- Monitoring reports prepared by the Project
- Annual Operational Plans (AOPs/POAs)
- Local consultant's reports and products
- District Cooling Specialist reports
- Memorandum of Agreements
- Contracts and Addendums
- Project operational guidelines, manuals and systems
- Project site location maps
- UNDP Combined Delivery Report (CDR)

The MTR examined the baseline and midterm GEF Focal Area Core Indicators and project indicators presented in the Project Results Framework and the GEF Core Indicators submitted to the GEF at CEO endorsement.

At the outset of this review process, all the above relevant documents were reviewed to gather preliminary information and data to be intimately familiar with the project design, objectives, outcomes, outputs and planned activities. This review and analysis process was augmented by further documentation that became available throughout the MTR process, in particular during the MTR mission to Trinidad and Tobago and additional or supplementary information obtained after the MTR mission for clarification. Furthermore, other documents, such as publications originating from the project (research and media publications, etc.) were also analyzed as they were made available. Media and other dissemination documents were also consulted.

(c) ***Key stakeholders interviews***: Engagement of stakeholders is vital to a successful collaborative and participatory-approach MTR, the MTR therefore ensured the stakeholder who have project responsibilities were included in the interviews during the MTR mission. This included but not limited to: UNDP Trinidad and Tobago CO, UNDP Panama Regional Hub Regional Project Technical Advisors, Ministry of Planning and Development; senior officials and task team leaders, key experts and all consultants in the subject area who have been hired by the project, Project Board, project stakeholders, local government and CSOs including project beneficiaries. The interviews were carried out either in person or virtually (due to CONVID-19 situation or participants based outside the country) during the MTR mission to Trinidad and Tobago.

(d) ***Focus Group Discussions:*** A total of six (6) sessions of Focus Group Discussion were held, two with personnel who were involved directly with project implementation or providing administrative and financial support to the National Implementation Modality (NIM): PMU and UNDP Trinidad and Tobago Administrative and Finance personnel; one session with the Trinidad and Tobago Bureau of Standards (TTBS).; and two (2) sessions separately with the participants and beneficiaries of the two District Cooling Services demonstration projects, and one session with the Technical Experts providing both technical and business analysis support to the District Cooling pilots.

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(e) ***Site Visits:*** Site visits took place during the MTR mission to the two District Cooling pilot enterprises: Edan K Properties and TOSL Engineering Limited for in-person Focus Group Discussion, and to the site at Marabella where the project site demonstration intervention will be implemented.

A review matrix (Annex 2) was developed for this MTR process. This matrix guided the data collection process and was used to collect and display data obtained from various sources that relate to relevant review criteria, and sets of questions and sub questions, detailing each review criteria, Indicators; sources; and methodology.

2.4 Structure of the MTR report

The MTR report is structured in line with UNDP' Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects and covers the following Sections:

Section 1 Executive Summary

Section 2 Introduction (the MTR report, purpose, objectives, scope and methodology of MTR)

Section 3 Project Description and Development Context (includes project design, its rationale and development context, the problems the project sought to address, the project objectives, outcomes, outputs, planned activities and expected results, baseline data, key stakeholders and implementation arrangements].

Section 4 Findings (Results of implementation and comparison with targets set at Midterm Review:

- Project Design/Formulation
- Progress Towards Results
- Sustainability

Section 5 Conclusions, Recommendations and Lessons-Learned

Section 6 Annexes

2.5 Ethics

The Midterm Review was conducted following the principles contained in the ethical guidelines for evaluation by the United Nations Evaluation Group (UNEG). The International Consultant signed the Code of Conduct for Evaluators, and this is included as Annex 7.

3. PROJECT DESCRIPTION AND BACKGROUND CONTEXT

3.1 Development Context

The Project's vision is to create a sustained market change towards the adoption of low-carbon RAC technologies in Trinidad and Tobago, which will deliver multiple benefits at local, regional and global levels through the integration of energy efficient technologies that would reduce the use of high GWP and ODS refrigerants. It has been organized into three (3) components and five (5) substantive outcomes with an effective monitoring and adaptive management built-in. The four outcomes are:

1.1 The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened.

2.1 Investment path along the RAC market chain enhanced.

2.2 Investment portfolio on replacement of energy intensive technologies implemented.

3.1 An information strategy to share knowledge gained, lessons learned, and best practices developed.

3.2 A Monitoring and Evaluation plan and adaptive management applied.

The project will implement a framework to overcome a series of institutional, capacity and financial barriers, engaging a diverse group of stakeholders, including national authorities [the National Ozone Unit of Ministry of Planning and Development (MPD), Ministry of Energy and Energy Industries (MEEI), Ministry of Trade and Industry (MTI), Ministry of Finance (MOF), and Trinidad and Tobago Bureau of Standards (TTBS)], primarily interested in providing an integrated policy guidance for the development of an appropriate administrative and regulatory

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framework under the country´s commitments with the Montreal Protocol and UNFCCC; public agencies acting as a corporate beneficiaries [Environmental Management Authority (EMA), University of Trinidad and Tobago (UTT) and T&T Airports Authority], interested in triggering an alternative cooling path based on the innovative District Cooling technology; technological CSOs [Air Conditioning and Refrigeration Association (ARIA) and Refrigerant Recovery and Recycle Association (RRRA)], actively engaged already in capacity building activities to enhance technical capacity for assembling and manufacturing RAC alternatives as well as on safety transportation, handling and use of low-GWP/HCFCs alternatives; private sector stakeholders and financiers, fully engaged already in the RAC project investment continuum to cope with the demand of the citizens, as the main beneficiaries; as well as UNDP that will be a fundamental partner for the overall implementation.

The project will build upon ongoing efforts of the Government of the Republic of Trinidad and Tobago (GORTT) to fulfil its global environmental commitments through the implementation of two legal instruments. One is the UNFCCC, which aims at reducing GHG emissions to contribute to voluntary climate change mitigation, as well as strengthening collateral socioeconomic and environmental sustainability reforms at the national level, through engagement with key ministries and other public and private stakeholders. The other legal instrument is to strengthen compliance with ongoing actions to reduce the consumption of HCFCs that affect the ozone layer as a signatory of the Montreal Protocol and the recent approval of the Kigali Amendment on HFCs, and funded by the Multilateral Fund for the Implementation of the Montreal Protocol (MLF).

It is expected that the Project will provide global environmental benefits in terms of direct emission savings of at least 450,289 tCO_2e in 4 years as well as direct post-project savings of at least 765,351 tCO2e and indirect savings in the 20 years of at least 284,693 tCO_2e, after the project completion. Total lifetime direct and indirect GHG emissions avoided will be 1,500,333 tCO_2e.

3.2 Problems that the project sought to address

The project aims to overcome barriers. in a national context, to promote a significant market change for the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-use in order to reduce GHG emissions in the residential and commercial sectors. Based on analysis, the Project has identified different levels of causes for the existence of these barriers that needs to be addressed:

Immediate Causes:

1. Lack of willingness by public to change to low-carbon technologies
2. Increased use of high GWP and ODS refrigerants
3. High upfront cost of EE projects (new installations and conversion and retrofits)

Major underlying causes:

4. Lack of knowledge and awareness
5. Insufficient regulation of the RAC sector
6. Large amount of low-EE equipment in major buildings
7. High cost of EE equipment and credit for financing low-carbon EE projects

Structural / root causes:

8. Limited institutional and human national capacity to mainstream low-carbon EE RAC equipment
9. Underdeveloped / Insufficient regulatory and policy framework to support low-carbon RAC technologies
10. Lack of diversification of the financial sector with respect to financing EE projects

3.3 Project Description and Strategy

The objectives of this Project are to create a sustained market change towards energy efficiency, low-carbon technologies in the RAC sector, leading to a reduction in GHG emission and the use of ozone depleting substances.

The Project's strategy is based on three principles: (i) an integrated approach, creating synergies among the otherwise poorly coordinated decisions of national policy-makers (ministries of the central government and power and environmental regulators), and actions at the operational level (project developers, investors and consumers); (ii) encouragement of reliable innovation, accompanying decision makers to foster the necessary structural changes in public policies and among key stakeholders and practitioners (for instance, increase the institutional capacity for

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DCS); and (iii) the implementation of pilot programs as an effective way to remove barriers to change, to learn from experience, to accelerate the adoption of innovative, low-carbon/HCFC phase-out RAC technologies and best practices at all levels, from regulators to operators to end users over the long run.

The project has three substantive components aligned with five main outcomes, embracing the institutional, regulatory and technological dimensions needed to reach the proposed structural change with regard to promote the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-use.

Component I: Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies of the project aims at enhancing the policy, regulatory and institutional dimensions needed to reach the proposed structural change with regard to low-carbon for the use of RAC systems in the country, resulting in one Outcome 1.1.

> **Outcome 1.1:** *"The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened"*. This outcome will follow best industry practices in relevant aspects of policy implementation. Accordingly, the government will enforce this policy through the incorporation and integration of a variety of stakeholders and drafting an amendment of relevant legislation. The implementation of this policy should be aligned with the multilateral environmental agreements to which T&T is a signatory, particularly the UNFCCC and the Montreal Protocol.

Component II: Accelerate RAC market transformation towards less energy intensive and low-GWP technologies strengthens technology implementation over the long run and customer confidence through the implementation of pilots as an effective way to remove the presence of systemic barriers and to change the existing highly subsidized electricity pricing landscape based on thermal power generation as well as on the lack of successful business cases by triggering investments and private sector involvement. Outcomes 2.1 and 2.2 will be generated.

> **Outcome 2.1:** *"Investment path along the RAC market chain enhanced".* The rationale for this outcome is that pilots are considered by the project strategy as essential to overcoming current knowledge capacity and cultural behaviour, which make policy-makers and project developers skeptical towards new RAC alternatives. The project will be supporting this outcome, providing the necessary assistance to project developers and investors in the piloting interventions. Several pilot interventions in selected public and private facilities have been finalized and are being executed according to the investment path developed
>
> **Outcome 2.2:** *"Investment portfolio on replacement of energy intensive technologies implemented"*. The rationale for this outcome is that pilot investments are considered by the project strategy as essential to overcoming current knowledge capacity and cultural behaviour, described above, which make project stakeholders skeptical towards new RAC alternatives. The project will be supporting this outcome, providing the necessary assistance to project developers in the piloting interventions. Two District Cooling Services (DSC) pilot interventions were finalized after change of participant and location. One of the final pilot site is in a selected cluster of private workshops and office buildings and the other infrastructures located within an industrial park. Memorandum of Agreements have been finalized and the pilots are being executed according to the national policy developed. In addition, pilot of early retirement and replacement of energy-intensive old units and low-efficient light units will also be implemented.

Component III: Information outreach and Monitoring & Evaluation (M&E) implemented aims at collecting the lessons learned from the pilots as input for enhancement of technical regulation, for improving standards and labelling, learning from experience, and sharing a learning curve with similar contexts in the Caribbean as well as a full-fledged compliance verification of global environmental indicators will take place during project execution under the supervision of UNDP. Two Outputs are expected.

> **Outcome 3.1:** "*An information strategy to share knowledge gained, lessons-learned and best practices developed".* The rationale for Outcome 3.1 responds to the need for designing and implementing a holistic strategy to increase public awareness towards the global environmental issues associated to the sustainable use of RAC technologies. Based on outputs of Components I and II, and under the operational leadership of the EPPD of the MPD, this strategy will highlight local benefits and global impacts to raise awareness in the national population, including gender and social related issues. Of greater importance will be given in this strategy to mainstream knowledge and stakeholder benefits of the District Cooling technology, given its great potential for climate change mitigation in T&T and the entire Caribbean region.

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Outcome 3.2: *"A Monitoring and Evaluation plan and adaptive management applied in response to needs, as per the UNDP/GEF ProDoc procedures and of its environmental progress and impact indicators, has been designed and implemented"*. This outcome includes a programmatic monitoring of project indicators together with a review of on-going activities to ensure successful project implementation in accordance with UNDP and GEF procedures. M&E will also include the GEF Core Indicators of the Projects Results Framework.

3.4 Project Implementation Arrangements

The project is implemented under National Implementation Modality (NIM), with an agreement signed between UNDP and MPD for UNDP Trinidad and Tobago County Office (UNDPTT))to provide administrative and financial support to the project . The Implementing Partner (IP) is the Ministry of Planning and Development (MPD) who assumes full responsibility and accountability for the effective use of UNDP resources and the delivery of outcomes and outputs, as set forth in the project document. The Deputy Environmental Manager from MPD is the National Project Director (NPD) and serves as the Chairwoman of the Project Steering Committee (Project Board). UNDP as the GEF Implementing Agent, is accountable to the GEF for the implementation of this project. This includes oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and provisions. UNDP is responsible for delivering GEF project cycle management services comprising of project approval and start-up, project supervision and oversight, and project completion and evaluation. UNDP is responsible for the Project Assurance role of the Project Board/Steering Committee.

A Project Board was established that is responsible for taking corrective action as needed to ensure the project achieves the desired results. In order to ensure UNDP's ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition.

The Project Board was integrated by the Ministry of Planning and Development, Ministry of Energy and Energy Industries, Trinidad and Tobago Bureau of Standards, Ministry of Public Utilities, Customs and Excise, Ministry of Trade and Industry and the UNDP. This Committee will meet at least twice per year. As part of its role, it will approve the Annual Operating Plans and will carry out periodic monitoring of the project to evaluate its performance. It will also ensure the implementation of corrective actions that are necessary to ensure that the desired outcomes are achieved.

Day-to-day implementation of project activities are carried out by the Project Management Unit (PMU) team consists of the Project Manager, Project Finance and Administrative Officer, Project Officer, Monitoring and Evaluation Officer, Energy Efficiency Specialist, Legal Expert and Procurement Associate.

3.5 Project timing and milestones

The four-year (48 months) project started implementation on 1 September 2020 upon signature of the UNDP Project Document by the Implementing Partner (MPD) and UNDP. While the GEF CEO endorsement was approved on 3 March 2020, the signature of the Project Document was delayed due to the COVID-19 pandemic that posted consideration challenges to establish and finalize the implementing arrangements.

Table 3: Project Milestone:

Milestone	Date
PIF approval	29 November 2017
CEO Endorsement	3 March 2020
Project Document signature	1 September 2020
Project Manager Recruited	12 august 2020
First Disbursement	6 November 2020
Inception workshop	18 November 2020
First meetings of the Project Steering Committee	4 May 2021
Midterm Review	October 2022 - February 2023
Terminal evaluation (planned)	1 June 2024
Planned closing date	1 September 2024

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3.6 Man stakeholders

A diverse group of stakeholders was engaged during the project preparation stage and remains closely involved, consulted and coordinated during project implementation. Their respective roles and responsibilities during the project's execution have been clearly defined. A Stakeholder Engagement Plan has been developed that seeks to strengthen institutional partner capacities for managing social and environmental risks and ensuring full and effective stakeholder engagement, including appropriate mechanisms to respond to complaints from project-affected people. Key partners and stakeholders involved in project implementation include:

National Government:

- Environmental Planning and Policy Division (EPPD) of the Ministry of Planning and Development (MPD)
- Ministry of Energy and Energy Industries (MEEI)
- Ministry of Trade and Industry (MTI)
- Ministry of Finance (MOF)
- Trinidad and Tobago Bureau of Standards (TTBS)

Public Agencies:

- Environmental Management Authority (EMA)
- Trinidad and Tobago Airports Authority (AATT)
- Trinidad and Tobago Electricity Commission (T&TEC)
- Regulated Industries Commission (RIC)
- University of Trinidad and Tobago (UTT)

CSOs:

- Air Conditioning and Refrigeration Association (ARIA)
- Refrigerant Recovery Recycle Association (RRRA)

Private Sector:

- Edan K Properties Limited
- TOSL Engineering Limited
- School of Refrigeration and Air-conditioning (SORAC)
- Caribbean Basin Sustainable Energy Fund (CABEF)
- Energy Dynamics Ltd (EDL)

Beneficiaries:

For the purposes of the project, the beneficiaries are the citizens of T&T, the end-users that enjoy an acclimatized environment for their comfort and demand a cooling load to cope with their daily business activities. A complete list of main project stakeholders and their roles during project execution was included in the Stakeholders Engagement Plan (SEP) attached as an Annex to the Project Document.

Among them, Key stakeholders that are closely involved with the implementation of project activities are:

National Authorities: Ministry of Planning and Development (MPD), Ministry of Energy and Energy Industries (MEE), Ministry of Trade and Industry ((MTI), Ministry of Finance (MOF) and Trinidad and Tobago Bureau of Standards (TTBS).

Public Agencies: Environmental Management Authority (EMA), University of Trinidad and Tobago (UTT), Trinidad and Tobago Electricity Commission (T&TEC), Regulated Industries Commission (RIC).

Technological CSOs: Air Conditioning and Refrigeration Association (ARIA), Refrigerant Recovery Recycle Association (RRRA).

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Private Sector: Energy Dynamics Ltd. Sustainable Energy Caribbean, Edan K. Properties Limited, TOSL Engineering Limited, School of Refrigeration and Air-conditioning (SORAC), Caribbean Basin Sustainable Energy Fund (CABEF).

4. FINDINGS

4.1 Project Strategy

As summarized from the Theory of Change analysis, the project is formulated to:

- Strengthening the policy and regulatory framework in support of low-carbon EE, low GWP for RAC technologies.
- Fostering an Energy Efficiency culture by building the capacity in the RAC sector on matters of design, installation and maintenance of low-carbon technologies and increasing the awareness of the benefits of using low-carbon technologies at the corporate and consumer levels.
- Developing successful pilots that can serve as an example for financial institutions to adjust their risk and lending models for scale-up project investments, including the District Cooling technology.

4.1.1 Project Design

The Project Document (ProDoc) was used as the main reference for the Midterm Review. The ProDoc is well written and structured. The Development Challenge Chapter presents detailed background information, careful analysis of current situation, clearly defined the barriers to change and provides a very detailed baseline analysis of the situations relating to the global and Trinidad and Tobago's specific efforts to reduce global greenhouse gas (GHG) emissions in view of the fact that Trinidad and Tobago (T&T) was ranked in the 2005 World Resources Institute Report as the 10th highest emitter of GHG emissions. It further outlined T&T's efforts in mainstreaming climate change considerations through the development and implementation of a national policy framework for climate change, which includes the National Climate Change Policy (NCCP), Carbon Reduction Strategy (CRS) and the National Determined Contribution (NDC), while unfortunately mainstreaming of climate change at the sector level has been limited within the power generation, transport, Refrigeration and Air Conditioning (RAC) and industry sectors, which has translated to limited mainstreaming at organizational level.

The Project Document further provided details on the background on Energy Efficiency situation in the country's industrial, transport, residential, commercial and power sectors. T&T is among the highest per capita consumption of electricity in the Caribbean at over 6,500 kWh due to its energy-intensive industries. On the other hand, T&T has the lowest electricity prices throughout the Caribbean which presents a major challenge to its promotion and implementation of energy efficiency programs. Energy efficiency development in T&T is currently at a rudimentary stage due to the high level of subsidies to the price of electricity for all customers.

In detailing the background on Ozone-Depleting Substances (ODS), it highlighted the country's environmental challenge of moving away from high demand of ODS and high GWP substances to low-GWP alternatives with more efficient technologies. The country's efforts in operational point of view of a set of programs, initiatives and studies and a series of associated baseline projects being implemented, and the impacts and experience that this project could be benefited from were outlined. While it showed the complementary contribution of the independent interventions funded by the Montreal Protocol, the Government and UNDP, it also pointed out the necessity of a proper coordination mechanism that can filter, evaluate, define priorities, monitor and guide holistic approaches and interventions. It concluded that the development challenge would be to overcome a national context, that would address a series of institutional, capacity, environmental and financial externalities.

The Barriers to Change section described the three different levels of cause, i.e., immediate, underlying and structural/root causes that were identified when carrying out the analysis of the development challenge in preparing the problem tree included as *Figure 1: Theory of Change – Problem Tree Analysis Diagram* included in the Project Document. This section provided a thorough analysis and presented in-depth details of the causes that served as very useful links to developing the strategies of interventions contained in this project.

The Strategy Chapter clearly outlined the project aims to provide a significant market change for the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-use in order to reduce GHG emission in

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the residential and commercial sectors in T&T. The project will bring about integrated institutional planning and coordination of ground-breaking technology interventions aligned with greater efficiency and increasing equitable socioeconomic returns on low-emission public and private investment in a very innovative way. It further provided the rational approach the project is designed to specifically address the immediate, underlying and root causes.

The Project Approach

As summarized in the Theory of Change, the Project Document depicted the direct interventions the project is designed to strategically address the immediate, underlying and structural/root causes identified to achieve the project's vision of creating a sustained market change toward the adoption of low-carbon RAC technologies.

The project was designed with three major components of interventions. The first one aims at enhancing the policy, regulatory and institutional dimensions needed to reach the proposed structural change with regard to low-carbon for the use of RAC systems in the country. The strengthening of public policy proposed by this project is consistent with the long-term strategies stated on Trinidad and Tobago's National Climate Change Policy effective since 2011. This component contains one Outcome and six (6) Outputs with detailed planned activities clearly defined to achieve each Output. The MTR concludes that most of the planned activities under this component have been initiated and are progressing well with excellent results generated already at time of MTR, and is expected to fully achieve the desired results at project completion. Detailed review and analysis are described in the Results Framework section below.

The second component strengthens technology implementation over the long run and customer confidence through the implementation of pilots as an effective way to remove the presence of systemic barriers and to change the existing highly subsidized electricity pricing landscape based on thermal power generation as well as on the lack of successful business cases by triggering investments and private sector involvement. This component contains two Outcomes. Under Outcome 2.1, four (4) Outputs are anticipated, each Output is accompanied with detailed planned activities listed. For Outcome 2.2, four (4) Outputs will be achieved with the support of detailed planned activities. The MTR is of the opinion that while the planned activities for both Outcomes have been initiated but implementation has encountered slight delay due to the impacts of movement and in-person contact restrictions imposed as a result of the COVID-19 pandemic as well as the changes in the participation and locations of the DSC pilots. The activities are now progressing in a satisfactory manner, despite the delayed commencement and unexpected changes. It is however expected that the pilots will be able to complete before the planned completion date of the project, and will be able to share and replicate the demonstration results, knowledge and experience gained during and after the implementation of the pilots.

A third component aims at collecting the lessons-learned from the pilots as inputs on the enhancement of technical regulations, on improving standards and labelling, on transfer of technologies, learning from experience, and on sharing the learning curve with similar contexts in the Caribbean as well as a full-fledged compliance verification of global environmental indicators that will take place during project execution under the supervision of UNDP. This component contains two (2) Outcomes, each with two (2) Outputs to be achieved. Each Output is supported by a list of detailed planned activities. Under this component, quite a number of knowledge sharing and public awareness products have been produced with workshops, webinars or events conducted regularly during the first half of project implementation, achieving excellent results and impacts on public awareness, information sharing and effective promotion strategies.

4.1.2 Results Framework

The Project Results Framework included eleven (11) indicators for the project objectives, as well as indicators for each Outcome under the three components. The choice of indicators presents a good balance between measurement of achieving project Outcomes and the delivery of Outputs. Critical assumptions are listed in the Project Results Framework as how the risks identified against each indicator would be addressed or mitigated. The listed assumptions are judged to be reasonable and sound. The risks registered in the Risk Log are considered reasonable with adequate corresponding proposed risk management measures. As the CEO Endorsement was approved in March 2020, the original indicators contained at that point of tine would not have included the risk or risk management measures associated with the COVID-19 pandemic declared first quarter of 2020, after submission of the CEO Endorsement package. As such the COVID-19 pandemic has impacted the commencement of the project

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as well as the initiation and subsequent progress of some of the project activities. Nonetheless, while there have been situations that were affected by the COVID-19 pandemic, the project has been able to manage well the situations to reduce the adverse impacts.

The MTR undertook an assessment of the degree to which these indicators meet the definition of SMART (Specific, Measurable, Achievable, Relevant, Time-bound) indicators. Table 4 below shows the results of the assessment, in which green means the indicator has the corresponding characteristics, yellow indicates partial compliance and red implies that the indicator does not meet the property assessed.

Table 4: Analytical assessment of the Indicators

Indicator	Baseline	Midterm Target	End-of-Project Target	S	M	A	R	T	Justification
Project Objective: To promote the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-use									
Project Indicator 1 (GEF Core Indicator 6.2): Number of GHG emissions avoided over the investment period of the project (direct).	0	200,000 CO_2eq	651,000 CO_2eq						The indicator refers to direct emission reduction and is proposed to be measured utilizing the CO_2 emissions model implemented by the Environmental Policy and Planning Division of the MPD, based on monitoring of project Outcomes and Outputs. This will be a regular (annual) monitored indicator that can be collected by the PMU and is a requirement on reporting in the annual PIR.
Project Indicator 2 (GEF Core Indicator 6.3): Energy saved GWh (equivalent to 3.6 million mega joules).	0	8	22						Accurate measurement may depend on the ability, methodology and reporting details on data collection that will need a good system of clear identification and clear coding that can differentiate the correct energy efficient, alternative low-carbon systems.
Project Indicator 3 (GEF Core indicator 11): Number of direct project beneficiaries disaggregated by gender as co-benefit of GEF investment during the project implementation period.	*Total: 145 (100%)* *Men: 100 (69%)* *Women: 45 (31%)*	*Total: 160 (100%)* *Men: 104 (65%)* *Women: 56 (35%)*	*Total: 250 (100%)* *Men: 150 (60%)* *Women: 100 (40%)*						Data collection and verification can be effectively conducted by PMU.
Indicator 4: Number of women participating in leadership positions for the execution of the pilot projects.	0	2	5						Data and information can be collected through participation of key stakeholders and project beneficiaries segregated by gender
Component 1/Outcome 1.1									
Indicator 5: Regulations and code of practice for DCS and CCHP published by the T&T Government.	0	1	1						Data collection and verification can be effectively undertaken by PMU with close coordination with TTBS which is responsible for the establishment and

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									implementation of regulations and standards
Indicator 6: Standards & Labelling (S&L) regulations for RAC technologies developed, approved and ready for enforcement by the T&T Bureau of Standards (TTBS).									Data collection and verification can be directly obtained from TTBS. It is learned during MTR that Standards and Labelling can be classified as compulsory or voluntary in terms of enforcement, this indicator may cause confusion in terms of enforcement, and may suggest to further break down the indicator into these two classifications for proper reporting..
Component II/Outcome 2.1 Investment path along the RAC market chain enhanced									
Indicator 7: Number of trained professionals and technicians directly linked to the project execution to sustainable RAC technologies and the reduction of GHG emissions.	0	50	150`						Close coordination will be required to take account accurately.
Indicator 8: Number of financial and market mechanisms for the development of low-carbon RAC technologies.	0	1	2						As the Labelling requirement is not yet compulsory, accounting low-carbon technologies, especially relating to imports will be confusing.
Component II/Outcome 2.2 Investment portfolio on replacement of energy intensive technologies implemented									
Indicator 9: Amount of private sector capital investment mobilized by the project.	0	250,000	750,000						Due to voluntary nature of the current Standards and Labelling, accurate accounting may become subjective.
Component III/Outcome 3.1 An information strategy to share knowledge gained, lessons-learned and best practices developed and **Outcome 3.2** A Monitoring and Evaluation plan and adaptive management applied in response to needs, as per the UNDP/GEF ProDoc procedures and of its environmental progress and impact indicators, has been designed and implemented									
Indicator 10: Number of relevant EE and HCFCC/HFC emission indicators integrated into the national MRV system implemented by the MPD and reported to the UNFCCC and the Montreal Protocol.	0	1	2						Development of indicators and the process of incorporating into national MRV system may take time and encounter lengthy government procedures.
Indicator 11: Percentage of project expenditure spent on the MSP planned activities.	0	50%	100%						Expenditures usually lag behind activities as payment usually effected after completion of tasks/ assignments. The 50% and 100% delivery rates are not realistic. achievable within the time limits. Suggest deleting or modify the end-of project target as 100% expenditure at project operational completion not achievable

4.2 Progress Towards Results

4.2.1 Progress towards outcomes analysis

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The MTR assessed the project's progress towards achievement of Outcomes against the Midterm Targets in the Project Results Framework at mid-point of project implementation (MTR). The main results and progress as well as the justification for the rating are described in the Table 5 below. Green represents the target has been achieved, yellow indicates progressing satisfactorily and is expected to be achieved with slight delay, and red as not on target to be achieved.

Table 5: Progress Towards Results

Project Strategy	Indicator	Baseline	Reported in first PIR (on 30 June 2021)	Midterm Target	End-of-Project Target	Achieved at Midterm	Achievement rating	Justification of Rating
Project Objective: To promote the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-use	Project Indicator 1 (GEF Core Indicator 6.2): Number of GHG emissions avoided over the investment period of the project (direct).	0	292,894 ton CO_2eq (Aug 2020 – Dec 2021)	200,000 CO_2eq	651,000 CO_2eq	292,894 CO_2eq		The reduction from the August 2020 to December 2021 is 292,894 CO_2eq, as reported in the first and only PIR submitted so far, exceeding the Midterm target. The reduction at time of MTR, which is not yet available, would have been even greater than what was reported in the PIR.
	Project Indicator 2 (GEF Core Indicator 6.3): Energy saved GWh (equivalent to 3.6 million mega joules).	0	N/A (on track)	8	22	2.12		The accurate accounting for this indicator is challenging as the annual update of national imports for energy efficient alternative, low-carbon systems reflected in TTBS report does not contain the level of details required to distinguish the different systems. The project would have achieved the target at time of MTR, but cannot be easily supported by reporting data due to structure of TTBS reporting. The Project will provide support to TTBS to develop a National Product Registration System for energy-efficient RAC equipment so that

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								TTBS can implement such a system. However, note that the rate not based on achievement but on available of data/information for accurate reporting. The project may have exceeded the target but requires accurate data to support the achievement.
	Project Indicator 3 (GEF Core indicator 11): Number of direct project beneficiaries disaggregated by gender as co-benefit of GEF investment during the project implementation period.	*Total: 145 (100%)* *Men: 100 (69%)* *Women: 45 (31%)*	*Total: 268 (100%)* *Men: 193 (72%)* *Women: 73 (28%)*	*Total: 160 (100%)* *Men: 104 (65%)* *Women: 56 (35%)*	*Total: 250 (100%)* *Men: 150 (60%)* *Women: 100 (40%)*	*Total: 268 (100%)* *Men: 193 (72%)* *Women: 73 (28%)*		Extensive efforts on training workshops and public awareness events were delivered by the Project Team, but the effort to attain gender equity is complicated by the gender composition of the industry. The numbers reported exceeded targets and is supported by attendance data collected and reported by PMU.
	Indicator 4: Number of women participating in leadership positions for the execution of the pilot projects.	0	10	2	5	10		Target achieved. The project has documented the composition of the teams involved in the implementation of the District Cooling Pilots. With special efforts to promote women leadership in District Cooling Services pilot projects , numbering 2, 3 and 5 women leadership in three entities involved in the pilots projects.
Component I: Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies								
Outcome 1.1	Indicator 5:	0	N/A (on track)	1	1	1		Target achieved. Refrigerant Code of

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The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened	Regulations and code of practice for DCS and CCHP published by the T&T Government.							T&T drafted and included in the National Cooling Strategy
	Indicator 6: Standards & Labelling (S&L) regulations for RAC technologies developed, approved and ready for enforcement by the T&T Bureau of Standards (TTBS).	3	2	4	5	5		Target exceeded. Includes Standards on Energy Labelling requirements for Air-conditioners and for Refrigerating Appliance, and MEPS adopted from the Caricom Regional Standards.
Component II: Accelerate RAC market transformation towards less energy intensive and low-GWP technologies								
Outcome 2.1 Investment path along the RAC market chain enhanced	Indicator 7: Number of trained professionals and technicians directly linked to the project execution to sustainable RAC technologies and the reduction of GHG emissions.	0	N/A (on track)	50	159	236		Target exceeded. Supported by detailed attendances list of a series of Webinars focusing on training professionals, policy makers and consumers on benefits of EE technologies. Train the Trainers initiated.
	Indicator 8: Number of financial and market mechanisms for the development of low-carbon RAC technologies.	0	N/A (on track)	1	2	1		On Target. Fiscal incentive consultant engaged and submitted deliverables 1 – 3.. Draft suggestions for fiscal incentives, (Draft incentive proposal have been circulated for comments
Outcome 2.2 Investment portfolio on replacement of energy intensive technologies implemented.	Indicator 9: Amount of private sector capital investment mobilized by the project.	0	N/A (on track)	250,000	750,000	6,839,560		Exceeded target. Co-financing from six (6) private sector entities as reported by IP (MPD)
Component III Information outreach and Monitoring & Evaluation (M&E) implemented								
Outcome 3.1	Indicator 10:	0	N/A	1	2	2		Target exceeded. MRV system was designed and

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An information strategy to share knowledge gained, lessons-learned and best practices developed, and **Outcome 3.2** A Monitoring and Evaluation plan and adaptive management applied in response to needs, as per the UNDP/GEF ProDoc procedures and of its environmental progress and impact indicators, has been designed and implemented	Number of relevant EE and HCFCC/HFC emission indicators integrated into the national MRV system implemented by the MPD and reported to the UNFCCC and the Montreal Protocol.							implemented by NDC Support Programme project with inputs of two indictors (one each for Refrigeration and Air Conditioning) for the RAC sector provided by the Project.
	<u>Indicator 11:</u> Percentage of project expenditure spent on the MSP planned activities.	0	N/a (off track due CONID-19 restriction on movement)	50%	100%	$1.1 M out of $5.15M total budget (21%)		As reported by UNDP Accounts Activity Analysis, the delivery rate is 21%.. While is below the stated target, the low delivery is due to the late conclusion of the two DCS pilot projects for which payment of large sum was delayed to 2023.

Indicator Assessment Key

Green – Achieved	Yellow = On target to be achieved	Red = Not on target to be achieved

Detailed description of the Outputs delivered to achieve the Outcomes under each of the three components is presented below.

Component I: <u>Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies</u>

Outcome 1.1 *"The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened"*.

<u>Achievements</u>

Output 1.1.1 Improved inter-governmental coordination for integrated policy making of environmentally friendly approaches among national public institutions.

Recommendations for changes to the National Climate Change Policy have been submitted to promote the market transition towards energy efficient RAC technologies and the use of low GWP and non-ODS refrigerants, in particular, refrigerants with a GWP of 150 or less and zero ODP. As such, the country has decided to adopt and promote the R290 hydrocarbon technology, and has taken extensive efforts in steering import of RAC equipment in that direction, and has conducted extensive training workshops to train technicians in this technology and to promote public awareness for wider end-users acceptance.

With regard to the review of building code, the Project Team is awaiting the submissions from the Green Building Council on the inclusion of Energy Efficiency design and passive cooling in the existing building regulatory frameworks.

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Output 1.1.2 Strengthened a national planning and policy framework for market development of EE gains for RAC end-uses.

In the concurrent implementation of the HCFC Phase-out Management Plan (HPMP) funded by the Multilateral Fund of the Montreal Protocol, and with the push forward by this project for energy efficiency gain, the country has adopted a national policy framework to promote low-GWP, low-carbon and non-ODS refrigerants.

The project has updated the National Cooling Strategy to include energy efficiency and gender considerations. Minimum Energy Performance Standards (MEPS) has been developed and approved at the Board level at TTBS. Policy review, looking at regulations and policies for update and development related to Energy Efficiency in RAC is on-going. Awareness raising events for the MEPS developed for the RAC equipment have been conducted with favourable response.

Output 1.1.3 Standards & Labelling (S&L) regulations for RAC technologies developed, approved and ready for enforcement by the T&T Bureau of Standards (TTBS), including enhancement of technical capacities of public officers to assure S&L compliance.

(i) To support the regulation of RAC technologies, two standards have been established by TTBS:

The **Energy Labelling – Air Conditioners – Requirements (TTS/CRS 59:2021)** was declared 19 July 2021. TTS/CRS 59:2021 specifies the labelling requirements for air conditioners. It is an adoption of CRS 59, Energy labelling – Air conditioners – Requirements which was developed under the authority of the CARICOM Regional Organisation for Standards and Quality (CROSQ).

The Standard is intended to improve the energy performance of air conditioners. The application of the standard is expected to improve energy efficiency within Trinidad and Tobago via the availability, selection and usage of more energy efficient air conditioners. The information given on the energy label provides consumers with information for consideration when making a purchasing decision.

In addition, the requirements of this Standard are expected to drive manufacturers, importers and retailers to provide more energy efficient air conditioner options to consumers as they compete to offer better value for money.

The **ENERGY LABELLING – REFRIGERATING APPLIANCES –**REQUIREMENTS (TTS/CRS 57:2021) was also declared 19 July 2021. TTS/CRS 57:2021 specifies the labelling requirements for refrigerating appliances. It is an adoption of CRS 57, *Energy labelling – refrigerating appliances – Requirements* which was developed under the authority of the CARICOM Regional Organisation for Standards and Quality (CROSQ).

The Standard is intended to improve the energy performance for refrigerating appliances. The application of the standard is expected to improve energy efficiency within Trinidad and Tobago via the availability, selection and usage of more energy efficient refrigerating appliances. The information given on the energy label provides consumers with information for consideration when making a purchasing decision.

In addition, the requirements of this Standard are expected to drive manufacturers, importers and retailers to provide more energy efficient refrigerating appliance options to consumers as they compete to offer better value for money.

The MTR however noted that compliance with the above two Standards is on voluntary basis, and thus with limited effectiveness in prohibiting the import of non-Energy Efficient RAC equipment, and not conducive to the market transformation envisioned by the Project. It is understood that draft to make the two Standards compulsory have been prepared and signed by the Ministry of Trade and Industry. But the long process to move the standards to compulsory status, i.e. technical negotiations, stakeholders comments, requirement for compliance by importers and approval by the cabinet etc. will take some time to have the process completed. It is recommended that the Project Team, TTBS and MPD will take close follow-up actions to monitor that process, so that the effective on-the-ground actions will be complemented with policy and enforcement efforts to achieve early transformation results.

(ii) Development of technical specifications for installation and connection to DCS.

A technical consulting company, DEVCCO was engaged to provide technical guidance and support to the two pilot projects on District Cooling Services (DSC). DEVCCO has conducted feasibility studies, technical, environmental,

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financial and market assessments for the two pilot sites. Technical and financial specifications and plans have been developed and accepted by the two enterprises to initiate actions on procurement of equipment and contracting on infrastructures for the demonstration projects.

(iii) Memorandum of Agreement (MOA) for testing, validation and certification of EE RAC equipment

The MOA for testing currently exists with the Bureau of Standards Jamaica and the members of Caribbean Regional Organisation for Standards and Quality (CROSQ) including the TTBS. The Bureau of Standards Jamaica has an accredited laboratory established for testing of RAC equipment. The project is in the process of exploring ways to further build capacity locally for testing because shipping items to Jamaica for testing is a costly process and can be a deterrent to testing of RAC equipment.

(iv) Develop a codified system for certification of RAC EE equipment

This activity forms a part of the MEPS established. A regional labelling scheme supports the MEPS. A MEPS consultant is expected to be engaged in the first quarter of 2023 and will assist TTBS in establishing an inspection regime supported by Standards and Labelling regulations. To date, the support to the regulation of RAC technologies is based on the two Standards Energy Labelling for Air Conditioners and for refrigerating Appliances adopted by TTBS in 2021, as indicated in item (i) above. TTBS is also responsible for the enforcement of these two Standards of Energy Labelling.

Output 1.1.4 Guidelines and model documents for mainstreaming the public procurement of RAC EE equipment, including considerations for not-in-kind technologies and natural refrigerants, implemented.

A Legal Consultant was engaged and the work scope was expanded to include procurement review. A preliminary analysis has been undertaken to examine the policy, legislative and regulatory regime for public procurement in Trinidad and Tobago, with a view to identifying the most practicable mechanisms for mainstreaming the public procurement of RAC EE equipment, including considerations for not-in-kind technologies and natural refrigerants.

The analysis identified that Trinidad and Tobago's framework for public procurement was in a state of transition. The country has long had a framework built around the Central Tenders Board Act, Chap. 71:91. That system relies on the Central Tenders Board as the hub for procurement above certain thresholds, and which maintains oversight over decentralized procurement in Government Departments at lower levels. Parallel to this, larger public sector capital projects are undertaken by Special Purpose Companies which are controlled by the State.

The country has however enacted the Public Procurement and Disposal of Public Property Act, 2015, which though passed in Parliament, has not been fully proclaimed. The material parts for the purpose of the project are therefore not in force. The new system is to be built around the Office of the Procurement Regulator, which will have oversight of public procurement, but unlike the Central Tenders Board framework, the system will be entirely decentralized. The continuing role of Special Purpose Companies in public procurement under the new regime was also to be determined as part of the analysis, together with the role of the Tobago House of Assembly, which has autonomous functions in respect of the island.

While the preliminary review looked at both systems, focus was placed on the new system, with the Central Tenders Board system being reviewed primarily to address transitional issues. However, the Attorney General, on behalf of the Government, has now announced that full implementation of the new regime will be delayed because of implementation challenges flagged by the Judiciary. In the circumstances, the new regime remains somewhat in limbo.

In response, the review and resulting recommendations will be refocused. Greater attention will be placed in the analysis on leveraging the existing Central Tenders Board system, with a plan for harmonizing the new system with project objectives when implemented. Completion of the review will require further consultation with stakeholders to ensure consensus on the approach, which would be a precursor to successful implementation under both systems. This includes in particular the Tobago House of Assembly, though some continued delay in their responsiveness can be expected due to the current political imbroglio. It is however anticipated that the entire exercise will be completed within the projected 6-month timeframe.

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Output 1.1.5 Fiscal instruments and economic incentives for the import of high EE rating RAC equipment with natural refrigerants where applicable, developed.

The report "Development of a fiscal pathway to achieving energy efficiency in RAC in Trinidad and Tobago through tax incentives" was submitted by a consultant on 16 November 2022. The report presents all information useful to propose a shift of the current system which promotes low-carbon and low GWP RAC markets. The following information was collected and developed to describe the potential of shifting the current system.

- The potential environmental gains - meaning how a certain shift of the current system would contribute to reduced GHG emissions.
- The potential budgetary impacts - meaning how a reform contribute to the budget.
- The distribution of impacts - meaning which groups would be affected by a reform.

Output 1.1.6 Strengthening technical capacities in the formal academic sector and in the specialized technical CSO (ARIA) to promote market development of energy efficient, low carbon refrigeration and cooling systems, including: design, assembling, installation, operation and maintenance.

Following the pathway on promoting low GWP, low-carbon and non-ODS- R290 hydrocarbon technology refrigerant under the HPMP project funded by the Montreal Protocol, and with the push forward by this project on promoting energy efficiency RAC equipment, extensive training workshops have been conducted, including ones organized in cooperation with Air Conditioning and Refrigeration Association (ARIA), targeting technicians promoting, raising awareness and generating buy-in on the hydrocarbon technology and training on the proper assembling, installation, operation and maintenance. Training for TTBS and Customs personnel on EE standards were also conducted. The first phase of training for bank officers and other financiers conducted by DEVCCO took place in November 2022. Part 2 of this training is scheduled for March 2023.

Component II. Accelerate RAC market transformation towards less energy intensive and low-GWP technologies

Outcome 2.1 ***"Investment path along the RAC market chain enhanced"***

Achievements

Output 2.1.1 Market analysis for RAC replacement initiatives and impacts at the national level carried out.

Consultant for market analysis has been engaged, the feasibility study is ongoing. The development of data collection and monitoring plan will follow and are expected to be completed by February 2023.

Output 2.1.2 In-country technical capacity and backstopping for assembling energy efficient RAC systems has been improved.

Webinars on EE conducted throughout 2022. Information brochures and pamphlets were produced. Curriculum outline completed and was approved by sector training entities. The Energy Efficiency Specialist was in the process of developing course content in collaboration with the consultant for market analysis (Energy Dynamics Limited). Training programme is expected to be rolled out in the first quarter of 2023

The project has received and initiated the distribution of eight (8) Hydrocarbon Training Units to training providers across Trinidad and Tobago. Training of trainers on these units took place 12th and 13th December 2022.

Output 2.1.3 A structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS established.

Determination of this structure will be made with the advice of the MEPS consultant. The MEPS consultant will provide support for MEPS sensitization and training and will support TTBS in establishing an inspection regime. The TTBS, the PMU and the NOU are collaborating on this.

Output 2.1.4 Capacities for project investment analysis and customized financing mechanisms in the financial sector to support market change for energy efficient RAC systems strengthened

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The consultant finalized the training materials for lending agencies and project developers. The first round of training for Lending Agencies and Project Developers was completed in November 2022. The second and final round are scheduled for March 2023, along with the development of knowledge products under this output.

Outcome 2.2 ***"Investment portfolio on replacement of energy intensive technologies implemented"***

Achievements

Output 2.2.1 District Cooling technical and financial performance feasibility study completed; aiming at the installation of two District Cooling Zones, including potential developers and end-users (Piarco Intl. Airport and the University of T&T in the Island of Trinidad).

The two pilot sites have been changed upon commencement of project implementation. Please refer to Output 2.2.2 below for more details. The technical support consultant, DEVCCO, was engaged to undertake the feasibility study and provide technical support on the District Cooling Pilot projects. The assessment was delayed due to travel restrictions and the country-wide "lockdown" that occurred in 2020 and 2021. During that period, work was progressed virtually in the interim as much as possible.

DEVCCO completed the Technical Update to their original reports submitted initially in November 2018. Two Update Reports were subsequently delivered in November 2021 and June 2022 for each of the two pilot projects, providing detailed analysis and assessment on Market Demand, Technical Specifications, Capital Expenditures (CAPEX) and Operational Expenditure (OPEX) to guide the two participating enterprises in District Cooling Services (DCS) pilot scheme at Couva and Marabella sites. The technical design is based on air-cooled electrical driven compressor chillers using a refrigerant with very low GWP and ODP (Ozone Depletion Potential). This conceptual design only requires sourcing of electricity for operation. The District Cooling system consists of five main sub-systems:

- Solar PV Production
- Air cooled chillers
- Auxiliaries for cooling production
- A distribution pipe network
- Energy Transfer Stations (ETS) in customer buildings

A Memorandum of Agreement (MOA) was developed between the two Pilot Sites and the Ministry of Planning and Development (MPD) for the implementation of the pilot projects. A data collection and monitoring plan will also be developed by DEVCCO in the second quarter of 2023 to enable evaluation of the performance of the pilot projects over time and as important parameters that will be valuable data for replication purposes.

Output 2.2.2 Implementation of District Cooling concept at Piarco International Airport and the University of T&T.

The Project Document original identified two District Cooling Services concept at Piarco International Airport and the University of Trinidad and Tobago (UTT). However, the pilot locations were changed during project implementation. Due to financial constraints, UTT and the Piarco International Airport could no longer participate in the pilot site as envisioned in the project document. UTT will still be included in the project being positioned as a Centre of excellence in District Cooling education and training. A new production site has been identified within the IBP (Industrial Business Park) and the identified potential market for District Cooling has been updated and has decreased in the absence of UTT in comparison with the 2018 and 2021 reports. The two new pilot sites identified and approved by Project Steering Committee were Edan K Properties Limited at Couva and TOSL Engineering Limited at Marabella. Pilot Site at TOSL Engineering Limited was chosen through response to a call for proposals.

The Couva pilot will be implemented with the same production configuration. DEVCCO concluded in its updated report dated June 30, 2022 that the investigated updated concept for implementing District Cooling at Pilot Couva is technically feasible. The market potential has decreased significantly in the absence of UTT. However, the smaller capacity demand in production and a reduced distribution system in combination with a change of pipe material to HDPE and local experience of cost for trenches has reduced the required CAPEX to matching the smaller market. In addition, new potential off-takers (customers) have been identified where Dumore Enterprise Ltd. is one of the several interesting opportunities.

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The airport location has been replaced by a commercial site consisting of several office buildings and warehouses of the TOSL Engineering Limited at Marabella. DEVCCO concluded in its updated report that implementing District Cooling at TOSL Engineering Ltd.'s Marabella location is technically feasible. The market potential is relatively small, identified to 1073 kW or 305 TR. However, the benefit of consolidating many small, older air conditioning split units with less efficiency and high charge of refrigerant with a high GWP impact to an efficient central production plant using low GWP refrigerant via a district cooling distribution network have a relevant potential from a technical as well as the environmental aspects. The new District Cooling plant intends to serve the identified buildings within the premises of TOSL and two external customers. The total cooling demand is summarized to 2,24 GWh.

Based on the Technical and Market Reports of DEVCCO, the calculated investment costs (CAPEX) for the TOSL Engineering Ltd. **Marabella location** was calculated at US$1,660,000, and the calculated Annual Operational Expenditures (OPEX) for the fully build out system is calculated at $77,827. The annual cooling energy demand for all buildings is calculated to approx. 2,4 GWH for a fully built out District Cooling system. By introducing District Cooling and Solar PV, the amount of electricity needed to operate on-site electrical driven chillers will be reduced. With the new system fully developed, the reduction of electricity consumption is about 0,55 GWh annually. With an operating margin of 0.77 ton CO_2/MWh electricity it results in about 426 ton CO_2/year reduction.

For the **District Cooling pilot at Couva**, the calculated total CAPEX would be US$2,134,342 and the calculated Annual OPEX for the fully built out system would be US$181,816. The annual consumption of cooling energy for all buildings is calculated to approx. 8,6 GWH for a fully built out District Cooling system by introducing District Cooling and Solar PV, the amount of electricity from the grid will be significantly reduced. With the new system fully developed, the reduction of electricity consumption is about 2,0 GWh annually. With an operating margin of 0.77 ton CO_2/MWh electricity consumption, it results in about 1,520 ton CO_2/year reduction.

A meeting between Edan K. Properties (the participating enterprise), the Project Team and DEVCCO took place on July 13, 2022 where findings from the June 30, 2022 Couva District Cooling Business Management Report was presented and discussed. Edan K. Properties has proposed minor modifications of the business model, a Status Profitability Analysis was thus conducted by DEVCCO and presented the results of the profitability analysis based on 5 different case showing the various CAPEX, GEF grant, Net CAPEX, NPV, IRR, payback and CO2 reduction scenarios, for a decision to be made in finalizing the pilot arrangements. Subsequently, Edan K Properties Limited Signed a MOA (Couva DCS Concept Project) with MPD on 30 September 2022 with an expiration date of 31 December 2024. The GEF grant agreed for this pilot is US$ 1.25 million.

TOSL Engineering also proposed modifications of the business model presented in the Business Management Report of District Cooling Pilot TOSL, Marabella Site dated June 30 2022 at a meeting attended by the Project Team and DEVCCO. The Profitability Analysis showed the results of 4 cases with different CAPEX, GEF grant, Net CAPEX, NPV, IRR, Payback and CO_2 reduction scenarios. Subsequently, TOSL Engineering Limited signed a MOA on 10 October 2022, with an expiration date of 31 December 2024. The amount of GEF grant agreed was US$0.75 million.

Both pilot projects were officially launched in November 2022E. Scheduled completion date for TOSL Engineering Limited was set for February 2024 and Edan K. Properties in May 2024. The original timeline for both projects have been adjusted, with activities being fast tracked to ensure the pilot will be able to complete on schedule. Both projects have technical specifications already finalized with support of DEVCCO and is now in the process of sourcing the equipment and local construction.

Output 2.2.3 Early-retirement of decentralized, energy-intensive old units and replacement with more energy efficient, centralized-based AC units in two large facilities with high visibility in public facilities installed and operating

Output 2.2.4 Early retirement of low-efficiency, light units (split/window systems) and their replacement with more energy efficient commonly used units in the residential and commercial.

Accelerator Lab was engaged to assist in this activity, in the form of an innovation challenge, which challenge stakeholders to come up with innovative ways to treat RAC waste. The project is looking for a sustainable business model that can collect and provide sector specific data. Consultations with stakeholders were conducted, and a call for proposals was developed. The call for proposals was planned to be published in December 2022. The idea derives from the concerns that in pushing forward for the early replacement of non-energy efficiency RAC equipment, if not

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properly managed, will accumulate at dump sites and waste that will need to be environmentally addressed. The call for proposal will seek idea for an initiative on refrigeration lifecycle management.

The Project has already received some Low GWP, non-ODS hydrocarbon (HC) equipment for installation as plan for early retirement of existing equipment. The equipment is being distributed with on-site installations being arranged.

Component III. Information outreach and Monitoring & Evaluation (M&E) implemented

Outcome 3.1 *"An information strategy to share knowledge gained, lessons-learned and best practices developed'*

Achievements

Output 3.1.1 An awareness raising campaign and information strategy implemented, including lessons learned and best practices dissemination at the national, regional and global levels.

A Communication and Media Plan was developed and implementation started with the objectives to: 1. Raise awareness of the Project; 2. Highlight the work of the partners and stakeholders in line with the Project; 3. Networking with other stakeholders; and 4. Advocacy. The Plan started with a series of webinars hosted in June and October 2021, then March, June, August, September, October and November of 2022 Knowledge products were also developed and distribution to wide target groups and public has started. The project's website has been established and launched in June 2022 (www.eer.gov.tt).

Output 3.1.2 National capacities for the public and private sectors for calculations and monitoring of global impact indicators enhanced.

A gap analysis is being conducted with the aid of the National Ozone Unit in MPD to re-evaluate this output so as to redesign requirements and respective consultancies to reflect the current context. Discussion with industry stakeholders is scheduled for January 2023, in order to develop a ToR for this role and specific deliverables.

Outcome 3.2 *"A Monitoring and Evaluation plan and adaptive management applied in response to needs, as per the UNDP/GEF ProDoc procedures and of its environmental progress and impact indicators, has been designed and implemented"*

Achievements

Output 3.2.1 Design and implementation of a module for data collection on GHG and HCFCC/HFC emissions by residential and commercial buildings integrated with the national MRV system (including the consolidation of relevant indicators).

EMA's MRV stakeholder consultation was attended by the Project Team's GEF & Montreal Protocol Project Officer in June 2022. Initial meetings with the developers of the MRV system were conducted in July 2022 to discuss upgrades that can be incorporated and the deliverables for required consultancy. The Project Manager attended the "CBIT PROJECT: Stakeholder Consultation Workshop to design and develop indicators and accompanying process documents for reporting and tracking of the progress on the implementation of T&T's Nationally Determined Contributions (NDC) and support received in October 2022. Further discussions are to be held in January 2023 to finalize a roadmap. The MRV system now contains the two indictors, one each for Refrigeration and Air Conditioning for the RAC sector.

Output 3.2.2 Design and approval of a monitoring and evaluation plan, including gender and reporting indicators as well as UNDP Social and Environmental Screening Procedures (SESP).

The Monitoring and Evaluation Plan developed at PPG stage and as contained in the Project Document is being implemented by the Monitoring and Evaluation Officer. A gender consultant was engaged, and initial gender training conducted in June 2022. However, the gender consultant severed her contact after a few months of engagement. Currently, UNDP Regional Gender Focal Points are now helping to undertake the tasks. The risks identified and the corresponding management measures planned in the UNDP SESP developed at the PPG stage together with the additional SESPs developed during project implementation specifically for the two District Cooling pilot sites, have been reviewed and updated and will be used for continuous monitoring for any changes and risks that may require mitigation. The M&E Officer has been tasked to monitor the risks and management measures and to take necessary adaptive management action as required.

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Output 3.2.3 Monitoring of project progress in compliance with UNDP and GEF guidelines.

The Project is being monitored at the component level and utilizing the Results Framework matrix and the M&E Plan developed during the PPG stage. Gender mainstreaming is being done following UNDP guidelines. This is further enhanced with continuous close monitoring carried out by the Monitoring & Evaluation Officer. A Gender Officer was recruited but severed her contract within a few months, therefore the PMU has engaged the UNDP Regional Gender Focal Point to support the initiatives outlined in the Gender Action Plan developed at the PPG stage. The project will engage local interns to support the Regional Gender Focal Point in Trinidad and Tobago. Project Steering Committee meetings have been organized regularly to meet at least twice a year. So far, five (5) PSC meetings have taken place, one in 2020, and two each in 2021 and 2022, with good exchanges and providing valuable inputs and guidance on project management and project activities implementation.

Output 3.2.4 Carrying out of project progress report(s), including PIRs, Midterm Review and a Terminal Evaluation.

The preparation and submission of progress reports as required by the GEF-financed, UNDP-support project has been undertaken in full compliance and in a timely manner. A Senior Advisor was recruited and was onboard since July 2021. PIR awareness and training was conducted for PMU personnel in advance of the annual PIR assessment exercise, Covid-19 pandemic delayed the start of project implementation, thus, the project's first PIR was completed and submitted third quarter of 2022 for period ending 1 July 2022. The Senior Advisor conducted training sessions ahead of the MTR process. The MTR consultant has been engaged October 2022 and the MTR process is on-going, with t MTR mission took place in December 2022, the MTR report is now being prepared for review.

4.2.2 Remaining barriers to achieving the project objective

The planned operational completion of the project is 1 September 2024, 19 months away from the time of preparation of this MTR Report. While the project has made significant progress towards achieving the project Outcomes and Objectives at midpoint of project implementation despite of the delayed commencement of the project as a result of COVID-19 pandemic, and the delay in launching the District Cooling pilots due to change of participant and pilot locations as well as the impacts by the COVID-19 pandemic situation. There are nonetheless still work ahead that will be needed to pay special attention so that the immediate, underlying and structural/root causes indicated in The Theory of Change – Problem Tree Analysis Diagram (Figure 1) in the Project Document can be fully addressed to make sure that the desired results will definitely be reached at time of project operational completion.

The project's work on policy under Component I to generate the proposed structural change with regard to low-carbon for the use of RAC systems in the country have contributed to removing or reducing some of the causes identified (causes 1, 2, 5, 6, 8 and 9), yet the lack of willingness by the public to change to low-carbon technologies (cause 1), The continued Increased use of high GWP and ODS refrigerants (cause 2), Insufficient regulation of the RAC sector (cause 5), and the Underdeveloped/insufficient regulatory and policy framework to support low-caron RAC technologies (cause 9) are all still need to put in additional work and efforts during the second half of project implementation in order to generate sufficient momentum to product results that these causes will be fully addressed. The additional work can include increased effort and speed in the replacement of non-EE equipment by making the EE Standards and Labelling compulsory to control import of non-EE RAC equipment, and generate behaviour changes towards the concept of energy-efficiency. Hopefully, this may be facilitated soon by the proposed increase in electricity costs with reduced subsidy, when it actually comes into effect.

Under Component II, increased effort in early replacement of non-EE RAC equipment will also help to address the causes indicated above. Increased effort in the already started technician training on hydrocarbon technologies will strengthen capacity to fast track early RAC equipment replacement. Early completion of the two District Cooling pilot projects and their positive results will provide valuable data, information and more important, technical capacity that with the evidence of lower upfront capital investment and attractive annual operating expenditures so as to promote the business model to attract additional enterprises to replicate . This will also be further facilitated with the study on fiscal pathway on tax incentive proposal for EE RAC equipment, and the investment pathway anticipated under Outcome 2.1 on financial mechanism to address investment requirements.

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Rating for Progress Towards Results: SATISFACTORY

(This rating is determined despite the fact that the Midterm target for Indicator 2 has not been met. The MTR is of the opinion that this situation is caused by the absence of mean of measurement and lack of quality data in the reporting system, with available of defined and accurate data, it could be possible that the target was met or even exceeded.)

4.3 Project Implementation and Adaptive Management

4.3.1 Management Arrangements

The Project is implemented under UNDP' National Implementation Modality (NIM) with agreement signed between UNDP and MPD for UNDP to provide support to procurement of goods and services, thereby assuming responsibility for the day-to-day management of the implementation of contracts with the support of the Project Management Unit (PMU):

- The project comprises a core team including a Project Manager, A Project Finance and Administration Officer, Project Officer – GEF and Montreal Protocol, and a Procurement Associate.. The PMU Team is responsible for coordinating various activities planned under all project components/Outputs.
- Activities related to Component I as supported by the Legal Expert and an Energy Efficiency Specialist.
- Activities under Component II would be initiated by the PMU with support of DEVCCO, the technical support consultant, and other consultants.
- Activities related to Component 3 would be supported by the PMU. A Monitoring and Evaluation Specialist was also recruited as part of the PMU..

The Ministry of Planning and Development (MPD) is the Implementing Partner (IP). UNDP as the GEF Implementing Agency, is accountable to the GEF for the implementation of this project, which includes oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and provisions. UNDP is responsible for delivering GEF project cycle management services comprising project approval and start-up, project supervision and oversight, and project completion and evaluation. UNDP is responsible for the Project Assurance role of the Project Board/Steering Committee.

Project Steering Committee (PSC): The PSC is responsible for taking corrective action as needed to ensure the project achieves the desired results. In order to ensure UNDP's ultimate accountability, PSC decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. The PSC also provided strategic guidance. PSC is composed of the following members:

- Ministry of Planning and Development Chair)
- UNDP
- Ministry of Energy and Energy Industries
- Trinidad and Tobago Bureau of Standards
- Ministry of Public Utilities
- Customs and Excise
- Ministry of Trade and Industry
- Pesticide and Chemical Inspectorate (PCI)
- Ministry of Agriculture – Plant Quarantine

So far, as of date of MTR, a total of five (5) PSC meeting have taken place. The first PSC meeting was organized on 18 December 2020 following the signature of the Project Document on 1 September 2020 and the Inception Workshop on 18 November 2020. The other PSC meetings took place on 19 July 2021, 16 December 2021, 7 April 2022 and 10 August 2022. At every PSC meeting, the minutes of the last meeting were reviewed, updates on the project's progress or any potential delay or obstacles that hinder smooth implementation of the project activities were flagged by the PMU for recommended or approval of action. Request for review, risk assessment or approval

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of major undertakings were discussed and actions recommended. Questions and Answer sessions would then follow to proactively prevent any potential issues that may delay or cause negative impacts to the project.

UNDP, aside from providing procurement support to the project, also performs the quality assurance role and supports the PSC and PMU by carrying out objective and independent project oversight and monitoring functions. This role ensured appropriate project management milestones are managed and completed. The PSC could not delegate any of its quality assurance responsibilities to the Project Manager. UNDP has provided a three-tier oversight services involving the UNDP Country Offices and UNDP Nature, Climate, Climate and Energy (NCE) Bangkok Regional Hub and New York headquarters levels. Project assurance was carried out totally independent of the project management function.

Risk Management

The Project Document Annex J UNDP Risk Log identified a total of seven (7) risks classified as environmental, social. organizational, financial and regulatory risks, and including detailed descriptions, assessment and ranking each risk's impact & probability. It also proposed countermeasures/management response to mitigate the risks identified, clearly identified the responsible parties that would take action on risk mitigation, and with identified sponsible parties and timeline to submit report and update the status. The seven identified risks related to : (a) environmental concerns related to technology piloting; (b) wastes generated in replacing RAC equipment and refrigerant; (c) gender equity and empowerment; (d) susceptibility to health damage; (e) technical, policy and political support to project implementation; and (f) ability to mobilize financial investment.

The project Risk Log was updated during project implementation to include nine (9) additional risks that were identified and are mainly associated with the two District Cooling pilots. The additional risks included: (i) costs; (ii) environmental impacts; (iii) biodiversity concerns; (iv) traffic congestions caused by construction at sites; and (v) low participation of women in the pilots. Therefore a total of sixteen (16) risks are being monitored during project implementation with status updated on the original seven risks only as physical works on the District Cooling pilots have yet to commence by time of MTR. While the Project Team had not added the COVID-19 as an identified risk, despite its impact in delaying the commencement of the project, it is however noted that there has been excellent progress made towards results since project initiation, and that shows the resilience and special efforts rendered by the Project Team during the difficult time in mitigating the impacts of the pandemic, and the Project Team considered the Team can manage the pandemic impact while the overall situation has improved. In fact, the Project Team's resilience and devotion can be demonstrated in one particular situation. During the MTR mission, one key member of the PMU was quarantined under COVID-19 situation, however this key person continued to lead the Team on all activities and everything for the MTR mission was organized in tip-top shape with absolutely no impact or disruption on any single mission arrangements.

The MTR considers the PMU has undertaken regular effective monitoring and update on the identified risks and taken appropriate and prompt actions on the corresponding countermeasures with regular updating of the risk log and reporting in QPRs, APR and the PIR.

4.3.2 Work planning

The Project Team has prepared AWPs for the years 2020, 2021 and 2022 by reviewing past activities and anticipating activities necessary to be implemented to achieve outputs targeted for the coming year. AWPs are prepared in consultation with key stakeholders and partners and presented to the APR meeting for review and approval. Major adjustments or changes in the project budget due to changes in project focus or planned results were presented to the PSC for review and approval.

Due to the late start of the project that had delayed activities planned for 2020, and the change of the two District Cooling pilot sites, these two situations necessitated significant adjustments in the activities of 2020 and 2021. Due to the COVID-19 pandemic situation 2020 and 2021, sizeable project budgets in the 2021 AWP were shifted to the 2022 AWP, reflecting that only limited activities could be carried out due to the impacts of COVID-19 pandemic.

4.3.3 Finance and co-finance

The MTR undertook a review of the annual project expenditures against annual project utilizing the UNDP annual Combined Delivery Reports (CDRs) and Accounts Activity Analysis which record actual disbursement in the UNDP

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financial system. The CDRs for the years 2020, 2021 and 2022 (up to end September 2022) recorded project expenditure incurred amounted to $628,695.19, which is about a 23% delivery rate of the planned 2020-2022 project budget of $2,701,715. It was pointed out by the Project Team that the Accounts Activity Analysis would be a more accurate and up-to-date expenditures records. Based on the Accounts Activity Analysis, project expenditures up to December 2022 would amount to $1,264,687, representing a 47% project delivery rate against the project budget of 2020-2022, and 24.5% against the total pr9ject budget of $5,152,392. While this delivery rate was below the midterm target of 50% delivery rate as per Indicator 11 stipulated in the Results Framework. However, the MTR cautions that it should not be interpreted as a slow implementation of project activities. It is noted that, in discussion with the PMU, and in reviewing their workplan for the year 2023, the expenditure rate will be picked up in 2023 as major expenditures will incur as a result of the progress of the investment project activities (DSC and RAC equipment replacement pilots), that would enable the Project to catch up on the planned project budget delivery rate.

The lower delivery rate was due to the late start of project implementation, more specifically, the late start of the investment demonstration activities under Component 2 due to a) change of one of the two previously identify pilot sits, b) the time frame required for a proper and comprehensive technical and financial assessment of the District Cooling Services pilots as a result of the movement restrictions cause by the COVID-19 pandemic, both domestically and internationally, as the technical experts for the DCS pilots are based overseas, and c) time required to finalize the MoA for the pilot activities. The MTR has confirmed that the two enterprises of the DCS pilots have already initiated the bidding process for equipment and infrastructure services, once these activities are initiated, disbursements for the large budget allocation of the investment component will catch up. Table 6 below shows the breakdowns of the project expenditures up to the time of MTR, reflecting both the project expenditure based on the CDR (up to September 2022) and based on the Accounts Activity Analysis (up to December 2022).

Table 6: Project Expenditures

Description	Amount Year 1 (2020)		Amount Year 2 (2021)		Amount Year 3 (2022)		Total		
	Planned	Actual	Planned	Actual	Planned	Actual)	Planned	Actual *	Actual **
Component 1: Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies	23,500		177,500	65,922	177,500	149,604	378,500	215,526	181,028
Component 2: Accelerate RAC market transformation towards less energy intensive and low-GWP technologies	85,000		920,000	67,533	845,000	748,237	1,850,000	815,770	275,006
Component 3: Information outreach and Monitoring & Evaluation (M&E) implemented	25,000	8,144	145,347	23,733	170,347	140,894	340,694	172,771	118,349.
Project Management Costs	26,637	6,664	53,932	15,659	51,952	38,297	132,521	60,620	54,312
Planned Project Total	**160,137**	**14,808**	**1,296,779**	**172,847**	**1,244,799**	**1,077,032**	**2,701,715**	**1,264,687**	**628,695**
Variance based on UNDP CDR	(-91%)		(-87%)		(-13%)			(-535%	**(-77%)**
Percentage of disbursement again planned budget at midterm	9%		13%		87%			**47%**	**23%**
Percentage of disbursement against Total Project Budget of $5,152,392 at MTR								**24.5%**	**12.2%**

**Delivery based on Accounts Activity Analysis up to December 2022.*
***Delivery based on UNDP CDRs up to end of 3rd Quarter 2022 (i.e. end September 2022) only*

A review and comparison of the committed co-financing at time of CEO Endorsement with the actual co-financing recorded at time of MTR was conducted. Table 7 below shows the planned co-financing committed at time of CEO

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Endorsement (the third column in Table 7 below) and the actual contribution mobilized up to the time of MTR (the fourth column, highlighted in green). It is noted that the planned co-financing amount of $21,126,252 at time of CEO Endorsement was listed in Table 10 (Co-financing Planning) of the Project Document. The amount mobilized at MTR amounted to $8,245,894, the collection rate is about 39%. The MTR noted the lower rate of collection may due to several practical reasons: 1) Many of the co-financing are in-kind contribution which might not yet been reported and the reporting would most probably happen only close to project completion; 2) Co-financing amount from the two investment pilot project at Couva and Marabella will come in starting 2023 as pilot project implementation will gather speed once the equipment purchase and infrastructure construction will begin; and 3) The largest co-financing contribution would come from Caribbean Basin Sustainable Energy fund (CABEF) in the form of cash/loan to the project pilots for installation on the DCS and other demonstration initiatives for which activities implementation was delayed by COVID-19 pandemic and the change in participants and locations of the demonstration projects. Despite the MTR noticing that a large sum of private sector investment have been mobilized ($6, 839,560, Indicator 9 of the Results Framework), It nonetheless recommends that the PMU, UNDP and MPD to take action during the second half of project implementation, to closely monitor and follow-up with the co-financing contribution and their accounting, to be sure that the original committed co-financing can materialize prior to project completion, ready to be evaluated and verified at Terminal Evaluation.

Table 7: Co-Financing contributions up to MTR

Source	Co-finance type	Planned Amount	Amount mobilized up to MTR	Description	Remarks	Follow-up Actions/Responsible Parties
Government (MPD)	In-kind	2,664,497	**268,629**	**Outputs:** all **Grants:** staff working hours. **In-kind:** office and meeting space.	On track but need close monitoring on the extent of the in-kind contribution	PMU and UNDP CO will monitor co-financing
Government (TTBS)	In-kind	839,458	**185,950**	**Output:** 1.1.3 **Grants:** staff working hours. **In-kind:** office and meeting space.	Low , will need close monitoring on accounting of in-kind contribution and/or timely reporting	PMU and UNDP CO will monitor co-financing
Government (MLF)	Grants	2,258,433	**821,756**	**Outputs:** all	To monitoring timely accounting and reporting of MLF funding	PMU, MPD and UNDP CO
Private Companies (Edan K Properties, Trinity Power Limited)	Cash	1,500,000	-	**Outputs 2.2.1 and 2.2.2**	May be due to delayed agreement on the DCS pilot, need	Loan provided by CABEF or appropriate financial body. PMU, MPD and UNDP to monitor

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					close monitoring	
Private Companies (Edan K Properties, Trinity Power Limited)	In-Kind	100,000	**20,000**	**Outputs 2.2.1 and 2.2.2**	Need Close monitoring and follow-up	PMU and UNDP CO will monitor co-financing.
Private Companies Caribbean Basin Sustainable Energy fund (CABEF)	Cash	15,000,000	**6,750,000**	**Outputs 2.2.1 and 2.2.2**	Need Close monitoring and follow-up	PMU and UNDP CO will monitor co-financing.
Private Companies Energy Dynamics Limited (EDL)	In-kind	100,000	**52,000**	**Outputs: all**	Need Close monitoring and follow-up	PMU and UNDP CO will monitor co-financing.
Private Companies School of Refrigeration and Air-conditioning (SORAC)	In-kind	150,000	**5,000**	**Outputs:** 1.1.6, 1.2.1 and 2.1.2 **In-kind:** training facilities and meeting rooms.	Need Close monitoring and follow-up	PMU and UNDP CO will monitor co-financing.
CSO (ARIA)	In-kind	420,000	**50,000**	**Outputs:** 1.1.6, 1.2.1 and 2.1.2 **Grants:** staff working hours. **In-kind:** training facilities.	Need Close monitoring and follow-up	PMU and UNDP CO will monitor co-financing.
CSO (RRRA)	In-kind	352,297	-	**Outputs:** 2.2.3 and 2.2.4 **Grants:** staff working hours. **In-kind:** training facilities.	Need Close monitoring and follow-up	PMU and UNDP CO will monitor co-financing.
Private Sector (DUMORE Enterprises Limited)	In-Kind		**5,000**	**Outputs 2.2.1 and 2.2.2**		PMU and UNDP CO will monitor co-financing.
Private Sector (TOSL Engineering Limited)	In-Kind		**7,559**	**Outputs 2.2.1 and 2.2.2**		PMU and UNDP CO will monitor co-financing.

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Private Sector (TOSL Engineering Limited	Cash	350,000	-	**Outputs 2.2.1 and 2.2.2**	Need Close monitoring and follow-up	Can consider financing via CABEF. PMU and UNDP CO will monitor co-financing.
Other (UTT)	In-Kind		**25,000**	**Outputs:** 1.1.6, 1.2.1 and 2.1.2 **In-kind:** training facilities and meeting rooms		
UNDP	In-kind	100,000	**60,000**	**In-kind:** Staff experience, training facilities and meeting rooms.	Need Close monitoring and follow-up	PMU, UNDP CO
Total			**8,245,894**			

4.3.4 Project-level monitoring and evaluation systems

The Monitoring and Evaluation Plan and Budget Section in the Project Document follows the typical M&E system for UNDP-support, GEF-financed project. The scope of M&E is sound and provides good guidance as a solid foundation for tracking project progress and to evaluate achievement of results. The M&E Plan outlined a detailed set of activities that meet the UNDP and GEF's M&E requirements. The Plan also defined the timeframe and specified the primary parties responsible to carry out M&E activities contained in the Plan. The budget allocated to carry out the M&E Plan is $126,000, approximately 2.4% of the GEF project grant of $5,152,392. A $10,000 co-financing was also allocated to support the Inception Workshop. Budget is also allocated to recruit independent international and national consultants to conduct Midterm Review at mid-point of project implementation and Terminal Evaluation prior to operational completion of the project.

A Monitoring & Evaluation Office was recruited as a member of the PMU. The M&E Officer is tasked to undertake the primary responsibilities of carrying out majority of the M&E activities, including risks management, and to ensure compliance of the requirements of the SESP. The M&E Officer has diligently conducted the M&E tasks, also helped to ensure Quality Assurance and on the firewall between UNDP's duty on oversight and UNDP's role undertaken to provide support to the project in implementing procurement activities.

4.3.5 Stakeholder engagement

A diverse group of stakeholders was engaged during the project preparation stage and would continue to be engaged during project implementation. Their roles during project execution were clearly stated in Annex H of the Project Document. The stakeholders were beneficiaries and public institutions with an interest in the project or the ability to influence project outcomes, either positively or negatively and which are directly or indirectly affected by the project. During the PPG stage, key stakeholders and partners were consulted and closely engaged in finalizing the project design. A Stakeholder Engagement Plan (SEP) was developed during the PPG stage and was included as Annex H to the Project Document. The Annex also included a grievance mechanism, a process by which people concerned with or potentially affected by the project could express their grievances for consideration and redress would be geared directly to EMA, as stated in the Environmental Management Act, Chapter 35:05. The SEP provides information relating to the key project stakeholders and partners that were identified. consulted and engaged during the PPG phase and would continue to be closely engaged during project implementation. A list of the key stakeholders and their roles and responsibilities in the Project were indicated in the SEP.

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A Stakeholder Analysis was conducted to assess the project's key stakeholder interests and the ways in which these stakeholders may influence the project's outcomes during the project's implementation. The exercise was essential because it helped to build local ownership, strengthens project integrity and design, and helped create foundational relationships that have contributed to constructive problem solving when difficulties or challenging issues arise. In addition, the SEP included timetable prepared for the engagement of key stakeholders during project implementation that has contributed greatly to smooth engagement and clear agreed roles and responsibilities. The COVID-19 pandemic has created significant challenges for the Project Team, the imposed movement restrictions that lasted from March 2020 to February 2022 have impeded in-person communications and interactions with key stakeholders that were required to effectively implement project activities.

Nonetheless, despite the restrictions, the Project Team showed its resilience and quickly made adaptive management actions in engaging the key stakeholders virtually through weekly online meetings, conducted training sessions and webinars with a wide range of stakeholders to move the project along, though a bit slower than normal. In-person meetings were able to commence since June 2022 for which a stakeholder update meeting was held to provide update and undertake more effective in-person exchanges and interactions. The project invited all key stakeholders and updated them on project progress made since the inception workshop held in November 2020 and undertook more effective in-person exchanges and interactions. Since then, the Project Team has kept up with frequent communications, consultations and coordination with key stakeholders and project partners and closely engaged them in their respective roles.

4.3.6 Reporting

Reporting, in compliance with the UNDP and the GEF requirements, has been duly undertaken in a timely manner. All GEF and UNDP required reporting, i.e., progress and review reports, meeting reports, mission reports, AWPs, QPRs, APRs, PIR and PSC meeting reports etc., have all been duly documented and archived. The Project Team prepared and kept records of an extensive array of the mentioned reports for the years 2020, 2021 and 2022. The quality of the reports is considered moderately satisfactory, with good details, logical and clear analysis of situations, challenges and issues encountered, and has developed practical solutions and taken timely actions to address and mitigate the impacts. These reports discussed progress and challenges and referred directly to achieving the Outcomes and Objectives of the project. Recommendations and actions from the meetings were duly recorded in the reports as action points, with a timeline and responsible parties duly indicated to facilitate timely actions. These efforts have greatly facilitated close monitoring, timely action and effective adjustments on project implementation.

Due to the late start of project implementation and delay in implementing project activities as a result of restrictions imposed on account of the COVID-19 pandemic, the first PIR to meet the GEF submission requirement was only delivered for FY2022 (reporting period of 30 June 2021 to 1 July 2022), with an Overall Rating of "Moderately Satisfactory" by both UNDP and the IP (MPD). The Overall Risk Rating was rated as "Low" based on the fact that fast-track actions taken by the Project Team after COVID-19 restrictions were relaxed, have made excellent progress to catch up and was able to compensate for the limited actions that could be undertaken during the pandemic.

4.3.7 Communications

As inputs from key stakeholders obtained through discussions and interviews during the MTR mission, the MTR recognized that internal communication within the Project Team, and between the Project Team and UNDP CO are considered satisfactory with a close working relationship. While there were minor initial mis-communications at the early stage of project implementation due to lack of clarity on expectation and timeframe (or different perception of). While there While there are still rare occasions when the need for more frequent, timely and clearer communication have been expressed, it is understood that the concerned parties have undertaken mutual efforts to achieve more effective communication channel. It is recognised that other than this few occasions, the Project Team, UNDP and MPD have established excellent working and communication relationship to deliver effective cooperation, which is an outstanding channel to communicate and engage key stakeholders and the general public, achieving an excellent outreach and promotional results.

The project has developed a Communication and Media Plan and has started its implementation. A series of webinars were hosted in June and October 2021, and in March, June, August, September, October and November 2022 A wide range of knowledge products, including both printed and audio/visual materials, brochures and flyers,

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articles, public outreach materials, radio and TV appearances etc. have been produced and distributed at workshops, seminars, training session and general public that helped to generate interest and attention to the activities of the Project, and thus successfully promoting the objectives of the project for market transformation to low GWP, low-carbon, energy efficiency RAC technologies. The project has also launched a website in June 2022 (www.eer.gov.tt) that provides an excellent exposure to a large set of audience on advocacy to effectively promote market transformation towards energy efficiency.

The use of social media as an effective channel of communication with key stakeholders and general public has also promote effective engagement.

Rating for Project Implementation: SATISFACTORY

4.4 Sustainability

Sustainability refers to the likelihood that the project's positive results will be maintained after the end of the project, without the resources that supported the project activities. Sustainability is evaluated in terms of identified risks that could affect the continuation of sustaining such positive results. The risks to sustainability can be categorized into (i) financial, (ii) socio-economic, (iii) institutional, and (iv) environmental.

4.4.1 Financial risks to sustainability

Financial risks can be attributed to be existence in two main areas for which the project has allocated significant resources to achieve market transformation. In the promotion of District Cooling Services (DCS), it is noted that significant amount of upfront investment is required, as demonstrated in the calculated Capital Expenditure (CAPEX) of the two pilot sites, even though the subsequent low annual Operational Expenditure (OPEX) is considered to be very attractive. For the two DCS pilot projects, a sizeable GEF grant under this Project has helped to attract the two participants to implement the demonstration project. While DCS is demonstrated at a location in an industrial business park, and the other in an existing community with cluster of office building and warehouses, the two pilot are very attractive and can entice many interested participants and most suitably replicate in other industrial parks or construction of new residential or commercial buildings. The other type of location in communities where sufficient space can be allocated to accommodate the equipment, new investors may not be able to support the high upfront CAPEX, or are not able to easily secure required financial investment in the commercial market, thus impeding wider market transformation.

On the other hand, the other pilot was to achieve market transformation to EE RAC equipment for residential or commercial end-users through promoting early replacement of energy-intensive, low-efficiency RAC units. However the current EE Labelling is on voluntary compliance that cannot easily restrict the continued import of non-EE RAC equipment that are lower in price and will be more attractive to end-users. While the project has been successful in promoting the EE RAC equipment and the country has decided to push forward with the R290 hydrocarbon technology, and has been successful in training technicians on the low GWP, low-carbon non-ODS technology to prepare for the market transformation, but without corresponding supporting actions to restrict supplies (import) of non-EE equipment, and the price differential will be a hindering factor to achieve market transformation. Furthermore, the low electricity price with high subsidy is also a deterring factor in achieving early market transformation. Therefore the risks on financial sustainability must be carefully managed.

4.4.2 Socio-economic to sustainability

The success in behaviour change will be a risk factor to sustainability. While the project has extended significant effort in promoting EE RAC equipment through successful public awareness and events and capacity strengthening in RAC technicians, and demonstrated EE RAC equipment through early retirement of energy-intensive, low efficiency RAC units, and promoting District Cooling systems, significant efforts will still be needed to address end-users' mentality to think of EE, least when the country's electricity costs are heavily subsidized at an artificial low rate.

Thus, to mitigate socio-economic risks, it is necessary to supplement the strong support from government authorities, industrial association and CSOs/NGOs, with actions on legislation to facilitate import of energy-efficient equipment,

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and at the same time, to restrict from the supply side the import of non-EE equipment, that will help to steer end-users towards EE equipment, and will be able to fast track market transformation.

4.4.3 Institutional framework and governance risks to sustainability

Significant efforts to promote energy efficient equipment have been carried out, together with the public awareness and advocacy events, and the enhanced coordination mechanism amongst government authorities, and various private sector industries. This established institutional framework need to be continued and further strengthened, to be used as a successful model of cooperation mechanism after project completion, and can be further deployed in other development projects. As a strong institutional framework for cooperation and coordination has already been established, functioning well to contribute to smooth implementation, this risk to the sustainability of this Project is considered to be minimal.

4.4.4 Environmental risks to sustainability

This project is a unique example of how the complementary efforts of the Montreal Protocol funded project in promoting low GWP, non-ozone depleting substance refrigerant technologies, with this GEF-financed project in climate change in promoting energy efficiency. The complementary effort will contribute to significantly improve environmental sustainability. A giant step in the effort in compliance with the multilateral environmental conventions, as well as consistent with the national policy and priority of the country.

However, while introducing environmentally friendly and energy efficient technologies, it needs to be mindful of the risks of wastes that may be generated as a consequence, e.g. stockpile of replaced old RAC equipment and wastes generated in actions on early retirement of non-EE RAC equipment, risks to biodiversity in construction and equipment replacement when piloting District Cooling etc. Therefore, extra effort in proactive preventive actions must be exercised to avoid such environmental risks.

4.4.5 Technological risks to sustainability

In addition to the above 4 risks identified, risks on technology selection must also be considered and evaluated. Selection of alternative technology must be made taking into consideration of appropriateness to local context and to the environment, and their long-term impacts. Appropriate training, public awareness and supporting mechanisms must also be introduced concurrently with the introduction of new technologies.

Rating for Sustainability: MODERATELY LIKELY

5. CONCLUSIONS AND RECOMMENDATIONS (4-6 PAGES)

5.1 Conclusions

The project is formulated to bring about a significant sustainable market transformation to the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-user in order to reduce GHG emission in the residential and commercial sectors in Trinidad and Tobago. The project design follows a structured UNDP-support, GEF-financed project, providing a strategy for barriers removal. The project will bring about integrated institutional planning and coordination of ground-breaking technology interventions aligned with greater efficiency and increasing equitable socio-economic returns on low-emission public and private investment in a very innovative way. It further provided the rational the approach the project is designed to specifically address the immediate, underlying and structural/root causes through three (3) project components: Component I aims at enhancing the policy, regulatory and institutional dimensions needed to reach the proposed structural change with regard to low-carbon for the use of RAC systems in the country. Component II strengthens technology implementation over the long run and customer confidence through the implementation of pilots as an effective way to remove the presence of systemic barriers and to change the existing highly subsidized electricity pricing landscape based on thermal power generation as well as on the lack of successful business cases by triggering investments and private sector involvement. Component III aims at collecting the lessons learned from the pilots as input for enhancement of technical regulation, for improving standards and labelling, learning from experience, and sharing a learning curve with similar contexts in the Caribbean as well as a full-fledged compliance verification of global environmental indicators that will take place during project execution under the supervision of UNDP.

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The MTR conducted October 2022 to February 2023 considered the project design and strategy were well formulated and well defined. Planned activities are organized to ensure achievements of the desired Outputs, Outcomes and the Project Objectives. The indicators included in the Results Framework highlighted the targets to be achieved at midterm of project implementation and at end-of-project, and were considered by the MTR as being MART compliance. The MTR concluded that good implementation progress has been made towards achieving most of the project's proposed targets at Midterm of the project and will lead to achievement of the project's objectives at end-of-project. This conclusion is supported by evidence gathered throughout the Midterm Review process, either through document review, in-person or virtual discussions or interview conducted. Achievements up to MTR for the three project components are summarized below.

Under Component I Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies, the MTR recognizes that significant progress has been made on legislation review where energy-efficient design has been incorporated into the current building governance framework; changes to the National Climate Change Policy; energy-efficient design and passive cooling techniques have been included into the building regulatory framework; Inputs were provided into the National Climate Change Policy to promote market transition towards energy-efficient RAC technologies and the use of low GWP and non-ODS hydrocarbon refrigerants; MEPS was developed and approved at Board level of TTBS, supported by EE Labelling for use as voluntary standards with intention to move to compulsory standard; gender amendments to National Cooling Strategy was drafted and circulated to stakeholders and Technical Steering Committee for review; initial suggestions for fiscal incentives has been drafted; and capacity development within the sector have been achieved through development of the Energy Efficiency on RAC training curriculum focusing initially on Training of Trainers and then targeted training sessions for the technical sector would follow, public awareness activities were conducted. (Outcome 1.1).

On Component II Accelerate RAC market transformation towards less energy intensive and low GWP technologies, the MTR confirmed that market analysis for RAC replacement initiatives and impacts at national level was initiated; training curriculum outline was completed and approved by sector training entities; the project has received and initiated distribution of 8 hydrocarbon training units to training providers with Training of Trainers conducted in December 2022; a consultant finalized the training materials for lending agencies and project developers with the first round of training completed in November 2022. (Outcome 2.1).

However, slight delay was encountered on the two District Cooling pilot project due to COVID-19 pandemic and changes in participants and locations. The two pilot sites were eventually finalized. Two entities have signed MOA for the pilot projects: Edan K. Properties Limited would implement the pilot at its Industrial Business Park at Couva, Point Lisas, and TOSL Engineering Limited would implement the pilot at its building and warehouse complex at Marabella. The University of Trinidad and Tobago would establish as the Center of excellency for District Cooling training and will provide training in a short course format as well as a module and elective in District Cooling at its Diploma level and BSc Level programs. The District Cooling technical support consultant entity, DEVCCO, has completed the Technical Reports and Business Management Reports with Social and Environmental Screening Procedures completed for the two pilot sites. DEVCCO concluded that both pilot projects are technically feasible. The two participants have now initiated their procurement process for equipment and construction works. Completion date of installation are estimated at February and May 2024 for TOSL Engineering Limited and Edan K. Properties Limited respectively. Depending on how long it takes for the equipment to be manufactured and the shipment from overseas, the project completion date may be slightly delayed but fast track actions taken would have both pilots completed just a few months before project operational completion. (Outcome 2.2).

There are five (5) demonstration sites in the private sector for the early retirement of energy-intensive, low-efficiency RAC units, 2 in Tobago and 3 in Trinidad. The project has received the hydrocarbon equipment which was being distributed and installation wase being arranged. (Outcome 2.2, Output2.2.4).

For Component III, Information Outreach and Monitoring and Evaluation Implemented, The MTR established that the project has developed a Communication and Media Plan and started its implementation with a series of targeted webinars first hosted since June 2021; the Project Officer of GEF and Montreal Protocol discussed with the developers of the MRV system on upgrades that could be incorporated; a Gender Consultant was engaged and an initial capacity building activity held in June 2022with the members of PMU and National Ozone Unit attending. However, the Gender Consultant served her contract end of June. Nonetheless, a second gender workshop was

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organized in July 2022 with the help of another stakeholder. The Monitoring and Evaluation Plan was developed and being implemented, and the project continue to be monitored at the component level. All UNDP and GEF reporting requirements were prepared and delivered on time. Due to the late start and the impact of COVID-19, the first PIR for the period of June 2021 to July 2022 was prepared and submitted in September 2022. Monthly reports on project activities were prepared. All reports and meeting records , including the Project Steering Committee minutes, were well organized and archived.

Significant amount of knowledge products, including printed, audio/visual, social media, articles, publications etc. were produced and shared with target groups and the general public to raise awareness and to promote market transformation to EE RAC technologies.

While the project shows a low financial delivery rate of 24.5% against the total GEF grant of $5,,152,392 based on UNDP Accounts Activity Analysis as of end 2022, as compared Indicator 11 of 50, it does not signify slow project progress as in most cases, disbursement always lags behind implemented activities. Major disbursement from the two pilot projects starting 2023 will pick up speed on financial delivery.

The MTR likes to emphasize that this project reflects a unique complementary efforts of moving towards low GWP, non-ODS refrigerants technology as funded by the Multilateral Fund, and at the same time, the emphasis on efforts to create a significant market transformation towards low GWP, low-carbon, energy efficiency RAC technology funded by the GEF.

The MTR reflects that, in hind sight, the project duration of four years is a tight timeframe to complete the many planned project activities if there are any unforeseen incidents. While this project may not eventually encounter delay in project completion despite the delayed start and the restrictions imposed by COVID-19 pandemic, a 5 year project duration may be a more appropriate timeframe to implement all the activities. This is further supported by the fact that most UNDP GEF projects submitted in the last few years have already applied the 5 year project duration.

The MTR therefore concludes that the project is progressing well and is on track to produce the relevant contributions towards achieving the Outputs, Outcomes at the midpoint of project implementation, and will lead to the full achievement of the project objectives at project completion. In the opinion of this MTR, despite the delay in the commencement of the project, and the impacts of COVID-19 that limited project activities for more than one and half year, significant progress in catching up on implementation by the extraordinary efforts of the Project Team and the project's key stakeholders, a project extension will not be considered necessary at this point of time. It is however, suggested that the PMU, IP and UNDP undertake close and regular monitoring on the progress of the District Cooling pilot projects, including frequent interactions with the two participants, to be appraised on the updates of the equipment delivery, installation, trial and final commissioning of the system, in order to make an practical judgement on a reliable estimation of the completion time of the pilot projects, to determine whether a project extension will be needed closer to the planned project completion date.

The sustainability off the project outcome was determined by the MTR as Moderately Likely, despite the expressed concerns on financial sustainability in view of the high upfront investment costs for replication of the District Cooling pilot, especially without the financial support of the GEF grant. In discussion with DEVCCO, it was learned that the payback period of such investment is usually between 7 – 10 years, while the life span of the system, with a low annual Operational Expenditures, can last 15-20 years and in many case the lifespan has up to 30-40 years with good maintenance. That means the owner of the system will not only enjoy low annual expenditures, but can continue to enjoy an extended period of significant savings in operating expenditures and energy costs after the payback period. Therefore, the only obstacle is to secure financing for the upfront capital expenditure. DEVCCO also indicated that the system can be easily incorporated with new construction design for an industrial park or a new residential or commercial building, while the adoption in a crowded close community will be more challenging, but as long as space can be spared to accommodate the footprint of the (sizeable) equipment, such replication is feasible.

In discussing with TOSL Engineering Limited, it was learned that TOSL is a trading company doing business all over the Caribbean. The MTR believes that, during and after the completing of the installation and successful operation of the District Cooling pilot, TOSL can become an advocate and promoter of the District Cooling system to the region, an added benefit to the project, and a significant contribution to the wider replication and market transformation to EE technologies, an excellent contribution to Global Environmental Benefits (GEB).

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5.2 Recommendations

Based on the findings and conclusions on the MTR, the MTR offers the following recommendations.

Recommendation 1: Currently, the two EE Labelling Standards on Air Conditioners and Refrigeration Appliances ae for use as voluntary standards with the intention of moving it to a compulsory standard. While good works have been done on the ground to promote EE equipment, this step is important to ensure enforcement and to restrict imports of non-EE equipment to facilitate market transformation. While it is understood that a draft has been prepared, signed by the Ministry of Trade and Industry, it is also understood that the process is lengthy and no timeline for its passing the cabinet can be estimated, it is nonetheless urged that all concerned government authorities grouped together to push forward and follow up on this process, in order to expedite, or at least, to avoid any slippage, to see the standards become compulsory, so that TTBS can have a legal basis to undertake appropriate enforcement actions.

Recommendation 2: The late start of the District Cooling pilot projects warrants close monitoring on its implementation and progress. The PMU and all concerned stakeholders will need to undertake close monitoring of its implementation, with regular and frequent interactions with all responsible parties in the two enterprises, to monitor on its procurement, equipment delivery, local permitting, local construction etc. to avoid any potential or unnecessary delay beyond their current estimated completion date of February 2024 for TOSL Engineering Limited and May 2024 for Edan K. Properties.

Recommendation 3: While it may be viewed as in the early stage, DEVCCO and the participating enterprises in the District Cooling pilot project both have expressed the feasibility of replicating the District Cooling pilot scheme. The pilot has unique benefits in that one pilot is in an Industrial Business Park and the other in a community with cluster of buildings and warehouses in close proximity. These settings seem to be quite common in T&T. The experience and knowledge gained by Edan K. Properties Limited can be easily adopted by any new construction of industrial park or malls, residential and commercial buildings in more open areas. Suitable locations in other communities with similar setting of TOSL Engineering may be found and as long as there is sufficient space to accommodate the cooling equipment, the experience and knowledge gained by TOSL can be easily transferred. It is suggested that the project undertake a study already to identify an inventory of such locations and start to promote the idea to attract potential participants/investors.

Recommendation 4: With implementation of the commendable program of early retirement of energy-intensive and low efficiency RAC equipment, as the country does not have the appropriate destruction facility , the program will build up significant old equipment stockpile that may end up in dump sites and also generate enormous amount of wastes. The setting-up of a disposal scheme as a viable business model warrants careful consideration for early implementation.

Recommendation 5: As indicated in the previous section, TOSL Engineering Limited is a trade company with extensive activities in the CARICOM Region. TOSL should be engaged to be an advocate and promoter of District Cooling scheme in the Region, especially when its pilot project would provide valuable data and information for promoting such EE technology.

Recommendation 6: There are only 19 months remaining for the continuing the implementation of project activities, some of which are in much advance stage to achieving intended results, some are still in early stage of implementation, despite recognizing the resilience and the devotion of the Project Team and key stakeholders, strengthened efforts of all parties involved in project implementation will be critical. The MTR recommends that closer cooperation, interaction, and frequent and clear communication channel be recognized and formalized.

Recommendation 7: The experience gained in this project that have contributed to effective inter-governmental coordination, efficient project management and cooperation efforts, yielding excellent project results, should be captured to serve as good example for the design and implementation of future projects, in particular, for countries in the CARICOM Region.

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6. ANNEXES

Annex 1 MTR ToR

Annex 2 MTR evaluative matrix and Example Questionnaire or Interview Guide used for data collection

Annex 3 Ratings Scales

Annex 4 MTR mission itinerary

Annex 5 List of persons interviewed

Annex 6 List of documents reviewed/consulted

Annex 7 Signed UNEG Code of Conduct form

Annex 8 Signed MTR final report clearance form

Annex 9 Audit trail from received comments on draft MTR report

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Annex 1 **MTR ToR**

Terms of Reference.pdf

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Annex 2 MTR evaluative matrix and Example Questionnaire or Interview Guide used for data collection

MTR Evaluation Matrix

Evaluative Questions	Indicators	Sources	Methodology
Project Strategy: To what extent is the project strategy relevant to country priorities, country ownership, and the best route towards expected result			
• How does the Project support the objectives of the UNFCCC and MLF • How does the Project support the related strategic priorities of the GEF?	• Existence of a clear relationship between project objectives and GEF focal area	• Project documents • GEF focal area strategies and documents	• Document analysis • GEF website • Interview with government, Project Team, UNDP and other project partners
• How does the Project support the development objectives of Trinidad and Tobago? • Does the Project adequately take into account the national realities, both in terms of institutional framework and programming, in its design and its implementation? • To what extent were national partners involved in the design and implementation of the Project? • Were the capacities of executing institutions and counterparts properly considered when the project was designed? • How country-driven is the Project?	• Degree of coherence between project objectives and national development priorities, policies and strategies • Level of involvement of government officials and other partners in project design and implementation • Coherence between needs expressed by national stakeholders and UNDP-GEF criteria	• Project documents • National Priority and Implementation Plan • Key project partners	• Document analysis • Interview with government officials and project partners
• How does the Project support the objectives of UNDP in this sector?	• Consistency between project objectives and UNDP strategies and development objectives	• Project document • UNDP strategies and programme	• Document analyses • Interviews with government, UNDP, other partners
• How does the Project support the needs of target beneficiaries? • Is the implementation of the Project been inclusive of all relevant Stakeholders? • Are local beneficiaries and stakeholders adequately involved	• Strength of the link between expected project results from the project and the needs of relevant stakeholders • Degree of involvement and inclusiveness of	• Project partners and stakeholders • Needs assessment studies • Project documents	• Document analysis • Interviews with relevant stakeholders

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Evaluative Questions	Indicators	Sources	Methodology
in Project design and implementation?	stakeholders and beneficiaries in project design and implementation		
• Are there logical linkage between expected results of the project (log frame) and the project design (in terms of Project components, choice of partners, structure, delivery mechanism, scope, budget, use of resources etc.)? • Is the length of the project sufficient to achieve project outcomes?	• Level of coherence between expected project results and project design internal logic • Level of coherence between project design and implementation approach	• Program and project documents • Key project stakeholders	• Document analysis • Key interviews
Progress Towards Results: To what extent have the expected outcomes and objectives of the project been achieved thus far:			
• Has the project been effective in achieving its expected outcomes? o Capacity, institutional arrangement, policy enabling environment established or strengthened; o Effective M&E activities implemented; o National replication options explored, project experience documented and disseminated; o Effective project management carried out and national capacity established and strengthened.	• Indicators in project document results framework and logframe	• Project documents • Project Team and relevant stakeholders • Data reported in project annual and quarterly reports	• Document analysis • Interviews with Project Team • Interviews with relevant stakeholders
• Are some outcomes more advanced than others in their implementation? • What is causing delays in implementation in particular outputs for the project? • Where are the implementation 'bottlenecks'? • Are the demonstrations being developed according to schedule? • How can these issues be solved? • What changes need to be implemented?	• Discrepancies between expected outputs/outcome by the time of Midterm and actual achievements	• Project document • Project Team and relevant stakeholders • Data reported by demonstration entities and Technical Specialist	• Document analysis • Minutes of meetings • Site visits observation • Stakeholder interviews

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Evaluative Questions	Indicators	Sources	Methodology
• What lessons have been learned from the project regarding achievement of outcomes? • What changes could have been made (if any) to the design of the project in order to improve the achievement of the project's expected results?		• Data collected through evaluation	• Data analysis
Project Implementation and Adaptive Management: Has the project been implemented efficiently, cost-effectively, and been able to adapt to any changing conditions thus far? To what extent are project-level monitoring and evaluation systems, reporting, and project communications supporting the project's implementation			
• Was adaptive management used or needed thus far to ensure efficient resource use? How did these modifications to the project continue to achieve the objective • Did the project logical framework and work plans and any changes made to them use as management tools during implementation • Were the accounting and financial systems in place adequate for project management and producing accurate and timely financial information? • Were progress reports produced accurately, timely and responded to reporting requirements including adaptive management change? • Did the leveraging of funds (co-financing) happen as planned? • Was procurement carried out in a manner making efficient use of project resources?	• Availability and quality of financial and progress reports • Timeliness and adequacy of reporting provided • Planned vs. actual funds leveraged • Occurrence of change in project design / implementation approach (i.e. restructuring when needed to improve project efficiency)	• Project documents and evaluations • UNDP • Project Team	• Document analysis • Key interviews
• To what extent partnerships/linkages between institutions / organizations were encourage and supported • What partnerships/linkages were facilitated? Which ones can be considered sustainable? • What was the level of efficiency of cooperation and collaboration arrangements?	• Specific activities conducted to support the development of cooperative arrangements between partners • Examples of supported partnership? • Evidence that particular	• Project documents and evaluations • Project partners and relevant stakeholders	• Document analysis • Interviews

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Evaluative Questions	Indicators	Sources	Methodology
	partnership/linkages will be sustained • Types/quality of partnership cooperation methods utilized		
• Did the project take into account local capacity in design and implementation of the project? • Was there an effective collaboration between institutions responsible for implementing the project?	• National expertise utilized • Number/quality of analysis done to assess local capacity potential and absorptive capacity	• Project documents and evaluations • UNDP • Beneficiaries	• Document analysis • Interviews
• What lessons can be learned from the project regarding efficiency? • How could the project have more efficiently carried out implementation (in terms of arrangement structures and procedures, partnership arrangements etc.)? • What change could have been made (if any) to the project in order to improve its efficiency)?		• Data collected throughout evaluation	• Data analysis
• How and to what extent have project implementation process, coordination with participating stakeholders and important aspects affected the timely project start-up, implementation and closure?	• Relationship and coordination mechanism of project partners • Timeliness of project activities implemented	• Project documents • Project Team and relevant stakeholders	• Document analysis • Key interviews
• Do the outcomes developed during the project formulation still represent the best project strategy for achieving the project objectives?	• Extent of relevance of project outcomes and objectives to changing circumstances	• Project documents • Project Team and relevant stakeholders	• Document analysis • Key interviews
• Does the project consult and make use of skills, experience and knowledge of the appropriate government entities, CSO/NGOs, community groups, private sector, local governments and academic institutions in the implementation and evaluation of project activities?	• National capacities utilized • Number/type of partnership formed	• Project documents • Project Team and relevant stakeholders	• Document analysis • Key interviews

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Evaluative Questions	Indicators	Sources	Methodology
Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?			
Sustainability possibilities	In what way may the benefits from the project are likely to be maintained or increased in the future?	indicators in Project Results Framework and log frame of the Project Document	Project Document and reports
Social sustainability factors	Is there sufficient public/stakeholder awareness in support of the project' s long-term objectives?	Evidence that particular partnerships/linkages will be sustained	MPD, Project Team, UNDP
Political/financial sustainability	Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?	Evidence that particular practices will be sustained	MPD, Local Authorities, Project Team, UNDP, RAC industry, other stakeholders
Replicability and upscaling	Which of the project's aspects deserve to be replicated in future initiatives? How is the upscaling to the entire country is expected to be carried out? What specific tools are being developed for replicability and upscaling?	Evidence that particular practices will be sustained, upscaled and replicated in other installations and localities.	MPD, Local governments, Project Team, UNDP, RAC industry, other stakeholders

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Annex 3 MTR Ratings Scales

No.	Box 4: Progress Towards Results Rating Scale	
6	Highly Satisfactory (HS)	The objective/outcome is expected to achieve or exceed all its end-of-project targets, without major shortcomings. The progress towards the objective/outcome can be presented as "good practice".
5	Satisfactory (S)	The objective/outcome is expected to achieve most of its end-of-project targets, with only minor shortcomings.
4	Moderately Satisfactory (MS)	The objective/outcome is expected to achieve most of its end-of-project targets but with significant shortcomings.
3	Moderately Unsatisfactory (HU)	The objective/outcome is expected to achieve its end-of-project targets with major shortcomings.
2	Unsatisfactory (U)	The objective/outcome is expected not to achieve most of its end-of-project targets.
1	Highly Unsatisfactory (HU)	The objective/outcome has failed to achieve its midterm targets, and is not expected to achieve any of its end-of-project targets.

No.	Box 5 Project Implementation & Adaptive Management Rating Scale	
6	Highly Satisfactory (HS)	Implementation of all seven components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as "good practice".
5	Satisfactory (S)	Implementation of most of the seven components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action.
4	Moderately Satisfactory (MS)	Implementation of some of the seven components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.
3	Moderately Unsatisfactory (MU)	Implementation of some of the seven components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.
2	Unsatisfactory (U)	Implementation of most of the seven components is not leading to efficient and effective project implementation and adaptive management.
1	Highly Unsatisfactory (HU)	Implementation of none of the seven components is leading to efficient and effective project implementation and adaptive management.

Box 6: Sustainability Rating Scale	
Likely (L)	Negligible risks to sustainability, with key outcomes on track to be achieved by the project's closure and expected to continue into the foreseeable future
Moderately Likely (ML)	Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review
Moderately Unlikely (MU)	Significant risk that key outcomes will not carry on after project closure, although some outputs and activities should carry on
Unlikely (U)	Severe risks that project outcomes as well as key outputs will not be sustained

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Annex 4 MTR mission itinerary

MTR MISSION SCHEDULE AND ACTIVITIES – Monday 12th December 2022 to Monday 19th, 2022

Date	Time	Details	Location	Participants/Contacts
Sunday, 11 December 2022		Arrival		
Monday, 12 December 2022	8:00 am – 9:30 am	Virtual meeting / Interview o DEVCCO (pilot activities, technical, performance and financial reports)	Virtual	PM and DEVCCO District Cooling Specialists, Mr. Lars Haargo and Mr. Anders Holqvist
	9:30 am - 10:00 am	Pre-Kickoff meeting Discussions with UNDP CO, Project Team and MPD (to finalize presentation of kick-off meeting)	MPD	UNDP, Project Team, MPD
	10:00 am – 11:00 am	Kick-off Meeting of MTR		UNDP, Project Team, MPD, members of the Project Steering Committee (PSC)
	11:00 am – 3: 00 pm	Discussions with Project Steering Committee, Project Team and MPD Meet with members of the PSC - MPD - ARIA o RAC industry/market status, Technician Training, marketing, EE, technologies - TTBS o Policy, regulatory, institutional o Standards/Labelling/EE/ coordination		
Tuesday, 13 December 2022	10:00 am – 12:00 pm 1:00 pm – 3:00 pm	Meeting with Programme Officer – Energy Environment and Disaster Management Meeting with UNDP Project Team (COS/NIM, procurement and financial matters etc.)	Virtual UNDP Small Conference Room	Programme Officer Operations team Deputy RR
Wednesday, 14 December 2022	9:00 am – 3:00 pm	Meeting/interview with Project Team (Update on project activities, achievements, bottlenecks etc.) Green procurement/Green Financial Framework, market transformation Public Awareness	UNDP CO	PMU, MPD Janille Huggins, Jonathan Bolai, Andrew Dalip (virtual), Candice Williams, Viveka Jackson, Muhammad Jaleel
Thursday, 15 December 2022	10:00 am – 12:00 pm	Site Visit to Marabella DS Concept Pilot project location	TOSL Engineering	Project Team

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			Limited, Marabella	TOSL Engineering Limited: Mr. Dave Ramnarine, Team Lead, Chemical Process and Asset Integrity; Mr. Russell Boodoo, Manager, Business Developent & Marketing; Mr. Sade Khan, Manager, Project Controls and Estimating; Ms. Auisha Mahabir, Project Engineer; Ms. Danelle Dhaniram, HSSEQ Manager
	1:00 pm – 3:00 pm	Site visit to Couva DS Concept Pilot project location	Edan K Properties Offices ,Marabella	Project Team, UNDP, Edan K. Properties Limited; Mr. Nyal Khan, Executive Director; Mr. Nigel A. Ali, Project Manager
Friday, 16 December 2022	9:00 am – 10:15am	TTBS: Energy Efficiency Testing Laboratory	TTBS	Mr. Doodnath Singh, Standard Officer, Energy Efficiency Lighting Laboratory; Ms. Nadits Raachanala
Saturday, 17 December 2022	TBD	Review documents and reports	Virtual	
Sunday, 18 December 2022		Rest Day		
Monday 19th December 2022	9:00 am – 12:00 pm	Review documents and follow-up	Virtual	
	2:00 pm – 3:30 pm	Presentation of initial findings/Wrap up meeting	Virtual	Key Stakeholders: -MPD - UNDP Programme Officer -PMU -Regional Technical Advisor (virtual)
Tuesday 20th December 2022		Departure		

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Annex 5 List of persons consulted/interviewed during MTR mission (In-person or virtual meeting)

Name	Position
Ministry of Planning and Development (MPD)– Implementing Partner	
Ms. Marissa Gowrie	Deputy Environmental Manager; Chairwoman, Project Board
Mr. Jonathan Bolai	Ozone Specialist
Trinidad and Tobago Bureau of Standards (TTBS)	
Ms. Kimberly Badloo	
Ms. Renee Abass	Head, Laboratory Services Division
Ms. Nadits Raachanala	
Mr. Doodnath Singh	Standard Officer, Energy Efficiency Lighting Laboratory
Project Management Unit	
Mr. Anselm Simon	Project Manager/Coordinator
Ms. Janille Huggins	Project Finance and Administrative Officer
Mr. Viveka Jackson	Project Officer – GEF and Montreal Protocol
Mr. Mohammed Ronaldo Jaleel	Energy Efficiency Specialist
Mr. Andres Dalip	Legal Expert
Ms. Candice Williams	Monitoring and Evaluation Officer
Ms. Patricia Lara	Procurement Associate
Air Conditioning & Refrigeration Industry Association (ARIA)	
Mr. Robert Nunez	Director
District Cooling Demonstration	
TOSL Engineering Limited	
Mr. Dave Ramnarine,	Team Lead, Chemical Process and Asset Integrity;
Mr. Russell Boodoo	Manager, Business Development & Marketing
Mr. Sade Khan	Manager, Project Controls and Estimating;
Ms. Auisha Mahabir	Project Engineer
Ms. Danelle Dhaniram	HSSEQ Manager
Edan Properties Limited	
Mr. Nyal Khan	Executive Director
Mr. Nigel A. Ali	Project Manager
United Nations Development Programme, GEF Implementing Agency	
UNDP Trinidad and Tobago Country Office	
Ms. Sharifa AL-ABDULLAH	Assistant Resident Representative

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Ms. Rosemary LALL	Programme Officer
Ms. Beverly Charles	Operations Manager
Ms. Lisa Maria Clarke	HR Associate
UNDP NCE Panama Regional Hub	
Mr. Kasper Koefoed-Hansen	UNDP-NCE Technical Advisor
Ms. Paloma Somohano	UNDP-NCE Regional Programme Specialist
District Cooling Technical Specialist, DEVCCO	
Mr. Lars Haargo	Partner, District Cooling Specialist
Mr. Anders Holqvist	Partner, District Cooling Specialist

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Annex 6 List of documents reviewed/consulted

- PIF
- UNDP Initiation Plan
- UNDP Project Document
- UNDP Social and Environmental Screening Procedures (SESP)
- Project Inception Workshop Report and Project Implementation Reports (APR/PIR's)
- Quarterly progress report and work plans of the various implementation task teams
- Finalized GEF Focal Area Core Indicators at CEO endorsement and midterm
- Minutes of meetings of the Project Steering Committee
- Minutes of Tripartite Meeting
- Minutes of Project Team meetings
- Oversight mission reports
- All monitoring reports prepared by the Project
- Annual Operational Plans (AOPs/POAs)
- Local consultant's reports and products
- District Cooling Specialist reports
- Memorandum of Agreements
- Contracts and Addendums
- Project operational guidelines, manuals and systems
- Project site location maps
- UNDP Combined Delivery Reports
- UNDP Accounts Activity Analysis
- Articles, Publications, flyers, Webinar contents, Project Website

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Annex 7 Signed UNEG Code of Conduct form

ToR ANNEX C:

UNDP-GEF Midterm Review Terms of Reference ANNEX D: UNEG Code of Conduct for Evaluators/Midterm Review Consultants[1]

Evaluators/Consultants:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

MTE Consultant Agreement Form

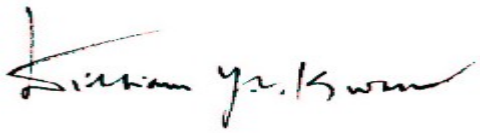
Agreement to abide by the Code of Conduct for Evaluation in the UN System:

Name of Consultant: _Yiu Chiu William Kwan

Name of Consultancy Organization (where relevant): N/A

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at New York on 5 March 2023

Signature: 

[1] www.undp.org/unegcodeofconduct

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Annex 8 Audit Trail From Received Comments on the Draft MTR Report

Incorporation of the comments received on 17 May 2023 from the Midterm Review of Project *UNDP PIMS ID 5957, Energy Efficiency through the Development of Low-carbon RAC Technologies in Trinidad and Tobago*

The following comments were provided to the draft Midterm Review Report; they are referenced by the Project Manager of the project ("Author" column) and track change comment number ("#" column):

Author	#	Para No./ comment location	Comment/Feedback on the draft MTR report	MTR Team response and actions taken
Project Manager	1	**Section 5.2, Recommendation 1:** Project Team and Government Authorities to follow-up and push forward moving the two EE Labelling Standards for Air-conditioners and Refrigeration Appliances from voluntary to compulsory Standards	We understand the importance of moving the EE Labelling Standards to compulsory standards. We will work closely with concerned government authorities to expedite the process and ensure the enforcement and restriction of non-EE equipment imports	Noted project's acknowledgement of the recommendation and will be taking appropriate action
Project Manager		**Section 5.2, Recommendation 2:** Close monitoring and follow-up on the progress of the two District Cooling pilot projects to prevent any slippage in project completion beyond the planned operation completion of project	Given the late start of the District Cooling pilot projects, we agree on the need for close monitoring of their implementation and progress. Our project management unit (PMU) and all stakeholders will regularly interact with the responsible parties to avoid unnecessary delays.	Recommendation acknowledged by the project and will undertake follow-up and monitoring actions to ensure timely implementation of activities at the two pilot locations to ensure on-time completion of the pilot projects
Project Manager		**Section 5.2, Recommendation 3:** Identify inventory of potential enterprises and	We acknowledge the feasibility of replicating the District Cooling pilot scheme in various settings. We will initiate a study to identify suitable locations and promote the idea to	Project's effort to undertake feasibility study to identify and promote replication will contribute further project impacts

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		locations to participate in replication of District Cooling scheme	attract potential participants and investors	
Project Manager		**Section 5.2, Recommendation 4:** Establish mechanism to address accumulation of replaced RAC equipment and to address waste generated as a result of early retirement of energy-intensive, low-efficiency equipment	We recognize the importance of using a disposal scheme for retired RAC equipment to avoid environmental concerns. We will carefully consider implementing a viable business model to address this issue.	Project's further action in exploring the establishment of a disposal scheme for retired RAC equipment will contribute to sound management of wastes generated.
Project Manager		**Section 5.2, Recommendation 5:** Enlist TOSL Engineering Limited as advocate and promoter to promote District Cooling scheme in CARICOM Region	We appreciate your suggestion of engaging TOSL Engineering Limited as an advocate and promoter of the District Cooling scheme in the CARICOM Region. We will establish collaboration with TOSL to leverage their extensive activities and experience	The action by the project will help to promote and replicate District Cooling technology in the region
Project Manager		**Section 5.2, Recommendation 6:** Leverage implementation experience to be model for other project including projects in the CARICOM Region	We acknowledge the value of capturing the project's experience in effective inter-governmental coordination and commit to both the continued capture and dissemination during the remaining implementation period of the project.	Knowledge sharing will help to promote low-carbon technology in RAC in the region
Project Manager		**Section 5.2, Recommendation 7:** Close cooperation, interaction, and frequent and clear communication channel be recognized and formalized amongst Project Team and key	We understand the criticality of closer cooperation, interaction, and clear communication channels among all parties involved in the project implementation. We will formalize and strengthen these aspects to ensure efficient progress in the remaining 16 months	The efforts of the Project Team and key stakeholders will further enhance project implementation and ensure efficient and effective achievement of project results and impacts

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		stakeholders to strengthen efforts in project implementation for the remaining 19 months.		

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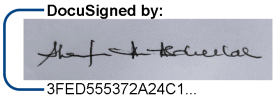
Annex 9 Signed MTR Final Report Clearance form

Midterm Review Report Reviewed and Cleared by:

Commissioning Unit

Name: Sharifa Ali-Abdullah

Signature: DocuSigned by:  3FED555372A24C1...

Date: 25-May-2023

UNDP-GEF NCE Regional Technical Advisor

Name:

Signature:

Date: